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Employers' Demand for Personality Traits

Vera Brenčič
Andrew McGee

I Z A Institute
of Labor Economics
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Vera Brenčič
University of Alberta

Andrew McGee
University of Alberta and IZA

ABSTRACT

Employers' Demand for Personality Traits*

We measure firms' demand for workers' personality traits expressed in job ads and find that firms primarily demand workers who are extroverted, conscientious, and open-to-experience. The personality demand measures are correlated with the soft skills required on the job and produce intuitively plausible rankings of occupations in terms of personality requirements. Consistent with firms needing more time to fill vacancies with more requirements, ads requiring extroversion and conscientiousness remain posted online longer. Using the personality demand measures and wage information in the ads, we show theoretically and empirically that firms seeking conscientious workers are less likely to offer incentive pay.

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Corresponding author:
Andrew McGee
Department of Economics
University of Alberta
8-14 Tory Building
Edmonton
AB T6G2H4
Canada
E-mail: mcgee1@ualberta.ca

1. Introduction

Personality traits are a relatively stable set of thoughts, feelings and behaviors that result in a tendency to behave in particular ways (Roberts [2009]). The Five Factor Model (Goldberg [1982]) characterizes personality in terms of the "Big Five" traits: extroversion, conscientiousness, agreeableness, openness-to-experience, and emotional stability. According to McCrae and John [1992], extroverts tend to be more energetic, outgoing, ambitious, and assertive. Conscientious individuals tend to be diligent, well-organized, and neat. Agreeable individuals tend to be more trusting, modest, and compliant. Individuals high in openness/intellect have greater need for varied and novel experiences, aesthetic sensitivity, and curiosity. Emotionally stable individuals tend to be calm and even-tempered.

These traits influence the ways workers interact with coworkers and customers, respond to incentives, and react to the everyday challenges of the workplace. Meta-analyses have shown that personality traits are related to job performance (e.g., Barrick and Mount [1991], Tett et al. [1991], Salgado [1997]), and some employers screen applicants on the basis of personality (e.g., Autor and Scarborough [2008], Hoffman et al. [2018]). Despite this, evidence on the extent of employers' demand for the Big Five personality traits remains scarce. The Occupational Information Network (O*NET) work styles module surveys workers in occupations and occupational experts on a few sub-traits of conscientiousness, but these measures reflect neither employers' demand nor the full breadth of personality traits (Peterson et al. [2001]). Likewise, a handful of studies characterize employers' personality requirements for individual occupations using job ads, but no prior work characterizes employer demand for personality traits in a broad

cross-section of occupations in a uniform fashion.[1] Within the psychology literature, Sackett and Walmsley [2014] (p. 543) note that, "(t)here is no authoritative source of which we are aware that summarizes the personality attributes employers seek in potential employees."

We fill this gap by measuring employers' expressed demand for the Big Five personality traits in a sample of 140,193 job ads posted to Monster.com over a two-week period in 2006. Our approach builds on the insight of the lexical hypothesis in psychology, the notion that important individual differences in the way people engage with each other and their environments become encoded into language (Allport and Odbert [1936]). Specifically, we identify job ads containing trait-descriptive terms that Goldberg [1981] and John [1990] associated with each of the Big Five trait extremes. We find that employers predominantly demand extroversion (31% of ads), conscientiousness (26% of ads) and openness (21% of ads), while references to the less socially desirable extremes of the Big Five traits (i.e., introversion, non-conscientiousness, closed-to-experience, antagonism, and neuroticism) are essentially absent from job ads. We pay particular attention to the problems of false positives (i.e., ads with trait-descriptive terms used for reasons having nothing to do with personality) and false negatives (i.e., ads in which we fail to identify personality trait demands). False positives prove significant: as many as half of all instances of trait-descriptive terms in job ads are false positives. By contrast, false negatives appear to be a less significant problem as a tripling of the number of trait-descriptive terms used to categorize ads yields increases in the fraction of ads referencing personality traits of only around 20 percent.

To validate that our measures capture requirements imposed by employers when filling vacancies, we confirm that the rankings of the 249 occupations represented in our sample in terms of their demands for personality traits are intuitively plausible. For example, the

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[1] Job ads have been used to infer personality requirements for librarians (Tokarz [2019]), civil servants (Kruyen et al. [2020]), supply management professionals (Klezl et al. [2022]), and brand managers (Wroblowska [2019]).

occupations highest in demand for extroversion include occupations in which individuals interact regularly with customers or subordinates, while the occupations highest in the demand for conscientiousness include jobs where attention-to-detail and effort may be difficult to monitor. We find that demands for the Big Five traits are weakly correlated with requirements for "soft skills" such as people management and customer service but uncorrelated with "hard" skills such as financial and specific software skills. In addition, the demand measures for extroversion and conscientiousness—the traits most demanded in our data—are negatively correlated with the probability of an ad being removed from Monster.com, which is consistent with employers requiring more time to fill vacancies with personality requirements.

Measures of employers' demand for personality traits can be used to investigate a host of labor market phenomena ranging from gender segregation in occupations to worker-firm match effects. Here we revisit Bowles et al.'s [2001] incentive-enhancing traits model, which assumes that workers are endowed with traits such as conscientiousness that allow employers to elicit effort from them at lower cost. Bowles et al. observed that if workers with these traits can be identified, then employers must pay them more in perfectly competitive labor markets when employers cannot capture worker-specific rents. The Bowles et al. model served as a theoretical framework motivating much of the empirical literature on personality and wages, but estimates of the wage returns to traits have not provided strong support for the model's hypotheses. For conscientiousness, Mueller and Plug [2005], Heineck and Anger [2010] and Heineck [2011] find limited evidence of a positive correlation between wages and conscientiousness for women but not men in samples from the United States, Germany, and the UK, respectively, while Fletcher [2013] finds no evidence of a positive return to conscientiousness for either gender after accounting for family effects in the United States. Nyhus and Pons [2006] find an insignificant

but positive return to conscientiousness at the outset of employment but a significant negative return associated with the interaction between conscientiousness and tenure.

We propose an alternative model in which incentive-enhancing personality traits influence not wage levels but the wage structure. Bowles et al. [2001] assume that firms can observe incentive-enhancing traits, but where personality is concerned this involves either personality testing or interviewing—both more costly than the resume reviews used to screen for other requirements. Moreover, employers may find learning about personalities difficult when applicants have incentives to misrepresent themselves.[2] In our model, employers choose between offering a fixed wage or incentive-based compensation when effort is unobservable and workers differ in their intrinsic motivation to supply effort. We show that the difference between expected profits from the fixed wage and incentive-pay contracts is higher for firms that screen for conscientious workers, and thus firms indicating demand for (and presumably screening for) conscientiousness should be less likely to offer incentive pay. Intuitively identifying conscientious workers benefits the firm more when it relies on intrinsic motivation with a fixed wage to elicit effort.

This prediction is borne out in our data, which is particularly well-suited for this analysis given that job ads often mention the form of compensation even when wages are not posted (Brenčič and Norris [2010]).[3] Job ads indicating demand for conscientious workers are as much as 3.7 percentage points less likely to offer incentive pay than other ads in a sample in which 21 percent of ads indicate the use of incentive pay. As a robustness exercise, we note that firms may alternatively use promotion tournaments to motivate workers when effort is non-contractible, but

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[2] McGee and McGee [2022] show that incentivized personality measures such as those taken in job applications are only weakly to moderately correlated with non-incentivized measures for the same individuals in a lab experiment.
[3] 81% of the ads in our sample either post a wage or wage range or describe the nature of compensation (e.g., incentive pay, bonuses, employee stock purchase plans, 401Ks, benefits, etc.).

firms seeking out conscientious workers would have less need to offer promotion opportunities to solve the moral hazard problem. Consistent with this hypothesis, ads demanding conscientious workers are as much as 2.7 percentage points less likely to reference promotion opportunities in a sample in which 16% of ads reference promotion opportunities. Concerning the negative interaction between conscientiousness and tenure in wage regressions, Nyhus and Pons [2005] speculate that firms may not need to raise the wages of conscientious workers to motivate them. Our findings provide direct evidence that conscientious workers are sought out for positions offering fewer advancement opportunities and thus potentially less opportunity for wage growth.

Our study makes four primary contributions. First, we provide proof-of-concept that personality trait demands can be measured in job ads to fill noteworthy gaps in our understanding of employers' demand for non-cognitive skills. In particular, 54% of job ads make at least one reference to personality traits—the same percentage of ads that reference educational requirements which suggests strong demand for noncognitive skills. We also provide the first characterization of occupations in terms of personality requirements from job ads, an endeavor similar in spirit to studies applying text analysis to job ad data to replicate O*NET measures of occupation skill and task requirements (e.g., Djumalieva and Sleeman [2018] and Lassébie et al. [2021]). Our findings concerning the occupational personality requirements are complementary to studies such as Krueger and Schkade [2008], Borghans et al. [2008] and Deming [2017] documenting that workers sort into occupations based on their gregariousness and sociability. Specifically, we shed light on the employer-side of the matching process for a broader set of worker traits by providing evidence on the personality traits employers seek out for different occupations.

Second, the study contributes to the literature measuring personality using text from social media (e.g., Schwartz et al. [2013], Plank and Hovy [2015], Arnoux et al. [2017], Kern et al. [2019]). The study most similar to ours is that of Kern et al. [2019] who analyze tweets from Twitter users to create occupation-specific personality profiles. In contrast to their study, we seek to measure employer demand rather than the average traits of workers in an occupation who are active on Twitter—especially if personality is systematically related to the decision to use Twitter. Using job ads rather than Twitter posts also allows us to examine how personality demands are related to working conditions, contracts, skills and tasks as indicated in the ads to further our understanding of the relationships between personality and employment.

Third, our findings regarding false positives highlight the pitfalls for economists of using simple text analysis relying on keywords. Searching for personality keywords without considering the context of their use would dramatically overstate the demand for these traits.[4] Moreover, the measurement error associated with identifying keywords in inappropriate contexts is almost certainly systematic as words do not appear randomly. For example, "progressive" is a trait-descriptive term associated with openness, but job ads frequently seek candidates with "progressive experience," meaning individuals with a job history of positions of increasing responsibility. Failing to identify this false positive risks inducing a positive correlation between the openness demand measure and outcomes such as posted wages, job levels, or promotion opportunities. As text data grow in importance for the social sciences, addressing the nuances of text will require the use of sophisticated natural language processing approaches.

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[4] Kruyen et al. [2020], for example, search for 336 trait-descriptive terms in 21,003 ads for Dutch civil servants between 1980 and 2017. They find that by 2017 each socially desirable personality trait extreme is referenced in at least 60% of ads. While high demand for one trait might reflect the nature of civil servant positions, the fact that the demands for all traits are so high is almost surely the result of false positives.

Fourth, we contribute to the literature on firms' choice of wage structure (Lazear [1986], Brown [1990]) by providing evidence that personality demands are related to how employers structure wages and incentives. In a field experiment randomizing compensation structure, Donato et al. [2017] found that post-birth complications fall when maternity care providers in India received incentive pay, but the health benefits arising from incentive pay are absent among conscientious providers. Our findings from a broad sample of employers indicate that employers appreciate this interaction between incentives and conscientiousness and are much less likely to offer extrinsic rewards when seeking out conscientious applicants. Moreover, our findings point to a potentially important interaction between the decision to screen for personality traits and firms' choice of wage structure.

2. Measuring personality trait demands

2.1 Data

The job ad sample consists of 142,618 job ads posted to Monster.com from June 26, 2006, to July 8, 2006; we restrict our attention to ads with text resulting in a final sample of 140,193 job ads.[5] Pre-eminent among employment websites operating in the US in 2006, Monster.com ranked first in the share of visitors and the number of resumes hosted and second in the share of page views among 350 employment websites in the online recruiting industry at the time (Weddle [2009]). According to the Bureau of Labor Statistics [2006], there were 3.8 million job openings in July 2006—some of which were existing vacancies (i.e., the stock rather than the flow of new job postings). Given that we observe less than half of the month, our sample likely accounts for approximately 10% of new job postings in the United States in this period.

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[5] Ads without text result from scraping errors.

The job ad data include characteristics of the job from standardized Monster.com fields (e.g., location) and others extracted from the text of the ad. We control for the length of the ad in characters, education and experience requirements (if any), the job's location, occupation, and the skill and task requirements mentioned in the ad.[6] Similar to the job ads analyzed in Hershbein and Kahn [2018], only 54% of job ads included education requirements and 30% experience requirements. The skill requirements mentioned in the ad were constructed following Deming and Kahn [2018].[7] The tasks required on the job are measured as described in Brenčič and McGee [2023].[8] A total of 249 occupations are represented in our data, and 84% of ads were matched to occupations.[9] Finally, we identify the firm posting the ad for 68% of the ads.[10]

Our measures of outcomes include the number of weeks the ad was posted, the offered wage, whether incentive pay is part of the compensation and whether the ad mentions promotion

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[6] The 262 location codes in the Monster data roughly correspond to PUMA codes.

[7] The skill requirements include financial skills, cognitive skill, general computer skill, specific software skill, customer service skill, social skill, character, project management skill, people management skill, and writing. We construct indicators for these skill requirements using the keywords and phrases detailed in Table 1 of Deming and Kahn [2018] except for the specific software requirement for which we supplied our own list of software and programming languages.

[8] We measure whether employers indicate that cross-functional tasks (e.g., communication, maintaining interpersonal relationships, caring and service tasks), routine tasks, and mathematics tasks are required using dictionaries of phrases associated with each task drawn from corresponding task measures in O*NET. By cross-functional tasks, we mean tasks that are neither knowledge-domain nor occupation specific. Using the same sample, Brenčič and McGee [2023] show that the personality trait requirements in the ads are broadly correlated with cross-functional tasks requirements but negatively correlated or uncorrelated with routine and mathematics tasks.

[9] We use the Dorn [2009] occupation codes that aggregate U.S. Census occupation codes to a balanced panel of occupations for the 1980, 1990, and 2000 Census and the 2005-2008 ACS in order to facilitate the merge of our personality demand measures to other data sets. To identify the occupation, we first attempt to match the text following the string "Job Title:" in the ad to strings associated with each occupation code. For example, for the "Special Education Teachers" category, we searched for the strings "special education teacher*", "spec-ed teacher*" and "special needs teacher*". Not all ads, however, contain the "Job Title:" string. For the remaining ads, we count the number of times strings associated with each Dorn occupation code appear in the ad. We then identify the occupation mentioned most often in the ad giving priority to specific occupations over "not elsewhere categorized" occupations (e.g., "electrical engineer" instead of "engineer, n.e.c." even if strings associated with the latter appear more often). Monster had an occupation field, but it was relatively coarse with only 9 categories (i.e., business and management professions, engineering and computer science professions, education-related professions, medical professions, administrative, clerical, or legal professions, mechanics or laborers, service industry professions, research, science or technical professions, or other professions).

[10] Deming and Kahn [2018] are similarly able to match 63% of ads in their sample to firms. We use a fuzzy matching algorithm applied to the firm name strings to match ads from the same firm. We set the firm identifier equal to missing for ads associated with well-known recruiting agencies.

opportunities. When the data were collected in 2006, the ads were tracked each week for 16 weeks to determine whether they were still posted.[11] In our sample, ads disappear in 5.6 weeks on average conditional on being gone within 16 weeks, while 10% of ads remained posted after 16 weeks. We also use this information to create an indicator for whether an ad remained posted for more than 60 days—an indication that employers paid to extend the ad beyond the initial 60-day posting. To construct offered wages, we take the midpoint of the upper and lower bounds on wages listed in the ad and separately analyze ads associated with hourly and annual rates of pay. As documented in Brenčič [2012], offered wages are available for 24% of the ads in our sample.[12] Finally, we identify 21% of the ads that indicate that bonuses, commissions, pay-for-performance, piece-rates, or incentive pay form part of a job's compensation and 16 percent of the ads that mention promotion opportunities (e.g., "within firm advancement," "in-house promotion," "promotion opportunities"). Summary statistics for these outcome variables and the controls described above are reported in Table 1.

2.2 Background

According to Allport and Odbert's [1936] lexical hypothesis, individual differences that are most significant in daily interactions eventually become encoded in language. Allport and Odbert [1936] initiated a literature dedicated to identifying descriptive adjectives associated with individual traits. Refining Norman's [1967] catalogue of 2,797 trait-descriptive adjectives in the English language, Goldberg [1981, 1982] narrowed this list to 1,710 trait-descriptive adjectives.

