Beyond the Big Five: New Directions for Personality Research and Practice in Organizations

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Abstract
Industrial and organizational personality researchers and practitioners contend with ever-changing requirements of the workplace, and therefore, it is important to reevaluate and innovate with respect to useful organizational research. Much research evidence documents the importance of personality variables in determining behavior and performance in work settings, yet further advances in understanding and predicting work outcomes will depend upon more sophisticated taxonomic structures of personality, better criterion constructs and measurement, and different validation strategies. We describe the logic, strengths, and weaknesses of four taxonomic approaches to the structure of personality—the Five-Factor Model, HEXACO model, circumplex models, and nomological-web clustering—and how each limits or facilitates future developments in theory and practice. We describe how improved measurement and modeling approaches to personality, along with advances in synthetic validation efforts, will enable greater accuracy in our theories, hypotheses, and prediction of work outcomes.
OVERVIEW

The onrush and intermixing of technology, globalization, teamwork, and temp work have created a complex modern-day workplace—so complex that organizational science runs the risk of being less relevant to practice unless our science incorporates these radical workplace and workforce changes at a similar pace. More specifically, personality researchers need to rethink and augment their current strategies to maintain relevance and usefulness of their findings in organizational settings. Just as mindfulness has been shown to be good for individual health (Keng et al. 2011), our collective mindfulness will contribute to the improved health of personality-based organizational science and practice if we continually revisit the theoretical and empirical structure of personality; recognize the importance of a good structure of outcome/criterion constructs that is compatible with personality structures; rethink the traditional validation model that dominates our findings and our thinking; and gather, accumulate, and analyze data using the methods that multidisciplinary science has to offer.

Our goal is to convince our readers of some critical ways in which personality research, and the use of personality variables in work settings, needs to change. An overview of the literature on the Big Five and the structure of personality traits can often come across as routine (if not liturgical), but we provide it as an important backdrop for explaining our quest to improve our prediction and understanding of the determinants of a variety of important work outcomes throughout the employment process—for example, job search behaviors, responsiveness to job recruiting efforts, applicant reactions to selection processes, newcomer adjustment, training outcomes, teamwork, and task and contextual performance (at the individual level and team level). We also provide a research agenda and practice agenda to move beyond where we are today—and yes, beyond the Big Five. New paradigms are needed to advance personality research and practice in organizations.

Historically, the Big Five and the six-factor HEXACO model have been essential in providing a useful organizing structure, such that evidence about the empirical relationships between measured personality traits and outcome variables could focus on constructs, rather than on measures with idiosyncratic labels for similar constructs. Research findings thus became generalizable across measures, and the Big Five and its variants provided insight into the importance of personality in predicting important work and life outcomes. And today, more often than not, theoretical models in organizational research incorporate personality variables along with cognitive ability and other key determinants of behavior and performance (e.g., Barrick et al. 2003a, Borman et al. 1991, Campbell 1990, Johnson 2003, Motowidlo et al. 1997, Oswald & Hough 2011, Schmidt & Hunter 1992, Tett & Burnett 2003), whereas 25–30 years ago, such models did not include personality (e.g., Hunter 1986, Schmidt et al. 1986). Having said this, we continue to think (since the 1980s; e.g., Hough 1986, 1987, 1988, 1989, joined later by others, e.g., Ashton 1998, Mershon & Gorsuch 1988, Paunonen & Jackson 1996) that a sole focus on broad factors such as the Big Five can actually obscure important relationships and is not wholly adequate for describing, explaining, and understanding the complexity of personality at work. Small sample sizes, poor criterion measures, and personality measures that are reliable at the factor level, but not at the refined facet level, may have conspired to obscure important facet-level findings. Reexamining the structure and nature of personality variables to identify important traits that extend beyond the Big Five is needed—as is refining a criterion structure that will allow for the detection of refined patterns of validity.

Over the years, personality and organizational researchers have raised many criticisms of broad Big Five personality structures and their variants. Some of the most important criticisms are that Big Five structures (a) are method bound (e.g., results typically rely on factor analysis
models without much consideration of person-centered approaches); (b) are still lacking individual differences that are considered by many theorists and practitioners to be personality traits; (c) do not reflect relationships between factors very accurately (e.g., many facets load on multiple factors); (d) do not reflect or inspire enough research attention to personality facets that underlie broad factors (e.g., important relationships between personality variables and demographic and outcome variables are thus obscured); (e) limit the understanding and development of clusters of facets (personality trait compounds) that may be particularly relevant to certain jobs; and (f) limit the development of synthetic validity applications that may result in tailored predictor equations established a priori for current or future jobs and work settings.

In response to at least some of these criticisms, researchers using the Big Five and other broad-level personality structures began to focus their attention on more narrowly defined personality variables that are subsumed by the broad factors. The hope is that refining the personality domain improves the understanding and prediction of important life and work outcomes. Thus, the Big Five became the Five-Factor Model (FFM) of personality, a hierarchical model of factors, with facets being narrow traits that are aligned below each broad factor (e.g., Costa & McCrae 1992b). These hierarchical models appear artificial even at first glance; for example, nature would not likely dictate that each factor have exactly the same number of underlying facets. Nonetheless, as a function of the FFM, researchers are now increasingly sensitive to the importance of facets as a refined approach to personality. At the same time, this advance actually highlights the shortcomings of hierarchical models of personality, given the reality that relationships between and among factors and facets often appear to be more lattice-like than strictly hierarchical (Loehlin & Goldberg 2014). Thus, the FFM, HEXACO model, and other hierarchical structures have been important for helping researchers organize the way we think about and measure personality constructs. Researchers can treat these structures as security blankets in the sense that they allow us to think more closely about refined traits without worrying about regressing into our own history of confusion about personality constructs. The broad factor–based approach has gotten us far over the past several decades, but we argue that over the next several decades, a refined approach to personality traits is what will lead to significant advancements in the science and practice of personality in organizations.

Much work lies ahead, because improving our understanding of the role of personality in determining important work and life outcomes will require more innovative thinking with regard to personality measurement, research designs, data analytic and summary strategies, and validation models. With that in mind, we present our thoughts and a research agenda that move us in new directions to advance our understanding of personality and its role in organizational settings.

**STRUCTURE OF PERSONALITY**

One sign of a mature science is the quality of its taxonomies. Good taxonomies facilitate the accumulation of knowledge, hypothesis generation, and efficient communication (Fleishman & Quaintance 1984). Consider, for example, the periodic table of chemical elements, the classic example of taxonomic structure. Its importance to science and its applications is hard to overstate.

