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Using O*NET to Develop a Framework of Job Characteristics to Potentially Improve the Predictive Validity of Personality Measures

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Abstract

It has long been theorized that we can improve prediction of job-related behavior from measures of personality by identifying job characteristics that allow for the expression of individual differences (e.g., Mischel, 1968). For instance, **situational strength** (i.e., external cues regarding the desirability of potential behaviors [Meyer et al., 2010]) has been hypothesized to be one such variable, with behavior in strong situations predicted to be less influenced by personality than behavior in weak situations (e.g., Meyer, Dalal, & Hermida, 2010). Using O*NET data, the current paper develops a framework for job characteristics that could improve the extent to which we can predict behavior from personality. More specifically, it investigates **Work Styles, Generalized Work Activities**, and **Work Context** variables using both judgmental and empirical approaches. The final list of job characteristics includes **public speaking, conflict, lack of constraints, not-in-person communication, working with information**, and **helping others**. Limitations and future directions are discussed.

Introduction

People vary on a number of characteristics that affect their behavior and performance at work. Some of these individual differences include **cognitive ability** (Schmidt & Hunter, 1998), **interests** (Nye, Su, Rounds, & Drasgow, 2012), and **integrity** (Ones, Viswesvaran, & Schmidt, 1993). Another individual difference, **personality**, is well established as the second best predictor of various measures of job performance, behind cognitive ability (see Mattern et al., 2014 for a review). Personality is "the system of enduring, inner characteristics of individuals that contributes to consistency in their thoughts, feelings, and behavior" (Leary, 2005, p. 3). Considerable research has found that personality can be grouped into five broad factors. These "Big Five" factors of personality are: 1) **extraversion** (e.g., tendency to be sociable), 2) **agreeableness** (e.g., tendency to get along with others), 3) **conscientiousness** (e.g., tendency to be organized and hardworking), 4) **emotional stability** (e.g., tendency to be free from anxiety and worry), and 5) **openness to experience** (e.g., tendency to be imaginative and creative). More recently, other research has suggested that a sixth factor, **honesty-humility,** also frequently emerges (Ashton & Lee, 2007).

Personality has been shown to moderately predict several workplace outcomes, including, but not limited to, ratings of job performance, contextual performance ("behaviors that contribute to the psychological, social, and organizational context of work" Motowidlo, 2003, p. 44), and counterproductive work behaviors (behaviors that harm the organization such as deviant behavior, stealing, and laziness; Motowidlo, 2003). The purpose of this paper is to develop an empirically-informed theoretical framework that takes job characteristics more fully into account when using personality measures to predict job performance. This framework could then be used to show that personality prediction of job performance can be improved when considering these job characteristics.

It has long been theorized that behavior is a function of the person and the environment (Lewin, 1935). Clearly it is the case that both persons and environments do predict behavior (see Sherman, Rauthmann, Brown, et al., 2015 for a recent example). Thus, by attempting to predict work outcomes across many types of jobs, while ignoring the impact of varied environments on behavior, we may be forfeiting much of our ability to predict workplace behaviors. For instance, in his often cited 1968 book, Walter Mischel argued, "…personality cannot be studied in a vacuum; instead, the complexity of human behavior and its determinants must be studied from a perspective that accounts for the simultaneous and interactive impact of individual differences and situational characteristics" (Meyer, Dalal, & Hermida, 2010, p. 123). Mischel more specifically argued for this influence of situational strength on the expression of individual differences such as personality.

Situational strength has been defined as, "implicit or explicit cues provided by external entities regarding the desirability of potential behaviors" (Meyer et al., 2010, p. 122). Strong situations have very clear cues about behavioral desirability. For instance, most people know that speaking loudly is not appropriate at a library (a strong situation), and thus even a very extraverted person is likely to remain quiet while visiting one. In contrast, the extent to which loud talking is appropriate at the mall (a weak situation) is less clear. In that situation, it is likely that extraverts will talk more loudly than introverts. Although the notion that situational strength should influence the expression of individual

differences is intuitive, surprisingly little research has been conducted on it. In a recent review of the literature, Meyer et al. (2010) developed a theoretical model of situational strength in work settings that consisted of four facets:

- **Clarity**—"the extent to which cues regarding work-related responsibilities or requirements are available and easy to understand" (p. 125).
- **Consistency**—"the extent to which cues regarding work-related responsibilities or requirements are compatible with each other" (p. 126).
- **Constraints**—"the extent to which an individual's freedom of decision and action is limited by forces outside his or her control" (p. 126).
- **Consequences**—"the extent to which decisions or actions have important positive or negative implications for any relevant person or entity" (p. 127).

One theory that has expanded upon the idea of situational strength is **Trait Activation Theory** (Tett & Burnett, 2003). The theory states that two factors influence whether a personality trait is expressed in a situation. First, situational strength affects the expression of personality traits in ways similar to those described in the paragraph above. Second, a trait will be expressed to the extent that it is relevant to the situation at hand. For example, extraversion is more relevant to team activities than to solo activities, and thus, this trait should predict performance in those situations. Finally, trait-relevant cues can come from three sources: 1) the **organization** (e.g., my organization is very team-oriented), 2) **social** (e.g., the people I work with on a daily basis are very team oriented), and 3) **tasks** (e.g., the project on which I am currently working requires me to work with others). Therefore, the trait that is activated is influenced by the relevance of the situation, and the extent to which the activated trait is expressed is influenced by the strength of the situation.

For example, consistent with Trait Activation Theory, extraversion is more predictive for jobs that require social interaction than for jobs that do not (Barrick & Mount, 1991). Also, level of job autonomy has been shown to moderate the relationship of personality with job performance (Barrick & Mount, 1993). Finally, job complexity moderates the relationship of cognitive ability and job performance, although it is unclear whether this result would hold true for personality variables (e.g., Hunter & Hunter, 1984). Beyond these, "no further trends have been uncovered and no theoretical framework for interpreting these findings has been offered" (James & McIntyre, 2013, p. 917).

Occupational Information Network (O*NET)

One way to develop such a theoretical framework would be to analyze a database that includes information on both characteristics of work situations and the extent to which personality is important for specific jobs. Fortunately, such a database exists in the Occupational Information Network (O*NET; Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999). O*NET is an extensive job analysis of over 900 jobs conducted by the US Department of Labor. O*NET provides job-specific information on the importance and/or level of several worker characteristics (including personality-related variables), worker requirements, experience requirements, occupational requirements, workforce characteristics, and other occupation-specific information. Most of the ratings are made by either job incumbents or by occupational analysts (people who are knowledgeable about job analysis) on 5- (for importance ratings) or 7-point (for level ratings) scales. All O*NET questionnaires can be found at https://www.onetcenter.org/questionnaires.html. O*NET data are available at https://www.onetcenter.org/. A more detailed description of the O*NET data used in the current study is provided in the method section below.

