

# Inventory of Work-Relevant Values: 2001 Revision

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## **Abstract**

This research report describes changes made to the Inventory of Work-Relevant Values when it was revised for online use as a part of the Internet version of DISCOVER. Users will see the following differences between the online and CD-ROM versions of the inventory: 22 items rather than 61, simplified presentation, and the contribution of all items to the linkage with the World-of-Work Map. Changes to the Inventory of Work-Relevant Values were based on user feedback, field testing, and data analysis. Some value items were retained from the CD-ROM version of the inventory, and several new items were developed for the online version. Items retained in the final inventory passed a variety of statistical tests, including test-retest reliability and discriminant analyses, or were retained for other substantive reasons. Occupations were rated on all new values, and inter-rater reliability calculated. The report includes relevant literature that informs this revision and the finalized version of the Inventory of Work-Relevant Values for use in the Internet DISCOVER.



## **Acknowledgments**

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## **Inventory of Work-Relevant Values: 2001 Revision**

### **Context of Revision**

#### *History*

In 1982, ACT's computer-assisted career guidance system, DISCOVER, included a section in which users could obtain a list of occupations based on their yes-no responses to a set of job values. In this context, job values refer to the importance individuals give to certain preferred attributes that are satisfied in their work environments. At that time, this section of DISCOVER included 16 values and was based on the research of Donald Super (Super, 1982). The use and types of values in DISCOVER has since been modified to reflect changes suggested by additional research, improvements in computer technology, and input from users. A discussion of this evolution is beyond the scope of this report. Additional information can be located in the following ACT documents: Vansickle and Prediger (1991), Maze (1995), and Prediger and Staples (1996).

By the late 1990s, the Inventory of Work-Relevant Values appearing in the CD-ROM DISCOVER consisted of 61 items, grouped into 14 categories. See Maze (1995) for a discussion of its development. The user was shown a series of visuals (pictures of individuals in occupations conveying specific values) in sets of three, with audio explanations prior to responding to the items in each category. For each value item, its definition and corresponding characteristics were presented along with the response options (don't want, not important, somewhat important, very important). Users clicked on their preferred responses to all items, culminating (via the linkage procedure detailed in Prediger & Staples, 1996) in the recommendation of four career areas (families of related occupations). Career areas were presented visually on the World-of-Work Map. Sixteen of the value items were used to link to the World-of-Work Map due to their ability

to differentiate career clusters (families of related career areas) or due to special considerations. The remaining 45 value items were presented as useful information for users to consider as they determined which occupations better suited them.

### *2001 Revision*

A revision of the Inventory of Work-Relevant Values was an integral part of the 2001 development of the online version of the DISCOVER computer-assisted career guidance system. Given the variety of Internet connection speeds and capabilities of home computers, and the probability that home users would not have access to a counselor to help them interpret and use results, some changes were deemed necessary in order to achieve a product suitable for online use. The changes recommended by ACT's Research and Educational Services Divisions were as follows:

- Eliminate the series of pictures with audio presented prior to the value items

As there are differences in DISCOVER program compatibility with media players, users may not be able to play audio/visual slide shows and would, therefore, be unable to fully utilize the program with this option. In addition, differences in Internet connections would create lengthy loading times for users with a 56K modem as opposed to users with DSL, T1, or cable connections.

- Decrease the length of the inventory

Upon considering user feedback indicating that the inventory was too long and concerns that online users could be confused because not all 61 items contributed to making occupational recommendations, the consensus among ACT staff was to develop a shorter version of the Inventory of Work-Relevant Values. This online version would have every value item contribute to the World-of-Work Map linkage.

- Include only inventory items that were supported by research and practice for use in making occupational recommendations

Since all items would now be used in making occupational recommendations, the revised inventory needed to be psychometrically defensible, contain only items supported by the career guidance literature, and be supported by appropriate statistical procedures to ensure reliability and validity.

These recommendations and relevant literature guided the revision of the Inventory of Work-Relevant Values.

### **Relevant Literature**

#### *Introduction*

During the 1990s, two ACT Research Reports (Prediger & Staples, 1996; Vansickle & Prediger, 1991) addressed techniques for linking individuals' occupational attribute preferences (or "work-relevant values") to occupations themselves; that is, to determine which occupation(s) best matched a particular preference or preferences. Additionally, an unpublished paper by Maze (1995) describes the development of the values inventory used in the CD-ROM version of DISCOVER. These three manuscripts include documentation of the research and practice literature reviewed prior to development of the 61-item values inventory used in the CD-ROM DISCOVER.

As a part of the development of the Inventory of Work-Relevant Values to be used in the Internet DISCOVER, relevant material published since 1995 was reviewed. References were located through computer searches and from several journals likely to contain appropriate articles. Dale Prediger, who has followed the literature in this area for many years, also provided copies of several articles and instruments that proved useful.

The following areas were examined in the literature.

- Work-related values. Purposes were:
  1. to determine whether recent research had identified additional values that should be considered for inclusion in the inventory (in fact, no items were added based on this review);
  2. to determine the current research support for the use of values, in addition to interests and abilities, in career planning.
- Computer-assisted career guidance and information systems. Purposes were:
  1. to identify benefits and limitations of the use of such systems;
  2. to obtain information on using these systems without the assistance of a professional counselor.
- Cross-cultural issues (given the breadth of Internet access). Purposes were:
  1. to identify differences in value patterns across cultures;
  2. to determine whether the use of a values inventory by individuals from different cultures is viable for career exploration.

### *Work-Related Values*

Work values are a subset of what are sometimes referred to as “lifestyle” values (e.g. see Patton, 2000). Brown and Crace (1996) point out that, ideally, values should be a central focus of the counseling process, and that clients should be encouraged to take a holistic view of their lives and values. To that end, values associated with work are integral to making informed career/life decisions.

This review is limited to research that focuses on work-related values; that is, to values that have a reasonable opportunity of being satisfied in an employment setting. There has, in fact,

been considerable debate as to whether the word “values” is the most appropriate term to describe these personal characteristics; Prediger and Staples (1996) report the use of “job values,” “work values,” “work aspect preferences,” “preferences” (as a substitute for the entire span of needs, values, and interests), and “occupational attribute preferences.” However, this discussion of terminology has been limited to the research literature; most inventories continue to use some variant of the term “work values” in their titles and to describe their content to the user. Given that the inventory developed for the Internet version of DISCOVER is titled “Inventory of Work-Relevant Values,” the term “work-relevant values” will be used throughout this discussion.

Individuals have different patterns of work-relevant values, and research has shown that job satisfaction and performance are related to congruence between workers’ values and the opportunities to realize those values provided by their occupations (see Dawis, 2001; Hochwarter, Perrewe, Ferris, & Brymer, 1999). In practical terms, this research supports the use of values assessment as a part of career counseling and the career planning process.

Values assessment does not replace the use of interest assessment in career planning. Job values and interests are distinct categories with some overlap (see Prediger & Staples, 1996, for a discussion of this topic). Sager (1999) reports that interests predict later occupational membership better than do values, whereas values predict job satisfaction better than do interests. Brown (1995) points out that people whose values are discrepant with their work settings are likely to be dissatisfied with their jobs. For Rounds (1990), values and interests are important for job satisfaction, and the combination of these provides more accurate career information than a reliance on interest data only.

Knapp-Lee (1996) recommends that comprehensive career self-assessment should

include measures of values, interests, and abilities. The DISCOVER work-relevant values inventory is intended for use as part of such a comprehensive assessment.

### *Computer-Assisted Career Guidance Systems (CACGs)*

Mounting evidence suggests there is increased use of computers for career exploration and planning (Behrens & Altman, 1998; Boyce & Rainie, 2002; National Center for Education Statistics [NCES], 2003). A recent study indicated that the rate of use of computerized career information sources increased from 27% to 57% among public high school students between 1984 and 2002 (NCES, 2003). In addition, an estimated one out of every five Americans has searched online for occupational information and more than 4 million users do so daily (Boyce & Rainie, 2002). Since career planning on the Internet is a growing trend, some discussion of its benefits and limitations is warranted. Gore and Leuwerke (2000) describe a number of beneficial results from using the Internet to deliver CACGs that include the following: ability to access vast amounts of information, ability to easily update materials, ability to offer multiple assessments that provide immediate feedback upon their completion, potential for generating an interactive environment where individuals are actively involved in career planning, and the potential for conducting innovative research using data stored in computer databases. Additional benefits include making CACGs via the Internet accessible to individuals in geographically remote locations, accessible to individuals with physical disabilities, and accessible to people who may be uncomfortable seeking counseling (Sampson & Lumsden, 2000).

While the benefits may seem numerous, there are also limitations to this medium. The efficient delivery of computer-assisted career guidance may be compromised by a lack of appropriate hardware, different servers that are not equally capable, data transmission rates that are slower with video and audio program options, or even the size of monitors (Gore &

Leuwerke, 2000).

Sampson and Lumsden (2000) describe program limitations to using Internet-based career systems. There are problems with a lack of data on the reliability and validity of assessments placed on the Internet, along with a lack of information about the credentials of web site authors. Using unreliable and invalid assessments to help individuals make important career decisions is a critical issue. According to Sampson and Lumsden (2000), a majority of career-related Internet sites “offer little or no information on the reliability and validity of assessment instruments” (p. 23). Without access to information about the way career assessments are developed, individuals do not know whether a specific assessment is appropriate for them or if results accurately represent the responses entered into the program.

Another issue that has been expressed regarding CACGs is that users may make decisions based on inaccurate information or that they may not have the ability to make appropriate decisions even though accurate information is provided. The question is whether the assistance of a professional career counselor is necessary in order for individuals to make informed and satisfying career choices. The reality is that many people prefer to use Internet sources rather than professional help when preparing to make career decisions. While cost is an issue for some, others find that professional assistance requires scheduling during hours that are inconvenient for them. Rabasca (2000) reported that John M. Grohol, Psy.D., a psychologist and Vice-President of an Internet start-up in Texas, stated that “online therapy offers clients a degree of anonymity and the convenience of 24-hour services” (p. 4).

Palmer and Howland (1997), after summarizing research indicating that CACGSs are most effective when used in conjunction with counselor support, go on to say that CACGSs may be used by nontraditional clients without direct counselor involvement (e.g., in a library). While



clearly preferring the use of CACGSs in a counseling setting, they raise the question of whether the developers are responsible for ensuring that use of these systems in other settings is effective. However, Carson and Cartwright (1997) note that “published research shows that for many career issues clients benefit comparably from computerized interventions (as) those made by human counselors” (p. 29).

Of course, one needs only to visit the self-help section of any large bookstore to see that “do-it-yourself” counseling opportunities did not begin with the Internet. For instance, the popular *What Color Is Your Parachute?* (Bolles, 2001) has been a best seller in book form since its first edition in 1970 (supplemental activities are now available on a website). Both in bookstores and on the Internet, career products vary in quality. The wise user will select products developed by reputable sources and supported by research data.

### *Cross-Cultural Issues*

Material on the Internet can be accessed from virtually anywhere in the world. Therefore, it is important to consider whether a values inventory developed in the United States will be relevant for users elsewhere in the world. A major research project (eleven countries--Australia, Belgium, Canada, Croatia, Israel, Italy, Japan, Poland, Portugal, South Africa, United States--participated) on the study of life roles, values, and careers is described in a book edited by Super and Sverko (1995); chapters 5-15 describe studies in individual countries, while cross-national and topical studies are described in chapters 16-25. This project found that there were some cultural differences across countries regarding values patterns (e.g., patterns of “material success and prestige”, “relationships and understanding among people”, and “aesthetics and creativity”) (see Chapter 26).

