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ABSTRACT

The study explored the feasibility of deriving an educationally relevant occupational cluster structure based on Occupational Analysis Inventory (OAI) work dimensions. A hierarchical cluster analysis was applied to the factor score profiles of 814 occupations on 22 higher-order OAI work dimensions. From that analysis, 73 occupational clusters were identified and interpreted. Although those clusters were for the most part individually meaningful, the desired hierarchical pattern of clustering did not emerge in an interpretable form, and 155 of the 814 occupations in the sample failed to cluster in a logical manner at any stage of the hierarchical process. Several factors are considered that may have attenuated the clarity of the hierarchical structure. There is a long review of literature and a brief description of the clusters grouped under the following occupations: technical/scientific, business/organizational, clerical, sales/service, health-related, teaching/counseling, art/decorative, stationary machine operating, service/repair of electrical and mechanical systems, environmental/earth-working, and manual. Nearly half of the document comprises appendixes treating: importance scale, occupational clusters formed on the basis of OAI-derived higher-order work dimensions, and mean work-dimension and attribute-requirement profiles for 73 OAI-derived occupational clusters. (Author/PR)

CLUSTERS OF OCCUPATIONS BASED ON SYSTEMATICALLY DERIVED WORK DIMENSIONS:

AN EXPLORATORY STUDY

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CLUSTER OF OCCUPATIONS BASED ON SYSTEMATICALLY DERIVED WORK DIMENSIONS: An Exploratory Study

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PREFACE

This is the tenth report in the Ergometric Research and Development Series dealing with the development of a quantitative occupational taxonomy applicable to occupationally related education and guidance. The basic instrument in that taxonomic effort is the Occupation Analysis Inventory (OAI), designed to describe jobs and occupations in terms of (a) the various kinds of work activities and conditions involved and (b) the measurable human attributes (cognitive, psychomotor, and affective) required by those activities and conditions. The study reported here explored the feasibility of deriving an educationally relevant occupational cluster structure based on selected OAI variables.

The authors and the program director wish to express their appreciation to Dr. Raymond E. Christal, Dr. Thomas C. Tuttle, and other staff members of the Occupational and Career Development Branch of the Personnel Research Division, Lackland Air Force Base, for processing the OAI data through their CODAP program. Without their help, this study could not have been accomplished. Our thanks also to Mrs. Cynthia White and Mr. Douglas Champion, for computer programming assistance; Mrs. Faye Childers and Mrs. Evelyn Butler, for keypunching the data; Mrs. Joyce Pollard and Mrs. Olive Maynard, for typing and assembling the report; Mrs. Sue King, for assisting in editing and proofing; Mr. Clarke Knorr, for designing the cover and assisting in the duplication; and the entire Center clerical and technical staff for contributing to the production of this report.

Donald W. Drewes
DASP Program Director

ABSTRACT

In a previous study, a set of basic work dimensions was derived through factor analyses of job ratings on an Occupation Analysis Inventory (OAI) containing 622 work elements describing different kinds of work activities and conditions. The study reported here explored the feasibility of deriving an educationally relevant occupational cluster structure based on the OAI work dimensions. Pursuant to that purpose, a hierarchical cluster analysis was applied to the factor score profiles of 814 occupations on 22 higher-order OAI work dimensions. From that analysis, 73 occupational clusters were identified and interpreted. Although those clusters were for the most part individually meaningful, the desired hierarchical pattern of clustering--i.e., broad, general occupational clusters subsuming clusters that are narrower in scope--did not emerge in an interpretable form, and 155 of the 814 occupations in the sample failed to cluster in a logical manner at any stage of the hierarchical process. Several factors are considered that may have attenuated the clarity of the hierarchical structure. Based on those considerations, a second, larger study has been initiated in an effort to derive an OAI-based occupational cluster structure applicable to occupationally related education and guidance.

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INTRODUCTION AND PURPOSE

Previous reports in the Ergometric Series have documented the need for a quantitatively based system to describe and structure the world of work for educational and guidance purposes (Cunningham, 1969, 1971; Cunningham, Tuttle, Floyd, and Bates, 1971). It was pointed out that although some other fields (most notably biology) have invested considerable time and effort in systematic taxonomy development, the area of work and occupational taxonomy remains relatively undeveloped, especially in relation to educational needs. In this regard, it was proposed that the currently existing technology in "ergometrics" (the psychometric study of human work) be applied to gathering and organizing information from the work domain that could be used in such areas as occupational exploration and guidance, occupationally related curriculum analysis and development, and occupationally related test development.

The ergometric project, initiated in accordance with that proposed application, was conceived as an effort to develop a quantitatively based system designed to describe, compare, and group occupations for educational purposes. From its inception, it was recognized that the resulting system would be limited in both scope and specificity of information, since the development of a comprehensive taxonomy of human work will require some years of integrated effort by a number of investigators. Nevertheless, it seemed feasible to develop an initial, albeit limited, taxonomic system that would serve some educational purposes.

To that end, the staff of the ergometric project have been engaged during the past few years in the development and validation of a comprehensive set of occupational variables, or descriptors, based on the Occupation Analysis Inventory (OAI). The present study involved an exploratory effort to derive clusters containing occupations with similar profiles on selected OAI variables. Since the study was part of a larger effort, the remainder of this section will be devoted to a brief overview of the entire ergometric project.

Background of Present Study

The first phase of the ergometric project involved the development of the Occupation Analysis Inventory (OAI), a job-rating instrument containing 622 "work elements," or descriptions of work activities and conditions (Cunningham, Tuttle, Floyd, and Bates, 1971). In constructing the OAI, Cunningham et al. applied the procedures of E. J. McCormick and his associates in an attempt to develop an instrument applicable to problems in occupationally related education, particularly guidance and curriculum analysis and development. Accordingly, the OAI was designed to achieve as detailed a level of description as possible, while retaining applicability to the general population of jobs and occupations.

The work elements in the OAI were organized into the following five categories corresponding to the major components in an information-processing paradigm: (1) Information Received, (2) Mental Activities, (3) Work Behaviors, (4) Work Goals, and (5) Work Context. These major categories were further divided into subcategories according to selected concepts and theories pertaining to human behavior and work technology.

Upon completion of the instrument, an effort was made to link the OAI work elements, which describe work in terms of observable events (activities and conditions), to descriptions of measured human attributes in the cognitive, affective, and psychomotor domains (Neeb, Cunningham, and Pass, 1971). For this purpose, the investigators had 10 advanced graduate students in psychology assign ratings on the relevance of each of 103 defined human attributes to each of the 622 OAI work elements. The average rating of each OAI work element on each attribute constituted an attribute-requirement weight for that element. In this manner, estimated attribute-requirement profiles were derived for the OAI work elements, and these profiles, in turn, provided the data base for subsequent analyses to be described below.

The next phase of the ergometric project involved the derivation of a comprehensive (though tentative) set of work dimensions that could be used in describing, comparing, and classifying jobs and occupations for educational purposes. Work dimensions were independently derived from two separate data bases, though the procedures employed were essentially the same for each data set.

The first set of dimensions was derived from the attribute ratings of the OAI elements as mentioned above (Neeb et al., 1971). Specifically, work elements were intercorrelated within major OAI sections based on their attribute-requirement profiles, and the resulting correlations were employed in six separate principal components analyses. These analyses produced a total of 77 first-order factors, all of which were interpreted. Next, the first-order factors, or work dimensions, were subjected to a factor analysis which yielded 21 general, higher-order factors.

The second set of data consisted of the ratings of a representative sample of 814 occupations on the OAI work elements (Riccobono and Cunningham, 1971a, 1971b). Professional job analysts and trained graduate students were employed for this purpose. Ratings were based on written job descriptions drawn from the files of the U. S. Employment Service. Inter-rater reliabilities of the OAI work elements were computed based on a subsample of 134 occupations rated by two or more analysts, and 177 work elements were eliminated from further analyses because of either unreliability or infrequency of non-zero ratings. Based on the entire sample of 814 occupations, the remaining items were then intercorrelated within seven major sections of the OAI, and the resulting correlation matrices were subjected to separate principal components analyses. Those seven sectional analyses yielded a total of 90 first-order factors which were, in turn, factor analyzed yielding 22 interpretable higher-order factors, or work dimensions. It should be added that the factor structures

resulting from both data sets (i.e., attribute ratings and job ratings) were tested for replication by the application of Tucker's coefficient of congruence across split samples, and were found to be reasonably stable.

The factors, or work dimensions, obtained from the two forenamed data bases are subject to different interpretations: the first set represents classes of work elements (activities and conditions) that tend to have similar human attribute requirements (Neeb et al., 1971), and the second set represents classes of work activities and conditions that tend to coexist in jobs and occupations (Riccobono and Cunningham, 1971b). Jeanneret and McCormick (1969) have suggested that the relative utility of the two sets of factors is probably dependent upon the particular purpose for which they are intended. An important point, however, is that both sets of factors represent work activities and conditions and that, using either set, occupations can be described in terms of their quantitative work-dimension profiles. Furthermore, since these work dimensions are composites of elements that are weighted in terms of their human attribute requirements, the work-dimension profiles for occupations can be transformed into attribute-requirement profiles. (The procedure for accomplishing this transformation is described by Tuttle and Cunningham, 1972.) Thus, any job or occupation rated on the OAI can be quantitatively described in terms of: (a) a profile of scores on work dimensions (factors) representing different types of work activities and conditions (people, as well as occupations, could be characterized on these dimensions), and (b) a profile of scores representing the occupation's estimated requirements for defined human attributes (i.e., general vocational capabilities, cognitive and psychomotor abilities, etc.) for which there are standardized tests.

Following the derivation of the aforementioned OAI variables, two construct validity studies were conducted (Tuttle and Cunningham, 1972; Bates and Cunningham, in press). The rationale for those studies was that if the OAI variables were actually relevant to work-related human behavior, then it should be possible to demonstrate statistically significant relationships between those variables and the behavioral potentials measured by selected tests and inventories. In combination, the results of the two studies showed significant relationships between (a) the OAI work-dimension scores and attribute-requirement estimates for a sample of occupations and (b) the ability, interest, need, and satisfaction scores of incumbents and graduate trainees in those same occupations. Thus, the studies conducted to date have provided some evidence that the OAI variables are meaningful, reliable, and construct valid (within the limits of the two aforementioned studies).

Purpose of the Study

Although the OAI variables might have proved immediately useful in analyzing and describing individual occupations and occupational education programs, the investigators were more interested in applying

those variables to the derivation of an occupational cluster structure. The envisaged structure would be comprehensive in scope and hierarchically arranged, such that a set of rather broad (macro) occupational clusters would subsume a larger number of narrower (micro) clusters. The resultant framework, along with its descriptive variables and an instrument to measure them (i.e., the OAI), could find a number of uses in occupationally related education and guidance (Cunningham et al., 1971).

The purpose of the present study was to explore the feasibility of developing an educationally relevant occupational cluster structure based on the OAI work dimensions.

REVIEW OF THE LITERATURE

The Review portion of this report is divided into three major topics: (1) existing occupational taxonomies; (2) essential components of classification, including profile similarity indices and clustering methods; and (3) the comparison and evaluation of clustering methods.

Existing Occupational Taxonomies

A variety of occupational description and classification systems can be found in the literature. Several of the most prominent of these schemes, as well as some lesser known but more systematic taxonomic efforts, will be described in this section.

A major effort to develop a comprehensive taxonomy of occupations was made in a program conducted by the United States Employment Service (USES), culminating in 1965 with the publication of the Third Edition of the Dictionary of Occupational Titles (DOT). As early as 1951, Studdiford proposed a new classification scheme which would ". . . group jobs which are alike with respect to fundamental work activities and worker requirements" (p. 37). The Functional Occupational Classification Project (FOCP), as it was called, included the following eight classification components (or criteria): (1) work performed, (2) knowledges and abilities, (3) aptitudes, (4) physical demands, (5) temperament and interests, (6) working conditions, (7) industry, and (8) training time. Each of these components was further subdivided into several factors or levels. The eight components were arrived at "rationally" through a series of discussions. The FOCP aptitudes, physical demands, temperaments and interests, and training time components served as a basis for the later development and description of 114 DOT "worker trait groups" containing occupations with similar trait requirements. These worker trait groups are assigned to 22 broad occupational areas.

The functional job analysis system developed by the USES in connection with the occupational classification project has been described by Fine (1955). The system was designed to analyze the "work performed" component of an occupation in terms of three subcomponents: worker functions; materials, products, and subject matter; and methods groups. Worker functions indicate what the worker does and are expressed by means of "work-action verbs." A total of 27 worker functions were organized into three hierarchies based on the premise that all occupations require workers to function in relation to "data," "people," and "things." Any particular function in a hierarchy includes all those which fall below it and is, in turn, subsumed under all functions which lie above it. One function from each hierarchy is needed to express the worker's total relationship to what gets done in the job. Thus, in the DOT classification scheme, a job is assigned a weight of

zero to eight on each of the functional hierarchies as illustrated in Table 1; these weights constitute estimates of the level of functioning and the relative importance of data, people, and things in the job.

Table 1. DOT Worker Functions

Data	People	Things
0 Synthesizing	0 Monitoring	0 Setting-up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
3 Compiling	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking-Signaling	6 Feeding-Offbearing
7 No significant relationship	7 Serving	7 Handling
8 No significant relationship	8 No significant relationship	8 No significant relationship

Another well-known occupational classification model has been proposed by Roe (1956). Under this scheme, occupations are first classified into groups, or fields, according to their primary focus of activity. The group categories are: Service, Business Contact, Organization, Technology, Outdoor, Science, General Cultural, and Arts and Entertainment. Within each group, occupations are also classified into six hierarchical levels, with each successive level requiring more responsibility, capacity, and skill than those falling below it. The level categories used are: Professional and Managerial, higher; Professional and Managerial, regular; Semi-professional and Entrepreneur; Skilled; Semi-skilled; and Unskilled. This classification scheme is represented by an 8 x 6 matrix, and any particular occupation will fall into one of 48 possible cells. With the exception of "Outdoor," the fields are arranged so that the ". . . contiguous ones are more closely related than non-contiguous ones . . . . The arrangement should be thought of as circular" (pp. 144-145). It is not clear why Roe selected these particular group and level classifications, although some relationships with interest factors and other classifications of occupations are noted.

An empirical test of Roe's structure of occupations was conducted recently by Meir (1970). In this study, a total of 1,114 boys in their last year of elementary school were divided into three samples. Each sample was given one of three interest questionnaires containing 117 randomly ordered occupational titles. The three sets of occupations had been selected and classified into Roe's 48 categories by experienced

occupational counselors. Although the number of occupations per category varied, each category was represented by no fewer than three occupations. Subjects were asked to indicate whether or not they liked or were interested in each occupation. The responses for each category were then scored and weighted to equalize the total scores for all categories, and, for each of the three samples, intercorrelations were computed among the categories. Based on Roe's structure, it was hypothesized that a graded order of levels in each field and a circular structure of fields in each level would be reflected by the obtained correlational patterns.

The results only partially supported the hypothesis. Occupations were found to be arranged in a hierarchical structure of levels within fields. However, examination of the sequence of correlations between the fields in each level did not support Roe's position regarding the circular structure of the fields. Instead, through subsequent component analysis, two substructures were established. The first substructure was defined by five fields: Service, Organization, Business Contact, Technology, and Outdoor. This substructure was confirmed in the higher levels but was less clear-cut in the lower levels. Four fields comprised the second substructure: Business Contact, Service, General Cultural, and Science. This substructure was confirmed in all levels. One of the eight fields--Art and Entertainment--was not included in either substructure. Meir concluded that since the same results were obtained in three replications (a separate component analysis was performed on each of the three questionnaire data sets), "considerable generalization is possible . . . [and] . . . on the basis of the structures found, more accurate occupational counseling can be provided" (p. 48).

Super (1957) has proposed a three-dimensional system for classifying occupations which is very similar to Roe's structure. Thus, occupations are classified into eight fields and, within each field, into six levels. The field categories are: Outdoor-Physical, Social-Personal, Business-Contact, Administration-Control, Math-Physical Sciences, Biological Sciences, Humanistic, and Arts. The level categories correspond to Roe's six levels. In Super's model, occupations are also classified on the basis of "enterprise." The enterprise dimension is broken down into nine industrial or business areas: Agri-Forest, Mining, Construction, Manufacture, Trade, Finance, Transport, Services, and Government. These distinctions seem to be implicitly made in Roe's two-dimensional structure, although she emphasizes field rather than enterprise as the horizontal dimension.

Holland (1959) has proposed a two-dimensional system for classifying occupations based on a theory of personality types. The first dimension, "occupational environments," is divided into six major categories: (1) Motoric (technical, skilled, and laboring occupations), (2) Intellectual (scientific occupations), (3) Supportive (educational and social welfare occupations), (4) Conforming (office and clerical occupations), (5) Persuasive (sales and managerial occupations), and

(6) Aesthetic (artistic, literary, and musical occupations). The second dimension consists of four hierarchical levels of occupational choice within each environmental category. The particular level of choice is assumed to be a function of the individual's intelligence and self-evaluation.

Since 1959, Holland's classification scheme has undergone several revisions and has been extended to include 431 occupations comprising approximately 95 percent of the labor force. Moreover, Holland et al. (1970) have recently attempted to validate his scheme against the 32 PAQ (Position Analysis Questionnaire) job dimensions derived by Jeanneret and McCormick (1969). This was accomplished by having judges assign 832 occupations from the Jeanneret and McCormick sample to five of the Holland categories. (The aesthetic category had to be omitted because the Jeanneret and McCormick sample contained only two artistic occupations.) A one-way analysis of variance was then performed across the five Holland categories for each of the 32 PAQ dimensions, i.e., treating the five Holland categories as the independent variable and the PAQ factor scores for occupations as dependent variables. All but one of the 32 separate analyses of variance were significant ($p < .001$), supporting the conclusion that ". . . the Holland classification, developed almost entirely from psychological data, also encompasses more objective, situational data about jobs" (Holland et al., 1970, p. 17).

An interesting conceptual approach to the description and classification of occupations has been reported by Hamreus and Langevin (1967). These investigators have developed a two-dimensional task classification scheme incorporating the DOT worker function categories (Fine, 1955; Fine and Heinz, 1958) and a hierarchical set of mental processes adopted from Altman (1966). The total classification scheme is represented in a function-by-process grid containing 220 cells.

In an application of their classification system, Hamreus and Langevin chose a sample of occupations from each of the following content categories identified by Altman (1966): Mechanical, Electrical, Spatial, Chemical-Biological, Symbolic, and People. An attempt was made to obtain a sample possessing the following three characteristics: (1) occupations requiring some vocational education pre-training, (2) a wide variety of tasks among occupations, and (3) tasks that logically cluster into similar groups. The occupations in the sample were first analyzed for the purpose of identifying their basic task components; one or two basic tasks were selected from each occupation for subsequent analysis. Descriptions were then written for each of 27 selected basic tasks. The action statements making up these descriptions constituted the basic elements of analysis in the study. Every task action under each of the 27 basic tasks was assigned to one or more of the cells in the function-by-process matrix. This classification procedure involved the following steps: (1) analysis of the action in terms of its relevance to things, data, and people; (2) assignment of a function level to the action, under each of the three DOT worker function categories (things, data, and people); and (3)

determination of the level of mental process required to perform each of the assigned functions. Through this procedure, every task action was assigned one or more three-element codes, each code representing a cell in the function-by-process grid. Next, similarity indices were computed between each pair of basic tasks based on commonalities in the classification of their task action statements, and a cluster analysis procedure (Silverman, 1966) was applied to the resulting matrix of similarity indices. Three clusters, ranging in size from 3 to 11 basic tasks each, emerged from this analysis. When the basic tasks in these clusters were substituted with the titles of their respective occupations, the three clusters were found to be characterized by (1) drafting occupations, (2) truck repair occupations, and (3) electronics and welding repair occupations. Hamreus and Langevin cautioned that though these clusters have "high face validity," it would be unwise to generalize from these results because of the rather limited number of occupations and basic tasks employed in the study. It was further noted, however, that these results do have implications for developing vocational training curricula ". . . having a much broader base than is presently the case" (Hamreus and Langevin, 1967, p. 76).

McCormick, Finn, and Scheips (1957) used the worker traits of the United States Employment Service in a systematic effort to derive an occupational cluster structure. These investigators factor-analyzed 44 variables on which 4,000 occupations had been rated by USES job analysts. The variables fell into six major classes: training time, aptitudes, physical capacities, temperaments, interests, and working conditions. The factor analysis of the ratings yielded seven factors: (1) Mental and Educational Development vs. Adaptability to Routine, (2) Adaptability to Precision Operations, (3) Bodily Agility, (4) Artistic Ability and Aesthetic Appreciation, (5) Manual Art Ability, (6) Personal Contact Ability vs. Adaptability to Routine, and (7) Heavy Manual Work vs. Clerical Ability. Next, factor scores were derived for each of the 4,000 occupations by the Wherry-Doolittle test selection method. Factor score distributions for each factor were then examined and divided into "levels." Scores for one factor were categorized as "High," "Average," and "Low"; scores for the six remaining factors were dichotomized into "High" and "Low" categories. All possible permutations of these levels resulted in 192 unique combinations or "patterns" of factor scores. Most of the occupations, however, fell into a relatively small percentage of these patterns: 12 patterns accounted for 60 percent of the occupations in the sample, 20 patterns for 75 percent of the occupations, and 33 patterns for 88 percent of the occupations. The entire sample of occupations was accounted for by 115 patterns. The investigators were encouraged by these findings and concluded that ". . . jobs collectively do not scatter themselves to the four winds as far as job requirements are concerned, but rather tend to fall into certain predominant molds" (p. 363).[1]

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[1]McCormick and his associates are currently involved in the development of an occupational cluster structure based on work dimensions (factors) derived from the Position Analysis Questionnaire. The approach being taken is very similar to the one reported in the present study in that the resultant clusters will contain jobs involving similar activities and conditions as defined by the PAQ work dimensions (personal communication with E. J. McCormick, September, 1974).

Another investigation employing the USES trait ratings as a basis for clustering occupations was conducted by Orr (1960). In this study, Osgood and Suci's distance measure (see p. 14) was applied as a statistic for grouping occupations into relatively homogeneous clusters with regard to nine GATB aptitudes: Intelligence, Verbal, Numerical, Spatial, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. Separate cluster analyses were performed on two independent random samples of 140 occupations. Based on the graphic procedure suggested by Thorndike (1953), six was identified as the optimum number of clusters for the data, and each sample was clustered on the basis of this number. The six clusters from the first sample were then matched (based on distances between mean cluster profiles) with those from the second sample to establish six pairs of comparable clusters. Next, each of the 28 occupations of a third, "validation" sample were assigned to one of the clusters obtained from each of the original samples on the basis of its distance score from the various mean cluster profiles.

The results suggested that the clustering technique used in this study was reasonably consistent and workable: 75 percent of the occupations in the third sample fell into matched clusters, and 90.6 percent of them fell into the closest or next closest to the matched cluster in both samples. In addition, the six clusters obtained in this study seemed reasonable and describable in terms of patterns of aptitudes. Three basic "kinds" of clusters were identified: intellectual-supervisory, mechanical-manual, and clerical. Within these three types, clusters were differentiated on the basis of level of aptitudes required for successful performance. Based on his findings, Orr concluded that the clustering technique employed ". . . appears to hold some promise for dealing with the classification and functional structure of various job domains" (p. 49).

An attempt to derive educationally relevant occupational clusters was reported by Sjogren, Schroeder, and Sahl (1967). Their review of the literature on job analysis, job evaluation, psychomotor behavior, and cognitive behavior revealed five major categories of work activities: physical, intellectual, discrimination, decision-making and responsibility, and communication. A total of 42 activity items were defined within these five categories, and the following rating scales were developed for use with the items: Variety, Precision, Importance, Speed, Frequency, Complexity, and Strength. From four to seven of these scales were assigned to each of the 42 items; an analysis of of a job on the items yielded over 200 separate ratings. The instrument also included a check list of general work environment items, supervision activities, clerical activities, physical activities, and personal contact activities. In addition, certain scores from the DOT worker trait groups were obtained for each occupation, making a total of 329 measures per occupation for inclusion in subsequent data analyses. With the exception of the worker trait group scores, the data were collected through interviews with five or six job incumbents in each of 83 selected occupations in the agricultural and metal-working industries. A total of 466 incumbents were interviewed.

Preparatory to their analyses, Sjogren et al. computed the mean score on each of the 329 variables for each of the 83 occupations. These mean scores were then intercorrelated among occupations to produce three matrices: a matrix of correlations among the 47 agricultural occupations, a matrix for the 36 metal-working occupations, and a matrix for all 83 occupations. Factors extracted from transpose analyses of these separate matrices were interpreted as clusters of occupations with similar behavioral requirements. The 83 x 83 matrix of intercorrelations among all occupations yielded four significant factors, defined as: an industrial work cluster, a business cluster, a production agriculture cluster, and a technical or skilled worker cluster. The behaviors characterizing each cluster (or factor) were identified by comparing the item scores of each occupation in the cluster with the mean item scores for the entire group of 83 occupations. A variable was identified as a behavioral characteristic of a cluster if a large proportion of occupations in the cluster scored above the mean on that variable. The results of these analyses showed that commonalities among certain occupations existed across the two original occupational categories (agricultural and metal-working). It is reported, for example, that ". . . occupations in the agriculture industry and agri-business clusters apparently exhibited more commonality of behavior with industrial or business occupations in metal-working than with production agriculture occupations" (p. 82). Sjogren et al. concluded that the study identified "reasonable" occupational clusters and that the results offered some implications for curriculum development.

In March, 1971, in response to increasing demands for an occupational clustering framework adaptable to educational use, the Division of Vocational and Technical Education of the U. S. Office of Education issued a revised draft of 15 broad occupational clusters: (1) Transportation, (2) Agri-Business and Natural Resources, (3) Fine Arts and Humanities, (4) Manufacturing, (5) Construction, (6) Environment, (7) Business and Office Occupations, (8) Health Occupations, (9) Personal Service Occupations, (10) Hospitality and Recreation Occupations, (11) Public Service (Government Service), (12) Communication and Media, (13) Marine Science Occupations, (14) Marketing and Distribution Occupations, and (15) Consumer and Homemaking Education--Related Occupations. Though comprehensive, the USOE clusters are quite skeletal and need to be elaborated upon in greater detail. The failure to provide any description of their organizational rationale only adds to this problem. Commenting on the USOE scheme, Taylor et al. (1972) suggested that while it may provide a "feasible general guide" for career orientation and exploration in the lower grades, its utility with regard to the later preparation of students is doubtful, adding "much needs to be done to put flesh on the skeletal framework" (p. 8).

In response to the need for a framework for the development of career education programs, Taylor et al. (1972) have taken what might be described as an eclectic approach to occupational classification. Borrowing from a variety of sources, including the USES work in the development of the DOT, the USOE set of clusters, and certain aspects

of the Roe and Super schemes, Taylor and his associates have synthesized a new clustering scheme to be incorporated as part of a Comprehensive Career Education Model (CCEM). The proposed system is two-dimensional. One dimension is represented by the functions and contents of occupations, the other by the socioeconomic or status levels associated with occupations. These dimensions are arranged into two matrices, allowing for coordination of changing instructional objectives at different educational levels. The first matrix is defined by 12 broad institutional areas (adopted primarily from the USOE clusters) and seven career status or socioeconomic levels (ranging from unskilled through professional and executive). This matrix is suggested for use in the early grades for career awareness. The second matrix, to be used at the high school level, retains the seven career status levels but replaces the institutional areas with the nine major occuptional categories of the DOT. The clustering system represented by the two matrices is designed to be integrated with a separate system of nine curricular processes (e.g., communication, art, scientific).

Although the existing occupational description and classification systems provide useful structure and organization for a variety of purposes, most of these schemes will undergo further development and modification as a result of additional conceptualization and research. In this connection, it should be noted that the roles of conceptualization and research in taxonomy development vary considerably from one system to another. Thus, some taxonomies are based entirely on judgment and conceptualization, while others involve extensive data collection and analysis in both the development and validation phases. Conceptualization is, of course, essential to all taxonomies, since the investigator must, as a minimum, define a basic set of descriptive variables to be used in the development of a classification structure. It is to be hoped, however, that research will play a larger role in future occupational taxonomy development than it has in the past.

Future research in occupational taxonomy should be directed toward the development and measurement of descriptive variables (e.g., the work elements and dimensions of the Position Analysis Questionnaire and Occupation Analysis Inventory), the use of these variables in deriving occupational classification structures, and the validation of the resultant variables and structures. The present study represents an effort to explore the feasibility of developing a meaningful, quantitatively based occupational cluster structure through systematic data collection and analysis. As mentioned earlier, the variables employed for this purpose (i.e., the OAI work dimensions and attribute-requirement estimates) were developed through previous research efforts (Neeb, Cunningham, and Pass, 1971; Pass and Cunningham, in press; Riccobono and Cunningham, 1971a, 1971b).

The remainder of this Review deals with some procedural questions in taxonomic research.

Essential Components of Classification

Classification may be defined as the process of organizing individuals or objects according to their similarities on specified variables. Thus, as previously stated, one prerequisite for a systematically derived occupational classification system is the definition of a set of variables or dimensions on which jobs and occupations can be quantitatively profiled. In addition, there are at least two other essential components of any classification problem: (1) a quantitative index of profile similarity and (2) a cluster analysis or grouping method. These components will be treated separately in the next two sections of the Review. It should be emphasized, however, that they are highly interrelated aspects of the clustering problem, and the investigator must give joint consideration to their selection.

Profile Similarity Indices

Although an extensive discussion of the various alternative measures of profile similarity is beyond the scope of this report, several of the most commonly used indices will be briefly described here. For a comprehensive and more detailed review of this topic, the reader is referred to Cronbach and Gleser (1953), Helmstadter (1957), Abdel-Aty (1960), Schoenfeldt (1966), and Borgen (1970).

In their frequently cited article, Cronbach and Gleser (1953) introduced a conceptual model which provides the basis for systematic consideration of the assumptions underlying alternative measures of profile similarity. They identified three basic elements or components--elevation, scatter, and shape--which are characteristic of any profile. Elevation is defined simply as the mean of all scores comprising a particular profile. Scatter is equivalent to the standard deviation of a profile's elements about its mean. Shape, or pattern, is defined by the rank order of scores within a profile and refers to the residual information after equating profiles for both elevation and scatter.

The two types of similarity indices used most frequently as the basis for classification are the correlational and distance measures. Noting that while the proper choice of a similarity index necessarily depends on the purpose of the particular investigation, Cronbach and Gleser (1953) suggested that, in general, the best measure should take account of all the information in the data. Thus, they concluded that in most instances distance measures are superior to correlation measures since the latter, with the exception of the intraclass correlation coefficient, neglect information regarding profile elevation and scatter, thereby reducing the question of profile similarity to a consideration of shape alone.

Specifically, Cronbach and Gleser recommended the D^2 statistic proposed by Osgood and Suci (1952) as the most appropriate measure of profile similarity. Considering a score profile as a vector in

p-dimensional space with orthogonal axes, D^2 can be represented geometrically as the distance between two vector end points and can thus be readily derived from the generalized Pythagorean formula:

$$D^2_{ij} = \sum_{k=1}^{p} (X_{ik} - X_{jk})^2$$

where k refers to any one of the p variates and X_{ik} and X_{jk} refer to the score values of objects i and j, respectively, on variate k. In words, D^2 is simply the sum of the squared differences between corresponding pairs of profile elements.

The distance measure is actually an index of dissimilarity, i.e., the smaller the D^2 the greater the similarity. Thus, while the p-m correlation between two identical profiles will be one, the distance between these profiles will be zero. The important difference between the two measures, however, is that D^2 considers profile elevation, scatter, and shape whereas p-m correlation considers only profile shape.

The intraclass correlation coefficient has been proposed by Webster (1952) as a plausible index of profile similarity which, unlike other correlational measures, reflects all three aspects of profile information. However, Cronbach and Gleser (1953, pp. 462-463) have pointed to certain other difficulties associated with using intraclass correlation for this purpose:

> To illustrate, consider person X with standard scores 1.0, 1.0, on two variates, and person Y with standard scores 1.1, 1.1. For this pair, D is $\sqrt{0.02}$. S for each person is zero, the denominator is small, and r_{in} is -1. In other words, this pair of persons is reported by intraclass r to have maximum dissimilarity, whereas the D measure reports them to be close together.

Cattell (1949) has proposed a quasi-correlation profile similarity coefficient, r_p, which is much like the distance measure but has the added interpretive appeal of the simple correlation coefficient. Cronbach and Gleser (1953) have criticized this measure for placing an arbitrary limit (i.e., -1) on profile dissimilarity, stating that "complete dissimilarity of persons is an undefinable concept" (p. 462).

Burt (1937) employed covariance as a similarity measure. Utilization of covariance in this manner, however, results in equating the means of all profiles, thus allowing consideration only of profile shape and scatter.

DuMas (1949) proposed a similarity index based upon the slopes of the corresponding profiles. However, in addition to reflecting only profile shape, this index is an arbitrary function of the order in which the variates are arranged in the profile.

Nunnally (1962) has advocated utilization of the sum of raw score cross products as the measure of profile similarity. This index preserves all three components of profile information and, in contrast to distance measures, forms the kind of Gramian data matrix appropriate for factor analysis.

Finally, a number of investigators have indicated their preference for the generalized distance measure of Mahalanobis (see Rao, 1952) over the Osgood and Suci distance measure described earlier. The Mahalanobis D^2 is found by computing the sum of the products of all possible pairs of corresponding profile differences, weighted by the appropriate element of the inverse of the covariance matrix between variates within groups. Although this measure was orginially designed for measuring the distance between groups, it can also be used for evaluating the difference between individuals.. In the latter case, however, the intercorrelations of the variates for an appropriate reference group must be known (Cronbach and Gleser, 1953).

