

## FIVE REASONS WHY THE "BIG FIVE" ARTICLE HAS BEEN FREQUENTLY CITED

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*The Most Frequently Cited Article of the 1990s*

### **The Big Five Personality Dimensions and Job Performance: A Meta-Analysis**

This study investigated the relation of the "Big Five" personality dimensions (Extraversion, Emotional Stability, Agreeableness, Conscientiousness, and Openness to Experience) to three job performance criteria (job proficiency, training proficiency, and personnel data) for five occupational groups (professionals, police, managers, sales, and skill/semi-skilled). Results indicated that one dimension of personality, Conscientiousness, showed consistent relations with all job performance criteria for all occupational groups. For the remaining personality dimensions, the estimated true score correlations varied by occupational group and criterion type. Extraversion was a valid predictor for two occupations involving social interaction, managers and sales (across criterion types). Also, both Openness to Experience and Extraversion were valid predictors of the training proficiency criterion (across occupations). Other personality dimensions were also found to be valid predictors for some occupations and some criterion types, but the magnitude of the estimated true score correlations was small ( $p < .10$ ). Overall, the results illustrate the benefits of using the 5-factor model of personality to accumulate and communicate empirical findings. The findings have numerous implications for research and practice in personnel psychology, especially in the subfields of personnel selection, training and development, and performance appraisal.

The idea for our study grew out of our belief that people do, in fact, have long term, dispositional traits that influence their behavior in work settings. Although this idea is relatively well accepted now, at the time we conducted our 1991 study most conclusions in the literature about the usefulness of personality measures in personnel selection were quite

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We acknowledge the helpful comments of Wally Borman, Mike Campion, Bob Hogan, Tim Judge, Tom Lee, Deniz Ones, Joe Rosse, Craig Russell, Paul Sackett, and Greg Stewart for their helpful comments.

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pessimistic (e.g., Guion & Gottier, 1965; Mischel, 1968; Weiss & Adler, 1984). Nonetheless, we believed that there were meaningful relationships between individuals' personalities and performance outcomes at work that, for whatever reason, had not been discovered in previous research. We felt that the time was right to conduct a large-scale review of the personality-job performance literature. The critical issue facing us was how our study would contribute in ways that other studies had not.

We reviewed the literature with an eye toward understanding why the conclusions reached by previous researchers were so pessimistic. Based on our interpretation of the literature, we arrived at two major observations. First, literally thousands of personality traits had been investigated and/or potentially could be investigated. The sheer number of such traits made a review of research findings in this area unwieldy. To complicate matters, in a limited number of cases traits with the same names had different meanings, and in other cases traits with different names had the same meaning. The second observation was that most prior reviews of personality and performance were narrative reviews, which limited the nature of the inferences that could be drawn.

Based on the first concern, we recognized that it would be necessary to reduce the thousands of traits to a much smaller number of factors, and to do so in a way that was defensible and accepted by the field. How to do this became the number one priority, as we did not think the study would be worth undertaking unless this could be done in a conceptually meaningful way. As a starting point, we consulted with Jacob Sines of the Psychology Department at the University of Iowa. We are indebted to him for pointing us in the direction of the Big Five. We read the literature pertaining to the structure of personality and were especially influenced by Digman's (1990) chapter in the *Annual Review of Psychology*. Among other things, it showed that while there was not unanimous agreement among researchers, the views of a number of personality psychologists were converging (more or less) on five basic factors of personality. Particularly impressive was the evidence showing that these five factors had been obtained in different cultures, with different languages, using different instruments and with different theoretical frameworks. The solid scientific foundation of this taxonomy provided a defensible organizing framework that enabled us to proceed with our study. In our opinion, this was the missing link in studies seeking to understand personality-performance relationships.

Based on the second concern, we recognized that meta-analysis would be an appropriate data analytic tool for cumulating the personality-performance relationships across studies, and would provide numerous advantages over a narrative approach. Frank Schmidt and Jack Hunter had used validity generalization methods to demonstrate the validity of

General Mental Ability (GMA) across jobs and organizations. Many of the same problems that had plagued the research pertaining to GMA also applied to research pertaining to personality: sampling error due to small samples, measurement error in criteria and predictors, range restriction, and dichotomization of continuous measures—all of which distorted the research findings. We envisioned that by using meta-analytic methods we might be able to demonstrate validity generalization for one or more of the Big Five dimensions. If we could find even one personality factor whose validity generalized across jobs and occupations, it would have important practical and theoretical implications.

