

9 The Five-Factor Model of personality traits: consensus and controversy

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There is little doubt that the Five-Factor Model (FFM) of personality traits (the ‘Big Five’) is currently the dominant paradigm in personality research, and one of the most influential models in all of psychology. Digman’s 1990 review on the topic has become the most highly cited article in the history of the *Annual Review of Psychology*, with over 1,200 citations. Barrick and Mount’s 1991 meta-analysis of job performance and the FFM – itself cited over 900 times – brought personality back into the mainstream of Industrial/Organizational Psychology. The FFM has led to novel and compelling reformulations of the personality disorders that stand a fair chance of reshaping Axis II in the DSM-V (Widiger and Trull 2007). Cross-cultural collaborations have shown the universality of the FFM and demonstrated pervasive fallacies in national character stereotypes (Terracciano, Abdel-Khalak, Ádám *et al.* 2005). Social psychologist Harry Reis (personal communication, 24 April 2006) recently characterized the FFM as ‘the most scientifically rigorous taxonomy that behavioural science has’, and for his research on the FFM, Paul Costa was selected by the Division of General Psychology of the American Psychological Association to present the 2004 Arthur W. Staats Lecture for Contributions towards Unifying Psychology.

What is it that researchers from so many disciplines have come to appreciate? As Digman and Inouye (1986) put it, ‘If a large number of rating scales is used and if the scope of the scales is very broad, the domain of personality descriptors is almost completely accounted for by five robust factors’ (p. 116). In other words, these five factors provide a structure in which most personality traits can be classified. This structure arises because traits co-vary. For example, people who are sociable and assertive tend also to be cheerful and energetic; they are high on the Extraversion (E) factor, which is said to be *defined* by sociability, assertiveness, cheerfulness and energy. However, people who are sociable and assertive may or may not be intellectually curious and imaginative. Those traits define a separate factor, Openness to Experience (O). Neuroticism versus Emotional Stability (N), Agreeableness versus Antagonism (A), and Conscientiousness (C) are the remaining factors.

There is a widespread consensus that these five factors are necessary and more-or-less sufficient to account for the co-variation of most personality traits, and it is

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this comprehensiveness that chiefly accounts for the utility of the FFM. Researchers who wish to conduct a review of the literature on personality correlates typically find that many different scales and instruments have been used to assess personality. If each is assigned to one of the five factors, their results can be meaningfully combined. Again, the FFM provides a framework for systematic exploratory research. Suppose, for example, one wished to study the effects on personality of growing up in East versus West Germany (Angleitner and Ostendorf 2000). One might hypothesize that East Germans would be, say, higher in C and lower in O, and administer only measures of those two factors. But if the real differences turned out to be in levels of N and A, such a design would not reveal it. By administering measures of the full FFM one can be sure that important traits have not been overlooked.

Origins of the FFM

The origins of the FFM can be traced back to Sir Francis Galton and the beginnings of trait psychology, and the details of its history have been recounted by a number of authors (Digman 1990; John, Angleitner and Ostendorf 1988). Perhaps the most interesting historical question, however, is why the FFM was not widely adopted until the end of the twentieth century. There were a number of contributing causes to this delay.

It was not immediately clear how one could specify the full list of traits in order to determine what structure was needed to organize them. The solution came with the adoption of the lexical hypothesis, which argues that traits are so important in human affairs that common words will have been invented to name them all; an unabridged dictionary ought to provide an exhaustive listing of traits, which could be sorted out into a basic structure. Several generations of researchers pursued this strategy (see John, Angleitner and Ostendorf 1988), and it led to the discovery (Tupes and Christal 1961/1992) and rediscovery (Goldberg 1983) of the FFM.

However, the great majority of personality psychologists did not adopt the lexical hypothesis. They were sceptical that the lay vocabulary could be a proper basis for a scientific account of traits, and they tended to offer and defend their own, competing systems. Eysenck (1947) proposed a highly simplified system with only two factors, E and N; Jungian psychologists assessed four psychological preferences (Myers and McCaulley 1985); Block (1961) created a set of 100 theoretically-eclectic descriptors intended for use in clinical research. Disputes between rival schools continued for decades, but in the 1980s a series of studies showed that all these instruments assessed variations on the FFM. For example, research showed that the Extraversion, Intuition, Feeling and Judging preferences of the Myers-Briggs Type Indicator (Myers and McCaulley 1985) correspond to E, O, A and C, respectively (McCrae and Costa 1989).