Cronbach and Gleser (1953) provide a thorough discussion of the relationship between the Mahalanobis and Osgood and Suci distance measures. For variates which are standardized and uncorrelated, the two measures are identical. The advantages of the Mahalanobis D^2 are that it provides a "true" distance between profiles despite any intercorrelations among the variates, and it has a known sampling distribution. On the other hand, Osgood and Suci's D^2 is vastly simpler to compute, an advantage that should not be underestimated, especially when the clustering problem involves a large number of objects.

Based on their review of the various similarity indices, the present writers have concluded that there is no clear consensus concerning the optimal measure of profile similarity. One fact is clear, however: each of the alternative measures has special characteristics, and different measures will quite likely yield different results (Cronbach and Gleser, 1953). Therefore, it is important that the investigator understand the assumptions, limitations, and information utilized in each of the profile similarity measures and that he choose a measure according to the specific conditions and objectives of his study.

Clustering Methods

The clustering procedures discussed in this section are applied to matrices of similarity coefficients for the purpose of forming groups containing members with similar variate profiles. The techniques considered here were selected on the basis of their conceptual or methodological contributions or because of their frequent use. An excellent review of clustering procedures has been presented in a recent article by Borgen and Weiss (1971).

One of the earliest and most popular procedures for grouping objects or individuals is transposed factor analysis, or the Q-technique,

a detailed discussion of which is provided by Stephenson (1953). In contrast to the conventional R-technique (i.e., factor analysis of inter-variable correlations), in transposed factor analysis p-m correlations (or other profile similarity measures) are computed between pairs of objects based on their variate profiles. The resulting intercorrelation matrix is then factored and rotated in the usual manner. Such an analysis yields a set of factors marked by loadings on the objects. The rotated factor matrix is then used as the basis for assigning objects to groups. Thus, if several objects load substantially on a given factor, they are placed in the same group.

A number of problems pertaining to the use of Q-type, or transposed, factor analysis have been reported (Sawrey et al., 1960; Schoenfeldt, 1966; Borgen, 1970). Perhaps the most serious limitation of this technique is its failure to locate the boundaries of the clusters. For example, a classification, or grouping, problem arises when an object has high loadings on more than one factor. In such a case, the object is related to two or more groups (factors) and therefore falls somewhere between these groups. Another frequently cited limitation of transposed factor analysis is that it generally makes use of the correlation coefficient as the measure of relationship and is, therefore, insensitive to information concerning profile elevation and scatter. In regard to this point, Nunnally (1962) has suggested using the sum of raw cross products (which reflects all three profile components) instead of the correlation coefficients as the similarity measure in the Q-technique.

Recognizing the inherent difficulties associated with grouping by transposed factor analysis, Holzinger and Harman (1941) proposed an alternative method based on the assumption that a group of variables which define a factor should intercorrelate more highly with themselves than with variables outside the group. Accordingly, they defined the coefficient of belonging, B, as the ratio of the mean intercorrelation within a group of variables to their mean correlation with all remaining variables. For instance, a B-coefficient of 1.00 would indicate that the variables within a group correlate no more highly among themselves than they do with the variables outside the group. The proposed method begins by combining the pair of variables correlating highest and adding others until there is a sharp drop in the B-coefficient. The last variable added is presumed to have diluted the cluster, and should therefore be removed. Working with the unclustered variables only, the second and all subsequent clusters are similarly formed. The procedure is completed when all variables have been either assigned to a cluster or found not to fit in any cluster.

The B-coefficient is a correlational measure and, as such, has been criticized for ignoring profile elevation and scatter. Another objection to Holzinger and Harman's procedure concerns the necessary imprecision associated with requiring a subjective judgment to determine the occurrence of a "sharp drop" in the B-coefficient.

Rao (1952) has described a subjective procedure for using a matrix of Mahalanobis D's to arrange groups into clusters by visual inspection, relying on external criteria for assistance. Rao suggests that since the concept of cluster is essentially undefined, ". . . [the] only criterion appears to be that any two groups belonging to the same cluster should at least on the average show a smaller D^2 than those belonging to two different clusters" (p. 362). Beginning with two closely associated groups, Rao attempts to identify a third group having the smallest average D^2 from the first two. The fourth group is then chosen to have the smallest average D^2 from the first three; likewise for the fifth group, and so on. At the point where the average D^2 of a group from those already in the cluster appears to be rather large, the group in question is considered to be outside the cluster, and the first cluster of groups is considered complete. The procedure is repeated for the remaining groups.

Although Rao's method has been criticized for its reliance on the investigator's judgment, in at least one case (Norman, 1960) it has been employed with apparent success. On the other hand, the procedure is infeasible when there are a large number of objects to be grouped, since the distance matrix becomes too complex and unwieldy for visual inspection.

Concerned with the lack of objectivity associated with most existing clustering techniques, Tryon (1958) developed a complex statistical procedure called cumulative communality cluster analysis, or simply CC analysis. This procedure has since been adapted to computer processing on the BC TRY system at Berkeley (Tryon and Bailey, 1966). CC analysis begins by identifying "pivotal" independent cluster domains in the intercorrelation matrix, using specified criteria for: (a) maximal congruence of correlation profiles, (b) maximal independence across cluster domains, and (c) optimal number of variables in a cluster. The number of independent cluster dimensions, k, needed to account for the intercorrelations is determined by the key cluster method of factoring, which projects the axes through different clusters of variables. The complete factoring procedure, which requires computing all residual correlations, yields k partial communalities for each variable. By an iterative process the initial communality estimates quickly converge to their true value, and the residual correlations become negligible. All procedures are completely objective, including the criterion for terminating the factoring.

Tryon's CC analysis has been employed with apparent success in clustering persons on dimensions of drinking motivation (Grossman, 1965) and on vocational interest dimensions (Keat, 1968). The procedure has also been applied in the clustering of persons on ability and MMPI dimensions (Tryon, 1967).

Like Tryon, Sawrey et al. (1960) felt that prior clustering approaches, particularly those employing distance measures, lacked objectivity, leaving too many important decisions to be made on a

subjective basis. In an effort to overcome this limitation of the earlier methods, they outlined what they maintained to be a systematic, objective, and replicable procedure for grouping profiles on the basis of distance functions. This procedure involves establishing a highly homogeneous set of "nucleus groups" by combining profiles whose distances from each other are less than some specified maximum D^2. The remaining individual profiles are then compared to these nucleus groups and, based on these comparisons, profiles are systematically added to the groups by gradually increasing the maximum allowable D^2. Unfortunately, the method proposed by Sawrey and his associates is quite time-consuming and, to the writers' knowledge, has not been programmed for computer processing. Consequently, it has received comparatively little attention in the literature.

Ward (1961) has described a general procedure for combining individual profiles into mutually exclusive hierarchical groups which is especially useful because (a) it has been programmed for computer processing (Veldman, 1967) and (b) it can be applied to any kind of similarity matrix. The procedure forms clusters having minimum within-group variation and maximum between-group variation at each successive level in the hierarchical structure. Ward's method begins by defining each of the n cases as a "group" containing one member. Considering all possible pairs of cases, the two with the most similar profiles are then located and combined into a single entity (group), reducing the total number of "groups" from n to n-1. In the second stage the two most similar of the n-1 groups are located and combined. This process is repeated until all of the original n cases are combined into the same group. The goal of the procedure at any given stage is to reduce the number of groups by combining the two most similar or homogeneous groups, thereby increasing the total within-group error by the least possible amount.

As noted, Ward's hierarchical clustering method is a generalized procedure which is easily adapted to computer processing and can be applied to any measure of profile similarity. In addition, there are several other appealing characteristics of this procedure. For instance, it provides a complete hierarchical structuring with the number of possible solutions ranging from two groups to the total number of objects in the sample. Consequently, it is unnecessary to specify the number of clusters in advance or to select nucleus clusters (Schoenfeldt, 1966). Instead, the investigator can use the successive results to examine the hierarchical structure of the data or, if he prefers, only a single stage of grouping may be selected. Also, with each successive stage of grouping, the hierarchical method provides an index of error which may be helpful in deciding the appropriate number of clusters to retain in the final solution. Finally, the hierarchical procedure clusters all the objects in the sample, a characteristic which may be more desirable in some problems than in others.

The major objections to Ward's hierarchical grouping method arise from the fact that it is sequential. Once a grouping decision has been made, it is irreversible. Thus, objects that have been

combined in the initial stage of grouping continue to be grouped together through the final solution, allowing the possibility that the resulting clusters contain "deviant" members which, though properly combined early in the procedure, no longer fit in the final clusters.

Following Ward's approach, Johnson (1967) has developed two related hierarchical clustering schemes, both of which have been programmed for computer processing. The Minimum Method yields clusters that are optimally "connected" (i.e., a chain-like linkage among objects), while the Maximum Method forms clusters that are optimally "compact." Both methods depend only upon the rank ordering in the similarity matrix and thus yield clusters which are invariant under monotonic transformations of the data. Borgen and Weiss (1970) have pointed out that the merging of two clusters in these procedures is dependent upon a single similarity value (i.e., the smallest or largest in the particular set), and that this condition increases the possibility of obtaining unstable clusters (i.e., clusters affected by idiosyncrasies in the data).

One of the most prolific writers on the topic of cluster analysis has been Louis McQuitty. Among the numerous clustering techniques proposed by McQuitty are hierarchical syndrome analysis (1960), typal analysis (1961), multiple hierarchical classification (1962), rank order typal analysis (1963), multiple rank order typal analysis (1966), and iterative, intercolumnar correlational analysis (1968). Although there is an evolutionary trend in his work, most of these clustering methods are based on the concept of type, which was originally defined by McQuitty (1961, p. 677) as ". . . a category of people (or other objects) such that the members are internally self-contained in being like one another; if there are n persons in a type, then every one of these is more like the n-1 other persons of the type than he is like any person not in the type."

McQuitty's procedures have stimulated few applications in research, probably because they have not yet been computerized. Whatever the reason, this lack of data from the field, added to the fact that McQuitty himself has tended to illustrate his methods on artificially generated data, makes it difficult to evaluate the potential utility of his procedures. Moreover, as noted by Borgen (1970, p. 27), "The frequent elaboration on McQuitty's existing methods imply that the more recent methods are practical improvements over the earlier versions, but little definitive empirical evidence to this effect has been presented."

Comparison of Clustering Methods

Borgen and Weiss (1971) have evaluated the adequacy and potential utility of alternative clustering methods in terms of four criteria: (1) local availability of the method; (2) discriminability, i.e., the capacity of the method to form clusters which are maximally different

on the profile variables; (3) replicability, or stability, of results over different samples; and (4) validity of the results, i.e., the extent to which objects are "correctly" classified. The first criterion is strictly a matter of practicality. While most of the non-computerized methods are readily available, they cannot be applied to large clustering problems such as the one in the present study. Other highly complex computer-based methods, such as the BC TRY system at Berkeley (Tryon and Bailey, 1966), are not readily available for local use because of the difficulty involved in their adaptation to other computer systems. Thus, the number of alternative methods is substantially reduced purely by the practical considerations of availability and feasibility of application. The viable alternatives can then be compared in terms of Borgen and Weiss' other three research-based criteria. Several comparative studies have been conducted which shed some light on the relative performance of the most widely used methods with respect to these criteria.

One of the first studies involving a comparison of clustering methods was conducted by Sawrey et al. (1960). These investigators applied their procedure (described on p. 14) to a D^2 matrix of 25 profiles which were also grouped by a transposed factor analysis of the profile intercorrelation matrix. An inspection revealed considerable differences between the clusters resulting from the two methods, with those obtained from the Osgood and Suci distance matrix being generally superior. However, after removing elevation and scatter from the profile data and then repeating their procedure on a re-computed 25 x 25 distance matrix, they found that the resulting clusters were quite similar to those obtained by transposed factor analysis. These findings suggested that the two methods per se yielded similar clusters (i.e., when the information in their respective data matrices was essentially the same), but when the profile similarity measures reflected different information, different clusters resulted. In other words, the differences were apparently due to the similarity indices rather than the clustering methods.

Ward and Hook (1963) described the application of Ward's hierarchical grouping procedure, using Osgood and Suci's D^2 measure, to the same profile data clustered by Sawrey and his associates (1960). Although Ward and Hook obtained substantially the same results as Sawrey et al. obtained with their procedure, the desirable qualities of the hierarchical procedure noted earlier were cited as distinct advantages.

Schoenfeldt (1966) compared Ward's hierarchical grouping method using Mahalanobis' D^2 as the measure of similarity with a transposed factor analysis using the sum of the raw score cross products as the similarity measure. The data for this study were derived from the responses of 1,858 Peace Corps trainees to a 370-item life history inventory entitled the Peace Corps Self-Description Inventory. After a complete item analysis, the 150 life history items most indicative of success were intercorrelated and subjected to a principal axes factor

analysis. Nine factors were rotated obliquely to simple structure, and seven were interpreted. At that point, the records of 72 trainees had to be eliminated because of incomplete responses. Factor scores were then computed on the seven interpretable factors for the remaining 1,786 subjects. These seven factor scores comprised a life history profile for each subject.

The next phase of the study involved applying the two clustering procedures to the subjects' life history factor profiles. Unfortunately, because of limitations of the computer programs, only 200 subjects could be grouped by the hierarchical procedure and 150 subjects by transposed factor analysis. Consequently, two samples of 200 subjects each were randomly selected from the total sample of 1,786 subjects. (The second sample was drawn for replication purposes.) The life history profiles were then grouped within each of the samples by the hierarchical method, and the profiles of the first 150 subjects within each sample were independently grouped by transposed factor analysis.

The results of these analyses indicated that the factor analytic and hierarchical methods did about equally well in achieving the goal of maximizing between-group variation and minimizing within-group variation. In addition, both methods produced similar clusters when repeated on the two independent samples, indicating some stability in the cluster structures identified. The hierarchical method was, however, more consistent between the two samples in terms of number of clusters produced. The transposed factor analysis of the two 150 x 150 cross product matrices yielded seven groups accounting for 99 subjects in the first sample and ten groups accounting for 121 subjects in the second sample; with the hierarchical procedure, the eight-group stage was chosen as the optimal solution for both samples.

Schoenfeldt's findings seem reasonably consistent with those of Sawrey et al. In both studies, transposed factor analysis using one form of similarity measure was compared with another grouping procedure using a different form of similarity measure. In the Schoenfeldt study--where both procedures employed similarity measures accounting for shape, elevation, and scatter--the results produced by the two grouping methods were fairly similar. In the Sawrey et al. study, the results from the two methods were dissimilar when one procedure (transposed factor analysis) used a similarity measure accounting for shape only while the second procedure (cluster analysis) used a measure accounting for all three profile characteristics; however, the two procedures produced similar results when they both used similarity indices that accounted only for profile shape. These combined findings suggest that the outcomes of systematic grouping analyses might be more sensitive to differences in the profile similarity measures used than to differences in the grouping procedures.

The most recent comparative study of clustering methods was conducted by Borgen (1970). In this study, estimates of the reward conditions for 81 diverse occupations were derived from the ratings of

2,976 supervisors on the Minnesota Job Description Questionnaire (MJDQ) (Borgen et al., 1968), an instrument which measures 21 need-relevant characteristics of occupations. The combined MJDQ ratings for each occupation formed an Occupational Reinforcer Pattern (ORP), a profile estimating the occupation's level on 21 work-related reward dimensions. The ORP data were subsequently used to compare three grouping approaches: (1) transposed factor analysis using p-m correlations; (2) Ward's hierarchical grouping method using p-m correlations; and (3) Ward's method using Osgood and Suci's distance measure.

Borgen noted that previous studies of cluster stability or replicability (e.g., Orr, 1960; Schoenfeldt, 1966) had been conducted on only two samples of data, so that if either of the samples was particularly atypical the results and conclusions would be distorted. In order to avoid this problem, Borgen drew six random samples of ORP data, representing the same 68 occupations and differing only because of sampling error; these six samples were independently clustered by each of the three grouping procedures. Thus, the first phase of the study entailed a total of 18 cluster analyses, each clustering method being applied to six different samples of ORP's. The replicability of the results for each clustering method was evaluated by cross-classifying the results in a contingency table and determining the pairwise similarity with Goodman-Kruskal's symmetric index of predictive association (Hays, 1963).

The next phase of Borgen's study involved a rather unique method of assessing the validity of the three clustering approaches. Under this method, four independent samples of eight supervisors were drawn from each of 10 occupations. Four independent ORP's were then constructed for each of these occupations (i.e., one ORP for each sample of eight supervisors), with each set of four ORP's describing the same occupation and differing only because of sampling error. Next, the 40 resultant profiles, representing the 10 occupations, were subjected to the three clustering methods for validation purposes. The validity of each clustering method was determined by the extent to which it grouped together ORP profiles derived from the same occupation. Thus, the results of each analysis were arranged in a contingency table, with the 10 classes of the vertical dimension representing the known (original) occupational clusters of the ORP's, and the classes of the horizontal dimension representing the cluster assignments of the profiles. Goodman-Kruskal's index of predictive association was used to assess the overall agreement of the predicted and obtained results in this table.

The results of Borgen's study provided clear evidence that the specific nature of the sample itself can have a marked effect on the clusters which are obtained, regardless of the particular clustering method employed. With respect to the relative performance of the alternative clustering approaches, Ward's hierarchical method was found to be somewhat superior to transposed factor analysis when judged on the basis of either reliability or the validity criterion.

There was the least agreement between the clusters resulting from transposed factor analysis using the p-m correlation and hierarchical analysis using the distance measure, and the most agreement between the two sets of clusters obtained by applying the same grouping method (i.e., hierarchical analysis) to different similarity matrices. (It should be noted that this latter finding conflicts with the writers' earlier speculation concerning the relative influence of the similarity measure and the grouping procedure upon the results of systematic grouping analyses.) It was also reported that the hierarchical method had the "pragmatic" advantage of being easier to apply than transposed factor analysis, the latter involving considerable uncertainty and subjectivity in translating the factor loadings into discrete clusters. Based on his findings, Borgen (1970) concluded: "The hierarchical grouping method can be recommended as an efficient and effective grouping method, likely to be useful for future clustering of additional ORP data or for other taxonomic studies" (p. 112).

As can be inferred from the preceding review, little research effort has been devoted to systematically comparing the merits of various clustering procedures, especially as these pertain to occupational taxonomy development. Based on the data that are available, it appears that the hierarchical clustering method using a D^2 index may produce better results than transposed factor analysis using the p-m correlation. There are, of course, other alternatives for which no comparative data are available. Apropos to the dilemma faced by the investigator who must select an appropriate grouping procedure for a specific problem, Schoenfeldt (1966, p. 30) comments that ". . . although a considerable amount of literature has emerged concerning the problem of extracting homogeneous subgroups from a matrix of intersubject similarity, . . . the as yet unanswered questions outnumber those for which answers have been found."

PROCEDURE

As noted previously (pp. 2-3), a representative sample of 814 occupations was rated on the Occupation Analysis Inventory (OAI), and both work-dimension and attribute-requirement profiles were derived for each occupation (Riccobono and Cunningham, 1971a, 1971b; Pass and Cunningham, in press). These profiles provided the data for all analyses in the present study. The higher-order work-dimension (factor score) profiles were used as a basis for clustering the occupations, and the first-order work-dimension and attribute-requirement profiles were used in explicating the resulting clusters. Ward's (1961) hierarchical procedure, described on pages 18-19 of this report, was used in deriving the occupational clusters.[2]

The first stage of the cluster analysis involved computing similarity indices between the higher-order work-dimension profiles for each pair among the 814 occupations. The measure of profile similarity selected was the D^2 index proposed by Osgood and Suci (1952) and discussed previously. This index was chosen because it is the most commonly used of the profile similarity measures and because it accounts for all aspects of profile information, including level, scatter, and shape. In the present study, each of the 22 higher-order dimensions was differentially weighted in the calculation of the D^2 scores. The weights were derived from ratings of each of the 22 higher-order dimensions on the six-point importance scale presented in Appendix A. Five judges (graduate assistants employed on the project) rated each dimension on the importance scale, and a mean importance rating (or weight) was computed for each dimension. The resulting importance weights, shown in Table 2, were used as coefficients in the D^2 formula.

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[2]The hierarchical cluster analysis in this study was conducted using the CODAP/Profile Analysis System developed by the AFHRL Personnel Research Division of Lackland Air Force Base, Texas.

Table 2. Summary of 22 Higher-Order Work Dimensions

Dimension Code	Title of Dimension	Importance Weight
H-1	Business/organizational activities	4.20
H-2	Electrical/electronic activities	4.20
H-3	Mechanized equipment operation	2.80
H-4	Art/decorative activities	3.20
H-5	Medical/health-related activities	3.40
H-6	Sales/customer service activities	4.00
H-7	Chemically treating materials/substances	2.40
H-8	Verbal versus routine numerical activities	2.00
H-9	Clerical activities	4.40
H-10	Constructing/fabricating	3.20
H-11	Material joining/assembling	2.00
H-12	Mechanical activities	4.00
H-13	Technical planning and communication	2.40
H-14	Instructing and advising	4.00
H-15	Activities involving body coordination/orientation	2.00
H-16	Figural arrangement and problem-solving versus assisting superiors	1.00
H-17	Technical drawing and innovation	3.00
H-18	Environmentally related activities	2.40
H-19	Physical activities associated with unpleasant temperature conditions	1.00
H-20	Use of topographical information	0.20
H-21	Cutting/separating versus joining/assembling	0.60
H-22	Material forming and modification	1.80

RESULTS

The clustering procedure employed in this study groups all occupations in the sample and generates a complete hierarchical structuring, with the number of possible solutions ranging from the total number of occupations in the sample (i.e., one occupation per cluster) down to a single cluster containing all the occupations. Unfortunately, in the absence of any definitive guidelines or criteria, the responsibility for deciding how many and which clusters to retain in the final solution must rest primarily on the judgment of the investigators. In the present analysis, clusters were selected on the basis of size ($N \geq 2$), homogeneity (as indicated by the index of within-group variation), and meaningfulness (whether the occupations look like they belong together, i.e., does the cluster make sense?). In regard to the meaningfulness of these occupational clusters, it should be emphasized that this study represents only an exploratory effort in a long-range research project and that a future analysis, based on a revised set of OAI work dimensions and a larger sample of occupations ($N = 1400$), should result in a substantially more comprehensive, precise, and meaningful set of clusters. Despite their limitations, however, the clusters described in this section can be informative and, more importantly, suggestive of the feasibility of an ergometric approach to the problem of occupational taxonomy development.

Based on the previously mentioned criteria, 73 interpretable clusters were identified, accounting for 659 of the 814 occupations. The occupations comprising these clusters are listed in Appendix B; the average work-dimension and attribute-requirement profiles calculated for each cluster are shown in Appendix C. These clusters are briefly described in the remainder of this section. For purposes of simplification and clarity of presentation, the 73 clusters have been arranged into 11 major categories. It should be pointed out that this entire discussion reflects a substantial amount of subjectivity on the part of the investigators; other investigators might have chosen to name and describe these clusters quite differently. For this reason, it is suggested that the interested reader carefully examine the profile information contained in Appendix C. It is believed, however, that the clusters identified are generally meaningful and that the titles and brief descriptions which follow will enhance the utility of their profiles.

Technical and Scientific Occupations

The five clusters comprising this category are characterized by high scores on higher-order factors H-13 (Technical planning and communication) and/or H-17 (Technical drawing and innovation). The occupations contained in these clusters are concerned with the theoretical and applied aspects of such fields as the physical and biological sciences, engineering, and related technical work.

Engineering Occupations (Cluster 1)

The occupations in this cluster are concerned with the practical application of engineering principles and theory to the efficient and effective design, production, and utilization of tools, machines, materials, structures, and other devices, processes, or systems. Work activities include: planning, directing, and participating in structural, functional, compositional, and other tests to determine conformance of materials, substances, and equipment with operating specifications and standards; preparing technical drawings, specifications, and cost estimates; and preparing written technical reports.

Chemists, Physicists/Related Laboratory Scientists and Technicians (Cluster 2)

This cluster consists of research scientists and laboratory technicians in such fields as chemistry, physics, metallurgy, and related areas. Work activities involve applying the principles and methods of these disciplines to testing, analyzing, synthesizing, compounding, and treating various materials and substances, such as woods, metals, foods, chemicals, and drugs.

Drafting and Related Occupations (Cluster 3)

The occupations in this cluster are primarily concerned with preparing technical drawings and graphic displays to communicate engineering ideas and information. Typical work activities involve gathering or reviewing engineering data and design specifications for materials, equipment, and structures and drawing designs using drafting tools and techniques.

Surveying and Related Occupations (Cluster 4)

The occupations in this cluster are primarily concerned with determining and processing geographical or topographical information such as the shape, elevation, contour, and dimensions of land areas and the precise location of buildings, roads, lakes, and other distinguishing features.

Occupations Concerned with Water Supply and Quality (Cluster 5)

The occupations in this cluster are primarily concerned with applying the principles and techniques of geophysics, chemical engineering, and related disciplines to the establishment, maintenance, and evaluation of water supply, irrigation, flood control, and/or soil erosion programs for an area or region.

Business/Organizational Occupations

The clusters comprising this category are characterized by high profile scores on work dimension H-1, and thus are primarily concerned with information, activities, and objectives related to business/organizational matters.

Administration and Related Occupations (Cluster 6)

The occupations in this cluster are concerned with planning, formulating, and administering policies and programs within an organization or business establishment. Work activities involve establishing organizational goals and objectives, allocating resources and responsibilities to programs and components, and monitoring and coordinating the activities of the organization with the marketplace in a manner that will insure a successful overall operation. Knowledge and understanding of the concepts and practices in such areas as manufacturing, marketing, and finance are also required.

Managerial Occupations (Cluster 7)

The occupations in this cluster are primarily concerned with organizing, coordinating, and controlling the activities and functions of a component or branch of an organization or of a small business establishment.

Training and Supervisory Occupations (Cluster 8)

The occupations in this cluster are primarily concerned with supervising, training, and coordinating the activities of personnel working in a business or commercial enterprise.

Accounting, Auditing, and Related Business/Financial Occupations (Cluster 9)

The occupations in this cluster are concerned with applying the principles and procedures of accounting, auditing, cost-benefit analysis, and statistics to fiscal management and related problems. The performance of clerical tasks is also frequently involved. Work activities typically involve developing, examining, and appraising financial systems and management control procedures; compiling, reviewing, and analyzing business records; and preparing financial statements and reports, such as profit and loss statements, balance sheets, and cost studies for use by management in decision-making.

Miscellaneous Business/Organizational Occupations
(Cluster 10)

The occupations in this cluster are primarily concerned with technical and legal matters related to an organization's policies, practices, and procedures. Work activities include preparing, examining, and evaluating organizational policy; preparing and reviewing legal contracts and other technical documents for conformity to organizational rules and regulations; and interpreting and communicating organizational policies and programs to personnel within the organization and to the general public in a manner that will foster good will and public support.

Clerical Occupations

All of the clusters in this category have substantial profile scores on higher-order factors H-8 (Verbal versus routine numerical activities) and H-9 (Clerical activities). Based on their scores on the former, these clusters may be meaningfully divided into two clerical subcategories. Thus, clusters having positive scores on factor H-8 involve verbal or semantic types of activities primarily, while those receiving high negative scores on this factor are more numerical or computational in nature. It should be noted that the distinction is in terms of emphasis, however, and that occupations in each category may involve both types of activities to varying degrees.

Clerical Occupations, Verbal/Semantic
(Clusters 11 and 12)

This subcategory includes occupations in which the worker deals predominantly with verbal or semantic information. These occupations typically involve activities such as classifying, collating, comparing, checking, recording, transcribing, and verifying written materials either by hand or with the aid of an office machine (e.g., typewriter, transcribing machine). The major difference between Cluster 11 and Cluster 12 appears to be in the latter's much greater involvement with office machines and equipment.

Clerical Occupations, Numerical/Computational
(Clusters 13 through 15)

The occupations in this clerical subcategory are primarily concerned with numerical or quantitative types of information and activities. Work activities frequently involve performing basic arithmetic computations and classifying and recording numerical data in keeping sets of quantitative records and financial accounts. Performance of these activities typically requires the use of adding, billing, bookkeeping, or calculating machines.

Sales and Service Occupations

The clusters which comprise this category are concerned with influencing or persuading customers to purchase any of a wide variety of commodities and services or with responding to individuals' requests for information, commodities, and/or services.

Salesmen and Salespersons (Clusters 16 through 18)

These occupations are primarily concerned with using persuasive techniques to sell materials, products, or services when considerable knowledge of the commodities or services sold is required. Three clusters of salespeople were identified. Cluster 16 includes occupations concerned with selling highly specialized services and complex machinery. In contrast, the occupations in Cluster 17 are concerned with selling a variety of merchandise and products, usually in a retail store. The occupations comprising Cluster 18 are distinguished by their concern with aesthetics in the products and services being sold.

Salesmen-Drivers (Cluster 19)

The occupations in this cluster are primarily concerned with driving trucks or other vehicles over an assigned route or territory to deliver and/or sell certain products or merchandise.

Barbering, Cosmetology, and Related Occupations (Cluster 20)

The occupations in this cluster are primarily concerned with providing customers with a variety of personal services oriented toward improving their physical appearance.

Miscellaneous Customer Service Occupations (Clusters 21 and 22)

These occupations are concerned with providing a variety of services pertaining to the personal comfort, convenience, or needs of customers. Work activities include taking customers' orders, providing information, serving food and drinks, recording and receiving payments, cleaning, carrying luggage, and otherwise attending to the wishes of customers.

Custodial and Protective Service Occupations (Cluster 23)

The occupations in this cluster are primarily concerned with protecting people and property against injury, loss, or disturbance resulting from illegal acts, trespassing, unwanted intrusion, fire, accidents, and hazardous conditions.

Miscellaneous Personal Service Supervisors (Cluster 24)

The occupations in this cluster are primarily concerned with supervising and coordinating the activities of workers engaged in performing various personal or protective services for others.

Health-Related Occupations

This category includes occupations concerned with the health or physical condition of people and animals. Thus, the four clusters comprising this category are characterized by high profile scores on higher-order work dimension H-5 (Medical/health-related activities).

Occupations in Medicine (Cluster 25)

The occupations in this cluster are concerned with applying the knowledge and techniques of medical science to the diagnosis, prevention, and treatment of diseases, disorders, and injuries in humans or animals. Work activities also involve planning, directing, and/or participating in various therapeutic and rehabilitative programs for the physically and mentally ill or handicapped.

Medical Assistants (Cluster 26)

The occupations in this cluster are primarily concerned with assisting superiors in the medical or dental profession. Work activities involve preparing patients for examination, treatment, and consultation; sterilizing and arranging medical instruments; and performing various clerical and record-keeping duties regarding patients' appointments and medical histories.

Animal Care (Cluster 27)

The occupations in this cluster are primarily concerned with providing for the welfare of animals. Work activities include feeding, watering, exercising, washing, grooming, and breeding animals; examining

them to detect disease or injury; and medically treating minor diseases and injuries.

Child and Adult Care (Cluster 28)

The occupations in this cluster are concerned with caring for and attending to the needs of children, the aged, and others who are unable to do so for themselves. Work activities involve providing instruction and assistance to individuals with respect to such things as prescribed exercise and medication, personal hygiene, and recreation.

Teaching, Counseling, and Related Occupations

The occupations in Cluster 29 are primarily concerned with providing instruction, counsel, and guidance to individuals in regard to their educational, vocational, personal, or social problems. Work activities focus on helping individuals improve their capabilities and better understand themselves, their problems, and their opportunities so that they can cope effectively with their environment and lead more satisfying and productive lives.

Art/Decorative and Related Occupations

The occupations in Cluster 30 are primarily concerned with the creative expression of original concepts, feelings, and moods in artistic designs, objects, and arrangements. Work activities also include creating, modifying, or reproducing industrial designs for use in advertising and promoting the sales of products or services; creating sketches and drawings to illustrate technical subject matter; and designing models or preparing small exhibits for display purposes.

Stationary Machine Operating Occupations

All of the clusters in this category are concerned with the operation of stationary machines that treat or process materials/substances by acting upon them in a variety of ways.

Material/Substance Treating Occupations
(Clusters 31 through 40)

The occupations in this subcategory are primarily concerned with setting up, starting, adjusting, watching, and stopping stationary machines and equipment which treat materials and substances, except textiles, by means of heat, pressure, or chemical reaction Some knowledge

of the chemical and/or physical properties of the materials being processed is required. These occupations have been grouped into the following more specific clusters based on machine/equipment function and materials acted upon:

Combining/separating machine operators (Cluster 31). Work activities in this cluster are primarily concerned with the operation of stationary machines that combine or separate animal or plant materials through cutting, chopping, shreading, grinding, or crushing.

Pressing machine operators (Clusters 32 through 34). These occupations are primarily concerned with the operation of stationary machines which apply heat or pressure to materials and substances. Three clusters come under this title. In Clusters 32 and 33, the heat or pressure is applied in the processing of chemicals, synthetics, rubber, plastics, and related materials, whereas in Cluster 34, it is applied in pressing garments or assembling products.

Heat and chemical treating machine operators (Cluster 35). The occupations in this cluster are primarily concerned with the operation of stationary machines and equipment to treat materials and substances with heat and chemicals.

Forming machine operators (Clusters 36 and 37). These occupations are primarily concerned with the operation of stationary machines and equipment which modify materials through utilization of their plastic or molten properties.

Material parting machine operators (Clusters 38 and 39). These occupations are primarily concerned with the operation of stationary machines that fabricate or process metal and wood products through slicing, cutting, or grinding.

Paper processing machine operators (Cluster 40). The occupations in this cluster are primarily concerned with the operation of stationary machines that process paper materials and products.

Textile Occupations (Clusters 41 through 44)

The occupations in this subcategory are primarily concerned with setting up, starting, stopping, adjusting, and operating stationary machines that process fibers to manufacture thread and cloth and join together cloth and related materials such as leather, synthetics, and paper.