We felt that the use of the Big Five framework coupled with meta-analytic methods provided a solid foundation for investigating the questions of interest. Privately, however, we worried that the I-O field might not embrace the 5-factor model, particularly given that it was new to many in the field, and that it was not universally accepted by all personality researchers. Nonetheless, we proceeded with the idea that we would be able to ask and, hopefully, answer meaningful questions in a different way than those researchers before us.

We reanalyzed all available published and unpublished research from 1952 to 1988 by categorizing scales from personality inventories into the 5-factor model categories (i.e., Extraversion, Emotional Stability, Agreeableness, Conscientiousness, and Openness to Experience) or into a sixth, miscellaneous category. We examined the predictive validity of these scales for three performance criteria (i.e., job proficiency, training proficiency, and personnel data) in five different occupational groups (i.e., professionals, police, managers, sales, and skilled/semi-skilled).

The major finding was that one of the Big Five dimensions, Conscientiousness, correlated positively with job performance in all five occupational groups. Individuals who are dependable, persistent, goal directed and organized tend to be higher performers on virtually any job; viewed negatively, those who are careless, irresponsible, low achievement striving and impulsive tend to be lower performers on virtually any job. In addition, we found that extraversion was a valid predictor for two occupations (across criterion types), managers and sales, where interactions with others are a significant portion of the job. Thus, traits such as being sociable, talkative, assertive, and energetic contribute to performance in such jobs.

We also found that Extraversion and Openness to Experience were valid predictors of training proficiency across occupations. Being active, sociable, and open to new experiences may lead individuals to be more involved in training and, consequently, learn more. As an aside, we have been somewhat surprised that this finding has not had more of an impact. Most of the citations of our article pertain to personality in selection

contexts. There remains a relative void in the literature regarding the relationship between personality dimensions and training outcomes.

On one hand, we were excited and heartened by the findings regarding Conscientiousness and believed they could play a key role in developing comprehensive theories of job performance. Our research in subsequent years has investigated the processes by which Conscientiousness affects job performance. On the other hand, we were somewhat disappointed and a little dismayed at the relatively low magnitude of the correlations for Conscientiousness ( $\rho = .21$  to  $.23$ ) and the other four dimensions. However, we reasoned that the raw correlations used in the meta-analyses were based on single scales from personality inventories, which are imperfect measures of the Big Five constructs. For example, when composite measures of Conscientiousness are used the true validity is .31 (Mount & Barrick, 1995). We also found that Conscientiousness is more strongly related to those criteria that are substantially determined by motivational effort or "will do" factors ( $\rho = .42$ ) rather than by ability or "can do" factors ( $\rho = .25$ ). This underscores the importance of the conscientiousness construct as a measure of trait-oriented motivation. The magnitude of these validities was more encouraging, though still well below those for GMA.

The finding that Extraversion predicted successful performance in jobs involving interactions with others was also intriguing, and we believed it could also have important practical and theoretical implications. A recent meta-analysis builds on these findings (Mount, Barrick, & Stewart, 1998) by examining the relationship of personality to performance in jobs involving considerable interpersonal interaction, either with customers or with other employees. Findings indicate that Emotional Stability, Agreeableness, and Conscientiousness are also positively related to on-the-job success in these jobs. Furthermore, these relations appear to be stronger for jobs requiring teamwork interactions among employees than for jobs requiring interpersonal interactions with customers. Consequently, in such jobs, viewed from the negative pole, those who are anxious, insecure, emotional, and tense (low emotional stability), argumentative, inflexible, uncooperative, and uncaring (low agreeableness), and impulsive, irresponsible, careless, and lazy (low conscientiousness) tend to be less effective in interactions with others at work. These findings demonstrate that Big Five personality characteristics other than Conscientiousness are meaningfully related to criteria, but their predictive efficiency is more situationally specific than Conscientiousness.

