



# What Are the Most Important Dimensions of Personality? Evidence from Studies of Descriptors in Diverse Languages

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## Abstract

Progress is reviewed with respect on how attributes of personality and character can best be organized and structured. Key insights on this important scientific issue have been gained by a lexical approach, which posits that the degree of representation of an attribute in language corresponds substantially with the general importance of the attribute in real-world transactions. The rationale for studying the language of personality is explained, followed by a review of the most salient findings from lexical studies of person-descriptors in 16 languages. In these studies, one- and two-factor structures are found to be not only the most parsimonious but also the most easily replicated across variable selection procedures, and across languages and cultures. Structures with more factors are likely to show a comparative predictive advantage, but replicate more unevenly. Lexical studies appear to support a six-factor model at least as well as the Big Five. Future research attention should be directed toward inclusion of a wider range of individual differences, integration with models of temperament, and the search for causal factors and underlying mechanisms that are associated with the best-replicated personality dimensions.

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How personality attributes are best organized and structured is an important scientific issue. Studies of person descriptors in diverse languages have been crucial for addressing this issue. After explaining the rationale for such studies, I will discuss insights that have been gained from them. Because inquiries into the structure of attributes depend significantly on how personality and character are defined, I begin there.

## **Defining Personality**

Definitions of personality are consequential: They affect how one selects variables when studying personality phenomena. And these definitions vary fairly widely. Allport (1937) reviewed definitions of the concept of personality, cataloging 50 distinct meanings. Allport's own preferred definition – 'personality is the dynamic organization within the individual

of those psychophysical systems that determine his unique adjustments to his environment' (p. 48) – was a 'biophysical' conception focusing on attributes within a person – 'what an individual is regardless of the manner in which other people perceive his qualities or evaluate them' (p. 40).

Allport's conception can be critiqued by arguing as follows: One cannot fully characterize an individual without taking into account how others perceive and evaluate him/her, how s/he affects and impacts others, and the place and function s/he assumes in a social milieu. Along these lines, other ways of defining personality, consistent with what Allport called a 'biosocial' view, have included: (a) the role one assumes or the status one has achieved in society; (b) one's external appearance (including one's attractiveness) as it psychologically impacts others; and (c) the reactions of others to the individual as a stimulus – the person's social stimulus value – including social effects that may contribute to a person's reputation. Including such variables, one arrives at a broad definition: Personality is all of the psychologically relevant attributes, qualities, and characteristics that distinguish the behavior, thoughts, and feelings of individuals as well as the psychological impacts individuals have on others (including the evaluations they tend to elicit). This definition corresponds roughly to that guiding selection of variables in some lexical studies (Benet-Martinez & Waller, 1997; Tellegen & Waller, 1987; Saucier, 1997) that sought a more 'exhaustive specification of personality' (John et al., 1988; p. 186). By this definition, attributes like Charming, Intimidating, Evil, Impressive, and Sexy contain information relevant to personality (cf., Imperio et al., 2008) and are within the purview of personality science, even if they depend largely on the person's perceived effect on others and on the evaluation of others.

The definitions that Allport (1937) reviewed can be largely reduced to a spectrum between restrictive definitions (like Allport's) and broader ones. To facilitate a comparison of the two types of definition, consider a reasonable definition of personality that is somewhat restrictive but more contemporary than Allport's: 'an individual's characteristic patterns of thought, emotion, and behavior, together with the psychological mechanisms – hidden or not – behind those patterns' (Funder, 2001; p. 2). A small addition to its opening clause – 'an individual's characteristic patterns of thought, emotion, behavior, *and impacts on others*' – yields a much more inclusive definition. Whether the more restrictive or more inclusive definition should be relied upon is a source of contention between personality researchers and the models they favor because it has some major consequences for the structure and measurement of personality attributes.

### **Why a Structural Model Is Useful and What Makes a Model Good**

Among the scales in current personality inventories, one finds a bewildering variety of constructs. Among single words potentially referring to personality

attributes in modern world languages, the variety is overwhelming: Allport and Odbert (1936), for example, catalogued nearly 18,000 words from Webster's Second International Dictionary referring to characteristics that might be used to distinguish one human being from another. Some parsimonious summary of this vast domain is needed, thus the interest in finding a scientifically compelling taxonomy of all personality attributes. A taxonomy systematically divides phenomena into ordered groups or categories, providing a standard scientific nomenclature that facilitates communication and aids in the accumulation of empirical findings.