The periodic table of the elements is one of the most powerful icons in science, a single document that captures the essence of chemistry in an elegant pattern. The observation that certain elements prefer to combine with specific kinds of elements prompted early chemists to classify the elements in tables of chemical affinity. Later these tables would lead, somewhat indirectly, to the discovery of the periodic system, perhaps the biggest idea in the whole of chemistry. (Scerri 2006, p. xiii)
The periodic system is characterized by at least six important characteristics from which we can learn: (a) The elements in the periodic table are fundamental, distinct, indestructible, and universal; (b) nonetheless, all elements are not found in all environments; (c) elements bond with each other to form molecules; (d) the same elements can combine in different quantities and configurations to form different molecules (e.g., H₂O forms water, whereas H₂O₂ forms hydrogen peroxide); (e) when compounds decompose into their elements, the elements are unchanged; and (f) the periodic table can grow as new information leads to the discovery of new elements.

Obviously, personality is not chemistry, but all of these points about chemistry have useful relevance to personality by analogy. First, the unit of study—the facet or trait—should be basic, even if these building blocks naturally combine to form compound traits. Compound personality variables, such as integrity and service orientation, consist of the same basic personality traits but in different concentrations (see Ones & Viswesvaran 1996, 1998). Second, although all facets, traits, and compounds may exist across cultures or languages, they should not be expected to be present in the same amounts everywhere. Third, our knowledge about the structure of personality should be stable yet changeable as new information accumulates and in light of the intended purpose of personality measurement. The structure of personality should also be continually open to the type of measures, research designs, data, and data analyses that inform it.

Taxonomies often precede and facilitate the associated theoretical models and interpretations of organizational phenomena. Similarly, the adequacy of a given personality taxonomy is critically important for the future of personality in the workplace and in scholarly research relevant to industrial and organizational (I/O) psychology and organizational behavior. Developing a more refined taxonomic structure of personality, then, is both scientifically and practically important. It requires that all kinds of data be obtained across samples and settings (both organizational and research) and be accumulated and summarized systematically in a matrix of personality traits and criterion constructs.¹ The personality structure should be dynamic and open to change as data accumulate, with the goal of supporting construct validity flexibly and in ways previously unachieved, so that focal personality constructs are associated with detailed profiles of validity and structural relationships. Whether an immutable or “true” structure of personality is ever discovered in this continuous process seems secondary to the more general goal of refining facets as the basic elements of personality and obtaining better criterion-related validities as a result.

This process would result in a data bank that is much more detailed than either a typical meta-analysis database or a synthetic validity database, as it would allow for the flexible buildup and exploration of a personality taxon (basic trait) × criterion construct matrix (see Hough 2001, p. 38–39, for an example of such a matrix). With such data in hand, the effect and value/utility of personality can be estimated after combining available empirical information involving relevant personality taxons together with specific criteria (e.g., dimensions of performance, satisfaction, turnover), moderators (e.g., types of jobs, different subgroups), and mediators (e.g., motivation, goals). The available evidence (or lack thereof) in the matrix would highlight for researchers needed theory development and refinement and hypothesis testing. The matrix would also provide practitioners with data-driven guidance on how to build criterion-valid personnel selection test

¹A structure of criterion constructs is also critically important. Hough & Paullin (1994, p. 138) advocate a construct-oriented approach in which both theoretical and empirical links between predictors and criteria are crucial “if scientific understanding is desired.”
batteries in a more efficient and effective manner. For example, practitioners could use the matrix to build a predictor battery for a new situation by first identifying the outcomes most relevant to a new situation and then examining the personality construct × criterion construct matrix to locate the most critical personality determinants (predictors). Ongoing work by researchers and practitioners could contribute back to the database as part of the continuous process of refining and building construct-valid personality taxons.

In this vein, a current project by Piers Steel, Frank Bosco, Krista Uggerslev, and colleagues (http://www.metaBUS.org) is nothing short of revolutionary in its aims: attempting to code virtually all published empirical findings from past studies in organizational science, then flexibly and usefully summarizing those findings in order to accelerate our scientific knowledge of organizations. Already, they have developed an interactive map involving more than 3,000 variables found in top-tier journals. The benefit to personality research will likely be immense in terms of revealing in greater detail what we know, what we thought we knew, and what we do not know yet.

BRIEF HISTORY OF THE IMPORTANCE OF PERSONALITY TRAITS IN ORGANIZATIONAL RESEARCH

Universally, laypeople have recognized and appreciated the important role of personality in the workplace and in life in general: Both research and life bear out the fact that there are many personal characteristics that are relatively stable over time and across situations; are cross-culturally relevant; and are not cognitive in nature, yet meaningfully explain behavioral phenomena. By contrast, the psychological study of personality has had a checkered past of obscurity and little respect, but that has since turned around dramatically. Since the mid-1980s, personality research has surged due in large part to the research approach and findings from Project A, a large-scale consortium-driven personnel selection project funded by the Army Research Institute. At the time, its multidimensional focus on constructs, on both the predictor and criterion sides, was considered cutting edge; today, it is hard for researchers to imagine the joint predictor and criterion space in any other way. This is a form of progress in our field that cannot (and should not) be reversed. The modern-day focus on psychological constructs relevant to organizations has revealed important relationships between personality traits and important work outcomes that are more specific and interpretable than what was achieved previously. Indeed, the field of organizational science owes many of its advances to the acceptance of personality factors as critical in its theoretical models of the determinants of behavior, performance, and effectiveness at the individual and team levels (Hough 2001). Current thinking now centers around multiple appropriate ways to consider the nature and structure of personality traits and facets vis-à-vis their multiple roles in various organizational processes.

THE BIG FIVE FACTORS OF PERSONALITY

It goes almost without saying at this point that the Big Five has dominated our scientific thinking, research, and applications in personnel selection settings. Dozens of meta-analyses of

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2See Campbell & Knapp (2001) and the entire 1990 summer special issue of Personnel Psychology for information about the overall Project A research approach and findings. See Hough (1986, 1989), Hough et al. (1990, 2001), and McHenry et al. (1990) for comprehensive information about the research approach and findings specific to personality.

3Lew Goldberg (1981) is credited with the term Big Five.
criterion-related validities of personality variables have been undertaken using the Big Five as the organizing system. Thus, the Big Five and meta-analysis together have been critically important in moving beyond the vagaries of idiosyncratic personality measures and wide-ranging effects due to small-sample studies (i.e., sampling error variance), focusing instead on large-sample validity findings that are centered on personality constructs (e.g., through meta-analysis), thereby meaningfully advancing our knowledge of the personality-based determinants of work-related outcomes. Below, we briefly remind the reader of the history of the development and use of the Big Five; we review a range of criticisms of the Big Five; and then we describe how the FFM has evolved, examining structures of personality variables more generally (beyond the Big Five and beyond hierarchical models). All of this is done in the service of inspiring future constructive directions for both research and practice.