At the time we conducted our study, two other meta-analyses of personality-performance relationships were being conducted (Hough, Eaton, Dunnette, Kamp & McCloy, 1990; Tett, Jackson & Rothstein,

1991). Subsequently, another meta-analysis of studies in the European community was conducted (Salgado, 1997). Some of the validities reported for Big Five constructs in these studies differed from those reported in our study, and in some cases the differences were quite large. For example, true score validities for the same construct differed by .30 or more. For agreeableness, Tett et al. reported a validity of .33, whereas Hough et al. and Salgado reported a validity of  $-.01$  (for job proficiency and ratings of performance, respectively). And, for openness to experience Tett et al. reported a validity of .27, whereas we reported a validity of  $-.03$  (for job proficiency). Further, we found that conscientiousness was a valid predictor of job performance in all jobs studied and for all criterion types, but Tett et al. found that it had lower validity than three other personality constructs: Agreeableness, Openness to Experience, and Emotional Stability. Moreover, the highest validity in the Tett et al. study was for Agreeableness. Goldberg (1993) pointed out that this inconsistency in the findings between two large-scale quantitative reviews of a similar body of knowledge was "befuddling."

Two articles that appeared in *Personnel Psychology* in 1994 (Ones, Mount, Barrick & Hunter, 1994; Tett, Jackson, Rothstein & Reddon, 1994) sought to explain these discrepant results. At least some of the differences can be explained by the fact that the studies had different purposes and made different assumptions in the meta-analytic procedures. In retrospect, however, we believe the debate was only moderately successful in resolving the discrepancies between the two studies. We, like most people we talked to informally who had read the original articles and the ensuing critiques, felt that although some important issues had been clarified, those pertaining to the Big Five results had not. Perhaps the most important outcome of the debate was that it stimulated additional research and illustrated that there are complex methodological and theoretical issues that must be considered when conducting research in this area. Clearly, the field of personnel psychology has made great strides in the past decade in understanding the role of personality measures in personnel selection. Nonetheless, much needs to be done before we understand the intricate relationships that exist between particular personality constructs and job performance measures. One useful study would be to examine existing meta-analytic studies that have used the Big Five framework with the objective of identifying and resolving the apparent discrepancies in results. It is possible that if methodological differences and statistical artifacts are corrected in similar ways across the meta-analyses, there may actually be more consistencies in the findings than appears at present.

The foregoing has highlighted why we conducted the study, some of the issues we addressed in conducting the study, and the major findings.

The issue John Hollenbeck asked us to address was why we think this article has been cited so frequently. As of July 1, 1998, the article had been cited slightly more than 200 times (Social Science Citation Index). We don't know for certain what factors led to our article being widely cited; nonetheless, we have several ideas and we discuss them below. We also thought it would be interesting and worthwhile to pose this question to other researchers. We asked a non-random sample of prominent researchers in the field for their views on this question. Their responses revealed several common themes that agreed quite closely with our views. In the paragraphs that follow, we offer five (what else) possible reasons why our study has been frequently cited.

First, our paper addressed one of the most fundamental topics in the field of industrial-organizational psychology. Understanding individual differences and their implications for behavior at work is one of the central tenets of our field, and personality characteristics are central to understanding individual differences. Thus, our topic is important to the field and has widespread appeal as a result.

Second, the study was one of the first to introduce the Big Five personality framework to the industrial-organizational psychology field. It is a simple and parsimonious way to classify the thousands of personality traits that exist in the English language. This taxonomy was well known in the field of personality psychology, though not universally accepted at the time the article was written; however it was less well known and understood in the field of industrial-organizational psychology. Thus the taxonomy itself had informational value to the field quite aside from the findings of the study. It is quite possible that if someone had written a review article about the Big Five (without the meta-analytic analysis) and had discussed the numerous implications of the taxonomy for the I-O field, the article would have been widely cited. Clearly, it would have been difficult for us to conduct our study and for it to have the impact it has had without the Big Five taxonomy. It was instrumental in organizing the multitude of traits and was equally important as a vehicle for parsimoniously communicating the results.

Third, the timing of the study was a factor. Several people mentioned that it was the right article at the right time. (Sometimes you just get lucky.) Around the time we conducted our study, we think the field of industrial-organizational psychology was receptive to a paradigmatic shift in thinking about the utility of non-cognitive predictors such as personality measures. Meta-analytic evidence accumulated during the 1980s showed that cognitive ability tests were valid predictors of performance in most, if not all, jobs in the U.S. economy (Hunter & Hunter, 1984; Schmidt, Hunter, & Pearlman 1981; Schmitt, Gooding, Noe, & Kirsch, 1984). Following this finding there was considerable interest in

the field in identifying additional predictors to add incremental validity to cognitive ability in predicting job performance while simultaneously reducing adverse impact.