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[11] An ad was deemed removed when accessing the vacancy's website resulted in the following message: "We're sorry. This job has been removed from the site and is no longer available for viewing." Ads were tracked for twice the length of the paid period; employers paid for a 60-day posting. For a detailed discussion of the duration of the vacancy's on-line posting refer to Brenčič and Norris [2009].

[12] Marinescu and Wolthoff [2020] report that 20% of job ads from CareerBuilder.com reveal information about the offered wage. In our sample, 301 job ads (0.2%) post a wage using a rate of pay other than hourly or annual. We exclude these ads from our analysis of posted wages for simplicity.

Goldberg [1981] surveyed university students concerning whether the adjectives accurately described them or someone they knew and identified five factors (each with two poles) that accounted for most of the correlations among adjectives—the Big Five taxonomy of personality traits. This research confirmed the five factors identified in earlier lexical studies (e.g., Tupes and Christal [1961], Norman [1963], Borgatta [1964], Digman and Takemoto-Chock [1981]) and was subsequently validated in other studies (e.g., John [1990], Wiggins [1995]).

2.3 Methodology

We take the lexical hypothesis as our starting point and assume that firms indicate desired personality traits through the terms used in job ads. We match terms in the ads to the trait-descriptive term lists from Goldberg [1981] and John [1990] to identify ads containing terms associated with each personality trait extreme (e.g., extroversion/introversion and emotional stability/neuroticism). There are two potential sources of measurement error: Type II errors (false negatives) when our ten trait categorization dictionaries omit terms that employers use to signal preferred personalities and Type I errors (false positives) when we identify trait-descriptive terms in ads that are not indicative of desired personality traits.

In the next section, we demonstrate that expanding the word lists leads to small increases in the number of trait descriptive terms identified, suggesting that false negatives may not be that prevalent. The more challenging issue in measuring the use of trait-descriptive terms in job ads proves to be false positives. For instance, "flexible" is in the agreeableness dictionary, but "flexible" in job ads frequently refers to work arrangements. Similarly, job ad jargon is problematic as adjectives like "progressive" and "direct" are used in ways very particular to human resources. To address the issue of false positives, we require that trait-descriptive terms be used to describe desired job candidates, the firm's existing workers, the firm itself, or its

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environment.[13] We assume that firms may describe themselves, their employees, or their environment using personality-related adjectives in order to attract similar applicants. We further require that the adjectives are used as adjectives (rather than another part of speech) and that the adjectives are used in a sense relevant to personality.[14,15] We thus exclude instances of words in our dictionaries when they appear as proper nouns (e.g., "Progressive Insurance"), nouns (e.g., "objective"), or verbs (e.g., "articulate") and when they are used to describe a firm's product or geographic location or in any sense not related to personality.

We implemented these rules using an extensive exclusion list of over 18,000 words and phrases to be ignored when measuring the frequency of personality-related adjectives. The list was developed using the natural language processing software WordStat to review *all* the contexts in which words in our personality dictionaries appeared in the job ads. This allowed us to identify expressions associated with false positives and to exclude them from the counts.

2.4 Measured trait demands

Table 2 reports the fraction of job ads in which trait-descriptive terms appear for each of the ten trait extremes using different categorization dictionaries and different exclusions lists for eliminating Type I errors. Column 1 reports the statistics using dictionaries including only the traits themselves (e.g., "extroversion," "extrovert," and "extroverted") to reflect the fact that the Big Five personality taxonomy is known to firms and HR professionals. Very few ads, however,

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[13] We count adjectives modifying job tasks in some instances given how many job ads are written. For instance, a firm may require "courteous service," but "courteous" is a function of the individual performing the task rather than an intrinsic feature of "service." In all such instances—which admittedly fall in something of a grey area between adjectives and adverbs and require some judgment—we require that the adjective describe the person performing the task rather than an essential feature of the task.

[14] A small number of nouns appear in our lists, and for these we count instances in which they appear as nouns.

[15] The requirement that the adjective be used in a sense relevant to personality addresses the concern that many adjectives have multiples uses and meanings.

explicitly state a preference for one of the Big Five personality traits: no trait extreme is represented in more than 1% of ads except for emotional stability.[16]

The traits-only categorization dictionary in Column 1, however, undoubtedly misses a great many terms signaling employers' demand for personality traits (Type II errors) as the Big Five traits themselves were identified from the correlations among many adjectives. Column 2 reports the summary statistics using a categorization dictionary that includes the traits themselves together with the word lists from Goldberg [1990], Saucier and Goldberg [1996], and John [1990]. Goldberg [1990] reduced Goldberg's [1981] list of 1,710 items to a list of 339 terms associated with the Big Five traits to be used in studies with subjects, while Saucier and Goldberg [1996] categorize by trait 435 of the most familiar terms in Goldberg's [1981] list. John's [1990] list consists of words assigned to a Big Five domain by at least 90% of expert judges. We include John's [1990] list to reduce our reliance on a single source, but the three lists overlap to a significant extent. Each term is placed in the categorization dictionary of the trait for which it had the highest factor loading in these studies. Because some terms load on different traits in different studies, a small number of terms appear in categorization dictionaries for more than one trait. In total, the categorization dictionary used in Column 2 includes 560 terms.[17]

In Column 2, a term is counted regardless of how it is used in the ad. Using these categorization dictionaries, 53% of job ads include terms associated with extroversion and conscientiousness, while over a third of the job ads include terms associated with openness and agreeableness. The problem of false positives (Type I errors), however, appears to be very important. Using the same categorization dictionaries but applying the rules described in the

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[16] The fraction of ads containing references to emotional stability stems from our inclusion of "stable" in the traits-only category dictionary for emotional stability.
[17] Appendix Table 1 lists the trait categorization dictionaries (i.e., word lists) used for every column in Table 2.

previous section to identify and remove false positives from the adjective counts in Column 3, firms primarily demand workers who are extroverted (26% of ads), conscientious (20%), and open-to-experience (20%)—nearly 50% reductions relative to Column 2. For some traits like neuroticism, almost all instances of personality-related adjectives are false positives.

To examine the importance of false negatives, we expand in Column 4 the categorization dictionaries to include all of the terms in Goldberg's [1981] list as well as the terms from John [1990]—a near tripling of the number of terms counted in the personality demand measures—while continuing to remove false positives. The fractions of ads containing trait-descriptive terms associated with extroversion and conscientiousness, however, increase by a mere 20 to 25%, while the fractions of ads containing terms associated with the remaining trait extremes are basically unaffected by the expansion of the dictionaries. Thus while Type II errors (false negatives) undoubtedly exist in the personality demand measures in Column 4, it would appear that the dictionaries have entered the region of rapidly diminishing returns to further expansion.

According to the measures in Column 4, employers primarily demand extroversion (31% of ads), conscientiousness (26%), and openness (21%), but a non-trivial number of ads indicate demand for agreeableness (12%) and emotional stability (7%) as well. Figure 1 displays the word clouds associated with each socially desirable personality trait extreme.[18] In the word clouds, the size of a word indicates its relative frequency among the words in the trait dictionary. Two things are apparent. First, a small number of words represent a disproportionately large share of the trait descriptive terms identified in our data for each trait. One could obtain broadly similar measures using far fewer than 1,710 terms or even the 560 used in Columns 2 and 3.

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[18] The word clouds for introversion, non-conscientiousness, antagonism, closed-to-experience, and neuroticism are available from the authors.

Second, two words, "verbal" (in the dictionary for extroversion) and "analytical" (in the dictionaries for conscientiousness and openness), play an outsized role in our measures of personality demands. "Verbal" (in 9% of ads) and "analytical" (in 5% of ads) appear in many ads in the phrases "verbal skill" and "analytical skill." Both contexts satisfy our rules insofar as the terms are being used as adjectives modifying an attribute (skill) of the desired worker. Furthermore, who is to say that a person who has verbal skill is not verbal or that a person with analytical skill is not analytical? We are agnostic on these questions, but we also recognize that these expressions—which significantly influence the measured personality trait demands—may not refer to the applicant's personality. Thus, in Column 5 of Table 2 we report the fraction of ads in which trait-descriptive terms are mentioned excluding "verbal" and "analytical," but it remains the case that employers primarily demand extroversion (22% of ads), conscientiousness (21%), and openness (15%).

Finally, we consider how many trait-descriptive terms job ads use. While different adjectives might indicate demand for different facets (i.e., sub-traits) of personality, the number of trait descriptive terms in an ad may also signal the intensity of the employer's desire for an individual with a given trait. Table 3 reports the fraction of ads with less than or equal to a given number of references to individual personality traits or any personality trait. Conditional on an ad containing a trait-descriptive term for a trait, the modal number of such terms in an ad is one for all of the Big Five traits.[19] That said, for each trait a small number of ads contain several terms associated with the trait—as many as 16 such references in the case of openness. Finally, we note in Column 6 that 54% of job ads contain at least one trait-descriptive term—the same fraction of ads that include education requirements.

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[19] We focus on the socially desirable extremes of the Big Five traits from here onward given the very small number of ads containing terms associated with the other extremes.

2.5 Trait demands by occupation and skill requirements

Workers in different occupations perform different tasks in different environments, and thus the optimal personality trait combination informing how workers respond to situations likely varies by occupation. Table 4 reports the top 10% of occupations when ranked in descending order by the fraction of ads in an occupation using trait-descriptive terms for each trait. We restrict the sample to the 133 occupations for which we observe more than 20 job ads to limit the role of sampling variance in the rankings; the summary statistics for all occupations for all traits are reported in Appendix Tables 2 and 3.

Three things are apparent from the occupation rankings. First, the measures of employer demand for personality traits produce mostly intuitive rankings of occupations. The occupations highest in employer demand for extroversion include those in which individuals interact regularly with the public (e.g., restaurant staff, sales) or subordinates (e.g., managers). The occupations highest in the demand for conscientiousness include jobs where attention-to-detail (e.g., technical writers, proofreaders, industrial engineers, actuaries) and effort (e.g., porters, housekeepers) may be difficult to monitor. The occupations highest in demand for agreeableness include many customer-facing jobs (e.g., photographers, cashiers, bank-tellers). The occupations highest in the demand for emotional stability include many occupations in which interactions with unhappy individuals are possible (e.g., waiters/waitresses, clerks). Small samples in some occupations likely contribute to a few unusual rankings (e.g., the demand for agreeableness among geologists), but overall the rankings of occupations seem very plausible. [20]

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[20] A potential concern is that ads may mention only essential but scarce skills, which would result in under-reporting of personality demands if personality traits are not scarce. For instance, literacy may be an essential skill for librarians, but job ads do not specify literacy as a requirement given that literacy is abundant among would-be librarians. As long as selection into occupations is not entirely based on personality, however, personality traits are unlikely to be so abundant within occupations as to not merit mention when important. If sorting into occupations based on personality were sufficient to create applicant pools so homogeneous as to make personality traits

Second, some occupations appear in the top 10% of the rankings for several traits (e.g., religious workers, coaches). This suggests that for some occupations, personality trait bundles are important. Third, high-skill occupations are not well-represented among the occupations with the highest personality demands. In particular, we note the near-complete absence in Table 4 of STEM occupations even while many of these occupations are well-represented in our sample. This suggests that personality traits may matter most in occupations where responses to situations and other individuals are more important than well-defined or domain-specific skills.

To further explore these issues, Table 5 reports the correlations between the indicators for trait-descriptive terms appearing in an ad for each trait with the same measures for the other traits and the skill requirement measures in Deming and Kahn [2018]. The correlations use the trait demand indicators created using the extended dictionaries with "verbal" and "analytical" removed. Among the traits, the demands for extroversion and agreeableness are the most highly correlated (0.27), which is perhaps not surprising given the high rankings of occupations requiring interactions with the public for both traits in Table 4. None of the correlations between trait demands in the job ads, however, are very high, which suggests variation in the personality trait bundles required by employers.

The skill requirements could be broadly grouped into "soft skills" involving interactions with others (i.e., social skills, character, customer service, and people management) and domain-specific skills (i.e., project management, financial skills, writing, general computer skills, and specific software skills) with "cognitive" skill (defined by the keywords "problem solving,"

abundant, the only ads in which these traits would be mentioned would be positions for which the personality requirements were at odds with the occupational norm. If this were the case, we would expect potentially counterintuitive rankings of the occupations by personality trait demands, but this is not what we observe in Table 4. Moreover, in contrast to job ads in newspapers, employers were not charged for the length of ads on Monster.com. As such, employers were less constrained in their ability to list job requirements in ads.

"research," "analytical," "critical thinking," "math," and "statistics") not fitting well in either category. Broadly speaking, the personality trait demands are uncorrelated with the domain-specific skills and mostly uncorrelated with cognitive skill. By contrast, the trait requirements are weakly correlated with most of the soft skills, which is consistent with our earlier supposition that personality traits are most important on jobs involving interactions with others.

2.6 Duration of job ad posting

We conclude this section by investigating whether the personality demand measures capture something that employers are screening for in their hiring processes. Other things being equal, employers with more requirements for workers should, on average, need more time to fill vacancies than employers with fewer requirements.[21] With this in mind, we estimate models of the probability that an ad is withdrawn from Monster.com, where the length of time an ad is posted proxies for the duration of the firm's search.[22]

We note, however, that employers specifying requirements in job ads limit the pool of acceptable applicants, but the details in the ads may attract more suitable applicants. The two dynamics have countervailing effects on the probability that a vacancy is filled. Nevertheless, we proceed under the assumption that the effect of limiting the pool of acceptable applicants tends to outweigh the matching effects—largely because this appears to be the case when looking at well-defined job requirements such as education and experience (Baron et al. [1997]).

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[21] Alternatively firms may be engaging in cheap talk in describing themselves and their desired employees, in which case the personality terms in job ads should be unrelated to how long the ad is posted. While possible, this seems unlikely given that employers are vying for job seekers' limited attention on job boards. Brenčič [2014], for instance, finds that visitors view only 14 job postings on average on employment websites.
[22] The length of time an ad was posted on Monster.com has two limitations as a proxy for the duration of the firm's search. First, the observed start date may not be the actual start date if the search began offline or if the posting was renewed with a lag after an initial posting had been exhausted. Second, ads withdrawn from the job board may not be associated with filled vacancies. For instance, the vacancy's withdrawal from the job board may indicate that either the need to fill the position ceased to exist or that the employer started searching using alternative channels.

With this caveat in mind, we use discrete-time proportional hazard models to estimate the probability that an ad no longer appeared on Monster.com for each of the first 16 weeks after it was posted.[23] These complementary log-log models control for the week after posting using 16 indicator variables, the personality trait demand indicators, the length of the ad in characters, and various sets of additional controls using the sample of ads for which the occupations could be identified.[24] The estimated hazard ratios for the personality trait demand indicators reported in Columns (1) through (4) in Table 6 indicate that expressions of demand for extroversion and conscientiousness—the traits referenced most often by employers—are associated with lower probabilities of an ad being withdrawn from the job board in all specifications in which we control for occupation. The estimated hazard ratio for extroversion in Column 4 (0.942) suggests that the probability of being withdrawn for an ad using trait-descriptive terms associated with extroversion is 94% of that for an ad not containing such terms. The extroversion hazard ratio in Column (4) is similar to that for the requirement for a bachelor's degree (0.940), while the estimated hazard ratio for conscientiousness (0.963) is comparable to the requirement to have an associate's degree (0.966).[25]

The estimated hazard ratios for the extroversion and conscientiousness demands are consistent with the conjecture that employers screening for these characteristics require more

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[23] While the time elapsed prior to filling a vacancy is continuous, our duration measure is discrete. Moreover, the data exhibit "bunching" insofar as many ads are removed following the eighth week—the end of the 60-day posting period. We estimate discrete-time rather than continuous-time proportional hazard models in view of the large number ties in our data.

[24] In Table 6 and all of the tables that follow, we use the trait requirement measures derived using the extended trait dictionaries omitting "verbal" and "analytical", but all of the estimates in Table 6 and subsequent tables are robust to including "verbal" and "analytical" in the dictionaries.

[25] By contrast, none of the traits have effects on the probability of an ad being withdrawn comparable to experience requirements as the estimated hazard ratios for most experience categories are around 0.7. Complete estimates containing hazard ratios for all of the controls are available from the authors. Neither the hazard ratios for the education requirements nor the hazard ratios for the experience requirements vary significantly across specifications. In all of our specifications, the omitted category is the absence of experience and education requirements.

time to fill vacancies and thus leave job postings online longer. While the estimates for the openness and agreeableness demand measures are not statistically significant in our preferred specification in Column (4), the emotional stability demand measure is associated with higher probabilities that job ad is withdrawn.[26] Again, this is not necessarily inconsistent with employers screening for these traits as it may indicate that ads requiring these traits attract well-suited applicants. Indeed, the fact that fewer employers search for emotional stability may make it easier to attract individuals with this trait.