Brief History of the Big Five

The roots of the FFM of personality can be traced to Galton’s (1884) “lexical hypothesis,” which states that the frequency of the type of words that people use to differentiate themselves and others reveals personality traits. He began, and later Allport & Odbert (1936) continued, to catalog words in the dictionary that are expressive of character and personality. Allport & Odbert’s list contained 17,953 words—clearly extensive—and served as a place to start identifying themes with the goal of reducing the number to a size that can be more easily summarized. Cattell (1943, 1945) was the first to start the reduction process and ultimately reduced the list to 35 factors. Fiske (1949) was the first to identify five factors. He used raters from different rating perspectives (self, peers, and psychologists) to reduce Cattell’s descriptors to factors that he named social adaptability, emotional control, conformity, confident self-expression, and inquiring intellect. Tupes & Christal (1961, 1992) identified what is recognized today as the FFM through factor analysis of eight data sets consisting of peer ratings. They named their factors surgency, agreeableness, dependability, emotional stability, and culture. These five factors were found in seven of the eight data sets. Goldberg (1993) declared Tupes & Christal the “true fathers” of the FFM.

Initially, the five factors were criticized because the research in support of them had been based on some or all of Cattell’s 35 variables (see Waller & Ben-Porath 1987). Goldberg (1990), however, supplied additional support for the five factors when he factor analyzed ratings based on a new list of variables. Later, factor analysis of rating data in other languages and cultures further corroborated the FFM (Bond 1994, McCrae & Costa 1997, McCrae et al. 1998).

Criticism of the Big Five

Although many scholars and practitioners embrace the Big Five structure of personality, we believe that it is limiting as an adequate taxonomic structure of personality for organizational research. As mentioned earlier, the Big Five model (a) is bound by its method of discovery, (b) is missing many personality traits shown to be important in work settings (or may be important in the future), (c) might obscure rather than highlight relationships with criterion constructs, (d) consists of factors with relatively low construct validity (i.e., distinctiveness of the facets), and

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4See Hough & Schneider (1996) and Schneider & Hough (1995) for a thorough description of the history of the FFM.

5We use the terms Big Five and FFM interchangeably; although, as De Fruyt et al. (2004) point out, the Big Five is derived from the lexical approach, and the FFM is derived from the questionnaire approach.
thus (e) is useful but in some important ways will hinder our progress in modeling personality-based determinants of work-related behaviors and outcomes.

**Method bound.** An important concern with regard to the Big Five is that discovery and confirmation of the five factors have been largely dependent upon factor analysis, a highly useful and important method for reducing a set of variables to its common core. Factors are identified by common variance shared between facets and items; common variance by definition ignores unique variance that may or may not be important. In a very real sense, what you “discover” depends upon what variables are included in the correlation matrix. Costa & McCrae (1992a, p. 661) note that “the axes chosen by a varimax rotation will depend completely on the selection of variables.” The results are essentially predetermined, and this “prestructuring,” to use Block’s (1995a) term, casts at least some doubt on the actual robustness and comprehensiveness of the findings offered in support of the Big Five, suggesting that the consistency found in factor structures across studies may be due more to the sameness of the variable sets used rather than due to any “true” structure of personality. We refer readers who are interested in learning more about these issues to Block’s (1995a,b, 2001) insightful description of issues underlying the discovery of the five factors.

Similarly, a universal taxonomy of personality traits should not be dependent upon a particular language or culture. Although several studies have found five factors in non-English languages and non-Western cultures (e.g., McCrae & Costa 1997, Paunonen et al. 1992), several other studies have found other solutions (e.g., Ashton et al. 2004b). Studies that used person-descriptive sentences concluded that the Big Five are a biologically based human universal (e.g., McCrae et al. 1998), whereas the lexical approach tends to find poor similarity of factors across culture and language (e.g., Di Blas & Forzi 1999, De Raad et al. 1997). De Raad (1998, p. 122) concluded, “A study of the various studies participating in the crusade for cross-lingual personality descriptive universals makes it clear that researchers are unlikely to find one and only one canonical, cross-culturally valid trait structure.” Moreover, a Big Five structure that is “discovered” through factor analysis of English personal-descriptive statements relevant to Western culture should not be the only standard to try to fit to other languages and cultures; more exploratory investigations are also appropriate. As we describe in greater detail below, the Big Five structure is neither universal in English or Western cultures nor universal in other languages or cultures. Declarations that the Big Five structure is universal or basic were premature.

**Missing variables.** Another important criticism of the Big Five is that it is not a comprehensive map of the personality domain, meaning that important constructs are missing, some of which might be considered important now in organizational research, and others that may become important as we incorporate new constructs as possibilities in our theoretical models of performance. Certainly, the periodic table of chemical elements includes some elements that are of lesser importance than others, depending on the purpose, yet the structure would be considered incomplete without them. The same is true for personality. Some of the missing variables, broadly grouped, appear in Table 1. Naturally, they vary in their breadth, in how closely they relate to the Big Five, in their relationships with one another, and in their potential importance to research and practice.

The list of missing variables could go on—for example, vigilance, graciousness, and so forth—but hopefully the list in Table 1 is convincing enough to make our point that neither the Big Five nor the FFM with its facets is a comprehensive system of personality variables. For instance, it would not make sense, on the face of it, for each Big Five factor to have exactly six facets as some Big Five inventories do. There remains more than enough room for scientific exploration to
Table 1  Personality variables missing from the Five-Factor Model

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Name of variable used by specific researchers</th>
<th>Research evidence</th>
</tr>
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<tbody>
<tr>
<td>Honesty</td>
<td>Fairness</td>
<td>Saucier &amp; Goldberg (1998)</td>
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<td></td>
<td>Villainy</td>
<td>De Raad &amp; Hoskens (1990)</td>
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<tr>
<td>Interpersonal</td>
<td>Consideration</td>
<td>Tokar et al. (1999)</td>
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<tr>
<td></td>
<td>Folksiness</td>
<td>Saucier &amp; Goldberg (1998)</td>
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<td></td>
<td>Need to be supportive</td>
<td>Sanz et al. (2008)</td>
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<tr>
<td></td>
<td>Prejudice</td>
<td>Saucier &amp; Goldberg (1998)</td>
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<td></td>
<td>Psychopathy</td>
<td>Hodson et al. (2009), Lee &amp; Ashton (2005)</td>
</tr>
<tr>
<td></td>
<td>Social insight/social adroitness</td>
<td>Ashton et al. (1998a), Davies et al. (1998), Gough (1968), Hogan (1969), Schneider et al. (1996)</td>
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<tr>
<td></td>
<td>Reciprocal altruism (forgiveness versus retaliation)</td>
<td>Ashton et al. (1998b)</td>
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<td></td>
<td>Social independence</td>
<td>Dancer &amp; Woods (2006)</td>
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<tr>
<td>Intrapersonal</td>
<td>Absorption</td>
<td>Church &amp; Burke (1994)</td>
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<tr>
<td></td>
<td>Ease in decision making</td>
<td>Sanz et al. (2008)</td>
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<td></td>
<td>Ego resiliency/self-regulation</td>
<td>Baumeister et al. (2006), Block &amp; Block (2006)</td>
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<tr>
<td></td>
<td>Emotionality</td>
<td>Averill (1997), Plutchik (1997)</td>
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<tr>
<td></td>
<td>Heroism/prowess</td>
<td>Saucier et al. (2005)</td>
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<tr>
<td></td>
<td>Narcissism</td>
<td>Hodson et al. (2009), Paunonen et al. (2006), Lee &amp; Ashton (2005)</td>
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<td></td>
<td>Need for rules and supervision</td>
<td>Sanz et al. (2008)</td>
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<td></td>
<td>Tolerance for contradiction</td>
<td>Chan (2004)</td>
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<tr>
<td></td>
<td>Uncertainty orientation</td>
<td>Hodson &amp; Sorrentino (1999)</td>
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(Continued)
add meaningful constructs into our repertoire as organizational researchers interested in the power of personality.