In a ten-year study of high school students in six countries (United States, Norway,

Finland, Canada, Australia, France), Lebo, Harrington, and Tillman (1995) reported that “selected work values were more similar than dissimilar across countries and cultures” (p. 350). While all the countries studied were classified as “developed nations” with a history of capitalism, they varied in size, ethnic makeup, political structure, economic position in world markets, and dominant culture.

A comparison of Russian immigrant and native Israeli first-year university students (Sagy, 1997) found that “more similarities than differences exist between work values of students, both men and women, who have been socialized in two different cultural environments” (p. 241).

Cross-cultural research has been used in developing some values inventories. For instance, the ValueSearch Model (Karp & Guterman, 2000) is based on research from 20 countries. Relying on universal human requirements (physical/biological survival needs, social interaction, survival and welfare needs of groups), this model offers eight categories of values that are distinguished in numerous cultures as important “guiding principles of life” and “crucial for career satisfaction” (p. 5). These value categories are benevolence, universality, tradition, security, power, achievement, excitement, and self-direction. This research supports the idea that there are values with universal meaning, and their clarification promotes decisions that lead to more fulfilling work lives.

Work values served as the topic for a 1999 international review in the journal *Applied Psychology*. Articles by Ros, Schwartz, and Surkiss (1999), Elizur and Sagie (1999), Roe and Ester (1999), and Schwartz (1999) all address the relationship between values and work in a cultural context. While it appears that different cultures vary to some degree in the values they consider most important, there is nothing to suggest that the values patterns of individuals within

those cultures should not be used in career exploration.

In summary, research supports the contention that values assessment is a necessary element in the process of making informed career decisions that contribute to increased job satisfaction and performance. The increased use of computer-assisted career guidance systems as a venue for engaging in career-related self-assessment presents various benefits and limitations, which were considered as the Inventory of Work-Relevant Values was revised. Given the wide accessibility of this venue, it is noteworthy that work values tend to be more similar than dissimilar across cultures despite some differences in values patterns. As a career intervention, these systems may be most effective when used with the assistance of a counselor, but they represent career planning tools that can be effectively used without counselor assistance, especially for individuals who would otherwise not avail themselves of traditional modes of career counseling.

### **Revision Process**

The process of revising the Inventory of Work-Relevant Values (IWRV) began with a review of the 61 items in CD-ROM DISCOVER and in particular the 16 items used in the linkage to the World-of-Work Map. An ACT Research Report (Vansickle & Prediger, 1991) recommended values items commonly reported in the literature, 10 of which were not among the 16 items used in the linkage. These additional 10 items were all considered for inclusion in the revised inventory. Suggestions for item content, based on previous research and reader feedback, were also generated by staff in ACT's Research and Educational Services Divisions. The updated literature, combined with previous literature reviews, were used to ensure that all items in the revised Inventory of Work-Relevant Values were supported by research and practice.

A first draft of 20 items was developed, using the information referred to above, and

circulated for initial review. (At that point, the working assumption was that the inventory would not exceed 20 items in length.) It was later decided to expand the draft inventory to 25 items to enable additional recommended items to be included, and to allow for some attrition during the development process. A core group of ACT staff was involved in finalizing the items to be used in the draft inventory.

The draft inventory was then distributed to a larger group of ACT staff in the Research Division, Educational Services Division, and Educational Technology Center (ETC) for final review prior to field testing. The field test version included 14 items that were already used in the linkage to the World-of-Work Map (working in an office, working outside, working separately, public contact, physical activity, 40-hour week, short training time, high income, authority, influencing others, making things, creating order [renamed “organization” so as not to be confused with “creativity”], precision, and certification). Because these items had already been thoroughly researched and documented (see Prediger & Staples, 1996), it was decided in advance of field testing that they would be retained in the final inventory.

In addition to those 14 items, seven items were based on the Vansickle and Prediger Research Report (1991) findings: Working Inside (from “Work Setting”), Flexible Hours (from “Flexible Schedule”), Prestige, Helping Others, Creativity, Independence, and Variety. All of these except “Helping Others” appeared in the 61-item DISCOVER inventory. The other four items, Management, Intellectual Stimulation, Safety, and Achievement were based on input from ACT Research and Educational Services Division staff; all but the last of these also appeared in the 61-item DISCOVER values inventory (this inventory has several other items that address achievement, primarily in the “accomplishment” and “recognition” categories).

The following section provides more detail on the reasons why some items previously

used in the linkage or recommended in RR91-7 were not included in the field test version of the inventory.

*Determination of Items for 25-item Draft Inventory*

The primary source for twenty-one items was ACT research (see Research Report 91-7 and Research Report 96-3). Four additional items were derived from items that appear in the CD-ROM version of DISCOVER, but are not used in the World-of-Work Map linkage; furthermore, these were all recommended by ACT staff during the preliminary review process. Table 1 lists the 25 Internet DISCOVER IWRV items used in field testing and shows their source(s).

*Unselected items and rationale.* The following items were not selected from those suggested by RR 91-7 or the existing World-of-Work linkage.

In RR 91-7 but not in the Internet DISCOVER list:

- Travel
- Job security
- Job opportunities
- Education level

Linkage item in CD-ROM DISCOVER but not in Internet DISCOVER list:

- Immediate response
- Financial challenge

*Travel* was dropped because, with a few exceptions, the amount of travel is related more to the specific job than to the occupation. For example, some computer specialists travel extensively and others not at all.

At the time the Internet DISCOVER Inventory of Work-Relevant Values was being developed, the economic situation was such that *job security* and *job opportunities* were

changing dramatically; downsizing and layoffs were common across the occupational spectrum. Therefore, occupations could not reliably be coded on these characteristics.

*Education level* was not included as a specific item, though some of the other items (for example, “High Income”), are more likely to link with occupations in career areas that tend to require a higher education level. Since “Education Level” is not, for most people, a value in and of itself but rather a means to an end, this seemed an appropriate decision.

*Immediate response* referred to working in a setting where others could see and evaluate one’s work, with the possibility of responding with tips, applause, etc. *Financial challenge* was defined as “Making decisions or advising others about money. These decisions could produce big payoffs, or could lose money for yourself, clients, or the organization you work for.” Based on feedback from the ACT reviewers that these items were too specific and that valuing other types of recognition was not covered, these two items were dropped and, as recommended by ACT staff, a more general “Achievement” item added to reflect a desire for being recognized for outstanding performance.

*Wording changes.* “Creativity” was a heading in the CD-ROM DISCOVER version (items were “uniqueness,” “new ideas,” and “problem solving”); the “Creativity” item in Internet DISCOVER is based on the “new ideas” item, with some changes to reflect the fact that “creativity” comprises, but is not limited to, the concept of “new ideas.”

“Creating order” in the CD-ROM DISCOVER version was changed to “Organization” at the recommendation of ETC staff, who noted that users sometimes confused “creating order” with “creativity.”

*Additional items.* Some items were added that were neither in RR 91-7 nor in the DISCOVER linkage to the World-of-Work Map.

Staff in ACT's Educational Services Division reported that users wanted more items likely to be associated with intellectual and managerial types of occupations. Therefore, "management," "intellectual stimulation," and "achievement" were added ("management" and "intellectual stimulation" are items and "accomplishment" is a category heading in the CD-ROM inventory, but none of these are used in the linkage).

"Safety" appears in the CD-ROM inventory, but is not used in the linkage. It was also a recommendation of ACT staff who, based on user feedback, considered this value particularly important.

"Working inside" was added because it appeared to fill a gap between two other items ("working in an office" and "working outside"). This item appears in the CD-ROM inventory.

*DISCOVER item comparison.* Table 2 shows whether each proposed DISCOVER values inventory item appears in any of seven other similar inventories used in career guidance. For comparison, the last two columns show whether the item appears in the CD-ROM version of DISCOVER or was recommended in Research Report 91-7.

### *Field Testing*

The purpose of field testing was to determine whether any items should be eliminated either on the basis of low test-retest reliabilities or because of redundancy (defined as high correlation with one or more other items). Initially, a pilot field test was conducted at two schools (one suburban [School A] and one rural [School B]). The IWRV was administered on paper to volunteer 9<sup>th</sup> and 11<sup>th</sup> grade students on two occasions separated by a two-week interval. They were instructed to circle the appropriate number next to each value item indicating the degree to which they considered a value important in the work they ultimately chose to do. Their response options were don't want, not important, somewhat important, and very important, each

of which were defined on the inventory. At School B, the staff rewrote the instructions for administering the IWRV and also informed students that they would be taking the inventory twice. Data from School B were dropped due to this failure to follow the standardized instructions. After reviewing item responses from the School A sample of completed inventories for 54 9<sup>th</sup> graders and 53 11<sup>th</sup> graders, minor revisions were made to the wording of four items (Prestige, Independence, Variety, Intellectual Stimulation) to clarify their definitions but not to alter their meaning.

Final field testing was conducted at an urban school (School C) with 246 9<sup>th</sup> graders and 258 11<sup>th</sup> graders. Once again, a two-week interval separated the first and second administrations of the inventory and students received the same instructions as those from School A. Completed inventories were obtained from 214 students in the Grade 9 sample and 214 students in the Grade 11 sample. Data from this field test were combined with those from School A, resulting in a final sample of 268 9<sup>th</sup> graders and 267 11<sup>th</sup> graders. Test-retest reliabilities and item intercorrelations were obtained for this sample.

Test-retest reliabilities (Pearson product-moment correlations) for all items that were not already being used in the World-of-Work linkage are shown in Table 3. Although reasonable reliabilities are expected, a high level of reliability for individual items is not crucial as the values are considered as a group in the linkage procedure (Prediger & Staples, 1996). Prediger and Staples (1996) set single item test-retest reliability coefficients at .46 and higher. Using the Inventory of Work Preferences with field study samples of 9<sup>th</sup> and 12<sup>th</sup> graders, reliability coefficients (including both grades) ranged from .32 to .75 (Prediger & Staples, 1996). After reviewing single item reliabilities for similar instruments and taking into consideration the criterion set by Prediger and Staples (1996), overall test-retest reliability coefficients of .40 and



higher were considered acceptable for items on the Inventory of Work-Relevant Values. All but three items, including those used in the World-of-Work linkage, met or exceeded the criterion for acceptability. Three item recommendations from Research Report 91-7 (Working Inside [Work Setting in Research Report 91-7], Variety, and Independence) failed to meet this criterion and were dropped from the draft inventory, leaving a total of 22 items.

Overall (grades 9 and 11 combined) disattenuated item intercorrelations were examined to determine whether any items with high intercorrelations were redundant. These intercorrelations are available from the ACT Career Transitions Research Department. As was done by Prediger and Staples (1996), we set the redundancy criterion, a priori, at a correlation of .90 in this study. The overall range of disattenuated intercorrelations was -.59 to .82. The median intercorrelation was .16 (interquartile range of .04 to .3). Because the size of the correlation coefficient can be affected by the range of responses, the response distributions were examined; restriction of range was not evident. See Table 4 for the response distributions for grades 9 and 11. Therefore, since the absolute value of all item intercorrelations fell below .90, no items were eliminated on the basis of these findings.