Finally, Column (5) reports coefficient estimates from a linear probability model of the probability that an ad was renewed after 60 days incorporating firm fixed effects.[27] This specification addresses two potential concerns. First, ads for different positions at the same firm often use similar language. Correlations between trait requirements and the duration of a job posting on Monster.com could arise if this language is correlated with unobserved dimensions of a firm's search. Incorporating firm effects accounts for firm-specific search behaviors. Second, phantom vacancies, ads that remain posted for positions that have already been filled, are common on job boards (Cheron and Decreuse [2017], Albrecht et al. [2023]). Ads that firms renew after 60 days are less likely to be phantom vacancies given that renewal is costly for firms. The disadvantage of this specification, however, is that it does not exploit the variation in the duration of an ad posting—especially given that 83% of ads are withdrawn in 60 days or less.[28]

The coefficient estimates in Column 5 imply that indications of demand for extroversion, conscientiousness, and openness are associated with statistically significant increases in the

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[26] Whether employers mention personality traits in ads could be endogenous if it is correlated with local labor market conditions, work conditions, wage offers and other factors. For this reason, the specification in Column (4) includes extensive controls for local labor markets, occupations, education and experience requirements, and the skill and task requirements of the job.
[27] We recognize the shortcomings of linear probability estimators, but probit models cannot be estimated with firm fixed effects and logit models with firm fixed effects proved difficult to estimate due to the large number of firms.
[28] In addition, it is unclear why phantom vacancies would be more likely to reference personality traits.

probability of renewal of 1.2, 0.8 and 0.9 percentage points, respectively, in a sample in which 17.6 percent of ads are renewed. Similar to the proportional hazard models, emotional stability and agreeableness are associated with lower probabilities of an ad being renewed. Overall, the evidence suggests that ads indicating demand for extroversion and conscientiousness remain posted longer than ads not indicating demands for these traits.

3. Incentive-enhancing personality traits, wages, and contracts

3.1 Evidence on personality traits and posted wages

To demonstrate the usefulness of job-specific personality trait requirement measures, we re-visit Bowles et al.'s [2001] incentive-enhancing trait model. Bowles et al. hypothesized that worker traits such as conscientiousness enable employers to induce effort at a lower cost when effort is not contractible. In a competitive labor market, firms pay workers with these traits more even when the trait does not directly contribute to production. Among the Big Five traits, conscientiousness lends itself most directly to a hypothesis regarding its relationship to wages in the incentive-enhancing trait model, but, as noted in the Introduction, the estimates of these wage returns vary considerably across the different studies in the literature.

We begin by testing the hypothesis that employers' demand for conscientiousness is positively correlated with posted wages in job ads. The sample is restricted to ads for which posted wages are available and the occupation could be identified. Table 7 reports coefficient estimates from regressions of the log of the posted wage on the personality trait measures and various sets of controls including the length of the job ad in characters, education and experience requirements, job location, occupation, skill and task requirements, and firm fixed effects. We

run the regressions separately for ads posting hourly wages and ads posting annual salaries, and the usual caveats about analyses in a sample in which 76% of ads do not post a wage apply.[29]

Among ads posting hourly wages in Panel A, posted wages for ads referencing conscientiousness are an estimated 1.1 percent lower than for jobs without such terms with all of the controls in Column (4) and 1.9 percent lower including firm fixed effects in Column (5)—though neither estimate is statistically significant. Among ads posting annual salaries in Panel B, the posted wages of ads demanding conscientiousness are an estimated 2.0 percent higher than those for other jobs in Column (4) with all of the controls but only 0.7 percent higher controlling for firm effects in Column (5). Overall we find little consistent evidence in support of the incentive-enhancing hypothesis where conscientiousness and wages are concerned.

By contrast, the estimated coefficients for extroversion, agreeableness, and emotional stability are consistently negative, statistically significant and larger in magnitude than those for conscientiousness in almost all specifications and in both job ads with hourly and annual wage offers. Only for openness in the hourly wage sample are the coefficient estimates positive and statistically significant. For all of the estimates, we note that omitted variables biases could influence the coefficients of the Big Five traits if the demands for traits are correlated with unobserved job requirements or work conditions. We attempt to mitigate this concern by controlling for occupations, locations, and an extensive vector of job-specific skill and task requirements, but nevertheless the endogeneity of job requirements remains an issue. That said, the mixed evidence on the associations between wages and personality traits both here and in other studies raises the following questions: if employers do not pay for personality traits, why

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[29] For instance, Brenčič [2012] and Banfi and Villena-Roldan [2019] show that posted wages are more common in ads seeking less skilled workers.

do some employers seek out workers with these traits, and how do these traits influence the employment relationship?

3.2 Model of screening for incentive-enhancing traits and wage structure

Bowles et al. [2001] assume that incentive-enhancing traits are observed, but employers may find screening for and observing personality traits difficult. Even those employers that do screen applicants for personality traits may not need to reward these traits if sufficiently many employers do not observe these traits. That is, firms may be able to retain worker-specific rents in the presence of incomplete information where incentive-enhancing traits are concerned.

We propose a simple, alternative model in which incentive-enhancing traits influence the wage structure—rather than the wage level—offered by employers. Specifically, firms should not offer fixed wage contracts due to the moral hazard problem if effort is prohibitively costly to monitor. Workers with incentive-enhancing traits, however, may supply effort even when effort is unobservable. Consequently, employers have less need to offer incentive-based compensation when they seek out workers with these traits.

Suppose that workers supply unobservable effort e and that the firm's (observed) output is $e + v$, where v is an i.i.d. mean zero random variable. The revenue generated by the worker is $p(e + v)$, where p is the price of the firm's output. The worker's earnings consist of a fixed wage w and any compensation conditioned on output (e.g., piece-rates or commissions) paying r per-unit of output. Further assume that the worker's utility is a function of compensation, the disutility of effort $(-e^2)$, and possibly intrinsic motivation given by

$$U = w + r(e + v) - e^2 + \theta(e - \underline{e})$$

where $\theta \geq 0$ is a parameter characterizing the degree to which the worker is intrinsically motivated. We assume that traits such as conscientiousness map into this job-specific parameter.

Workers for whom $\theta = 0$ respond only to extrinsic incentives, while other workers attach some importance to intrinsic motivations. Intrinsically motivated workers derive utility from supplying more than the norm effort level $\underline{e}$ and disutility when they shirk relative to this benchmark.

Workers maximize their expected utility by choosing effort $e^* = \frac{r+\theta}{2}$. If labor is the only input, the firm's expected profit is $E(\pi) = (p - r)\left(\frac{r+E(\theta)}{2}\right) - w$. Suppose firms choose between a fixed wage contract $(w_1, r_1 = 0)$ and a contract paying both a fixed wage and compensation conditioned on performance $(w_2, r_2 > 0)$. Firms choose whether to screen applicants and seek out individuals with high values of θ $(S = 1)$ such that $E(\theta|S = 1) > E(\theta|S = 0)$. The firm-specific screening costs are given by the random variable C_i; firms with large C_i may choose not to screen.

The difference in expected profits between the contracts is given by

$$E(\pi_1) - E(\pi_2) = E(\theta)\left(\frac{r_2}{2}\right) - (p - r_2)(r_2/2) - (w_1 - w_2)$$

It follows that the difference in expected profits between a fixed wage contract and the performance pay contract will always be larger for firms that engage in screening (i.e., $E(\pi_1 - \pi_2|S = 1) > E(\pi_1 - \pi_2|S = 0)$). Put differently, the probability that a firm hires workers on a fixed wage contract should be higher for firms screening job applicants for the trait θ.

We make two observations. First, not all firms screening will choose the fixed wage contract as $E(\pi_1 - \pi_2|S = 1)$ may be negative depending on the contract terms (w_1, w_2, r_2). Other things being equal though, screening will make the fixed wage contract more attractive relative to incentive pay. In Lazear's [1986] seminal paper on the firm's choice between salaries and piece rates, the value of piece rates rises relative to fixed wages as the difference between the effort induced by the piece rate and the effort exerted under the fixed wage increases. Screening for

incentive-enhancing traits tends to reduce the difference between these effort levels by ensuring a higher level of effort under the fixed wage and thus attenuates the benefits of piece rates.[30]

Second, screening firms may also make different decisions regarding the contract choice because of differences in the way personality traits map into the parameter θ. How personalities manifest themselves depends on situations and contexts. If the nature of work on a job is particularly unpleasant or grueling, the upper bound on values of θ may be lower than in other contexts. That is, even conscientious (and thus intrinsically motivated) workers may not derive much utility from doing exceptionally unpleasant work, in which case the benefit to screening would be small. This implies that controlling for occupations and tasks will be important when estimating the relationship between conscientiousness and wage structure.

3.3 Evidence on incentive-enhancing traits and extrinsic rewards

To test this model of incentive-enhancing traits applied to wage structure, we estimate models of the probability that an ad indicates incentive compensation (i.e., bonuses, commissions, performance pay, incentives, or piece-rates) is offered controlling for the personality trait demand indicators, the length of the ad in characters, and the same sets of controls as in the log-posted wage regressions. In contrast with the log-posted wage regressions, the incentive compensation indicator is defined for all of the job ads in our sample, which we again restrict to the ads for which the occupation is identified.

Columns (1) to (4) of Table 8 report the estimated marginal effects for the trait requirements from probit models with different sets of controls. Controlling in Column (3) for education and experience requirements, location, and occupation, conscientiousness is associated with a 4.3

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[30] Our model does not incorporate the monitoring costs incurred under piece rates and fixed wages, which influence the firm's choice in Lazear's [1986] model. An alternative model could assume that workers with incentive-enhancing traits require less monitoring with fixed wages, which would also tend to make the fixed wage more attractive to firms.

percentage point reduction in the probability that incentive pay is offered—a sizeable effect considering only 21 percent of ads indicate the use of incentive pay. As noted in the log-wage regressions, personality trait requirements may be correlated with job characteristics that also influence whether incentive pay is used. Plausibly exogenous sources of variation in the trait requirements are not available as with most research using job ads. Instead we attempt to control for a very wide variety of job characteristics in addition to occupation, education and experience requirements by including the ten skill requirement measures from Deming and Kahn [2018] together with eleven task requirement measures (e.g., working in teams, independent work, routine and repetitive tasks) from Brenčič and McGee [2023]. Even after adding this extensive vector of job characteristics to the controls in Column (4), however, ads indicating demand for conscientiousness remain an estimated 3.7 percentage points less likely to offer incentive pay. Moreover, demand for conscientiousness is associated with a 1.6 percentage point reduction in the probability of offering incentive pay in the linear probability model in Column (5) adding firm fixed effects. Even within firms, positions requiring conscientious workers are less likely to be compensated using incentive pay than positions not requiring conscientious workers. These estimates are consistent with the hypothesis that firms seeking workers with incentive-enhancing traits are less impacted by moral hazard issues and thus able to offer fixed wages when effort is non-contractible.

In lieu of incentive pay, firms may instead use the prospect of future promotions to elicit effort from workers (Lazear and Rosen [1981]). Similar to the model above, firms hiring conscientious workers may have less need to elicit effort via promotion tournaments as these workers supply effort in the absence of extrinsic incentives. As an alternative test of our hypothesis

that incentive-enhancing traits reduce firms' reliance on extrinsic incentives to motivate workers, we estimate models of the probability that an ad mentions promotion opportunities.

Consistent with our hypothesis, demand for conscientiousness is associated with significant reductions in the probability that an ad mentions promotion opportunities of 3.1 percentage points in the probit model in Column (3) controlling for education, experience, location and occupation and 2.7 percentage points in Column (4) adding the extensive vector of job characteristics. The linear probability model estimates incorporating firm effects in Column (5) indicate that positions indicating a need for conscientious workers are 3.6 percentage points less likely to be associated with promotion opportunities than positions in the same firm without similar requirements. In a sample in which 15.6 percent of ads mention promotion opportunities, these estimates imply sizable reductions in the probability that firms reference promotion opportunities when recruiting conscientious workers. Together with the incentive pay estimates, we infer that firms are less likely to offer extrinsic incentives when employing conscientious workers.[31]

4. Conclusion

We develop measures of employer demand for personality traits by identifying job ads containing personality trait-descriptive terms. These novel measures complement existing measures of skill and task requirements at the occupation level in O*Net and can be used to investigate the role of personality in the labor market. In that regard, we show that job ads demanding conscientious workers are less likely than other ads to mention incentive pay and promotion opportunities given that such workers are more likely to supply effort in the absence

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[31] We did not hypothesize that the remaining Big Five traits would be incentive-enhancing, but openness is negatively correlated with incentive pay and promotion opportunities in all but one specification in Tables 8 and 9. By contrast, the demands for extroversion and emotional stability are positively correlated with both incentive pay and promotion opportunities in all specifications in which we control for occupation—suggesting that these traits may be incentive-disenhancing. Extroverts, for instance, may engage in social behaviors that distract from effort—thus making incentive pay even more necessary for such individuals.

of extrinsic motivation. When these traits are difficult to observe—as they often are—non-cognitive traits may influence employment relationships through contracts and the work environments to which workers match rather than the level of wage.

Our measures of employer demand for personality traits, however, might be improved. The way forward is obviously to measure employer demand for personality traits in a larger sample representative of the universe of job vacancies such as the Burning Glass datasets. That said, the size of our sample is also what allows us to review every instance of trait-descriptive terms to achieve a degree of accuracy where false positives are concerned that may not be possible in larger samples. Our "brute force" approach to identifying trait-descriptive terms and removing false positives, however, will not scale up to a dataset that is orders of magnitude larger than that used in this study. Instead, a machine-learning approach will be necessary, and we conclude by highlighting the challenges that such a project would have to overcome.

First, a machine learning approach will require a training dataset to teach the algorithm to identify trait demands. Studies such as Schwartz et al. [2013] using machine learning (ML) to classify social media profiles in terms of their personality traits had access to personality tests taken on the social media platform to train the ML algorithms, but no similar training dataset is readily available in this context. Second, Schwartz et al. [2013] show that the prediction accuracy of open-vocabulary ML approaches to text analysis in which all words are used as potential predictors of traits is greater than that of closed-vocabulary approaches (similar to that in this study) relying on word dictionaries. Open vocabulary ML algorithms, however, need large amounts of text to achieve predictive accuracy. The job ads in our sample average 292 words, and thus an open vocabulary ML algorithm will not likely be viable in this context. Relying on word dictionaries of trait-descriptive terms in a closed-vocabulary approach, however, might

work well in this context given that employers are explicitly describing desired employees in job ads (in contrast to the largely random subjects of social media). Finally, our study highlights that the key challenge of any natural language processing ML algorithm will be to distinguish between the usages of trait-descriptive terms to reduce false positives. We leave these challenges for the future but stress the potential for personality trait demand measures in job ads to shed light on the role of personality in the workplace and the labor market.

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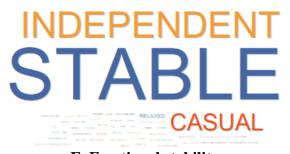
A. Extroversion

B. Conscientiousness

C. Openness

D. Agreeableness

E. Emotional stability

Figure 1: Personality trait word clouds from job ads

Notes: Each panel depicts the words clouds for the "socially desirable" trait extremes of the Big Five personality traits. Within each word cloud, the size of a word indicates its relative frequency in the job ad sample among the trait-descriptive terms in the dictionary for that trait extreme. The word clouds for the remaining five, socially undesirable trait extremes are available from the authors. Because the word clouds have been individually re-scaled to fit the page, comparisons of word sizes in different word clouds should be avoided.