The discoverers of the significance of the FFM, Tupes and Christal, were Air Force psychologists who published their work in a Technical Report that was

essentially lost to the literature until it was published thirty years later (Tupes and Christal 1961/1992). It had been brought to the attention of psychologists by Norman (1963), but at a time when personality psychology was entering a period of crisis. In 1968 Mischel published a critique of trait psychology that led most psychologists to conclude that traits were cognitive fictions with no predictive value; the FFM was merely an adequate taxonomy of illusions. Slowly, defenders of traits made the case that traits were both real (McCrae 1982; Yamagata, Suzuki, Ando *et al.* 2006) and consequential (Ozer and Benet-Martínez 2006). The revival of trait psychology and the ascendance of the FFM went hand in hand.

Most personality assessment takes the form of self-report inventories, in which respondents are asked to say if, or how well, each of a series of statements describes them. This has proven to be a very useful technique, but it is by no means perfect. People may not understand the questions, or they may not understand themselves. They may be prone to agreeing with almost any assertion, or may choose to endorse only positive statements about themselves. They may be bored by the task and careless in their responses. Sceptics came to believe that self-reports were nothing but a collection of errors and biases.

It was, therefore, an important advance when psychologists showed that there was substantial (though not complete) agreement between descriptions from self-reports and those obtained when the same questions were put to knowledgeable informants – spouses, roommates, friends (Funder 1980; Kurtz and Sherker 2003). In 1987, McCrae and Costa showed that the FFM could be found in analyses of peer ratings as well as self-reports, and that there was substantial agreement across these different methods of measurement on the standing of each individual on all five factors. The FFM was subsequently found using Q-sort methods, in which people sort statements from most to least characteristic (Lanning 1994; McCrae, Costa and Busch 1986), and even in sentence completion tests, in which people describe themselves in response to the question, ‘Who am I?’ (McCrae and Costa 1988).

Questionnaires, however, remain the most popular and well-validated tools for assessing the FFM. The most widely used is the Revised NEO Personality Inventory (NEO-PI-R) (Costa and McCrae 1992a), whose 240 items assess 30 specific traits (or facets) that define the five factors. A brief version, the NEO Five-Factor Inventory (NEO-FFI) (Costa and McCrae 1992a) assesses only the five factors. The Big Five Inventory (Benet-Martínez and John 1998) is another widely-used measure of the five factors; De Raad and Perugini (2002) have edited an entire volume devoted to alternative measures of the FFM in a variety of languages.

Research discoveries

Armed with a comprehensive model and a variety of validated assessment tools, personality psychologists began to address basic questions about how traits operated. Widely replicated results have yielded a body of knowledge that

had proven elusive during most of the twentieth century. Traits had always been assumed to be enduring dispositions; longitudinal research showed that individual differences in all five factors are in fact remarkably stable (Costa and McCrae 1992b; Roberts and DelVecchio 2000). At the same time, there are gradual changes in the average levels of traits. Both cross-sectional and longitudinal studies suggest that between adolescence and old age, individuals generally decline in N and E and increase in A and C. O increases until some time in the twenties, after which it slowly declines.

Research on the FFM has shown consistent patterns in gender differences. These differences are generally small, with substantial overlap between the distribution of traits in men and in women. But in most samples, women score higher in N and A than men. At the level of specific facets, there are sometimes differences within domain. Thus, both Warmth and Assertiveness are facets of E, but women are typically warmer and men more assertive. Again, women are more open to aesthetic experiences, whereas men are more open to ideas.

Over the past twenty years, researchers around the world have begun to translate instruments like the NEO-PI-R (McCrae and Allik 2002) and the Big Five Inventory (BFI) (Schmitt, Allik, McCrae *et al.* 2007), and have administered them to respondents in dozens of countries. Results are easily summarized: personality is much the same everywhere. The FFM structure itself is universal. McCrae and colleagues (McCrae, Terracciano and 78 others 2005) reported an almost perfect replication of the American adult self-report NEO-PI-R structure using 11,985 observer ratings of college-age and adult targets from 50 cultures. The same study replicated the American pattern of age differences (although the age effects for N and A were much smaller in the international sample). As Figure 9.1 shows, that study also replicated gender differences seen in the self-reports of American men and women ($r = .82, p < .001$)

These findings would have astounded psychologists and anthropologists who studied personality and culture in the first half of the twentieth century. They believed that personality was a cultural creation that would probably vary as much across cultures as diets and religious beliefs. As late as 1996, Juni wrote that ‘Different cultures and different languages should give rise to other models that have little chance of being five in number nor of having any of the factors resemble those derived from the linguistic/social network of middle-class Americans’ (Juni 1996, p. 864). Cross-cultural research on the FFM has created a revolution in thinking on this issue.