In the 1970s and 1980s there was relatively little research being published that directly examined the validity of personality measures for predicting performance. Some have referred to this period humorously as the time when we had no personalities. There had been a few presentations at SIOP and some limited research published in journals in the 1980s that investigated personality and its relationship to job performance. Yet not enough consistent information had accumulated to alter the prior pessimistic conclusions. As mentioned earlier, unbeknownst to us at the time we embarked on our study, Leatta Hough and her colleagues (e.g., Hough et al. 1990) had also concluded that the best way to study the predictive validity of personality was to use a construct-oriented approach to examine the relationship between specific personality traits and performance measures. We would like to acknowledge their contributions in moving the field forward. In a similar fashion Bob and Joyce Hogan were conducting research in the 1980s showing relationships between personality and job performance pertaining to customer service, integrity, and other criteria, at a time when most people *knew* that such research was a waste of time (e.g., Hogan & Hogan, 1989; Hogan, Hogan, & Busch, 1984). The work of these researchers paved the way for our research by creating a climate receptive to future research on personality. They shared our conviction that we do, in fact, have personalities and what's more they do matter.

Fourth, related to the point above, our study used meta-analysis, which was rapidly becoming a well accepted data analytic technique at the time we conducted our study. The goal of our study was to identify broadly defined personality characteristics whose validity would generalize across different criteria and different occupational groupings. Using meta-analysis allowed us to quantitatively summarize the results of a large number of studies while correcting for statistical artifacts that could account for the seemingly contradictory findings in prior research. We suspect that large-scale meta-analytic reviews such as ours are more likely to be widely cited than single, empirical studies or narrative reviews. It will be interesting to see if the most frequently cited articles in *Personnel Psychology* 50 years from now are meta-analyses.

Fifth, the results of the study enhanced understanding and contributed to the theoretical development of causal models explaining job performance. This was especially the case with the findings for Conscientiousness, the only dimension of the Big Five whose validity was found to generalize across occupations and criterion types. We believe Conscientiousness to be the important trait-oriented motivation variable that

has long eluded I-O psychologists. This meant that there are now two dispositional predictors in our field whose validity generalizes: general mental ability and conscientiousness. Thus, no matter what job you are selecting for, if you want employees who will turn out to be good performers, you should hire those who work smarter and work harder. An equally important development was in demonstrating that measures of other Big Five dimensions also predicted success in certain jobs or with specific criteria, and again, these relationships could be hypothesized a priori.

We were also asked what advice we have for researchers who desire to conduct research that is likely to have an impact on the field. We don't profess to have all the answers to this question. (If we did, all of our articles would be as frequently cited as this one.) So we would be the first to admit that writing a highly cited article is a low probability event that involves hard work, creativity, good timing and luck. Nonetheless, here are some ideas based on our experiences in this project.

First, ask questions that are of interest to you, personally, and that you think will be of interest to the field. In our case we had a strong belief that there were meaningful, consistent relationships between certain aspects of personality and job performance, and that they were stronger than the results portrayed in the literature. Second, be committed to your theory. Any study that challenges traditional thinking in the field will encounter difficult obstacles. Possessing strong beliefs about a theory enables one to persist in the face of such obstacles. Third, read the research literature very broadly. Research in the personality psychology area was invaluable to us in conducting our study. Similarly, we believe that reading the social psychology literature would be helpful to many researchers in I-O psychology. Fourth, if possible, look at the research question in a different way. This is related to the third point above. Reading different, but related, literatures can help bring a fresh perspective to a question. This was particularly true in our case, where there were conflicting findings in the literature, and where the research in our field appeared to have stagnated. Fifth, have the good fortune to obtain results that are relatively straightforward and understandable. Research findings do not have to be complex to be important. Our finding that the validity of conscientiousness generalized across occupational groups was simple to understand, easy to remember and had implications for the field. Finally, never underestimate the importance of dispositional traits. Always be persistent, dependable, organized, efficient, careful, thorough, hard working and achievement striving when conducting your research.



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