The Current Study

Recall that Trait Activation Theory (Tett & Burnett, 2003) states that situational strength and trait relevance influences the expression of personality in jobs. The use of job-specific information from O*NET should provide information about these two characteristics for each occupation. To develop a framework of job characteristics that can help us learn when personality measures could be more predictive of job behaviors and performance, we examined the current O*NET database (version 19.0) using both empirical and judgmental methods. The goal was to develop a short list of work contexts and/or activities that are the most predictive of the importance ratings for personality among the majority of jobs in the US. This list of contexts and/or activities can then be validated in future studies in which predictive validity coefficients of personality measures are compared as a function of these contexts and activities. That is, jobs can be categorized along contexts and activities, and personality measures should be more predictive of job behavior and performance for those jobs in which the relevant contexts and activities are present.

Method

Database

O*NET database 19.0 (released in July 2014) was used in the current study. Because these data are at the job level (one rating per construct per job), using all ratings from all jobs may lead to misleading results. For example, ratings from a job that employs 560 people nationwide (e.g., private household cooks) will receive the same weight in the analysis as a job that employs well over 4,000,000 people (e.g., retail salespersons). Because the point of the current analysis was to identify job characteristics that would affect the predictive validity of personality measures for jobs that employ the most people, the analysis was restricted to the most frequently held jobs that cumulatively employed 70% of the people in the US. This was done by merging the May 2014 employment data from the Bureau of Labor Statistics (http://www.bls.gov/oes/) into the database and selecting jobs that employed 70% of the US workforce. This eliminated 771 jobs and resulted in a sample of 117 jobs (see Appendix).

Measures

Three sets of O*NET ratings were used in the current analysis. First, Work Styles ratings were used as the measure of personality. O*NET uses the term Work Styles, rather than 'personality,' to emphasize personal characteristics that are occupationally related (Tippins & Hilton, 2010, p. 29). There are 16 Work Styles dimensions. Each is rated on importance by job incumbents on scales from 1 (Not Important) to 5 (Extremely Important). An example item is, "How important is ACHIEVEMENT/EFFORT to the performance of your current job?"

Second, Generalized Work Activities (GWAs) were used as one set of job characteristics. GWAs are "underlying behavioral components of tasks" (Tippins & Hilton, 2010, p. 34). There are 41 GWAs that are rated by job incumbents on an **Importance** scale that is the same as that used for Work Styles. Additionally, job incumbents rate them on **Level,** using a 7-point scale. An example item is, "What level of GETTING INFORMATION is needed to perform your current job?" Respondents are provided with three anchors for each of the Level rating scales. For this example, scale point 2 is labeled with "Follow a standard blueprint," scale point 4 is labeled with "Review a budget," and

scale point 6 is labeled with "Study international tax laws." Scale point 7 is simply labeled "Highest level." The current analysis used the Level items only. Because preliminary analyses indicated that Importance and Level ratings are correlated at .95, results are likely to be similar regardless of which items are used (Peterson et al., 1999).

Third, Work Contexts were used as a second set of job characteristics. They are physical and social factors that influence the nature of work. There are 57 Work Contexts. Job incumbents rate each on 5-point scales that are, for the most part, either frequency or importance scales. One example of frequency scale is, "How often does your current job require face-to-face discussions with individuals and within teams?" Response options are: 1 (Never), 2 (Once a year or more but not every month), 3 (Once a month or more but not every week), 4 (Once a week or more but not every day), and 5 (Every day). An example importance item is, "How important are interactions that require you to work with or contribute to a work group or team to perform your current job?" The 5-point response scale is identical to the scale used for Work Styles.

Analysis Plan

The ultimate goal of the data analysis was to reduce the 114 variables to a manageable number in three steps that maximizes the prediction of personality importance. The first step was to attempt to reduce the number of variables in the analysis by creating summed scales. Because exploratory factor analyses did not produce interpretable solutions for Work Styles and Work Contexts, we used a judgmental approach based on item intercorrelations. For GWAs, exploratory factor analysis did produce an interpretable solution, although expert judgment had to be used on where to place several items.

The second step was to identify the Work Context and GWA scales that were most highly related to the Work Styles scales by correlating them with those scales. Decisions were made about which scales should remain in the analysis and which ones should be dropped.

The third step was to regress the Work Styles scales on the remaining Work Context and GWA scales to examine which scales predict Work Styles while simultaneously controlling for other scales. Once again, decision rules were applied when dropping scales. The remaining variables constituted the final work characteristic framework.

Results

Work Styles Sum Scale Development

An exploratory factor analysis with varimax rotation did not reveal an easily interpretable solution. Thus, a judgmental approach based on item intercorrelations (presented in Table 1) was used to develop sum scales. Four sum scales emerged. The first is labeled **Achievement** and consists of achievement/effort, persistence, initiative, leadership, independence, innovation, and analytical thinking (average inter-item *r* [zero-order correlation coefficient] = .63; α [Cronbach's alpha reliability statistic] = .94). The second is labeled **People Orientation** and consists of cooperation, concern for others, social orientation, and self-control (average inter-item r = .75; α = .91). The third is labeled **Stability** and consists of stress tolerance and adaptability/flexibility (r = .72). Finally, the fourth is labeled **Attention to Detail** and consists of dependability, attention to detail, and integrity (average inter-item r = .55; α = .88). As a comparison, the average inter-item correlation of all Work Styles

scales was .49. Note that in Big Five personality terms, Achievement corresponds to a blend of conscientiousness and extraversion, People Orientation corresponds to agreeableness, Stability corresponds to emotional stability, and Attention to Detail corresponds to conscientiousness.

GWA Sum Scale Development

An exploratory factor analysis with varimax rotation on the GWA items revealed an interpretable four-factor structure. The results of the factor analysis are presented in Table 2. Factors to which GWA descriptors were ultimately placed are outlined. Four factors emerged. Factor 1 was labeled **Working with Information** and consisted of 16 items (α = .98). Factor 2 was labeled **Leading**, **Motivating**, **and Coordinating** and consisted of 14 items (α = .97). Factor 3 was labeled **Manual and Physical Activities** and consisted of 8 items (α = .93). Finally, factor 4 was labeled **Helping Others** and consisted of only 2 items (r = .53).