#### *Occupational Rating Rules and Value Definitions*

In order to form a linkage between occupations and values, each of the 555 occupations in DISCOVER required ratings on each of the 22 values in the inventory. The value definitions (called occupational attribute definitions in 1994) and rating rules used in 1994 were reviewed for use in the 2001 revision. Those criteria (percent of workers experiencing a value and percent of time workers experience the value) were considered appropriate for this current revision (Contact Career Transitions Research Department for Value Definitions and Rating Rules). The definitions and coding for 17 items already rated were retained. Definitions were developed for

the following items: Flexible Hours, Helping Others, Prestige, Achievement, and Intellectual Stimulation. This involved collaboration between an ACT staff member and an external consultant to develop definitions, percent-of-time levels, clarifying notes, and examples. This consultant had a Ph.D. in Psychology and over 20 years experience.

*Occupational rating procedures.* The rating of occupations on the five new values was carried out in a series of steps. A second consultant with expertise in job analysis was enlisted to rate occupations. This rater was instructed in the use of the rating rules and value definitions described above. The task involved assigning a yes, maybe, or no rating to each of the 555 occupations on each of the new values. The appropriate rating depended on the percent of workers who experience a value in an occupation and the percent of time that value is experienced, both of which can vary by occupation and by value. As a first step, the consultant rated 52 occupations (two from each of the 26 career areas found on the World-of-Work Map) on one of the new value items. An ACT staff member with occupational expertise also rated these 52 occupations using the rating rules and value definitions. Inter-rater reliability was calculated for the 52 occupations rated by the consultant and the ACT staff member. The agreement percentage between the raters was 92.3 and the Kappa was .77.

Discrepancies among the 52 rated occupations were reconciled by the first consultant, who also had previous experience in rating occupations. The reconciled ratings were then submitted to staff at ETC, where a final review was conducted. Two discrepancies were identified between ETC and ACT staff; these were resolved through discussion between ETC and ACT staff.

The consultant and ACT staff member raters then independently completed the occupational ratings (with occupations arranged by career areas) for the remaining new value

items. Inter-rater reliability was then calculated for all new value ratings. The agreement percentage was 88.8 with a Kappa of .68. The other consultant again reconciled any disagreements.

### *Discriminant Analyses*

Modeled after a study by Prediger and Staples (1996), discriminant analyses were conducted to determine whether the 22 items in the revised Inventory of Work-Relevant Values discriminated among the six career clusters and 26 career areas on the World-of-Work Map. The data for these analyses included 555 occupations currently classified in DISCOVER. The occupations were grouped into six career clusters (Administration and Sales, Business Operations, Technical, Science and Technology, Arts, and Social Service), which were further subgrouped into 26 career areas. The data also included ratings for each occupation on each of the 22 values.

Since there was no theoretical basis for removing any specific values and research supported the use of such values, the authors opted for stepwise discriminant analyses to inform the decision of which values should be retained. The dependent variable was represented by career cluster; the independent variables were represented by the 22 values. In the stepwise analyses, a significance level of .15 to enter and remove values (default set by SAS for stepwise procedures) was used. A Wilks' lambda index for the final model arising from the analyses was significant at the .0001 level with 19 of the 22 values contributing significantly ( $p < .0001$ ) to the discrimination among career clusters. Three values (Physical Activity, Short Training Time, and Flexible Hours) could not be entered into the model.

Though three values were not recommended for inclusion by the stepwise analyses, they were considered for inclusion in the overall discriminant analysis based on other reasons.

Physical Activity and Short Training Time were already being successfully used in the linkage procedure. Because 14 of 16 values used in the prior linkage were retained in the revision of the IWRV, it was important to consider the lower rates of referral for Business Operations and Technical Career Clusters with these values (Prediger & Staples, 1996). Upon examining response distributions from the field study, Short Training Time was highly endorsed and, as noted in Prediger and Staples (1996), aided the referral of users to the Technical Career Cluster. Physical Activity was also highly endorsed and frequently appeared in other values instruments. Therefore, both Physical Activity and Short Training Time were retained in the overall analysis. Although Flexible Hours could not be entered into the stepwise model, it was retained for nonstatistical reasons as follows.

- In view of the changing labor force composition (working parents, dual career couples), scheduling of work hours has become increasingly important (Kalleberg & Rockwell, 1995).
- Technological advancements have not only altered the location of work but also the time in which work may be done, which may be addressed by variations in work schedules.
- User feedback indicated that this value has become more significant to work decisions.

Based on results from the stepwise discriminant analyses and the other reasons for including three values, an overall discriminant analysis was carried out including the 22 values under consideration. The resultant discriminant functions, with their respective percent of variance, are reported in Table 5. All five discriminant functions were significant at .0001, accounting for between 5.9 and 40.2% of total variance. The percentages of variance accounted for indicate that each function significantly contributes to our ability to discriminate between career clusters. Consistent with Prediger and Staples (1996), target correlations of .40 or higher with at least one of the discriminant functions was the criterion set for the inclusion of values in

the linkage procedure. As shown in Table 5, 18 of the 22 values correlated .40 or higher with at least one of the discriminant functions. The F-to-remove ranks are for the most part consistent with the correlation criterion.

The relationships between career clusters and patterns of correlations between values and discriminant functions seemed reasonable. For example, the first function showed its highest correlations for Influencing Others and Public Contact, while showing its highest negative correlations for Working Separately and Making Things, discriminating the Social Service and Administration and Sales Career Clusters from the Technical Career Cluster. The second function had its highest two positive correlations for Organization and Short Training Time while its highest two negative correlations were for Influencing Others and Intellectual Stimulation, discriminating the Business Operations Career Cluster from the Administration and Sales Career Cluster. The third function had a high positive correlation for Precision, which helps discriminate the Science and Technology Career Cluster from the other career clusters.

Upon examining mean value ratings (2 = yes, 1 = maybe, 0 = no) for the career clusters in conjunction with the value correlations, the rating profiles also seemed reasonable. For example, Influencing Others correlated .64 with the first discriminant functions and had an F-to-remove rank of 1. The mean value ratings for Influencing Others ranged from .25 to 1.88 across the six career clusters. Consistent with what one might expect given the correlation, the mean value rating for the Administration and Sales Career Cluster was 1.88 and 1.68 for the Social Service Career Cluster; whereas the Technical Career Cluster mean rating was .25. Organization correlated .57 with the second discriminant function and had an F-to-remove rank of 2. The mean value rating for the Business Operations Career Cluster was 1.67 while the mean value rating for Administration and Sales Career Cluster was .23. Working Outside had an F-to-

remove rank of 19 and lower correlations, -.19, .03, -.13, .14, with the discriminant functions. The mean value ratings for Working Outside were close together for the six career clusters; the highest mean value rating was for the Technical Career Cluster (.49), with mean ratings below .2 for the other five clusters. Based on these findings, we would conclude that use of the work values effectively discriminates among the career clusters.

Discriminant analyses were conducted and mean ratings examined to determine if the values discriminating among the career clusters also discriminate among the career areas. An analysis for each career cluster with career area as the grouping variable was used. Based on results from the six discriminant analyses, the values that discriminated between the career clusters also appeared to discriminate between the career areas within each cluster. (Discriminant analyses results may be obtained from the Career Transitions Research Department.) Mean value ratings were examined to determine whether they were consistent with the discriminant analyses (see Figures 1-9). The mean value ratings also indicated that values discriminating between career clusters also discriminate between career areas within career clusters. Although this was the case, many career areas have unique profiles (with considerably different mean value ratings for career areas in a cluster) that need to be accommodated so that users will be appropriately referred to career areas on the World-of-Work Map. The linkage procedure developed in 1996 accommodates differences among career areas, the tendency for these areas to have unique profiles, within career clusters (Prediger & Staples, 1996). Given this feature of the linkage procedure, it makes sense to retain this procedure in the current revision.

*Special considerations.* Although four values (Working Outside, Flexible Hours, Management, and Certification) did not meet the statistical criteria in the overall discriminant analysis, there were other reasons for including these values. Primarily, the use of values allows

us to discriminate between career areas within career clusters. The precedent for retaining items that did not meet statistical criteria also appears in Prediger and Staples (1996). Working Outside contributes to our ability to discriminate between career areas within the Technical Career Cluster. This deduction is based on an examination of the differences in mean value ratings for each career area compared to every other career area in this cluster. For example, in the Agriculture, Forestry, & Related and Computer & Information Specialties Career Areas, substantial differences are evident, which would be expected given that occupations (e.g. Farmer, Logger) in the former career area involve working outside while those (e.g. Programmer, Desktop Publisher) in the latter area primarily take place indoors.

The value Flexible Hours contributes to our ability to discriminate between career areas within the Science and Technology Career Cluster. For example, there are substantial mean value rating differences between the Social Science and Medical Technologies Career Areas with the former being much higher than the latter. This result would be expected as occupations (e.g. Sociologist, Experimental Psychologist) in the Social Science Career Area would be subject to flexible hours to a greater extent than occupations (e.g. Pharmacist, Optician) in the Medical Technologies Career Areas.

The value Management contributes to our ability to discriminate between career areas within the Administration and Sales Career Cluster. For example, there are substantial mean value rating differences between the Marketing & Sales and Management Career Areas, with the latter rating being much higher than the former rating. This result would be expected given the nature of the occupations in each career area.

The value Certification contributes to our ability to discriminate between career areas within the Social Service Cluster. This conclusion is based on moderate to substantial mean

value rating differences for each career area in this cluster. In the Education and Personal Services Career Areas, this result would be expected as certification is required for many teaching occupations but rarely required for waiters and travel guides. Given that Working Outside, Flexible Hours, Management, and Certification are values that aid our ability to discriminate between career areas within the career clusters, they are included in the IWRV.

Education level is also important to consider in the context of the Inventory of Work-Relevant Values. Two issues of concern include using redundant items (a number of values that are related to education) in the linkage procedure and overrepresenting education level in various parts of DISCOVER. On the first issue pertaining to redundant items, if education-related values make an important contribution to the ability to discriminate between career clusters or career areas within those clusters, they should also be included in the inventory. For example, Prestige and Creativity (values that have been suggested as relating to education) contributes to our ability to discriminate between some of the career areas in the Arts Career Cluster. High Income (education-related in Prediger and Staples, 1996) had a high endorsement rate in the field study samples and frequently appeared in other values instruments; this value was included in the linkage because of its importance to users and career guidance. Given that the values in the IWRV do not load entirely on education, and that there are up to 22 values that may be included in the linkage procedure (which considers Very Important, Somewhat Important, and Don't Want responses in assigning scores while excluding Not Important responses), career area recommendations will be based on a varied combination of values.

On the second issue, there are two primary areas where users may choose education levels. In one area, users can select a desired education level or levels after completing an inventory and before obtaining results. This selection of education level functions as a filter so



that entire occupation lists are not presented. If users select all education levels, entire lists of occupations would be retrieved. In the second area, users may choose to explore occupations by various characteristics, one of which is education level. A key point is that users have a choice in whether or not to select one or more education levels to reduce the number of occupations generated by their inventory results, or to search for occupations by education level. Another key point is that users who decide to explore occupations by job characteristics such as education level may not opt for taking inventories, and hence will not revisit education level options in DISCOVER.