For grouping the phenomena in a personality taxonomy, the most useful procedure has been factor analysis. Factor analysis is a variable-reduction procedure, in which many variables are organized by a few factors that summarize the interrelations among the variables.

Before using factor analysis, one must first make a crucial determination – which variables to include in the analysis. One cannot have a dimension or factor without including a set of variables relevant to it. Variable selection is guided partly by how the construct of interest (e.g., personality) is defined. *But variable selection is also inevitably affected by the investigator's beliefs about what makes a structural model good.* These beliefs involve criteria which can be applied both to variables and factors formed from variables, and tend to focus on criteria from among the following eight alternatives:

1. *Social importance* of the variables or factors, that is, whether they are 'shown to interact [i.e., relate] powerfully with social activities widely regarded as important' (Eysenck, 1991, p. 785).
2. *Predictive power and validity* of the variables or the factors they form. This criterion is related to social importance, but relies more heavily on predictive performance in specific practical contexts.
3. *Reliability and cross-time stability.* This criterion is important because personality attributes are expected to be relatively consistent across time.
4. *Comprehensiveness* of the variables or factors (as a set), so that they cover 'a wide field, and [are] not restricted to a narrow segment of personality research' (Eysenck, 1991, p. 774).
5. *Generalizability across types of data.* For example, we should be less interested in a variable or factor found only in self-report data than in one found to be important also in ratings by knowledgeable others, or in observer data.
6. *Generalizability across cultures and languages.* This might be termed 'universality' (Costa & McCrae, 1992, p. 653) or independence of 'national, racial and cultural differences' (Eysenck, 1991, p. 784). It may indicate a genetic or biological basis for the attributes, or alternatively point to universal non-biological features of human social environments.
7. *Genetic or other causal basis* established for the variables or factors. Personality characteristics are known to be moderately heritable

(Bouchard, 1994), which indicates causal biological influences of a genetic nature. There may be non-genetic causal factors as well.

8. *A theory*, plausible and logically consistent, related to personality functioning or dynamics, that is linked to the model. A theory enables testable deductions and hypotheses to explain known phenomena and predict phenomena that are not yet known (cf. Eysenck, 1991, p. 774).

Because of the diversity of criteria (and of combinations of criteria) employed by developers of personality inventories, the long tradition of packaging structural models into multiscale inventories led to little agreement on the most important variables of personality. The literature on the structure of personality characteristics was formerly a maelstrom of competing inventories, mostly proprietary, embedded in a mass of mutually isolated research measures. Beginning from its first applications in the 1980s, the lexical approach has brought more order to the field. This approach, while not perfectly engaging all relevant criteria, has enabled the simultaneous application of most of the major criteria for the goodness of a structural model.

### **The Basis for the Lexical Approach**

As has long been recognized (e.g., Allport, 1937; Cattell, 1943; Goldberg, 1981; Norman, 1963), some of the most basic personality attributes might be discovered from studying conceptions implicit in use of the natural language. If a distinction is highly represented in the lexicon, it can be presumed to have practical importance. Folk concepts of personality (Tellegen, 1993) provide basic but not exhaustive (necessary but not sufficient) components for a science of personality attributes (Goldberg & Saucier, 1995). The degree of representation of an attribute in language corresponds substantially with the general importance of the attribute in real-world transactions. This key premise of the lexical approach links semantic representation directly with the *social importance criterion*.

If terms in a language are used as variables, an attribute that is represented by multiple terms will likely appear as a factor. Moreover, if the factor includes terms that are used with high frequency, the importance of the factor is underscored. Such factors are but a 'starting point': The lexicon could omit some scientifically important variables, and the meaning of single natural-language terms can be vague, ambiguous, or context-dependent (John, Angleitner, & Ostendorf, 1988).

Many variables, and potential factors, might have rich semantic representation and thus satisfy a social importance criterion, so we should not rely on this criterion alone. The lexical study paradigm has relied especially on a singularly demanding criterion that is the most potentially efficient in rapidly reducing the field of candidate structures.