There is a plausible explanation for this universality: the FFM is strongly rooted in biology. Each of the five factors is heritable (Riemann, Angleitner and Strelau 1997), and studies of twins (Yamagata, Suzuki, Ando *et al.* 2006) and of family relatives (Pilia, Chen, Scuteri *et al.* 2006) show that the five-factor structure of the observed traits mirrors the structure of their underlying genes. Apparently, Warmth and Assertiveness are both definers of E because they are influenced by some of the same genes. We know that the human race is a single species, so the universality of the FFM is probably a reflection of the fact that variations on the same trait-related genes are found in *Homo sapiens* worldwide.

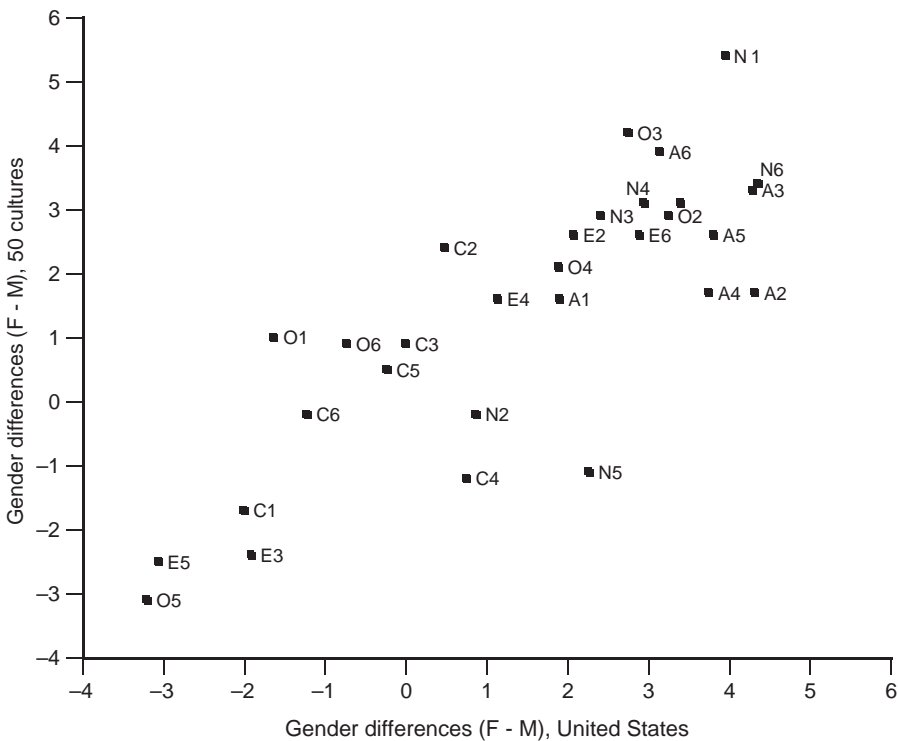


Figure 9.1. Gender differences, in T-scores, for adults in the United States (self-reports) vs. 50 cultures (observer ratings) on the 30 facets of the NEO-PI-R. See Table 9.1 for facet labels. Women score higher than men on traits in the upper right quadrant, such as N1: Anxiety, O3: Feelings and A6: Altruism. Men score higher than women on traits in the lower left quadrant, such as O5: Ideas, E5: Excitement Seeking and C1: Competence. Data from Costa and McCrae 1992a and from McCrae, Terracciano et al. 2005.

There is now consensus that the general personality dimension of N is associated with most personality disorders (Widiger and Costa 2002), that E predisposes people to be happy (DeNeve and Cooper 1998), that O predicts social and political liberalism (McCrae 1996), that low A is a risk factor for substance abuse (Ball 2002), that C is associated with good job performance (Barrick and Mount 1991). The utility of the FFM has been securely demonstrated.