*Summary.* Twenty-five value items were selected as possible items on the revised Inventory of Work-Relevant Values. Due to low test-retest reliabilities, three values were eliminated. The remaining 22 values were included in the stepwise discriminant analyses. Based on these analyses, 19 of 22 values statistically contributed to the discrimination among career clusters. The remaining three values were retained for nonstatistical reasons. The results of an overall discriminant analysis indicated that 18 of the 22 values met the statistical criterion for inclusion in the linkage procedure. The remaining four values were retained because they helped to discriminate between career areas within specific career clusters (see section on special considerations). Overall, the values can be used to discriminate among career clusters and/or discriminate between career areas within career clusters. Based on the results from a series of statistical analyses and substantive considerations, the decision was made to retain 22 values in the Inventory of Work-Relevant Values.

*Internet DISCOVER Inventory of Work-Relevant Values*

Using the statistical procedures and practical steps described earlier, the Inventory of Work-Relevant Values was developed. This inventory contains 22 items, grouped into four

categories. As in the CD-ROM DISCOVER, this grouping is intended to facilitate the reporting of results. This is a common feature of other inventories such as O\*NET, eChoices, and the Career Locker. The four categories based on logical clustering of items in the Inventory of Work-Relevant Values are: Work Settings, Work Tasks, Work Preparation, and Work Opportunities. A copy of this inventory with these four categories is located in the Appendix.

#### *Linkage Procedure to World-of-Work Map*

After reviewing the procedures used to link values to occupational suggestions documented in Prediger & Staples (1996), it was decided to retain the bulk of these procedures, using the expected utility model, with the revised Inventory of Work-Relevant Values. The following articulates linkage guidelines and procedures:

#### Guidelines

- User responses to the items on the IWRV represent the degree of importance users place on experiencing various work values.
- Occupational ratings (yes, maybe, no) represent the probabilities that a person will experience a value in an occupation.
- A combination of the degree of importance a user places on a value and the probability of experiencing that value in a certain occupation is used to determine the degree-of-fit between what a user wants and what an occupation provides.
- The values used in the linkage procedure meet test-retest reliability criteria (three values out of 25 did not meet this criteria and were eliminated).
- The values used in the linkage procedure discriminate among career clusters and career areas or are included for justifiable reasons (three values did not contribute to the discrimination but were included for other reasons).

- Values rated by users as Very Important, Somewhat Important, and Don't Want are included in the list that will be used to search for occupations. Users must rate at least six values as Very or Somewhat Important before the linkage procedures are carried out; a minimum number of qualifying values are necessary to provide sufficient information that, once applied to the linkage procedure, provides users with career area recommendations that more accurately reflect their complement of values.

#### Procedures

- The degree of importance (Very Important, Somewhat Important, Don't Want) for each value is compared with the occupational rating (no, maybe, yes) for each value, and a degree-of-fit score (0,1,2,4) is assigned to each value (see Table 6).
- Degree-of-fit scores are summed across all values on user's list of included values to obtain an overall degree-of-fit score for each occupation.
- Using degree-of-fit scores for all occupations, the mean of the degree-of-fit scores for occupations in each of the 26 career areas is the degree-of-fit score for that career area.
- Obtain degree-of-fit scores for all 26 career areas and suggest the four career areas with the highest degree-of-fit scores to the user (in writing and by location on the World-of-Work Map).
- Within these career areas, the occupations that best fit a user's values are suggested for exploration. A cut-off score, the average of the degree-of-fit scores for the fourth- and fifth-ranking career areas, determines which occupations to suggest.
- This procedure is executed by a computer program designed to link the value items. The program is organized by sections as follows:
  1. Section 1 inputs the 26 career areas, 555 occupations with their ratings, 22 values, and 9

degree-of-fit configurations. This section also defines the ratings (no =1, maybe = 2, yes = 3) and sorts the occupations into their respective career areas.

2. Section 2 inputs sample cases with responses to 22 values, and defines the value responses (Very Important = 3, Somewhat Important = 2, Don't Want = 1).
3. Section 3 determines if there are at least six Very Important or Somewhat Important value responses for the sample case, which allows the program to continue, or ends the program for lack of sufficient qualifying value responses.
4. Section 4 computes degree-of-fit scores for the values, sums the values scores, computes the degree-of-fit scores for career areas suggesting the four highest ranking areas, and computes the cut-off score used to suggest occupations within the four recommended career areas.

The following example demonstrates the above process. A user takes the IWRV, rating at least six values as Very or Somewhat Important, which provides the linkage procedure program with a sufficient number of value responses from which to compare occupational ratings (no, maybe, yes) for each value. For each of the 555 occupations, value ratings are available for a total of 22 values. For each occupation, obtain degree-of-fit scores for all the values included on the user's search list (those values that were rated Very Important, Somewhat Important, or Don't Want). If the user has eight qualifying values, there will be eight scores for every occupation. In Career Area A (Employment-Related Services), there are nine occupations and hence, there will be nine sets of eight value scores. Sum the degree-of-fit value scores to get an overall degree-of-fit score for each occupation. For Compensation Manager, the first occupation in Career Area A, sum the eight value scores to obtain an overall score for this occupation. Each occupation in career area A will have an overall score. Sum these scores and divide by the number of occupations in the

career area, in this case nine. This is the degree-of-fit score for Career Area A. Carry out these procedures for every career area and suggest the four career areas with the highest degree-of-fit scores to the user. Within each of the suggested four career areas, a cut-off score is established to determine which occupations are suggested to users. This cut score is the sum of the fourth-ranking career area degree-of-fit score and the fifth-ranking career area degree-of-fit score divided by two. Those occupations with overall degree-of-fit scores above the “cut” criterion are placed on the list of suggested occupations within each of the four recommended career areas.

The original idea pertaining to the values inventory was to rank order the suggested occupations by degree-of-fit. This was not executed in the DOS version or the Windows version of DISCOVER. In this current version of online DISCOVER, a business decision was made not to rank order occupations. In addition, the suggested career areas (those with the four highest degree-of-fit scores) are presented in alphabetical order rather than by rank.

### **Future Research**

Given the importance of values to comprehensive career planning and a revision of the Inventory of Work-Relevant Values suitable for online use, further research considerations are in order. Additional reliability studies using test-retest values assessment results from DISCOVER users grouped by user type (e.g. high school, college, working adult) are warranted. This research allows us to evaluate the reliability of the online administered inventory as opposed to the paper-and-pencil version. We are also able to examine the inventory’s reliability among developmentally different groups of individuals who use the DISCOVER program.

Other research involves evaluating whether the results from specifying work values on the IWRV accurately link to appropriate occupational choices. Once executed, the current linkage procedure culminates in four recommended career areas that most closely correspond to

a user's value responses. To validate these recommendations, a study is necessary that enlists individuals working in occupations that correspond to a variety of career areas. Their responses to the IWRV can provide support for the accuracy of linking a combination of values to specific career areas.

Another study can help determine to what extent the use of the IWRV, as a part of the comprehensive career guidance system DISCOVER, increases users' career decision-making self-efficacy. Do users increase their knowledge of values? Do users better understand how values are related to occupations? Are users more decided about their careers after completing inventories on values, interests, and abilities and using the various components in DISCOVER? These are questions that may be addressed with self-efficacy research.

A final study would consider the effects of using the IWRV with individuals from diverse cultures. This type of study is increasingly important as DISCOVER becomes more accessible in other countries. Research cited earlier indicates that there are some value pattern differences across cultures. At the same time, the use of values is important to the career planning process. By examining the value patterns of culturally diverse users of the IWRV, we can modify the inventory as needed and provide supplemental information in the DISCOVER program that addresses the needs of an international clientele.

The revised Inventory of Work-Relevant Values has the potential to provide users around the world with values information that can enhance their comprehensive career planning experience. Increased knowledge of one's values and increased understanding of how those values relate to occupational options more accurately informs career decisions. Thus, it is prudent to maintain a high quality values assessment and engage in ongoing research to further enhance the usefulness and effectiveness of this instrument.



## References

- Behrens, T., & Altman, B. (1998). Technology: Impact on and implications for college career centers. *Journal of Career Planning and Employment*, 58, 19-22, 24.
- Bolles, R. N. (2001). *What color is your parachute? A practical manual for job-hunters and career changers*. Berkeley, CA: Ten Speed Press.
- Boyce, A., & Rainie, L. (2002, July). *Online job hunting*. Pew Internet Project Data Memo. Retrieved April 15, 2003, from the Pew Internet & American Life Web site: <http://www.pewinternet.org/reports/>
- Brown, D. (1995). A values-based approach to facilitating career transitions. *The Career Development Quarterly*, 44, 4-11.
- Brown, D., & Crace, R. K. (1996). Values in life role choices and outcomes: A conceptual model. *The Career Development Quarterly*, 44, 211-223.
- Carson, A. D., & Cartwright, G. F. (1997). Fifth generation computer-assisted career guidance systems. *Career Planning and Adult Development Journal*, 13, 19-40.
- Dawis, R.V. (2001). Toward a psychology of values. *The Counseling Psychologist*, 29, 458-465.
- Elizur, D., & Sagie, A. (1999). Facets of personal values: A structural analysis of life and work values. *Applied Psychology: An International Review*, 48, 73-87.
- Gore, P. A., Jr., & Leuwerke, W. C. (2000). Information technology for career assessment on the Internet. *Journal of Career Assessment*, 8, 3-19.
- Harrington, T. F., & O'Shea, A. J. (1993). *The Harrington-O'Shea Career Decision-Making System Revised*. Circle Pines, MN: American Guidance Service.
- Hochwarter, W., Perrewe, P., Ferris, G., & Brymer, R. (1999). Job satisfaction and performance: The moderating effects of value attainment and affective disposition. *Journal of Vocational Behavior*, 54, 296-313.
- Kalleberg, A. L., & Rockwell, R. C. (1995). Employers, employees, and work: A research program (281-302). In D. T. Bills (Ed.), *The new modern times: Factors reshaping the World of Work* (pp. 281-302). Albany, NY: State University of New York Press.
- Karp, T., & Guterman, M. (2000). *ValueSearch Facilitator's Manual*. Union City, CA: ValueSearch.
- Knapp-Lee, L. J. (1996). Use of the COPES, a measure of work values, in career assessment. *Journal of Career Assessment*, 4, 429-443.



- Lebo, R. B., Harrington, T. F., & Tillman, R. (1995). Work values similarities among students from six countries. *Career Development Quarterly*, 43, 350-362.
- Maze, M. (1995). *Designing a new DISCOVER values inventory: The Hunt Valley portion of the project*. Unpublished manuscript.
- National Center for Education Statistics. (2003, August). *High school guidance counseling*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- Nevill, D. D., & Super, D. E. (1986). *The Values Scale: Theory, application, and research*. Palo Alto, CA: Consulting Psychologists Press.
- Palmer, R., & Howland, P. (1997). Computer-assisted career guidance systems and the new world of work: Practical and ethical dilemmas. *Career Planning and Adult Development Journal*, 13, 9-17.
- Patton, W. (2000). Changing career: The role of values. In A. Collin & C. Young (Eds.), *The Future of Career* (pp. 69-82). Cambridge, England: Cambridge University Press.
- Prediger, D. J., & Staples, J. G. (1996). *Linking occupational attribute preferences to occupations*. (ACT Research Report 96-3). Iowa City, IA: American College Testing.
- Pryor, R. G. L. (1987). Differences among differences: In search of general work preference dimensions. *Journal of Applied Psychology*, 72, 426-433.
- Rabasca, L. (2000). Self-help sites: A blessing or a bane? [Electronic version]. *Monitor on Psychology*, 31(4), 1-6.
- Roe, R. A., & Ester, P. (1999). Values and work: Empirical findings and theoretical perspective. *Applied Psychology: An International Review*, 48, 1-21.
- Ros, M., Schwartz, S. H., & Surkiss, S. (1999). Basic individual values, work values, and the meaning of work. *Applied Psychology: An International Review*, 48, 49-71.
- Rounds, J. B. (1990). The comparative and combined utility of work value and interest data in career counseling with adults. *Journal of Vocational Behavior*, 37, 32-45.
- Rounds, J. B., Jr., Henly, G. A., Dawis, R. V., Lofquist, L. H., & Weiss, D. J. (1981). *Manual for the Minnesota Importance Questionnaire: A measure of vocational needs and values*. Minneapolis: University of Minnesota Press.
- Sager, C. E. (1999). Occupational interests and values. In *An occupational information system for the 21<sup>st</sup> century: The development of O-NET* (pp. 197-211). Washington, DC: American Psychological Association.