Work Contexts Sum Scale Development

As with Work Styles, an exploratory factor analysis with varimax rotation did not reveal an easily interpretable solution. A 57x57 correlation matrix would be extremely difficult to interpret, so as a first step to immediately greatly reduce the number of context variables, all variables that asked about the physical requirements of the job (25) were eliminated. Most of the physical requirement items (e.g., "In your current job, how often are you exposed to whole body vibration (like operating a jackhammer or earth moving equipment)?") did not seem as relevant to personality variables as the other items. Also, there was a strong tendency for the physical environment context variables to be negatively correlated with Work Styles. Thus, using these variables may lead to counterproductive messaging, (e.g., "This job involves a lot of exposure to whole body vibrations, and thus it requires less dependability than other jobs"). A correlation table for the remaining 22 variables can be found in Table 3.

Item intercorrelations were again used to develop sum scales. There were several context variables that were not highly correlated with other variables and which seemed to stand on their own (i.e., they could not be easily grouped with other variables). These were thus retained as 1-item scales. These include: the amount of public speaking, the amount of in-person communication, the amount of customer interaction, the importance of being accurate, the level of competition present, the amount of time pressure present, and the level of automation present. A scale was formed called **Not-In-Person Communication** that consisted of the frequency of communication by telephone, electronic mail, and written letters and memos (average inter-item r = .76; α = .88). A scale called **Teamwork** was formed that consisted of the amount of time working with a team, coordinating and leading others, and responsibility for the outcomes and results of others (average inter-item r = .59; α = .79). A scale called **Conflict** was formed that consisted of the frequency of conflict situations, dealing with unpleasant or angry people, and dealing with physically aggressive people (average inter-item r = .70; α = .87). A scale called **Consequences of Work** was formed that consisted of consequences of error and impact of decisions on coworkers or company (r = .65). Finally, a scale called **Lack of Constraints** was formed that consisted of freedom to make decisions and structured versus unstructured work (r = .81). The final list of Work Styles, GWAs, and context variables used in the remainder of the study is provided in Table 4. As a comparison, the average inter-item correlation of all Work Context scales was .33.

Correlations of GWAs and Work Contexts with Work Styles

The next step in the analysis was to correlate the remaining GWA and Work Context scales with the four Work Styles scales to identify the strongest relationships. The GWA and Work Styles correlations can be found in Table 5 and the Work Context and Work Styles correlations can be found in Table 6. They demonstrate that all GWAs are strongly related to Work Styles. Manual and physical activities are negatively related to Work Styles. For identical reasons described above concerning the elimination of physical requirement context items, they were thus excluded from future analyses. Given their strong relationships with Work Styles, the three remaining GWAs were retained.

The GWAs that were retained were more strongly related to Work Styles than all Work Contexts, with the exception of lack of constraints and not-in-person communication, which were the two most strongly related job characteristics overall. Visual inspection of the correlations reveals that there is a distinct cutoff between Work Contexts that correlate at or above .40 (on average) with Work Styles, and those that do not. The closest to that .40 threshold is importance of being accurate or exact (.29) but no other contexts are correlated (on average) with Work Styles at greater than .16. Thus, a decision was made to retain all contexts that reached the .40 threshold. This left public speaking, face-to-face discussion, dealing with external customers, teamwork, conflict, consequences, lack of constraints, and not-in-person communication.

Regression Analyses Predicting Work Styles

We next regressed each of the four Work Styles sum scales on the retained GWA and Work Context sum scales, with the plan of retaining the predictors that remained significant while simultaneously controlling for the others. Results are presented in Table 7. Six variables significantly predicted at least two of the four Work Styles, and these were retained as the final set of job characteristics. The variables are:

- The amount of public speaking needed for a job
- The amount of conflict with others
- The lack of constraints in a job
- The frequency of not-in-person communication present
- The frequency of working with information
- The frequency of helping others

A second set of regressions was conducted with only the final set of job characteristics entered to examine the extent to which the variance explained is reduced by the reduction of variables. As can be seen in comparing Table 7 to Table 8, this reduction was minimal. The reduced set up job characteristics predicted 74% of ratings of achievement importance (down from 76% from the full set of characteristics), 66% of ratings of people orientation importance (down from 71%), 60% of ratings of stability importance (down from 63%), and 62% of attention to detail importance (down from 64%). Thus, a relatively parsimonious six-component model of job characteristics was identified that is potentially highly predictive of Work Styles ratings.

Example Job Profiles

To provide a few illustrative examples of how jobs range on these six characteristics, job profiles can be found in Figures 1–6. To create these profiles, scores were first standardized on each characteristic (characteristics were not on the same scale because scales consisted of different numbers of items). Six profiles were created by making line graphs in Excel. Each profile displays one job that is very high, and one that is very low, on each of the six job characteristics. For public speaking, profiles of secondary school teachers and dental assistants are presented. For conflict, sheriffs and computer systems analysts are presented. For lack of constraints, neurologists and postal service mail carriers are presented. For not-in-person communication, lawyers and construction laborers are presented. For working with information, automotive engineers and cashiers are presented. Finally, for helping others, critical care nurses and investment fund managers are presented.

The profiles, along with the regression analyses previously described, serve to suggest the personality constructs that may be most predictive of performance on these specific jobs. For example, Figure 1 shows that secondary school teachers tend to be high in public speaking and conflict. Thus, assessments of achievement, people orientation, and stability should be predictive of job performance for secondary school teachers (and for other jobs with like profiles). Similar predictions could be made using other profiles. For example, Figure 6 shows that critical care nurse jobs are high in helping others and conflict. Thus, people orientation, stability, and attention to detail should predict critical care nurse performance. Interestingly, Figure 4 shows that construction laborers tend to be relatively low on all dimensions, suggesting that personality may not be very predictive of performance in these jobs.

As a final illustrative example, the top 10 jobs for each of the six job characteristics are listed in Table 9.

Discussion

In the current paper, both rational and empirical approaches were used to reduce the O*NET GWA and Work Context variables into a manageable set of job characteristics that could help workforce researchers determine when, and which, personality dimensions will be most predictive of job performance. The final list of characteristics included public speaking, conflict, lack of constraints, not-in-person communication, working with information, and helping others. This set of characteristics accounted for an impressive amount of variance in job incumbents' ratings of the importance of several personality dimensions to performance on the job, with R^2 ranging from .60 to .74. In theory, jobs can be classified on these dimensions in an effort to improve our ability to predict performance within them.