Table 1: Summary statistics

	(1)		(2)
Dependent variables:			
Weeks ad posted | Ad gone in < 16 weeks	5.64		
	(3.32)		
Ad still posted at 16 weeks	0.10		
Hourly wage offered in $ (n = 12,971)	17.28		
	(10.78)		
Annual salary offered in $ (n =20,653)	61,344		
	(28,545)		
Incentive pay offered	0.21		
Promotion opportunities	0.16		
Ad characteristics:			
No occupation determined	0.20		
Firm identified	0.68		
Ad length in characters	2,654		
	(1,341)		
Education requirements:		Experience requirements:	
None given	0.46	None given	0.70
High school	0.14	< 1 year of experience	0.03
Associates degree	0.06	1-2 years of experience	0.06
Bachelor's degree	0.32	2-5 years of experience	0.12
Post-graduate degree	0.02	5-7 years of experience	0.06
		7-10 years of experience	0.01
		10-15 years of experience	0.01
		> 15 years of experience	0.00
Skill requirements:		Task requirements:	
Customer service	0.59	Communication	0.37
People management	0.52	Interpersonal relationships	0.18
Financial	0.25	Teamwork	0.20
Cognitive	0.29	Caring/service	0.24
General computer	0.34	Leadership & decision-making	0.22
Social	0.39	Problem-solving	0.13
Software	0.11	Creative	0.04
Character	0.14	Attention-to-detail	0.15
Project management	0.06	Independent work	0.08
Writing	0.05	Routine	0.07
		Mathematical	0.04
Number of job ads	140,193		

Notes: Standard deviations are given in parentheses when applicable. The number of weeks an ad was posted was not observed for ads still posted after 16 weeks. Incentive pay includes bonuses, commissions, incentive compensation, pay-for-performance, and piece-rates. The education, experience, skill and task requirement variables are all indicator variables for whether an ad included the requirement as described in the text.

Table 2: Fraction of ads containing personality trait-descriptive terms

Trait	(1)	(2)	(3)	(4)	(5)
Extroversion	0.00	0.53	0.26	0.31	0.22
Conscientiousness	0.00	0.53	0.20	0.26	0.21
Openness	0.00	0.34	0.20	0.21	0.15
Agreeableness	0.00	0.36	0.12	0.12	0.12
Emotional stability	0.04	0.15	0.07	0.07	0.07
Introversion	0.00	0.08	0.00	0.00	0.00
Non-conscientiousness	0.00	0.00	0.00	0.00	0.00
Disagreeableness	0.00	0.11	0.01	0.02	0.02
Non-openness	0.00	0.05	0.00	0.01	0.01
Neuroticism	0.00	0.01	0.00	0.00	0.00
Traits only	X				
Short trait-descriptive term list		X	X		
False positives removed			X	X	X
Extended trait-descriptive term list				X	X
"Verbal" & "analytical" removed					X

Notes: Each column indicates the fraction of ads in which words for a given trait are found using different categorization dictionaries and exclusion lists. Column (1) searches for the plain English names of the traits themselves (e.g., "extrovert" and "extroversion). Column (2) searches for words in the lists from Goldberg [1990], Saucier and Goldberg [1996], and John [1990]. Column (3) removes false positives from the measures in Column (2) using exclusion lists. Column (4) expands the word list in Column (2) to include all 1,710 trait descriptive adjectives in Goldberg [1981] with false positives removed. Column (5) uses the same list as in Column (4) but removes the words "verbal" and "analytical" from the categorization dictionaries.

Table 3: Frequency of trait-descriptive terms in ads

# of terms	(1) Extroversion	(2) Conscientiousness	(3) Openness	(4) Agreeableness	(5) Emotional stability	(6) Total
0	69.34	74.08	79.32	87.94	92.60	46.30
1	91.17	92.69	94.20	97.03	99.20	67.06
2	97.54	97.73	98.03	99.01	99.92	80.46
3	99.15	99.15	99.23	99.76	100.00	88.62
4	99.64	99.54	99.83	99.90	100.00	93.34
5	99.88	99.66	99.93	99.98	100.00	96.25
6	99.98	99.98	99.97	99.99		97.78
7	99.99	99.99	99.99	99.99		98.47
8	100.00	100.00	99.99	100.00		98.92
9	100.00	100.00	99.99	100.00		99.26
10		100.00	100.00	100.00		99.39
11		100.00	100.00	100.00		99.81
12		100.00	100.00			99.87
13		100.00	100.00			99.92
14			100.00			99.96
15			100.00			99.98
16			100.00			99.99
17						99.99
18						99.99
19						100.00
20						100.00
21						100.00
22						100.00
23						100.00
24						100.00

Notes: Columns (1) to (5) report the fraction of ads containing the number of trait-descriptive terms specified in each row or fewer for each of the Big 5 traits using the extended trait-descriptive term list in Column (4) of Table 1. Column (6) reports the fraction of ads containing the number of trait-descriptive terms specified in each row or fewer from any of the trait descriptive terms lists for the Big 5 traits. Multiple entries of "100.00" reflect the rounding to two decimal points; the last entry in each column reflects the maximum number of occurrences of words associated with a given trait in an ad in our sample.

Table 4: Top 10% of occupations by trait demand measures

	Extroversion	Conscientious.	Openness	Agreeableness	Emotional Stability
1	*Photographers (189)*	Clergy and religious workers (176)	Clergy and religious workers (176)	Clergy and religious workers (176)	Waiters and waitresses (435)
2	Miscellaneous food preparation and service workers (444)	Technical writers (184)	Insurance sales occupations (253)	*Kindergarten and earlier school teachers (155)*	*Airplane pilots and navigators (226)*
3	Chief executives, public administrators, and legislators (4)	Management support occupations (37)	Fire fighting, fire prevention, and fire inspection occs (417)	*Photographers (189)*	Insurance sales occupations (253)
4	*Interviewers, enumerators, and surveyors (316)*	*Proofreaders (384)*	Actuaries (66)	*Bakers (687)*	Respiratory therapists (98)
5	*Managers of medicine and health occupations (15)*	Industrial engineers (56)	*Kindergarten and earlier school teachers (155)*	Social workers (174)	General office clerks (379)
6	Heating, air conditioning, and refrigeration mechanics (534)	Cashiers (276)	Industrial engineers (56)	Gardeners and groundskeepers (451)	*Mail clerks, outside of post office (356)*
7	Management support occupations (37)	Actuaries (66)	Athletes, coaches, and officials (199)	*Airplane pilots and navigators (226)*	*Photographers (189)*
8	Advertising and related sales jobs (256)	Baggage porters, bellhops and concierges (464)	Writers and authors (183)	Guards and police, except public service (426)	Data entry keyers (385)
9	*Kindergarten and earlier school teachers (155)*	Fire fighting, fire prevention, and fire inspection occs (417)	*Weighers, measurers, and checkers (368)*	Cashiers (276)	*Bakers (687)*
10	Real estate sales occupations (254)	Mathematicians and statisticians (68)	Advertising and related sales jobs (256)	*Weighers, measurers, and checkers (368)*	File clerks (335)
11	Athletes, coaches, and officials (199)	Operations and systems researchers and analysts (65)	*Airplane pilots and navigators (226)*	Bank tellers (383)	Housekeepers, maids, butlers, and cleaners (405)
12	Cooks (436)	*Gardeners and groundskeepers (451)*	Baggage porters, bellhops and concierges (464)	Baggage porters, bellhops and concierges (464)	Secretaries and stenographers (313)
13	Sales supervisors and proprietors (243)	Athletes, coaches, and officials (199)	Patternmakers and model makers (645)	*Interviewers, enumerators, and surveyors (316)*	Customer service reps, invest., adjusters, excl. insur. (376)
14	Human resources and labor relations managers (8)	Housekeepers, maids, butlers, and cleaners (405)	Operations and systems researchers and analysts (65)	Geologists (75)	Payroll and timekeeping clerks (338)

Notes: The table reports the top 10 % of occupations when ranked in descending order by the fraction of ads including trait-descriptive terms associated with the trait for each column. We restrict the ranking to the 133 occupations for which we observe 20 or more ads. Occupations in italics are close to this 20-ad threshold. The occupation codes are listed in parentheses.

Table 5: Correlations among trait demand and skill measures

	Trait demand measure				
	(1)	(2)	(3)	(4)	(5)
	Extroversion	Conscient.	Openness	Agreeable	Emotional stability
Trait measure:	A. Correlations among trait requirement measures				
Extroversion	1.00				
Conscientiousness	0.16	1.00			
Openness	0.15	0.15	1.00		
Agreeableness	0.27	0.18	0.19	1.00	
Emotional stability	0.07	0.05	0.18	0.09	1.00
Skill measure:	B. Correlations with skill requirement measures				
Cognitive	0.01	0.10	0.18	0.02	-0.01
Social	0.14	0.14	0.20	0.13	0.04
Character	0.14	0.23	0.13	0.09	0.05
Writing	0.00	0.03	0.05	0.03	0.00
Customer Service	0.18	0.10	0.13	0.13	0.03
Project Management	0.00	0.02	0.06	0.00	-0.01
People Management	0.10	0.11	0.14	0.10	0.00
Financial	-0.02	0.01	-0.01	-0.02	0.00
Computer	0.01	0.06	0.03	0.02	0.09
Software	-0.02	0.00	0.03	-0.02	-0.01

Notes: The table reports the correlations between the indicators for trait-descriptive terms appearing in an ad and the other trait indicators and skill measures constructed as described in Deming and Kahn [2018].

Table 6: Models of duration of job ad posting

	Removed in a week through 16 weeks after posting				Renewed after 60 days
	(1)	(2)	(3)	(4)	(5)
Extroversion	0.920***	1.018**	0.926***	0.942***	0.012***
	(0.007)	(0.009)	(0.008)	(0.008)	(0.004)
Conscientiousness	1.026***	1.017**	0.955***	0.963***	0.008**
	(0.008)	(0.009)	(0.008)	(0.009)	(0.004)
Openness	1.083***	1.034***	1.025***	1.003	0.009**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.005)
Agreeableness	1.148***	1.094***	1.021*	1.016	-0.002
	(0.012)	(0.012)	(0.011)	(0.011)	(0.005)
Emotional stability	1.100***	1.289***	1.203***	1.191***	-0.006
	(0.014)	(0.017)	(0.016)	(0.016)	(0.006)
Controls:					
Education, exp. & location		X	X	X	X
Occupation			X	X	X
Skill & task requirements				X	X
Firm fixed effects					X

Notes: Columns (1) to (4) report exponentiated coefficient estimates (i.e., hazard ratios) from complementary log-log models of the probability that a job ad was no longer posted to Monster.com in a given week after being posted up through 16 weeks using the sample of ads for which an occupation could be identified (n = 112,812). Column (5) reports coefficient estimates from a linear probability model of the probability that a job posting was renewed after 60 days further restricting the sample to 80,385 ads for which a firm could be identified. The model specifications include indicators for weeks after an ad was posted (in Columns (1) to (4)), the length of the job ad in characters, the indicators of personality trait demands and other controls as specified at the bottom of the table. Heteroskedasticity robust standard errors are given in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

Table 7: Log-wage models

	(1)	(2)	(3)	(4)	(5)
	A. Ads reporting an hourly wage (n=10,323)				
Extroversion	-0.128***	-0.119***	-0.059***	-0.048***	-0.042***
	(0.010)	(0.009)	(0.008)	(0.008)	(0.015)
Conscientiousness	-0.092***	-0.053***	-0.024***	-0.011	-0.019
	(0.011)	(0.010)	(0.009)	(0.009)	(0.016)
Openness	0.118***	0.060***	0.045***	0.031**	0.050**
	(0.019)	(0.016)	(0.015)	(0.015)	(0.023)
Agreeableness	-0.072***	-0.068***	-0.058***	-0.044***	-0.063***
	(0.012)	(0.012)	(0.011)	(0.010)	(0.018)
Emotional stability	-0.100***	-0.079***	-0.033***	-0.032***	-0.015
	(0.010)	(0.009)	(0.008)	(0.008)	(0.018)
R^2	0.058	0.315	0.543	0.575	0.848
	B. Ads reporting an annual salary (n=17,273)				
Extroversion	-0.099***	-0.057***	-0.076***	-0.052***	-0.019
	(0.008)	(0.008)	(0.007)	(0.007)	(0.012)
Conscientiousness	-0.049***	-0.044***	-0.008	0.020***	0.007
	(0.008)	(0.008)	(0.007)	(0.008)	(0.013)
Openness	0.034***	-0.032***	-0.019**	-0.002	0.009
	(0.009)	(0.009)	(0.009)	(0.009)	(0.015)
Agreeableness	-0.173***	-0.120***	-0.072***	-0.063***	-0.052***
	(0.012)	(0.011)	(0.010)	(0.009)	(0.018)
Emotional stability	-0.120***	-0.070***	-0.028***	-0.024***	-0.025
	(0.011)	(0.010)	(0.009)	(0.009)	(0.017)
R^2	0.103	0.297	0.434	0.483	0.829
Controls:					
Education, exp. & location		X	X	X	X
Occupation			X	X	X
Skill & task requirements				X	X
Firm fixed effects					X

Notes: Each column reports coefficient estimates from log-posted wage regressions controlling for the indicators of personality trait demands, the length of the job ad in characters and other controls as specified at the bottom of the table. Panel A uses the subsample of ads posting an hourly wage for which an occupation could be identified, while Panel B uses the subsample of ads posting an annual salary. In Column 5, the samples are further restricted to include only those job ads for which a firm could be identified (n = 5,645 in Panel A and n = 11,547 in Panel B). Heteroskedasticity robust standard errors are given in parentheses. Significance levels: *** $p<0.01$, ** $p<0.05$, * $p<0.10$

Table 8: Incentive pay models

	Dependent variable: Incentive pay offered				
	(1)	(2)	(3)	(4)	(5)
Extroversion	0.087***	0.084***	0.044***	0.040***	0.052***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Conscientiousness	-0.048***	-0.048***	-0.043***	-0.037***	-0.012***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Openness	-0.031***	-0.027***	-0.046***	-0.031***	-0.020***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)
Agreeableness	0.020***	0.003	0.002	-0.002	-0.011*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.006)
Emotional stability	-0.018***	-0.009*	0.012**	0.013***	0.021***
	(0.005)	(0.005)	(0.005)	(0.004)	(0.007)
Controls:					
Education, exp. & location		X	X	X	X
Occupation			X	X	X
Skill & task requirements				X	X
Firm fixed effects					X

Notes: Columns (1) to (4) report estimated marginal effects from probit models of the probability that an ad indicates that incentive pay is part of the compensation controlling for the indicators of personality trait demands, the length of the job ad in characters, and other controls as specified at the bottom of the table. Column (5) reports coefficient estimates from a linear probability model of the probability that an ad indicates that incentive pay is part of the compensation including firm fixed effects. The sample in Columns (1) to (4) is restricted to 112,812 observations for which an occupation could be identified; the sample in Column (5) is further restricted to 80,385 job ads for which a firm could be identified. Heteroskedasticity robust standard errors are given in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

Table 9: Promotion opportunities models

	Dependent variable: Promotion opportunities mentioned				
	(1)	(2)	(3)	(4)	(5)
Extroversion	0.066***	0.065***	0.049***	0.043***	0.027***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Conscientiousness	-0.030***	-0.032***	-0.031***	-0.027***	-0.036***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Openness	-0.033***	-0.018***	-0.023***	-0.023***	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Agreeableness	0.013***	0.008**	0.008**	0.003	0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Emotional stability	0.057***	0.048***	0.052***	0.050***	0.009
	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)
Controls:					
Education, exp. & location		X	X	X	X
Occupation			X	X	X
Skill & task requirements				X	X
Firm fixed effects					X

Notes: Columns (1) to (4) report estimated marginal effects from probit models of the probability that an ad indicates that promotion opportunities are available controlling for the indicators of personality trait demands, the length of the job ad in characters, and other controls as specified at the bottom of the table. Column (5) reports coefficient estimates from a linear probability model of the probability that an ad indicates promotion opportunities are available including firm fixed effects. The sample in Columns (1) to (4) is restricted to 112,812 observations for which an occupation could be identified; the sample in Column (5) is further restricted to 80,385 job ads for which a firm could be identified. Heteroskedasticity robust standard errors are given in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.10