**Relationships obscured.** The first summary of validities of personality variables according to the Big Five was undertaken during the Army personnel-selection project Project A in the 1980s. Simultaneously, the research conclusions of Guion & Gottier (1965), Pearlman (1985), and Schmitt et al. (1984) were the received wisdom in scholarly circles: Personality variables were of very little value in predicting work-related criteria. With that history in mind, the Project A personality research team (Leaetta Hough, John Kamp, and Bruce Barge) reasoned that given Project A’s deliberate focus on constructs, a summary of the criterion-related validities of personality variables according to personality constructs and criterion constructs was needed—perhaps the poor showing in prior summaries was due to summarizing validities across personality variables with little regard to their relevance for criteria. Ghiselli (1966) was perhaps the first person to publish a summary of validities of personality variables that were hypothetically (theoretically) linked to the job. The

<table>
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<th>Cluster</th>
<th>Name of variable used by specific researchers</th>
<th>Research evidence</th>
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<tbody>
<tr>
<td></td>
<td>Conventionality</td>
<td>Lee et al. (2005b), O’Neill &amp; Hastings (2010), Paunonen et al. (2003)</td>
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<td></td>
<td>Frugality/thriftiness</td>
<td>Lee et al. (2005b), O’Neill &amp; Hastings (2010), Paunonen &amp; Jackson (2000),</td>
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<td></td>
<td>Religiosity/devoutness</td>
<td>Goldberg (1990), Lee et al. (2005b), O’Neill &amp; Hastings (2010), Paunonen &amp;</td>
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<td></td>
<td></td>
<td>Jackson (2000), Paunonen et al. (2003), Saucier &amp; Goldberg (1998)</td>
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<td></td>
<td></td>
<td>&amp; Zavala (1993)</td>
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<tr>
<td>Interests</td>
<td>Artistic</td>
<td>Barrick et al. (2003b)</td>
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<tr>
<td></td>
<td>Conventional</td>
<td>Barrick et al. (2003b), Larson et al. (2002)</td>
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<tr>
<td></td>
<td>Enterprising</td>
<td>Barrick et al. (2003b), Larson et al. (2002)</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>Barrick et al. (2003b), Larson et al. (2002)</td>
</tr>
<tr>
<td>Other</td>
<td>Fashionableness</td>
<td>Saucier &amp; Goldberg (1998)</td>
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<tr>
<td></td>
<td>Humorousness</td>
<td>Lee et al. (2005b), O’Neill &amp; Hastings (2010), Paunonen et al. (2003), Paunonen</td>
</tr>
<tr>
<td></td>
<td>Masculinity/femininity/rugged individualism</td>
<td>Costa et al. (1985), Goldberg (1990), Hough et al. (1990), Kamp &amp; Gough (1986),</td>
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<td></td>
<td>Work pace</td>
<td>Lee et al. (2005b), O’Neill &amp; Hastings (2010), Paunonen &amp; Jackson (2000),</td>
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<td></td>
<td></td>
<td>Paunonen et al. (2003), Saucier &amp; Goldberg (1998)</td>
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<td></td>
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<td>Sanz et al. (2008)</td>
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Project A team knew that if they were to summarize the data and find validities similar to what Ghiselli found, they would need a process that others could replicate. The Project A Scientific Advisory Group (Phil Bobko, Tom Cook, Milt Hakel, Lloyd Humphreys, Lawrence Johnson, Robert Linn, Mary Tenopyr, and Jay Ulhaner) would demand no less, as they were well aware that personality measures were held in low esteem, and to persuade this group to include personality measures in the Project A criterion-related validity project required hard evidence. The Project A personality research team reasoned that they needed

- a set of personality constructs within which to summarize criterion-related validities of personality measures—in short, a relatively broad structure of personality variables;
- personality scales sorted into groupings with each group consisting of scales measuring a similar construct characterized by convergent validity (higher correlations within groupings) and discriminant validity (lower correlations) between groupings;
- a broad set of criterion constructs that included personality-relevant criteria; and
- an exhaustive set of criterion-related validity studies that included measures of personality.

Once these four things were in place, they could summarize criterion-related validities according to predictor and criterion construct, and their results—good or bad—would likely be replicable.

The first step, thus, was to choose or develop a structure of personality variables. In the early and mid-1980s, academic personality researchers were wrestling with the structure of personality, and no well-accepted framework existed. As mentioned above, Tupes & Christal (1961, 1992) had identified, through factor analysis of peer ratings and nominations, five basic dimensions that they labeled dependability, emotional stability, surgency, agreeableness, and culture. Norman (1963) found a similar structure, and Goldberg (1981) endorsed these in the self-report domain. Hogan (1982), by contrast, identified six factors, splitting Tupes & Christal’s surgency factor into two factors, ascendance (ambition) and sociability. Hogan’s logic for splitting involved thinking about how these two variables falling under surgency might operate quite differently in an applied prediction setting (this a general lesson to learn with regard to the refinement of personality constructs). Thus, the Project A personality research team began with six factors, knowing that, later, information could easily be combined to form five factors.

The personality research team then began the painstaking process of searching the research literature and technical reports, gathering intercorrelations between existing personality scales, and sorting them into one of the six personality construct categories, plus a miscellaneous category. An iterative process of classifying the 146 content scales of the 12 most widely used multiscale personality inventories at the time resulted in 117 of the 146 scales being classified into the six personality construct categories6 with the remaining scales placed in the miscellaneous category. The results indicated reasonable patterns of convergent and discriminant validity for the six construct categories.7

The personality research team then systematically investigated whether criterion-related validities of personality constructs for predicting performance on relevant criterion constructs were at relatively high levels, levels more similar to Ghiselli’s (1966) results than to Guion & Gottier’s (1965) and Schmitt et al.’s (1984) results. The research team gathered from as many sources as possible criterion-related validity studies conducted or published during the prior 25 years that included personality scales and work-related criteria. Work-related criteria included job proficiency (e.g., overall job performance, technical proficiency, and job knowledge), job

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6The six construct categories are not the same constructs as those of the HEXACO model.