Current controversy concerning the FFM

Precisely because it plays such a prominent role in contemporary psychology, the FFM has become the target of numerous critiques. This is healthy; science advances by constantly challenging established views. Sometimes these challenges force a change in thinking, as when Costa and McCrae moved from their three-factor

model (Costa and McCrae 1980) to the FFM (McCrae and Costa 1987). Other times, they result in stronger evidence for the challenged ideas. In the end, trait research benefited from Mischel's (1968) critique, because researchers had to design better and more telling studies to demonstrate what they thought they knew about traits.

Objections to the FFM take two different forms. The first is a critique of trait theories themselves from other perspectives in personality psychology. Advocates of a person-centred approach claim that types more faithfully represent the operation of psychological processes than do variable-centred traits (see Asendorpf, Caspi and Hofstee 2002, for a balanced discussion of these issues). Social cognitive theorists (Cervone 2004) have argued that traits merely describe, without explaining, behaviour (see McCrae and Costa 2008a for a rebuttal). Other personality theorists have pointed out that, even if it is a fully adequate model of personality traits, the FFM itself does not constitute a full theory of personality, explaining human development, day-to-day functioning and social interactions in cultural context (McAdams and Pals 2006). This point is well taken, and McCrae and Costa have offered a much broader perspective on personality in the form of Five-Factor Theory (McCrae and Costa 2003, 2008b).

The other class of objections to the FFM, which will be considered in more detail, come from researchers who are committed to trait models and factor analytic methods, but who propose some variation on or refinement of the FFM. The FFM is a hierarchical model of personality traits: each of the five broad factors is defined by more narrow and specific traits or facets. There are currently disagreements among researchers at the level of the five factors; at a level above the five factors; and at the level of the specific facets.

Three and six factor alternatives

The foundation of the FFM and thus of contemporary trait psychology is that five factors are both necessary and sufficient to summarize co-variation among specific personality traits. However, some researchers have argued that more or fewer than five factors are needed. De Raad and Peabody (2005) reported analyses of trait descriptive adjectives in Dutch, Italian, Czech, Hungarian and Polish samples and found more robust support for a three-factor model consisting of E, A and C than for the FFM. Conversely, Ashton and colleagues (Ashton and Lee 2005; Ashton, Lee, Perugini *et al.* 2004) reported lexical studies in a number of languages in which six replicable factors appeared. Ashton's model basically divides FFM A into two factors, the second called Honesty-Humility; in addition, the factors are rotated a bit from their usual positions.

Perhaps the most problematic feature of these studies is that they are, properly speaking, not so much studies of personality traits as of personality trait *language*. The people of two different cultures might have identical traits, but a factor that is richly represented in the vocabulary of the first culture might be missing from the vocabulary of the second. McCrae (1990) noted that there are relatively few English-language adjectives that reflect O. For example, there is no single term

that designates sensitivity to aesthetic experience; ‘artistic’ comes closest, and it refers to the producer rather than the consumer of art. Yet surely English speakers are capable of responding to beauty (McCrae 2007).

Other researchers have argued that entirely new factors are needed. Cheung and her colleagues (Cheung, Cheung, Leung *et al.* 2003; Cheung, Leung, Fan *et al.* 1996) developed an inventory based on indigenous Chinese personality characteristics, which was subsequently translated into English. She argued that the Chinese Personality Assessment Inventory (CPAI) revealed a new factor, originally called Chinese Tradition, but later renamed Interpersonal Relatedness because it was also found in non-Chinese samples. In a joint factor analysis with the NEO-FFI, when six factors were examined, the FFM was supplemented with a factor defined by CPAI Harmony, Relationship Orientation, Thrift, Logical Orientation, Self Orientation, Defensiveness and low Flexibility. However, when only five factors were extracted, the elements of this factor were simply redistributed among A and C factors. It thus appears that the FFM encompasses distinctively Chinese traits.

Spirituality has also been proposed as a sixth factor (Piedmont 1999). The Spiritual Transcendence Scale includes facets assessing Prayer Fulfilment, Universality and Connectedness, and these three defined a separate factor in a joint analysis with the facets of the NEO-PI-R. One might question whether spirituality is in the domain of personality at all, or whether it is better regarded as an attitude or practice. However, in this case another issue is raised. All the items in this version of the Spiritual Transcendence Scale are positively keyed, so their intercorrelation may be inflated by acquiescent responding, the tendency to agree with items regardless of content. (NEO-PI-R facet scales are balanced, with roughly equal numbers of positively- and negatively-keyed items, so acquiescence is not relevant to their structure.)