Appendix Table 1: Trait descriptive terms by trait

Trait	Terms
Extroversion	*active adventurous* affirmative *aggressive ambitious* amorous *assertive assured* audacious aweless bigheaded big-mouthed blunt *boisterous bold bossy* brash *brave* brazen brisk broad-spoken brusque bubbly buoyant *carefree* chatty *cheerful* chitchatty clear-cut clownish cocky coherent *communicative* companionable *competitive* competitory *confident* conversational *courageous daring* dauntless definite *demonstrative* devil-may-care *direct* disguiseless *dominant* dynamic eager effervescent emphatic *energetic enterprising enthusiastic exhibitionistic* expansive explicit *explosive expressive* **extroversion extrovert extroverted** fatigueless fearless fervent *flamboyant flirtatious forceful* forcible forthright forward *frank friendly* frisky gabby gallant *gregarious* gushy gutsy *happy-go-lucky* hasty headlong *hearty* heroic high-spirited *humorous* hypersensual immodest *impetuous* imprudent incautious indefatigable indeliberate inexhaustible informative injudicious *intrusive* jocular jolly *jovial* lion-hearted live lively long-winded loose-tongued loud-mouthed lucid *magnetic merry* militant mirthful *mischievous* nervy *noisy opportunistic optimistic out-going outspoken* overbold overbrave overconfident overdaring overemphatic overhasty overintense overmerry overrash overtalkative overvaliant participative peppy perky *persistent* persuasive pert plain-spoken *playful* plucky pretenseless *proud rambunctious* rivalrous rollicking self-assertive self-centered self-expressive self-important self-respecting self-revealing self-satisfied sensuous *sexy* short-spoken *show-off* smooth-spoken *sociable social* sparkling speedy *spirited spontaneous* sprightly spry *spunky* stalwart steadfast stout-hearted *straightforward* sultry swellheaded *talkative* terse tireless ultrasensual uncautious unchaste unconcealing uncontriving undevious undisguised unguarded *uninhibited* unreserved *unrestrained* unselfconscious unshrinking untiring unwary valiant valorous venturesome venturous *verbal verbose* vibrant *vigorous vivacious* vivid vocal voluptuous well-spoken *witty wordy zealous zestful*
Introversion	acquiescent *aloof* anti-social *apathetic* asocial *bashful* bendable *bland* boastless broody chaste clannish clingy cliquish close-mouthed cool counselable *cowardly* coy demure *detached* discourageable dispassionate distant *docile* doleful *dull* emotionless exclusive fatalistic feelingless flatterable hermitish *humorless impartial* impassive incongenial indefinite indifferent *indirect* ineloquent inexplicit inexpressive *inhibited* **introversion introvert introverted** *joyless* lamblike leadable *lethargic* lukewarm lustless malleable manipulable *meek melancholic* moldable *morose negativistic* nonegotistical *nonpersistent* nonvocal overmodest overquiet overserious overthoughtful overtrusting overwary *passive* persuadable *pessimistic placid* pliable pliant pouty *prudish quiet* reclusive *reserved* restrainable *restrained retiring seclusive secretive sedate* self-defensive *serious* servile shrinking *shy silent sluggish* solemn *somber* stand-offish *submissive* sulky sullen temptable tight-lipped *timid*

timorous unaccessible *unadventurous unaffectionate unaggressive* unanimated unapproachable unassertive unboastful uncheerful uncheery *uncommunicative* uncompanionable *uncompetitive* unconfiding undemonstrative undramatic unemphatic *unfriendly* ungallant ungregarious unheroic *unimaginative* unlively unmirthful unneighborly unobstrusive unostentatious unpersuasive unpresuming unpretentious *unsociable* unsocial unsparkling unspeaking unstirrable *untalkative* unventurous unvoluptuous *vague* vigorless *wary* weak-hearted weak-kneed withdrawing *withdrawn* zealless

Conscientiousness	abstinent accurate aimful *alert ambitious analytical* anticipative businesslike calculable calculating *careful cautious* changeless clairvoyant clear-sighted *concise* **conscientiousness conscientious** *conservative consistent* constrained *controlled conventional* crusading *cultured decisive* dedicated *deliberate dependable* designful devout *dignified* diligent *discreet* doctrinaire dogged dutiful eagle-eyed *economical efficient* evangelistic exact *exacting* exhaustive farseeing *fastidious firm* forbearing *foresighted* forethoughtful *formal* forward-looking frugal god-fearing hard-working heedful high-minded high-principled incorrupt incorruptible indivertible *industrious* invariable just law-abiding literal *logical mannerly* matter-of-fact *mature* mechanistic methodical *meticulous moralistic* moralizing mystical nonvariant *objective orderly organized* other-worldly overambitious overcareful overcautious overconscientious overdiligent overearnest overfastidious overlogical overparticular overrighteous overrigorous overscrupulous overzealous *painstaking* particular *perfectionistic* persevering *persistent* pious plain-dealing *planful poised practical* prayerful preachy *precise predictable* premeditative prim *principled* productive *prompt* proper prophetic prudent *punctual* puritanical *purposeful* purposive *rational refined reliable responsible* rigorous ritualistic saintly self-consistent self-denying *self-disciplined* self-restrained serious-minded single-minded *sophisticated* spiritual *steady stern* strait-laced *strict systematic tenacious thorough* thoroughgoing *thrifty* tidy *traditional* ultraconservative ultrafastidious ultrareligious unadulterous unchangeable unchanging undeviating unerring unextravagant unfailing unfaltering unforgetful unprogressive unresting unspontaneous unswerving untemptable unvarying unwavering unworldly *wise* worshipful
Non-conscientiousness	*absent-minded aimless* blasphemous breezy cagy canny capricious *careless* changeable deceptive defiant devilish digressive discourteous *dishonest disorderly disorganized* distractible double-tongued elfish elusive *erratic* evasive exaggerative excessive *extravagant* fanciful fancy-free fickle flighty *foolhardy* footloose foresightless *forgetful* foul-mouthed foxy free-living *frivolous* frolicsome glib *haphazard* heedless heretical hit-or-miss *illogical immature* immoderate impertinent impious impish *impractical* imprecise *impulsive* inaccurate *inconsistent* inconstant *indecisive indiscreet indulgent inefficient* inexact insolent

insubordinate intemperate irreformable irresolute *irresponsible* knavish lackadaisical lavish lawless *lax lazy* leisurely light-hearted loud *lustful* lusty melodramatic messy mutinous neglectful *negligent* **nonconscientious not conscientious** *nonconforming* ostentatious overcunning overcurious prankish profane purposeless rascally *rash rebellious reckless* retortive risqué roguish rootless rowdy sassy saucy scampish scandalmongering *scatterbrained* scheming self-destructive self-excusing shiftless shortsighted showy slick *slipshot sloppy slothful* slovenly sneaky snoopy thriftless *transparent* tricky *unambitious* unaspiring unbusinesslike uncalculating uncareful unceremonious *unconscientious* unconstructive *unconventional* undeliberate *undependable* undiligent undisciplined unearnest uneconomical unenterprising unfaithful unforseeing ungovernable unheedful unindustrious unmethodical unmindful *unobservant unpredictable* unproductive unpunctual *unreliable* unreligious *unsophisticated unstable unsystematic* unthrifty untidy untruthful variable *wasteful* whimsical wily *wishy-washy* zany

Openness   abstract accomplished affected *analytical animated* aristocratic *articulate artistic autonomous* blasé bookish brainy *bright candid* cavalier ceremonious chic *clever complex* complicated *contemplative cosmopolitan* courtly *creative* cultivated *cultured curious* dapper debonair *deep diplomatic distrustful* earthly-wise educable educated elegant *eloquent empathetic* enlightened *ethical* flaunty *foresighted* genteel graceful gracious haughty high-faluting *idealistic imaginative independent individualistic* informed *ingenious innovative* inquiring *inquisitive insightful* instructible *intellectual intelligent intense* intricate *introspective* intuitive *inventive* jaunty know-it-all *knowledgeable* learned literary literate many-sided *meditative* musical nimble-witted *nonconforming* **openness open to experience open to experiences open to new experience** *original* overstudious oversubtle *perceptive philosophical* philosophizing poetic polished profound *progressive* questioning quick-witted *refined resourceful* scholarly *scrupulous self-critical sensual sharp-witted shrewd smart sophisticated* studious stuffy suave *subjective* tasteful *tenacious* ultraintellectual ultrarefined *unconventional* unimpressible *unpredictable* unprovincial *versatile* well-read *wide-interests wise witty worldly* worldly-wise

Non-openness   awkward blunt-witted boorish childish childlike clumsy *commonplace condescending* confusable *conventional* credulous deceivable *dependent* divertible *dogmatic dull* earthly-minded graceless *ignorant* imitative *imperceptive* impressible *inarticulate* incurious indelicate inelegant inexperienced ingenuous irrational juvenile materialistic misleadable muddle-headed narrow *narrow-interests* **nonopenness not open to experience** overcredulous *patronizing* perspectiveless *pompous predictable pretentious* provincial *shallow simple* superficial *surly* thick-headed *traditional* unaccomplished unanalytic unartistic unauthoritative *uncreative* uncultivated uncultured undeliberative undignified

undiscerning undiscriminating unenlightened ungenteel ungraceful *unimaginative* unimpressionable uninformed uningenious *uninquisitive unintellectual unintelligent* unintrospective uninventive uninvestigative unmannered *unobservant* unoriginal unphilosophical unpolished unquestioning unreasoning unrefined *unreflective* unscholarly *unscrupulous* unspiritual unstudious unthinking untrained untutored unwise worldly-minded

Agreeableness   acceptant accessible *accommodating adaptable* adaptive adjustable *affectionate* **agreeableness agreeable** *altruistic amiable* amicable angelic *appreciative* approachable beneficent *benevolent* bighearted bountiful broad-minded *charitable cheerful* cherubic chipper chivalrous civil *compassionate* complacent complaisant *compliant* comradely conciliatory congenial *conscientious considerate* consolatory constant constructive *cooperative cordial courteous* democratic *diplomatic earnest earthy easy-going* empathic equalitarian *ethical* fair-minded fair-natured faithful *feminine flexible folksy forgiving friendly generous genial gentle* gentle-hearted gentlemanlike giving good-hearted good-humored *good-natured* good-tempered great-hearted *gullible helpful homespun honest* hospitable humane humanitarian *humble* impressionable inaggressive *informal* ingratiating ingratiatory inirritable intimate *jovial kind* kind-hearted kindly *lenient* long-suffering loving *loyal* magnanimous *mannerly* maternal merciful mild mild-hearted ministrative moderate *modest moral* mushy *naïve natural* neighborly nonbelligerent noncoercive nonhostile noninterfering nonrigid nonvolatile *obliging* open-hearted open-minded *optimistic* overcaring overcharitable overindulgent overpatient pacifistic *passionate patient peaceful* peacemaking philanthropic *pleasant polite* praising prejudiceless *principled* protective quiet-spoken *reasonable relaxed religious respectful* responsive *reverent selfless* self-sacrificing *sensitive sentimental simple sincere soft-hearted* soft-spoken solicitous sportsmanlike statesmanlike sugary *suggestible* sunny *sympathetic tactful* temperate tender tender-hearted *thoughtful tolerant trustful truthful trusting* ultrademocratic ultrasentimental unargumentative *unassuming* unbelligerent unbiased unbigoted uncomplaining *uncritical undemanding understanding* undespairing undiscourageable undogmatic unembittered unenvious unexacting ungrudging unhardened unimpatient unmalicious unmeddling unmercenary unmoralizing unpartisan unrevengeful *unselfish* unsuspicious unvindictive unwarlike *warm* warm-hearted well-mannered

Disagreeableness   abrasive *abrupt abusive* acid agitative *antagonistic* arbitrary *argumentative* arrogant austere authoritative autocratic balky *belligerent* biased *bigoted bitter* blustery *boastful* brawlsome bristly *bullheaded* bullish bullying *callous* cantankerous catty *caustic* censorial closed-minded closefisted *coarse* coercive *cold* cold-hearted *combative* compassionless *conceited condescending* contradictious contradictory contrary contrary-minded corrective covetous *crabby crafty cranky*

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critical cruel cunning curt cynical deceitful demanding derisive derogatory destructive *devious* dictatorial **disagreeable disagreeableness** disdainful disobliging disregardful *disrespectful* disruptive *distrustful domineering egocentric egotistical* embittered exploitative *explosive* facetious factious fanatical *faultfinding* fierce fiery flammable *flippant greedy gruff* grumbly *grumpy* hardened *hard-hearted* hard-nosed hard-shelled *harsh* headstrong high-handed hostile hot-blooded hot-tempered hypercritical icy ill-humored ill-natured ill-tempered ill-willed immovable *impersonal impolite impudent* incompliant *inconsiderate* incontrollable inconvincible inflexible inharmonious inhospitable inquisitorial *insensitive insincere* insuppressible *intolerant* iron-hearted ironical irrepressible irrestrainable *irreverent irritable* magisterial malicious *manipulative masochistic* mercenary *miserly* mistrustful mulish nagging narrow-minded negative niggardly *nonreligious* nonunderstanding *obstinate* obtrusive one-sided *opinionated* ornery overbearing overcritical overgreedy overharsh overjealous overpartial overrigid oversevere overstrict oversuspicious peevish peppery persecutive petty pig-headed *pompous* precondemning predatory *prejudiced* presumptuous provocable *quarrelsome* quick-tempered *rebellious* reformative relentless remorseless reproachful retaliative revengeful *rigid rough rude ruthless* sadistic *sarcastic* satiric *scornful* scrappy *self-indulgent selfish* self-righteous *self-seeking* self-willed severe sharp-tongued short-tempered shrewish *skeptical* slanderous *sly smug snobbish* sober-minded sour spiteful *stern stingy* stormy stringent strong-minded *stubborn surly suspicious tactless tempestuous* testy *thankless thoughtless tough* tyrannical ultracritical unaccommodating unalterable unamiable unbendable unbending unbenevolent *uncharitable* unchivalrous uncomplaisant uncompromising unconstrainable unconstrained uncontradictable uncontrolled *uncooperative* uncordial *uncouth underhanded* undiplomatic unforbearing *unforgiving unfriendly* ungenerous ungentle ungiving *ungracious* unindulgent *unkind* unmalleable unmovable unobliging unpersonable unpersuadable unpitying unpleasable unpliable unreasonable unrelenting unrepressible unrestrainable *unruly* unsatisfiable *unscrupulous* unsmiling unsolicitous unsubmissive unswayable *unsympathetic* untamable untrustful unyielding *vain* vengeful *vindictive* violent *volatile* volcanic warlike wild willful

Emotional stability   arbitrative astute *autonomous brave calm casual* certain clear-headed *contented* cool-headed *courageous* deliberative discerning discriminative *down-to-earth* durable *earthy easy-going* **emotional equilibrium emotional stability** free-minded free-thinking fretless hard-headed imperturbable incoercible *independent* indestructible *individualistic* indomitable inexcitable *informal* invincible inward judicious level-headed *masculine nonchalant* nonirritable observant *passionless patient* penetrative pensive poised realistic reflective *relaxed* rugged self-assured self-confident self-controlled self-examining self-possessed self-reliant

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Neuroticism	self-sufficient serene **stable** thick-skinned tough-minded *unassuming* unblushing undeceivable undefeatable *undemanding* undisturbable *unemotional unexcitable* unflinching unhurried unimpassionate unshakable unstormy *weariless* wide-awake worriless agitable alarmable *anxious bossy* busyish careworn choosy *compulsive crabby cranky defensive despondent* easeless *emotional envious excitable* exhaustible *extravagant faultfinding fearful* feelingful fidgety *finicky* fluttery *fretful* frightenable fussy *gossipy grumpy gullible* hectic *high-strung* hypersensitive *hypocritical impatient* inconfident *insecure intrusive irritable jealous meddlesome moody naïve negativistic nervous* **neurotic neuroticism** *nosey obsessive* overactive overemotional overexcitable overimaginative oversensitive perturbable picky *possessive quarrelsome restless* self-conscious *self-critical* self-deceiving self-defeating self-deluding self-deprecating self-disparaging self-doubting *self-indulgent selfish self-pitying self-punishing* self-reproachful *snobbish* soft-shelled squeamish *suggestible* supersensitive *superstitious temperamental tense* thin-skinned *touchy* unassured unconfident unhardy unpoised *unstable* unsure *volatile* weak-spirited weepy whiny wishful world-weary *worrying*

Notes: Words in bold appear in the "traits-only" list in Column (1) of Table 1. Words in italics appear in the shorter trait descriptive term list in Column (2) of Table 1 along with the words in bold. The remaining words appear in the extended list used in Column (4) of Table 1 along with all of the words in bold and italics.