The *cross-cultural generalizability criterion* can be used to judge among competitor taxonomic structures. Structural models derived within one

limited population or sample are prone to reflect the unique patterns found within that population or sample. Culture-specific patterns are surely interesting and might be incorporated in models to be used in one cultural context. But models that transfer well across populations, and thus across languages and sociocultural settings, better realize the scientific ideals of replicability and generalizability.

As a criterion, cross-cultural generalizability might be applied in either a lenient or a stringent way. The lenient way: Export a set of variables (most often, those represented in a single personality inventory) for use in other populations, and then examine whether these preselected variables (after translation, if necessary) generate the same factor structure in each new language or culture (as in Rolland, Parker, & Stumpf, 1998; Rossier, Dahouru, & McCrae, 2005). If the scales in a personality inventory generate similar factors across populations, one might argue (as in McCrae & Costa, 1997) that the structure is widely generalizable. This test shows only that the model can be recovered when personality variables in a new language are cut down, in a manner akin to the mythical Procrustes, to the specifications of one model. A large variety of models may be highly exportable in this manner. But a truly pervasive model would involve constructs important in any culture and sedimented in any language, so that it would fall readily out of the most frequently used personality descriptors in any language. Meeting the lenient criterion is a necessary but not sufficient part of demonstrating such pervasiveness.

Let us turn then to a more stringent test: Identify the most salient and important personality concepts within each linguistic/cultural context, derive an indigenous factor structure from those variables, and then examine the extent to which this new structure corresponds to previously proposed models. A model that could meet this test in any language could be considered far more pervasive and universal than a structure that simply showed a high degree of translatability.

The lexical approach applies the more stringent test. Analyses are carried out separately within each language, using a representative set of native-language descriptors, rather than importing selections of variables from other languages (e.g., English). Generally, factors identified by the lexical approach have fared well with respect to the first six criteria for a good structural model, generating a relatively comprehensive set of socially important personality constructs that evidence consistency across time, good predictive validity, and generalizability across differing types of data as well as across cultures. Thus, these factors deserve in-depth consideration.

## **What We Learn from Natural-Language Personality Descriptions**

The majority of lexical studies of personality descriptors have attempted to test the most widely influential personality model of the last two

decades – the Big Five factor structure (Goldberg, 1990, 1993; John, 1990). The Big Five factors are customarily labeled Extraversion, Agreeableness, Conscientiousness, Emotional Stability (or its opposite, Neuroticism), and Intellect (or, in some inventories, Openness to Experience). There were signs of the Big Five structure in much earlier studies (for reviews, see Digman, 1990; Goldberg, 1993; John, 1990), but its identification in studies of natural-language descriptors in English (e.g., Goldberg, 1990) was decisive. If we value cross-cultural generalizability, however, applicability to one language is not enough. Beyond English, as I will describe, lexical studies have provided only mixed support for the Big Five.

Lexical studies have been completed in some 16 languages – English, Dutch, German, Polish, Czech, Croatian, French, Italian, Spanish, Hungarian, Hebrew, Greek, Turkish, Filipino, Korean, and Chinese. These lexical studies have revealed a great deal about the relative robustness of the Big Five, as well as information about other less well-known candidate models having a different number of factors. I will now discuss the most consistent findings from lexical studies to date by describing models with successively more factors.

#### *What if we allowed ourselves only one factor?*

Several lexical studies have reported evidence about factor solutions containing only one factor (Boies et al., 2001; De Raad & Barelids, 2008; Di Blas & Forzi, 1999; Goldberg & Somer, 2000; Saucier, 1997, 2003). The findings from these studies have been quite consistent, and would likely be confirmed by data from all studies upon examination. The single factor contrasts a heterogeneous mix of desirable attributes at one pole with a mix of undesirable attributes at the other pole. This unrotated factor can be labeled Evaluation.

Recent empirical results have identified a similar, partly heritable ‘Big One’ factor in personality-questionnaire scores (Musek, 2007; Rushton, Bons, & Hur, 2008). Findings of a single large evaluative factor are, moreover, no doubt related to a classic finding in psychology. In judgments about the meanings of diverse objects in a wide array of cultural settings, a global evaluation factor (good vs. bad) was found recurrently to be the first and largest factor (Osgood, May, & Miron, 1975). Evaluation is also the first factor to emerge in the cognitions of young children. Whereas older children employ more differentiated trait concepts, younger children typically rely on global, evaluative inference (Alvarez, Ruble, & Bolger, 2001).