Foremen (Clusters 45 through 47)

The occupations in this subcategory are primarily concerned with supervising and coordinating the activities of plant workers involved in

manufacturing or processing various materials and products. Knowledge and skill in the particular field of work and in the use of the materials, tools, and machines involved are also required.

Service and Repair of Electrical and Mechanical Systems

The occupational clusters under this category involve the fabrication, inspection, repair, maintenance, or set-up of mechanical or electrical/electronic devices or the utilization of such devices in the manufacturing or processing of other products.

Mechanics and Repairmen (Cluster 48)

The occupations in this cluster are primarily concerned with the maintenance and repair of machines and devices.

Machinists (Cluster 49)

The occupations in this cluster are primarily concerned with setting up or preparing machines for operation in machine shops. Although the worker may operate the machine, even on a production basis, the major requirement of the job is knowing how to set up machines properly.

Electricians, Electronic Technicians, and Related Occupations (Clusters 50 through 52)

These occupations are primarily concerned with work activities involving the assembly, inspection, repair, maintenance or operation of electrical and electronic equipment, devices, or systems.

Environmental/Earth-Working and Related Occupations

The occupational clusters in this category are primarily concerned with activities, information, and objectives pertaining to the outdoor environment. The operation of mechanized equipment is frequently involved.

Farming, Fishery, Forestry, and Related Occupations (Clusters 53 and 54)

These occupations are primarily concerned with growing, cultivating, harvesting, catching, and gathering plant and animal life and the diversified products thereof, and with maintaining parks, forests, and

natural resources. While Clusters 53 and 54 are both concerned with these activities, the emphasis in Cluster 54 is on planning, supervising, and coordinating the activities of other workers.

Driving Vehicles (Cluster 55)

The occupations in this cluster are primarily concerned with driving trucks, tractors, and mechanized equipment requiring stopping, starting, steering, etc., and transporting or moving materials from one place to another.

Miscellaneous Heavy Equipment Operators (Cluster 56)

The occupations in this cluster are primarily concerned with the operation of machines which require steering or guiding to arrange, stack, or move materials. Knowledge of the materials is of little importance.

Miscellaneous Earth-Related Occupations (Cluster 57)

The occupations in this cluster are concerned with a variety of earth-related activities, such as gardening, groundskeeping, excavating, and farm work.

Manual Occupations

The clusters in this category are primarily concerned with assembling, fabricating, processing, inspecting, or repairing materials, products, or structures. The occupations contained in these clusters are characterized by an emphasis upon manual skills and by a knowledge of the properties of the materials worked upon and/or spatial arrangement of the structural units.

Construction Occupations (Clusters 58 through 60)

These occupations are mainly concerned with the building, maintenance, repair, and alteration of buildings and structures. Workers are skilled craftsmen who are concerned with the appearance as well as the structural soundness of their work. Knowledge of assembly and construction operations and tools and materials and the ability to perceive and process spatial information are required.

Structural Maintenance Occupations (Cluster 61)

The occupations in this cluster are primarily concerned with the maintenance and repair of metal structures or structural systems consisting of metal rods, bars, sheets, pipes, plates, cables, etc., interconnected by welds, bolts, threads, and related connections and fittings. Work activities require the ability to perceive and process spatial and structural information as well as manual dexterity and general physical strength.

Occupations in the Preparation and Modification of Surfaces (Cluster 62)

The occupations in this cluster are primarily concerned with modifying surfaces by grinding, sanding, or abrading, and preparing the modified surfaces by applying liquids such as paint, varnish, chemicals, or adhesives.

Assembling Occupations (Clusters 63 through 66)

The occupations in this subcategory are primarily concerned with the dexterous use of hands, hand tools, or special devices to assemble products or parts. Additional processing of the parts to be assembled is usually not required. Four specific clusters of assemblers were identified:

Electrical assemblers (Cluster 63). These occupations are concerned with assembling electrical or electronic equipment and devices.

Mechanical assemblers (Cluster 64). These occupations are concerned with assembling mechanical devices.

Assemblers, small or fragile objects (Cluster 65). These occupations are concerned with assembling small or fragile objects and products which have no electronic parts or components.

Miscellaneous assemblers (Cluster 66). These occupations are concerned with assembling a variety of products and equipment which involve somewhat less skill and precision than is required in the assembling clusters described above.

Food Processing Occupations (Clusters 67 and 68)

These occupations are primarily concerned with the dexterous use of hands and hand tools in the handling, cutting, and processing of foods and food materials. Workers in these occupations are employed either in cold storage facilities or in bakeries. Two clusters fall into this category; in contrast to Cluster 67, the occupations in Cluster 68 require considerable knowledge about the processing of food.

Inspecting, Packaging, and Material Handling Occupations (Cluster 69)

The occupations in this cluster are concerned with performing elemental, routine, repetitive tasks requiring very little skill and essentially no previous formal training. Work activities involve examining, inspecting, sorting, packaging or otherwise handling materials, products, or supplies.

Miscellaneous Manual Occupations (Clusters 70 through 73)

These occupations are primarily concerned with the dexterous use of hands, hand tools, or special devices to work on, move, or place objects or materials. Work activities are often characterized by the emphasis placed upon the application of knowledge related to materials, tools, and principles associated with various skilled crafts. There is also a tendency for the products or objects acted upon to be aesthetically pleasing.

DISCUSSION

Although the 73 clusters identified in this study were, for the most part, individually meaningful, the overall hierarchical structure was not as interpretable as the investigators had hoped. The desired pattern of clustering--broad, general occupational clusters subsuming clusters that are narrower in scope--did not emerge in a clear form. Considerable subjective judgment had to be applied at different levels in the hierarchical diagram in order to identify what seemed to be meaningful and potentially useful occupational clusters that were fairly narrow in scope; a meaningful set of broader, subsuming clusters could not be determined from the diagram. Moreover, 155 of the 814 occupations in the sample failed to cluster in a logical manner at any stage of the hierarchical process.

A number of factors may have operated to diminish the clarity of the hierarchical cluster structure. Among those possible attenuating factors are inadequacies in: (a) the performance of the raters, (b) the job descriptions upon which the ratings were based, (c) the sample of occupations, (d) the profile variables, (e) the profile similarity index, and (f) the clustering procedure. Since a meaningful and reasonably stable OAI factor structure was previously obtained from the same data in this study despite the possible inadequacies noted under a, b, and c above (Riccobono and Cunningham, 1971b), and because it would be prohibitively expensive and time-consuming to attempt to correct those aspects of the data at this point in the ergometric project, it would seem reasonable to eliminate factors a, b, and c from further consideration as major or correctable sources of difficulty. The hierarchical clustering procedure used in this study (factor f) might also be eliminated from further consideration, based on the Air Force's past success with that procedure and on the meaningful results obtained from an earlier application of the procedure in clustering the OAI work elements.[3] There is reason to believe, however, that some correctable difficulties might be found in the two remaining factors, the profile variables and the profile similarity index, the elimination of which could improve the OAI-based occupational cluster structure.

Regarding the profile variables, it should be recalled that the 73 clusters presented in this report contain occupations with similar profiles on 22 differentially weighted higher-order OAI factors. Two problems might have inhered in those profiles: the higher-order factors may have been too general for clustering purposes (i.e., they may have failed to discriminate adequately among occupations and clusters), and the judgmental weights applied to the higher-order factors may have lacked validity and therefore caused some distortion in the cluster

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[3]Unpublished study by Ronald R. Boese, Center for Occupational Education, North Carolina State University, 1974.

structure. It seems possible that some combination of OAI first-order factors or work elements, which are considerably more specific than the higher-order factors, might discriminate better among occupations and thus produce an improved cluster structure.

Another potential difficulty with the profile variables lies in the appreciable skewing of the factor score distributions, in which disproportionate numbers of cases have low values. This skewing tendency, which occurs with the OAI first-order factors and work elements as well as the higher-order factors, could cause especially large distortions in the occupational cluster structure when the D-square index of profile similarity is used (as in the present study). Under such circumstances, a shared non-relevance of factors to occupations (i.e., common low scores on factors) contributes more heavily to clustering than when some other profile similarity indices are used (e.g., the summed absolute or percent overlap in scores). The use of the D-square index is further complicated by the fact that different analysts rated different occupations in the OAI sample, thus confounding any differences in rater adaptation levels with differences between occupations on the OAI variables. In view of the above considerations, the question arises as to whether or not elevation should have been removed from the profile scores in deriving occupational clusters based on the OAI factors. (This would result in treating two profiles with the same shape but different elevations as equivalent.) Addressing themselves to that issue, Cronbach and Gleser suggest: "In general it appears undesirable to eliminate elevation unless the investigator can interpret it definitely as representing individual differences in a quality which he does not wish to take into account in his similarity measure" (1953, p. 464). In retrospect, it appears that the exception to the use of the D-square index, as noted by Cronbach and Gleser, applies to the OAI data and that it might be advisable in future OAI-based clustering efforts to employ a similarity index that suppresses information on profile level (e.g., correlation, cosine, or percent overlap).

Based on the foregoing consideration of factors that may have attenuated the clarity of the hierarchical cluster structure, a second study was conducted involving comparative cluster analyses of 50 occupations drawn from six DOT worker trait groups.[4] In that study, several profile similarity indices and several combinations of OAI factors were used in clustering the 50 occupations, and the results were compared with the worker trait group memberships of the occupations. In addition, the similarity matrices generated from the various combinations of indices and factors were correlated with a matrix based on the average pair-wise similarity ratings of the 50 occupations by seven judges. From the results, it was decided that the Pearson correlation coefficient applied to a revised set of unit weighted first-order OAI factors (derived in a

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[4]Unpublished study conducted by R. M. Hamer, J. W. Cunningham, and J. J Pass, Center for Occupational Education, North Carolina State University, 1974.

study by Boese and Cunningham, in press) would be used in a subsequent effort to derive an OAI-based occupational cluster structure. Pursuant to that goal, 1414 occupations are currently being clustered based on their OAI factor score profiles.

It should be emphasized that this study was exploratory in nature and that the 73 occupational clusters were presented for research purposes only; they are not recommended for use in educational development. It is hoped, however, that research currently underway will produce an OAI-based occupational cluster structure that will prove useful in occupationally related education and guidance.

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APPENDICES

APPENDIX A

IMPORTANCE SCALE

Using the scale shown below, indicate how important each OAI work dimension is for describing, comparing, and grouping occupations for educational, training, and counseling purposes. In making your judgments, consider such things as the dimension's generality or scope of applicability, number and size of item loadings, stability, and meaningfulness or interpretability.

Scale Value	Importance
0	No importance
1	Very little importance
2	Limited importance
3	Moderate importance
4	Considerable importance
5	Great importance

APPENDIX B

OCCUPATIONAL CLUSTERS FORMED ON THE BASIS OF OAI-DERIVE HIGHER-ORDER WORK DIMENSIONS

Table 3. Occupational Clusters Formed on the Basis of OAI-Derived Higher-Order Work Dimensions

Cluster 1

Maintainability Design Engineer
Engineering Technician
Production Engineer
Tool Designer
Thermodynamics Engineer
Nuclear Engineer
Cost Analysis Engineer
Electronic Engineer
Field Engineer
Superintendent, Tests
Commissioner, Public Utilities

Cluster 2

Spectroscopist (foundry)
Metallurgical Technologist
Chemist, Organic
Wood Technologist
Chemical Laboratory Technician
Lab Technician, Microbiology
Pharmacist
Biochemist
Laboratory Tester I (water supply)
Physicist (spectroscopist, waterworks)

Cluster 3

Draftsman, Detail
Draftsman, Mechanical
Building Designer
Patternmaker

Cluster 4

Surveyor
Programmer, Engineering and Scientific
Survey Worker

Table 3 (continued)

Cluster 5

Hydrologist (water supply)
Microbiologist (waterworks)
Chemical Engineer (municipal water department)

Cluster 6

Market-Research Analyst I
Administrative Assistant
Technical Reporting Analyst
Manager, Area Development
Corporation President

Cluster 7

Curator, Natural History Museum
Executive Housekeeper
Personnel Manager
Proprietor-Manager, Retail Automotive Service
Manager, Retail Food Store
Manager, Theater
Superintendent, Airport
Purchasing Agent
Buyer, Grain
Embalmer
Hostess, Restaurant or Coffee Shop
Motel Manager
Dietitian
Manager, Cafeteria or Lunchroom
Manager, Sales
Manager, City Circulation
Manager, Advertising
Manager, Utility Sales and Service
Production Superintendent
Traffic Agent
Credit and Collection Manager
Branch Bank Manager
Assistant Branch Bank Manager
Insurance Salesman
Manager, Industrial Organization
Salesman, Public Utilities

Table 3 (continued)

Cluster 8

Coordinator, Personnel Services
Manager, Warehouse
Agency Appointments Supervisor
Telephone Operator, Chief

Cluster 9

Material Scheduler
Accountant
Production Clerk, Paperboard Products
Estimator
Systems Analyst, Business-Electronic-Data Processing
Mathematician
Programmer, Business
Policyholder's Information Clerk
Underwriter
Racing Secretary and Handicapper
Controller
Credit Man
Securities Trader
Operations Officer
Credit Supervisor
Personnel Clerk
Employment Clerk
Insurance Clerk
Manager, Office

Cluster 10

Superintendent, Schools
Corporation Lawyer
Policy Technician (contract technician)
Editor, Sports
Job Analyst

Cluster 11

Collator
Proofreader
Proofreader I
Job Printer

Table 3 (continued)

Cluster 12

Correspondence Clerk
Transcribing-Machine Operator
Medical Secretary
Proof-Machine Operator
Typesetter-Perforator Operator
Monotype Keyboard Operator
Stenographer

Cluster 13

Bookkeeping-Machine Operator I
Accounting Clerk
Production Clerk II
Audit Clerk
Cashier I
Invoice-Control Clerk
Calculating-Machine Operator
Billing Machine Operator
Bookkeeper I
Collection Clerk
Checker II
Airport Clerk
Loan Officer
Authorizer, Regular Accounts
Hotel Clerk
Teller
Payroll Clerk
Teletype Operator
Mail Desk Clerk
Key Punch Operator
Classification Clerk
Typist
File Clerk II
Encoder
General Office Clerk
Secretary
Card-Tape Machine Operator A
Licensing Clerk
Telegrapher
Billing-Control Clerk
Bookkeeper I
Transit Clerk
Stock Clerk
Librarian
Telephone Operator
Order Clerk II

Table 3 (continued)

Cluster 14

Label Processor
Ticketer
Traffic Clerk
Telephone Order Dispatcher
Ward Clerk (medical service)

Cluster 15

Checker I
Head Teller
Time Keeper, Chief
Wires Transfer Clerk
Telephone Answering Service Operator
Tabulating-Machine Operator

Cluster 16

Salesman, Building and Construction, Equipment and Supplies
Salesman, Real Estate
Salesman, Soft-Water Service
Salesman, Financial Service
Salesman, Advertising
Salesman, Radio and Television Time
Salesman, Paper and Paper Products
Salesman, Construction Machinery

Cluster 17

Ticket Seller
Fountain Girl
Groceryman, Journeyman
Salesperson, Automotive Parts
Salesperson, Book
Bakery-Wagon Driver
Salesman, Food Products
Salesperson, General
Salesman, Floor Coverings

Table 3 (continued)

Cluster 18

Manager, Store
Salesperson, Men's Furnishings
Silver Saleslady
Home Service Representative
Manager, Catering
Gemologist

Cluster 19

Routeman, Wholesale Ice Cream Products
Salesman, Leather Products
Salesman, Trading Stamps

Cluster 20

Hair Stylist
Barber
Cosmetologist
Manicurist

Cluster 21

Superintendent, Service
Conductor, Passenger Car
Airplane, Stewardess
Checker, Fitting Room
Waitress II
Automat-Car Attendant
Sales Clerk
Grocery Checker
Bar Boy
Cashier-Wrapper
Waitress
Dispatcher, Motor Vehicle
Countergirl

Cluster 22

Food Tabulator, Cafeteria
Order Clerk, Food and Beverages
Ticket Agent
Hotel Clerk
Salesperson, Sporting Goods
Bartender
Baggageman

Table 3 (continued)

Cluster 23

Dock Attendant
Dockmaster
Press Box Custodian
Receiving Barn Custodian
Receptionist
Watchman I
Corrections Officer
Patrolman
Lifeguard
Air-Traffic Control Specialist, Tower
Light Cleaner
Patrolman
Lineman, Repair
Switchman
Fire Fighter

Cluster 24

Housekeeper
Guard, Captain
Car Wash Supervisor
Kitchen Steward
Bell Captain
Usher, Head

Cluster 25

Nurse, General Duty
Nurse, Licensed Practical
Nurse Aide
Psychiatric Aide
Physical Therapist
Psychiatric Technician
Rehabilitation Counselor
Psychiatrist
Occupational Therapy Aide
General Practitioner
Veterinarian
Radiologic Technologist
Medical Technologist
Osteopath
Inhalation Therapist
Dentist

Table 3 (continued)

Cluster 26

Dental Hygienist
Medical Assistant
Dental Assistant
Surgical Technician

Cluster 27

Medical Laboratory Assistant
Stableman
Farm Hand, Dairy I
Artificial-Breeding Technician

Cluster 28

Camp Counselor
Cottage Parent
Homemaker
Animal Keeper, Head
Superintendent, Home for Aged

Cluster 29

Faculty Member, College or University
Teacher, Secondary School
Instructor, Bridge
Teacher, Elementary School
Music Teacher
Placement Officer
Head Catalog Librarian
Representative, Personal Service
Supervisor, Stock
Senior Accounting Clerk
Personnel Representative
Case Worker
Housemother
Clergyman
Psychologist
Sociologist
Chief Pilot
Biologist
Athletic Coach
Occupational Therapist

Table 3 (continued)

Cluster 30

Illustrator
Display Man
Artist
Job Compositor
Production Manager, Advertising
Stripper
Photographer, Newspaper
Seamstress, Women's Garment Alterations
Cloth Designer
Furniture Designer
Clothes Designer
Art Teacher

Cluster 31

Centrifuge Operator
Crushing-Machine Operator
Garnetter
Noodle Maker
Bread Chopper

Cluster 32

Flaker Operator
Coater
Filler
Compressor
Drier Operator
Spray-Machine Operator
Extruder Operator

Cluster 33

Batch-Still Operator I
Propellant-and-Gas Mechanic
Soft-Water Serviceman
Bag Machine Adjuster
Soapery Pumper
Electrical Assembler
Stillman
Autoclave Operator
Extruding Machine Operator
Quality Control Projectionist
Offset-Duplicating Machine Operator
Mailing-Machine Operator

Table 3 (continued)

Cluster 34

Brim-and-Crown Presser
Assembly-Press Operator
Assembler V
Tire Mounter
Stapling-Machine Operator
Seal Press Assembler
Filling-Machine Operator
Garment Folder

Cluster 35

Weigher II
Finish Mixer
Banbury-Mixer Operator
Ammonium-Nitrate Crystallizer
Dye Weigher
Acid Maker
Extractor Operator, Solvent Process
Dairy Processing Equipment Operator
Egg-Breaking Machine Operator
Masher
Cloth Bleaching-Range Middleman
Boarding-Machine Operator
Ice Maker
Plater
Twitchell Operator
Process Equipment Operator
Silver Stripper, Machine
Bleacher Man, Pulp
Treating Engineer
Dope-Dry-House Operator
Cook
Food Service Worker II
Baker
Induction-Machine Operator
Kiln Burner
Inspector, Continuous-Weld-Pipe Mill

Cluster 36

Dividing-Machine Operator
Paraffiner Operator
Injection-Molding-Machine Tender
Blocker, Automatic

Table 3 (continued)

Cluster 37

Die-Casting-Machine Operator
Compression-Molding Machine Tender
Ring Stamper
Record-Press Tender
Forming-Machine Upkeep Man
Wire Drawer

Cluster 38

Frame Stripper
Strip-Cutting-Machine Operator
Trimmer
Corner Cutter
Folding-Machine Operator
Box Machine Operator
Die Cutter
Hemmer
Packager, Machine
Powderer
Edge Shaper
Punch-Press Operator II
Cut-Off Sawyer, Log
Profile-Shaper Operator, Automatic
Grain Elevator Man
Machine Set-Up Operator
Honing Machine Set-Up Operator, Tool
Pressman
Production-Machine Operator
Tube Finisher and Assembler A
Broaching Machine Set-Up Operator
Grinder Set-Up Operator, External
Fabricator A-Cutting Department
Extrusion Saw Operator
Woodworking Machine Operator
Veneer Clipper
Sawman
Punch-Press Operator I
Sheet-Metal Worker
Shift Foreman, Specialty Manufacturing

Table 3 (continued)

Cluster 39

Dovetail Machine Operator
Foreman
Stereotyper
Model Maker I
Patternmaker, Plaster
Cabinet Maker

Cluster 40

Foundrinier-Machine Tender
Web Press Man
Printer-Slotter Operator
Packaging Machine Mechanic

Cluster 41

Glue-Spreading-Machine Operator
Hosiery Looper
Threader
Seamer
Stitcher, Special Machine
Glove Sewer
Sewing Machine Operator, Regular Equipment
Cushion Man
Spinner, Frame
Creeler
Braiding-Machine Operator
Yarn Winder
Edger
Armoring-Machine Operator

Cluster 42

Weaver, Narrow Fabrics
Transfer Knitter
Stitcher, Standard Machine
Hosiery Mender
Looper
Binder II
Brim-Welt-Sewing-Machine Operator
Fancy Stitcher
Seamstress
Battery Loader

Table 3 (continued)

Cluster 42 (continued)

Wrapper
Stocking Inspector
Tailor II
Upholsterer
Supervisor, Alteration Workroom
Sock Knitter
Rug Clipper

Cluster 43

Drawing-Frame Tender
Carding Machine Operator
Spinner, Ring Frame
Paper Sorter and Counter
Cellophane Wrapper, Hand
Burler

Cluster 44

Weaver
Knitting Machine Operator

Cluster 45

Paste Plant Shift Foreman
Manager, Soap and Synthetics and Glycerin
Foreman
Foreman, Refill Assembly
Foreman, Plating and Point Assembly

Cluster 46

Foreman, Plate Manufacturing
Chief, Feed Mill
Foreman, Record Press
Assembly Foreman
Glass Blower, Laboratory Apparatus
Factory Supervisor
Yard Superintendent
Director, Quality Control

Table 3 (continued)

Cluster 47

Polymerization Foreman
Foreman, Production Department
General Foreman

Cluster 48

Automobile Mechanic
Aircraft and Engine Mechanic
Powder-Line Repairman
Sewing-Machine Repairman
Loom Fixer
Knitting Machine Fixer
Refrigeration Mechanic
Maintenance Mechanic, Wire Department
Diesel Mechanic
Farm Equipment Mechanic I
Gas Appliance Serviceman
Engine Assembler
Automobile Service Station Mechanic

Cluster 49

Tool-and-Die Maker
Machinist I
Turret-Lathe Set-Up Operator, Tool
Boring-Mill Set-Up Operator, Horizontal
Metal Fabricator I
Punch-Press Operator

Cluster 50

Inspector, Finished Goods
Checker and Tester
Aircraft Mechanic
Crew Leader, Power House

Cluster 51

Furnace Operator
Firesetter
Welder, Gas Shielded Arc
Welder, Pipe-Making
First Helper, Electric Furnace

Table 3 (continued)

Cluster 52

Radio Operator
Playback Operator
Aircraft Mechanic, Electrical
Electrician A
Television Service and Repairman
Electrician
Electrician Helper
Electronic Technician
Inspector, Subassemblies
Electronics Mechanic
Electronics Assembler
Senior Communications Electrician
Foreman, Electrical Assemblies
Precision Assembly Mechanic
Maintenance Man, Factory or Mill
Electrical Appliance Serviceman
Substation Operator
Maintenance Man, Building

Cluster 53

Farm Hand
Farm Hand, Livestock
Farmer, General
Grass Farmer
Berry Grower
Rose Grower
Farmer, Cash Grain
General Manager, Farm
Dairy Farmer
Cattle Rancher
Tobacco Grower
Forester Aide
Fish and Game Warden
Harvest Hand, Citrus Fruit

Cluster 54

Forester
Logging Manager
Captain, Fishing Vessel
Vegetable Grower
Farm Foreman

Table 3 (continued)

Cluster 55

Feeder
Gasoline Truck Operator
Truck Driver
Tractor-Trailer Truck Driver
Fork-Lift-Truck Operator
Locomotive Crane Operator

Cluster 56

Pipe Layer
Sand-Slinger Operator
Power-Shovel Operator
Log Stacker Operator
Operating Engineer II
Jackhammer Operator

Cluster 57

Farm Hand, Vegetable II
Groundskeeper
Farm Hand, General
Scraper Operator
Fisherman
Rotary-Driller Helper

Cluster 58

Bracket Mounter
Upholsterer II
Utility Man
Carpenter, Floor Rolling
Lip-and-Gate Builder and Oiler Maintenance Man
Bricklayer
Ornamental Iron Worker

Cluster 59

Carpenter Helper, Maintenance
Maintenance Carpenter
Carpenter
Shipfitter
Bricklayer Helper

Table 3 (continued)

Cluster 59 (continued)

Plasterer
Carpenter, Floor Rolling
Furniture Upholsterer
Welder, Arc

Cluster 60

Boat Mechanic
Spar Mechanic

Cluster 61

Millwright
Aircraft Mechanic, Rigging and Controls
Air-Conditioning Installer, General
Pipe Fitter, Maintenance
Welder, Combination
Automobile Body Repairman
Boilermaker I
Maintenance Mechanic II
Welder

Cluster 62

Casting Inspector
Grinder
Patternmaker, Wood
Precision Lens Grinder
Fishing Rod Assembler
Polisher
Finisher
Sander, Hand
Glue Spreader, Veneer
Porter I
Painter, Maintenance

Table 3 (continued)

Cluster 63

Assembler Machine Operator
Module Assembler
Mounter I
Solderer
Electrical Control Assembler
Electronic-Sensing-Equipment Assembler
Semiconductor Assembler
Electric Motor Assembler

Cluster 64

Power Lawn Mower Assembler
Outboard Motor Assembler
Venetian Blind Assembler

Cluster 65

Instrument Assembler
Assembler
Bench Assembler
Heavy Assembler
Boat Loader
Can Solderer
Stone Setter
Battery Assembler

Cluster 66

Vending Machine Assembler
Glueman
Finisher, Hand
Braided Band Assembler
Inspector
Cementer, Hand
Assembler, Metal Furniture
Staker

Table 3 (continued)

Cluster 67

Chipping Machine Operator
Material Handler
Laborer
Meat Grinder
Scale Mechanic

Cluster 68

Meat Cutter
Butcher, Head
Laborer, Bakery

Cluster 69

Shipping Clerk II
Laborer, Stores
Parcel Post Clerk
Order Filler
Shipping Clerk II
Stock Clerk
Salesman, Driver
Garment Packer
Starchwork Folder
Duster
Sorting-Machine Operator
Mirror Inspector, Face Cleaner Tailer and Examiner
Film Inspector I
Egg Candler
Egg Puller
Peanut Sorter
Container Maker-Filler-Packer Operator
Silver Wrapper
Folder, Hand
Egg Room Supervisor
Sorter, Agricultural Produce
Cannery Worker
Apple Packer
Bead Stringer
Sample Serviceman
Labeler
Candy Packer
Sausage Packer
Receiving Clerk
Raw-Stock Tubman

Table 3 (continued)

Cluster 69 (continued)

Card Tender
Wrapping Machine Operator
Mounter, Automatic
Laborer, General

Cluster 70

Dental Laboratory Technician
Photolithographer
Screen Maker, Photographic Process
Top Brilliandeer, Bottom Brilliandeer
Copy Cameraman
Multiple Photographic Printer Operator

Cluster 71

Production Operator
Dental Ceramist
Transferer I
Fireworks Assembler
Decorator
Decorator, Hand
Finish Inspector-Instructor

Cluster 72

Presser, Hand
Pairer
Hat Trimmer
Sorter
Houseman

Cluster 73

Glove Former
Glove Turner and Former, Automatic
Fettler
Bit Bender
Assembler, Small Products
Silversmith Helper

APPENDIX C

MEAN WORK-DIMENSION AND ATTRIBUTE-REQUIREMENT PROFILES FOR 73 OAI-DERIVED OCCUPATIONAL CLUSTERS

Table 4. Mean Standard Scores of Higher-Order Work Dimensions for OAI-Derived Occupational Clusters

Dimension Number	Cluster Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
H-1	0.80	-0.32	0.24	0.19	0.58	4.05	1.91	3.69	1.73	1.80	0.08	-0.47	-0.11	-0.30	0.04	0.84	-0.39	0.85	-1.18	-0.65	-0.67	[illegible]	1.00
H-2	1.39	0.15	-0.40	-0.40	0.18	-0.29	-0.20	-0.06	-0.30	-0.33	-0.17	-0.31	-0.31	-0.32	0.43	-0.26	-0.27	-0.02	-0.77	-0.22	-0.24	-0.36	0.40
H-3	-0.09	-0.74	-0.04	0.59	-1.61	-0.20	-0.17	-0.10	-0.41	-0.20	-0.40	-0.15	-0.19	-0.26	0.10	0.50	-0.13	-0.68	-0.42	-0.02	-0.03	0.18	1.25
H-4	-0.26	0.08	-1.05	0.40	0.61	0.33	-0.43	0.07	0.57	0.33	-0.18	0.35	0.43	0.23	0.67	-0.21	-0.63	-2.68	-1.52	-0.58	[illegible]	[illegible]	0.46
H-5	0.02	-0.43	-0.00	0.54	-0.28	0.26	0.13	0.11	-0.01	0.02	0.30	0.17	0.28	0.18	-0.18	0.50	0.26	-0.28	1.02	-2.73	-0.01	-0.17	-0.13
H-6	-0.23	-0.52	-0.18	-1.05	-0.37	-0.20	1.50	-0.09	0.06	0.15	-0.82	-0.25	-0.09	-0.33	0.66	2.05	2.36	3.86	5.05	2.03	1.11	3.00	0.44
H-7	0.12	1.36	-0.26	-0.25	0.47	-0.49	-0.36	-0.06	-0.49	-0.69	-0.44	-0.09	-0.47	-0.47	-0.16	-0.62	-0.71	0.23	0.22	-0.45	-0.60	-0.56	0.02
H-8	-0.36*	-0.72*	-0.14*	-0.39*	0.05	1.37	-0.43*	-0.32*	-1.23*	1.45	1.00	-0.26*	-1.58*	-0.99*	-1.68*	-0.26*	-1.44*	0.54	0.48	-0.1[illegible]*	-1.15*	-1.09*	-0.20*
H-9	0.10	0.28	-0.26	0.46	-1.54	-0.90	-0.24	-1.25	-1.21	-1.95	-2.28	-4.23	-1.82	-0.41	-4.14	0.29	0.15	-0.38	0.08	[illegible]	[illegible]	-0.68	0.19
H-10	-0.65	-0.06	0.72	-0.09	-0.82	-0.31	-0.29	-0.29	-0.28	-0.00	-0.20	-0.30	-0.43	-0.57	-0.23	-0.17	-0.46	0.23	0.26	[illegible]	-0.62	-0.79	-0.43
H-11	-0.21	-0.26	0.49	-1.85	-0.25	-1.22	-0.57	0.56	-0.65	-0.93	-0.71	0.40	-0.23	-0.28	0.30	-0.76	-0.26	-0.29	-0.96	0.28	-0.19	0.62	-0.60
H-12	0.25	0.68	0.71	0.63	0.24	0.49	0.42	0.65	0.59	0.42	0.31	-0.42	0.52	0.68	0.15	0.40	0.47	0.57	-1.01	0.60	0.60	0.38	0.78
H-13	-2.53	-1.40	0.44	-0.21	-1.92	-2.38	-0.16	-0.11	-0.90	-1.88	-0.57	0.13	0.28	0.13	0.33	-0.62	-0.31	-0.28	-1.51	[illegible]	0.13	-0.09	0.42
H-14	0.00	-0.42	-0.[illegible]	-0.06	-0.45	0.52	0.55	1.83	0.02	1.02	-0.71	-0.44	-0.39	-0.30	0.05	-0.45	-0.68	0.34	0.97	-0.47	-0.18	0.08	0.15
H-15	-0.00	-0.78	-0.01	-0.05	-1.09	-1.26	-0.42	-0.45	-0.39	-1.02	-0.84	1.09	-0.15	-0.34	0.93	-1.26	-0.53	-0.67	2.87	-0.06	-0.36	0.62	0.01
H-16	0.01	0.45	1.29	1.39	-0.08*	-0.17*	0.45	-0.21*	-0.13*	0.17	0.58	0.07	-0.58*	-0.13*	-1.32*	-0.20*	-0.01*	0.18	-0.35*	0.39	-0.00*	0.20	-0.08*
H-17	-5.15	-0.34	-3.30	-1.74	-2.07	-0.56	-0.02	-0.14	-0.34	0.04	0.61	0.78	0.14	0.33	-0.42	-0.28	0.30	-0.32	0.54	-0.05	[illegible]	0.21	0.40
H-18	0.89	1.30	-0.37	1.90	7.76	0.22	0.02	-0.11	-0.11	0.01	-0.19	-0.35	-0.36	-0.30	-0.32	-0.41	-0.31	-0.03	0.70	-0.84	-0.25	-0.[illegible]	0.11
H-19	-0.08	-1.04	-0.58	-0.94	-0.66	-0.34	0.23	0.40	-0.51	-0.19	-0.07	-0.40	-0.48	-0.31	-0.38	-0.[illegible]7	0.26	-0.40	-0.40	-0.[illegible]	0.65	0.69	0.67
H-20	-0.16	0.15	0.08	-2.[illegible]9	-1.22	-0.52	0.08	0.33	0.55	0.07	0.14	0.14	0.52	0.50	-0.71	-0.04	[illegible]	1.00	0.69	[illegible]	-0.77	-0.8[illegible]	-0.78
H-21	-0.22*	-0.60*	-0.25*	0.32	-0.65*	0.08	0.11	-0.17*	-0.33*	-0.08*	-0.33*	-0.10*	-0.12*	0.04	0.31	-0.38*	0.2[illegible]	0.51	[illegible]	0.18	0.73	[illegible]	-0.[illegible]*
H-22	0.19	0.70	-0.26	-0.14	0.43	-0.29	-0.12	-0.60	-0.21	-0.21	-0.13	-0.55	-0.27	-0.29	-0.63	-0.27	-0.13	0.50	-2.04	0.56	-0.31	-0.1	-0.36

*Negative pole of a bipolar dimension.