Appendix Table 2: Trait summary statistics by occupation (+)

Occupation	Ext. (1)	Con. (2)	Ope. (3)	Agree. (4)	Emo. Stab. (5)	Any trait (6)	# of ads (7)
Uncategorized (0)	0.27	0.21	0.16	0.10	0.07	0.46	27383
Chief executives, public administrators, and legislators (4)	0.65	0.34	0.10	0.05	0.02	0.95	195
Financial managers (7)	0.18	0.19	0.14	0.07	0.09	0.35	57
Human resources and labor relations managers (8)	0.48	0.33	0.30	0.18	0.09	0.72	250
Managers and specialists in marketing, advert., PR (13)	0.45	0.36	0.32	0.18	0.07	0.69	14351
Managers in education and related fields (14)	0.25	0.00	0.50	0.25	0.00	1.00	4
Managers of medicine and health occupations (15)	0.59	0.14	0.14	0.09	0.00	0.64	22
Managers of properties and real estate (18)	0.40	0.31	0.17	0.15	0.07	0.61	169
Funeral directors (19)	0.00	0.00	0.33	0.00	0.00	0.33	3
Managers and administrators, n.e.c. (22)	0.36	0.31	0.26	0.14	0.08	0.62	19497
Accountants and auditors (23)	0.28	0.32	0.26	0.10	0.10	0.57	5340
Insurance underwriters (24)	0.50	0.50	0.00	0.00	0.00	0.50	4
Other financial specialists (25)	0.09	0.18	0.32	0.14	0.00	0.36	22
Management analysts (26)	0.31	0.31	0.28	0.08	0.05	0.60	7272
Personnel, HR, training, and labor rel. specialists (27)	0.37	0.24	0.20	0.13	0.05	0.56	86
Buyers, wholesale and retail trade (29)	0.25	0.00	0.00	0.25	0.00	0.25	4
Purchasing managers, agents, and buyers, n.e.c. (33)	0.36	0.35	0.32	0.11	0.08	0.62	574
Business and promotion agents (34)	0.00	0.00	0.00	0.00	0.00	0.00	1
Construction inspectors (35)	0.09	0.09	0.09	0.18	0.09	0.36	11
Inspectors and compliance officers, outside (36)	0.24	0.25	0.19	0.11	0.04	0.41	314
Management support occupations (37)	0.55	0.54	0.21	0.09	0.05	0.75	149
Architects (43)	0.27	0.21	0.24	0.06	0.04	0.50	614
Aerospace engineers (44)	0.25	0.29	0.19	0.04	0.00	0.43	68
Metallurgical and materials engineers (45)	0.21	0.18	0.21	0.03	0.03	0.42	33
Petroleum, mining, and geological engineers (47)	0.15	0.05	0.15	0.00	0.05	0.30	20
Chemical engineers (48)	0.19	0.20	0.21	0.05	0.03	0.45	159
Civil engineers (53)	0.19	0.13	0.10	0.06	0.06	0.37	454
Electrical engineers (55)	0.21	0.18	0.17	0.06	0.04	0.42	917
Industrial engineers (56)	0.32	0.51	0.43	0.10	0.05	0.69	167
Mechanical engineers (57)	0.17	0.15	0.17	0.06	0.05	0.36	629
Engineers and other professionals, n.e.c (59)	0.28	0.24	0.24	0.07	0.05	0.51	7831
Computer systems analysts and computer scientists (64)	0.13	0.20	0.20	0.00	0.00	0.47	15
Operations and systems researchers and analysts (65)	0.32	0.41	0.36	0.09	0.05	0.63	665
Actuaries (66)	0.24	0.48	0.44	0.10	0.04	0.68	50
Mathematicians and statisticians (68)	0.25	0.41	0.34	0.09	0.02	0.60	99
Physicists and astronomists (69)	0.21	0.07	0.14	0.00	0.00	0.36	14
Chemists (73)	0.22	0.30	0.35	0.08	0.10	0.57	161
Atmospheric and space scientists (74)	0.00	0.00	0.00	0.00	0.00	0.00	1
Geologists (75)	0.30	0.25	0.27	0.23	0.02	0.57	60
Agricultural and food scientists (77)	0.67	0.17	0.17	0.00	0.17	0.67	6
Biological scientists (78)	0.03	0.11	0.06	0.00	0.00	0.14	36
Foresters and conservation scientists (79)	0.00	0.00	0.00	0.00	0.00	0.00	2

Occupation							
Medical scientists (83)	1.00	0.00	0.00	0.00	0.00	1.00	1
Physicians (84)	0.17	0.16	0.13	0.10	0.06	0.32	1538
Dentists (85)	0.01	0.00	0.00	0.01	0.00	0.02	804
Veterinarians (86)	0.53	0.47	0.53	0.35	0.00	0.88	17
Optometrists (87)	0.17	0.00	0.17	0.17	0.00	0.17	6
Podiatrists (88)	0.00	0.00	0.00	0.00	0.00	0.00	1
Other health and therapy occupations (89)	0.00	0.00	0.00	0.00	0.00	0.00	1
Registered nurses (95)	0.15	0.15	0.08	0.13	0.07	0.36	2963
Pharmacists (96)	0.07	0.03	0.03	0.02	0.01	0.11	993
Dieticians and nutritionists (97)	0.00	0.00	0.00	0.00	0.00	0.00	5
Respiratory therapists (98)	0.14	0.07	0.09	0.07	0.25	0.55	76
Occupational therapists (99)	0.17	0.18	0.07	0.14	0.05	0.46	148
Physical therapists (103)	0.19	0.21	0.08	0.14	0.03	0.49	329
Speech therapists (104)	0.64	0.09	0.27	0.18	0.00	0.73	11
Therapists, n.e.c. (105)	0.09	0.33	0.08	0.07	0.07	0.48	90
Physicians' assistants (106)	0.12	0.04	0.04	0.04	0.00	0.16	25
Kindergarten and earlier school teachers (155)	0.52	0.22	0.43	0.48	0.04	0.78	23
Primary school teachers (156)	1.00	0.00	0.00	0.00	0.00	1.00	1
Special education teachers (158)	0.00	0.40	0.20	0.20	0.20	0.60	5
Teachers, n.e.c. (159)	0.41	0.24	0.15	0.14	0.02	0.58	567
Vocational and educational counselors (163)	0.67	0.33	0.42	0.25	0.08	0.83	12
Librarians (164)	0.19	0.16	0.22	0.03	0.06	0.47	32
Archivists and curators (165)	1.00	1.00	0.00	0.00	0.00	1.00	1
Economists, market and survey researchers (166)	0.50	0.31	0.44	0.25	0.00	0.69	16
Psychologists (167)	0.10	0.05	0.24	0.14	0.10	0.43	21
Urban and regional planners (173)	0.00	0.00	0.25	0.00	0.00	0.25	4
Social workers (174)	0.15	0.28	0.17	0.39	0.05	0.60	109
Clergy and religious workers (176)	0.03	0.90	0.90	0.88	0.05	0.98	93
Lawyers and judges (178)	0.21	0.18	0.27	0.12	0.04	0.48	1142
Writers and authors (183)	0.34	0.32	0.41	0.13	0.06	0.67	293
Technical writers (184)	0.13	0.67	0.10	0.04	0.04	0.80	359
Designers (185)	0.25	0.23	0.29	0.10	0.06	0.54	1369
Musicians and composers (186)	0.01	0.02	0.01	0.01	0.00	0.02	162
Actors, directors, and producers (187)	0.75	0.13	0.00	0.13	0.13	0.88	8
Painters, sculptors, craft-artists, and print-makers (188)	0.16	0.22	0.22	0.09	0.05	0.45	211
Photographers (189)	0.82	0.18	0.29	0.43	0.21	0.93	28
Art/entertainment performers and related occs (194)	1.00	0.00	0.00	1.00	0.00	1.00	2
Editors and reporters (195)	0.27	0.24	0.26	0.17	0.08	0.53	172
Athletes, coaches, and officials (199)	0.51	0.40	0.42	0.14	0.07	0.76	136
Clinical laboratory technologies and technicians (203)	0.41	0.30	0.23	0.22	0.05	0.60	145
Dental hygienists (204)	0.22	0.22	0.00	0.11	0.00	0.33	9
Radiologic technologists and technicians (206)	0.26	0.18	0.08	0.23	0.02	0.56	61
Licensed practical nurses (207)	0.12	0.19	0.02	0.13	0.06	0.31	52
Health technologists and technicians, n.e.c (208)	0.33	0.11	0.22	0.44	0.00	0.56	9
Engineering technicians (214)	0.35	0.15	0.25	0.05	0.06	0.61	93
Drafters (217)	0.06	0.06	0.06	0.03	0.04	0.18	592

Surveryors, cartographers, mapping scientists/techs (218)	0.12	0.16	0.10	0.00	0.07	0.35	69
Chemical technicians (224)	0.25	0.00	0.25	0.25	0.00	0.50	4
Other science technicians (225)	0.00	0.00	0.00	0.00	0.00	0.00	1
Airplane pilots and navigators (226)	0.40	0.40	0.40	0.35	0.45	0.65	20
Air traffic controllers (227)	0.00	0.00	0.00	0.00	0.00	0.00	398
Broadcast equipment operators (228)	0.50	0.00	0.00	0.25	0.00	0.75	4
Computer software developers (229)	0.33	0.25	0.33	0.09	0.07	0.61	2656
Programmers of numerically controlled machine tools (233)	0.00	0.00	1.00	0.00	0.00	1.00	1
Legal assistants and paralegals (234)	0.17	0.20	0.18	0.09	0.10	0.47	983
Technicians, n.e.c. (235)	0.19	0.21	0.10	0.16	0.04	0.49	3008
Sales supervisors and proprietors (243)	0.48	0.31	0.29	0.22	0.08	0.66	4645
Insurance sales occupations (253)	0.21	0.20	0.51	0.04	0.44	0.71	129
Real estate sales occupations (254)	0.52	0.21	0.35	0.08	0.09	0.67	392
Advertising and related sales jobs (256)	0.53	0.28	0.40	0.08	0.05	0.79	100
Sales engineers (258)	0.35	0.13	0.17	0.03	0.04	0.53	284
Salespersons, n.e.c. (274)	0.45	0.20	0.20	0.15	0.07	0.63	3793
Retail salespersons and sales clerks (275)	0.24	0.27	0.16	0.13	0.05	0.53	828
Cashiers (276)	0.44	0.48	0.17	0.34	0.05	0.79	197
Door-to-door sales, street sales, and news vendors (277)	0.63	0.16	0.00	0.68	0.00	0.84	19
Sales demonstrators, promoters, and models (283)	0.69	0.15	0.15	0.31	0.00	0.69	13
Office supervisors (303)	0.41	0.47	0.12	0.35	0.00	0.76	17
Computer and peripheral equipment operators (308)	0.24	0.16	0.14	0.14	0.02	0.43	63
Secretaries and stenographers (313)	0.36	0.29	0.16	0.15	0.16	0.63	3195
Typists (315)	0.38	0.44	0.06	0.38	0.13	0.56	16
Interviewers, enumerators, and surveyors (316)	0.62	0.17	0.21	0.24	0.14	0.90	29
Transportation ticket and reservation agents (318)	1.00	0.20	0.20	0.20	0.20	1.00	5
Receptionists and other information clerks (319)	0.34	0.23	0.09	0.18	0.15	0.57	1833
Human resources clerks, excl payroll and timekeeping (328)	0.33	0.00	0.00	0.00	0.33	0.33	3
Library assistants (329)	0.50	0.17	0.08	0.17	0.08	0.67	12
File clerks (335)	0.22	0.33	0.08	0.14	0.20	0.59	51
Bookkeepers and accounting and auditing clerks (337)	0.15	0.24	0.10	0.07	0.11	0.43	2374
Payroll and timekeeping clerks (338)	0.13	0.21	0.02	0.11	0.16	0.43	95
Billing clerks and related financial records processing (344)	0.26	0.34	0.10	0.10	0.12	0.50	68
Mail and paper handlers (346)	0.25	0.50	0.25	0.25	0.00	0.50	4
Telephone operators (348)	0.25	0.13	0.25	0.38	0.13	0.75	8
Other telecom operators (349)	0.00	0.00	0.00	0.00	0.00	0.00	3
Mail carriers for postal service (355)	0.00	1.00	1.00	0.00	0.00	1.00	1
Mail clerks, outside of post office (356)	0.39	0.22	0.00	0.04	0.22	0.52	23
Messengers (357)	0.43	0.36	0.57	0.50	0.14	0.79	14
Dispatchers (359)	0.28	0.28	0.09	0.14	0.09	0.55	148
Shipping and receiving clerks (364)	0.25	0.29	0.09	0.13	0.10	0.48	103
Stock and inventory clerks (365)	0.17	0.20	0.07	0.10	0.02	0.39	41
Meter readers (366)	0.00	0.00	0.00	0.25	0.25	0.50	4
Weighers, measurers, and checkers (368)	0.10	0.15	0.40	0.30	0.00	0.55	20
Material recording, sched., prod., plan., expediting cl. (373)	0.31	0.27	0.17	0.09	0.05	0.52	281
Insurance adjusters, examiners, and investigators (375)	0.31	0.23	0.12	0.08	0.15	0.62	26

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Customer service reps, invest., adjusters, excl. insur. (376)	0.40	0.24	0.11	0.23	0.16	0.63	1700
Eligibility clerks for government prog., social welfare (377)	1.00	0.00	0.00	0.00	0.00	1.00	1
General office clerks (379)	0.26	0.21	0.04	0.17	0.25	0.52	84
Bank tellers (383)	0.44	0.18	0.12	0.29	0.15	0.53	34
Proofreaders (384)	0.09	0.52	0.26	0.13	0.04	0.61	23
Data entry keyers (385)	0.31	0.32	0.10	0.13	0.21	0.63	3046
Teacher's aides (387)	0.00	0.00	1.00	0.00	0.00	1.00	1
Administrative support jobs, n.e.c. (389)	0.83	0.17	0.00	0.00	0.17	1.00	6
Housekeepers, maids, butlers, and cleaners (405)	0.29	0.40	0.21	0.21	0.19	0.54	52
Laundry and dry cleaning workers (408)	0.33	0.33	0.33	0.00	0.67	1.00	3
Fire fighting, fire prevention, and fire inspection occs (417)	0.27	0.44	0.51	0.02	0.04	0.80	45
Police and detectives, public service (418)	0.19	0.01	0.00	0.00	0.00	0.19	386
Sheriffs, bailiffs, correctional institution officers (423)	0.44	0.00	0.06	0.38	0.00	0.50	16
Crossing guards (425)	0.00	0.00	0.00	0.00	0.00	0.00	4
Guards and police, except public service (426)	0.28	0.28	0.26	0.35	0.04	0.64	72
Protective service, n.e.c. (427)	1.00	0.00	1.00	1.00	0.00	1.00	1
Supervisors of food preparation and service (433)	0.00	0.00	0.00	0.00	0.00	0.00	1
Bartenders (434)	0.73	0.36	0.18	0.27	0.09	0.82	11
Waiters and waitresses (435)	0.11	0.18	0.03	0.05	0.53	0.76	38
Cooks (436)	0.50	0.09	0.23	0.18	0.06	0.67	223
Miscellanious food preparation and service workers (444)	0.68	0.39	0.13	0.18	0.09	0.81	95
Dental Assistants (445)	0.05	0.03	0.00	0.04	0.01	0.08	223
Health and nursing aides (447)	0.25	0.15	0.03	0.11	0.01	0.40	205
Supervisors of cleaning and building service (448)	0.00	0.00	0.00	0.00	0.00	0.00	3
Gardeners and groundskeepers (451)	0.44	0.41	0.00	0.37	0.04	0.70	27
Janitors (453)	0.13	0.19	0.13	0.15	0.04	0.41	78
Pest control occupations (455)	0.40	0.11	0.09	0.09	0.09	0.49	35
Hairdressers and cosmetologists (458)	0.00	0.00	0.00	0.00	0.00	0.00	3
Guides (461)	0.50	0.00	0.00	0.00	0.50	0.50	4
Baggage porters, bellhops and concierges (464)	0.37	0.46	0.39	0.26	0.02	0.76	46
Motion picture projectionists (467)	0.00	1.00	0.00	0.00	0.00	1.00	4
Child care workers (468)	0.00	0.17	0.00	0.33	0.00	0.33	6
Animal caretakers, except farm (472)	1.00	0.00	0.00	0.00	0.00	1.00	3
Farm workers, incl. nursery farming (479)	1.00	1.00	1.00	0.00	0.00	1.00	1
Supervisors of mechanics and repairers (503)	0.00	0.00	0.00	0.00	0.00	0.00	3
Automobile mechanics and repairers (505)	0.10	0.00	0.20	0.00	0.00	0.30	10
Bus, truck, and stationary engine mechanics (507)	0.20	0.10	0.00	0.00	0.00	0.20	10
Aircraft mechanics (508)	0.00	0.00	0.00	0.00	0.00	0.00	8
Small engine repairers (509)	0.17	0.50	0.00	0.00	0.00	0.50	6
Auto body repairers (514)	0.38	0.13	0.00	0.38	0.63	0.88	8
Heavy equipement and farm equipment mechanics (516)	0.27	0.00	0.09	0.09	0.00	0.36	11
Machinery maintenance occupations (519)	0.24	0.16	0.08	0.00	0.08	0.40	25
Repairers of household appliances and power tools (526)	0.64	0.64	0.09	0.55	0.18	0.73	11
Telecom and line installers and repairers (527)	0.50	0.00	0.00	0.00	0.00	0.50	2
Repairers of electrical equipment, n.e.c (533)	0.00	0.00	0.00	0.00	0.00	0.00	35
Heating, air conditioning, and refrigeration mechanics (534)	0.58	0.04	0.04	0.00	0.00	0.64	81