#### *Are two factors as replicable as one?*

Two-factor solutions from several lexical studies also suggest a consistent pattern: One factor includes attributes associated with positively valued

dynamic qualities and individual ascendancy, whereas the other factor includes attributes associated with social self-regulation, socialization, solidarity, and community cohesion (De Raad & Barelds, 2008; Di Blas & Forzi, 1999; Goldberg & Somer, 2000; Hřebíčková, Ostendorf, Osecká, & Čermák, 1999; Saucier, 1997, 2003). Such a factor structure resembles that embodied in the theoretical model of Bakan (1966), who labeled the two factors Agency and Communion. In addition, these two factors may be aligned with some of the other sets of dual personological constructs reviewed by Digman (1997) and by Paulhus and John (1998), including Hogan's (1983) distinction between 'getting ahead' (Dynamism) and 'getting along' (Social Self-Regulation).

Exemplifying this 'Big Two' is a basic bivariate structure of personality attributes evident across lexical studies in nine languages, selected so as to maximize linguistic diversity (Saucier et al., 2009). In this multi-language comparison, the adjectival concepts best representing Social Self-Regulation were Honest, Kind, Gentle, Generous, Good, Obedient, Respectful, Diligent, Responsible, and Unselfish – or the opposites thereof. Those best representing Dynamism were Active, Brave, Lively, Bold, and (representing the opposite pole) Timid, Weak, and Shy.

To date, this two-factor structure appears to be as ubiquitous across languages and cultures as is the one-factor structure. Moreover, unlike structures described later, both these structures are relatively impervious to variable-selection effects; they appear whether one operates from a restricted or inclusive definition of personality (Saucier, 1997), and whether one studies adjectives or type-nouns (Saucier, 2003). If both the one- and two-factor structures eventually turn out to be universal, the latter has some advantage: Two factors provide more information than one.

This constellation of two factors is also related to the three most ubiquitous dimensions of affective meaning, which include Potency (or Strength) and Activity in addition to Evaluation (Osgood, May, & Miron, 1975). In judgments about human targets, Potency and Activity tend to merge into a single dimension that Osgood and his associates called 'Dynamism'.

Interestingly, in English the descriptive phrase 's/he has a lot of personality' appears to concern mainly Dynamism (e.g., Lively, Brave, Attractive). The phrase 's/he has a lot of character (or has good character)', in contrast, appears to concern mainly Social Self-Regulation (e.g., Honest, Kind, Gentle). Allport sought to exclude ethical judgments from the study of personality, but one of the two main factors focuses largely on ethical aspects.

### *Regularities at the five-factor level*

Lexical studies have yielded structures resembling the Big Five most consistently in languages from the Germanic and Slavic language families of northern Europe, including German (Ostendorf, 1990), Dutch (De Raad, Hendriks, & Hofstee, 1992), Czech (Hřebíčková, Ostendorf, & Angleitner,

1995), Croatian (Mlačić & Ostendorf, 2005), and Polish (Szarota, 1996), as well as in English. Although a study in Turkish (Goldberg & Somer, 2000) also found a structure with much resemblance to the Big Five, studies of other non-north-European languages (e.g., Church, Katigbak, & Reyes, 1998; Di Blas & Forzi, 1998; Church, Reyes, Katigbak, & Grimm, 1997; Szirmak & De Raad, 1994) have led to results that are less clearly supportive. The most common problems have been failures of a clearly interpretable Intellect factor to appear where expected in the five-factor solution, as in Italian (De Raad, Di Blas, & Perugini, 1998), Hungarian (Szirmak & De Raad, 1994), and Greek (Saucier et al., 2005). A Chinese lexical study (Zhou et al., forthcoming) analyzed self- and peer-rating samples separately, and found Big Five replication in China to be marginal in self ratings and quite poor in peer ratings.

Several lexical studies have included a relatively broad selection of variables, each including many terms that could be classified as referring to emotions and moods (e.g., Sad, Angry) or as being unusually highly evaluative (e.g., Impressive, Disgusting), and two of these studies (Goldberg & Somer, 2000; Saucier, 1997) included terms referring to physical appearance. Because none of these analyses has found the Big Five in a five-factor solution when the highly evaluative terms were included, it seems clear that the appearance of the Big Five *as the first five factors* is contingent upon one's variable-selection procedure.