- Sagy, S. (1997). Work values: Comparing Russian immigrants and Israeli students. *Journal of Career Development, 23*, 231-243.
- Sampson, J. P., & Lumsden, J. A. (2000). Ethical issues in the design and use of Internet-based career assessment. *Journal of Career Assessment, 8*, 21-36.
- Schwartz, S. H. (1999). A theory of cultural values and some implications for work. *Applied Psychology: An International Review, 48*, 23-47.
- Super, D. E. (1982). The relative importance of work: Models and measures for meaningful data. *Counseling Psychologist, 10*, 95-103.
- Super, D. E., & Sverko, B. (Eds.) (1995). *Life roles, values, and careers: International findings of the work importance project*. San Francisco: Jossey-Bass, Inc.
- United States Military Entrance Processing Command. (1997). *Exploring careers: The ASVAB workbook*. North Chicago, IL: Hq USMEPCOM/MEPCO
- Vansickle, T. R., & Prediger, D. J. (1991). *Occupational attributes differentiating Holland's occupational types, job families, and occupations*. (ACT Research Report 91-7). Iowa City, IA: American College Testing.



## Appendix

### Inventory of Work-Relevant Values

The purpose of this inventory is to find out what work values are important to you. DISCOVER can help you explore career areas (groups of occupations) that are likely to satisfy the values you prefer most and avoid those you prefer least.

Twenty-two value characteristics are placed into four categories: work settings, work tasks, work preparation, and work opportunities. Read the following definitions and mark one of the four choices by circling its number next to each value.

Circle **0** – **Don't Want** - if you want to avoid work that has this characteristic.

Circle **1** – **Not Important** - if you don't care if your work has this characteristic or not.

Circle **2** – **Somewhat Important** - if you hope to have this characteristic in your work.

Circle **3** – **Very Important** - if you really want this characteristic in your work.

#### Work Settings

0 1 2 3 Working in an Office - Working in an office setting most of the time.

0 1 2 3 Working Outside - Working outdoors most of the time, being exposed to the weather.

0 1 2 3 Working Separately - Doing work in which you do not talk to or work with other people very often.

0 1 2 3 Public Contact - Doing work in which you talk to or are seen by people who are not co-workers much of the time. You may interact with many different people in a day.

0 1 2 3 40-Hour Week - Being able to limit your work to not more than 40 hours a week; not being expected to work overtime or take work home most of the time.

0 1 2 3 Flexible Hours - Being able to choose which hours you want to work, as long as the work gets done on time.

0 1 2 3 Safety - Working in an environment that is unlikely to cause physical injury or illness; not working near fast-moving machinery, dangerous chemicals, high places you could fall from, etc.

### **Work Tasks**

- 0 1 2 3 Authority - Telling people (who are not employees) what to do; preventing people from doing things they should not do.
- 0 1 2 3 Management - Having a job in which you direct others in their work and make sure their work gets done accurately and on schedule.
- 0 1 2 3 Influencing Others - Convincing or advising people to do the things you believe they should do, even though you have no authority over them.
- 0 1 2 3 Helping Others - Improving the lives of others by activities such as counseling, mentoring, physically assisting, etc.
- 0 1 2 3 Making Things - Using your hands and/or tools to make or fix things; producing or repairing objects that you can see or touch.
- 0 1 2 3 Physical Activity - Moving around and getting exercise in your work by walking, lifting, etc.
- 0 1 2 3 Organization - Doing work in which you put things in order for others; using a system or rules to organize, schedule or arrange things or events.
- 0 1 2 3 Precision - Doing work that uses exact standards, either by measuring very carefully or following procedures very carefully.

### **Work Preparation**

- 0 1 2 3 Short Training Time - Being able to start working with no more than 6 months' training after high school.
- 0 1 2 3 Certification - Working in an occupation in which a license, credential, or degree that documents preparation to do the work is usually needed to get a job.

### **Work Opportunities**

- 0 1 2 3 Prestige - Doing work that others consider important; people will respect you and look up to you because of your occupation.
- 0 1 2 3 Achievement - Doing work that gives you the opportunity to be recognized by others as being outstanding at what you do.
- 0 1 2 3 High Income - Earning more than 75% of the people who work in the United States. (In 2000, this meant at least \$30,000 starting or \$40,000 with experience.)

0 1 2 3 Creativity - Creating something new or developing new methods of doing things;  
original thinking.

0 1 2 3 Intellectual Stimulation - Doing work that requires you to think about difficult concepts;  
learning about new things as a part of your work.

Enter your results from the Inventory of Work Values into DISCOVER by first selecting the  
Inventories section, then clicking on Values Inventory and following the instructions.

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*Note.* The ratings were changed from 1-4 in the field test version to 0-3 in the final version to  
reinforce the fact that Don't Want (0) refers to choosing to have the complete absence of a given  
value in one's work.



TABLE 1

## Origin of Items in Draft Internet Discover Inventory of Work-Relevant Values

<b>Item</b>	<b>ACT Research Report 91-7</b>	<b>DISCOVER World-of-Work linkage item</b>	<b>DISCOVER, not linkage</b>
Working in an office	Work setting	Working in an office	
Working inside	Work setting		Working inside
Working outside	Work setting	Working outside	
Working separately		Working separately	
Public contact	Public contact	Public contact	
Physical activity	Physical activity	Physical activity	
40-hour week		40-hour week	
Flexible hours	Flexible schedule		Flexible hours
Short training time		Short training time	
Prestige	Prestige		Prestige
High income	Earnings	High income	
Authority	Authority	Authority	
Influencing others	Influencing others	Influencing others	
Helping others	Helping others		
Making things		Making things	
Organization		Creating order	
Precision		Precision	
Creativity	Creativity		Creativity
Independence	Independence		Independence
Variety	Variety		Variety
Management			Management
Intellectual stimulation			Intellectual stimulation
Achievement			Accomplishment
Certification		Certification	
Safety			Safety



**TABLE 2****Comparison of Draft Internet DISCOVER Items with Those in Other Inventories**

<b>Item</b>	<b>WAPS</b>	<b>MIQ</b>	<b>VS</b>	<b>SIGI PLUS</b>	<b>CDM-R</b>	<b>ASVAB</b>	<b>O*NET</b>	<b>DISCOVER (CD-ROM)</b>	<b>RR 91-7</b>
Work in Office	Surroundings	Work conditions	Work conditions					Yes*	Work setting
Work Inside	Surroundings	Work conditions	Work conditions					Yes	Work setting
Work Outside	Surroundings	Work conditions	Work conditions		Yes			Yes*	Work setting
Work Separately							“J” in Work Conditions	Yes*	
Public Contact			Social interaction			Yes+		Yes*	Yes
Physical Activity	Yes	Yes			Yes			Yes*	Yes
40-hr Week								Yes*	
Flexible Hours				Yes				Yes	Yes
Short Training				Early entry				Yes*	
Prestige	Yes	Recognition & Social Status	Yes	Yes	Yes	Yes	“L” in Recognition	Yes	Yes
High Income	Money	Compensation	Yes	Yes	Good Salary	Yes	“G” in Work Conditions	Yes*	Yes
Authority	Yes	Yes	Yes				“E” in Recognition	Yes*	Yes
Influencing Others								Yes*	Yes
Helping Others	Altruism	Social Service	Altruism	Yes		Yes	“O” in Relationships		Yes
Making Things					Work w/hands	Work w/hands/equip+		Yes*	
Organization								Creating* Order	
Precision								Yes*	
Creativity	Yes	Yes	Yes		Yes			As a Heading	Yes
Independence	Yes	Yes	Autonomy	Yes	Yes	Yes	Yes	As a Heading	Yes

(table continues)

Item	WAPS	MIQ	VS	SIGI PLUS	CDM-R	ASVAB	O*NET	DISCOVER (CD-ROM)	RR 91-7
Variety		Yes	Yes	Yes	Yes	Yes		Yes	Yes
Management		Authority		Leadership	Leadership	Leadership	“E” in Recognition	Yes	
Intellectual Stimulation			Ability Utilization		Work with mind			Yes	
Achievement		Yes	Yes		Yes		Yes	Accomplishment (as a heading)	
Certification								Yes*	
Safety		Yes						Yes	Yes

*Note.* WAPS = Work Aspect Preference Scale (Pryor, 1987); MIQ = Minnesota Importance Questionnaire (Rounds, Henly, Dawis, Lofquist, & Weiss, 1981); VS = Values Scale (Nevill & Super, 1986); CDM-R = Career Decision-Making Scale, Revised (Harrington & O’Shea, 1993); ASVAB = Armed Services Vocational Aptitude Battery (United States Military Entrance Processing Command, 1997). The cells in other inventories contain a yes (indication the DISCOVER item has the same item label) or an item label that differs but has the same or similar meaning as the DISCOVER item.

+ Items under ASVAB so marked appear in the listing of interests, not values.

\* These are items used in linking to the World-of-Work Map in the CD-ROM version of DISCOVER

TABLE 3

## IWRV Test-Retest Reliabilities for Value Items Not in WWM Linkage

Value Items	Grade 9 <sup>a</sup>	Reliability Grade 11 <sup>b</sup>	Overall <sup>c</sup>
Flexible Hours	.48	.48	.48
Prestige	.46	.44	.45
Helping Others	.53	.57	.56
Independence <sup>d</sup>	.34	.37	.36
Variety <sup>d</sup>	.29	.33	.32
Intellectual Stimulation	.43	.53	.48
Achievement	.38	.44	.41
Working Inside <sup>d</sup>	.34	.39	.37
Creativity	.47	.53	.50
Management	.48	.54	.51
Safety	.45	.45	.45

*Note.* First and second inventory administration time interval = two weeks.

<sup>a</sup> $n = 268$ . <sup>b</sup> $n = 267$ . <sup>c</sup> $N = 535$ . <sup>d</sup>Value items not meeting the .40 cutoff set for the overall correlations.

TABLE 4

## Distributions of Inventory of Work-Relevant Values Item Responses for Grades 9 and 11

Response option	Values Items																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Grade 9 ( $n = 268$ )																									
Very Important	6	16	20	5	34	36	26	51	18	44	55	16	18	31	29	17	12	37	45	32	21	34	47	34	38
Somewhat Important	38	41	33	19	32	31	33	35	30	37	32	33	35	34	29	28	26	30	35	43	32	41	34	37	27
Not Important	42	36	31	33	25	25	35	10	33	15	10	40	34	25	25	38	41	25	17	20	38	18	15	25	25
Don't Want	14	7	16	43	9	8	6	4	19	4	3	11	13	10	17	17	21	8	3	5	9	7	4	4	10
Grade 11 ( $n = 267$ )																									
Very Important	6	12	12	4	36	18	27	52	14	49	60	14	20	38	16	18	14	38	48	41	18	43	51	40	36
Somewhat Important	26	41	32	16	34	39	35	32	25	35	26	35	43	28	27	28	25	34	35	35	33	36	36	34	27
Not Important	54	41	39	25	26	34	30	13	34	14	11	41	30	27	37	37	39	21	15	22	39	19	12	22	28
Don't Want	14	6	17	55	4	9	8	3	27	2	3	10	7	7	20	17	22	7	2	2	10	2	1	4	9

*Note.* Response distribution values are from the first administration and are expressed as percentages (decimal point omitted).