Table 4 (continued)

Dimension Number	Cluster Number 24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
H-1	0.24	0.22	-0.31	-0.56	0.38	0.21	0.10	-0.57	-0.34	-0.44	-0.45	-0.48	-0.46	-0.08	-0.29	0.12	0.51	-0.04	0.01	-0.28	0.71	1.09	1.52
H-2	-0.22	0.10	0.16	-0.30	-0.30	-0.30	-0.22	-0.48	-0.48	0.09	-0.52	-0.00	0.30	-0.36	-0.53	-0.52	-0.26	-0.51	-0.54	-0.46	-0.83	-0.21	0.32
H-3	0.38	-0.47	-0.63	0.15	0.22	-0.15	-0.15	0.16	-0.20	0.00	-0.42	-0.33	0.43	-0.17	-0.13	-0.22	-0.42	-0.37	-0.38	-0.30	-0.54	-0.03	0.17
H-4	0.46	-0.10	-0.07	-0.06	-0.00	-0.16	-4.69	0.13	0.63	-0.05	0.44	0.13	0.83	0.60	0.86	0.92	-0.34	-0.00	-0.19	-0.25	-1.11	0.28	0.18
H-5	0.05	-5.10	-3.75	-2.66	-2.32	0.00	-0.18	0.53	0.65	0.28	0.65	0.27	0.60	0.33	0.32	-0.05	0.20	0.40	0.35	0.41	0.24	0.47	0.36
H-6	0.49	-0.01	-0.08	-0.19	0.05	-0.20	0.38	-0.49	-0.38	-0.42	-0.46	-0.24	0.00	-0.15	-0.31	-0.28	-0.65	-0.69	-0.54	-0.74	-1.01	-0.53	-0.38
H-7	-0.05	0.18	-0.37	0.46	-0.78	-0.57	0.40	1.37	1.11	0.32	-0.08	2.90	0.73	0.19	0.03	-0.06	0.52	-0.50	-0.60	0.14	-0.49	0.67	0.64
H-8	-0.63*	-0.23*	-0.93*	0.27	0.36	0.29	1.32	0.66	0.62	-0.12*	0.78	0.14	0.30	0.16	0.58	0.09	-0.17*	0.52	0.53	0.45	0.63	-1.05*	-1.39*
H-9	0.73	0.27	[illegible]45	0.43	0.59	-1.01	-0.91	0.45	0.41	0.34	0.39	0.35	0.18	0.25	0.29	0.28	0.18	0.62	0.48	0.42	0.67	0.56	0.48
H-10	-0.61	0.09	[illegible]29	-0.49	-0.87	-0.40	0.63	-0.59	-0.33	-0.14	-0.40	-0.18	1.00	-0.60	0.48	3.56	-0.20	-0.83	-0.68	-0.81	-1.64	-0.10	0.01
H-11	0.19	-0.14	-0.45	-0.11	-0.51	-0.84	0.27	-0.18	0.18	0.09	1.01	-0.35	0.47	-0.19	0.35	0.26	-1.11	0.66	1.68	0.06	0.22	0.69	1.10
H-12	0.62	0.10	0.57	0.46	0.62	0.47	0.28	-0.17	-0.11	-0.85	0.21	-0.00	-0.58	-1.70	-0.83	-0.41	-3.52	0.00	0.00	-0.13	-2.03	0.12	-0.30
H-13	1.12	-0.41	-0.15	-0.49	1.41	-0.96	1.07	0.09	0.20	-0.00	0.45	-0.21	0.23	-0.01	0.39	0.44	0.33	0.51	0.43	0.20	0.84	0.28	0.76
H-14	0.69	1.59	-0.27	-0.58	1.02	3.66	-0.06	-0.28	-0.29	-0.16	-0.35	-0.40	-0.13	-0.42	-0.41	-0.23	-0.07	-0.47	-0.59	-0.51	-0.96	0.94	1.68
H-15	-0.29	0.12	0.01	0.18	-0.34	-0.47	-0.22	-0.26	-0.47	-0.54	-0.35	-0.46	-1.01	1.37	-0.16	-0.44	2.27	0.07	0.49	2.11	3.85	-0.24	0.03
H-16	0.84	-0.63*	-0.53*	0.47	-0.16*	0.36	0.79	-0.41*	-0.63*	0.33	-0.72*	-0.37*	-0.66*	-0.43*	0.39	1.43	-0.12*	-0.00*	0.11	-0.33*	-0.78*	1.14	0.66
H-17	0.22	0.02	0.41	0.34	0.07	0.01	-1.50	0.33	0.37	0.56	0.25	0.40	0.67	0.17	-0.14	-0.48	0.42	0.31	0.21	0.44	0.06	0.39	-0.84
H-18	0.19	-0.34	-0.70	0.50	0.09	-0.05	-0.31	-0.40	-0.08	-0.08	-0.17	-0.07	-0.15	-0.27	-0.48	-0.33	-0.23	-0.20	-0.33	-0.40	-0.49	-0.02	-0.05
H-19	0.15	-0.81	0.50	0.46	0.09	-0.34	-0.95	0.49	-0.29	-0.36	-0.11	0.43	-0.56	0.29	-0.20	-0.74	-0.48	-0.26	-0.14	-0.19	-0.51	0.08	-0.25
H-20	-0.94	-0.89	-1.21	0.86	-0.23	-0.24	-0.48	0.52	0.00	0.03	0.14	0.20	0.28	-0.36	0.00	0.12	-0.79	-0.09	-0.00	0.32	-0.86	-0.24	0.04
H-21	0.50	-0.11*	1.14	0.46	0.71	-0.11*	-0.21*	0.63	0.62	0.01	0.08	-0.07*	1.47	0.15	0.55	1.04	1.07	0.03	-0.05*	0.47	0.56	0.03	0.43
H-22	-0.79	0.10	-0.12	-0.44	0.42	0.10	0.59	-0.53	1.30	-0.31	-0.41	-0.01	1.73	4.40	-0.03	0.48	0.51	-0.28	-0.24	0.41	1.11	0.19	0.90

*Negative pole of a bipolar dimension.

Table 4 (continued)

Dimension Number	Cluster Number 47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
H-1	1.76	-0.36	-0.48	-0.24	-0.23	-0.01	0.78	0.77	-0.58	-0.10	-0.40	-0.53	-0.04	-1.11	-0.50	-0.62	0.02	0.28	-0.41	-0.39	-0.13	-0.14	-0.68
H-2	1.72	0.79	-0.87	1.69	2.60	4.68	-0.22	-0.05	-0.84	-0.10	-0.43	-0.05	0.03	2.28	0.74	-0.32	1.74	-0.22	0.43	-0.31	-0.56	-0.06	-0.39
H-3	0.06	-0.69	-0.74	-0.31	-0.27	-0.02	2.60	4.72	2.92	4.83	2.33	-0.23	0.00	0.10	-0.76	0.01	-0.53	-0.84	-0.39	-0.51	-0.34	-0.15	-0.15
H-4	0.31	-0.05	1.95	0.55	0.46	0.22	-0.42	0.02	-0.52	0.39	-0.24	-0.29	-1.08	0.96	0.26	0.40	0.55	-0.72	0.33	0.01	0.34	0.49	-0.68
H-5	0.54	-0.13	-0.05	0.42	0.12	0.14	-0.91	-0.59	0.33	0.45	-0.06	0.57	0.32	-0.17	0.07	0.27	0.04	0.17	0.26	0.42	0.24	-0.54	0.40
H-6	-0.66	-0.19	0.34	-0.32	0.28	-0.25	-0.10	0.70	-0.26	-0.25	-0.69	-0.79	-0.76	0.28	-0.21	-0.25	-0.24	-0.74	-0.46	-0.57	-0.84	-0.23	-0.48
H-7	1.69	-1.02	0.31	-0.12	1.50q	-0.80	-0.25	1.16	0.52	0.08	-0.45	-1.10	-1.33	-1.17	-0.54	0.02	-0.19	-1.18	-0.39	-0.50	-0.15	-0.15	-0.28
H-8	-2.17*	0.12	-0.03*	-0.25*	0.31	0.16	-0.48*	-0.39*	0.27	1.11	0.70	-0.06*	-0.73*	0.00	0.14	0.49	1.12	0.52	0.87	0.52	0.80	0.88	0.19
H-9	0.42	0.58	0.18	0.55	0.04	0.32	0.76	0.20	0.08	-0.01	0.58	0.87	0.81	0.62	0.51	0.27	0.26	0.73	0.33	0.54	0.50	0.12	0.59
H-10	-0.06	0.00	2.10	-0.39	0.54	-0.09	0.25	1.18	-0.17	0.17	-0.25	2.42	4.25	3.40	1.45	1.18	-0.20	0.73	-0.24	0.15	-0.95	-0.09	-0.49
H-11	1.65	-0.44	0.55	-0.36	-0.44	0.08	-0.60	-0.17	-0.56	-0.48	-0.66	0.75	-0.88	-0.10	-0.33	0.32	1.83	0.87	0.81	0.85	-0.18	-0.13	-0.02
H-12	-1.70	-2.94	-2.45	-0.49	-0.99	0.05	-0.57	-0.15	-1.25	-1.34	-0.01	0.28	0.36	2.62	-0.73	0.10	1.06	-1.13	0.85	0.46	0.06	0.04	0.48
H-13	0.45	0.26	-0.00	0.72	0.84	0.06	0.74	1.22	-0.99	-0.30	0.45	-0.13	0.20	0.04	0.29	0.21	0.65	0.59	0.74	0.44	0.13	-0.53	0.01
H-14	2.74	-0.30	-0.60	0.03	-0.37	-0.02	-0.06	1.34	-0.52	-0.68	-0.32	-0.21	-0.14	-0.33	-0.22	-0.35	-0.78	-0.75	-0.50	-0.34	-0.38	-0.90	-0.28
H-15	-0.28	-0.40	-0.04	0.08	0.81	0.62	0.33	2.29	0.96	-0.30	0.19	-0.18	1.63	-0.59	-0.01	-0.24	0.95	2.86	0.21	-0.20	-0.53	0.21	-0.02
H-16	-0.04*	0.48	2.25	0.21	-0.24*	0.54	0.19	0.84	-0.31*	-0.85*	-0.48*	-0.93*	-0.77*	1.37	0.69	-0.03*	0.27	-1.38*	-0.24*	-0.19*	-0.04*	0.88	0.02
H-17	-2.54	0.09	-2.03	0.13	0.43	-0.15	0.42	-0.42	0.38	0.35	0.22	0.29	0.00	-1.10	-0.41	0.29	0.46	0.72	0.26	0.35	-0.12	0.06	0.37
H-18	0.83	-0.01	-0.41	-0.25	-0.59	-0.01	3.35	4.82	-0.99	-0.95	0.53	13	-0.05	-0.10	-0.14	-0.00	-0.30	-0.20	-0.22	-0.09	-0.04	-0.62	-0.10
H-19	-2.02	0.42	0.04	-0.93	1.19	-0.40	0.48	1.16	-0.28	0.03	0.80	.43	1.70	0.86	1.51	-0.74	-0.29	0.27	-0.23	-0.01	2.81	4.34	0.26
H-20	-0.26	-0.02	-0.17	-0.34	-0.77	0.23	1.30	-0.84	-0.77	0157	0.82	-0.28	-0.54	0.65	0.04	0.79	0.24	-0.66	0.38	0.04	0.22	0.77	0.24
H-21	-0.09*	-1.67*	-0.45*	0.38	-0.54*	0.25	0.35	-0.04*	0.06	-1.29*	-0.66*	-0.45*	-1.62*	-2.05*	-1.74*	0.[illegible]	-1.30*	-2.85*	-0.84*	-0.61*	1.60	3.65	0.48
H-22	0.43	-0.46	0.67	-0.44	2.56	0.03	-0.57	-1.04	-1.74	-0.27	-0.15	-0.72	1.25	-0.88	-0.06	0.86	-0.05	0.47	-0.23	-0.73	-0.36	0.3[illegible]	-0.46

*Negative pole of a bipolar dimension.

Table 4 (continued)

Dimension Number	Cluster Number			
	70	71	72	73
H-1	-0.28	-0.43	-0.45	-0.49
H-2	-0.13	-0.18	-0.46	-0.28
H-3	0.03	-0.16	-0.33	-0.34
H-4	0.13	-0.83	-1.60	0.89
H-5	0.05	0.01	0.37	0.68
H-6	-0.48	-0.50	-0.35	-0.10
H-7	0.21	0.61	-0.24	0.23
H-8	0.51	0.06	0.23	0.93
H-9	0.14	0.18	0.41	0.27
H-10	-0.06	1.17	-0.46	-0.10
H-11	0.08	0.45	0.59	1.22
H-12	0.41	0.67	0.52	0.57
H-13	0.38	0.00	0.34	0.43
H-14	-0.36	-0.30	-0.27	-0.49
H-15	-0.21	0.32	2.23	-0.13
H-16	0.88	0.01	-0.21*	-0.74*
H-17	0.16	0.61	0.31	0.15
H-18	-0.37	-0.25	-0.36	-0.31
H-19	-0.78	-1.36	0.69	-0.25
H-20	0.11	0.78	0.32	0.18
H-21	-0.24*	-0.30*	-0.43*	0.23
H-22	-0.07	1.14	0.10	0.92

*Negative pole of a bipolar dimension.

Table 5. Mean Standard Scores of First-Order Work Dimensions for OAI-Derived Occupational Clusters

Dimension Number	Cluster Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A-1	2.63	-0.20	-0.26	-0.61	0.48	-0.14	-0.19	-0.02	-0.26	-0.35	-0.33	-0.13	-0.29	-0.34	0.80	-0.36	-0.30	-0.31	-0.32	-0.31	-0.28	-0.31	0.07
A-2	0.98	-0.18	-0.06	-0.09	-0.26	3.70	1.31	2.65	2.17	1.50	-0.09	-0.21	0.37	0.15	1.30	2.15	0.52	0.87	-0.61	-0.71	-0.29	0.41	-0.77
A-3	0.56	-0.05	-0.30	2.26	5.57	-0.13	-0.11	-0.09	-0.24	-0.20	-0.28	-0.21	-0.13	-0.19	-0.24	-0.21	-0.22	-0.17	-0.22	-0.24	-0.18	-0.26	0.10
A-4	4.53	0.39	1.02	0.13	1.00	0.10	-0.08	-0.15	-0.02	-0.22	-0.04	-0.37	-0.04	-0.06	0.14	0.68	0.01	-0.06	-0.20	0.38	-0.09	-0.32	-0.26
A-5	0.39	-0.47	-0.06	-0.38	0.21	-0.63	-0.41	-0.46	-0.53	-0.59	-0.34	0.30	-0.48	-0.64	-0.02	-0.34	-0.55	-0.66	0.13	-0.46	-0.51	-0.40	-0.50
A-6	-0.27	0.00	-0.02	-0.66	-0.36	-0.60	0.03	-0.52	-0.15	-0.35	-0.21	-0.22	-0.20	-0.18	-0.22	-0.13	-0.01	5.54	-0.28	-1.21	-0.13	-0.14	-0.15
A-7	2.35	2.38	-0.10	-0.19	1.97	-0.15	-0.12	0.35	-0.13	-0.32	-0.28	-0.24	-0.36	0.05	-0.29	-0.30	-0.13	0.29	-0.10	-0.67	-0.29	0.29	-0.06
A-8	0.52	0.82	-0.62	-0.67	0.55	-0.51	-0.37	-0.54	-0.67	-0.60	-0.41	-0.51	-0.57	-0.59	-0.63	-0.50	-0.19	1.20	-0.31	-0.52	-0.38	-0.56	-0.62
A-9	0.33	-0.46	-0.05	-0.33	-0.02	1.39	0.75	2.19	0.53	1.75	-0.59	-0.48	-0.41	-0.48	-0.24	-0.37	-0.67	1.10	0.58	1.56	-0.17	0.12	0.18
A-10	0.32	-0.15	-0.48	-0.60	1.60	1.94	3.75	1.69	1.31	2.83	3.00	3.96	1.37	0.38	1.80	-0.11	-0.72	0.53	0.77	-0.65	-0.29	0.76	-0.06
A-11	0.92	-0.62	1.80	-0.69	-0.65	-0.36	-0.37	-0.32	-0.31	-0.25	-0.03	-0.41	-0.54	-0.63	-0.54	0.02	-0.30	-0.51	-0.58	-0.75	-0.57	-0.35	-0.40
A-12	1.66	1.15	1.42	1.77	1.85	0.64	0.33	0.21	1.22	0.04	-1.09	-0.27	0.84	0.22	1.18	0.23	0.59	-0.05	0.14	-0.37	0.49	0.12	-0.55
A-13	-0.32	-0.48	-0.65	-1.10	-0.03	-0.33	1.61	-0.70	0.17	-0.88	-0.44	0.16	0.25	-0.26	0.23	1.66	1.39	3.22	4.42	2.02	1.61	2.44	0.31
A-14	0.42	-0.16	0.12	-0.24	-0.12	-0.09	0.66	-0.55	-0.35	-0.46	-0.03	-0.16	-0.36	-0.41	-0.43	-0.00	0.35	3.66	2.25	0.12	-0.20	-0.14	-0.52
A-15	0.55	0.26	0.23	0.68	0.99	1.95	0.62	0.06	-0.41	1.28	0.91	-0.42	-1.02	-0.63	-1.07	0.43	-0.99	1.56	0.80	-1.35	-0.39	-0.53	-0.74
A-16	0.78	-0.14	0.05	3.44	1.97	1.41	0.05	-0.17	-0.24	0.16	0.42	-0.24	-0.57	-0.87	0.07	0.33	-0.30	-0.19	0.07	-0.46	-0.18	-0.19	0.80
A-17	1.75	-0.76	2.23	1.04	-0.05	-0.75	0.67	0.16	-0.34	-0.36	-0.41	-0.12	-0.35	-0.04	-0.67	-0.35	0.03	0.70	-0.09	1.16	0.01	0.66	0.17
B-1	0.84	0.38	0.17	0.62	1.20	1.38	0.83	1.23	0.91	0.74	-0.75	-0.15	-0.42	-0.51	0.71	-0.12	-0.42	-0.24	0.34	1.35	-0.21	0.32	-0.39
B-2	0.49	0.29	1.16	-0.08	-0.21	-0.87	-0.51	-0.34	-0.25	-0.43	0.15	-0.19	-0.94	-0.64	3.07	-0.86	-0.54	-0.05	-0.80	0.07	-0.25	-0.16	-0.42
B-3	2.77	0.92	0.71	3.33	3.69	1.08	0.34	0.53	2.16	0.28	-0.32	-0.22	0.43	-0.28	1.28	-0.29	-0.34	-0.64	0.35	-0.58	-0.40	0.06	-0.65
B-4	0.64	-0.19	0.29	0.29	0.62	1.01	1.03	2.09	0.54	0.85	-1.64	-0.77	-0.11	-0.09	1.52	0.50	0.37	1.16	1.64	0.06	0.87	1.64	-0.04
B-5	1.45	0.08	2.41	0.00	-0.17	0.37	0.95	0.48	0.16	0.40	0.15	-0.38	-0.39	-0.47	0.14	0.45	0.15	2.51	1.34	1.81	-0.51	-0.06	-0.55
B-6	-0.28	0.16	0.35	-0.43	1.11	0.16	0.70	1.64	1.66	1.94	2.99	3.29	1.56	0.96	2.16	0.43	0.83	0.65	0.20	-0.12	0.10	0.92	-0.20
B-7	1.31	0.37	1.18	0.88	2.01	1.50	1.17	0.60	1.07	1.39	1.15	-0.48	-0.19	-0.61	-0.72	0.69	-0.14	0.72	-0.88	-0.18	-0.45	-0.62	-0.28
B-8	0.24	-0.36	-0.76	-0.83	1.01	2.34	0.31	0.65	0.14	2.70	0.47	0.99	-0.43	-0.43	0.27	0.51	0.18	1.40	1.83	0.15	-0.41	0.27	-0.05
B-9	0.61	-0.44	0.42	0.67	-0.05	-1.02	-0.34	-0.59	-0.49	-0.62	-0.53	0.37	-0.44	-0.48	-0.38	-0.83	-0.69	-0.36	1.66	0.17	-0.63	0.73	-0.10
C-1	-1.09*	-0.90*	-0.69*	-0.55*	-0.95*	-1.11*	-0.56*	-0.89*	-0.91*	-0.88*	-0.43*	-0.80*	-0.88*	-0.46*	-0.33*	-0.64*	-0.00*	-0.36*	-0.60*	-0.32*	0.37	0.04	0.72
C-2	-0.57	-0.56	-0.03	-0.58	-0.55	-0.42	-0.36	-0.41	-0.40	-0.37	-0.45	1.37	-0.20	-0.33	0.60	0.06	0.08	-0.17	4.23	-0.02	-0.35	0.08	-0.04
C-3	0.45	-0.33	-0.[illegible]	-0.47	-0.14	-0.44	-0.33	-0.35	-0.40	-0.21	-0.37	-0.04	-0.43	-0.47	0.01	-0.36	-0.46	-0.24	-0.30	-0.58	-0.43	-0.27	-0.02
C-4	0.08	1.39	-0.33	-0.27	0.04	-0.39	-0.25	-0.33	-0.36	-0.40	-0.28	0.14	-0.20	-0.36	-0.01	-0.47	-0.42	-0.22	-0.39	-0.14	-0.39	0.19	-0.44
C-5	-0.48	-0.09	0.67	-0.60	-0.82	-0.98	-0.55	-0.57	-0.59	-0.83	-0.61	1.72	0.04	-0.18	1.91	-0.78	-0.04	-0.03	1.25	0.19	-0.03	0.43	-0.03
C-6	-0.08	0.10	0.36	0.27	-0.20	-0.26	-0.34	-0.20	-0.23	-0.23	-0.12	0.42	-0.19	-0.31	-0.32	-0.29	-0.34	-0.29	-0.41	-0.31	-0.41	-0.34	-0.53
C-7	-0.16	0.89	-0.27	-0.08	0.06	-0.28	-0.20	-0.26	-0.31	-0.30	-0.17	0.01	-0.22	-0.31	0.07	-0.30	-0.34	-0.03	-0.48	2.24	-0.28	-0.17	0.44
C-8	-0.42	-0.17	0.81	-0.45	-0.52	-0.70	-0.44	-0.54	-0.53	-0.42	-0.45	-0.33	-0.40	-0.44	-0.22	-0.5	-0.34	-0.40	-0.17	0.58	-0.31	-0.35	-0.46
C-9	-0.05	0.52	0.64	-0.24	-0.01	-0.32	-0.23	-0.19	-0.29	-0.27	-0.28	[illegible]	-0.15	0.03	-0.24	-0.49	-0.10	1.01	-0.30	0.91	0.03	0.03	-0.65
C-10	-0.34	-0.04	-0.33	-0.35	-0.37	-0.43	-0.25	-0.33	-0.35	-0.34	-0.38	-0.25	-0.35	-0.34	-0.25	-0.27	-0.15	0.37	-0.08	0.71	-0.07	-0.07	-0.14
C-11	-0.04	-0.12	-0.58	0.68	0.38	0.20	0.33	0.44	0.22	0.41	0.31	0.24	0.19	0.22	0.11	0.35	0.46	0.17	0.54	-0.69	0.49	0.31	0.66
C-12	-0.61	-0.44	-0.66	-0.58	-0.27	-0.34	-0.07	-0.60	-0.34	-0.34	-0.39	-0.51	-0.38	-0.27	-0.39	-0.14	0.15	-0.02	0.53	1.29	0.25	0.06	-0.15
C-13	-0.27	0.22	-0.43	-0.36	-0.65	-0.43	-0.34	-0.42	-0.41	-0.45	-0.20	-0.50	-0.36	-0.41	-0.52	-0.33	-0.31	-0.11	-0.34	-0.03	-0.34	-0.40	-0.18
C-14	-0.12	0.12	0.24	0.17	-0.09	-0.13	0.02	-0.10	-0.16	-0.10	-0.07	-0.21	-0.14	-0.19	-0.31	-0.23	-0.28	-0.26	-0.51	-0.36	-0.35	-0.31	-0.29
C-15	0.04	0.34	0.14	0.08	0.08	0.13	0.07	0.08	0.15	0.07	0.21	0.72	0.29	0.20	0.77	-0.13	-0.14	0.24	-0.64	0.26	-0.00	0.22	-0.23
C-16	1.85	1.42	-0.11	0.43	0.59	-0.30	-0.33	-0.35	-0.31	-0.29	-0.44	-1.10	-0.56	-0.44	-0.82	0.03	-0.04	0.31	0.53	-0.50	-0.11	-0.45	-0.18
C-17	-0.48	-0.85	-0.23	-0.30	-0.60	-0.37	-0.38	-0.28	-0.23	-0.34	0.04	0.48	-0.04	-0.28	-0.01	-0.37	-0.54	-0.77	-0.30	1.18	-0.41	-0.23	-0.29
C-18	-0.22	0.29	-0.06	-0.30	-0.05	0.04	-0.15	-0.18	-0.09	-0.13	-0.15	0.10	-0.04	-0.26	0.15	0.54	-0.54	-0.60	-0.25	-0.17	-0.69	-0.38	0.00
C-19	-0.17	0.54	0.17	-0.25	0.06	0.03	-0.13	0.07	0.02	0.00	-0.19	0.10	0.02	-0.01	0.06	0.12	-0.15	-0.23	-0.64	-0.49	-0.45	0.12	-0.37
C-20	-0.27	0.31	-0.42	-0.30	-0.27	-0.48	-0.24	-0.43	-0.47	-0.42	-0.32	-0.64	-0.54	-0.46	-0.55	-0.37	-0.32	0.17	-0.32	-0.40	-0.22	-0.35	-0.31
D-1	0.90	0.21	0.35	-0.14	0.91	1.72	1.23	1.63	1.01	1.74	-0.77	-0.30	0.18	-0.01	0.62	1.28	0.64	1.37	1.28	0.71	0.49	0.96	0.42
D-2	0.99	0.78	0.62	0.31	1.21	0.37	0.90	0.47	1.73	0.17	-0.04	1.40	1.95	1.15	2.21	0.68	1.26	0.39	1.30	0.12	0.30	0.68	-0.15
D-3	6.02	0.20	6.51	2.44	2.09	1.14	0.21	0.31	0.14	0.37	-0.88	-1.18	-0.23	-0.27	0.64	0.83	-0.07	0.33	-0.26	-0.16	-0.01	0.47	-0.31
D-4	-0.05	-0.74	-0.46	-0.14	0.81	0.02	-0.24	0.24	0.46	-0.00	0.60	3.78	2.02	-0.05	4.50	-0.36	-0.27	-0.03	-0.04	-0.03	-0.22	0.73	0.03
D-5	-2.83	-1.98	0.01	-1.71	-3.81	-2.19	-0.21	-0.97	-1.05	-1.34	-1.20	-0.87	0.93	0.54	-1.45	0.46	0.72	-0.56	0.81	0.60	0.55	0.18	0.35
D-6	-0.87	0.32	-0.55	1.38	-0.98	-1.85	-0.63	-1.28	-1.04	-1.44	-0.04	0.34	-0.	0.30	-0.83	-0.01	-0.09	-0.96	1.13	-0.30	0.36	-0.01	1.55
D-7	-0.05	-0.35	0.15	-0.17	0.20	1.22	0.24	0.64	-0.09	1.70	0.12	0.24	-0.43	-0.13	1.55	0.57	-0.54	0.02	0.51	-0.66	-0.26	0.11	-0.11
E-1	0.42	-0.22	-0.64	0.34	0.92	1.44	1.55	2.74	0.43	0.24	-0.45	-0.44	-0.38	-0.43	9.37	-0.47	-0.46	0.31	-0.27	0.93	-0.01	-0.44	-0.35
E-2	-0.50	0.60	0.23	0.53	0.66	-0.55	0.81	-0.32	0.15	-0.59	-0.47	0.42	0.15	-0.04	2.79	-0.16	1.17	1.54	1.44	1.66	1.86	1.94	1.10
E-3	1.66	-0.60	0.48	-0.54	1.28	2.40	0.31	2.24	1.23	2.57	-0.41	0.29	-0.04	-0.35	0.66	-0.02	-0.45	0.86	-0.25	0.05	-0.29	0.00	0.07
E-4	-0.22	-0.39	-0.26	-1.59	-0.77	-0.93	-0.74	0.05	-0.06	-0.42	0.16	0.76	0.40	0.15	1.37	0.02	-0.09	-0.85	0.62	-1.24	-0.16	-0.08	0.16
E-5	0.06	-0.22	-0.26	-0.29	0.33	0.26	-0.12	1.49	-0.13	-0.24	-0.20	-0.15	-0.18	-0.18	-0.18	-0.10	-0.42	0.48	-0.84	-0.70	-0.49	-0.23	-0.19
E-6	0.34	-0.39	-0.01	-0.47	0.35	0.28	1.30	0.73	-0.06	0.33	-0.39	-0.48	-0.25	-0.41	-0.02	3.86	2.05	4.39	3.79	1.07	0.44	0.90	-0.20
E-7	0.06	-0.15	-0.[illegible]	-0.23	0.31	0.13	0.42	0.27	0.12	0.64	-0.21	0.07	-0.15	-0.05	-0.07	-0.63	-0.68	0.23	5.33	-1.01	-0.50	0.54	-0.22
E-8	-0.10	0.06	-0.19	-0.61	0.75	-0.13	-0.18	0.68	0.29	-0.06	0.13	0.16	0.17	-0.47	2.68	-0.05	-0.05	1.02	-1.56	0.30	0.64	0.27	-0.27
F-1	0.24	-0.00	0.01	.56	-0.11	-0.38	1.02	1.42	1.91	-0.68	-1.00	0.32	1.80	0.97	2.44	0.74	1.73	1.02	0.22	0.26	0.70	1.21	-0.08
F-2	1.10	-0.19	0.0.	0.25	0.17	-0.28	-0.24	-0.14	-0.37	-0.40	-0.34	-0.24	-0.10	-0.28	0.37	-0.32	-0.29	-0.28	-0.55	-0.23	-0.29	-0.24	0.25
F-3	5.2.	0.39	1.50	0.97	1.41	0.90	-0.05	0.45	0.09	-0.00	-0.27	-0.43	-0.27	-0.31	-0.04	-0.15	-0.33	0.10	-0.56	0.08	-0.26	-0.34	-0.21
F-4	0.03	-0.59	-0.70	-0.72	-0.21	-0.57	-0.47	-0.55	-0.52	-0.51	-0.13	0.08	-0.47	-0.54	-0.15	-0.55	-0.50	-0.69	0.59	-0.56	-0.50	-0.44	-0.48
F-5	0.19	0.21	0.43	0.29	0.18	-0.13	-0.66	-1.69	0.30	-0.32	0.49	0.28	0.32	0.62	3.08	0.41	0.47	-0.30	-1.02	0.54	0.10	0.21	-0.06
F-6	-0.37	-0.64	-0.00	-0.79	-0.49	-0.77	0.61	0.54	-0.61	-0.40	-0.33	-0.42	-0.29	-0.24	-0.58	-0.11	1.30	2.93	3.21	-0.16	0.86	1.56	-0.30
F-7	0.05	-0.22	0.15	0.03	-0.56	0.01	0.16	0.15	0.05	0.17	0.21	0.02	0.15	-0.29	0.15	0.46	0.40	0.12	0.82	-2.89	0.27	0.24	0.19
F-8	0.00	0.89	0.02	-0.19	-0.13	-0.46	-0.27	-0.26	-0.34	-0.62	-0.35	0.07	-0.61	-0.39	-0.20	-0.58	-0.59	-0.28	-0.04	-0.21	-0.42	-0.01	-0.23
F-9	0.69	1.91	-0.01	0.04	11.35	0.28	-0.08	0.04	0.07	-0.04	-0.31	-0.23	-0.12	-0.05	-0.05	0.06	-0.04	0.18	-0.26	-0.55	-0.10	-0.22	0.08
F-10	0.04	0.37	0.00	0.33	0.42	-0.39	-1.42	0.02	-0.06	-0.70	0.44	0.30	0.49	0.70	0.08	-1.69	-1.49	-3.93	-4.25	-2.84	-0.41	-2.60	-0.03
F-11	0.06	-0.07	0.48	0.48	0.66	1.03	0.72	1.59	0.66	1.98	2.37	4.18	1.49	0.32	4.33	-0.30	-0.47	0.11	-0.22	-0.23	-0.47	-0.00	-0.37
F-12	-0.54	0.30	0.46	-0.08	-0.60	-0.47	-0.36	-0.53	-0.38	-0.04	-0.33	-0.17	-0.57	-0.39	-0.69	-0.30	-0.53	0.26	-0.40	-0.61	-0.57	-0.61	-0.45
F-13	0.18	-0.29	-0.18	0.09	0.49	4.75	1.68	4.76	1.37	0.79	-0.01	-0.24	-0.04	-0.10	0.02	-0.02	-0.51	1.21	-1.01	-0.66	-0.53	-0.20	-0.35
F-14	3.81	0.52	-0.61	0.34	0.92	2.91	0.23	-0.30	0.50	1.63	0.55	-0.10	-0.27	-0.16	-0.52	0.23	[illegible]	-0.14	1.67	-1.67	0.21	0.08	-0.24
F-15	-0.10	-0.57	0.09	7.67	-1.32	-0.30	-0.07	0.48	-0.48	0.02	-0.87	0.13	-0.44	-0.65	0.31	0.03	-0.20	-1.21	-0.24	0.01	0.13	0.89	0.62
F-16	0.52	-0.32	0.09	-1.06	0.44	-1.05	-0.38	0.91	-0.64	-1.03	-0.71	-0.01	-0.62	-0.52	-0.65	-0.52	-0.24	-0.63	-0.87	0.66	-0.28	-0.12	0.33
G-1	[illegible]	0.34	0.67	0.14	.14	1.46	1.15	1.85	1.07	1.44	-0.07	0.04	0.16	-0.33	0.66	0.79	0.16	0.77	0.13	0.06	-0.19	-0.23	-0.37
G-2	[illegible]	-0.20	-0.77	-0.42	-0.[illegible]	-0.80	5.54	-0.66	-0.77	-0.90	-0.53	-0.77	-0.82	-0.82	-0.67	-0.74	-0.60	-0.74	0.11	-0.60	-0.46	-0.54	-0.59
G-3	[illegible]	0.36	0.35	-2.06*	0.28	0.60	0.14	0.38	0.30	0.25	0.36	0.34	0.33	0.32	-0.30*	-0.38*	0.22	0.33	-0.38*	-0.06*	0.20	0.05	-1.00*
G-4	-0.93	-0.57	-0.24	-1.85	-0.59	-1.23	-1.11	-0.19	-0.46	-1.12	-0.08	1.03	0.38	0.04	0.90	-1.07	-0.30	-0.61	-0.47	-0.99	-0.54	0.37	-0.11
G-5	3.25	-0.35	-0.21	-0.16	0.17	-0.08	0.31	-0.10	-0.09	-0.11	-0.11	-0.12	-0.09	-0.16	-0.17	-0.30	-0.26	-0.32	-0.31	-0.71	-0.13	-0.17	0.07
G-6	-0.32	0.44	-0.44	0.48	-0.11	-0.24	0.06	-0.30	-0.19	-0.32	-0.51	0.01	0.01	0.09	0.71	0.27	1.04	-0.04	0.10	1.50	1.58	3.35	0.08
G-7	-0.27	0.39	0.43	0.49	-0.24	0.02	-1.29	-0.94	-0.36	-3.58	0.51	0.06	0.21	0.26	-0.78	-0.68	-0.41	-2.05	-3.57	-0.42	0.14	-1.45	-0.50
G-8	-0.31	-0.37	-0.37	-0.07	-0.26	-0.22	-0.24	-0.27	-0.23	-0.23	-0.35	-0.37	-0.18	-0.37	-0.53	-0.33	-0.43	-0.43	-0.57	0.56	0.05	-0.45	-0.50
G-9	0.42	-0.31	-0.39	-0.05	-0.1	-0.29	-0.04	-0.27	-0.19	-0.08	-0.18	-0.12	-0.19	-0.30	-0.17	0.04	-0.14	-0.23	0.65	-0.61	-0.31	-0.31	2.03
G-10	-0.35	0.26	-0.32	-0.19	-0.42	-0.34	-0.12	-0.35	-0.43	-0.37	-0.31	-0.38	-0.25	-0.30	-0.20	-0.35	-0.23	0.11	-0.47	0.69	-0.28	-0.33	0.76
G-11	0.59	-0.11*	-0.03*	0.67	0.71	0.76	-0.14*	-0.14*	0.04	0.01	0.32	-0.19*	-0.03*	0.04	0.16	0.19	-0.14*	0.20	0.09	-0.43*	0.04	-0.90*	0.14
G-12	-0.17*	0.62	-0.11*	-0.69*	-1.19*	-1.23*	-0.76*	-1.87*	-0.72*	-1.05*	-0.64*	-0.56*	-0.58*	-0.09*	-0.57*	-0.45*	0.00	-0.19*	-0.02*	1.16	0.09	-0.37*	1.27
G-13	0.55	-0.14*	-0.60*	1.86	0.57	0.29	-0.52*	-0.49*	-0.37*	-0.35*	-0.64*	-1.10*	-0.97*	-0.40*	-0.84*	-0.69*	-1.02*	-1.14*	-0.56*	-0.97*	-0.01*	-1.68*	-0.03*