There are indications that three of the Big Five factors may be more robust than the other two, a subset that might be labeled the Big Three. De Raad, Perugini, and Szirmák (1997) found higher replicability across five languages for Extraversion, Agreeableness, and Conscientiousness than for the other two factors. Saucier (1997) found that three-factor structures in an English lexical study represented primarily these three factors, and that these structures were similar whether the variable selection was restricted or inclusive.

### *Lexical six-factor models*

Ashton et al. (2004) presented evidence that many of the lexical studies conducted to date yield a consistent pattern in six-factor solutions. Although the structure was first detected in studies of Korean (Hahn, Lee, & Ashton, 1999) and French, it has appeared to a recognizable degree in Dutch, German, Hungarian, Italian, and Polish. This structure seems less bound to the Germanic and Slavic language families than is the Big Five.

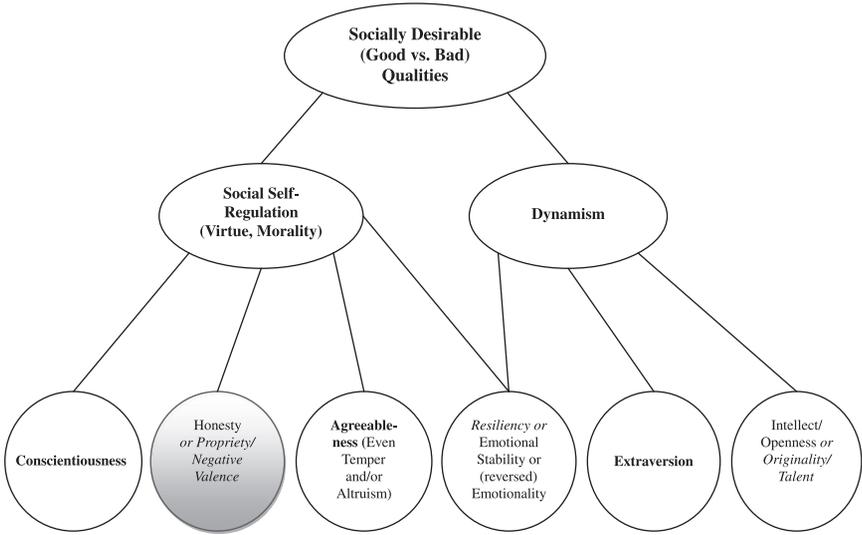
Empirically, the Extraversion, Conscientiousness, and Openness/Intellect factors in this six-factor model differ relatively little from corresponding factors in the Big Five. The other three factors emerge largely out of the interstitial areas between Big Five factors: Emotionality from Big Five (low) Emotional Stability and (low) Extraversion, Agreeableness from Big Five Agreeableness and Emotional Stability, and Honesty/Humility from

Big Five Agreeableness and Conscientiousness. However, especially in the case of Honesty/Humility, these factors are not entirely reducible to combinations of the two Big Five factors mentioned. The biggest contrast between the two models is between Big Five Agreeableness, which emphasizes empathic altruism versus its absence, and two factors in the six-factor model that are at least somewhat related to it: (a) an Agreeableness factor emphasizing patience and forgiveness versus hostility; and (b) an Honesty factor emphasizing integrity versus willingness to exploit and cheat for personal gain.

Evidence to date indicates that the replicability of the six-factor structure across languages at least equals that for the Big Five; if this is the case, the six-factor model might be considered superior because it provides more information than the Big Five.

Analyses leading to the Big Five (as well as the six-factor model of Ashton et al., 2004) have involved, in effect, removal of the most extremely evaluative terms at an early stage of the variable-selection process. Indeed, Allport (Allport & Odbert, 1936) and Norman (1963) both favored removal of purely evaluative terms. Also among those removed have been terms that can refer to either stable and temporary attributes (e.g., Happy, Tired, Bored), tendencies to affect others in a consistent way (e.g., Likeable, Annoying, Attractive), and relative eccentricity (e.g., Average, Strange, Unusual). Saucier (forthcoming) examined factors from previous lexical studies using a wider selection of attributes, including all or most of these exclusion categories, in seven languages (Chinese, English, Filipino, Greek, Hebrew, Spanish, and Turkish), finding six recurrent factors: Conscientiousness, Negative Valence (including Honesty/Propriety), Agreeableness, Resiliency (versus Internalizing Negative Emotionality), Extraversion, and Originality/Talent. In American data, markers for these six factors showed substantial incremental prediction of important criterion variables over and above that provided by standard Big Five markers. Based on marker-scale correlations, these six factors corresponded well to those found by Ashton et al. (2004), even though based on inclusive rather than restricted variable selections. Accordingly, Saucier (forthcoming) proposed an integration of the two six-factor models as slightly divergent expressions of a latent 'Big Six' model. Because either variant of the Big Six was derived from languages of diverse (not just European) origin, we might expect the generalizability (beyond cultures using European languages) of the Big Six to exceed that for the Big Five.