Note that these characteristics are, for the most part, highly consistent with the two components of Trait Activation Theory (Tett & Burnett, 2003). Recall that the theory says that the expression of personality is influenced by both situational strength and a trait's relevance to the situation at hand. The final framework consists of one of Meyer et al.'s (2010) facets of situational strength (constraints) and several characteristics that speak to the relevance of traits. For example, people

orientation is relevant to the helping others characteristic and, accordingly, helping others strongly predicts people orientation ratings. Furthermore, stability is relevant to conflict situations, and thus stability ratings are predicted by the conflict job characteristic. Lastly, attention to detail should be relevant to not-in-person communication and, indeed, attention to detail ratings are predicted by the not-in-person communication job characteristic.

Limitations

This study has several limitations and three of them will be delineated below. One limitation is that to quickly reduce the number of Work Context variables included in the analysis, all contexts pertaining to the physical conditions of the work environment were eliminated. This was done because physical conditions did not seem as pertinent to personality as the other contexts, and because ratings of physical conditions tend to be negatively related to Work Styles ratings. However, despite the correlational analysis in this paper, it is possible that physical conditions could in reality be positively related to personality. For instance, it might take a good degree of conscientiousness and emotional stability to work effectively outside in extreme heat.

Another limitation concerns the self-report nature of the O*NET data. That is, job incumbents rated their impression of the importance and level of each of these variables. It is well known that self-reported skill ratings are subject to several judgmental biases (Dunning, Heath, & Suls, 2004) and there is no reason to believe that O*NET ratings are not also subject to these biases. For example, for several reasons, people tend to overestimate the extent to which they possess desirable qualities. Because many of these ratings can be interpreted as desirable to possess (e.g., "I am achievement oriented;" "My job is very competitive"), they may be inflated as a function of this desirability. Indeed, a brief look at the mean ratings for the 16 Work Styles shows that mean ratings range from 3.48 to 4.38, well above the scale midpoint of 3.00. Furthermore, none of the Work Styles was rated "not important" for any of the jobs in the analysis, with the lowest rating equaling 1.85.

A third limitation of the study is that incumbent-reported importance ratings may not always be related to predictive validity. These ratings may instead simply be reflections of incumbents' impressions of the people they see on the job every day. One problem with this is that incumbents are seeing the personality characteristics of people who are hired, not those who were not hired. It is possible that the people who tend to apply for their current job all have very similar personality characteristics and that they tend to be selected based on other factors (e.g., skills, experience). As such, personality variables may not be predictive for those jobs.

Future Research

There is much room for future research in this area. For instance, future research can focus on including the physical environment variables in the analysis. Although it is unlikely that a similar analysis would retain these variables, a more complex analysis might include others. Furthermore, future research could include more jobs in the analysis. The current analysis was restricted to the top 70% of jobs, but results could change if the top 80% or 90% were retained. A third important area of future research will be to apply this, or a similar, methodology to the O*NET knowledge, skills, and abilities ratings. These variables have the potential to be just as, if not more, predictive of job performance as personality, especially if matched with specific job characteristics. A fourth topic for future research might be to apply this methodology to predicting performance in college majors. For example, Table 9 shows that several teaching jobs are high on public speaking. Thus, personality styles assessments that are related to public speaking may also predict school performance in teaching majors.

Finally, after jobs are grouped, it will be of critical importance to examine whether these six job characteristics do indeed help us to better predict job performance with personality assessments. Ideally, during a large-scale data collection effort, one should be able to categorize jobs along these characteristics and then surmise which personality scales should be predictive for specific jobs. This categorization could be done with a separate judgmental approach or possibly by looking at the O*NET database and matching jobs in the database to jobs in the study.

Conclusion

The fields of personality and industrial-organizational psychology have long searched for a way to maximize the prediction of behavior with personality assessments. One idea for doing so that is often discussed is to locate the characteristics of situations or jobs, within which behavior is highly influenced by personality. The current study utilized one method for identifying such characteristics. It is hoped that future research will be conducted to examine and improve upon the validity of the current framework. ■

Tables and Figures

Table 1. Work Styles Item Intercorrelations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(1) Achievement Effort[a]	1															
(2) Persistence[a]	.865*	1														
(3) Initiative[a]	.815*	.867*	1													
(4) Leadership[a]	.703*	.774*	.819*	1												
(5) Cooperation[b]	.477*	.481*	.546*	.540*	1											
(6) Concern for Others[b]	.351*	.383*	.411*	.492*	.751*	1										
(7) Social Orientation[b]	.287*	.300*	.335*	.451*	.746*	.843*	1									
(8) Self Control[b]	.410*	.466*	.468*	.521*	.719*	.790*	.764*	1								
(9) Stress Tolerance[c]	.606*	.627*	.630*	.622*	.693*	.690*	.679*	.856*	1							
(10) Adaptability/Flexibility[c]	.637*	.680*	.743*	.689*	.724*	.652*	.570*	.699*	.763*	1						
(11) Dependability[d]	.586*	.632*	.684*	.621*	.708*	.672*	.557*	.721*	.762*	.824*	1					
(12) Attention to Detail[d]	.634*	.622*	.652*	.482*	.487*	.383*	.258*	.390*	.534*	.630*	.717*	1				
(13) Integrity[d]	.675*	.679*	.713*	.621*	.668*	.563*	.493*	.687*	.740*	.751*	.814*	.686*	1			
(14) Independence[a]	.584*	.597*	.664*	.586*	.517*	.557*	.445*	.534*	.549*	.632*	.679*	.622*	.676*	1		
(15) Innovation[a]	.548*	.623*	.720*	.688*	.454*	.394*	.285*	.355*	.403*	.639*	.558*	.497*	.511*	.656*	1	
(16) Analytical Thinking[a]	.795*	.833*	.811*	.712*	.397*	.257*	.127	.320*	.526*	.646*	.615*	.722*	.668*	.599*	.700*	1

Note: *$p < .01$; a = assigned to Achievement sum scale, b = assigned to People Orientation sum scale, c = assigned to Stability sum scale, d = assigned to Attention to Detail sum scale.