*negative pole of a bipolar dimension

Table 5 (continued)

Dimension Number	Cluster Number 24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
A-1	-0.33	0.15	-0.21	-0.35	-0.30	-0.33	-0.24	-0.35	-0.37	-0.09	-0.36	-0.28	0.37	-0.15	-0.35	-0.38	-0.10	-0.36	-0.37	-0.35	-0.42	-0.31	0.71
A-2	-0.35	-0.24	-0.48	-0.31	-0.38	-0.03	-0.24	-0.38	-0.43	-0.39	-0.35	-0.52	-0.51	-0.12	-0.41	-0.33	-0.26	-0.27	-0.34	-0.30	-0.15	0.62	0.97
A-9	-0.08	-0.38	-0.24	0.08	0.35	-0.10	-0.10	-0.21	-0.24	-0.23	-0.20	-0.22	-0.22	-0.27	-0.22	-0.20	-0.20	-0.21	-0.19	-0.17	-0.16	-0.20	-0.17
A-4	0.10	-0.31	-0.35	-0.14	0.35	-0.18	-0.32	-0.15	-0.21	-0.67	-0.08	-0.31	-1.36	0.32	0.00	-0.07	-0.10	-0.07	-0.17	-0.14	-0.22	-0.34	0.72
A-5	-0.59	-0.07	-0.60	-0.48	-0.68	-0.55	-0.32	0.07	0.19	1.00	-0.43	0.41	0.67	1.98	0.51	0.11	2.41	0.02	-0.09	0.19	2.67	0.07	0.72
A-6	-0.05	4.75	3.35	3.34	3.86	0.25	-0.19	-0.19	-0.28	-0.26	-0.30	-0.06	-0.21	-0.73	-0.31	-0.35	-0.14	-0.29	-0.29	-0.27	-0.29	-0.21	-0.31
A-7	-0.32	1.14	0.03	0.1	-0.38	-0.24	0.20	-0.08	0.07	0.11	-0.31	0.97	-0.26	0.97	-0.34	-0.68	-0.34	-0.37	-0.37	-0.38	-0.72	0.38	-0.17
A-8	-0.43	-0.18	-0.26	0.12	-0.44	-0.48	-0.07	0.43	1.37	-0.02	-0.37	0.50	1.16	3.20	-0.16	0.63	0.90	-0.26	-0.07	0.81	1.45	0.30	1.11
A-9	0.17	3.48	0.18	-0.71	0.87	3.63	0.04	-0.39	-0.36	-0.39	-0.37	-0.43	-0.31	-0.37	-0.30	-0.33	-0.38	-0.38	-0.36	-0.31	-0.28	-0.13	0.76
A-10	-0.40	0.13	0.76	-0.33	-0.35	1.38	0.40	-0.53	-0.50	-0.44	-0.55	-0.43	-0.39	-0.31	-0.52	-0.59	0.32	-0.30	-0.53	-0.47	-0.40	-0.35	-0.24
A-11	-0.44	0.22	-0.74	-0.67	-0.61	-0.43	1.79	-0.48	-0.09	-0.22	0.01	-0.73	0.05	-0.49	-0.05	1.09	-0.32	-0.17	0.25	-0.42	-0.67	-0.61	0.67
A-12	-0.37	0.62	0.52	-0.27	-0.97	0.31	-0.17	-0.74	-0.44	0.20	-0.95	0.22	-0.04	-0.35	-0.12	0.65	0.06	-0.90	-0.37	-0.91	-0.73	0.33	1.11
A-13	0.35	-0.33	0.06	-0.25	-0.26	-0.22	0.29	-0.39	-0.32	-0.42	-0.67	-0.32	-0.44	-0.21	-0.48	-0.60	-0.67	-0.44	-0.63	-0.43	-0.34	-0.63	-0.68
A-14	-0.42	0.42	-0.48	-0.43	-0.14	-0.24	5.26	-0.27	-0.30	-0.01	-0.25	-0.18	-0.12	-0.45	-0.2.	0.20	0.61	-0.20	0.00	0.06	0.95	-0.27	0.83
A-15	-0.41	-1.54	-0.65	0.77	0.03	0.03	0.38	0.18	0.42	0.31	-0.02	0.70	0.32	0.40	0.14	0.10	0.24	-0.10	-0.07	-0.07	-0.14	-0.36	-0.23
A-16	6.27	0.82	0.07	-0.35	-0.49	0.26	0.61	-0.13	-0.01	-3.02	-0.09	-0.13	-0.00	0.14	-0.06	-0.06	-0.34	-0.12	-0.21	-0.25	-0.44	-0.51	-0.74
A-17	0.19	-0.50	0.47	0.06	0.24	-0.09	1.77	-0.28	-0.32	-0.42	-0.35	-0.62	-0.65	-0.33	0.06	0.33	-0.23	-0.40	0.01	-0.31	0.35	0.23	0.74
B-1	-0.27	1.17	0.09	0.13	0.72	1.02	0.01	-0.69	-0.45	-0.13	-0.30	-0.44	-0.32	0.65	-0.47	-0.07	1.63	-0.54	-0.49	0.01	0.30	1.16	0.06
B-2	0.44	-0.08	0.3[illegible]	0.61	-0.71	-0.54	0.09	-0.67	-0.68	0.38	-0.30	-0.48	-0.78	0.31	0.20	1.25	0.48	0.60	0.46	0.16	0.28	0.63	0.43
B-3	-0.44	0.18	-0.13	-0.60	-0.61	1.15	-0.27	-0.61	-0.35	-0.41	-0.44	-0.31	-0.32	-0.62	-0.27	0.18	0.11	-0.61	-0.44	-0.52	-0.50	-0.21	0.21
B-4	1.35	1.26	0.25	0.64	0.67	1.27	-0.27	-0.63	-0.88	-0.54	-0.96	-0.67	-0.49	-0.79	-0.34	-0.10	0.11	-0.39	-0.59	-0.67	-1.03	1.18	1.34
B-5	-0.70	0.72	-0.20	-0.47	0.08	0.73	4.16	-0.53	-0.43	-0.45	-0.53	-0.63	-0.53	-0.26	-0.32	0.16	-0.25	-0.48	-0.27	-0.57	-0.20	-0.49	0.29
B-6	0.19	-0.14	0.84	-0.12	-0.60	0.66	-0.10	-0.82	-0.78	-0.31	-0.81	-0.49	-0.98	-0.36	-0.50	-0.18	-0.14	-0.43	-0.50	-0.41	-0.48	0.51	-0.06
B-7	0.68	0.35	0.46	-0.68	0.29	0.67	0.67	-0.96	-0.72	0.11	-1.14	-0.34	-0.44	-0.61	-0.13	1.03	0.30	-0.62	-0.58	-1.20	-0.98	1.29	1.33
B-8	-0.82	0.43	0.22	-0.18	0.48	2.06	0.00	-0.04	-0.06	-0.36	-0.03	-0.19	-0.38	-0.20	-0.23	-0.65	-0.14	-0.16	-0.13	-0.17	-0.10	-0.61	-0.41
B-9	-0.54	0.34	-0.20	-0.61	-0.48	-0.05	0.56	-0.34	-0.36	-0.44	-0.69	-0.43	-0.62	1.36	0.06	-0.00	1.00	-0.43	-0.23	1.99	3.22	-0.20	0.13
C-1	-0.29*	-0.39*	-0.15*	0.44	-0.40*	-0.40*	-0.44*	0.07	-0.42*	0.84	0.05	0.19	0.35	-0.60*	0.42	-0.20*	-0.31*	-0.20*	-0.20*	0.03	-0.67*	-0.05*	-0.68*
C-2	-0.21	-0.23	0.04	-0.08	-0.48	-0.20	-0.07	0.66	-0.44	-0.01	0.60	-0.07	-0.46	0.21	-0.03	-0.03	1.90	-0.25	0.08	-0.27	0.20	-0.54	-0.39
C-3	-0.35	0.07	-0.31	-0.24	-0.35	-0.42	-0.43	-0.24	-0.28	-0.27	-0.71	-0.24	-0.21	-0.94	-0.03	-0.61	3.29	-0.28	-0.26	-0.02	0.72	-0.46	0.35
C-4	-0.35	0.70	0.13	0.42	-0.39	-0.38	0.00	1.10	0.94	0.32	-0.35	2.31	-0.52	-0.06	-0.40	-0.39	1.31	-0.34	-0.36	0.90	-0.27	0.17	-0.13
C-5	-0.70	-0.09	-0.17	0.46	-0.78	-0.20	0.23	-0.44	-0.29	0.25	-0.43	-0.28	-0.31	1.28	-0.04	-0.42	1.02	-0.76	0.25	1.33	2.76	0.14	-0.14
C-6	-0.35	-0.09	-0.65	-0.40	-0.49	-0.25	-0.22	-0.11	0.23	-0.06	0.05	-0.23	0.46	0.19	1.03	1.90	0.60	-0.09	0.05	-0.33	-0.13	0.22	0.54
C-7	-0.38	3.39	1.53	4.32	1.02	-0.02	0.60	-0.87	-0.38	-0.14	-0.75	-0.36	-1.00	0.03	-0.28	0.72	0.07	-0.42	-0.40	-0.33	-0.12	-0.65	-0.39
C-8	-0.40	0.10	0.09	-0.34	-0.19	-0.51	1.06	-0.19	-0.44	-0.14	0.11	-0.23	-0.47	0.32	0.24	0.12	0.11	2.24	3.34	1.34	5.99	-0.43	-0.12
C-9	-0.08	0.23	0.10	0.78	-0.09	-0.35	0.66	0.02	-0.24	-0.04	0.14	-0.06	0.84	-1.51	0.32	0.43	-0.55	0.08	0.43	-0.47	-1.61	0.23	0.20
C-10	-0.02	-0.39	0.42	-0.11	0.31	-0.27	0.39	-0.39	-0.41	-0.41	-0.64	0.00	0.79	1.24	-0.29	1.17	0.01	-0.37	-0.29	-0.26	-0.26	-0.17	-0.17
C-11	0.57	0.03	-0.12	0.47	0.49	0.29	-0.10	0.49	0.57	0.01	-0.08	0.14	0.70	1.12	0.59	0.18	1.99	0.38	0.11	0.51	0.97	0.11	0.28
C-12	-0.06	0.16	0.36	0.11	0.27	-0.38	-0.20	1.05	0.10	-0.22	-0.14	0.69	0.51	0.31	0.25	0.35	0.67	-0.11	-0.26	0.65	0.13	-0.35	-0.52
C-13	-0.20	0.19	0.30	-0.24	0.00	-0.38	0.01	-0.29	1.40	-0.09	0.[illegible]	-0.07	1.69	6.72	0.03	0.39	0.65	-0.48	-0.46	-0.13	-0.09	-0.06	0.46
C-14	-0.33	0.70	-0.23	-0.57	-0.08	-0.18	0.24	-0.40	-0.06	-0.19	-0.36	-0.28	-0.23	-0.30	-0.02	3.29	-0.12	-0.28	-0.40	-0.29	-0.61	-0.31	-0.03
C-15	-0.11	0.39	0.35	-0.10	-0.14	0.19	0.43	0.11	0.05	0.12	0.27	0.21	-0.25	0.44	0.22	0.69	0.1	0.07	0.21	0.05	0.12	0.19	0.03
C-16	-0.06	0.39	-0.25	0.27	-0.28	-0.38	0.62	-0.46	0.31	-0.39	-0.30	0.43	-0.09	0.45	-0.57	-0.83	-0.36	-0.36	-0.67	-0.57	-0.30	0.34	0.37
C-17	-0.40	0.27	0.09	-0.45	0.07	-0.36	0.23	0.17	0.04	0.18	0.39	-0.43	0.54	0.49	0.49	0.41	2.76	-0.17	-0.39	0.25	-0.01	-0.31	-0.17
C-18	-0.14	-0.39	-0.36	-0.41	-0.49	-0.02	-0.10	-0.47	-0.14	0.07	-0.62	-0.08	-0.47	-0.09	0.10	-0.03	-0.23	0.08	0.03	-0.38	-0.15	-0.01	-0.44
C-19	-0.38	-0.24	-0.[illegible]	-0.25	-0.44	0.04	0.06	0.02	2.20	1.03	1.23	-0.23	0.07	0.11	-0.03	0.49	-0.68	0.10	0.49	-0.55	-1.72	0.54	0.23
C-20	-0.12	-0.22	-0.33	0.37	-0.39	-0.43	-0.23	0.84	1.54	-0.02	0.43	2.03	2.14	0.19	0.44	0.54	0.44	0.03	-0.30	-0.12	0.99	0.39	0.04
D-1	0.33	1.63	1.10	-0.01	0.95	1.60	0.05	-1.14	-0.90	-0.16	-0.87	-0.39	-0.34	-0.81	-0.34	-0.13	-0.12	-0.63	-0.67	-1.30	-1.45	0.63	1.10
D-2	-0.17	-0.21	0.58	-0.67	-0.57	0.34	-0.53	-0.84	-0.84	-0.06	-0.91	0.08	-0.37	-0.38	-0.57	-0.40	-0.33	-0.62	-0.61	-0.81	-0.74	0.35	0.6[illegible]
D-3	-0.01	-0.28	-0.48	-0.22	-0.41	0.09	1.98	-0.34	-0.44	-0.13	-0.43	-0.43	-0.44	-0.31	-0.29	0.85	-0.26	-0.38	-0.31	-0.38	-0.31	-0.59	0.28
D-4	-0.16	-0.38	-0.39	-0.39	-0.24	0.11	0.46	-0.16	-0.07	-0.43	-0.10	-0.29	-0.12	-0.28	-0.33	-0.32	-0.13	-0.25	-0.26	-0.16	-0.15	-0.46	-0.35
D-5	0.62	-1.21	-0.00	0.05	0.26	-0.99	0.14	0.42	0.41	0.41	0.39	0.32	0.30	0.34	0.40	0.27	0.62	0.44	0.44	0.38	0.40	0.18	-0.17
D-6	1.26	-0.61	-0.37	-0.26	-0.28	-0.78	-0.26	-0.12	-0.12	0.63	-0.16	0.01	-0.17	-0.05	0.11	-0.11	0.30	0.34	0.20	-0.15	-0.15	-0.15	-0.29
D-7	-0.11	0.32	-0.14	-0.02	-0.15	1.40	1.06	-0.20	-0.29	-0.06	-0.24	-0.18	-0.03	-0.04	-0.23	-0.35	-0.01	-0.22	-0.25	-0.17	-0.09	-0.19	-0.07
D-8	7.[illegible]	0.19	0.40	0.68	0.[illegible]	0.[illegible]	0.14	0.48	0.49	0.[illegible]	0.49	0.49	0.37	0.47	0.35	0.19	0.65	-0.45	-0.40	-0.40	-0.48	2.33	2.87
E-2	0.68	0.17	0.35	0.28	0.44	0.03	0.04	-0.41	-0.34	-0.36	-0.42	-0.34	-0.41	-0.32	-0.42	-0.30	-0.53	-0.42	-0.39	-0.32	-0.61	-0.42	-0.47
E-3	-0.13	1.16	-0.04	0.02	0.27	0.98	0.38	-0.38	-0.37	-0.38	-0.33	-0.28	-0.37	-0.23	-0.30	-0.63	-0.41	-0.36	-0.34	-0.32	-0.40	-0.37	0.11
E-4	-0.24	-1.31	-0.25	-0.27	-1.26	-0.79	-0.49	0.33	0.24	-0.00	0.82	0.55	0.76	0.14	0.39	-0.14	-0.27	0.00	0.59	0.30	-0.03	-0.07	-0.00
E-5	0.03	0.59	-0.22	-0.23	0.80	4.30	0.63	-0.19	-0.19	-0.[illegible]	-0.18	-0.19	-0.19	-0.19	-0.14	-0.28	-0.26	-0.20	-0.20	-0.19	-0.20	0.96	1.29
E-6	0.20	0.03	-0.55	-0.11	-0.23	0.57	0.51	-0.40	-0.41	-0.33	-0.38	-0.39	-0.41	-0.41	-0.41	-0.40	-0.46	-0.40	-0.36	-0.23	-0.41	0.08	0.33
E-7	-0.16	0.86	-0.21	-0.06	0.76	0.97	-0.49	-0.17	-0.19	-0.21	-0.16	-0.18	-0.16	-0.16	-0.19	-0.15	-0.24	-0.18	-0.17	-0.19	-0.18	-0.09	6.05
E-8	-0.27	2.21	4.14	0.06	0.71	0.42	-0.06	-0.45	-0.27	-0.21	-0.37	-0.35	-0.49	-0.45	-0.32	-0.05	-0.31	-0.39	-0.35	-0.50	-0.45	-0.17	0.11
F-1	-0.00	0.03	0.59	-0.37	-0.50	-0.12	-1.37	-0.65	-0.45	-0.13	-0.69	-0.27	-0.22	-0.44	-0.53	-0.19	-0.15	-0.39	-0.49	-0.66	-0.75	0.46	1.00
F-2	-0.26	0.10	-0.07	-0.33	-0.23	-0.36	-0.12	-0.35	-0.34	0.18	-0.31	-0.19	0.42	-0.27	-0.29	-0.35	-0.46	-0.34	-0.32	-0.34	-0.47	-0.35	0.31
F-3	-0.70	-0.17	-0.38	-0.28	0.11	-0.18	1.51	-0.28	-0.29	-0.26	0.22	-0.14	-0.44	-0.30	-0.08	0.17	-0.09	-0.23	-0.31	-0.26	-0.28	-0.09	0.70
F-4	-0.39	-0.19	-0.48	-0.36	-0.40	-0.48	-0.38	0.25	0.04	0.94	-0.41	0.13	0.80	1.79	0.47	-0.26	3.23	-0.11	-0.22	0.16	2.04	-0.09	0.29
F-5	-0.63	-1.93	0.26	0.60	-0.62	-3.07	0.68	0.32	0.37	0.26	0.31	0.34	0.45	0.38	0.63	0.46	0.21	0.32	0.36	0.27	0.39	-0.61	-1.33
F-6	0.05	-0.26	0.78	0.62	-0.16	-0.17	2.67	0.02	-0.50	-0.17	-0.63	-0.20	-0.51	-0.79	-0.59	-0.63	-0.65	-0.36	-0.17	-0.[illegible]5	-0.57	-0.25	-0.38
F-7	-0.29	-5.16	-4.39	-1.33	-3.35	-0.00	-0.19	0.30	0.21	0.18	0.26	0.16	0.03	0.17	0.16	0.26	0.16	0.72	0.19	0.31	0.17	0.26	0.34
F-8	0.03	0.19	-0.09	-2.00	-0.39	-0.28	0.88	1.[illegible]	1.12	0.17	-0.28	2.05	0.88	1.10	0.02	0.03	0.77	-0.07	-0.33	0.59	0.38	0.73	2.00
F-9	-0.28	-0.05	0.14	-0.24	-0.42	0.10	-0.00	-0.41	-0.27	-0.13	-0.20	0.04	-0.27	-0.40	-0.29	-0.17	-0.34	-0.24	-0.21	-0.35	-0.37	-0.17	0.00
F-10	-0.45	0.08	0.40	0.65	-0.42	-0.22	-1.19	0.49	0.20	0.35	0.32	0.38	-0.02	-0.13	0.09	0.34	0.01	0.35	0.29	0.44	0.12	0.34	0.33
F-11	-0.43	0.04	0.32	-0.50	-0.40	0.92	1.14	-0.35	-0.36	-0.10	-0.40	-0.37	-0.17	-0.15	-0.36	-0.31	-0.29	-0.35	-0.35	-0.44	-0.23	-0.41	-0.35
F-12	-0.42	0.10	-0.11	-0.20	-0.43	-0.34	0.72	-0.41	0.29	-0.23	-0.26	-0.23	2.67	0.85	0.44	3.31	-0.13	-0.32	-0.35	-0.50	-0.49	0.01	0.32
F-13	0.47	-0.32	-0.37	0.14	0.36	0.01	0.16	-0.31	-0.31	-0.41	-0.27	-0.34	-0.31	-0.34	-0.32	-0.18	-0.31	-0.28	-0.27	-0.29	-0.23	0.20	0.78
F-14	-0.43	0.18	0.67	0.27	-1.56	0.69	-1.56	0.12	-0.12	-0.09	-0.39	0.01	0.08	-0.04	-0.11	0.10	0.17	-0.27	-0.16	-0.11	-0.02	-0.10	-0.58
F-15	0.98	-0.24	-0.07	0.02	0.22	-0.37	-1.09	0.27	-0.16	0.12	-0.37	-0.07	0.97	-0.34	-0.13	0.24	0.12	-0.22	-0.20	-0.10	-0.13	0.35	0.37
F-16	0.15	-0.32	-0.77	-0.35	0.17	-0.62	0.33	-0.65	-0.09	-0.05	0.54	-0.34	-0.09	0.55	0.00	0.14	-0.30	0.57	1.35	-0.13	0.63	1.01	1.64
G-1	-0.51	1.22	0.68	0.05	0.29	1.00	0.58	-0.96	-1.01	-0.35	-1.20	-0.21	-0.17	-0.48	-0.52	0.16	0.24	-1.03	-0.49	[illegible].97	-0.48	0.38	1.03
G-2	-0.49	-0.70	-0.43	-0.44	-1.05	-0.87	-0.77	0.85	0.40	0.13	0.10	0.51	0.35	0.67	1.08	1.25	1.05	-0.11	0.04	[illegible].25	-0.39	0.50	0.04
G-3	-0.21*	0.10	0.34	-0.22*	-1.23*	0.28	-0.21*	-0.61*	0.23	0.02	0.26	0.34	-0.40*	-0.16*	0.32	0.30	0.58	0.23	0.27	0.29	0.21	0.32	-0.18*
G-4	-0.53	-0.91	-0.13	0.18	-0.99	-1.28	-0.72	0.45	0.50	0.08	0.67	0.69	0.45	0.67	0.38	-0.42	0.39	0.20	0.76	1.29	1.35	-0.52	-0.10
G-5	-0.14	-0.73	-0.78	0.41	-0.57	-0.22	-0.33	0.06	0.10	-0.11	0.09	-0.00	-0.34	0.97	-0.10	-0.25	-0.45	0.03	0.03	-0.04	-0.05	-0.15	-0.12
G-6	0.36	1.46	2.[illegible]3	-0.15	0.97	-0.00	0.12	-0.49	-0.10	-0.30	-0.16	-0.34	0.03	0.47	-0.25	-0.34	0.55	-0.65	-0.11	-0.34	0.40	-0.04	-0.23
G-7	-1.27	-1.25*	-0.34	0.07	-0.37	-0.68	0.17	0.44	0.47	0.36	0.46	0.43	0.57	0.32	0.45	0.38	0.06	0.42	0.34	0.37	0.09	0.11	-0.24
G-8	0.31	0.00	-0.10	0.46	0.03	-0.21	-0.30	0.80	0.16	-0.23	-0.17	2.09	-0.38	-0.23	-0.27	-0.18	0.64	-0.23	-0.29	-0.31	-0.33	0.32	-0.16
G-9	-0.31	-0.37	-0.24	0.31	-0.13	-0.04	-0.09	-0.62	-0.51	-0.23	-0.44	-0.33	-0.40	-0.08	-0.34	-0.50	0.65	-0.48	-0.39	-0.42	-0.21	-2.10	-0.13
G-10	-0.32	0.23	0.55	-0.88	0.01	-0.25	-0.07	0.12	-0.01	0.05	-0.36	1.24	0.44	0.54	-0.22	0.09	0.21	-0.34	-0.42	-0.31	-0.37	0.07	0.04
G-11	-0.12*	-0.01*	-0.02*	0.24	-0.30*	0.40	1.20	0.51	-0.49*	0.26	-0.53*	0.40	-0.56*	-0.41*	-0.25*	-0.82*	0.07	-0.48*	-0.56*	0.23	0.64	-0.32*	0.04
G-12	0.32	1.75	1.35	1.46	0.53	-0.94*	-0.50*	0.10	-0.46*	0.46	-0.31*	0.35	0.23	-0.32*	-0.04*	0.26	-0.63*	-0.31*	-0.37*	-0.16*	-0.44*	-0.38*	0.04
G-13	0.69	0.70	0.51	0.19	0.40	0.02	-0.69*	-0.41*	-0.00*	0.00	0.[illegible]	-0.17*	-0.12*	-0.15*	0.25	0.01	1.71	0.33	-0.05*	-0.21*	1.5[illegible]	0.61	0.38

*Negative pole of a bipolar dimension.