Beyond the 'Big Six' level, factors tend to split into their subcomponents, in a way that is more faithfully reflected in oblique, correlated factors rather than orthogonal, independent ones. There have been attempts to identify replicable subcomponents using lexical variables (Peabody & De Raad, 2002; Saucier & Ostendorf, 1999), but these have not yet led to strong proposals for a more differentiated model that would include such subcomponents.



**Figure 1** The hierarchical structure of personality factors based on evidence from lexical studies.

Figure 1 organizes the dimensions described above into a single hierarchy. If only one factor is allowed, it references the degree of socially desirable qualities. If two are allowed, they reference Social Self-Regulation and Dynamism, both likely to be correlated with the single evaluative factor above. The lowest tier on the figure shows what most typically happens if five or six are allowed. On this tier, the factors that are the most replicable are in bold type, those labels that characterize uniquely results from the more inclusive variable selections are in italics, and the still controversial sixth factor of Honesty (and Propriety) is shaded for emphasis. If the Honesty factor were removed from this figure, one would find essentially the Big Five at the lowest tier. Lines to the two-factor level indicate which of the two factors are most likely to be correlated with each of the five (or six).

*Strengths and limitations of lexically derived structural models*

In terms of cross-cultural generalizability, more studies are needed in non-Western settings where the majority of the world’s human population resides, and with non-European languages. In terms of generalizability across data types, lexical studies have focused almost entirely on those attributes represented in adjectives, although some attributes may be represented mainly as type nouns (e.g., Know-it-all) or as attribute nouns (e.g., Fortitude). Type nouns have been studied in three languages (De Raad & Hoskens, 1990; Henss, 1998; with some indications of cross-language convergence Saucier, 2003), with some indications of cross-language convergence

among these studies, although the results did not converge consistently with those based on adjectives except at the one- and two-factor levels. More studies that include attributes represented in non-adjectival forms are needed. In addition, most lexical studies to date have relied exclusively on self-descriptions, a methodology whose use should be supplemented with descriptions by knowledgeable informants; to date, there is insufficient evidence regarding whether such informant descriptions generate a different structure than do self-descriptions.

Are sets of lexical factors comprehensive? Certainly they are more comprehensive than the structural models that came before. The NEO-PI-R inventory (Costa & McCrae, 1985) gained greater comprehensiveness after the grafting of two lexical factors (Agreeableness and Conscientiousness) into its initial NEO structural model. This lexically inspired comprehensiveness is a prime reason for that inventory's rapid gain in popularity. But, there are clearly dimensions of individual differences that are beyond the Big Five, particularly if we widen the taxonomy to include abilities, values and social attitudes, and appearance-related characteristics (Saucier, 2000; Saucier & Goldberg, 1998). There is no clear and precise consensus among personality psychologists on which attributes ought to be counted as personality variables. This is true even in lexical studies; several lexical studies have included a wide range of highly evaluative, emotion, and (in a few cases) attractiveness terms, although a majority of lexical studies have excluded such variables. It is most informative to sample broadly from attributes of diverse types, classify the descriptors and use these classifications in studies controlling for the effects of variable selection (as in Saucier, 1997).

Because of their derivation in commonly referenced attribute concepts, lexical factors are guaranteed *strong social importance*, although there is no guarantee that all socially important factors will be richly represented in the lexicon. Lexical factors have already performed a service to the field in enhancing the *comprehensiveness* of personality models; prior to the Big Five there was little attention to Agreeableness or Conscientiousness. Lexical factors have shown good evidence of *cross-time stability*, and their *predictive validity* (e.g., in work settings) has been a major force behind their rising popularity. As our review indicates, their *generalizability across types of data* has been impressive, and *generalizability across cultures* has been good particularly for structures with relatively few factors. On these six criteria, lexically based factors like the Big Five can be judged as falling between adequate and superb. Structural models might be developed that are incrementally better on one or more of these criteria, but improvements are unlikely to be huge. It is the last two criteria that reveal possible limitations of lexical factors.