Table 2. GWA Factor Loadings

	Factor			
GWA Characteristic	1	2	3	4
Processing Information	.882	.310	-.151	-.020
Updating and Using Relevant Knowledge	.856	.384	-.010	.039
Analyzing Data or Information	.841	.432	-.156	-.063
Documenting/Recording Information	.841	.304	-.040	.243
Interpreting the Meaning of Information for Others	.814	.434	-.099	.056
Making Decisions and Solving Problems	.798	.451	-.051	.135
Getting Information	.793	.428	-.231	.119
Evaluating Information to Determine Compliance with Standards	.783	.349	-.050	.167
Identifying Objects, Actions, and Events	.781	.249	.016	.352
Monitor Processes, Materials, or Surroundings	.739	.212	.348	.399
Interacting with Computers	.689	.294	-.258	-.250
Thinking Creatively	.667	.522	.011	-.145
Communicating with Supervisors, Peers, or Subordinates	.662	.587	-.120	.087
Estimating the Quantifiable Characteristics of Products, Events, or Information	.655	.395	.403	-.026
Organizing, Planning, and Prioritizing Work	.637	.601	-.152	-.044
Judging the Qualities of Things, Services, or People	.633	.526	.142	.228

	Factor			
GWA Characteristic	1	2	3	4
Providing Consultation and Advice to Others	.631	.665	-.064	.020
Developing Objectives and Strategies	.628	.666	-.056	-.011
Performing Administrative Activities	.565	.530	-.288	.165
Scheduling Work and Activities	.548	.714	.022	-.028
Communicating with Persons Outside the Organization	.519	.563	-.357	.132
Establishing and Maintaining Interpersonal Relationships	.480	.588	-.310	.263
Training and Teaching Others	.462	.661	.111	.264
Developing and Building Teams	.399	.821	.074	.076
Coaching and Developing Others	.365	.799	-.012	.196
Monitoring and Controlling Resources	.349	.770	.130	-.026
Guiding, Directing, and Motivating Subordinates	.345	.858	.110	.111
Resolving Conflicts and Negotiating with Others	.335	.722	-.219	.296
Staffing Organizational Units	.325	.819	-.002	.148
Coordinating the Work and Activities of Others	.317	.834	.115	.031
Assisting and Caring for Others	.301	.116	.109	.827
Inspecting Equipment, Structures, or Materials	.266	.039	.829	.201
Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment	.193	.274	.739	-.353
Selling or Influencing Others	.156	.669	-.256	-.044
Repairing and Maintaining Electronic Equipment	.054	.049	.788	-.248
Performing for, or Working Directly with, the Public	.021	.252	-.178	.743
Controlling Machines and Processes	-.029	-.118	.890	.021
Repairing and Maintaining Mechanical Equipment	-.133	-.034	.915	-.165
Operating Vehicles, Mechanized Devices, or Equipment	-.149	-.042	.809	-.008
Performing General Physical Activities	-.329	-.089	.824	.272
Handling and Moving Objects	-.381	-.192	.797	.222

Note: These loadings are based on varimax rotation. Factor to which descriptors were placed are shaded in blue. F1 = Working with Information; F2 = Leading, Motivating, and Coordinating; F3 = Manual and Physical Activities; F4 = Helping Others.

Table 3. Work Context Item Intercorrelations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
(1) Public Speaking	1																					
(2) Telephone	.241	1																				
(3) Electronic Mail	.426	.768	1																			
(4) Letters and Memos	.371	.743	.779	1																		
(5) Face-to-Face Discussions	.345	.503	.456	.464	1																	
(6) Contact with Others	.248	.490	.288	.436	.391	1																
(7) Work with Work Group or Team	.321	.373	.304	.358	.466	.524	1															
(8) Deal with External Customers	.311	.608	.387	.531	.309	.683	.423	1														
(9) Coordinate or Lead Others	.464	.401	.437	.454	.482	.351	.716	.399	1													
(10) Responsibility for Outcomes and Results	.239	.286	.255	.255	.410	.123	.454	.151	.603	1												
(11) Frequency of Conflict Situations	.459	.415	.326	.497	.428	.513	.340	.537	.453	.270	1											
(12) Deal with Unpleasant or Angry People	.133	.264	.020	.251	.191	.568	.284	.573	.220	.089	.733	1										
(13) Deal with Physically Aggressive People	.269	.116	-.032	.169	.150	.315	.268	.352	.267	.095	.645	.727	1									
(14) Consequence of Error	.059	.304	.208	.279	.329	.042	.204	.177	.320	.430	.265	.151	.304	1								
(15) Impact of Decisions on Co-Workers or Company Results	.333	.579	.494	.576	.453	.349	.364	.502	.474	.518	.514	.254	.255	.649	1							
(16) Frequency of Decision Making	.269	.507	.391	.509	.475	.404	.298	.509	.344	.410	.543	.347	.254	.552	.889	1						
(17) Freedom to Make Decisions	.383	.539	.498	.548	.487	.315	.307	.394	.426	.446	.386	.066	.103	.438	.747	.676	1					
(18) Degree of Automation	-.177	.238	.294	.271	.015	-.044	-.054	.071	-.084	.002	-.015	.027	-.196	.021	.036	.066	-.086	1				
(19) Importance of Being Exact or Accurate	-.121	.442	.389	.382	.298	.270	.213	.256	.184	.307	.150	.159	.033	.503	.526	.505	.352	.362	1			
(20) Structured versus Unstructured Work	.340	.668	.646	.655	.489	.347	.358	.411	.448	.382	.312	.026	-.010	.324	.648	.586	.812	.007	.371	1		
(21) Level of Competition	.182	.474	.482	.339	.270	.026	.096	.273	.254	.382	.127	-.086	-.211	.376	.560	.470	.464	.311	.466	.451	1	
(22) Time Pressure	-.096	.179	.301	.240	.181	.001	-.068	.009	-.024	.202	.146	.052	-.065	.343	.361	.412	.173	.269	.507	.166	.371	1

Note: All correlations with an absolute value above .166 are significant ($p < .05$).