Table 5 (continued)

Dimension number	Cluster Number 47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
A-1	1.59	0.74	-0.55	1.17	2.29	4.57	-0.21	0.19	-0.39	-0.09	-0.33	-0.34	-0.38	1.28	-0.00	-0.26	1.50	-0.36	-0.00	-0.34	-0.34	-0.28	-0.32
A-2	0.13	-0.39	-0.46	-0.52	-0.64	-0.10	0.57	-0.00	-0.31	-0.23	-0.31	-0.51	-0.25	-0.69	-0.59	-0.41	-0.30	-0.01	-0.44	-0.35	-0.61	-0.63	-0.34
A-3	-0.25	-0.26	-0.36	-0.25	-0.23	-0.15	4.30	6.89	-0.07	0.51	1.03	-0.17	-0.17	-0.26	-0.26	-0.22	-0.21	-0.[illegible]	-0.22	-0.20	-0.20	-0.11	-0.19
A-4	1.67	0.58	2.36	-0.05	-1.16	0.23	-0.23	-0.76	-0.35	-0.42	-0.02	0.09	0.18	1.62	0.49	-0.19	-0.32	-0.50	-0.17	-0.19	-0.02	-0.61	-0.01
A-5	2.29	2.49	2.33	0.86	1.13	0.22	0.26	0.8	1.13	1.36	-0.17	-0.68	-0.51	2.21	0.43	-0.29	-0.85	1.56	-0.61	-0.54	-0.30	-0.18	-0.48
A-6	-0.05	-0.21	-0.38	-0.27	-0.34	-0.23	1.23	0.26	-0.19	-0.23	-0.19	-0.34	-0.29	-0.29	-0.29	-0.29	-0.31	-0.23	-0.26	-0.25	-0.26	0.44	-0.29
A-7	1.07	0.03	-0.35	-0.54	0.72	0.07	-0.09	-0.76	-0.15	-0.25	-0.15	-0.59	-0.17	-1.06	-0.46	-0.25	0.06	-0.48	-0.26	-0.26	-0.19	-0.06	-0.37
A-8	0.96	-0.31	1.11	-0.81	1.40	-0.16	-0.14	0.16	-0.65	-0.75	-0.53	0.24	1.04	-0.29	-0.08	0.51	-0.34	0.22	-0.72	-0.58	-0.46	0.12	-0.11
A-9	0.62	-0.29	-0.26	-0.28	-0.31	-0.15	-0.24	0.76	-0.58	-0.35	-0.33	-0.34	-0.35	-0.26	-0.34	-0.34	-0.37	-0.31	-0.60	-0.63	-0.38	-0.64	-0.40
A-10	0.12	-0.42	-0.58	-0.66	-0.42	-0.35	-0.28	-0.51	-0.17	-0.54	-0.46	-0.60	-0.50	-0.55	-0.43	-0.56	-0.41	-0.46	-0.53	-0.51	-0.65	-0.50	-0.47
A-11	0.61	0.71	1.11	-0.18	0.63	1.[illegible]2	0.07	-0.17	-0.57	-0.12	-0.03	1.95	2.41	2.55	2.25	-0.15	1.33	2.22	0.58	0.27	-0.34	-0.59	-0.47
A-12	2.09	0.42	1.91	0.79	0.04	0.09	-0.19	0.89	-0.77	-1.10	-1.02	0.11	0.50	1.05	0.41	-0.46	-1.11	-1.66	-0.54	-0.75	-0.69	-0.32	-0.62
A-13	-0.48	-0.05	-0.37	-0.21	-0.04	-0.29	0.16	0.07	-0.19	-0.38	-0.33	-0.47	-0.44	-0.40	-0.29	-0.53	-0.15	-0.27	-0.63	-0.40	-0.43	-0.01	-0.26
A-14	-0.32	-0.29	-0.26	-0.05	-0.23	-0.27	-0.27	0.08	-0.30	-0.18	-0.06	-0.18	0.37	-0.18	-0.33	-0.04	-0.56	-0.09	-0.22	-0.05	-0.23	-0.33	-0.17
A-15	-0.09	0.26	0.70	0.09	0.28	0.21	0.21	-0.37	-0.33	0.15	-0.02	0.17	0.06	0.87	0.35	0.00	0.09	-0.39	0.19	-0.06	0.08	1.12	-0.09
A-16	-0.72	0.32	0.61	0.11	-0.07	-0.35	-1.22	1.63	0.07	-0.30	-0.76	-0.07	-0.14	0.43	0.37	0.06	-0.05	-0.39	0.02	-0.06	-0.12	-0.63	-0.21
A-17	1.18	-0.10	0.64	-0.57	-0.01	0.30	-0.00	1.65	0.13	-0.33	-0.48	-0.30	0.81	-0.17	0.67	-0.22	-0.44	-0.79	-0.38	-0.36	-0.40	0.01	-0.29
B-1	1.88	-0.05	-0.06	-0.59	-0.01	0.11	0.22	1.78	-0.21	-0.46	-0.63	-1.02	0.19	-0.80	-0.14	-0.49	-0.11	0.87	-0.40	-0.58	-0.61	-0.67	-0.35
B-2	-0.81	0.93	1.52	0.15	0.52	0.79	-0.46	-0.08	-0.72	-0.57	-0.32	0.23	0.18	0.86	1.00	0.19	0.98	0.98	-0.15	-0.04	-0.00	-0.34	0.16
B-3	0.98	-0.38	0.72	-0.19	-0.25	0.54	-0.25	0.20	-0.44	-0.46	-0.62	-0.27	-0.28	0.00	0.25	-0.41	-0.49	-0.34	-0.43	-0.39	-0.43	-0.33	-0.65
B-4	2.15	-0.16	0.47	0.37	-0.18	-0.23	0.38	1.70	-0.65	-1.13	-0.67	-0.22	-0.06	0.13	0.00	-0.56	-0.41	-0.62	-0.60	-0.57	-0.60	-0.34	-0.67
B-5	0.38	-0.35	0.22	-0.59	0.42	-0.09	-0.32	0.75	-0.43	-0.59	-0.47	-0.22	0.69	-0.07	-0.15	-0.29	-0.53	0.12	-0.51	-0.26	-0.67	-0.22	-0.51
B-6	-0.63	-0.36	-0.06	-0.36	-0.53	-0.17	-0.52	-0.45	-0.49	-0.98	-0.80	-0.88	-0.51	-0.95	-0.10	-0.59	-0.28	-0.53	-0.75	-0.57	-0.64	-0.78	-0.35
B-7	1.71	0.53	0.93	0.31	0.10	0.57	0.81	0.63	-0.48	-0.49	-0.67	0.11	0.40	1.78	0.31	0.06	-0.85	-1.13	-0.97	-0.70	-3.76	0.09	-0.92
B-8	-0.04	-0.67	-1.22	-0.56	-0.25	-0.34	-0.48	0.21	0.16	0.04	-0.12	-0.37	-0.49	-1.02	-0.45	-0.19	-0.08	-0.48	-0.08	-0.19	-0.26	-0.18	-0.17
B-9	-0.12	0.61	0.79	0.38	1.09	1.17	0.69	2.06	0.25	-0.57	0.28	0.51	1.72	1.28	0.87	-0.24	0.69	2.25	-0.09	-0.34	-0.52	0.60	-0.67
C-1	0.00	1.36	0.92	-0.62*	-0.13*	-0.54*	0.51	1.09	-0.44*	0.05	1.44	1.75	2.02	2.39	1.51	0.21	-1.05*	0.76	-0.45*	0.82	1.16	1.62	0.77
C-2	-0.76	1.21	0.76	-0.49	0.85	-0.81	0.96	1.22	3.44	6.63	-0.57	-0.40	0.00	0.20	-0.03	-0.52	-0.12	-0.08	-0.07	0.05	-0.52	0.56	-0.08
C-3	1.76	2.58	0.23	2.20	1.84	3.37	0.11	0.12	-0.11	0.43	-0.26	-0.42	-0.26	7.03	1.13	-0.14	0.30	-0.60	-0.36	-0.71	0.04	0.17	-0.39
C-4	1.15	0.16	0.29	-0.14	0.80	-0.40	0.16	0.02	-0.52	-0.57	-0.03	-0.40	0.28	-0.08	-0.04	-0.45	-0.[illegible]	-0.58	-0.26	-0.51	0.08	0.18	-0.61
C-5	0.27	-1.23	0.06	0.36	1.03	0.71	-0.15	1.36	0.76	-0.07	0.05	-0.53	0.79	-0.60	-0.61	0.31	0.57	2.55	0.11	-0.16	-0.61	0.36	-0.01
C-6	0.00	-0.00	5.77	-0.19	0.94	-0.53	-0.19	0.03	-0.37	-0.62	-0.26	-0.22	0.16	1.96	0.63	0.16	-0.32	-0.28	-0.45	-0.18	-0.20	0.61	-0.28
C-7	-0.64	0.34	0.13	-0.26	-0.22	0.09	1.75	1.77	-0.41	-0.83	0.63	-0.34	-0.39	0.54	-0.01	-0.21	0.32	-0.30	-0.08	-0.64	-0.45	0.71	-0.66
C-8	-0.52	0.43	-0.02	-0.48	-0.11	-0.06	0.04	-0.43	-0.67	-0.20	-0.06	0.46	1.32	-0.50	-0.06	-0.27	0.23	1.01	-0.17	0.00	-0.48	-0.09	-0.19
C-9	-1.37	-0.96	0.16	0.58	-1.06	0.19	-0.61	-0.79	-0.71	-0.58	-0.16	-0.26	-2.37	-2.04	-0.83	1.17	1.15	-2.79	0.90	0.55	0.06	1.06	0.53
C-10	0.02	0.91	1.17	-0.62	0.44	-0.29	-0.03	0.35	-0.27	-0.09	-0.25	0.06	1.96	3.48	0.58	2.64	-0.72	1.58	-0.65	-0.56	-0.29	0.[illegible]	-0.11
C-11	-0.05	-0.85	-1.20	0.18	-0.62	-1.79	0.05	0.35	0.47	0.17	-0.00	-1.04	-1.19	-3.56	-1.50	0.32	-3.61	-3.35	-1.75	-0.92	0.35	-0.05	0.37
C-12	-0.77	-0.85	-0.61	-0.38	-0.09	0.41	.12	-0.95	-0.11	-0.18	-0.11	0.50	-0.03	-0.06	-0.17	-0.43	-0.37	-0.85	-0.57	-0.55	1.54	5.15	0.63
C-13	0.13	-0.07	0.20	-0.31	2.41	0.08	-0.25	-0.24	-0.32	0.38	0.03	-0.39	1.45	-0.92	0.46	-0.25	0.70	-0.61	0.48	-0.49	-0.40	0.18	-0.37
C-14	-0.44	-0.35	0.00	-0.07	-1.02	0.19	0.20	0.76	0.08	0.06	-0.31	2.35	5.28	-0.97	0.69	0.26	0.02	-0.41	-0.06	0.00	-0.29	0.61	-0.39
C-15	-0.48	0.74	0.70	0.18	-0.41	-0.11	-3.87	-5.06	-0.10	-1.59	-2.62	-0.14	-0.80	0.56	0.09	-0.15	0.38	0.64	0.35	0.61	-0.03	0.56	0.02
C-16	1.40	-0.35	0.61	0.11	1.06	0.17	-0.31	0.85	-0.13	0.06	-0.75	1.59	1.27	-0.21	0.50	-0.26	0.00	1.65	-0.30	-0.07	-0.58	-0.99	-0.10
C-17	-0.65	0.82	-0.21	-0.54	-0.43	-0.75	-0.15	-0.72	-0.56	0.63	0.02	1.59	0.57	-0.76	-0.28	1.07	-0.14	3.29	0.12	0.68	0.11	-1.02	-0.10
C-18	-0.46	0.52	0.44	-0.28	-0.09	-0.05	0.67	1.14	3.08	5.14	1.70	0.05	-0.32	1.08	-0.27	-0.23	0.08	-0.23	-0.14	-0.44	-0.24	0.27	-0.35
C-19	0.88	-0.22	-0.41	-0.25	-0.51	0.02	0.11	-0.08	0.02	-0.32	-0.29	0.71	-1.32	0.57	-0.57	-0.17	-0.11	-1.61	-0.65	0.38	-0.48	-0.50	-0.17
C-20	0.03	-0.70	-0.29	-0.14	1.04	-0.19	-0.03	0.52	0.12	0.21	-0.12	-1.02	-1.32	-0.46	-0.98	0.67	0.38	0.91	-0.40	-0.27	0.26	-0.57	-0.11
D-1	0.70	-0.33	-0.80	-0.20	-0.35	0.68	0.12	1.26	-0.03	-0.12	-0.83	-0.65	-0.52	-0.63	-0.59	-0.66	-0.67	-1.47	-0.97	-0.92	-1.10	-1.08	-0.73
D-2	0.87	-0.57	0.01	0.02	-0.56	-0.31	0.24	-0.43	-1.09	-0.51	-0.66	-0.15	-0.26	-0.47	-0.63	-0.96	-0.82	-0.84	-0.58	-0.78	-0.65	-0.50	
D-3	1.13	-0.06	0.93	0.05	-0.25	0.27	0.00	0.99	-0.32	-0.44	-0.41	-0.02	0.32	1.35	0.26	-0.25	-0.39	-0.39	-0.38	-0.33	-0.39	-0.38	-0.35
D-4	-0.66	-0.42	-0.56	-0.54	-0.18	-0.41	-0.37	0.01	0.04	-5.04	-0.17	-0.21	-0.40	-0.44	-0.36	-0.28	-0.20	-0.17	-0.17	-0.27	-0.18	-0.31	-0.20
D-5	-2.53	0.22	0.08	0.36	-0.45	-0.53	0.09	-0.92	0.33	3.60	0.45	0.53	0.42	-0.09	0.41	0.50	0.23	0.34	0.36	0.46	0.40	0.33	0.40
D-6	0.99	0.70	-0.12	0.71	0.44	0.27	0.42	1.76	1.46	0.53	-0.10	0.36	0.15	0.96	-0.10	-0.20	-0.08	-0.19	-0.08	-0.04	-0.11	-0.18	0.32
D-7	0.27	-0.27	-0.29	-0.25	-0.17	0.23	0.01	0.51	-0.15	-0.52	-0.26	-0.27	-0.[illegible]	0.00	-0.30	-0.26	-0.30	-0.34	-0.23	-0.20	-0.18	-0.15	-0.22
E-1	3.35	-0.45	-0.40	-0.190	-0.43	0.03	1.20	3.22	-0.46	-0.46	-0.42	-0.39	-0.22	-0.48	-0.46	-0.45	-0.47	-0.49	-0.48	-0.37	-0.44	-0.19	-0.44
E-2	-0.67	0.09	-0.32	-0.36	-0.41	-0.12	0.14	0.67	-0.14	-0.44	-0.46	-0.45	-0.37	0.33	-0.41	-0.42	-0.39	-0.41	-0.35	-0.44	-0.46	-0.34	-0.61
E-3	-0.16	-0.25	-0.28	-0.11	-0.39	-0.18	0.11	0.44	-0.34	-0.30	-0.35	-0.36	-0.35	-0.43	-0.38	-0.35	0.17	-0.40	-0.45	-0.35	-0.40	-0.34	-0.38
E-4	0.63	-0.38	0.03	0.42	0.38	0.27	-1.40	-0.79	0.35	1.10	0.36	0.75	-0.22	0.13	0.27	0.52	0.67	0.44	0.22	0.01	-0.06	-0.61	-0.11
E-5	1.12	-0.18	-0.21	0.16	-0.21	0.11	-0.25	-0.51	-0.24	-0.18	-0.20	-0.20	-0.21	-0.23	-0.15	-0.19	-0.20	-0.20	-0.22	-0.21	-0.21	-0.22	-0.21
E-6	0.42	-0.34	-0.39	-0.21	-0.42	-0.11	0.68	0.35	-0.26	-0.36	-0.39	-0.38	-0.15	-0.28	-0.37	-0.39	-0.41	-0.41	-0.38	-0.40	-0.39	-0.51	-0.38
E-7	-0.56	-0.09	-0.19	-0.11	-0.19	-0.12	-0.16	1.68	-0.24	-0.17	-0.19	-3.16	-0.23	-0.22	-0.19	-0.17	-0.30	-0.17	-0.22	-0.21	-0.19	-0.23	-0.20
E-8	0.44	-0.35	-0.14	-0.08	0.65	0.09	-0.46	-0.22	0.09	-0.31	-0.15	-0.25	0.08	-0.52	-0.01	-0.40	-0.53	-0.49	0.10	-0.31	-0.17	-0.56	-0.30
F-1	2.13	-0.33	-0.11	-0.26	-7.48	-0.21	0.41	0.35	-0.39	-0.92	-0.73	-0.25	0.15	0.28	-0.36	-0.47	-0.76	-0.44	-0.75	-0.61	-0.60	-0.25	-0.34
F-2	2.57	0.63	-0.50	1.19	2.25	4.79	-0.19	0.51	-0.48	0.21	-0.28	-0.08	-0.13	2.74	0.15	-0.16	1.17	-0.31	0.21	-0.29	-0.31	-0.20	-0.33
F-3	4.59	0.03	0.47	-0.29	-0.55	0.15	-0.21	0.54	-0.45	-0.27	-0.18	-0.19	0.16	1.22	0.22	-0.29	-0.25	-0.17	-0.[illegible]	-0.20	-3.26	-0.37	-0.28
F-4	1.99	3.16	1.43	0.83	1.28	0.46	0.23	0.14	0.78	1.77	0.07	-0.52	-0.56	3.40	1.16	-0.36	-0.56	0.73	-0.55	-0.53	-0.06	-0.18	-0.44
F-5	-3.65	0.14	0.47	-0.11	0.36	0.05	-0.21	-1.25	0.50	0.59	0.31	-0.03	-0.10	-0.04	0.18	0.40	0.30	0.21	0.25	0.32	0.30	0.56	0.31
F-6	0.20	0.03	-1.09	-0.49	-0.49	-0.23	0.40	0.94	1.05	-0.34	0.25	0.04	0.70	0.40	-0.00	-0.49	-0.44	-0.3	-0.44	-0.35	-0.01	0.51	0.44
F-7	0.43	0.23	0.18	0.04	0.13	0.26	0.00	0.39	9.08	0.13	0.17	0.35	0.37	0.29	0.28	0.15	0.[illegible]7	0.[illegible]	0.35	0.24	0.21	0.20	0.19
F-8	1.55	-1.39	0.61	0.23	0.96	-0.66	0.37	0.31	3.17	-0.63	-0.31	-1.16	-1.06	-2.48	-1.26	0.06	-0.41	-1.4[illegible]	-0.75	-0.53	-0.24	0.07	-0.25
F-9	0.51	-0.09	-0.28	-0.26	-0.14	-0.11	1.32	1.37	-0.44	0.64	-0.15	-0.06	-0.13	-0.05	-0.10	-0.17	-3.17	-0.04	-0.14	-0.17	-0.22	-0.29	-0.22
F-10	1.75	0.63	-0.22	0.02	0.01	0.19	0.67	-0.29	0.35	0.22	0.42	0.83	0.93	0.71	0.39	0.16	0.25	0.45	0.38	0.38	0.50	0.42	0.51
F-11	-0.23	-0.51	-0.38	-0.31	-0.16	0.15	-0.47	0.85	-0.19	0.00	-0.38	-0.57	-0.42	-0.80	-0.55	-0.40	-0.30	-0.39	-0.35	-0.42	-0.52	-0.42	-0.55
F-12	1.41	-0.10	1.96	-0.51	1.47	-0.49	-0.10	0.55	-0.72	0.12	-0.41	1.49	3.24	2.97	0.56	1.65	-0.53	0.47	-0.55	-0.51	-0.46	0.02	-0.59
F-13	2.05	-0.29	-0.39	-0.30	-0.12	-0.36	0.90	0.56	-0.47	-0.50	-0.23	-0.41	-0.30	-0.58	-0.32	-0.33	-0.10	-0.15	-0.21	-0.27	-0.32	-0.40	-0.41
F-14	-0.79	-0.44	0.30	-0.25	-0.71	0.27	-0.45	-0.47	0.97	-0.25	-0.41	-0.05	-0.13	0.36	-0.22	-0.24	-0.90	-0.72	-0.88	-0.44	-0.13	0.18	0.02
F-15	0.69	-0.42	-0.09	-0.22	-0.48	-0.12	2.24	4.86	2.24	4.41	0.29	0.27	0.31	0.19	-0.31	-0.36	-0.48	-0.42	-0.53	-0.36	-0.18	6.04	-0.10
F-16	2.42	-0.27	0.37	-0.04	0.60	0.[illegible]8	-0.39	-0.34	-0.29	-0.74	-0.29	-0.07	0.53	0.74	0.00	-0.16	2.05	1.75	1.19	0.85	-0.23	-0.31	-0.19
G-1	1.91	0.01	0.59	-0.08	0.01	0.78	0.54	1.65	-0.08	0.00	-0.70	-0.51	-0.02	0.66	0.13	-0.34	-0.63	0.00	-0.95	-0.82	-0.69	-0.51	-0.96
G-2	2.01	0.70	2.01	-0.38	1.32	-0.11	0.69	1.27	1.24	2.72	1.42	0.08	0.56	1.25	1.24	0.47	-0.04	0.64	-0.02	-0.07	0.17	0.69	-0.21
G-3	0.33	0.28	0.31	0.[illegible]	33	-0.29*	-2.26*	-3.96*	-0.91*	7.27*	-2.62*	0.00	0.22	0.13	0.26	0.23	0.28	0.51	0.28	0.28	0.15	0.41	0.03
G-4	-0.07	-0.31	-0.19		14	0.17	-0.95	-0.31	0.28	0.23	-0.9*	0.64	0.04	0.30	-0.28	0.64	1.31	1.04	1.08	0.60	-0.58	6.27	0.07
G-5	1.47	0.00	-0.16	-0.[illegible]		-0.46	0.11	0.55	-0.25	-0.19	0.19	0.00	0.25	-0.46	-0.14	-0.11	-0.12	-0.31	-0.02	-0.06	6.15	7.75	-0.03
G-6	0.53	-0.45	0.17	-0.[illegible]		-0.62	-1.05	0.57	0.64	0.[illegible]9	0.30	-0.52	-0.20	-0.65	-0.49	-0.59	0.17	0.87	-0.44	-0.62	-0.32	0.87	-0.36
G-7	-1.53	0.63	0.69	0.4[illegible]		0.33	-0.92	-1.17	0.33	0.66	0.53	0.61	0.54	0.51	0.44	0.46	0.48	0.39	0.43	0.40	0.32	0.46	0.42
G-8	1.08	-0.26	-0.22	-0.93		1	0.16	1.02	0.66	0.34	0.57	-0.23	-0.34	-0.40	0.52	-0.[illegible]	-0.39	-0.14	-0.21	-0.01	1.22	-0.33	0.18
G-9	-0.09	0.04	-0.36	0.2[illegible]			1.58	2.94	1.62	1.46	2.29	0.25	2.20	1.37	-0.13	-0.22	-0.21	0.73	-0.34	-0.40	-0.93	-0.23	-0.39
G-10	0.13	0.08	-0.36	0.47	[illegible]		0.71	-0.66	-1.26	-0.76	-0.93	-0.41	0.98	0.44	1.84	-0.25	0.07	-0.48	-0.19	-0.34	-1.30	-0.34	-0.21
G-11	-0.37*	-0.60*	-0.74*	-0.73*	-0.[illegible]		8	0.50	2.57	0.47	0.84	-1.64*	-0.21*	-0.82*	-0.14*	-0.49*	-0.95*	-0.[illegible]*	-0.21*	-0.43*	0.06	-0.77*	-0.02*
G-12	-0.12*	0.42	0.14	0.38	0.32			1.16	0.24	-0.10*	0.01	-0.15*	-0.15*	2.31	0.27	0.35	-0.25*	-0.69*	-0.11*	-0.19*	0.39	0.88	-0.01*
G-13	0.69	0.36	-0.11*	1.19	0.2[illegible]	1.17		1.[illegible]0	0.56	-0.71*	0.66	0.[illegible]1	0.83	0.19	0.17	-0.11*	0.30	1.01	0.09	0.37	0.84	-0.42*	0.33

*Negative pole of a bipolar dimension

Table 5 (continued)

Dimension Number	Cluster Number			
	70	71	72	73
A-1	-0.05	-0.31	-0.34	-0.37
A-2	-0.40	-0.25	-0.37	-0.42
A-3	-0.27	-0.18	-0.15	-0.21
A-4	-0.55	-0.30	-0.50	0.23
A-5	0.63	-0.33	-0.38	-0.60
A-6	-0.26	-0.21	-0.31	-0.50
A-7	-0.17	0.02	-0.41	-0.51
A-8	0.14	1.19	0.75	0.87
A-9	-0.43	-0.29	-0.21	-0.37
A-10	-0.50	-0.44	-0.49	-0.50
A-11	-0.46	0.46	0.07	0.12
A-12	0.36	-0.26	-0.61	-0.97
A-13	-0.53	-0.48	-0.60	-0.30
A-14	-0.19	0.90	1.51	-0.32
A-15	0.37	-0.29	-0.45	-0.08
A-16	0.19	-0.29	-0.34	0.16
A-17	-0.39	-0.33	0.73	-0.50
B-1	-0.22	0.20	-0.21	0.56
B-2	0.72	0.84	0.36	-0.66
B-3	-0.39	-0.34	-0.55	-0.65
B-4	0.08	-0.75	-0.41	-1.13
B-5	-0.58	0.34	-0.13	-0.47
B-6	-0.25	0.08	-0.36	-0.83
B-7	0.19	-0.19	-1.10	-0.72
B-8	-0.55	-0.24	-0.10	0.05
B-9	-0.44	0.04	1.75	-0.46
C-1	0.88	-0.64*	0.68	0.00
C-2	-0.00	0.09	0.43	0.27
C-3	-0.04	-0.72	-0.64	-0.63
C-4	0.37	0.74	-0.16	-0.71
C-5	0.10	0.39	1.69	-0.25
C-6	0.02	-1.26	-0.87	0.30
C-7	-0.12	0.14	-0.25	-0.58
C-8	-0.07	-0.18	1.31	-0.12
C-9	0.36	1.99	-0.48	1.05
C-10	-0.41	1.64	-0.03	-0.43
C-11	-0.11	-0.44	0.16	-0.30
C-12	-0.31	-0.75	-0.48	0.01
C-13	-0.06	0.89	0.23	1.63
C-14	-0.30	1.26	-0.08	-0.49
C-15	0.26	0.62	0.36	0.54
C-16	-0.63	-0.11	-0.22	0.06
C-17	0.19	1.46	-0.34	0.08
C-18	0.10	0.05	-1.04	-0.38
C-19	1.63	0.19	-0.60	0.60
C-20	0.17	0.22	0.12	0.82
D-1	-0.11	-0.46	-0.89	-1.06
D-2	-0.17	-0.15	-0.61	-0.80
D-3	-0.13	-0.36	-0.31	-0.42
D-4	-0.43	-0.34	-0.21	-0.16
D-5	0.47	0.40	0.48	0.38
D-6	1.32	0.11	-0.11	-0.12
D-7	-0.03	-0.20	-0.21	-0.23
E-1	-0.56	-0.28	-0.46	-0.67
E-2	-0.66	-0.41	-0.34	-0.36
E-3	-0.36	-0.31	-0.25	-0.25
E-4	0.26	0.44	0.70	1.36
E-5	-0.21	0.04	-0.18	-0.17
E-6	-0.38	-0.40	-0.60	-0.37
E-7	-0.18	-0.16	-0.15	-0.14
E-8	-0.34	-0.43	0.23	-0.40
F-1	-0.16	-0.05	-1.47	-0.62
F-2	0.18	-0.20	-0.34	-0.34
F-3	-0.33	-0.27	-0.14	-0.30
F-4	0.70	-0.48	-0.48	-0.34
F-5	0.32	0.25	0.33	0.36
F-6	-0.33	-0.39	2.45	-0.62
F-7	0.12	0.13	0.18	0.21
F-8	0.36	0.52	-0.14	0.36
F-9	-0.19	-0.06	-0.27	-0.26
F-10	0.18	0.30	0.61	0.06
F-11	-0.34	-0.31	0.43	-0.32
F-12	-0.06	1.12	-0.43	0.44
F-13	-0.38	-0.29	-0.29	-0.27
F-14	0.10	-0.24	-0.13	-0.29
F-15	0.26	-0.43	-0.14	-0.50
F-16	0.10	0.23	0.44	0.78
G-1	-0.19	-0.36	-0.87	-1.03
G-2	0.48	-0.08	-0.30	-0.30
G-3	0.22	0.34	0.36	0.[illegible]4
G-4	0.04	0.55	0.92	1.28
G-5	-0.12	-0.31	-0.00	0.00
G-6	0.59	-0.48	-0.16	-0.59
G-7	0.41	0.45	-0.25	0.41
G-8	-0.18	-0.02	-0.25	-0.18
G-9	-0.34	-0.40	0.35	-0.39
G-10	0.16	0.29	-0.15	0.09
G-11	-0.40*	0.40	-0.25*	-0.64*
G-12	0.18	0.58	-0.21*	-0.26*
G-13	-0.11*	-0.24*	-0.35*	0.10

*Negative pole of a bipolar dimension.

Table 6. Mean Standard Scores of 103 Attributes for OAI-Derived Occupational Clusters