One of these criteria is a genetic or other causal basis. The Big Five shows evidence of heritability for all factors in the model (Bouchard, 1994; Jang et al., 1996), but it is not clear whether some alternative set of

factors would show even higher heritability. Moreover, there is no clear evidence that the Big Five correspond closely to the primary lines of influence from genes or any other causal influence, or that these factors enable easy integration with studies of the brain.

The other criterion is theory. The Big Five (and any other lexical models) are inductively and empirically derived, and lack theoretical underpinnings. There are ongoing attempts to link the empirical structures with some body of theory (e.g., Ashton & Lee, 2001; McCrae & Costa, 1996; MacDonald, 1995; Nettle, 2006), but these attempts seem not to have yet achieved impressive success. Comparing the Big Five and Big Six, a key issue is whether the Big Five Agreeableness factor that tends to emphasize empathic altruism will turn out to have a stronger theoretical basis than what replaces it in the Big Six: an Agreeableness factor emphasizing patience and forgiveness versus hostility, and an Honesty/Propriety factor emphasizing integrity versus willingness to exploit and cheat for personal gain. The more widely replicable two-factor model may be theoretically linked to biological variables: DeYoung (2006) has proposed that a Stability factor (akin to Social Self-Regulation) is linked to serotonergic functioning, whereas a Plasticity factor (akin to Dynamism) is linked to dopaminergic functioning. But overall, we do not yet have a consensual theory matched to a consensual model of empirical factors.

Structural models like the Big Five are vulnerable to being superseded by some model with a clearer basis in biology or in some other causal element, and by a model with a stronger basis in theory. There are a number of models (e.g., that including sensitivity to reward and sensitivity to punishment; Torrubia et al., 2001) that meet this description, but many of them contain only one or two factors, giving them little in the way of comprehensiveness, and they have been measured exclusively via self-report methodologies with little attention paid to cross-cultural generalizability. Models that are lacking in so many respects give up more than they gain in comparison with a lexical model like the Big Five.

### *Temperament, character, attitudes, and heritability*

‘Temperament’ and ‘character’ tend to be defined more narrowly than personality. Temperament usually includes dispositions present early in life, with Rothbart and Bates (1998) defining it as ‘constitutionally-based individual differences in emotional, motor, and attentional reactivity and self-regulation’ (p. 109). Definitions of the term ‘character’, in contrast, emphasize volition and morality. Allport (1937, p. 51) stated that when ‘personal effort is judged from the standpoint of some code’ that is based on social standards, it is called character. He considered such an ethical standpoint on personality unnecessary for psychology. However, some commonly used dimensions of personality (e.g., Honesty, Agreeableness, Conscientiousness) can be aptly labeled as character dimensions.

We find considerable overlap between structural models of personality and temperament. For example, the childhood temperament model of Rothbart and Derryberry (1981), developed from studies using laboratory measures and parent report, found two factors that are present from infancy to adulthood: Extraversion/Surgency and Negative Affectivity. Also persisting into adulthood is a third, Effortful Control factor that becomes evident fairly early in childhood. This structural model contains three dimensions which correspond fairly well to the higher-order factors of Positive Emotionality, Negative Emotionality, and Constraint proposed by Tellegen (1985; cf., Clark & Watson, 1999). These temperament dimensions also match up reasonably well with three of the Big Five factors (Evans & Rothbart, 2007).

It is not clear, however, whether one- and two-factor lexical structures converge with those from temperament measures. Extraversion/Surgency (temperament) and Dynamism (lexical) are clearly related. Attributes in the lexically derived Social Self-Regulation factor reference whether a person is relatively well-behaved or ill-mannered. Such attributes are important in judgments made about the behavior of children (e.g., by teachers), but have conventionally been thought of as primarily effects of socialization, and perhaps of moral development, as extrinsic in origin and not primarily effects of intrinsic temperament. Attributes related to character evaluation have not been included in temperament studies, and consequences follow from this exclusion: One cannot find a factor if its constituent variables have been excluded from data at the outset.