Table 4. Work Styles, GWAs, and Context Scales Investigated in the Study

Work Styles	GWAs	Contexts
Achievement	Working with Information	Amount of Public Speaking
People Orientation	Leading, Motivating, and Coordinating	Amount of In-Person Communication
Stability	Manual and Physical Activities	Amount of Customer Interaction
Attention to Detail	Helping Others	Importance of Being Accurate
		Level of Competition Present
		Amount of Time Pressure Present
		Level of Automation Present
		Not-In-Person Communication
		Teamwork
		Conflict
		Consequences of Work
		Lack of Constraints

Table 5. GWA Correlations with Work Styles

		Work Styles				
		Achievement	People Orientation	Stability	Attention to Detail	Average
GWAs	Working with Information	0.761	0.266	0.542	0.659	0.557
	Leading, Motivating, Coordinating	0.717	0.29	0.508	0.582	0.524
	Manual and Physical Activities	-0.288	-0.302	-0.366	-0.34	-0.324
	Helping Others	0.321	0.756	0.534	0.452	0.516

Note: All correlations significant ($p < .05$).

Table 6. Work Context Correlations with Work Styles

		Work Styles				
		Achievement	People Orientation	Stability	Attention to Detail	Average
Work Contexts	Public Speaking	.497	.342	.430	.323	.398
	Face-to-Face Discussions	.526	.398	.499	.509	.483
	Deal with External Customers	.330	.567	.500	.435	.458
	Importance of Being Exact or Accurate	.336	.114	.284	.427	.290
	Level of Competition	.429	-.154	.125	.237	.159
	Time Pressure	.234	-.081	.127	.269	.137
	Degree of Automation	-.053	-.191	-.030	.009	-.066
	Teamwork	.514	.375	.434	.364	.422
	Conflict	.218	.593	.526	.297	.409
	Consequences	.500	.296	.465	.476	.435
	Lack of Constraints	.730	.369	.539	.615	.563
	Not-In-Person Communication	.724	.368	.615	.710	.604

Note: All correlations with an absolute value above .127 are significant ($p < .05$).

Table 7. Regression Predicting Work Styles with Job Characteristics

	Work Style											
	Achievement			People Orientation			Stability			Attention to Detail		
Job Characteristic	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β
Public Speaking	.632	.241	.140**	.420	.144	.170**	.171	.080	.143*	.018	.098	.012
Face-to-Face Discussions	.276	.543	.026	.603	.323	.106	.260	.180	.094	.416	.220	.120
Deal with External Customers	-.606	.266	-.153*	-.270	.158	-.125	-.096	.088	-.091	-.136	.108	-.103
Conflict	.167	.110	.088	.160	.065	.155**	.145	.036	.287**	.040	.045	.063
Teamwork	.190	.124	.083	.125	.074	.100	.011	.041	.018	-.065	.050	-.086
Consequences	-.256	.156	-.100	-.330	.093	-.235**	-.041	.052	-.060	-.043	.063	-.050
Lack of Constraints	1.318	.223	.384**	.209	.133	.111	.137	.074	.150	.223	.090	.195*
Not-In-Person Communication	.208	.082	.203**	.160	.049	.285**	.088	.027	.325**	.147	.033	.431**
Working with Information	.105	.021	.469**	.005	.012	.041	.018	.007	.306***	.026	.008	.349**
Leading, Motivating, Coordinating	-.026	.020	-.121	-.043	.012	-.368**	-.016*	.006	-.290	-.014	.008	-.203
Helping Others	.058	.088	.044	.546	.053	.759**	.087	.029	.250**	.118	.036	.268**
R^2		.757			.713			.626			.643	

Note: *$p < .05$; **$p < .01$.

Table 8. Regression Predicting Work Styles with Final Set of Job Characteristics

	Work Style											
	Achievement			People Orientation			Stability			Attention to Detail		
Job Characteristic	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β	*B*	SE *B*	β
Public Speaking	.594	.215	.132**	.337	.136	.136*	.100	.071	.084	-.062	.087	-.041
Conflict	.134	.105	.071	.133	.066	.128*	.148	.035	.294**	.034	.043	.054
Lack of Constraints	1.239	.200	.361**	.066	.126	.035	.122	.066	.134	.190	.081	.166**
Not-In-Person Communication	.126	.070	.123	.132	.044	.236**	.072	.023	.265**	.129	.028	.379**
Working with Information	.096	.014	.426**	-.026	.009	-.213**	.009	.005	.152	.018	.006	.240**
Helping Others	-.071	.074	-.054	.466	.046	.647**	.060	.024	.171*	.082	.030	.186**
R^2		.740			.655			.600			.616	

Note: *$p < .05$; **$p < .01$.

Table 9. Top 10 Ranked Jobs for Each job Characteristic

	Job Characteristic				
Public Speaking	Conflict	Lack of Constraints	Not-In-Person Communication	Working with Information	Helping Others
Career/Technical Education Teachers, Middle School	Correctional Officers and Jailers	Hairdressers, Hairstylists, and Cosmetologists	Claims Examiners, Property and Casualty Insurance	Neurologists	Sports Medicine Physicians
Secondary School Teachers, Except Special and Career/ Technical Education	Police Patrol Officers	Neurologists	Insurance Sales Agents	Ophthalmologists	Acute Care Nurses
Career/Technical Education Teachers, Secondary School	Sheriffs and Deputy Sheriffs	Physical Medicine and Rehabilitation Physicians	Lawyers	Pathologists	Radiologists
Middle School Teachers, Except Special and Career/ Technical Education	Loss Prevention Managers	Sports Medicine Physicians	Human Resources Specialists	Clinical Nurse Specialists	Ophthalmologists
Elementary School Teachers, Except Special Education	Child, Family, and School Social Workers	Urologists	Paralegals and Legal Assistants	Sports Medicine Physicians	Allergists and Immunologists
Special Education Teachers, Middle School	Advanced Practice Psychiatric Nurses	General and Operations Managers	Ophthalmologists	Allergists and Immunologists	Hospitalists
Kindergarten Teachers, Except Special Education	Critical Care Nurses	Dermatologists	Medical and Health Services Managers	Automotive Engineers	Critical Care Nurses
Loss Prevention Managers	Special Education Teachers, Secondary School	Pathologists	Customs Brokers	Radiologists	Advanced Practice Psychiatric Nurses
Forest Firefighters	Social and Human Service Assistants	Allergists and Immunologists	Regulatory Affairs Managers	Computer and Information Systems Managers	Urologists
Special Education Teachers, Secondary School	Acute Care Nurses	Ophthalmologists	Administrative Services Managers	Physical Medicine and Rehabilitation Physicians	Municipal Firefighters

Note: Jobs are ranked in order such that the jobs at the top of the table are rated higher on the characteristics than the jobs listed below them.