7See Hough et al. (1990, 2001) and Kamp & Hough (1986) for more detail on the classification process and results.
involvement, training, education, delinquency, and substance abuse. They summarized the validity coefficients as defined by both predictor and criterion constructs (rather than by measures), a Project A signature concept that persists today in how research is approached in I/O psychology. Empirical results were disappointing for predicting job proficiency: None of the observed correlations were in the .20s or .30s, levels that Ghiselli reported. However, validities for several of the personality constructs for predicting other criteria were at highly useful levels (validities in the .20s, .30s, and .40s for several predictor-criterion construct combinations). Overall, the level and patterns of validity obtained in that literature review were sufficient evidence for the Scientific Advisory Group to endorse (albeit tepidly at that point) the development of the personality scales for the Project A criterion-related validity study.

The Project A criterion-development team devised measures of several criterion constructs, including three particularly relevant to personality: effort and leadership, personal discipline, and physical fitness/military bearing. Using the results of the literature review, the team identified relevant personality constructs—emotional stability, agreeableness, surgency/dominance, achievement, dependability, internal control, and masculinity (relabeling it rugged individualism8)—and developed measures of them.

The personality constructs predicted the three cross-military occupational specialty criteria they were designed to predict (uncorrected validities in the .20s). With sample sizes ranging from 7,666 to 8,477, results were both statistically significant and stable.9

The classic Barrick & Mount (1991) meta-analysis used the Big Five factors as its organizing scheme to summarize the validity of personality measures for predicting work-related criteria. The authors reported uncorrected validities that ranged from −.02 to .13. These uncorrected correlations are low and more in line with the low validities that Guion & Gottier (1965), Pearlman (1985), and Schmitt et al. (1984) had found, and they had not made use of any structure of personality to capture convergent and discriminant validities. By contrast, Ghiselli (1966) had higher validities averaging in the .20s. In short, if Ghiselli used an organizing model, it was not the FFM.

Hough (1992) expanded upon the Project A literature review of criterion-related validities of personality measures, adding studies that had been conducted after the Project A literature review as well as locating several more earlier studies. She concluded that five factors were too few and that at least seven were needed to highlight relationships between personality constructs and criterion constructs (Hough 1997).

None of these extensive literature reviews produced validities in the range of Ghiselli’s (1966) results for predicting job proficiency. For targeted personality predictor–criterion construct combinations, Project A validities were as high as Ghiselli’s, but none of the personality constructs predicted job proficiency at levels similar to those that Ghiselli reported for personality variables. One possible conclusion is that Ghiselli’s (1966, p. 21) approach—“[o]nly those results were included in this summary where the trait seemed pertinent to the job in question”—could have amounted to simply cherry-picking results. Anyone who knew Ed Ghiselli would be horrified at such a thought. Instead, an alternative hypothesis is more likely: The FFM of personality was

8Later, the masculinity/rugged individualism scale was removed from the personality inventory and added to the interest inventory. The reasons for this were twofold: First, the literature review indicated that masculinity/rugged individualism scales were very useful predictors of combat effectiveness—obviously a very important criterion for the military. Second, the uncertain future of the personality scales made it risky to include such an important predictor with the personality inventory of the predictor battery. Adding it to the interest inventory ensured its inclusion. Oddly enough, though, the only part of the predictor battery that ultimately survived for entry-level military processing was the personality component.

9See Hough (1989) for Project A zero-order correlations between personality and criterion constructs.
simply not the organizing structure that guided his decisions. He may very well have used correlations that would have emerged from composites of personality variables (either unit weighted or through linear regression). Although reporting the validity of composite personality variables might lead to higher validity and predictive power, it does not provide validity information for specific traits, information that allows for refined understanding, tailored testing, synthetic validity, and more. But the question still remains: What structure of personality variables should be used to accumulate validities?

Hierarchical Structure

Over the years, the FFM has evolved into a hierarchical structure with facets underlying each factor, facets that are more narrow and specific than the factor. This evolution has resulted in meta-analyses and accumulation of evidence at the facet level, which has improved our understanding of the relationships between personality and criteria. Nonetheless, we embrace Block’s (2001, p. 105) assessment: “all in all, it seems to me wisest still to be ambivalent about the current five-factor fashion as the way to study personality” (emphasis in original). Indeed, we are reminded of Dunnette’s (1966, p. 344) concerns about “fads, fashions, and folderol” and “premature commitment to Some Theory or Great Method” where there is an inappropriate mindset of proving rather than leaving theories and models open to modifications and extensions.

Importance of Facets

Facets refer to latent variables that are more narrowly defined than, for example, the five broad Big Five factors. An array of facets is subsumed by the broad factors, but there are other traits we list in Table 1 that are narrow constructs, like facets, that do not fit neatly into the Big Five or any hierarchical model of personality. Meta-analytic research has been helpful in gaining an understanding of the facets of Big Five factors; in fact, enough studies regarding facets have been conducted to allow for a meta-analysis of facets within each of the five factors of the FFM (e.g., emotional stability: Birkland & Ones 2006; extraversion: Davies et al. 2008; agreeableness: Connelly et al. 2008a; conscientiousness: Connelly & Ones 2007; Roberts et al. 2004, 2005; openness to experience: Connelly et al. 2008b; Woo et al. 2014a,b). Similar to what research found at the level of broad factors, when personality items are lexical (word based) versus person descriptive (sentence based), somewhat different sets of facets are identified (see Roberts et al. 2004, 2005). Note that these meta-analyses have been conducted within factors and do not address the issue of different personality models of the Big Five placing facets in different factors. For example, Costa & McCrae (1992b) assert that there are 6 facets in each of their Big Five factors (yes, remarkably exactly 6 facets in each factor, for a total of 30 facets),10 yet Saucier & Ostendorf (1999) specify 18 facets in their structure of the FFM (3–4 facets in each factor), and Soto & John (2009) identify 15 facets (3–4 facets in each factor). According to John et al. (2008), the key differences in these structures are the placement of warmth, anxiety, and adventurousness facets. These placements are interesting to explain, not only to understand the specific decisions of each of these research teams, but also to serve as a general example for how facets might justifiably be placed under different factors (i.e., how some facets may not be pure representations of any factor):

10Equally remarkable is that each of the six HEXACO facets consists of exactly four facets (see Ashton & Lee 2007).

Hough • Oswald • Ock

Anxiety: Costa & McCrae (1992b) place anxiety in the neuroticism factor, as do Saucier & Ostendorf (1999). Soto & John (2009), by contrast, place it at the opposite end of social confidence under the extraversion factor, suggesting that for them, anxiety is more salient to social interactions.

Adventurousness: Soto & John (2009) place adventurousness in the openness factor (i.e., suggesting this facet is more about novel experiences), whereas Saucier & Ostendorf (1999) place it along with activity in the extraversion factor (i.e., this facet is more about stimulating experiences). Similarly, in the Costa & McCrae (1992b) structure, adventurousness is part of the authors’ excitement-seeking facet, which falls under extraversion.

According to John et al. (2008), these are key differences in which different facets fit into the larger, factor-level Big Five variables. There are, however, many other meaningful differences as well.