'All human behavioral traits are heritable' was proposed by Turkheimer (2000, p. 160) as the first law of behavior genetics, based on a wealth of empirical evidence. If Turkheimer's law holds, previous assumptions dividing off and discarding 'biosocial' traits in favor of 'biophysical' traits may be outdated. More specifically, traits related to ethics, morality, and socialization should not be arbitrarily excluded from biological models of personality. Character dimensions may have heritability little different from that for so-called temperament dimensions (Ando et al., 2002), and analogues of moral behavior have been identified in other social species (Flack & de Waal, 2000; Stent, 1980). Present psychobiological models (and not just those for temperament) have some difficulty accounting for individual differences in patterns of social behavior that, in humans, are more likely to be called character than temperament. A challenge for the psychology of personality is to create a theoretically strong model of socially important traits incorporating psychobiology without at the same time ignoring dimensions of moral and ethical behavior.

An interesting challenge involves the domain of values, social attitudes, and beliefs. These patterns of thinking, often associated with affect and motivation, are usually ignored by personality researchers, but can have strong effects on behavior that are obviously very consequential in the contemporary world. Like character dispositions, such belief-dispositions

have long been assumed to be environmental in origin. However, consistent with Turkheimer's first law, recent behavior-genetic studies suggest that attitudes are substantially heritable, and by genetic influences independent of those operating on commonly studied personality traits (e.g., D'Onofrio et al., 1999; Olson et al., 2001). The dispositional factors (e.g., Saucier, 2000) that underlying individual differences in this domain therefore will be important to integrate with models of personality structure.

An unresolved issue is the relation of psychology-relevant aptitudes and abilities to personality. Aptitudes and abilities are usually measured with *maximum*-performance tests, whereas personality measures usually reference a person's *typical* performance or behavior. Investigators in lexical studies have varied widely between those who include terms that suggest ability attributes, such as Wise or Smart (Goldberg, 1990; Ostendorf, 1990; Saucier, 1997) and those who tend to exclude them (e.g., Ashton et al. 2004). Interesting questions remain. Should cognitive abilities be considered 'thinking patterns' and thus considered either personality attributes or more specific processes subsumable under personality attributes? Are lay perceptions of intelligence (in self or in others) based on academic performance or aptitude tests, and do they draw on wider applications of intelligence, for example in practical, emotional, or social realms? To what degree can one measure personality variation in terms of varying aptitudes? Much might be learned from attempts to integrate understanding of personality with that of various skills, aptitudes, and various kinds of 'intelligence' (e.g., social, emotional).

## Conclusions

Recent decades have seen important progress in discerning the structure of personality attributes. At the very broadest level, this structure has regularities at the one- and two-factor levels that appear, by a rather stringent criterion, to be generalizable cross-culturally. At a slightly less broad but more informative level are the well-known Big Five factors. Lexical studies have tended to converge toward a 'Big Six' model, slightly more informative than the Big Five, that may be more replicable particularly outside languages of northern European origin and in variable selections that are more inclusive than has sometimes been conventional.

It is important to remember that scientific models are by definition set out tentatively, subject to the judgment of subsequent evidence. Researchers should bear in mind criteria – such as the eight described in this article – by which structural models can be compared, these being criteria for what makes a structural model 'good'. By focusing on these criteria, researchers might keep focused on the most important objective – an ultimately optimal structural model that will provide the most efficient vehicle toward improving scientific understanding. Such a model will include explicit linkage to the psychological mechanisms that underlie

individual differences, and will have both basic-science foundations and real-world applications.

### Short Biography

Gerard Saucier is a professor in the Department of Psychology at the University of Oregon. He earned a B. A. from the University of North Carolina, Chapel Hill, and a PhD in 1991 from the University of Oregon. Saucier's research focuses on delineation of the most cross-culturally generalizable structure of personality attributes, including the work on the nature of interindividual variation in beliefs and values. He has served as associate editor for *Journal of Personality and Social Psychology* as well as *Journal of Research in Personality*, and has authored or co-authored research articles in such outlets as *Journal of Personality and Social Psychology*, *Perspectives on Psychological Science*, *Psychological Bulletin*, and the *Journal of Personality*.

### Note

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