TABLE 5

## Discrimination of 555 Occupations (Grouped by 6 Career Clusters)

Value	<i>F</i> -to-remove rank *	Correlation with the five discriminant functions***				
		1st	2nd	3rd	4th	5th
Working in an office	10	.25	-.01	-.03	-.46	.25
Working outside**	19	-.19	.03	-.13	.14	.07
Working separately	17	-.44	-.12	.12	-.28	.11
Public contact	13	.52	.01	.07	.24	-.11
40 hour week	18	-.26	.41	.13	-.07	.14
Flexible hours**	21	.10	-.36	-.11	-.17	-.24
Safety	7	.32	.06	-.02	-.45	-.22
Authority	6	.30	.14	.01	.47	-.14
Management**	11	.26	-.26	-.17	.18	.28
Influencing others	1	.64	-.57	.00	.14	.08
Helping others	5	.23	-.06	.36	.49	-.15
Making things	4	-.51	.09	-.28	.32	-.27
Physical activity	22	.11	-.42	-.05	-.02	.22
Organization	2	.22	.57	.42	-.08	-.09
Precision	3	-.34	-.06	.45	-.13	.19
Short training time	20	-.06	.49	.06	-.08	-.01
Certification**	12	.09	-.37	.33	.30	.19
Prestige	16	.12	-.50	.05	-.15	-.23
Achievement	9	.13	-.47	.04	-.15	-.38

(table continues)

<b>Value</b>	<b><i>F</i>-to-remove rank *</b>	<b>Correlation with the five discriminant functions***</b>				
		<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>	<b>5th</b>
High Income	15	.12	-.50	-.11	-.09	.21
Creativity	14	.18	-.50	.10	.01	-.27
Intellectual stimulation	8	.07	-.58	.31	-.09	.17

\*Rank of unique contribution to variance (1 = highest)

\*\*Values used in the linkage procedure because of other reasons noted on page 20-21.

\*\*\*Percent of variance for the five functions, respectively: 40.2, 23.4, 17.4, 13.0, and 5.9.

**TABLE 6****Degree-of-Fit Scores Value Responses by Occupational Ratings**

<b>User Value Responses</b>	<b>Value Ratings for Occupations</b>		
	<b>No</b>	<b>Maybe</b>	<b>Yes</b>
Very Important	0	2	4
Somewhat Important	0	1	2
Don't Want	4	0	0

*Note.* Values with Not Important responses are not included in the user's list of values by which to search for occupations.

FIGURE 1. Profiles of mean value ratings for Technical and Social Service Career Clusters. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

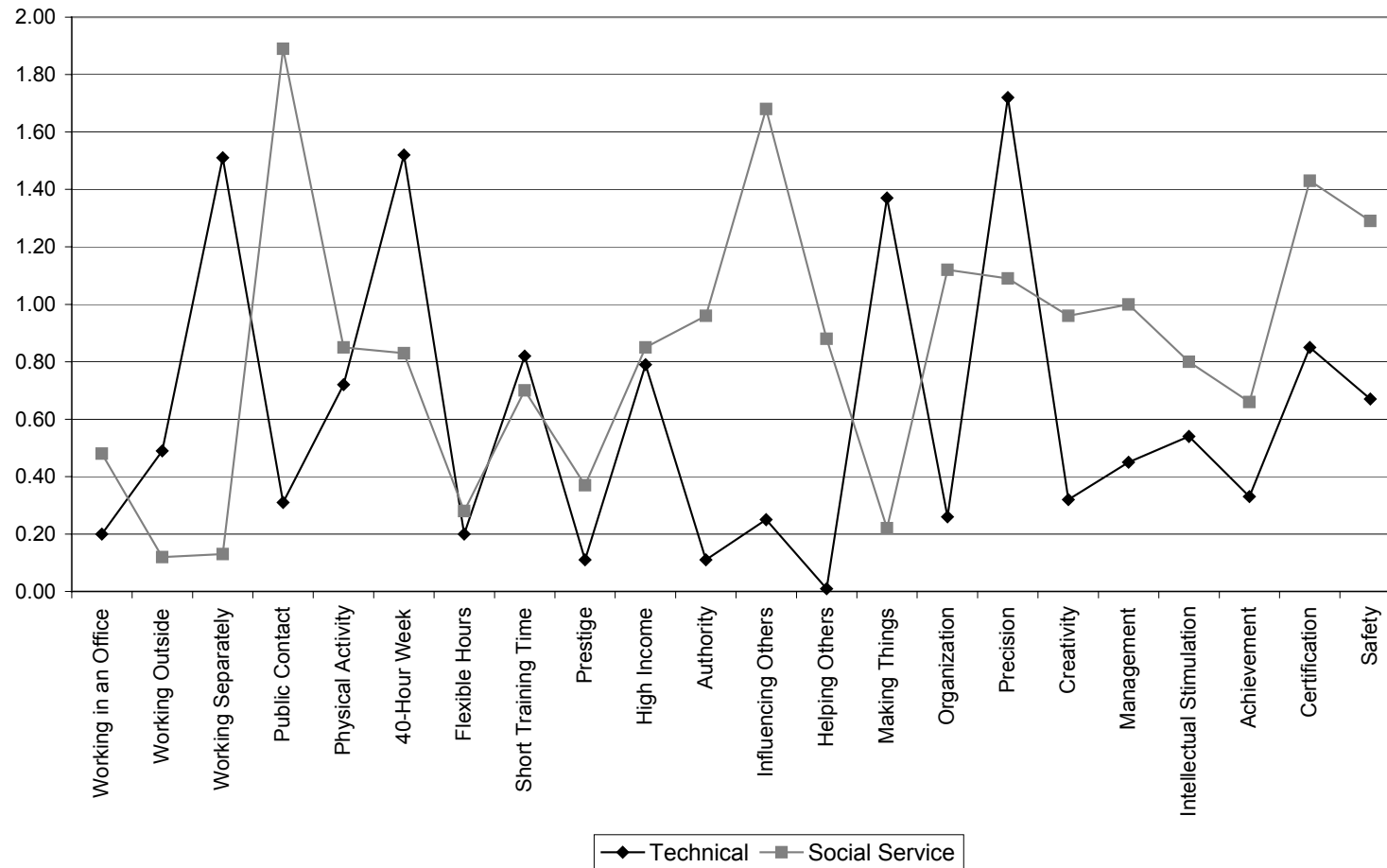




FIGURE 2. Profiles of mean value ratings for Administration & Sales and Science Career Clusters. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

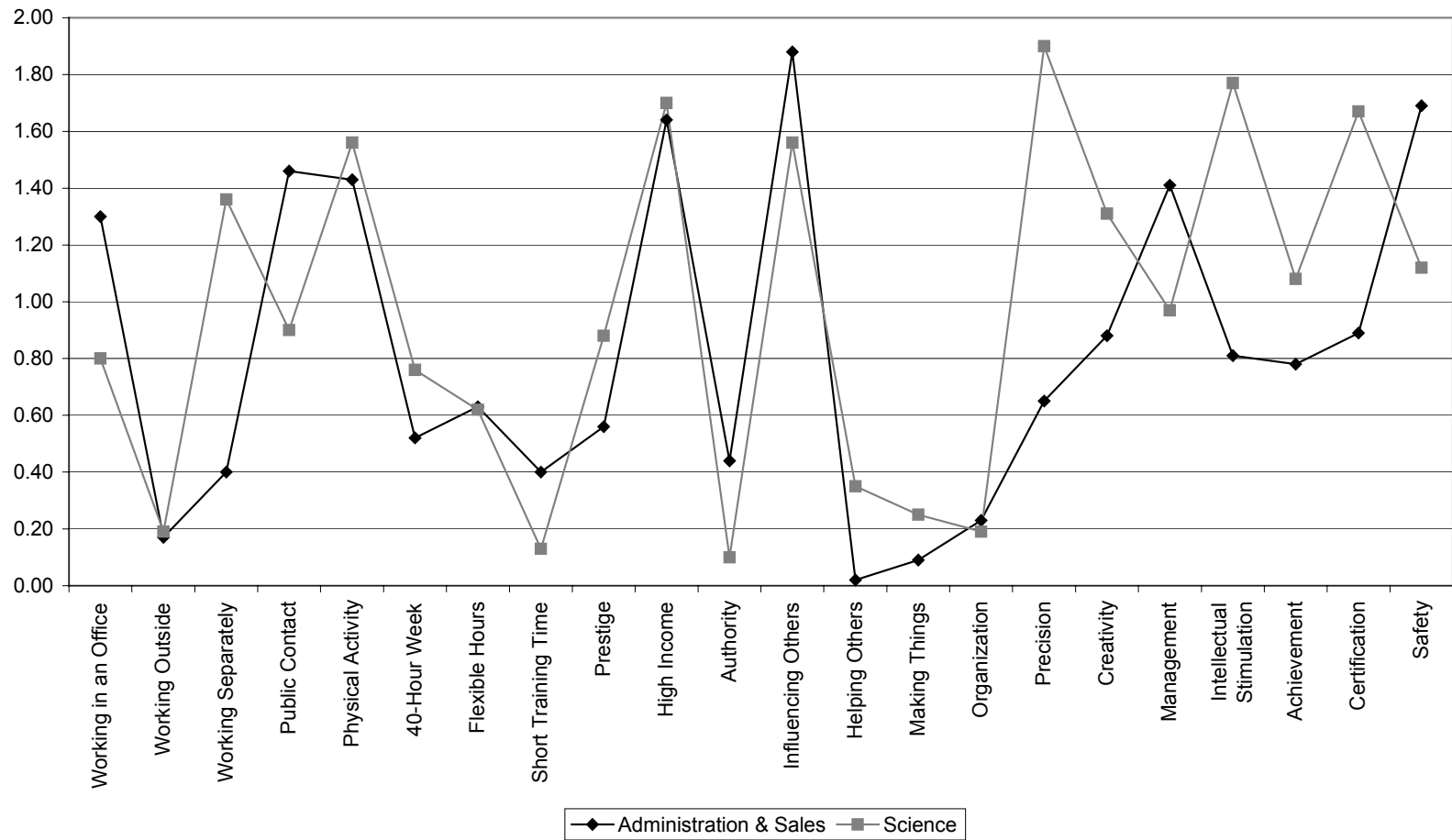


FIGURE 3. Profiles of mean value ratings for Business Operations and Arts Career Clusters. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