The conceptual and empirical ambiguity with regard to how facets fit under the factors of different models of the Big Five suggests that future profitable research can be conducted at the facet level, where the content is more specific and often better understood and communicated. In fact, personality traits are explained in terms of their facets; just like in the cognitive ability domain, general factors (e.g., g, fluid intelligence and crystallized intelligence) are also often explained by their subfactors. Bolstering this line of thinking in the personality domain is a mountain of evidence demonstrating that, depending upon the criterion construct and its measurement, many personality facets have higher criterion-related validity than their parent factor (e.g., Ashton 1998; Ashton et al. 1995; Dudley et al. 2006; Hogan & Holland 2003; Hough 1992; Jenkins & Griffith 2004; Kwong & Cheung 2003; LePine et al. 2000; Mershon & Gorsuch 1988; Moon et al. 2008; Paunonen & Ashton 2001a,b, 2013; Paunonen et al. 1999, 2003; Paunonen & Nicol 2001; Roberts et al. 2005; Stewart 1999; Tett et al. 2003; Van Iddekinge et al. 2005; Vinchur et al. 1998; Warr et al. 2005). Clearly, narrow-level personality measures have a place in theoretical models and applied uses of personality variables.

Nonetheless, controversy about the primacy and the use of broad versus narrow constructs continues to this day. Cronbach & Gleser (1957) argued that broad predictors predict broad criteria with moderate validity, which is no surprise, in the similar sense that sets of predictors and criteria that are justified by the research literature will tend to demonstrate some level of general association with one another (e.g., in a canonical correlation, or linear regression with multiple predictors). They then pointed out that maximizing validity between a predictor and criterion is most likely when there is a high degree of theoretical/rational correspondence between the predictor and criterion, such that specific criteria will require specific predictors that are conceptually related. Indeed, narrow measures might provide higher validity for narrower criteria, but we view the broad versus narrow debate in predictor and criterion measurement not as a debate to be resolved but as a tension between theory (understanding) and practice (prediction) that should be continuously examined and evaluated.

Sometimes broad and complex measures are unavoidable, particularly on the criterion side, where complexity might be deeply embedded in employee performance and thus cannot be easily distilled into simpler components. This may happen in part because of the complexity of worker behavior (e.g., it is dynamic, team based) but also because raters themselves have a difficult time distilling complex behavior into simpler components (e.g., limited powers of observation, decomposition, recall, and component weighting). In the case of complex criteria, the correlation
pattern provided by multiple predictors might reveal an understanding of what generally underlies this complexity (hence the term policy capturing in our literature).

Again, broad versus narrow is not a dichotomous debate or dilemma, as it has multiple features and considerations. Synthetic validity as a choice of an appropriate validation strategy allows for narrow predictors to be tailored to the criterion and assembled to form a predictor battery. This yields higher levels of validity, potentially, and it also suggests how to reduce testing time (removing measures of some constructs) to achieve that validity. The so-called bandwidth-fidelity dilemma is not always a dilemma [and by the way, it’s also not the original meaning of the term; see Cronbach (1991) who refers to Shannon’s information theory]. It is something of a dilemma in cases such as (a) being unable to match the breadth and content of the predictor with the criterion very closely, (b) not having enough time to measure the range of desired constructs reliably, and (c) being constrained by traditional validation models that can be usefully replaced, revised, or extended by other approaches and research findings (e.g., additional data available from the organization, archival data sets, meta-analyses, synthetic validity).

There can be little doubt that the conceptualization and reliable measurement of facet-level personality traits improve our understanding of the content of broad factors and provide the opportunity for better theoretical linking of personality predictors to criterion constructs. There is also a distinct advantage in tailoring prediction, based on established theoretical and empirical relationships with criteria of interest, to afford the best chance of predictability in new prediction situations, such as when a job changes over time or when a new job is created.

OTHER APPROACHES

Although the FFM has become the dominant structural model of personality, evidence indicates that it is now limiting our progress in understanding and using personality variables in the workplace. Other approaches and models of the structure of personality, such as the HEXACO model, circumplex models, and the nomological-web clustering approach, also yield important insights. Similar to the FFM, the HEXACO model is hierarchical, whereas the circumplex models and the nomological-web clustering approach are not. These other models and approaches are described below.

HEXACO Model of Personality

The HEXACO model of personality is composed of six factors: honesty-humility (H), emotionality (E), extraversion (X),11 agreeableness (A), conscientiousness (C), and openness to experience (O). These six factors emerged from analyses of both self- and other-ratings of personality-descriptive adjectives (lexical approach).

Like the FFM, the HEXACO model also has its origins in lexical research and factor analysis: a reanalysis of several studies, involving seven languages (Dutch, French, German, Hungarian, Italian, Korean, and Polish). The key finding was that six factors emerged, not five (Ashton et al. 2004b). A six-factor solution has also been reported in four additional languages: Greek (Lee & Ashton 2009), Croatian (see Ashton & Lee 2008a), Turkish (Wasti et al. 2008), and Tagalog/Filipino (Ashton et al. 2006). Another study collected 1,839 Polish adjectives, rationally reduced

11Note that in the FFM, E typically stands for extraversion, whereas in the HEXACO model, E stands for emotionality and X stands for extraversion.
this set to 290 adjectives, collected self-ratings data on them, and finally factor analyzed these data, once again producing a six-factor solution (Szarota et al. 2007). Thus, a six-factor model of personality—the HEXACO model—has been identified in at least a dozen languages.

Initially, the thinking was that the number of factors that emerged from these more recent studies was due to the languages and cultures not being related to the English language. However, this hypothesis was rejected early on when researchers significantly expanded, compared with other Big Five studies, the number and type of adjectives included (i.e., 1,710 English adjectives analyzed by Ashton et al. 2004a). This analysis also yielded six factors that accounted for the variance in the English lexicon.

Although the HEXACO model is similar to the FFM in that it is hierarchical, with factors subsuming multiple facets, it is not merely the Big Five plus an honesty-humility factor. First, the HEXACO emotionality factor is characterized by sentimentality, vulnerability, fearfulness, anxiety, and emotional dependence, but in the FFM model, these are components of two factors: neuroticism and agreeableness. The HEXACO emotionality factor, however, lacks the anger component that is part of the Big Five neuroticism. The HEXACO agreeableness factor is defined by characteristics such as being gentle, willing to compromise, patient, peace loving, slow to anger, and forgiving. This definition contains the gentleness component of the agreeableness Big Five factor and the anger component (reversed) of the neuroticism Big Five factor (Ashton et al. 2014).

Second, although the HEXACO model is also guided or constrained by factor analysis like the FFM, it is more comprehensive. Specifically, although the honesty-humility factor is highly correlated with the straightforwardness and modesty facets of Big Five agreeableness, it correlates only weakly or moderately with Big Five factor-level variables (Ashton & Lee 2005, Lee et al. 2003). Although not explicit facets in the HEXACO model, personality traits such as social adroitness, self-monitoring, Machiavellianism, narcissism, psychopathy, altruism, modesty, fairness, and greed avoidance (Ashton & Lee 2005, 2007, 2008b; Ashton et al. 2014; Ashton et al. 2000)—traits that are not well represented in the Big Five model—are covered by the HEXACO model.