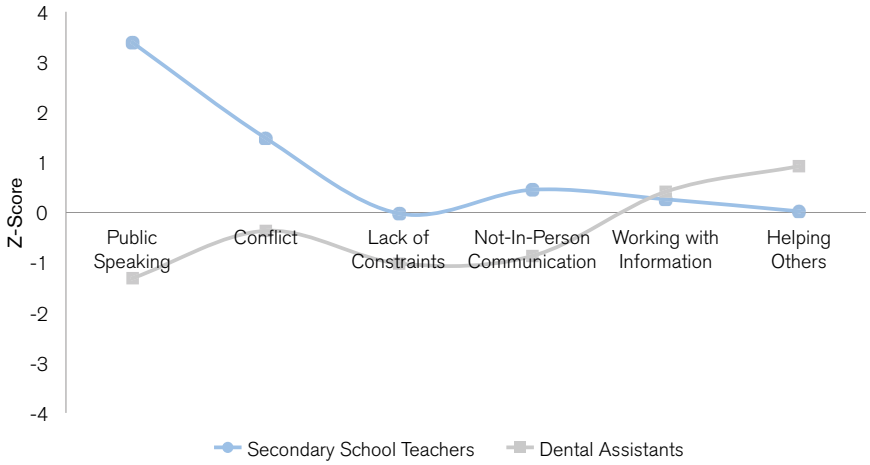

Figure 1. Two example job profiles for high/low public speaking

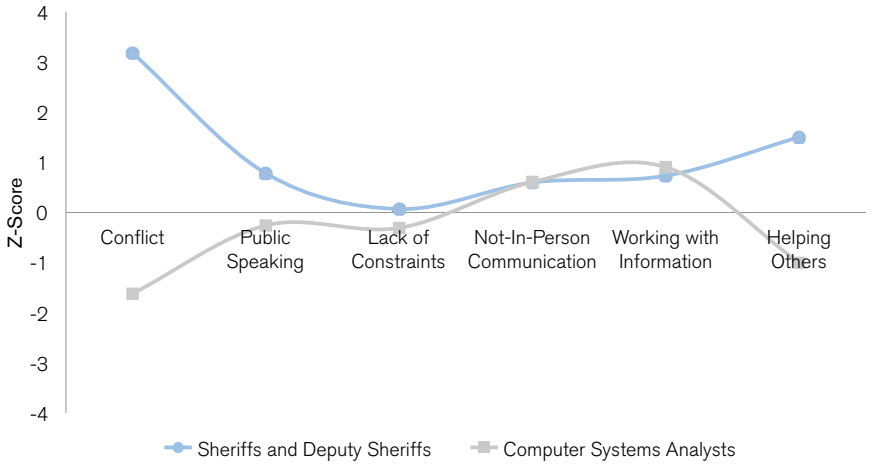

Figure 2. Two example job profiles for high/low conflict

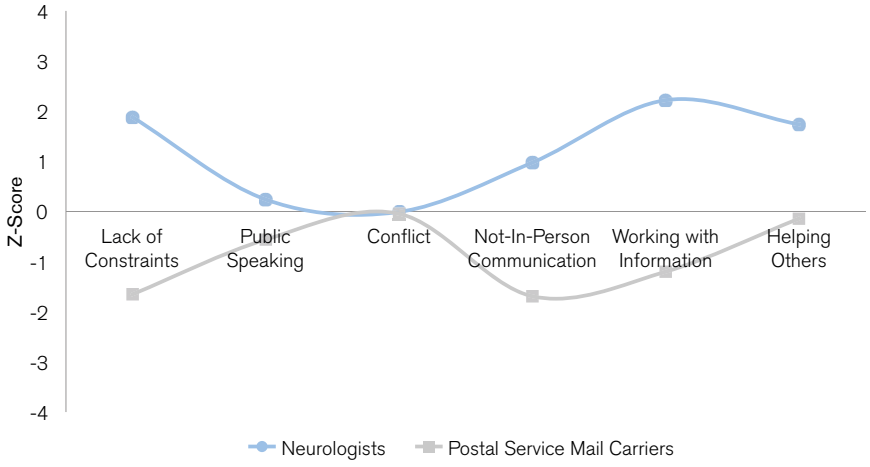

Figure 3. Two example job profiles for high/low lack of constraints

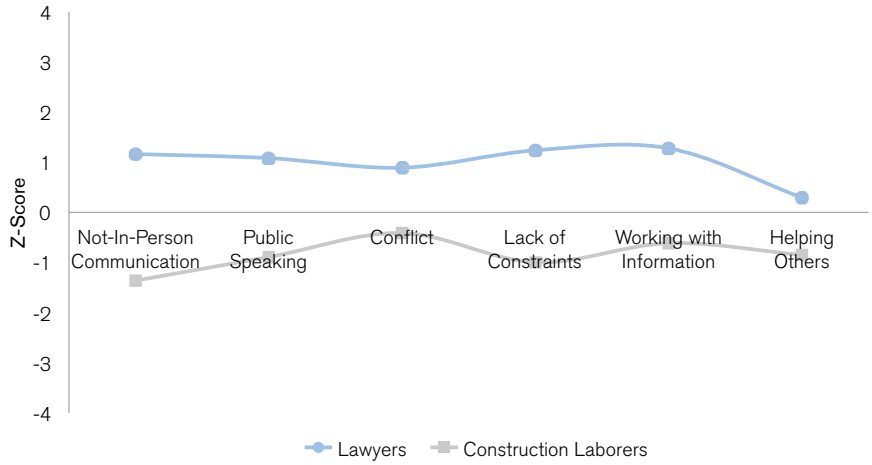

Figure 4. Two example job profiles for high/low not-in-person communication

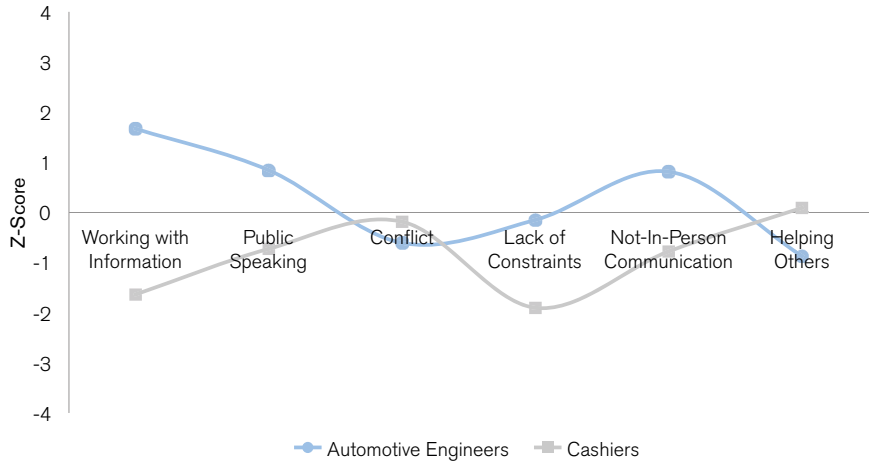

Figure 5. Two example job profiles for high/low working with information

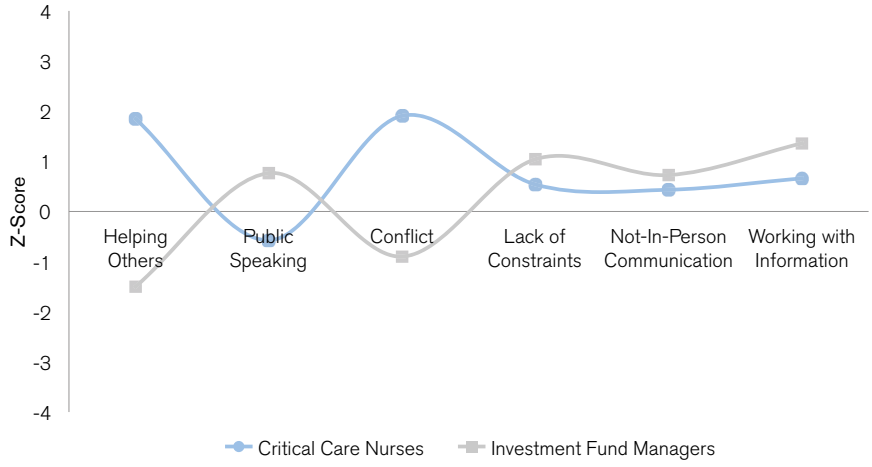

Figure 6. Two example job profiles for high/low helping others

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Appendix

Jobs Included in the Analysis

- Retail Salespersons
- Cashiers
- Combined Food Preparation and Serving Workers, Including Fast Food
- Office Clerks, General
- Registered Nurses
- Customer Service Representatives
- Waiters and Waitresses
- Laborers and Freight, Stock, and Material Movers, Hand
- Secretaries and Administrative Assistants, Except Legal, Medical, and Executive
- Janitors and Cleaners, Except Maids and Housekeeping Cleaners
- General and Operations Managers
- Stock Clerks and Order Fillers
- Heavy and Tractor-Trailer Truck Drivers
- Bookkeeping, Accounting, and Auditing Clerks
- Nursing Assistants
- First-Line Supervisors of Office and Administrative Support Workers
- Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
- Elementary School Teachers, Except Special Education
- Maintenance and Repair Workers, General
- Personal Care Aides
- First-Line Supervisors of Retail Sales Workers
- Teacher Assistants
- Accountants and Auditors
- Team Assemblers
- Cooks, Restaurant
- Security Guards
- Receptionists and Information Clerks
- Secondary School Teachers, Except Special and Career/Technical Education
- Business Operations Specialists, All Other
- Maids and Housekeeping Cleaners
- Landscaping and Groundskeeping Workers
- First-Line Supervisors of Food Preparation and Serving Workers
- Construction Laborers
- Food Preparation Workers
- Sales Representatives, Services, All Other
- Home Health Aides
- Light Truck or Delivery Services Drivers
- Executive Secretaries and Executive Administrative Assistants
- Licensed Practical and Licensed Vocational Nurses
- Packers and Packagers, Hand
- Software Developers, Applications
- Shipping, Receiving, and Traffic Clerks
- Police and Sheriff's Patrol Officers
- Automotive Service Technicians and Mechanics
- Middle School Teachers, Except Special and Career/Technical Education