Some evidence for this hypothesis comes from analyses of a different instrument, the Temperament and Character Inventory (TCI) (Cloninger, Przybeck, Svrakic and Wetzel 1994). The TCI has three scales that define a Self-Transcendence factor, and these scales, too, are susceptible to acquiescent responding, because all the Self-forgetfulness and Transpersonal Identification items and ten of thirteen of the Spiritual Acceptance items are positively keyed. A joint factor analysis of the twenty-five TCI scales with the five NEO-PI-R factors yielded clear N, A and C factors, a factor defined by both E and O, and a separate Self-Transcendence factor (McCrae, Herbst and Costa 2001). However, when acquiescence was assessed and statistically controlled, the full FFM appeared, with the three Self-Transcendence scales loading on the O factor (evidently measuring something like Openness to Spiritual Experience).

A higher-order structure

Digman (1997) proposed that the five factors are not the highest level of personality structure. Across different instruments and samples he showed that the factors were themselves intercorrelated, and that a factor analysis of these correlations revealed two higher-order factors, alpha (defined by A and C versus N) and

beta (defined by E and O). Such factors have been reported by a number of other researchers (e.g., DeYoung, Peterson and Higgins 2002), so there is little controversy about their existence. What remains in doubt is their interpretation. Some researchers believe that they are real, if highly abstract, features of the structure of personality, perhaps even with a genetic basis (Jang, Livesley, Ando *et al.* 2006).

Other writers have argued that they are artifacts of evaluative bias (McCrae and Costa in press-a). Such biases come in two forms, called Positive and Negative Valence, and McCrae and Costa (1995) showed that Negative Valence is related to N and low A and C, and thus low alpha, whereas Positive Valence is related to E and O, and thus beta. Biesanz and West (2004) reported that the five factors were correlated when self-reports and observer ratings were examined separately, but were orthogonal across observers; for example, E and O were correlated in self-reports and in observer ratings, but self-reported E was unrelated to observer rated O. DeYoung (2006), however, claimed correlations both within and across raters. It is possible that both substantive and artifactual explanations are correct in part.

Specifying facets

Although scores on the five factors give a general sense of what an individual is like, much more can be learned by assessing the specific traits that define the factors. For example, both cheerfulness and assertiveness are definers of E, because both reflect ways of interacting with others. But some people are cheerful without being assertive, and others are assertive without being cheerful, and knowing which is which is important to clinicians (Singer 2005) and researchers (Paunonen and Ashton 2001). The problem at the facet level is that there is no generally recognized way of sub-dividing the factors into constituent traits. For example, Costa and McCrae (1992a) distinguished between Warmth and Gregariousness facets of E, corresponding to the sub-divisions of the need to belong: 'ongoing mutual caring and concern', and 'a desire for frequent interactions' (Baumeister 2005, p. 112). By contrast, Watson and Clark (1997) thought this distinction was unnecessary, and combined them into a single trait of sociability.

Cattell, Eber and Tatsuoka (1970) argued that there were fifteen primary personality traits (plus intelligence), and an instrument developed by Eysenck and colleagues (Eysenck, Barrett, Wilson and Jackson 1992) assessed twenty-one primary traits. The NEO-PI-R has thirty facet scales, six for each factor. They were chosen to represent the most important constructs in the personality literature, while at the same time being maximally distinct. Items to tap each were written using rational methods, and the best items were selected by item analyses and targeted factor analyses in a series of samples (Costa and McCrae 1995a).

It is instructive to compare the three systems to form an idea of their correspondences. Table 9.1 reports the scales from the 16PF Fifth Edition (16PF) and the Eysenck Personality Profiler (EPP) assigned to the NEO-PI-R facet with which they show the highest correlation. Both the 16PF and EPP have scales representing each of the five factors, and the empirical correspondences of individual scales are all