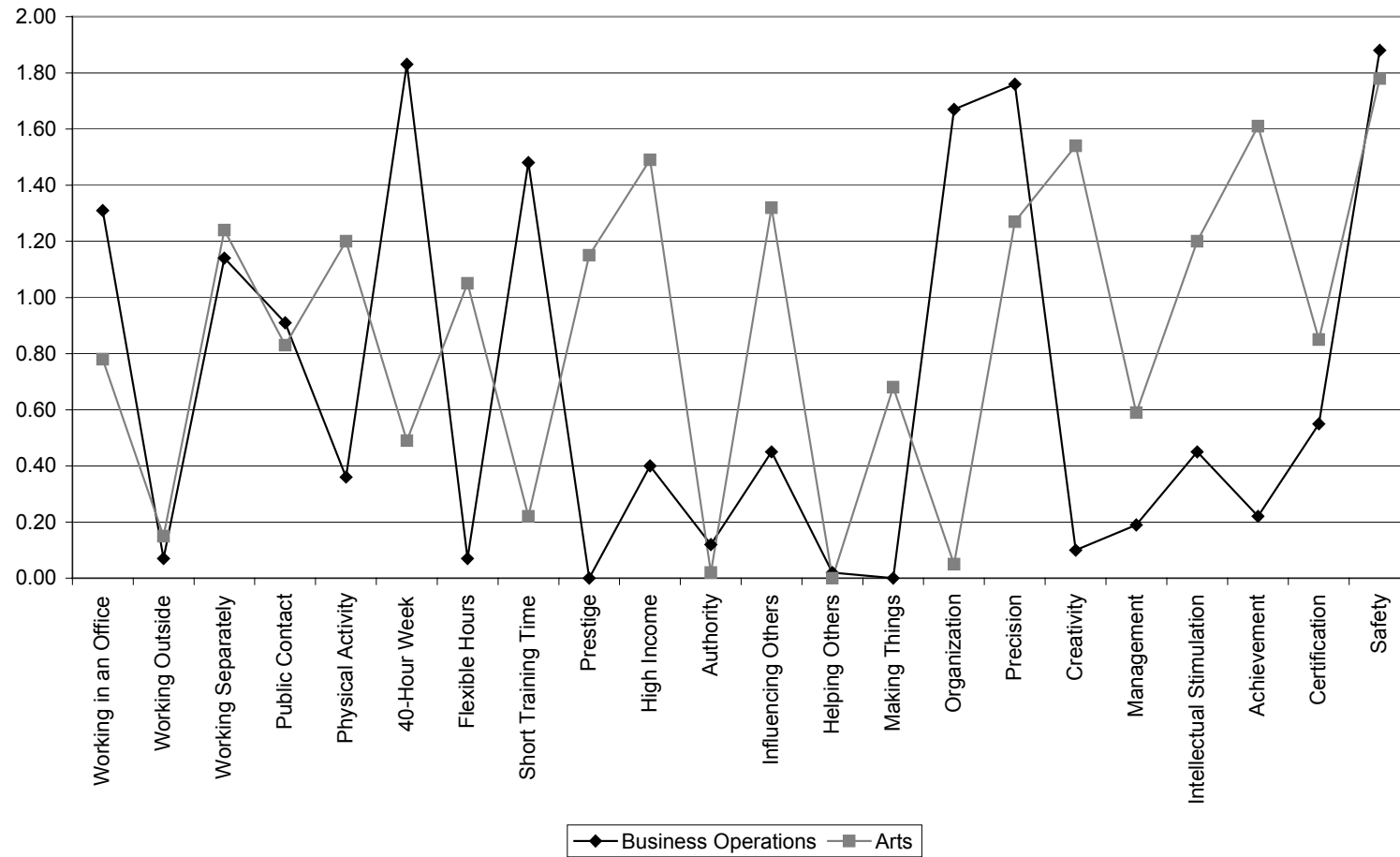


FIGURE 4. Profiles of mean value ratings for career areas in the Administration & Sales Career Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

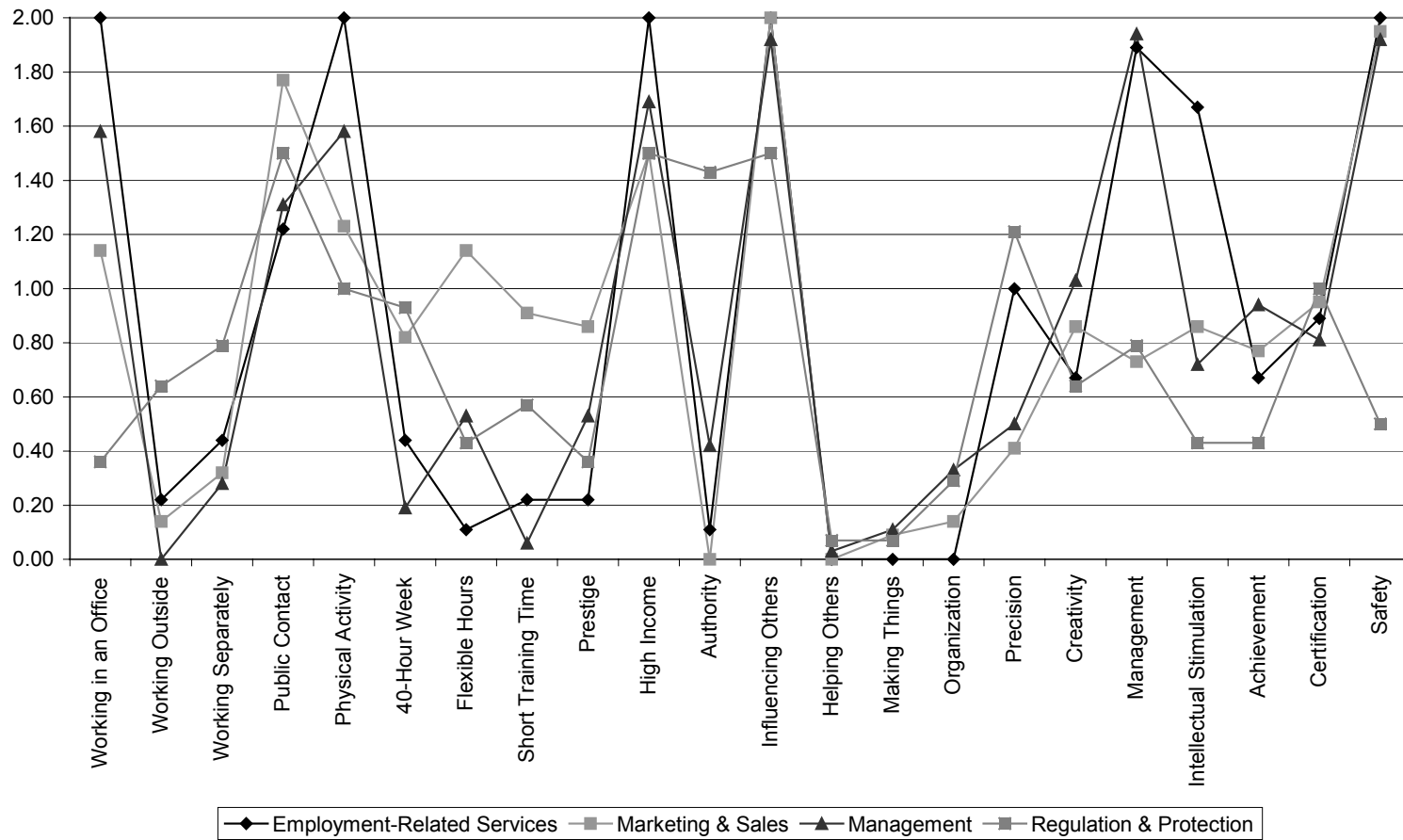


FIGURE 5. Profiles of mean value ratings for career areas in the Business Operations Career Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

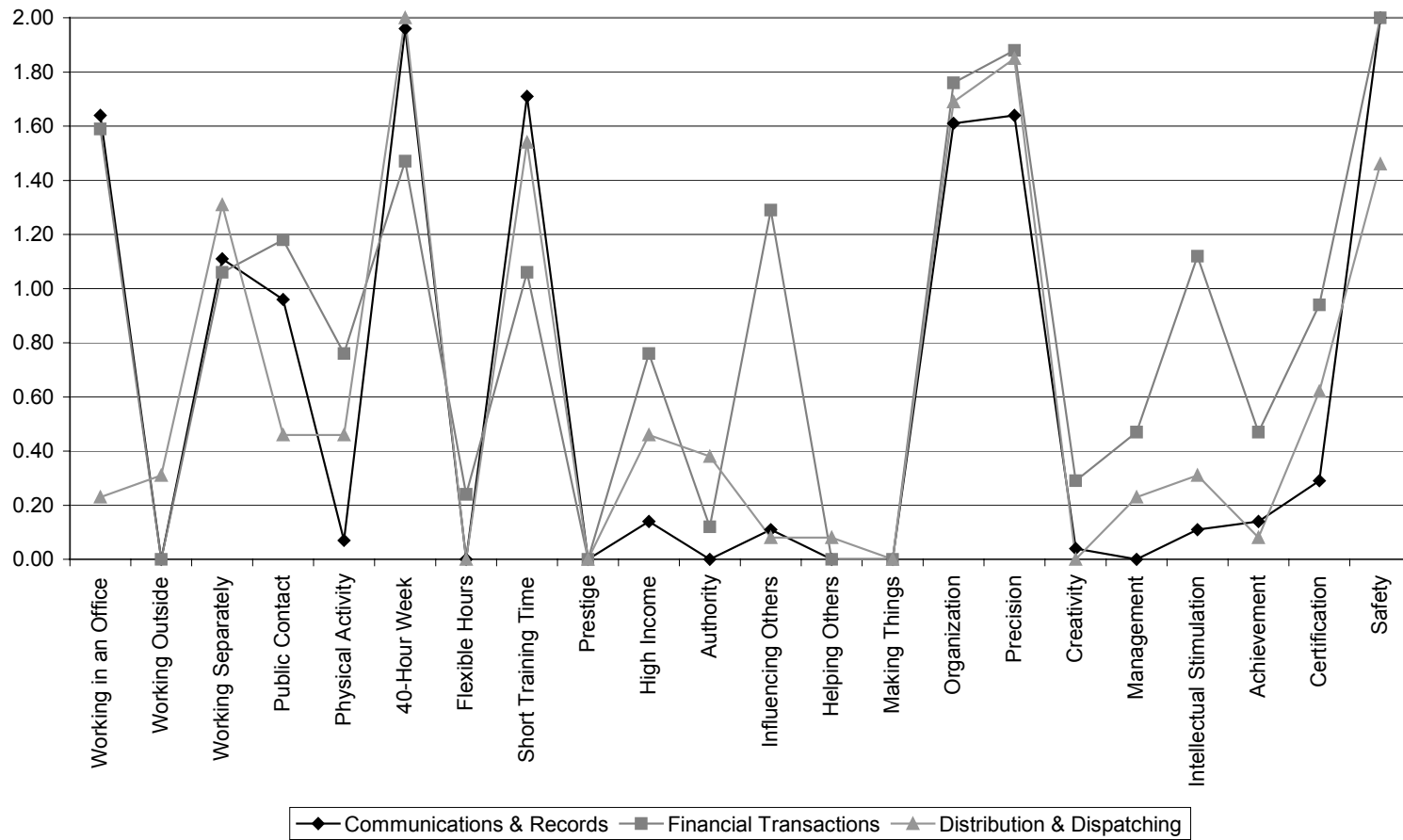


FIGURE 6. Profiles of mean value ratings for career areas in the Technical Career Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