- Substitute Teachers
- Carpenters
- Lawyers
- First-Line Supervisors of Production and Operating Workers
- Management Analysts
- Medical Assistants
- Childcare Workers
- Bartenders
- Electricians
- Computer User Support Specialists
- Computer Systems Analysts
- Industrial Truck and Tractor Operators
- Cooks, Fast Food
- Financial Managers

- Medical Secretaries
- Tellers
- Dishwashers
- Bus Drivers, School or Special Client
- First-Line Supervisors of Construction Trades and Extraction Workers
- Billing and Posting Clerks
- Inspectors, Testers, Sorters, Samplers, and Weighers
- Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
- Market Research Analysts and Marketing Specialists
- Human Resources Specialists
- Counter and Rental Clerks
- First-Line Supervisors of Mechanics, Installers, and Repairers
- Correctional Officers and Jailers
- Helpers—Production Workers
- Dining Room and Cafeteria Attendants and Bartender Helpers
- Driver/Sales Workers
- Cooks, Institution and Cafeteria
- Machinists
- Software Developers, Systems Software
- Packaging and Filling Machine Operators and Tenders
- Insurance Sales Agents
- Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop
- Plumbers, Pipefitters, and Steamfitters
- Welders, Cutters, Solderers, and Brazers
- Pharmacy Technicians
- Network and Computer Systems Administrators
- Managers, All Other
- Sales Managers
- Social and Human Service Assistants
- Preschool Teachers, Except Special Education
- Bill and Account Collectors
- Operating Engineers and Other Construction Equipment Operators
- Hairdressers, Hairstylists, and Cosmetologists
- Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
- Computer and Information Systems Managers
- Cleaners of Vehicles and Equipment
- Recreation Workers
- Securities, Commodities, and Financial Services Sales Agents
- Dental Assistants
- Industrial Machinery Mechanics
- Physicians and Surgeons, All Other
- Medical and Health Services Managers
- Firefighters
- Postal Service Mail Carriers
- Computer Programmers
- Loan Officers
- Production, Planning, and Expediting Clerks
- Pharmacists
- Purchasing Agents, Except Wholesale, Retail, and Farm Products
- Child, Family, and School Social Workers
- Amusement and Recreation Attendants
- Paralegals and Legal Assistants
- Mechanical Engineers
- Teachers and Instructors, All Other, Except Substitute Teachers
- Farmworkers and Laborers, Crop, Nursery, and Greenhouse
- Administrative Services Managers
- Claims Adjusters, Examiners, and Investigators
- Civil Engineers

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