Locksmiths and safe repairers (536)	0.00	0.25	0.25	0.25	0.00	0.25	4
Repairers of mechanical controls and valves (539)	0.00	0.00	0.00	0.00	0.00	0.00	1
Elevator installers and repairers (543)	0.50	0.50	0.50	0.00	0.50	0.50	2
Millwrights (544)	0.10	0.20	0.10	0.05	0.05	0.30	20
Mechanics and repairers, n.e.c. (549)	0.22	0.19	0.10	0.11	0.07	0.45	473
Supervisors of construction work (558)	0.05	0.14	0.09	0.05	0.05	0.18	22
Masons, tilers, and carpet installers (563)	0.27	0.16	0.14	0.18	0.04	0.39	56
Carpenters (567)	0.08	0.20	0.04	0.12	0.00	0.32	25
Drywall installers (573)	0.00	0.00	0.00	0.00	0.00	0.00	1
Electricians (575)	0.13	0.13	0.05	0.03	0.01	0.21	384
Electric power installers and repairers (577)	0.50	0.00	0.00	0.50	0.00	0.50	2
Plasterers (584)	0.00	0.00	0.00	0.00	0.00	0.00	2
Plumbers, pipe fitters, and steamfitters (585)	0.18	0.18	0.09	0.09	0.03	0.29	34
Glaziers (589)	0.50	0.00	0.00	0.00	0.00	0.50	2
Roofers and slaters (595)	0.33	0.33	0.00	0.00	0.00	0.67	6
Drillers of earth (598)	0.87	0.13	0.00	0.87	0.00	0.87	15
Drillers of oil wells (614)	0.00	0.00	0.00	0.00	1.00	1.00	1
Explosives workers (615)	0.00	0.00	0.00	0.00	0.00	0.00	2
Miners (616)	0.00	1.00	1.00	0.00	0.00	1.00	1
Other mining occupations (617)	0.00	0.00	1.00	1.00	0.00	1.00	2
Production supervisors or foremen (628)	0.27	0.23	0.20	0.06	0.04	0.50	342
Tool and die makers and die setters (634)	0.07	0.07	0.04	0.04	0.04	0.18	28
Machinists (637)	0.09	0.12	0.09	0.03	0.05	0.25	194
Boilermakers (643)	0.00	0.00	0.60	0.00	0.20	0.80	5
Precision grinders and fitters (644)	0.00	0.33	0.00	0.00	0.00	0.33	3
Patternmakers and model makers (645)	0.31	0.35	0.38	0.00	0.00	0.65	48
Engravers (649)	0.00	0.00	0.00	0.00	0.00	0.00	2
Other metal and plastic workers (653)	1.00	1.00	0.00	0.00	0.00	1.00	3
Cabinetmakers and bench carpeters (657)	0.40	0.00	0.00	0.20	0.00	0.60	5
Furniture/wood finishers, other prec. wood workers (658)	0.50	0.00	0.00	0.50	0.50	0.50	2
Dressmakers, seamstresses, and tailors (666)	0.71	0.00	0.00	0.14	0.00	0.71	7
Upholsterers (668)	0.00	0.00	0.00	0.00	0.00	0.00	1
Hand molders and shapers, except jewelers (675)	0.22	0.22	0.00	0.00	0.22	0.33	9
Dental laboratory and medical applicance technicians (678)	0.00	0.00	0.00	1.00	0.00	1.00	1
Butchers and meat cutters (686)	0.33	0.50	0.00	0.50	0.00	0.67	6
Bakers (687)	0.44	0.12	0.08	0.40	0.20	0.60	25
Power plant operators (695)	0.00	0.00	0.00	0.00	0.00	0.00	9
Plant and system operators, stationary engineers (696)	0.14	0.25	0.11	0.04	0.04	0.41	80
Lathe, milling, and turning machine operatives (703)	0.08	0.08	0.08	0.08	0.03	0.25	40
Punching and stamping press operatives (706)	0.00	0.00	0.00	0.00	0.00	0.00	1
Rollers, roll hands, and finishers of meta (707)	0.12	0.18	0.12	0.06	0.00	0.29	17
Drilling and boring machine operators (708)	0.00	0.00	0.00	0.00	0.00	0.00	2
Grinding, abrading, buffing, and polishing workers (709)	0.26	0.26	0.13	0.13	0.06	0.48	31
Sawing machine operators and sawyers (727)	0.00	0.00	0.00	0.00	0.00	0.00	4
Printing machine operators, n.e.c. (734)	0.00	0.00	0.00	0.00	0.00	0.00	1
Typesetters and compositors (736)	0.00	0.00	0.00	0.00	0.33	0.33	3

Occupation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Winding and twisting textile and apparel operatives (738)	0.17	0.00	0.33	0.17	0.00	0.50	6
Textile sewing machine operators (744)	0.00	0.00	0.00	0.00	0.00	0.00	2
Packers, fillers, and wrappers (754)	0.14	0.17	0.06	0.09	0.04	0.39	80
Furnance, kiln, and oven operators, apart from food (766)	0.00	0.00	0.00	0.00	0.00	0.00	1
Photographic process workers (774)	0.00	0.00	0.00	0.00	0.00	0.00	1
Machine operators, n.e.c. (779)	0.11	0.15	0.05	0.03	0.11	0.31	147
Welders, solderers, and metal cutters (783)	0.08	0.17	0.06	0.07	0.05	0.30	433
Painting and decoration occupations (789)	0.44	0.34	0.34	0.13	0.06	0.59	32
Production checkers, graders, and sorters in manufacturing (799)	0.29	0.32	0.25	0.09	0.05	0.57	307
Supervisors of motor vehicle transportation (803)	0.63	0.63	0.31	0.13	0.13	1.00	16
Truck, delivery, and tractor drivers (804)	0.25	0.31	0.16	0.13	0.06	0.55	3034
Bus drivers (808)	0.17	0.67	0.00	0.33	0.00	0.83	6
Taxi cab drivers and chauffeurs (809)	0.33	0.22	0.11	0.00	0.00	0.56	9
Locomotive operators: engineers and firemen (824)	0.00	0.25	0.00	0.00	0.13	0.38	8
Ship crews and marine engineers (829)	0.00	0.11	0.11	0.00	0.11	0.33	916
Miscellanious transportation occupations (834)	0.00	0.00	0.00	1.00	0.00	1.00	1
Crane, derrick, winch, hoist, longshore operators (848)	0.08	0.31	0.00	0.00	0.00	0.38	13
Excavating and loading machine operators (853)	0.00	0.75	0.50	0.00	0.00	0.75	4
Stevedores and misc. material moving occupations (859)	0.00	0.50	0.00	0.00	0.00	0.50	2
Helpers, constructions (865)	0.00	0.20	0.00	0.40	0.20	0.80	5
Production helpers (873)	0.00	0.50	0.00	0.00	0.00	0.50	2
Machine feeders and offbearers (878)	0.00	0.00	0.00	0.00	0.00	0.00	1
Packers and packagers by hand (888)	0.18	0.06	0.06	0.00	0.00	0.24	17
Laborers, freight, stock, and material handlers, n.e.c. (889)	0.16	0.30	0.05	0.05	0.06	0.44	111

Notes: The table reports the fraction of job ads in a given occupation in which trait descriptive terms associated with the socially desirable (+) trait extreme in the column appear in Columns (1) to (5). Column (6) reports the fraction of ads in an occupation in which any trait descriptive terms appear, while Column (7) reports the number of job ads associated with each occupation. The occupation codes are listed in parentheses.

Appendix Table 3: Trait summary statistics by occupation (-)

Occupation	Int.	Non-Con.	Non-Ope.	Dis-Agree.	Neu.	Any trait	# of ads
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Uncategorized (0)	0.00	0.00	0.00	0.01	0.00	0.46	27383
Chief executives, public administrators, and legislators (4)	0.00	0.00	0.00	0.01	0.00	0.95	195
Financial managers (7)	0.00	0.00	0.00	0.00	0.00	0.35	57
Human resources and labor relations managers (8)	0.01	0.00	0.03	0.02	0.00	0.72	250
Managers and specialists in marketing, advert., PR (13)	0.00	0.00	0.02	0.02	0.00	0.69	14351
Managers in education and related fields (14)	0.00	0.00	0.00	0.00	0.00	1.00	4
Managers of medicine and health occupations (15)	0.00	0.00	0.00	0.00	0.00	0.64	22
Managers of properties and real estate (18)	0.01	0.00	0.01	0.01	0.00	0.61	169
Funeral directors (19)	0.00	0.00	0.00	0.00	0.00	0.33	3
Managers and administrators, n.e.c. (22)	0.00	0.00	0.01	0.01	0.00	0.62	19497
Accountants and auditors (23)	0.00	0.00	0.00	0.01	0.00	0.57	5340
Insurance underwriters (24)	0.00	0.00	0.00	0.00	0.00	0.50	4
Other financial specialists (25)	0.00	0.00	0.00	0.00	0.00	0.36	22
Management analysts (26)	0.00	0.00	0.00	0.06	0.00	0.60	7272
Personnel, HR, training, and labor rel. specialists (27)	0.01	0.00	0.00	0.01	0.00	0.56	86
Buyers, wholesale and retail trade (29)	0.00	0.00	0.00	0.00	0.00	0.25	4
Purchasing managers, agents, and buyers, n.e.c. (33)	0.00	0.00	0.00	0.01	0.00	0.62	574
Business and promotion agents (34)	0.00	0.00	0.00	0.00	0.00	0.00	1
Construction inspectors (35)	0.00	0.00	0.00	0.00	0.00	0.36	11
Inspectors and compliance officers, outside (36)	0.00	0.00	0.00	0.00	0.00	0.41	314
Management support occupations (37)	0.00	0.00	0.00	0.00	0.00	0.75	149
Architects (43)	0.00	0.00	0.00	0.04	0.00	0.50	614
Aerospace engineers (44)	0.00	0.00	0.00	0.00	0.00	0.43	68
Metallurgical and materials engineers (45)	0.00	0.00	0.00	0.03	0.00	0.42	33
Petroleum, mining, and geological engineers (47)	0.00	0.00	0.00	0.00	0.00	0.30	20
Chemical engineers (48)	0.00	0.00	0.00	0.02	0.00	0.45	159
Civil engineers (53)	0.00	0.00	0.01	0.00	0.00	0.37	454
Electrical engineers (55)	0.00	0.00	0.00	0.04	0.00	0.42	917
Industrial engineers (56)	0.00	0.00	0.00	0.02	0.00	0.69	167
Mechanical engineers (57)	0.00	0.00	0.00	0.00	0.00	0.36	629
Engineers and other professionals, n.e.c (59)	0.00	0.00	0.00	0.02	0.00	0.51	7831
Computer systems analysts and computer scientists (64)	0.00	0.20	0.00	0.00	0.00	0.47	15
Operations and systems researchers and analysts (65)	0.00	0.00	0.00	0.01	0.00	0.63	665
Actuaries (66)	0.00	0.00	0.00	0.00	0.00	0.68	50
Mathematicians and statisticians (68)	0.00	0.00	0.00	0.01	0.00	0.60	99
Physicists and astronomists (69)	0.00	0.00	0.00	0.00	0.00	0.36	14
Chemists (73)	0.01	0.00	0.00	0.01	0.00	0.57	161
Atmospheric and space scientists (74)	0.00	0.00	0.00	0.00	0.00	0.00	1
Geologists (75)	0.00	0.00	0.00	0.00	0.00	0.57	60
Agricultural and food scientists (77)	0.00	0.00	0.00	0.00	0.00	0.67	6
Biological scientists (78)	0.00	0.00	0.00	0.00	0.00	0.14	36
Foresters and conservation scientists (79)	0.00	0.00	0.00	0.00	0.00	0.00	2

Medical scientists (83)	0.00	0.00	0.00	0.00	0.00	1.00	1
Physicians (84)	0.00	0.00	0.01	0.00	0.00	0.32	1538
Dentists (85)	0.00	0.00	0.00	0.00	0.01	0.02	804
Veterinarians (86)	0.00	0.00	0.00	0.00	0.00	0.88	17
Optometrists (87)	0.00	0.00	0.00	0.00	0.00	0.17	6
Podiatrists (88)	0.00	0.00	0.00	0.00	0.00	0.00	1
Other health and therapy occupations (89)	0.00	0.00	0.00	0.00	0.00	0.00	1
Registered nurses (95)	0.00	0.00	0.00	0.00	0.00	0.36	2963
Pharmacists (96)	0.00	0.00	0.00	0.00	0.00	0.11	993
Dieticians and nutritionists (97)	0.00	0.00	0.00	0.00	0.00	0.00	5
Respiratory therapists (98)	0.00	0.00	0.00	0.00	0.00	0.55	76
Occupational therapists (99)	0.01	0.00	0.00	0.01	0.00	0.46	148
Physical therapists (103)	0.00	0.00	0.00	0.00	0.00	0.49	329
Speech therapists (104)	0.00	0.00	0.00	0.00	0.00	0.73	11
Therapists, n.e.c. (105)	0.00	0.00	0.00	0.01	0.00	0.48	90
Physicians' assistants (106)	0.00	0.00	0.00	0.00	0.00	0.16	25
Kindergarten and earlier school teachers (155)	0.00	0.00	0.00	0.00	0.00	0.78	23
Primary school teachers (156)	0.00	0.00	0.00	0.00	0.00	1.00	1
Special education teachers (158)	0.00	0.00	0.00	0.20	0.00	0.60	5
Teachers, n.e.c. (159)	0.00	0.00	0.01	0.00	0.01	0.58	567
Vocational and educational counselors (163)	0.00	0.00	0.00	0.00	0.08	0.83	12
Librarians (164)	0.00	0.00	0.00	0.00	0.00	0.47	32
Archivists and curators (165)	0.00	0.00	0.00	0.00	0.00	1.00	1
Economists, market and survey researchers (166)	0.00	0.00	0.00	0.00	0.00	0.69	16
Psychologists (167)	0.00	0.00	0.00	0.00	0.00	0.43	21
Urban and regional planners (173)	0.00	0.00	0.00	0.00	0.00	0.25	4
Social workers (174)	0.00	0.00	0.00	0.00	0.00	0.60	109
Clergy and religious workers (176)	0.04	0.00	0.00	0.00	0.00	0.98	93
Lawyers and judges (178)	0.00	0.00	0.00	0.02	0.00	0.48	1142
Writers and authors (183)	0.00	0.00	0.03	0.02	0.02	0.67	293
Technical writers (184)	0.00	0.00	0.00	0.01	0.00	0.80	359
Designers (185)	0.00	0.00	0.01	0.02	0.00	0.54	1369
Musicians and composers (186)	0.00	0.00	0.01	0.00	0.00	0.02	162
Actors, directors, and producers (187)	0.00	0.00	0.00	0.00	0.00	0.88	8
Painters, sculptors, craft-artists, and print-makers (188)	0.00	0.00	0.00	0.01	0.00	0.45	211
Photographers (189)	0.00	0.00	0.00	0.00	0.00	0.93	28
Art/entertainment performers and related occs (194)	0.00	0.00	0.00	0.00	0.00	1.00	2
Editors and reporters (195)	0.02	0.00	0.00	0.02	0.01	0.53	172
Athletes, coaches, and officials (199)	0.00	0.00	0.02	0.01	0.00	0.76	136
Clinical laboratory technologies and technicians (203)	0.00	0.00	0.00	0.00	0.00	0.60	145
Dental hygienists (204)	0.00	0.00	0.00	0.00	0.00	0.33	9
Radiologic technologists and technicians (206)	0.00	0.00	0.00	0.00	0.00	0.56	61
Licensed practical nurses (207)	0.02	0.00	0.00	0.00	0.00	0.31	52
Health technologists and technicians, n.e.c (208)	0.00	0.00	0.00	0.00	0.00	0.56	9
Engineering technicians (214)	0.00	0.00	0.00	0.01	0.00	0.61	93
Drafters (217)	0.00	0.00	0.00	0.00	0.00	0.18	592