Attribute Number	Cluster Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	9.15	8.88	8.97	8.20	8.59	8.07	8.26	8.20	8.11	8.05	8.18	8.56	8.12	8.02	8.51	8.19	8.15	8.49	8.59	9.29	8.15	8.30	8.52
2	11.21	8.90	9.48	9.59	9.77	8.54	8.53	8.55	8.44	8.35	8.31	8.87	8.32	8.12	9.04	8.51	8.33	8.59	8.88	8.43	8.211	8.68	8.41
3	9.27	8.76	8.81	8.26	8.71	9.05	9.21	8.15	8.16	8.06	9.27	9.28	8.31	8.03	9.98	8.22	8.15	8.42	8.94	8.29	8.10	8.33	8.27
4	9.20	8.47	8.53	8.47	8.59	8.38	8.40	8.72	8.27	8.24	8.39	9.41	8.45	8.22	9.06	8.70	8.44	8.31	10.30	8.39	8.26	8.58	8.81
5	10.69	8.94	9.70	8.42	9.02	8.44	8.46	5.44	8.36	8.27	8.39	8.38	8.26	8.25	8.62	8.35	8.34	8.46	8.43	8.37	5.31	8.36	8.55
6	10.24	9.41	8.75	3.57	10.05	6.19	8.36	8.33	8.26	8.19	8.38	8.87	8.29	8.17	8.69	8.33	8.32	8.55	9.16	8.33	8.26	8.67	8.36
7	11.00	9.85	9.24	9.35	10.40	8.33	8.44	8.48	8.43	8.19	8.20	7.46	8.37	8.25	6.16	8.43	8.35	6.63	9.04	8.54	8.35	8.44	8.5
8	11.35	9.05	9.07	8.82	9.35	8.98	8.73	8.89	8.77	8.68	8.45	8.87	8.59	8.42	9.59	8.42	8.55	8.71	8.45	8.51	8.49	8.43	8.86
9	12.41	9.78	12.01	10.55	10.09	9.34	9.09	9.05	8.67	8.75	8.44	8.45	8.43	8.34	9.03	8.46	8.72	9.61	9.12	8.59	8.52	8.89	8.69
10	11.43	9.01	10.99	9.07	9.51	8.70	8.69	8.77	8.55	8.47	8.40	8.30	8.31	8.26	8.55	8.65	8.52	9.02	8.54	8.33	8.34	8.56	8.40
11	10.53	10.16	9.65	8.37	9.90	8.32	8.52	9.50	8.34	8.16	8.13	8.29	8.16	8.19	8.30	8.24	8.45	9.54	8.52	8.74	8.29	8.47	8.24
12	10.71	11.31	9.03	9.18	12.16	8.53	8.65	6.61	8.52	8.43	8.41	8.53	8.31	8.32	8.51	8.45	8.52	9.36	8.72	8.47	8.45	8.55	8.54
13	9.06	9.55	8.44	8.31	9.49	8.20	9.03	8.52	8.26	8.18	8.11	8.49	8.24	8.24	8.68	8.19	9.17	10.84	9.42	9.56	9.15	6.50	8.65
14	9.24	9.61	8.97	8.60	9.85	8.86	8.95	9.02	8.80	8.88	8.55	8.73	8.61	8.58	8.84	8.68	8.63	9.19	8.75	10.10	8.70	8.66	8.89
15	9.21	9.43	9.01	5.81	9.49	8.84	8.98	9.04	8.83	8.94	8.62	8.82	8.66	8.60	8.99	8.75	8.77	9.15	8.87	10.39	8.77	9.01	9.03
16	12.10	9.89	10.38	10.49	11.73	10.37	9.89	10.21	10.65	9.28	8.40	8.87	9.62	8.91	10.73	9.44	9.58	9.81	9.22	8.94	8.91	9.46	8.40
17	11.47	9.71	9.90	10.81	11.50	11.03	10.21	10.89	11.14	9.63	8.70	9.38	10.10	9.29	11.39	9.40	9.75	9.99	9.12	9.01	9.04	6.71	8.53
18	10.12	9.18	9.35	9.35	10.69	10.66	10.12	10.98	10.75	10.58	9.93	11.57	10.72	9.54	12.37	9.52	9.64	10.04	9.83	9.02	9.01	10.03	8.76
19	10.81	9.27	9.55	9.26	11.09	11.37	10.40	11.13	10.30	11.01	9.03	9.56	9.22	8.76	10.51	9.87	9.29	10.58	10.37	9.23	9.00	9.96	8.79
20	9.40	8.75	9.04	8.68	9.49	10.57	10.87	10.71	9.97	9.97	8.55	9.09	9.20	8.13	10.18	11.08	10.80	12.24	12.32	10.30	9.74	11.09	9.05
21	9.35	8.63	8.94	8.53	9.48	9.76	10.42	9.45	9.63	9.76	8.40	9.17	9.11	8.58	10.59	10.09	10.50	11.60	11.58	11.05	9.96	11.49	9.59
22	9.66	8.59	8.85	8.88	9.70	10.44	10.55	11.21	9.61	10.21	8.65	8.86	8.80	8.43	9.77	9.72	9.48	11.05	11.10	9.83	9.25	10.41	9.23
23	9.82	8.75	9.00	6.90	9.83	10.70	10.64	11.02	9.81	10.30	8.52	9.05	8.98	8.52	10.16	9.99	9.77	11.38	11.01	10.32	9.69	10.72	9.17
26	9.45	8.60	9.58	8.51	8.76	9.39	10.13	9.56	9.09	9.22	8.27	8.54	8.43	8.17	9.29	9.59	9.71	11.80	10.96	13.12	9.19	10.43	8.92
25	11.02	9.12	10.16	6.16	10.41	8.75	9.16	9.15	8.65	8.67	8.38	8.83	8.32	8.13	9.14	8.75	8.59	10.04	10.21	8.90	8.37	9.38	8.76
26	11.00	8.93	10.69	9.52	9.83	8.25	8.71	8.71	8.37	8.25	8.68	8.60	8.12	7.94	8.98	8.31	8.41	9.75	9.69	9.26	8.20	8.65	8.67
27	10.58	9.39	9.51	9.61	10.97	10.60	9.99	10.77	10.48	10.57	10.06	11.42	10.61	9.58	12.03	9.41	9.56	9.88	9.63	8.90	8.96	9.89	8.69
28	10.73	8.93	9.52	9.61	10.75	9.51	9.25	9.72	9.28	9.27	9.03	10.04	9.20	8.55	10.71	8.63	8.84	9.58	10.01	8.96	8.33	9.23	8.81
29	10.04	8.63	9.79	9.69	9.19	8.07	8.77	8.74	8.17	8.26	8.23	8.63	8.13	8.01	8.78	8.56	8.58	9.38	10.76	8.84	8.50	9.08	9.37
30	11.82	9.01	11.54	9.96	9.92	9.11	9.22	9.24	8.91	8.87	8.40	8.58	8.28	8.11	9.15	8.73	8.63	10.04	9.58	9.23	8.35	9.01	8.34
31	11.69	9.87	10.12	10.41	11.87	10.70	10.30	10.56	10.98	9.46	8.68	8.87	9.89	9.13	11.00	9.40	9.76	9.96	9.31	8.95	9.04	9.59	8.66
32	11.07	9.56	9.80	9.77	11.20	10.50	10.09	10.80	10.44	10.21	8.65	9.68	9.54	8.82	11.03	9.43	9.36	10.12	10.02	9.14	9.04	10.02	6.67
33	10.95	9.30	9.61	9.37	11.14	11.35	10.38	11.17	10.30	10.88	8.95	9.55	9.25	8.76	10.62	9.81	9.30	10.54	10.20	9.21	8.99	9.93	8.77
34	10.93	9.32	9.53	9.27	11.22	11.63	10.33	11.09	10.37	11.25	9.34	9.81	9.32	8.82	10.54	9.93	9.25	10.60	10.18	9.04	8.88	9.74	8.78
35	10.94	9.48	9.68	9.35	11.40	11.45	10.26	11.00	10.59	11.30	10.04	10.56	9.70	9.06	10.88	9.80	9.24	10.26	9.85	8.89	8.80	9.62	8.71
36	10.76	9.71	9.51	9.26	11.08	11.33	10.44	11.05	10.16	10.86	8.81	9.19	9.08	8.66	10.26	10.02	9.33	10.83	10.58	9.26	9.00	9.92	8.83
37	11.25	9.43	10.14	9.53	11.26	11.26	10.38	10.91	10.11	10.83	8.84	8.81	9.78	8.47	9.78	9.71	9.09	10.65	10.34	9.16	8.67	9.44	8.61
38	11.00	9.12	9.71	9.37	10.94	10.49	9.91	10.54	9.51	9.81	8.39	8.40	8.37	8.05	9.56	8.98	8.58	9.80	9.54	8.95	8.62	9.02	8.56
39	11.77	9.63	10.03	10.20	11.78	10.79	10.04	10.58	10.33	10.22	8.61	8..	8.94	8.51	10.02	9.30	8.91	9.43	9.75	8.91	8.65	9.30	8.52
40	11.93	9.67	10.17	10.14	11.86	11.21	10.11	10.72	10.22	10.39	8.75	8.8	8.86	8.47	9.85	9.20	8.82	9.88	9.60	8.97	8.86	9.15	8.50
41	11.21	9.51	10.08	9.58	11.07	11.24	10.32	10.76	9.87	10.69	7.71	8.76	8.77	8.47	9.63	9.71	9.11	10.78	10.65	9.39	8.64	9.19	8.63
42	9.73	8.67	8.92	8.95	9.76	10.49	10.56	11.17	9.60	10.15	8.44	8.81	8.79	8.42	9.75	9.82	9.57	11.11	10.83	10.07	9.33	10.63	9.12
43	9.98	9.00	10.32	8.95	9.33	9.20	9.82	9.03	8.88	9.23	8.91	8.67	8.57	8.52	8.49	9.15	9.33	12.26	10.61	10.08	8.67	9.14	8.52
45	10.44	9.46	9.74	9.60	10.28	10.61	10.27	10.13	9.68	10.44	8.69	8.97	8.95	8.48	9.37	9.81	9.31	10.12	10.15	9.74	8.69	9.62	8.76
45	8.34	8.89	8.94	8.07	8.15	7.81	9.11	7.99	8.07	7.91	8.18	9.89	8.43	8.12	9.44	8.33	8.32	8.44	10.45	9.24	8.16	8.60	8.58
46	8.29	8.56	8.63	8.01	7.99	7.75	8.15	7.94	7.95	7.85	8.06	9.52	8.34	8.00	9.04	8.19	8.43	8.68	10.01	9.20	8.41	8.58	8.95
47	8.58	8.56	8.48	8.37	8.42	7.97	8.19	8.15	8.19	7.97	8.14	9.69	8.38	8.16	9.87	8.43	8.43	8.35	10.42	8.85	8.21	8.65	8.99
48	9.07	8.99	9.33	8.35	8.49	7.93	8.16	8.08	8.16	7.88	8.01	9.43	8.57	8.16	9.80	8.10	8.27	8.69	9.34	9.72	8.15	8.65	8.44
49	8.76	8.87	8.98	8.08	8.32	7.84	8.12	7.99	7.99	7.82	8.02	8.96	8.28	8.01	9.21	8.00	8.25	8.67	9.03	9.65	8.31	8.55	8.50
50	9.57	9.04	9.70	8.50	8.73	8.17	8.32	8.24	8.39	8.03	8.05	9.48	8.81	8.23	10.38	8.04	8.38	8.98	9.11	9.84	8.33	8.79	8.43
51	9.35	9.19	9.63	8.41	8.42	8.04	8.20	8.05	8.13	8.00	8.09	9.33	8.45	8.09	9.48	8.13	8.29	8.72	9.22	10.17	8.28	8.64	8.52
52	8.54	8.43	8.42	8.10	8.31	8.04	8.35	8.16	8.06	8.09	8.29	8.42	8.19	8.23	8.39	8.14	8.45	8.46	8.83	9.31	8.60	8.55	9.06
53	8.30	8.41	8.47	7.97	8.04	7.87	8.51	8.03	7.95	7.98	8.13	8.59	8.13	8.23	8.76	8.07	8.42	8.59	9.07	9.05	8.83	8.77	9.10
54	8.29	8.42	8.42	8.05	8.02	7.86	8.28	8.08	7.95	7.99	8.30	8.40	8.10	8.16	8.87	7.99	8.58	8.63	8.73	9.22	8.84	8.88	8.32
55	8.73	8.54	8.52	8.55	8.45	8.12	8.60	8.21	8.28	8.30	8.35	9.34	8.39	8.15	9.16	8.44	8.91	8.73	10.65	8.89	9.08	8.74	10.06
56	8.43	8.25	8.68	8.02	8.16	7.99	8.41	8.14	8.12	8.12	8.35	8.80	8.33	8.21	9.14	8.20	8.69	8.61	9.15	9.14	8.82	8.97	9.77
57	11.43	9.43	9.84	9.17	10.70	9.61	9.26	9.72	9.48	9.30	8.56	9.72	9.15	8.52	10.68	8.76	8.87	9.68	9.46	9.06	8.40	9.15	8.33
58	9.59	8.41	8.92	8.66	9.59	8.15	8.73	5.62	8.07	8.13	8.02	8.02	8.11	7.88	9.06	8.42	8.63	9.64	10.43	8.97	8.41	8.96	9.03
59	9.73	8.77	9.46	8.68	9.22	7.93	8.40	8.24	7.99	7.93	8.09	8.91	8.14	7.89	9.01	8.22	8.39	9.27	9.71	9.08	8.21	8.67	8.73
60	10.31	9.19	9.47	9.00	10.30	8.40	8.85	8.56	8.17	8.10	8.20	8.46	8.09	7.95	8.94	8.57	8.73	10.63	9.79	9.31	8.38	8.67	8.50
61	10.04	8.69	8.76	8.56	10.01	9.93	9.45	10.49	9.45	9.77	8.07	9.50	8.90	8.26	10.57	9.71	9.40	10.53	11.17	9.59	9.10	10.28	9.19
62	9.45	9.13	9.18	8.26	8.90	7.84	8.26	8.03	8.03	7.85	8.07	9.12	8.24	7.96	9.13	8.12	8.41	9.15	9.44	9.61	8.20	8.56	8.42
63	9.09	8.75	8.70	7.98	8.67	7.70	8.17	8.[illegible]	8.04	7.76	8.01	9.25	8.31	7.97	9.50	7.99	8.46	8.79	9.51	8.90	8.33	8.85	8.65
64	9.36	8.44	9.18	8.33	9.05	8.06	8.36	8.39	8.[illegible]	8.07	8.15	9.22	8.26	7.96	9.33	8.25	8.29	8.70	9.34	8.68	8.13	8.66	8.47
65	9.59	8.73	9.01	8.40	9.98	9.84	10.22	10.64	9.56	8.93	8.30	9.34	8.98	8.65	10.51	9.77	8.86	11.15	11.21	10.53	8.66	10.88	9.28
84	9.45	8.81	9.00	8.61	9.47	9.69	9.97	10.41	9.31	9.62	8.33	9.07	8.[illegible]3	8.41	9.99	9.34	9.42	9.70	10.34	10.79	9.23	10.25	9.17
67	10.06	9.05	9.46	8.73	10.44	10.37	10.00	10.89	10.58	10.30	9.61	11.54	10.[illegible]	9.36	12.42	9.45	9.74	9.34	10.21	9.16	9.01	10.35	8.65
68	11.22	9.65	9.57	8.91	10.64	8.86	8.95	9.23	8.91	8.71	8.65	9.22	8.54	8.24	9.79	8.58	8.75	9.76	9.62	8.80	8.33	9.17	8.43
69	10.53	9.11	9.55	8.72	9.45	8.39	8.59	8.62	8.48	8.30	8.16	9.17	8.33	7.98	9.57	8.39	8.39	9.01	9.44	8.98	8.19	8.80	8.49
70	9.90	8.93	9.29	8.69	9.50	10.27	10.53	10.75	10.13	10.01	9.38	9.58	9.52	8.80	11.10	10.29	10.40	11.45	11.52	10.76	9.60	11.23	9.04
71	9.85	9.23	9.20	8.75	9.86	9.57	9.66	10.08	9.35	9.58	8.43	9.35	8.89	8.39	10.26	9.10	9.20	10.18	9.86	10.30	8.[illegible]	9.98	9.01
72	10.00	9.10	9.73	8.[illegible]2	9.58	9.15	9.78	9.76	9.13	9.21	8.20	9.24	8.61	8.01	10.20	9.30	9.59	11.09	10.68	[illegible]	[illegible]05	10.44	8.75
73	10.40	9.13	9.46	8.34	10.45	10.84	10.35	11.16	9.91	10.63	8.50	9.16	9.04	8.55	10.23	9.62	9.29	10.57	10.24	9.54	9.00	9.98	8.92
74	11.07	9.50	9.80	9.40	11.26	11.35	10.23	10.85	10.33	11.16	9.17	9.82	9.40	8.85	10.67	9.80	9.26	10.37	10.17	9.20	8.84	9.81	8.77
75	11.35	9.72	9.94	10.[illegible]	11.43	11.03	10.22	10.44	10.81	10.29	8.73	9.69	9.79	9.09	11.10	9.64	9.59	10.11	9.44	9.12	9.03	9.83	8.56
76	11.64	9.57	10.09	11.02	11.52	10.39	9.79	10.35	9.87	9.68	8.41	8.81	8.40	8.39	10.08	9.11	9.20	9.89		8.83	8.57	9.33	8.48
77	10.18	9.26	9.51	9.92	11.21	9.17	9.34	9.37	9.13	9.17	8.57	8.76	8.50	8.36	9.26	8.84	8.73	9.57	[illegible]	9.27	8.55	9.20	8.60
78	12.79	9.77	10.41	10.[illegible]3	11.75	10.43	9.81	10.27	10.04	9.94	8.58	8.5[illegible]	8.96	8.46	10.17	9.29	8.94	9.82	9.54	8.98	8.67	9.35	8.7
79	10.32	9.04	9.42	9.16	10.53	11.15	10.55	11.[illegible]1	10.25	10.90	8.88	9.55	9.27	8.73	10.58	9.98	9.54	10.86	10.78	9.44	9.06	10.26	8.89
80	10.54	9.16	9.48	9.45	1[illegible]6	11.40	10.62	11.45	10.27	10.58	8.58	9.06	9.08	8.61	10.74	9.66	9.[illegible]5	10.52	10.09	9.27	8.98	9.86	8.76
81	10.76	9.28	10.64	9.45	9.45	9.45	9.75	9.50	9.18	9.40	8.54	8.91	8.47	8.10	9.53	9.18	9.03	10.95	10.69	9.97	8.49	9.57	8.48
82	10.73	9.03	9.54	9.08	10.49	10.65	10.45	10.70	10.06	10.21	8.49	9.13	9.08	8.15	10.51	10.13	9.83	11.09	11.01	9.59	9.15	10.39	8.75
83	10.47	9.27	9.48	9.48	10.[illegible]	10.60	10.32	10.51	9.89	10.57	9.09	9.39	9.01	8.40	9.98	9.64	9.24	10.60	10.20	9.77	8.77	9.98	8.50
84	10.[illegible]0	9.09	9.41	9.14	10.30	10.45	10.25	10.52	9.78	10.50	8.73	9.18	8.[illegible]2	8.34	10.07	9.74	9.31	10.93	11.09	9.88	8.94	10.79	8.92
85	10.[illegible]	9.22	9.34	9.[illegible]	10.72	10.97	10.35	11.09	10.07	10.64	8.74	9.26	9.17	8.42	10.42	9.46	9.29	10.55	10.24	9.51	9.03	9.95	8.88
86	10.4[illegible]	9.41	9.44	9.36	10.[illegible]7	10.14	9.90	10.25	9.65	9.96	8.52	9.08	8.78	8.34	9.85	9.22	8.99	10.12	9.90	9.47	8.74	9.98	8.81
87	11.11	9.37	9.92	9.63	11.0[illegible]	10.[illegible]	9.90	10.55	9.81	10.00	8.54	9.27	8.88	8.31	10.32	9.23	8.99	10.19	10.11	9.28	8.60	9.55	8.53
88	11.[illegible]	9.35	9.79	9.22	10.77	10.53	10.10	10.73	9.74	9.30	8.24	9.02	8.86	8.23	10.27	9.31	9.04	10.32	9.99	9.67	8.66	9.58	8.57
89	[illegible]	9.2[illegible]	9.61	9.[illegible]	10.77	10.39	9.[illegible]	10.65	9.[illegible]	[illegible]	8.29	9.23	8.92	8.37	10.23	9.20	9.10	10.25	10.18	9.22	8.68	9.52	8.63
90	11.7	9.45	9.73	9.60	10.79	11.19	10.[illegible]	10.91	[illegible]	10	52	8.87	8.85	8.27	9.77	9.76	9.15	10.40	9.81	9.77	8.65	9.46	8.63
91	10.21	9.22	9.[illegible]	9.62	10.3[illegible]	11.04	10.5[illegible]	11.52	9.[illegible]	10	18	9.70	8.7[illegible]	8.44	9.71	9.25	9.98	10.36	9.63	9.14	8.90	9.14	8.93
92	10.89	9.63	9.73	9.49	10.57	11.11	10.19	10.97	9.63	10	[illegible]	9.02	8.87	8.20	9.94	9.67	8.91	9.97	9.28	9.13	8.94	9.34	8.52
93	6.84	8.47	9.43	8.41	9.75	10.13	10.70	11.15	9.58	10.	8.17	9.43	9.00	8.45	10.78	9.50	9.55	10.34	10.58	10.09	9.26	10.55	8.94
94	11.33	9.52	10.32	9.64	11.11	11.18	10.33	10.[illegible]	9.81	11.1	8.74	8.77	9.73	8.38	9.50	9.59	9.07	10.68	10.19	9.61	8.55	9.30	8.54
95	10.76	9.1	9.69	9.51	10.89	11.14	10.44	0.66	9.69	10.51	8.60	8.70	8.85	8.37	9.54	9.64	9.00	10.30	10.06	9.33	8.66	9.35	8.73
96	--	--	--	--	--	---	--	-	---	-	--	---	---	---	---	---	--	---	---	---	---	---	---
97	10.69	9.21	9.[illegible]9	9.76	[illegible]	10.[illegible]	10.37	10.91	9.80	10.50	8.17	8.[illegible]	8.95	8.43	10.1[illegible]	9.58	9.41	10.62	9.[illegible]0	9.63	9.01	10.34	8.87
98	10.92	9.54	9.73	9.[illegible]	11.07	12.96	10.36	10.65	9.99	10.06	8.42	8.[illegible]3	8.76	8.31	10.65	9.64	9.08	10.10	9.57	9.24	8.75	9.37	8.79
99	10.[illegible]	9.34	9.39	8.79	9.89	9.[illegible]0	9.07	10.65	9.57	9.44	9.37	9.17	9.08	5.70	10.55	8.93	8.58	9.67	9.04	8.68	9.04	9.38	8.33
100	9.[illegible]5	8.68	8.91	8.78	9.60	8.46	10.12	10.83	9.39	9.69	8.38	8.[illegible]9	8.80	5	9.92	9.36	9.34	10.69	10.23	10.67	9.71	10.28	9.19
101	10.76	9.45	9.[illegible]7	9.71	10.83	11.19	10.[illegible]1	11.02	10.01	11.71	8.61	9.76	8.91	8.43	9.68	9.59	9.03	10.[illegible]	9.21	9.26	8.75	9.58	8.71
102	10.89	9.5	9.73	9.42	10.73	10.86	10.75	10.79	9.69	10.76	8.40	8.81	8.93	8.31	[illegible]	9.27	8.97	10.[illegible]	10.73	9.37	8.77	9.56	8.77
103	10.46	9.31	9.86	8.93	9.99	10.23	9.93	10.93	9.99	9.60	9.24	9.61	9.40	8.99	10.55	9.36	9.23	10.34	8.32	9.16	9.19	10.04	8.27

[a] A constant of zero [illegible] was added [illegible] to each score to avoid the awkward interpretation of negative attribute-requirement scores.

[b] Attribute Number 36, "Moral Values," was deleted because of low reliability.

Table 6 (continued)

Attribute Number	Cluster Number 24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
1	9.14	9.81	9.17	8.85	8.55	8.18	9.16	8.66	8.78	9.06	8.66	8.96	9.47	10.10	9.30	10.47	10.61	8.63	8.90	8.89	9.76	8.53	9.24
2	8.19	9.30	8.59	8.41	8.26	8.40	9.21	8.71	8.85	9.34	8.44	9.04	9.27	10.32	9.23	9.50	11.15	8.61	8.75	8.81	10.26	8.88	9.88
3	8.11	8.94	8.33	8.41	8.05	8.16	8.95	9.20	9.65	9.43	8.84	9.60	10.21	11.03	9.98	10.44	11.45	8.99	9.15	9.18	10.77	8.97	9.63
4	8.40	8.90	8.38	8.49	8.23	8.37	8.64	9.00	8.97	9.63	8.48	9.21	9.35	10.58	9.28	9.01	11.80	8.83	8.85	9.20	11.10	8.74	9.29
5	8.26	8.84	8.47	8.35	8.38	8.30	9.41	8.49	8.55	9.22	8.20	8.59	9.12	9.38	8.99	9.71	9.67	8.84	9.17	8.81	9.69	8.75	9.53
6	8.76	9.48	8.71	8.99	8.33	8.25	8.89	8.96	9.53	9.82	8.39	9.86	9.66	11.23	9.21	9.16	11.77	8.67	8.69	9.02	10.31	9.03	9.64
7	8.27	10.12	9.06	9.20	8.41	8.33	9.19	8.53	9.11	9.22	8.31	9.49	9.24	10.40	9.02	9.35	10.38	8.41	8.63	8.72	9.40	8.86	9.82
8	8.44	9.33	8.74	8.62	8.47	8.63	8.81	8.60	8.66	9.10	8.44	8.96	9.41	9.50	8.77	8.85	9.57	8.51	8.58	8.59	8.98	8.76	9.63
9	8.42	9.16	8.84	8.57	8.52	8.49	11.96	8.52	8.78	8.68	8.63	8.61	8.65	8.70	8.87	9.96	8.96	8.44	8.76	8.60	8.72	8.67	9.96
10	8.34	8.99	8.51	8.46	8.43	8.45	10.31	8.53	8.75	8.71	8.71	8.62	9.29	9.71	8.97	10.46	8.96	8.32	8.91	8.58	8.60	8.94	10.10
11	8.19	9.51	8.63	8.97	8.47	8.21	9.60	8.80	9.46	8.80	8.51	9.03	9.98	10.97	9.11	10.37	9.55	8.50	8.79	9.21	9.40	8.99	9.80
12	8.52	11.04	9.71	10.11	9.12	8.61	9.37	8.85	9.61	8.91	8.24	10.40	9.42	9.90	8.61	9.06	9.24	8.53	8.35	8.84	8.79	9.07	9.48
13	8.51	10.57	9.71	9.67	10.11	8.68	9.76	9.57	9.66	8.81	8.36	10.38	9.76	9.98	8.83	9.30	9.32	8.53	8.35	8.64	8.79	9.07	9.48
14	8.77	14.29	12.32	11.58	10.82	9.55	8.91	8.92	8.69	8.69	8.47	8.97	8.70	8.80	8.63	8.77	8.87	8.50	8.54	8.65	8.60	8.77	8.93
15	8.84	14.37	12.47	11.21	10.75	9.55	8.96	8.57	8.60	8.68	8.50	8.80	8.69	8.86	8.66	8.90	8.90	8.49	8.60	8.65	8.70	8.76	8.92
16	8.35	9.79	9.57	8.71	8.57	9.41	9.17	8.11	8.24	8.64	7.94	8.79	8.47	8.75	8.52	9.37	9.07	8.11	8.28	8.09	8.28	9.12	9.99
17	8.69	9.37	9.35	8.40	8.51	9.59	8.93	8.74	8.20	8.56	8.05	8.43	8.40	8.49	8.38	8.90	8.70	8.18	8.25	8.11	8.14	9.16	9.83
18	8.85	9.36	9.31	8.54	8.76	8.97	9.14	8.14	8.70	8.57	8.09	8.62	8.47	8.48	8.34	8.57	8.88	8.23	8.25	8.16	8.21	9.11	9.58
19	8.13	10.32	9.35	8.80	9.42	10.75	9.41	8.05	8.09	8.50	8.05	8.40	8.32	8.44	8.51	8.70	9.00	8.19	8.25	8.4	8.11	9.43	9.98
20	9.34	9.00	9.26	8.72	9.28	10.02	9.38	8.21	8.22	8.50	8.22	8.41	8.38	8.34	8.32	8.50	8.52	8.30	8.34	7.17	8.13	9.03	9.48
21	9.41	11.07	10.11	8.91	10.05	10.35	9.22	8.26	8.29	8.43	8.26	8.41	8.42	8.33	8.35	8.43	8.40	8.31	8.34	8.26	8.19	8.85	9.33
22	9.98	10.91	9.70	8.74	10.05	10.78	9.70	8.25	8.29	8.44	8.25	8.59	8.43	8.41	8.40	8.76	8.81	8.27	8.37	8.25	8.27	9.40	10.11
23	9.44	10.39	9.72	8.74	9.94	10.63	9.36	8.16	8.24	8.50	8.19	8.40	8.47	8.34	8.35	8.71	8.74	8.24	8.35	8.13	8.14	9.29	9.71
24	9.12	11.44	9.88	7.29	10.68	9.86	11.25	8.10	8.25	8.42	8.28	8.32	8.49	8.42	8.41	9.01	8.82	8.71	9.26	8.68	9.68	8.53	9.15
25	8.68	10.15	9.16	8.99	8.77	9.13	11.30	7.95	8.17	8.63	8.03	8.42	8.41	9.61	8.55	9.50	10.51	8.51	8.65	9.18	10.07	9.01	9.79
26	8.33	9.98	9.26	9.08	8.56	8.52	11.22	8.06	8.64	8.92	8.23	8.60	9.07	10.06	9.17	10.30	9.94	8.57	8.90	8.79	9.58	8.96	10.01
27	8.75	9.57	9.35	8.69	8.66	9.96	9.19	8.01	8.10	8.59	7.98	8.44	8.36	8.48	8.51	8.82	8.98	8.19	8.10	8.13	8.14	9.14	9.67
28	8.35	9.82	9.78	9.06	8.59	9.12	9.97	8.14	8.12	8.76	7.90	8.76	8.65	9.11	8.52	8.84	10.15	8.18	8.43	8.76	9.59	8.71	9.41
29	8.46	9.18	8.44	8.96	8.62	8.66	10.52	8.47	8.34	8.66	8.27	8.60	8.70	9.48	8.92	9.23	10.16	8.44	8.81	9.43	10.07	8.48	9.14
30	8.47	9.35	9.04	8.56	8.53	9.07	11.66	8.07	8.18	8.58	8.22	8.26	8.42	9.23	8.94	10.07	9.44	8.45	8.78	8.85	9.44	9.09	10.08
31	8.70	9.56	9.32	8.61	8.58	9.57	8.97	8.07	8.19	8.64	7.96	8.72	8.42	8.65	8.44	9.20	8.95	8.13	8.28	8.02	8.19	9.21	9.91
32	9.10	10.56	9.72	8.85	8.92	10.30	9.26	8.01	8.05	8.57	7.84	8.59	8.36	8.75	8.34	8.95	9.29	8.05	8.14	8.12	8.23	9.42	10.12
33	9.11	10.37	9.55	8.80	9.48	10.66	9.40	8.04	8.09	8.48	8.03	8.41	8.34	8.46	8.31	8.71	9.01	8.17	8.23	8.08	8.15	9.43	10.04
34	8.95	10.19	9.32	8.75	9.32	10.76	9.41	8.06	8.12	8.53	8.09	8.48	8.42	8.41	8.32	8.65	8.92	8.20	8.24	8.01	8.05	9.26	9.84
35	8.75	9.94	9.38	8.71	9.06	10.62	9.46	8.03	8.12	8.55	8.05	8.32	8.41	8.44	8.31	8.65	8.89	8.19	8.21	7.97	8.05	9.21	9.71
36	9.23	10.27	9.41	8.73	9.53	10.83	9.45	8.06	8.15	8.51	8.11	8.43	8.41	8.40	8.34	8.74	8.94	8.20	8.27	8.05	8.07	9.47	10.03
37	8.95	10.18	9.27	8.47	9.36	10.75	10.07	8.10	8.15	8.36	8.07	8.38	8.34	8.34	8.39	9.08	9.18	8.22	8.30	8.13	8.23	9.37	9.58
38	8.92	10.73	9.31	8.91	9.55	9.81	9.60	8.12	8.21	8.75	7.95	8.48	8.66	9.14	8.39	9.37	10.10	8.13	8.34	8.34	8.89	9.33	10.40
39	8.76	10.52	9.45	8.89	9.17	10.31	9.44	8.06	8.11	8.66	7.98	8.66	8.37	8.76	8.42	9.04	9.35	8.14	8.24	8.15	8.66	9.44	10.18
40	9.02	10.37	9.41	8.79	9.35	10.55	9.73	8.07	8.12	8.35	8.01	8.40	8.29	8.71	8.38	9.12	9.35	8.16	8.30	8.20	8.43	9.34	10.24
41	8.95	10.28	9.21	8.79	9.45	10.66	10.57	8.09	8.12	8.33	8.03	8.40	8.42	8.35	8.34	9.03	9.17	8.13	8.28	8.12	8.25	9.29	9.88
42	9.46	11.08	9.81	8.85	10.16	10.85	9.30	8.18	8.23	8.63	8.23	8.37	8.42	8.36	8.29	8.78	8.78	8.24	8.34	8.22	8.22	9.69	10.15
43	8.66	9.41	8.89	8.71	9.34	9.38	16.43	8.66	8.38	8.71	8.62	8.66	8.37	8.85	8.35	9.21	9.10	8.67	8.73	8.78	9.11	8.73	9.22
44	8.79	10.35	9.59	9.11	10.00	10.67	10.35	8.15	8.00	8.37	7.91	8.24	8.38	8.82	8.40	9.29	9.60	8.08	8.34	8.34	8.50	9.11	9.92
45	8.13	9.36	8.91	9.07	8.08	8.25	9.09	8.17	8.95	9.22	8.31	9.12	9.31	10.31	9.50	9.91	11.07	8.76	9.21	9.36	10.87	8.55	8.82
46	8.19	9.37	8.92	9.41	8.55	8.76	8.93	8.84	8.77	9.03	8.50	8.92	9.23	10.47	9.20	9.94	10.88	8.67	9.04	9.67	10.74	8.53	8.73
47	8.30	9.42	8.99	8.85	8.15	8.29	8.94	8.99	8.95	9.23	8.32	9.40	9.19	10.27	9.41	9.36	11.11	8.75	8.89	9.40	10.57	8.57	8.79
48	7.91	9.95	9.36	9.21	8.35	8.20	9.50	8.51	8.41	8.99	8.28	8.92	9.11	10.26	9.24	10.40	10.60	8.60	9.08	9.28	10.43	8.40	8.95
49	8.02	10.05	9.41	9.39	8.57	8.10	9.30	8.74	8.71	8.98	8.45	8.98	9.23	10.14	9.21	10.26	10.47	8.83	9.06	9.22	10.19	8.42	8.96
50	7.98	10.32	9.80	9.38	8.66	8.32	9.65	8.14	8.20	8.95	8.17	8.56	8.86	9.95	8.96	9.80	10.31	8.83	9.16	9.05	10.39	8.31	9.[illegible]
51	7.98	10.47	10.04	9.68	8.58	8.27	9.72	8.56	8.41	9.01	8.16	8.75	8.95	10.05	9.06	10.25	10.55	8.46	8.97	9.18	10.34	8.26	8.89
52	8.24	9.25	8.80	8.85	8.90	8.25	8.90	8.78	8.69	9.29	8.41	8.66	8.99	9.45	9.35	10.35	10.06	8.63	8.85	8.75	9.35	8.59	8.64
53	8.27	9.16	8.44	9.37	8.64	8.09	8.71	8.66	8.59	9.25	8.45	8.75	9.35	9.58	9.37	10.32	9.69	8.56	8.77	8.64	9.05	8.48	8.64
54	9.58	9.30	8.83	9.24	8.96	8.22	8.88	8.77	8.52	9.21	8.66	8.75	9.28	9.45	9.36	10.18	9.83	8.64	8.84	8.92	9.11	8.42	8.56
55	8.70	9.33	8.95	9.23	8.80	8.69	9.93	8.75	8.58	8.95	8.55	8.90	9.25	10.59	8.79	9.26	11.19	8.51	8.31	10.17	10.87	8.70	8.78
56	8.63	9.40	8.94	9.18	8.97	8.33	8.76	8.66	8.69	9.15	8.42	8.71	8.65	9.76	8.85	9.67	9.95	8.69	8.96	9.06	9.65	8.44	8.63
57	8.07	10.55	9.51	8.86	8.60	9.04	9.59	8.06	8.24	8.85	7.88	8.85	8.85	9.65	8.84	9.38	9.94	8.13	8.45	8.46	9.29	8.78	9.92
58	8.47	9.98	8.90	9.24	8.90	8.69	9.95	8.60	8.67	9.00	8.21	9.05	9.50	9.89	8.95	9.45	10.61	8.39	8.65	9.10	10.07	8.80	9.50
59	8.13	10.01	9.11	9.13	8.53	8.38	10.04	8.69	8.66	9.02	8.29	8.95	9.29	10.19	9.15	9.95	10.59	8.68	8.87	9.16	10.24	8.68	9.47
60	8.79	10.31	9.18	9.42	8.99	8.55	11.16	8.25	8.75	8.96	8.15	9.05	9.19	9.77	8.57	9.25	10.17	8.48	8.[illegible]	9.20	10.22	8.75	9.35
61	9.07	10.86	9.77	8.85	9.36	10.27	8.99	8.22	8.19	8.76	8.00	8.58	8.64	8.99	8.59	8.75	9.92	8.12	8.17	8.21	8.69	9.16	9.98
62	8.00	10.19	9.44	9.46	8.61	8.25	9.64	8.45	8.64	9.10	8.28	9.05	9.43	10.71	9.04	9.99	10.78	8.57	9.01	9.32	10.62	8.36	9.38
63	7.99	9.41	8.95	9.12	8.30	8.07	8.98	8.92	8.89	9.22	8.45	9.39	9.49	10.47	9.25	9.77	11.03	8.60	8.94	9.42	10.34	8.37	9.20
64	8.16	9.42	8.80	8.76	8.17	8.30	9.27	8.65	8.82	9.25	8.35	9.15	9.45	10.57	9.28	9.84	11.21	8.57	8.93	9.26	10.58	8.85	9.48
65	9.47	11.48	10.13	9.31	10.09	10.39	9.45	8.11	8.12	8.59	8.08	8.59	8.58	8.65	8.34	8.65	8.97	8.16	8.34	8.47	9.03	9.16	8.9
66	9.34	12.83	11.18	10.73	10.86	10.35	9.25	8.21	8.23	8.42	8.17	8.50	8.46	8.45	8.39	8.68	8.86	8.23	8.41	8.50	8.59	9.10	1.67
67	8.46	9.54	9.67	8.69	8.56	9.97	9.16	7.99	8.04	8.60	8.02	8.62	8.59	8.78	8.59	8.60	9.17	8.21	8.45	8.46	8.71	9.05	9.44
68	8.35	10.26	9.60	9.20	8.60	8.89	9.36	8.10	8.58	8.94	8.00	9.09	8.97	10.23	8.72	9.26	10.43	8.24	8.65	8.90	9.81	9.06	10.12
69	8.22	9.69	8.5[illegible]	8.86	8.55	8.36	9.70	8.29	8.53	9.05	8.10	8.90	9.15	10.35	9.02	9.91	10.77	8.58	8.76	9.06	10.14	8.85	9.74
70	9.21	10.18	9.44	8.85	9.34	10.31	9.34	8.07	8.07	8.44	8.02	8.42	8.42	8.56	8.50	8.39	8.91	8.11	8.28	8.26	8.38	9.14	9.67
71	9.04	12.94	11.60	10.04	10.95	10.17	9.53	8.02	8.14	8.55	7.97	8.44	8.44	9.02	8.46	8.95	9.55	8.14	8.42	8.55	8.95	9.15	9.74
72	8.74	11.38	10.29	9.31	9.80	9.81	10.38	7.97	8.10	8.51	7.84	8.69	8.37	9.41	8.56	9.31	9.71	8.26	8.88	8.88	9.77	8.91	9.76
73	9.43	10.71	9.61	8.94	9.82	11.08	9.50	8.01	8.04	8.45	7.98	8.38	8.55	8.56	8.55	8.87	9.15	8.12	8.27	8.26	8.54	9.72	10.44
74	8.82	10.26	9.58	8.86	9.32	10.71	9.44	7.98	8.05	8.50	7.97	8.43	8.39	8.55	8.51	8.76	9.06	8.13	8.26	8.09	8.19	9.23	9.81
75	8.86	9.94	9.51	8.75	8.91	10.22	9.76	7.98	8.01	8.57	7.50	8.35	8.57	8.57	8.35	8.98	8.97	8.12	8.22	8.05	8.20	9.36	9.94
76	8.82	10.07	9.18	8.62	8.94	9.81	9.44	7.93	8.13	8.68	7.84	8.37	8.49	9.19	8.32	9.26	9.90	8.12	8.33	8.33	8.91	9.31	10.46
77	8.89	10.72	9.77	10.31	9.79	9.57	9.76	8.10	8.10	8.65	7.91	8.33	8.38	9.10	8.55	9.16	9.67	8.24	8.44	8.49	9.13	9.17	9.55
78	8.70	10.11	9.29	8.79	8.92	9.97	9.81	7.94	8.11	8.65	7.90	8.34	8.45	9.01	8.47	9.29	9.52	8.13	8.31	8.26	8.60	9.34	10.21
79	9.27	10.24	9.49	8.80	9.44	10.73	9.46	8.05	8.10	8.44	8.05	8.38	8.36	8.68	8.31	8.71	9.01	8.13	8.26	8.16	8.25	9.36	9.91
80	9.50	10.21	9.35	8.79	9.39	10.40	9.41	8.02	8.08	8.47	8.01	8.37	8.39	8.51	8.35	8.94	9.19	8.14	8.29	8.16	8.27	9.80	10.44
81	8.70	10.24	9.42	9.01	9.13	9.70	11.98	7.79	8.01	8.50	7.81	8.24	8.49	9.44	8.37	9.91	9.79	8.12	8.38	8.78	9.40	9.12	9.87
82	9.06	10.15	9.35	8.78	9.23	10.24	9.53	7.94	8.00	8.55	7.88	8.36	8.39	8.75	8.32	8.82	9.4[illegible]	8.05	8.21	8.15	8.47	9.34	10.04
83	9.34	10.51	9.42	8.81	9.75	10.69	10.22	7.92	7.97	8.50	7.86	8.32	8.21	8.67	8.34	9.25	9.25	8.08	8.34	8.26	8.39	9.40	10.18
84	9.25	10.41	9.48	8.92	9.39	10.71	10.36	7.90	7.96	8.46	7.86	8.28	8.28	8.83	8.38	9.08	9.49	8.15	8.31	8.42	8.72	9.41	9.91
85	9.24	10.73	9.70	8.82	9.68	11.01	9.32	7.99	8.07	8.50	7.98	8.41	8.36	8.48	8.32	8.84	9.02	8.13	8.26	8.12	8.22	9.37	10.21
86	9.00	17.23	10.83	9.67	9.96	10.41	9.66	7.91	7.99	8.51	7.84	8.41	8.28	8.96	8.43	9.19	9.59	8.10	8.35	8.50	8.95	9.37	9.93
7	8.81	10.55	9.32	8.99	9.11	10.17	9.80	7.91	7.97	8.57	7.78	8.39	8.41	9.04	8.45	9.29	9.79	8.03	8.29	8.41	8.88	9.43	10.14
.	8.87	10.71	9.62	9.06	9.42	10.13	9.72	7.97	8.01	8.56	7.87	8.44	8.44	8.95	8.44	9.23	9.65	8.02	8.29	8.33	8.66	9.47	10.28
89	8.74	10.55	9.51	8.99	9.17	9.68	9.69	8.05	8.07	8.59	7.80	8.36	8.42	9.16	8.45	9.18	9.93	8.00	8.29	8.37	8.95	9.23	10.25
90	9.11	10.45	9.40	8.90	9.69	10.31	9.69	8.05	8.09	8.40	8.00	8.41	8.70	8.45	8.47	9.11	9.12	8.03	8.35	8.32	8.37	9.43	10.35
91	9.94	10.34	9.34	8.81	10.03	10.83	9.27	8.15	8.19	8.47	8.12	8.39	8.50	8.64	8.43	9.04	9.30	8.20	8.35	8.26	8.76	10.37	10.93
92	9.21	10.31	9.43	8.58	9.35	10.35	9.85	7.92	8.22	8.49	8.04	8.43	8.77	8.88	8.42	9.49	9.39	8.06	8.38	8.12	8.28	9.32	10.29
93	9.17	11.10	10.24	8.75	10.18	10.93	9.70	8.28	8.45	8.45	8.34	8.44	8.66	8.52	8.34	8.89	8.67	8.28	8.31	8.35	8.42	9.39	9.44
94	8.87	10.16	9.12	8.64	9.67	10.60	10.96	8.10	8.09	8.39	8.04	8.31	8.42	8.68	8.40	9.17	9.17	8.15	8.39	8.78	8.47	9.22	9.92
95	9.39	10.44	9.37	9.03	9.95	10.75	9.99	8.09	8.06	8.36	7.95	8.30	8.30	8.75	8.33	9.13	9.36	8.05	8.31	8.26	8.34	9.82	10.35
96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
97	9.79	10.49	9.82	8.91	9.85	10.78	9.31	8.07	8.19	8.31	8.01	8.54	8.84	8.39	8.43	8.99	8.93	8.13	8.33	8.19	8.18	9.53	10.15
98	9.31	10.50	9.43	9.20	9.77	10.35	9.64	8.00	8.04	8.46	7.84	8.42	8.44	8.68	8.10	9.27	9.51	8.02	8.30	8.16	8.30	9.50	10.43
99	9.13	9.87	9.60	8.67	8.85	9.85	9.58	8.31	8.12	8.99	8.54	9.21	7.81	9.13	9.11	9.31	9.73	8.56	8.83	8.26	8.41	8.52	9.61
100	9.48	12.47	10.97	9.19	10.81	11.03	8.19	8.27	8.31	8.42	8.27	8.41	8.45	8.43	8.4[illegible]	8.45	8.76	8.30	8.40	8.53	8.42	9.33	9.87
101	9.24	10.49	9.67	8.97	9.74	10.88	9.99	8.07	8.22	8.58	8.00	8.47	8.55	8.41	8.42	9.18	9.05	8.14	8.34	8.01	8.04	9.49	10.23
102	9.14	10.47	9.36	8.97	9.76	10.63	10.26	8.09	8.10	8.49	7.98	8.32	8.37	8.78	8.34	8.94	9.36	8.15	8.28	8.28	8.71	9.47	10.04
103	9.24	10.02	10.08	8.71	9.31	10.08	9.44	7.72	8.35	8.95	8.65	8.50	8.53	8.32	8.31	9.30	8.87	8.64	8.90	8.01	8.02	8.42	9.30

[a] A constant of nine has been added to each score to avoid the outward interpretation of negative attribute-requirement estimates.