An important question that has not been sufficiently answered is whether the HEXACO factors and facets provide stronger validities or overall $R^2$ than Big Five factors when predicting workplace criteria relevant to personality. HEXACO proponents cite studies that answer this question in the affirmative (e.g., Ashton & Lee 2008b; Lee et al. 2003, 2005a, 2006). However, these studies generally use criterion measures such as self-reported performance, others’ reports of how likely the target person is to enact a particular behavior (versus actually enacting behaviors), and self- or other-reported scores on other nonability tests. Such criteria are subject to common method variance or suffer other forms of contamination and deficiency, thus limiting our understanding of the predictive power of personality measures (HEXACO and others).

Criterion-related validity studies involving better performance criteria are needed to answer questions about predictive validity of HEXACO versus Big Five measures, factors, and facets. Nonetheless, given the supportive literature on the validity of integrity tests (e.g., Berry et al. 2007, Ones et al. 1993), we do agree with the hypothesis that the HEXACO honesty factor will logically predict counterproductive behavior. But overall, the research to date is far from definitive. And further, as a reminder, we believe that all of this is superseded by our general encouragement to increase our thinking about personality at more of a facet level that expands beyond traditional hierarchical models like the FFM and the HEXACO model. Nonetheless, the HEXACO model is an improvement over the FFM because it is not just a reorganization of personality variables; it encompasses more of them. Yet, the HEXACO
model is still lacking a number of personality variables, such as several of those indicated as missing from the FFM.

### Circumplex Models

One of the unavoidable realities in personality research is that personality variables tend to correlate with each other. Even many of the facets underlying the Big Five and HEXACO models, for example, tend to correlate with more than the one factor to which each supposedly belongs (i.e., the facets often show cross-loadings). Thus, one reasonable alternative to hierarchical models of personality is the circumplex model, where relationships between personality traits are envisioned as a circle, such that constructs that correlate more strongly and positively with each other are situated closer together within the circle, and constructs that correlate weakly or negatively with each other lie farther apart or even at the diametric opposite sides of the circle (Browne 1992). Relationships on the circle can then be represented by coordinates expressed on two axes (dimensions) that cut the circle into quadrants. The circle does not change if the axes are rotated, so, much like factor analysis, the interpretation of axes depends on where they are placed.

One example of a circumplex model of personality is the Abridged Five Dimension Circumplex Model (AB5C; Hofstee et al. 1992). It consists of Big Five factors and their facets. Each of the five factors is considered two at a time, for a total of 10 unique pairings and, therefore, 10 circumplexes (circles). For example, conscientiousness is paired with agreeableness such that each trait is represented as an axis (i.e., the conscientious axis is at a 90° angle to the agreeableness axis), and their facets are arrayed around a circle based on their correlations with the factors and facets. Thus, data have shown that dutifulness, defined as well behaved, well mannered, and thoughtful, can be located somewhere between the high end of conscientiousness and the high end of agreeableness (Johnson & Ostendorf 1993). Other research also indicates that circumplex traits representing the intersections of conscientiousness and agreeableness, agreeableness and emotional stability, and conscientiousness and emotional stability account for significantly more variance in predicting counterproductive work behavior than do the Big Five factors alone (Gonzalez-Mulé et al. 2013).

The strength of the circumplex model is that, unlike strict hierarchical models, it allows facets to correlate with all other factors when such correlations exist. It thus seems to provide a more realistic understanding and portrayal of personality facets. However, circumplex models are two-dimensional and might consider only two factors at a time, which can limit the way the facets are considered. For example, integrity and service orientation, two of the best predictors of important work-related criteria, consist of three factors, conscientiousness, agreeableness, and emotional stability, albeit in different concentrations (see Ones & Viswesvaran 1996, 1998). The circumplex representation, as it is currently in use, cannot accommodate the complexity of three factors and their respective facets in a straightforward manner, whereas hierarchical factors have better success. In today’s era of Big Data, we can expect greater use of interactive software and user interfaces that allow for a more complex exploration of multivariate personality data. Such software should operate off of principled constraints that reveal visual complexity but also reveal inaccuracy due to sampling error variance.

### Nomological-Web Clustering Approach

Another nonhierarchical approach to discovering the structure of personality is the nomological-web clustering approach. It was first articulated by Hough (see Hough & Ones 2001, Hough &
Johnson 2013, Oswald & Hough 2011, Oswald et al. 2013) and has its historical roots in the Project A work described above.

We contend that a useful organizing taxonomy of personality involves not only examining internal measurement strength and structure, but also extending multitrait-multimethod matrices so that the nature and organization of broad and narrow traits are shaped in important ways by their relationships with organizational outcomes. We realize that this extension must be done carefully in terms of improving our understanding, because in any individual study, personality items and scales might contain variance that is not trait related, yet improves the prediction of outcomes. However, these unique-yet-predictive aspects of personality measures are often not trait or theory driven and, therefore, are suspected to be unreliable and not generalizable. Conversely, the tenets of test theory assume that the construct-relevant variance of personality items is what they have in common; it is also the variance that is most generalizable and predictive. Thus, to the extent test theory assumptions are met, an apparent conflict here is reduced to a possible tension between reliability and validity. The nomological-web clustering approach is one way to examine this tension closely and understand how internal and external measurement influences affect, and in part define, personality taxonomies.

So what is the nomological-web clustering approach? Under this approach, personality taxons are defined by groups of personality variables that bear similarities in their linear relationships (e.g., similar patterns of correlation with other personality variables as well as similar patterns of validities with outcome variables) and nonlinear relationships (e.g., interaction with environmental factors, patterns of mean score differences between demographic subgroups). A given construct of interest serves as the center of the web. The threads to other constructs are literally in $n$-dimensional space, with the distance from the construct of interest an indication of the direction and strength of relationship between the constructs. Positive correlations are closely situated, zero-correlations are far away, and negative correlations are still farther away (and these three general regions should be clearly indicated).

Naturally, creating reliable groupings through dimension reduction procedures (e.g., factor analysis, latent class analysis) is a challenging prospect, especially when the profile of characteristics to be matched is extensive as well as when more statistical artifacts are present (e.g., measurement error variance, range restriction). Nevertheless, both theory and practice suggest that this approach is worth exploring to the limits that the combined powers of data, exploratory methods, and substantive interpretation allow. For example, Tett & Burnett’s (2003) trait activation theory posits that trait-relevant situational cues moderate the relationship between personality and behavior, such that a situation may provide a ripe context for personality-expressive behavior, in which case the cued personality is expected to be more predictive of outcomes, versus other situations that limit such behavioral outcomes. For instance, if a certain organizational context is shown to facilitate expression of the sociability facet of extraversion but does not elicit the dominance facet of extraversion, this serves as a signal that sociability and dominance should be considered within separate nomological-web clusters. In other words, personality facets (or traits) within the same cluster should—ideally—share at the latent level the same profile of characteristics, such as the following:

- Having similar psychobiological bases;
- Correlating similarly with other individual-difference variables and the environment;
- Correlating similarly with various criteria;
- Interacting similarly with other variables (i.e., moderate and mediate with other variables in the same way);
- Having similar patterns of the relationships listed above across demographic subgroups (i.e., no evidence of differential mean score differences or differential validity across demographic subgroups); and
- Being similarly malleable over time (e.g., traits versus states; age-related differences).