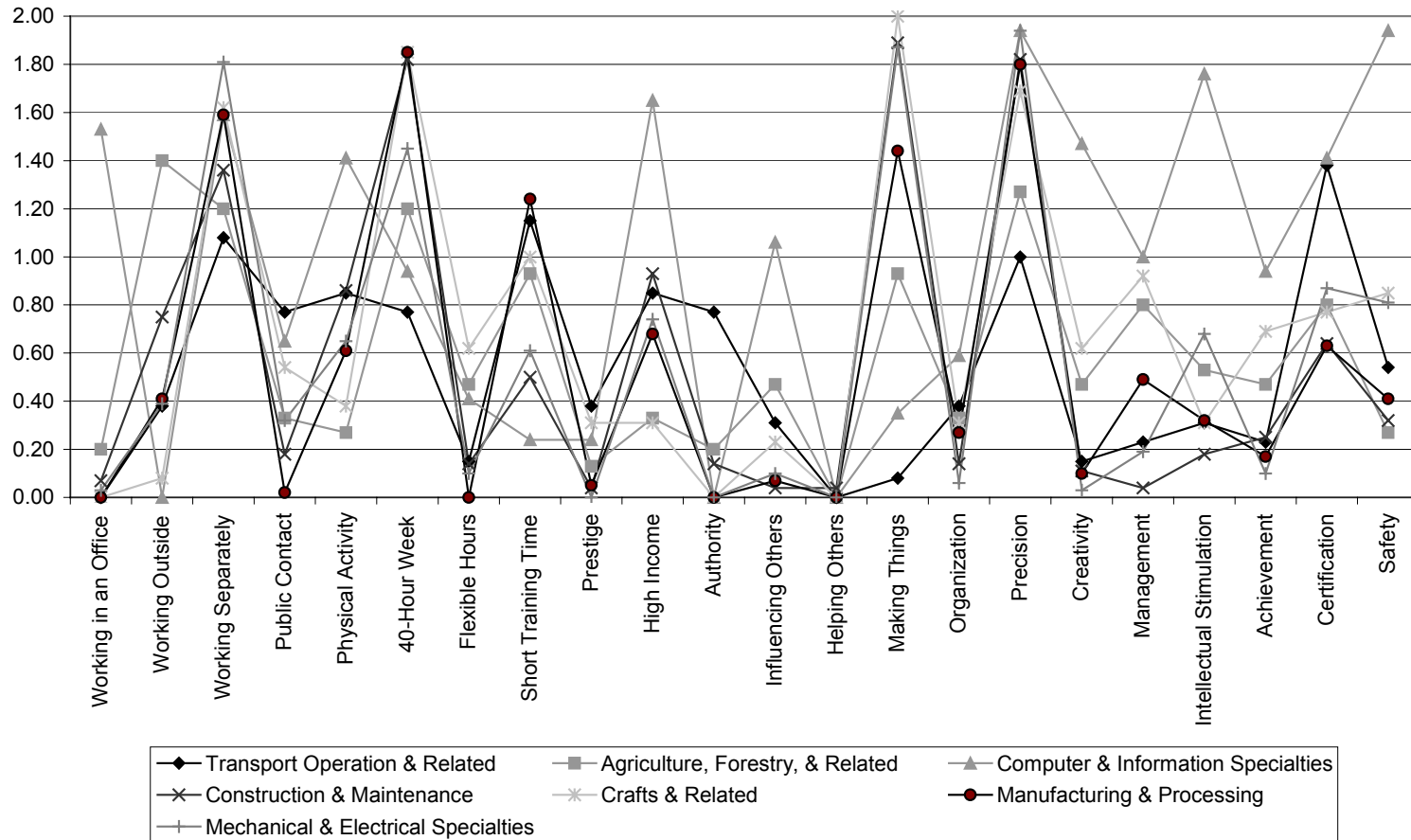


FIGURE 7. Profiles of mean value ratings for career areas in the Science and Technology Career Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

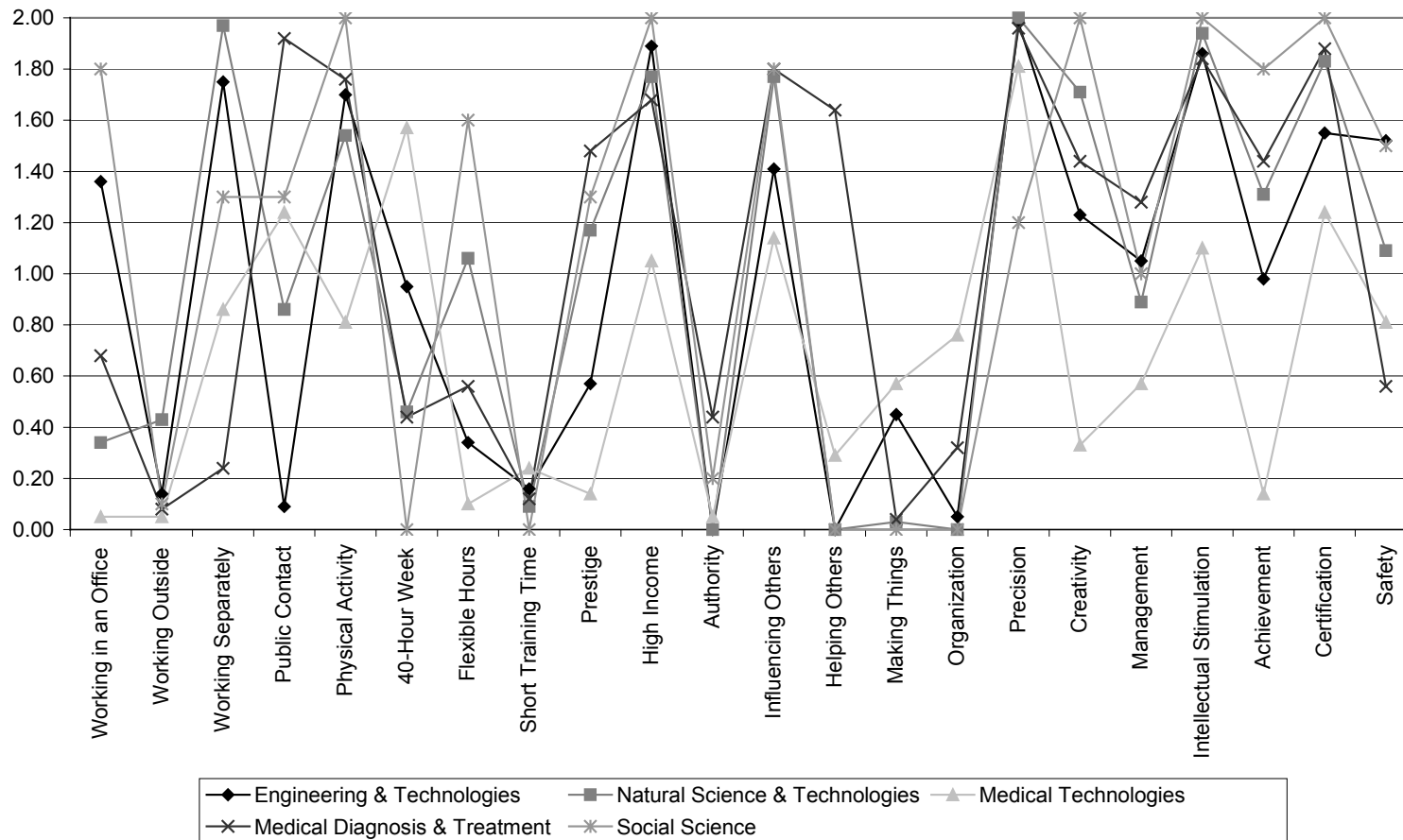


FIGURE 8. Profiles of mean value ratings for career areas in the Arts Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

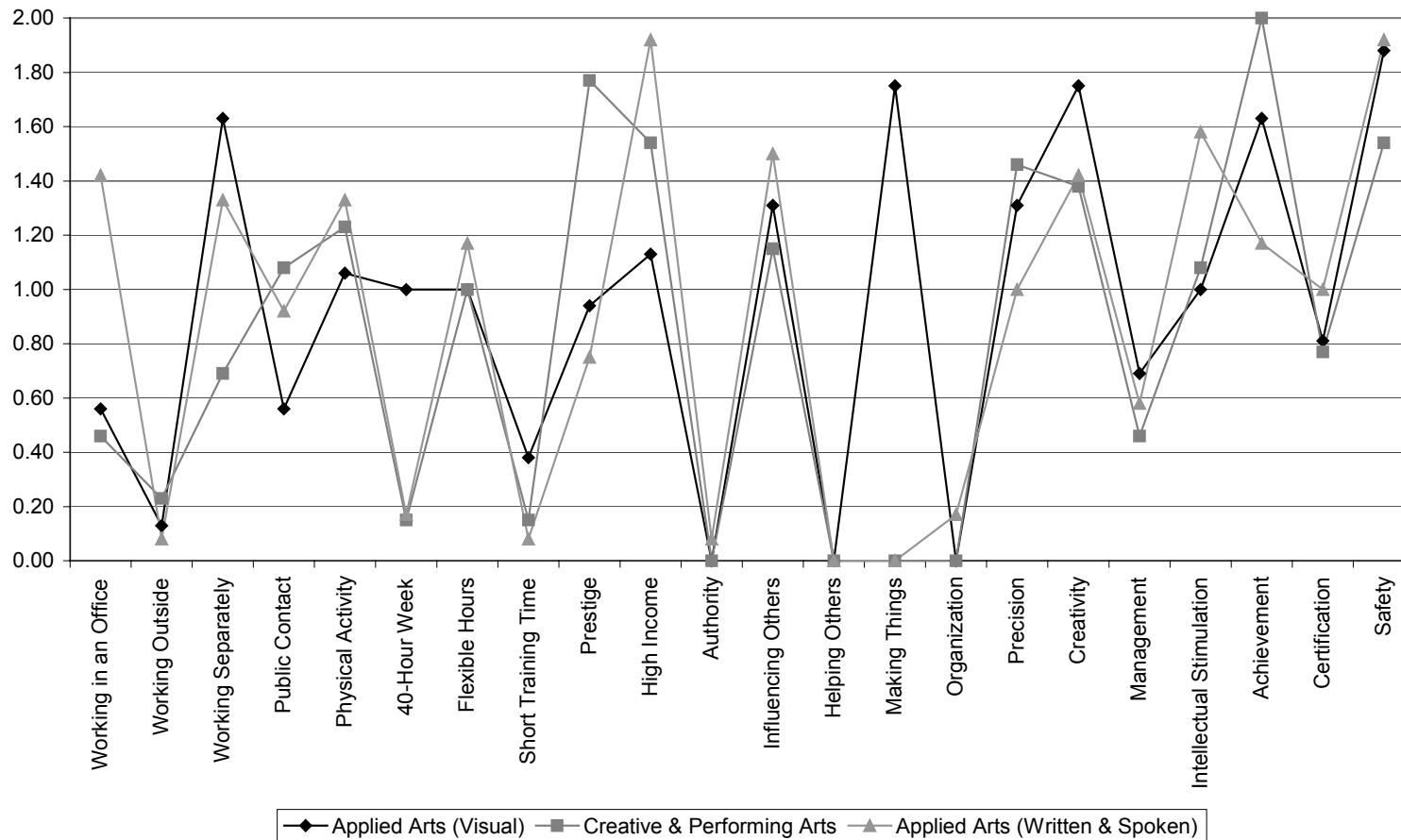


FIGURE 9. Profiles of mean value ratings for career areas in the Social Service Career Cluster. Score scale: 2 = Yes; 1 = Maybe; 0 = No.