Table 9.1 *Correspondence of facet-level scales for three inventories.*

NEO-PI-R facet scale	16PF scale	EPP scale
N1: Anxiety	O: Apprehension	Anxious, Hypochondriacal
N2: Angry Hostility	Q4: Tension	
N3: Depression	<i>C: Emotional Stability</i>	Unhappy, Dependent
N4: Self-Consciousness		Inferior, Guilty
N5: Impulsiveness		
N6: Vulnerability		
E1: Warmth		
E2: Gregariousness	<i>Q2: Self-reliance</i> , A: Warmth	Sociable
E3: Assertiveness	H: Social Boldness, E: Dominance	Assertive
E4: Activity		Active
E5: Excitement Seeking	F: Liveliness	Sensation-seeking
E6: Positive Emotions		
O1: Fantasy	M: Abstractedness	
O2: Aesthetics	I: Sensitivity	<i>Tough-minded</i>
O3: Feelings		
O4: Actions	Q1: Openness to Change	
O5: Ideas		<i>Practical</i>
O6: Values		<i>Dogmatic</i>
A1: Trust	<i>L: Vigilance</i> , <i>N: Privateness</i>	
A2: Straightforwardness		<i>Manipulative</i>
A3: Altruism		
A4: Compliance		<i>Aggressive</i>
A5: Modesty		
A6: Tender-mindedness		
C1: Competence		
C2: Order	Q3: Perfectionism	Obsessive
C3: Dutifulness		<i>Irresponsible</i>
C4: Achievement Striving		Ambitious
C5: Self-discipline		
C6: Deliberation	G: Rule-consciousness	<i>Impulsive, Risk-taking, Expressive</i>

Note. Each 16PF and EPP scale is assigned to the NEO-PI-R facet with which it is most strongly correlated. Adapted from Conn and Rieke (1994), Table 6.4, $N=257$; and Costa and McCrae (1995b), Table 1, $N=229$. Absolute correlations = .38 to .81, all $p < .001$. Scales given in italics are inversely related to the NEO-PI-R facet. NEO-PI-R = Revised NEO Personality Inventory. 16PF = 16PF Fifth Edition. EPP = Eysenck Personality Profiler.

reasonable: NEO-PI-R N1: Anxiety, for example, is most strongly related to 16PF Apprehension and EPP Anxious; NEO-PI-R C2: Order corresponds to Perfectionism and Obsessive. Some facets, such as N2: Angry Hostility, are represented in the 16PF but not the EPP; other facets, such as N4: Self-Consciousness, are found in the EPP

but not the 16PF. Table 9.1 demonstrates that there is in fact considerable consensus at the level of lower-order traits.

Because the NEO-PI-R has thirty facet scales, there are inevitably some facets without corresponding scales in the 16PF and EPP, such as N6: Vulnerability, E6: Positive Emotions, and O3: Feelings. This does not mean that this content is completely absent from the other inventories; every NEO-PI-R facet is significantly correlated with at least one scale from each of the other measures. But the thirty facets of the NEO-PI-R allow one to make distinctions that cannot be made with these other inventories, such as the distinction between Warmth and Gregariousness. An inventory with sixty facet scales could make even more distinctions, but so large a number of subtle distinctions would be difficult to learn and usefully employ.

The facet system of the NEO-PI-R has been criticized as being arbitrary, because ‘the key ingredient for a system to provide an adequate lower order structure of the Big Five is some empirical foundation to selecting lower-order traits’ in contrast to the ‘theoretical insight and intuition’ used in developing the NEO-PI-R (Roberts, Walton and Viechtbauer 2006, p. 29). Certainly it would be ideal to identify, solely by empirical means, a set of lower-level traits that consistently emerged across languages, methods of measurement and item pools, as the FFM often does at a higher level (e.g., Markon, Krueger and Watson 2005; McCrae 1989; McCrae, Terracciano and 78 others 2005). So far, however, that has not happened, and an ambitious effort to provide an empirical basis for the facets of C (Roberts, Bogg, Walton, Chernyshenko and Stark 2004; Roberts, Chernyshenko, Stark and Goldberg 2005) illustrates some of the problems (see McCrae and Costa 2008a). The facets of C identified by those researchers in a pool of trait descriptive adjectives bore only limited resemblance to those they found in a selection of personality inventory scales. The eight factors found in adjectives included Punctuality and Formalness facets not found in inventory scales; the six factors found in inventory scales included a Virtue facet not found in adjectives. The empirical strategy does not seem to yield consistent results at the facet level.

In the meantime, the facets of the NEO-PI-R do provide one system that has been successfully used in many applications and in dozens of cultures. Researchers have documented the discriminant validity, heritability and developmental course of all thirty facets, and no obvious gaps in covering the scope of the FFM have been identified. At present, NEO-PI-R facets arguably offer the best available delineation of the FFM at the next-lower level in the trait hierarchy.

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