Surveryors, cartographers, mapping scientists/techs (218)	0.00	0.00	0.01	0.00	0.00	0.35	69
Chemical technicians (224)	0.00	0.00	0.00	0.00	0.00	0.50	4
Other science technicians (225)	0.00	0.00	0.00	0.00	0.00	0.00	1
Airplane pilots and navigators (226)	0.00	0.00	0.05	0.00	0.00	0.65	20
Air traffic controllers (227)	0.00	0.00	0.00	0.00	0.00	0.00	398
Broadcast equipment operators (228)	0.00	0.00	0.00	0.00	0.00	0.75	4
Computer software developers (229)	0.00	0.00	0.00	0.04	0.00	0.61	2656
Programmers of numerically controlled machine tools (233)	0.00	0.00	0.00	0.00	0.00	1.00	1
Legal assistants and paralegals (234)	0.00	0.00	0.00	0.00	0.00	0.47	983
Technicians, n.e.c. (235)	0.00	0.00	0.00	0.01	0.00	0.49	3008
Sales supervisors and proprietors (243)	0.00	0.00	0.00	0.01	0.00	0.66	4645
Insurance sales occupations (253)	0.00	0.00	0.00	0.00	0.00	0.71	129
Real estate sales occupations (254)	0.00	0.00	0.00	0.00	0.00	0.67	392
Advertising and related sales jobs (256)	0.00	0.03	0.00	0.02	0.00	0.79	100
Sales engineers (258)	0.00	0.00	0.00	0.02	0.00	0.53	284
Salespersons, n.e.c. (274)	0.00	0.00	0.00	0.02	0.00	0.63	3793
Retail salespersons and sales clerks (275)	0.00	0.00	0.01	0.02	0.00	0.53	828
Cashiers (276)	0.00	0.00	0.00	0.01	0.00	0.79	197
Door-to-door sales, street sales, and news vendors (277)	0.00	0.00	0.00	0.00	0.00	0.84	19
Sales demonstrators, promoters, and models (283)	0.00	0.00	0.00	0.00	0.00	0.69	13
Office supervisors (303)	0.00	0.00	0.00	0.06	0.00	0.76	17
Computer and peripheral equipment operators (308)	0.00	0.00	0.00	0.00	0.00	0.43	63
Secretaries and stenographers (313)	0.00	0.00	0.00	0.01	0.00	0.63	3195
Typists (315)	0.00	0.00	0.00	0.00	0.00	0.56	16
Interviewers, enumerators, and surveyors (316)	0.00	0.00	0.00	0.03	0.00	0.90	29
Transportation ticket and reservation agents (318)	0.00	0.00	0.00	0.00	0.00	1.00	5
Receptionists and other information clerks (319)	0.00	0.00	0.00	0.00	0.00	0.57	1833
Human resources clerks, excl payroll and timekeeping (328)	0.00	0.00	0.00	0.00	0.00	0.33	3
Library assistants (329)	0.00	0.00	0.00	0.00	0.00	0.67	12
File clerks (335)	0.04	0.00	0.00	0.00	0.00	0.59	51
Bookkeepers and accounting and auditing clerks (337)	0.00	0.00	0.00	0.00	0.00	0.43	2374
Payroll and timekeeping clerks (338)	0.01	0.00	0.00	0.01	0.00	0.43	95
Billing clerks and related financial records processing (344)	0.00	0.00	0.00	0.00	0.00	0.50	68
Mail and paper handlers (346)	0.00	0.00	0.00	0.00	0.00	0.50	4
Telephone operators (348)	0.00	0.00	0.00	0.00	0.00	0.75	8
Other telecom operators (349)	0.00	0.00	0.00	0.00	0.00	0.00	3
Mail carriers for postal service (355)	0.00	0.00	0.00	0.00	0.00	1.00	1
Mail clerks, outside of post office (356)	0.00	0.00	0.00	0.00	0.00	0.52	23
Messengers (357)	0.00	0.00	0.00	0.00	0.00	0.79	14
Dispatchers (359)	0.00	0.00	0.00	0.00	0.01	0.55	148
Shipping and receiving clerks (364)	0.00	0.00	0.00	0.01	0.00	0.48	103
Stock and inventory clerks (365)	0.00	0.00	0.00	0.02	0.00	0.39	41
Meter readers (366)	0.00	0.00	0.00	0.00	0.00	0.50	4
Weighers, measurers, and checkers (368)	0.00	0.00	0.00	0.00	0.00	0.55	20
Material recording, sched., prod., plan., expediting cl. (373)	0.00	0.00	0.00	0.00	0.00	0.52	281
Insurance adjusters, examiners, and investigators (375)	0.00	0.00	0.00	0.00	0.00	0.62	26

Customer service reps, invest., adjusters, excl. insur. (376)	0.00	0.00	0.00	0.00	0.00	0.63	1700
Eligibility clerks for government prog., social welfare (377)	0.00	0.00	0.00	0.00	0.00	1.00	1
General office clerks (379)	0.00	0.00	0.00	0.00	0.00	0.52	84
Bank tellers (383)	0.00	0.00	0.00	0.00	0.00	0.53	34
Proofreaders (384)	0.00	0.00	0.00	0.00	0.00	0.61	23
Data entry keyers (385)	0.00	0.00	0.00	0.00	0.00	0.63	3046
Teacher's aides (387)	0.00	0.00	0.00	0.00	0.00	1.00	1
Administrative support jobs, n.e.c. (389)	0.00	0.00	0.00	0.00	0.00	1.00	6
Housekeepers, maids, butlers, and cleaners (405)	0.00	0.00	0.00	0.00	0.00	0.54	52
Laundry and dry cleaning workers (408)	0.00	0.00	0.00	0.00	0.00	1.00	3
Fire fighting, fire prevention, and fire inspection occs (417)	0.00	0.00	0.00	0.02	0.00	0.80	45
Police and detectives, public service (418)	0.00	0.00	0.00	0.00	0.00	0.19	386
Sheriffs, bailiffs, correctional institution officers (423)	0.00	0.00	0.00	0.00	0.00	0.50	16
Crossing guards (425)	0.00	0.00	0.00	0.00	0.00	0.00	4
Guards and police, except public service (426)	0.07	0.00	0.01	0.00	0.00	0.64	72
Protective service, n.e.c. (427)	0.00	0.00	0.00	0.00	0.00	1.00	1
Supervisors of food preparation and service (433)	0.00	0.00	0.00	0.00	0.00	0.00	1
Bartenders (434)	0.09	0.00	0.18	0.00	0.00	0.82	11
Waiters and waitresses (435)	0.00	0.00	0.00	0.00	0.00	0.76	38
Cooks (436)	0.00	0.00	0.01	0.03	0.00	0.67	223
Miscellanious food preparation and service workers (444)	0.00	0.00	0.00	0.00	0.00	0.81	95
Dental Assistants (445)	0.00	0.00	0.00	0.00	0.00	0.08	223
Health and nursing aides (447)	0.00	0.00	0.00	0.00	0.00	0.40	205
Supervisors of cleaning and building service (448)	0.00	0.00	0.00	0.00	0.00	0.00	3
Gardeners and groundskeepers (451)	0.00	0.00	0.07	0.00	0.00	0.70	27
Janitors (453)	0.00	0.00	0.00	0.00	0.00	0.41	78
Pest control occupations (455)	0.00	0.00	0.00	0.03	0.00	0.49	35
Hairdressers and cosmetologists (458)	0.00	0.00	0.00	0.00	0.00	0.00	3
Guides (461)	0.00	0.00	0.00	0.00	0.50	0.50	4
Baggage porters, bellhops and concierges (464)	0.00	0.00	0.00	0.00	0.00	0.76	46
Motion picture projectionists (467)	0.00	0.00	0.00	0.00	0.00	1.00	4
Child care workers (468)	0.00	0.00	0.00	0.00	0.00	0.33	6
Animal caretakers, except farm (472)	0.00	0.00	0.00	0.00	0.00	1.00	3
Farm workers, incl. nursery farming (479)	0.00	0.00	0.00	0.00	0.00	1.00	1
Supervisors of mechanics and repairers (503)	0.00	0.00	0.00	0.00	0.00	0.00	3
Automobile mechanics and repairers (505)	0.00	0.00	0.00	0.00	0.00	0.30	10
Bus, truck, and stationary engine mechanics (507)	0.00	0.00	0.00	0.00	0.00	0.20	10
Aircraft mechanics (508)	0.00	0.00	0.00	0.00	0.00	0.00	8
Small engine repairers (509)	0.00	0.00	0.00	0.00	0.00	0.50	6
Auto body repairers (514)	0.00	0.00	0.00	0.00	0.00	0.88	8
Heavy equipement and farm equipment mechanics (516)	0.00	0.00	0.09	0.00	0.00	0.36	11
Machinery maintenance occupations (519)	0.00	0.00	0.00	0.00	0.00	0.40	25
Repairers of household appliances and power tools (526)	0.00	0.00	0.00	0.00	0.00	0.73	11
Telecom and line installers and repairers (527)	0.00	0.00	0.00	0.00	0.00	0.50	2
Repairers of electrical equipment, n.e.c (533)	0.00	0.00	0.00	0.00	0.00	0.00	35
Heating, air conditioning, and refrigeration mechanics (534)	0.00	0.00	0.00	0.01	0.00	0.64	81

Locksmiths and safe repairers (536)	0.00	0.00	0.00	0.00	0.00	0.25	4
Repairers of mechanical controls and valves (539)	0.00	0.00	0.00	0.00	0.00	0.00	1
Elevator installers and repairers (543)	0.00	0.00	0.00	0.00	0.00	0.50	2
Millwrights (544)	0.00	0.00	0.00	0.00	0.00	0.30	20
Mechanics and repairers, n.e.c. (549)	0.00	0.00	0.00	0.00	0.00	0.45	473
Supervisors of construction work (558)	0.00	0.00	0.00	0.00	0.00	0.18	22
Masons, tilers, and carpet installers (563)	0.00	0.00	0.02	0.00	0.00	0.39	56
Carpenters (567)	0.00	0.00	0.00	0.00	0.00	0.32	25
Drywall installers (573)	0.00	0.00	0.00	0.00	0.00	0.00	1
Electricians (575)	0.00	0.00	0.00	0.00	0.00	0.21	384
Electric power installers and repairers (577)	0.00	0.00	0.00	0.00	0.00	0.50	2
Plasterers (584)	0.00	0.00	0.00	0.00	0.00	0.00	2
Plumbers, pipe fitters, and steamfitters (585)	0.00	0.00	0.00	0.00	0.00	0.29	34
Glaziers (589)	0.00	0.00	0.00	0.00	0.00	0.50	2
Roofers and slaters (595)	0.00	0.00	0.00	0.00	0.00	0.67	6
Drillers of earth (598)	0.00	0.00	0.00	0.00	0.00	0.87	15
Drillers of oil wells (614)	0.00	0.00	0.00	0.00	0.00	1.00	1
Explosives workers (615)	0.00	0.00	0.00	0.00	0.00	0.00	2
Miners (616)	0.00	0.00	0.00	0.00	0.00	1.00	1
Other mining occupations (617)	0.00	0.00	0.00	0.00	0.00	1.00	2
Production supervisors or foremen (628)	0.00	0.00	0.00	0.00	0.01	0.50	342
Tool and die makers and die setters (634)	0.00	0.00	0.00	0.00	0.00	0.18	28
Machinists (637)	0.00	0.00	0.00	0.00	0.00	0.25	194
Boilermakers (643)	0.00	0.00	0.00	0.00	0.00	0.80	5
Precision grinders and fitters (644)	0.00	0.00	0.00	0.00	0.00	0.33	3
Patternmakers and model makers (645)	0.00	0.00	0.00	0.19	0.00	0.65	48
Engravers (649)	0.00	0.00	0.00	0.00	0.00	0.00	2
Other metal and plastic workers (653)	0.00	0.00	0.00	0.00	0.00	1.00	3
Cabinetmakers and bench carpeters (657)	0.00	0.00	0.00	0.00	0.00	0.60	5
Furniture/wood finishers, other prec. wood workers (658)	0.00	0.00	0.00	0.00	0.00	0.50	2
Dressmakers, seamstresses, and tailors (666)	0.00	0.00	0.14	0.00	0.00	0.71	7
Upholsterers (668)	0.00	0.00	0.00	0.00	0.00	0.00	1
Hand molders and shapers, except jewelers (675)	0.00	0.00	0.00	0.00	0.00	0.33	9
Dental laboratory and medical applicance technicians (678)	0.00	0.00	0.00	0.00	0.00	1.00	1
Butchers and meat cutters (686)	0.00	0.00	0.00	0.00	0.00	0.67	6
Bakers (687)	0.00	0.00	0.00	0.00	0.00	0.60	25
Power plant operators (695)	0.00	0.00	0.00	0.00	0.00	0.00	9
Plant and system operators, stationary engineers (696)	0.00	0.00	0.00	0.00	0.01	0.41	80
Lathe, milling, and turning machine operatives (703)	0.00	0.00	0.00	0.00	0.00	0.25	40
Punching and stamping press operatives (706)	0.00	0.00	0.00	0.00	0.00	0.00	1
Rollers, roll hands, and finishers of meta (707)	0.00	0.00	0.00	0.00	0.00	0.29	17
Drilling and boring machine operators (708)	0.00	0.00	0.00	0.00	0.00	0.00	2
Grinding, abrading, buffing, and polishing workers (709)	0.00	0.00	0.00	0.00	0.00	0.48	31
Sawing machine operators and sawyers (727)	0.00	0.00	0.00	0.00	0.00	0.00	4
Printing machine operators, n.e.c. (734)	0.00	0.00	0.00	0.00	0.00	0.00	1
Typesetters and compositors (736)	0.00	0.00	0.00	0.00	0.00	0.33	3

Occupation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Winding and twisting textile and apparel operatives (738)	0.00	0.00	0.00	0.00	0.00	0.50	6
Textile sewing machine operators (744)	0.00	0.00	0.00	0.00	0.00	0.00	2
Packers, fillers, and wrappers (754)	0.00	0.00	0.00	0.03	0.00	0.39	80
Furnance, kiln, and oven operators, apart from food (766)	0.00	0.00	0.00	0.00	0.00	0.00	1
Photographic process workers (774)	0.00	0.00	0.00	0.00	0.00	0.00	1
Machine operators, n.e.c. (779)	0.00	0.00	0.00	0.01	0.00	0.31	147
Welders, solderers, and metal cutters (783)	0.00	0.00	0.00	0.01	0.00	0.30	433
Painting and decoration occupations (789)	0.00	0.00	0.00	0.00	0.00	0.59	32
Production checkers, graders, and sorters in manufacturing (799)	0.00	0.00	0.00	0.02	0.00	0.57	307
Supervisors of motor vehicle transportation (803)	0.00	0.00	0.00	0.00	0.00	1.00	16
Truck, delivery, and tractor drivers (804)	0.00	0.00	0.02	0.04	0.00	0.55	3034
Bus drivers (808)	0.00	0.00	0.00	0.17	0.00	0.83	6
Taxi cab drivers and chauffeurs (809)	0.00	0.00	0.00	0.00	0.00	0.56	9
Locomotive operators: engineers and firemen (824)	0.00	0.00	0.00	0.00	0.00	0.38	8
Ship crews and marine engineers (829)	0.11	0.00	0.00	0.00	0.00	0.33	916
Miscellanious transportation occupations (834)	0.00	0.00	0.00	0.00	0.00	1.00	1
Crane, derrick, winch, hoist, longshore operators (848)	0.00	0.00	0.00	0.00	0.00	0.38	13
Excavating and loading machine operators (853)	0.00	0.00	0.00	0.00	0.00	0.75	4
Stevedores and misc. material moving occupations (859)	0.00	0.00	0.00	0.00	0.00	0.50	2
Helpers, constructions (865)	0.00	0.00	0.00	0.00	0.00	0.80	5
Production helpers (873)	0.00	0.00	0.00	0.00	0.00	0.50	2
Machine feeders and offbearers (878)	0.00	0.00	0.00	0.00	0.00	0.00	1
Packers and packagers by hand (888)	0.00	0.00	0.06	0.00	0.00	0.24	17
Laborers, freight, stock, and material handlers, n.e.c. (889)	0.00	0.00	0.01	0.00	0.00	0.44	111

Notes: The table reports the fraction of job ads in a given occupation in which trait descriptive terms associated with the less socially desirable (-) trait extreme in the column appear in Columns (1) to (5). Column (6) reports the fraction of ads in an occupation in which any trait descriptive terms appear, while Column (7) reports the number of job ads associated with each occupation. The occupation codes are listed in parentheses.