[b] Attribute Number 34, "Moral Values," was deleted because of low reliability.

Table 6 (continued)

Attribute Number	Cluster Number 47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
1	10.40	10.79	11.29	9.17	10.87	10.77	9.72	10.18	8.75	9.55	9.08	9.51	11.42	12.73	10.61	9.38	9.98	10.41	9.06	6.47	8.61	9.58	8.50
2	12.06	11.23	11.2	9.69	10.55	10.71	9.35	9.76	9.36	9.87	8.76	9.02	9.78	12.27	10.09	8.65	9.35	10.12	8.60	8.40	8.48	8.80	8.23
3	10.61	10.65	12.	9.30	11.38	9.86	9.05	9.34	9.64	9.73	8.71	8.71	9.66	11.45	9.57	9.08	9.21	9.75	8.47	8.34	6.53	9.31	8.33
4	10.67	11.08	10.39	9.51	10.56	9.85	10.48	10.94	11.84	21.80	9.45	8.59	9.01	11.19	9.32	8.63	8.83	10.00	8.66	8.32	8.36	9.04	8.45
5	11.82	11.01	10.63	9.23	10.71	11.43	8.97	9.26	8.54	9.42	8.68	10.19	11.29	12.98	10.78	8.81	10.68	11.39	9.66	9.22	8.61	8.59	8.38
6	11.90	11.36	10.70	9.78	10.69	9.89	9.39	9.55	9.22	9.83	8.69	8.66	9.08	11.37	9.84	8.72	8.81	9.78	8.42	8.31	8.44	8.78	8.32
7	11.59	10.22	10.87	10.10	11.12	10.95	9.34	10.63	8.79	9.01	6.50	8.97	9.69	11.01	9.53	8.65	9.34	9.28	8.49	8.21	8.31	8.85	8.50
8	11.60	10.19	9.44	10.39	11.37	13.25	8.90	9.55	8.71	9.11	8.50	8.85	8.91	11.60	9.32	8.66	10.26	8.84	8.94	8.42	8.49	8.65	8.40
9	11.10	9.41	10.67	9.15	9.23	10.31	9.14	10.72	8.48	8.54	8.57	9.67	10.51	11.27	10.11	8.67	9.29	9.29	8.94	8.67	8.33	8.51	8.37
10	11.68	9.58	10.96	8.65	10.15	10.00	9.03	9.57	8.31	8.76	8.25	10.47	12.28	12.03	10.59	9.13	9.66	10.68	9.20	8.98	8.35	8.63	8.31
11	10.70	9.23	11.10	8.25	10.82	9.37	9.09	9.37	8.20	8.56	8.49	9.54	11.35	10.56	9.54	9.55	9.21	9.77	8.34	8.41	8.41	9.47	8.37
12	10.64	8.88	9.49	8.42	10.17	9.11	10.21	10.42	8.36	8.56	8.87	8.76	9.51	8.90	8.85	9.06	8.73	8.93	8.35	8.25	8.55	9.21	8.43
13	9.87	8.73	9.70	8.35	10.03	8.68	9.61	9.72	8.19	8.21	8.36	8.75	9.48	8.84	8.73	8.96	8.34	9.08	8.22	8.19	8.78	11.12	8.66
14	9.24	8.82	8.89	8.70	8.95	8.92	10.68	10.58	8.55	8.56	9.12	8.66	8.80	8.85	8.79	8.68	8.74	8.70	8.41	8.51	8.43	9.03	8.55
15	9.25	8.90	8.93	8.73	8.93	9.00	9.72	9.65	8.65	8.70	8.73	8.77	8.95	9.03	8.87	8.70	8.74	8.84	8.59	8.52	8.37	9.01	8.53
16	11.28	9.02	10.24	9.12	9.12	9.71	9.35	10.11	8.17	8.03	8.03	8.69	9.31	9.83	9.11	8.27	8.66	9.29	8.15	8.10	8.03	8.40	8.14
17	10.75	8.62	9.42	8.86	8.60	9.17	9.31	9.76	8.32	8.05	8.11	8.38	8.73	9.00	8.70	8.25	8.35	8.13	8.16	8.18	8.13	8.39	8.27
18	10.13	8.39	8.74	8.61	8.34	8.74	9.02	9.46	8.49	8.16	8.05	8.21	8.50	8.53	8.35	8.29	8.27	8.06	8.16	8.17	8.09	8.40	8.29
19	10.86	8.63	8.73	8.60	8.63	9.12	9.21	10.36	8.65	8.26	8.15	8.27	8.68	8.69	8.58	8.29	8.50	8.17	8.12	8.12	8.12	8.26	8.18
20	9.60	8.69	8.38	8.57	8.42	8.73	9.32	10.04	8.53	8.40	8.26	8.30	8.69	8.62	8.35	8.32	8.32	8.14	8.23	8.25	8.20	8.30	8.39
21	9.47	8.55	8.41	8.59	8.44	8.70	9.13	9.96	8.63	8.45	8.29	8.30	8.63	8.35	8.35	8.36	8.34	8.49	8.32	8.27	8.26	8.32	8.33
22	10.76	8.54	8.47	8.71	8.54	8.84	9.41	10.76	8.50	8.45	8.35	8.37	8.54	8.49	8.42	8.38	8.36	8.36	8.27	8.26	8.23	8.37	8.28
23	10.27	8.48	8.45	8.65	8.54	8.82	9.26	10.26	8.52	8.44	8.30	8.53	8.48	8.50	8.41	8.35	8.33	8.25	8.23	8.18	8.21	8.30	8.25
24	9.30	8.71	8.91	8.56	8.63	8.92	9.31	10.03	8.15	8.19	8.35	8.87	9.13	8.87	8.69	8.60	8.78	8.82	8.51	8.62	8.16	8.42	8.33
25	11.17	9.80	10.16	9.16	10.02	10.53	9.76	11.66	8.87	8.82	8.47	8.83	10.05	10.43	9.66	8.69	9.63	9.91	8.70	8.21	8.09	8.55	8.30
26	10.80	9.92	11.16	9.23	10.51	10.38	9.39	10.78	8.72	9.11	8.49	9.20	10.16	11.25	9.94	9.04	9.61	9.85	8.69	8.37	8.12	8.88	8.31
27	10.38	8.58	9.0	8.83	8.63	9.12	8.93	9.48	8.51	8.10	8.00	8.22	8.57	8.76	8.52	8.26	8.35	8.07	8.12	8.08	8.03	8.36	8.25
28	10.93	9.63	10.04	9.13	9.92	10.10	10.74	12.91	9.76	9.59	8.61	8.44	9.31	10.64	9.06	8.39	8.96	9.11	8.29	7.95	7.90	8.70	8.11
29	10.13	9.74	9.98	8.98	10.21	9.75	11.08	13.70	10.42	10.32	9.96	9.74	11.28	11.25	9.85	8.76	9.16	10.32	8.76	8.57	8.36	9.28	8.42
30	10.96	9.46	10.93	8.71	9.65	10.01	9.11	10.80	8.42	8.68	8.58	9.38	10.51	11.22	10.15	8.61	9.29	9.89	8.67	8.48	8.23	9.62	8.24
31	11.00	8.88	9.85	9.07	8.91	9.42	9.30	9.82	8.28	8.02	8.04	8.53	9.02	9.37	8.90	8.25	8.33	8.12	8.11	8.15	8.08	8.56	8.20
32	11.10	8.95	9.50	8.96	8.98	9.51	9.27	10.39	8.34	8.09	7.98	8.22	8.81	9.18	8.80	8.21	8.49	8.31	8.04	7.97	7.97	8.39	8.09
33	11.04	8.44	8.78	8.62	8.64	9.17	9.25	10.60	8.44	8.22	8.15	8.27	8.58	8.76	8.58	8.28	8.32	8.24	8.11	8.11	8.12	8.26	8.17
34	10.75	8.58	8.63	8.60	8.56	9.13	9.13	10.13	8.48	8.32	8.17	8.28	8.62	8.70	8.53	8.29	8.28	8.04	8.13	8.13	8.12	8.25	8.19
35	10.74	8.56	8.73	8.57	8.52	9.08	9.03	9.85	8.67	8.22	8.10	8.25	8.65	8.74	8.56	8.28	8.23	7.99	8.11	8.15	8.10	8.26	8.20
36	10.87	8.55	8.59	8.62	8.58	9.11	9.25	10.49	8.31	8.35	8.19	8.30	8.64	8.61	8.53	8.30	8.29	8.12	8.13	8.16	8.11	8.27	8.20
37	10.94	8.79	9.10	8.44	8.76	9.27	9.22	10.33	8.47	8.32	8.26	8.34	8.84	8.91	8.82	8.37	8.36	8.38	8.12	8.18	8.18	8.42	8.17
38	12.27	9.69	9.74	9.12	9.88	10.26	10.14	11.59	8.39	8.86	8.46	8.74	9.43	10.58	9.36	8.41	8.79	9.27	8.22	8.06	8.11	8.53	7.95
39	11.63	9.22	9.52	9.06	9.11	9.56	9.41	10.36	8.39	8.29	8.17	8.33	8.92	9.61	9.04	8.29	8.65	8.41	8.12	8.13	8.12	8.34	8.12
40	11.76	8.91	9.34	8.78	8.87	9.57	9.65	10.50	8.34	8.22	8.26	8.38	8.96	9.38	8.93	8.35	8.38	8.58	8.12	8.18	8.18	8.37	8.17
41	11.14	8.82	8.99	9.65	8.60	9.33	9.39	10.60	8.41	8.39	8.34	8.34	8.88	9.06	8.75	8.33	8.31	8.44	8.09	8.15	8.15	8.33	8.17
42	10.72	8.50	9.46	8.70	8.52	8.86	9.44	10.61	8.50	8.44	8.34	8.57	8.54	8.63	8.46	8.34	8.35	8.33	8.24	8.22	8.23	8.34	8.24
43	9.15	8.66	8.87	8.34	8.95	8.82	8.91	9.56	8.56	8.43	8.66	8.59	9.28	8.71	8.78	8.74	8.50	8.31	8.44	8.57	8.49	8.42	8.53
44	10.28	9.04	9.28	8.57	8.83	9.31	9.62	10.36	8.58	8.58	8.53	8.44	9.11	8.64	9.10	8.28	8.46	8.52	8.06	8.09	8.02	8.60	8.06
45	9.22	10.26	11.34	8.91	10.99	9.92	9.93	10.81	11.28	10.66	9.10	9.09	10.43	11.16	9.67	9.09	9.46	10.40	8.71	8.62	8.37	9.68	8.42
46	8.35	10.33	10.58	8.43	10.66	6.58	10.71	11.56	10.50	10.47	9.76	9.52	11.50	11.26	9.75	9.23	9.49	10.91	8.81	8.69	8.60	9.84	8.50
47	9.82	10.00	11.04	9.7	11.09	9.56	10.37	11.68	11.68	21.08	9.37	8.77	10.00	10.84	9.36	8.74	9.07	9.95	8.40	8.28	8.34	9.44	8.41
48	10.97	10.31	11.22	9.74	10.81	10.22	9.85	10.69	9.44	9.65	8.98	9.71	11.39	12.09	10.00	9.19	10.01	10.56	9.03	8.52	8.36	9.80	8.29
49	9.96	10.53	10.92	8.72	10.76	10.25	10.16	10.91	9.09	9.70	9.31	9.86	11.31	12.14	10.21	9.37	10.01	10.75	9.22	8.63	8.60	9.92	8.45
50	10.32	10.70	10.51	8.93	10.69	10.97	9.68	10.26	8.60	9.09	8.73	9.52	10.43	12.34	9.95	9.13	10.36	10.79	9.29	8.65	8.31	9.44	8.30
51	9.66	10.39	10.95	8.88	10.61	10.30	9.66	10.54	9.26	9.29	8.80	9.75	12.18	12.03	10.08	9.16	10.03	10.82	9.02	8.66	8.45	8.66	8.50
52	9.98	10.45	10.26	8.73	9.68	9.82	11.33	12.00	9.42	10.63	10.71	10.21	12.00	12.99	10.39	9.28	9.36	10.15	8.91	8.78	8.99	10.63	8.47
53	9.75	10.18	10.71	8.57	9.95	9.37	11.10	11.75	9.14	10.07	10.34	10.29	11.93	12.37	10.18	9.52	9.00	10.52	8.89	9.02	9.36	10.34	8.98
54	9.90	10.14	9.90	8.60	10.02	9.61	10.86	11.94	9.01	9.80	10.37	10.60	12.60	11.75	10.23	8.68	9.25	11.12	9.09	9.21	9.18	10.14	8.84
55	10.11	9.85	9.20	8.60	10.65	9.30	10.33	11.77	8.60	9.84	9.85	9.69	12.35	10.59	10.00	9.09	8.34	11.18	8.39	8.46	8.60	9.02	8.64
56	9.58	9.73	9.56	8.54	10.01	9.22	11.96	13.37	9.58	10.31	11.18	9.81	12.04	10.56	9.69	9.22	9.12	10.38	8.90	8.80	9.06	10.02	8.72
57	11.76	9.66	10.51	9.18	10.23	10.57	9.52	10.55	8.55	8.62	8.15	8.78	9.91	11.08	9.38	8.50	9.15	9.28	8.55	8.02	7.92	8.72	8.00
58	11.36	10.[illegible]	10.31	9.01	10.76	9.98	11.19	13.22	10.17	10.45	9.61	8.91	10.34	11.10	9.[illegible]	8.74	9.09	9.81	8.60	8.08	8.20	9.14	8.26
59	10.81	10.32	10.97	8.58	10.84	10.23	10.44	11.46	9.65	10.06	9.16	9.41	10.90	11.69	9.87	8.94	9.56	10.39	8.73	8.32	8.23	9.32	8.25
60	11.09	9.77	9.56	9.27	10.64	10.92	10.29	11.62	8.72	8.90	9.72	8.85	9.74	10.77	9.07	9.00	9.66	9.46	8.63	8.22	8.09	8.85	8.36
61	11.06	9.67	9.15	8.56	9.42	9.89	9.63	11.09	9.42	9.39	8.38	8.17	8.52	9.46	8.72	8.21	8.69	8.61	7.97	7.86	7.99	8.39	7.98
62	10.32	10.40	8.7	9.02	10.93	10.32	9.89	10.51	9.29	9.68	8.26	9.35	10.81	11.65	9.84	9.26	9.69	10.66	8.74	8.61	8.32	9.45	8.33
63	10.53	10.34	10.83	9.14	11.08	10.12	10.24	11.32	9.45	9.84	9.36	9.47	11.00	11.53	9.74	9.20	9.53	10.61	8.76	8.64	8.53	9.72	8.45
64	11.02	10.42	11.27	9.46	11.26	10.81	9.53	10.38	9.58	9.93	8.77	9.24	10.21	11.86	9.93	8.93	9.41	10.38	8.65	8.32	8.32	9.20	8.26
65	10.29	9.64	8.44	8.56	8.81	8.90	9.37	10.66	8.67	8.53	8.21	8.38	8.73	8.53	8.47	8.35	8.42	8.66	8.21	8.12	8.00	8.44	8.22
66	10.09	8.66	8.61	8.62	8.76	8.90	9.63	10.49	8.56	8.67	8.33	8.43	8.49	8.60	8.51	8.40	8.31	8.63	8.35	8.20	8.14	8.61	8.24
67	10.30	8.58	8.91	8.73	8.61	8.96	8.84	9.53	8.56	8.23	7.87	8.32	8.64	8.66	8.42	8.35	8.55	8.50	8.26	8.09	7.85	8.48	8.23
68	11.65	10.01	10.49	9.40	10.44	10.77	9.38	10.35	8.51	8.71	8.10	8.78	9.41	10.80	9.42	8.43	9.36	9.59	8.35	8.04	7.95	8.76	8.14
69	11.12	10.55	11.09	9.13	11.00	10.96	9.46	10.56	9.22	9.38	8.54	9.29	10.58	11.81	10.00	8.89	9.68	10.34	8.63	8.24	8.15	9.05	8.15
70	10.09	8.58	8.72	8.61	8.44	8.87	9.21	10.20	8.68	8.39	8.06	8.28	8.63	8.56	8.42	8.27	8.39	8.50	8.13	8.07	7.98	8.42	8.22
71	10.44	8.92	9.05	8.84	9.25	9.32	9.38	10.28	8.57	8.50	8.14	8.50	8.93	8.99	8.71	8.49	8.73	9.02	8.27	8.04	7.95	8.71	8.14
72	10.31	9.14	9.86	8.48	9.56	9.36	9.20	10.36	8.47	8.38	8.00	8.71	9.49	9.40	8.92	8.40	8.80	9.56	8.22	7.94	7.78	9.10	8.02
73	11.49	8.63	8.51	8.72	8.71	9.12	9.44	10.77	8.49	8.35	8.16	8.35	8.77	8.78	8.63	8.33	8.35	8.58	8.12	8.11	8.00	8.36	8.16
74	9.82	8.65	8.67	8.58	8.66	9.22	9.11	10.17	8.67	8.23	8.11	8.29	8.76	8.73	8.44	8.26	8.34	8.33	8.11	8.09	8.03	8.23	8.15
75	11.48	8.68	9.22	8.75	8.66	9.19	9.22	9.97	8.32	8.05	8.00	8.33	8.76	8.96	8.73	8.25	8.29	8.25	8.06	8.10	8.03	8.27	8.18
76	10.97	9.45	10.37	9.11	9.63	10.17	9.57	11.96	8.38	8.47	8.16	8.60	9.37	10.25	9.32	8.37	8.74	9.05	8.15	8.03	7.97	8.37	8.05
77	9.91	9.13	9.56	8.44	9.26	9.31	12.39	14.09	9.95	9.[illegible]	10.04	8.78	9.41	9.53	9.11	8.40	8.58	9.19	8.13	8.14	8.28	8.44	8.33
78	11.63	9.23	9.97	8.97	9.32	10.04	9.27	10.5.	8.34	8.24	.13	8.58	9.2[illegible]	9.95	9.25	8.36	8.69	8.79	8.15	8.08	8.03	8.33	8.08
79	10.59	8.56	8.71	8.54	8.60	8.97	9.[illegible]	10.42	8.44	8.25	[illegible].13	8.27	8.63	8.58	8.53	8.29	8.33	8.37	8.12	8.11	8.06	8.32	8.19
80	11.26	8.61	8.89	8.6	8.67	9.08	9.50	10.79	8.43	8.28	8.15	8.31	8.74	8.75	8.43	8.33	8.34	8.42	8.11	8.11	8.07	8.41	8.16
81	10.22	9.30	10.03	8.56	9.52	9.73	9.34	10.67	8.38	8.27	8.30	9.05	10.16	10.06	9.69	8.81	9.05	9.69	8.31	8.12	7.90	8.72	8.07
82	11.17	9.70	9.17	8.92	9.20	9.78	9.9	10.44	8.67	8.41	8.04	8.33	8.88	9.52	8.89	8.25	8.51	8.60	8.07	7.98	7.94	8.32	8.08
83	10.80	8.87	9.13	8.71	8.89	9.15	9.3[illegible]	10.51	8.63	8.32	8.10	8.43	8.93	9.1	8.75	8.40	8.49	8.54	8.13	8.04	7.88	8.52	8.04
84	10.50	8.91	9.[illegible]	8.67	9.15	9.23	9.[illegible]	76	8.55	8.39	8.28	8.53	9.25	9.08	8.91	8.42	8.48	8.92	8.06	8.03	7.93	8.50	8.11
85	11.03	8.65	8.82	8.65	9.65	9.12	9.5	43	8.44	8.30	8.13	8.30	8.70	8.79	8.59	8.29	8.29	8.12	8.08	8.08	8.04	8.26	8.15
86	10.57	9.04	9.29	8.70	9.03	9.47	9.58	1.63	8.47	8.31	8.21	8.57	9.19	9.32	8.97	8.43	8.73	9.03	8.18	8.05	8.00	8.64	8.09
87	11.44	9.33	9.81	8.42	9.48	9.97	9.46	1.09	8.55	8.44	8.22	8.53	9.43	9.97	9.23	8.35	8.72	9.08	8.07	7.97	7.93	8.53	8.00
88	11.76	9.15	9.67	8.72	9.34	9.83	9.87	11.22	8.68	8.59	8.29	8.53	9.34	10.02	9.10	8.35	8.61	8.98	8.10	7.95	7.95	8.57	7.97
89	12.03	9.48	9.77	8.83	9.58	9.99	10.08	11.60	8.61	8.75	8.38	8.50	9.27	10.20	9.05	8.32	8.65	8.90	8.10	7.91	7.91	8.56	7.97
90	11.31	9.76	9.29	8.63	8.84	9.47	9.42	10.55	8.39	8.63	8.25	8.53	8.88	9.05	8.89	8.34	[illegible].0	8.76	8.13	8.06	8.12	8.42	8.09
91	11.64	8.57	8.70	8.76	8.62	9.04	9.29	11.26	8.44	8.36	8.26	8.37	8.67	8.60	8.61	8.34	8.35	8.41	8.18	8.20	8.19	8.50	8.23
92	10.84	9.09	9.45	8.75	9.14	9.45	9.36	11.07	8.63	8.55	7.97	8.69	8.98	9.14	9.16	8.62	8.54	9.07	8.21	8.12	8.08	8.61	8.16
93	10.58	9.36	8.55	8.[illegible]	9.80	8.93	8.94	9.92	8.64	8.64	8.36	8.50	8.53	8.58	8.40	8.38	8.56	8.87	8.35	8.3	8.21	8.34	8.27
94	11.01	8.73	9.16	8.45	8.79	9.26	9.46	10.54	8.44	8.62	8.38	8.41	9.04	8.87	8.88	8.42	8.39	8.75	8.12	8.3	8.10	8.44	8.15
95	11.01	8.25	8.9[illegible]	8.51	8.67	9.25	9.65	10.89	8.55	8.29	8.31	8.35	8.92	8.61	8.83	8.31	8.37	8.80	8.10	8.09	8.12	8.49	8.11
96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
97	11.06	8.52	8.91	8.72	8.93	9.47	9.33	10.50	8.31	8.48	8.21	8.42	8.60	9.97	8.57	8.30	8.26	8.37	8.10	8.10	8.11	8.42	8.17
98	11.38	8.87	9.28	8.64	9.[illegible]	9.39	9.87	10.93	8.57	8.51	8.31	8.53	8.88	9.42	8.96	8.37	8.36	8.72	8.02	8.05	8.3	8.45	8.09
99	11.27	9.2[illegible]	9.[illegible]	9.38	9.[illegible]	8.91	7.[illegible]	8.16	9.20	8.32	7.87	8.88	8.56	9.08	9.02	9.20	8.77	8.72	8.77	8.86	8.19	9.13	8.65
100	10.20	8.5	8.[illegible]	8.64	8.[illegible]	8.81	9.33	10.16	8.52	8.44	8.38	8.19	8.56	8.47	8.45	8.34	8.40	8.55	8.33	8.24	8.28	8.44	8.32
101	10.42	8.69	9.0[illegible]	8.71	8.70	9.22	9.47	10.46	8.3	8.35	8.16	8.61	8.60	9.03	8.69	8.41	8.36	8.7[illegible]	8.16	8.17	8.18	8.49	8.14
102	11.35	8.96	9.07	8.70	8.92	9.43	9.9[illegible]	11.[illegible]	8.[illegible]	[illegible]	8.61	8.38	9.17	9.21	8.89	8.32	8.34	9.10	8.03	8.22	8.[illegible]	8.33	8.14
103	9.95	8.83	8.5[illegible]	8.49	8.07	9.[illegible]	8.29	8.46	8.28	8.20	8.08	8.7[illegible]	8.54	8.89	8.70	9.00	9.2	8.93	8.93	8.59	7.99	8.01	8.58

[a] A constant of also has been added to each score to avoid the awkward interpretation of negative attribute-requirement estimates.

[b] Attribute Number 94, [illegible] values, was deleted because of low reliability).

Table 6 (continued)

Attribute Number	Cluster Number 70	71	72	73
1	8.61	9.32	8.50	8.74
2	8.49	8.67	8.46	8.67
3	8.89	8.99	8.55	9.10
4	8.76	8.54	8.61	8.39
5	8.31	9.12	8.75	8.65
6	8.61	8.90	8.50	8.68
7	8.59	8.81	8.52	8.61
8	8.62	8.58	8.44	8.68
9	8.58	9.02	9.19	8.35
10	9.65	9.65	9.00	9.09
11	8.71	10.13	8.97	9.19
12	8.64	9.89	8.59	8.57
13	8.62	9.60	9.14	8.66
14	8.68	8.81	8.60	8.53
15	8.67	8.84	8.66	8.55
16	8.36	8.51	8.19	8.02
17	8.30	8.50	8.23	8.07
18	8.34	8.59	8.22	8.16
19	8.37	8.37	8.28	8.04
20	8.30	8.41	8.39	8.20
21	8.33	8.41	8.46	8.30
22	8.36	8.63	8.69	8.28
23	8.33	8.39	8.35	8.23
24	8.30	9.17	9.11	8.48
25	8.73	9.27	9.83	8.20
26	9.01	9.33	9.05	8.70
27	8.21	8.58	8.20	8.04
28	8.17	8.83	8.79	7.96
29	8.64	8.86	9.89	8.18
30	9.02	9.33	9.42	8.46
31	8.62	8.67	9.17	8.00
32	8.63	8.31	8.26	7.88
33	8.36	8.56	8.28	8.05
34	8.19	8.32	8.19	8.09
35	8.30	8.58	8.16	8.06
36	8.33	8.31	8.26	8.13
37	8.39	8.66	8.37	8.12
38	8.40	8.68	8.39	8.05
39	8.40	8.59	8.30	8.00
40	8.33	8.68	8.40	8.07
41	8.33	8.70	8.60	8.00
42	8.37	8.63	8.39	8.25
43	9.61	9.43	9.71	8.61
44	8.63	8.90	8.44	8.00
45	8.98	9.16	8.96	8.86
46	8.67	9.27	9.41	8.39
47	8.69	8.68	8.96	8.44
48	8.33	9.50	8.87	8.77
49	8.48	9.32	8.90	8.81
50	8.33	9.32	8.79	8.61
51	8.63	9.60	8.84	8.50
52	8.33	8.33	8.74	8.38
53	8.37	9.03	9.13	8.54
54	8.33	9.17	9.16	8.36
55	8.37	8.84	10.26	8.06
56	8.33	8.99	9.42	8.38
57	8.18	8.96	8.42	8.20
58	8.38	9.07	9.15	8.39
59	8.35	9.30	9.17	8.60
60	8.77	9.93	9.31	8.44
61	8.11	8.26	8.21	7.94
62	8.62	9.71	9.06	8.74
63	8.63	9.34	9.20	8.79
64	8.76	9.14	8.93	9.[illegible]
65	8.33	8.60	8.72	8.17
66	8	8.67	8.61	8.30
67	8	8.78	8.58	8.3[illegible]
68	8.[illegible]	9.20	9.83	8.42
69	8.70	9.26	9.91	8.42
70	8.27	8.55	[illegible].51	8.12
71	9.68	8.87	[illegible].69	8.22
72	8.33	9.78	9.11	8.74
73	8.41	8.43	8.44	8.07
74	9.61	8.55	8.30	8.03
75	8.42	8.61	8.23	7.97
76	8.49	8.82	8.50	8.00
77	8.75	8.86	8.95	8.10
78	8.31	8.78	8.[illegible]5	8.01
79	8.33	8.57	8.39	8.09
80	8.67	8.65	8.78	8.08
81	9.08	9.73	9.28	[illegible].25
82	8.31	8.32	[illegible].39	7.96
83	8.74	8.82	8.36	8.11
84	8.71	8.81	8.75	7.92
85	8.38	8.51	8.31	8.05
86	8.58	8.88	8.67	8.04
87	8.68	8.76	8.32	7.91
88	8.31	8.77	8.38	8.00
89	8.05	8.69	8.41	7.96
90	8.68	8.73	8.36	8.10
91	8.61	8.65	8.37	8.17
92	9.04	8.82	8.33	8.33
93	8.30	8.32	8.60	8.52
94	8.66	8.89	8.60	8.17
95	8.61	8.76	8.39	8.06
96	---	---	---	---
97	8.31	8.35	[illegible]	8.17
98	8.36	8.79	[illegible]	7.93
99	9.22	8.87	[illegible]	9.60
100	8.37	8.31	8.35	8.31
101	9.39	8.61	8.17	8.08
102	8.60	8.72	8.37	8.09
103	8.20	8.72	8.29	8.65

[a]A constant of nine has been added to each score to avoid the outward interpretation of negative attribute-requirement estimates.

[b]Attribute Number 96, "Moral Values," was deleted because of low reliability.

ABSTRACT

In a previous study, a set of basic work dimensions was derived through factor analyses of job ratings on an Occupation Analysis Inventory (OAI) containing 622 work elements describing different kinds of work activities and conditions. The study reported here explored the feasibility of deriving an educationally relevant occupational cluster structure based on the OAI work dimensions. Pursuant to that purpose, a hierarchical cluster analysis was applied to the factor score profiles of 814 occupations on 22 higher-order OAI work dimensions. From that analysis, 73 occupational clusters were identified and interpreted. Although those clusters were for the most part individually meaningful, the desired hierarchical pattern of clustering--i.e., broad, general occupational clusters subsuming clusters that are narrower in scope--did not emerge in an interpretable form, and 155 of the 814 occupations in the sample failed to cluster in a logical manner at any stage of the hierarchical process. Several factors are considered that may have attenuated the clarity of the hierarchical structure. Based on those considerations, a second, larger study has been initiated in an effort to derive an OAI-based occupational cluster structure applicable to occupationally related education and guidance.