Recent research suggesting that personality trait structures tend not to be strongly hierarchical (Loehlin & Goldberg 2014) is one piece of evidence that supports thinking in a nomological-web sense. We hasten to add that the nomological-web clustering approach does not preclude organizing taxons into larger related groupings that are hierarchical in nature. Our point for advancing this approach is a philosophy as much as it is an application: to explore depth first so that any resulting breadth is more meaningful. Past research has focused more on breadth and organizing personality constructs, but at the expense of the sort of depth that we, as a science, can now afford to pursue.

Importantly, nomological-web clustering—unlike the Big Five or HEXACO structures—is an open network that can be continuously revised and refined as more knowledge is gained and new criteria for clustering are added. Possible new criteria for clustering include types of nonlinearity (Vasileopoulos et al. 2007), types of intraindividual longitudinal processes implied by traits (Bauer 2011, Kanfer & Ackerman 2004, Yeo & Neal 2008), and types of measurement invariance analysis as established by classical test theory (Vandenbergh & Lance 2000) or ideal-point item response theory (IRT) models (O’Brien & LaHuis 2011). Of course, the refinement and dimensionality of the criterion side of the equation will remain critically important, as it has in the last 25 years of organizational research, when developing construct-valid nomological-web clusters.

Analyses beyond descriptive statistics, correlations, and structural equation models will be required to take full advantage of nomological-web clustering. For example, generalizability theory is a statistical approach to modeling reliability as multifaceted (i.e., reliable variance comes from multiple sources, the focal trait being only one of them; Putka & Sackett 2010). Likewise, synthetic validity is a statistical approach to treating validity as multifaceted (based on a wealth of criterion-related coefficients established across jobs, models of validity can be tailored to new jobs or even jobs anticipated in the future; Scherbaum 2005). Thus, generalizability theory and synthetic validity are ideal tools to operationalize and refine the constructs and moderators that underlie nomological-web clustering.

SYNTHETIC VALIDATION

Many of the meta-analyses we cite provide information on the occupation-specific and criterion-specific validities of a wide range of personality traits. Synthetic validity is a more flexible version of meta-analysis that can enable a greater understanding of the conditions under which personality traits provide predictive value (and those under which they do not). The logic is (a) to accumulate vast amounts of specific personality × criterion-based validities that can be filtered and organized by computerized search and then (b) to tailor new performance models and predictor equations to new configurations of work in ways that are informed by personality-based12 and criterion-based work analyses. Organizations could save time and money to the extent that a local validity study of a personality measure does not provide value-added results for a given selection problem when compared with a rich store of similar results located within a synthetic validity database (Johnson & Carter 2010).

12Personality-based job analysis should be used more frequently to this end. See Goffin et al. (2011) for an example of a personality-oriented job analysis.
Although a critical assumption of synthetic validity is that a given psychological attribute has constant validity across relevant jobs, this assumption can be relaxed when moderators are in the database. With respect to personality, such moderators might be job complexity, a climate for autonomy, and other moderators that reflect situational strength, because research finds that weak work situations can lead to stronger prediction by personality traits (Beaty et al. 2001).

Synthetic validity databases involving personality traits are an integral part of the family of other data aggregation techniques that serve similar informative purposes. Computer hardware and software technology are no longer limiting factors in making such a large synthetic validity database a reality. Furthermore, many of the critical considerations concerning logistics, measurement, and design have already been specified in recent work (Johnson et al. 2010, Steel et al. 2006). The real issue at hand is whether the payoff is worth what would undeniably require a very large investment of money, multiple sources of expert knowledge informing its development, and a great deal of attention to logistical design and execution. We believe that for our science and practice to increase its relevance, such an investment is required.

### RESEARCH AGENDA FOR FUTURE PERSONALITY RESEARCH AND PRACTICE

- Update and improve theoretical and empirical structures of personality.
  - Develop, use, and refine the nomological-web clustering approach.
    - Identify and examine moderators, mediators, differential validity, and mean score differences between demographic groups.
    - Cluster using latent class analysis, profile analyses, and other strategies.
  - Judiciously extend existing organizing personality frameworks (the Big Five model, HEXACO) to include nonhierarchical structures as well as loosely hierarchical structures of traits.
  - Use narrow personality traits (facets) to contribute to more refined models of the determinants of behavior, performance, and outcomes in organizational settings.
  - Strike a balance between variables that are too specific and those that are too broad—do not return to the “good old daze” (Hough 1997).
  - Use person-centered analyses as well as variable-centered analyses of data.
  - Do not neglect issues of both construct validity and reliability (an age-old principle worth repeating in the era of Big Data).
- Update and improve theoretical and empirical structures of criterion constructs/outcomes that are compatible with refined personality structures.
- Examine and understand the nature of compound personality traits that are composites of more specific personality traits or facets.
- Generate research data that contribute to growing a data bank of specific personality × criterion-based validities.
- Use synthetic validation models in applied settings for new and changing configurations of work and work settings.
  - Tailor prediction equations a priori for current or future jobs and work settings.
  - Test efficacy over time—make more use of rolling validation over time to be sensitive to information about changing organizations, teams, applicants, technologies, etc.
SUMMARY RESEARCH AGENDA AND CONCLUSION

Our central goal was to persuade our readers that a paradigm shift is needed to ensure that personality research, findings, and practice remain relevant and useful in organizational settings and a world of work that is complex and constantly changing. Reflecting this central goal, we provide a brief but critical agenda for the future of personality research to address the needs of the modern-day workplace (see sidebar).

A taxonomy of personality characteristics that could function for the behavioral sciences in a manner analogous to the periodic table of elements for chemistry could greatly advance our understanding of the determinants of work behavior. We contend that the nomological-web clustering approach provides a strategy to more closely approximate that ideal. Synthetic validity, traditional meta-analyses (which are not as fine grained or as flexible as synthetic validity), personality-based job analysis, work/criterion-based analysis (with better criterion constructs), and nomological-web clustering should inform one another, with the integrated collection of these tools being greater than the sum of their parts. We envision a future for personality research in which science and practice build on each other more flexibly and dynamically, such that our methodology, technology, and substantive thinking together will allow us to investigate and respond to the rapidly changing nature of work more quickly and appropriately than our traditional research models have ever allowed.

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Errata

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