

# NEO Personality Inventory: Unlock Your Five Factor Profile

Authored by  
**mohammad looti**

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The Revised NEO Personality Inventory, or NEO PI-R, is a psychological personality inventory; a 240-item measure of the Five Factor Model: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Additionally, the test measures six subordinate dimensions (known as 'facets') of each of the "FFM" personality factors. The test was developed by Paul T. Costa, Jr. and Robert R. McCrae for use with adult (17+) men and women without overt psychopathology. The short version, the NEO-Five Factor Inventory (NEO-FFI), has 60 items (12 items per domain). The NEO PI-R and NEO-FFI were updated in 2010 in a manual called the NEO Inventories for the NEO Personality Inventory-3, NEO Five-Factor Model 3, and NEO Personality Inventory-Revised. While the NEO PI-R is still being published, the NEO-PI-3 and NEO-FFI-3 feature updated normative data and new forms.

### **Personality dimensions**

A list of the personality dimensions measured by the NEO PI-R, including facets, is as follows:

#### **Neuroticism**

Anxiety  
Hostility  
Depression  
Self-Consciousness  
Impulsiveness  
Vulnerability to Stress

#### **Extraversion**

Warmth  
Gregariousness  
Assertiveness  
Activity  
Excitement Seeking  
Positive Emotion

#### **Openness to experience**

Fantasy  
Aesthetics  
Feelings  
Actions  
Ideas  
Values

## Agreeableness

Trust  
Straightforwardness  
Altruism  
Compliance  
Modesty  
Tendermindedness

## Conscientiousness

Competence  
Order  
Dutifulness  
Achievement Striving  
Self-Discipline  
Deliberation

## Name

The original version of the measurement was the Neuroticism-Extroversion-Openness Inventory (NEO-I). This version only measured three of the Big Five personality traits. It was later revised to include all five traits and renamed the NEO Personality Inventory (NEO PI). In this version, "NEO" was now considered part of the name of the test and was no longer an acronym. This naming convention continued with the third and latest version, the NEO PI-R. A mnemonic device for the five primary factors is the acronym "OCEAN," or alternatively CANOE".

## History

In the 1970s, Costa and McCrae were researching how personality changed with age. Personality inventories were included in the batteries of assessments participants took in the Normative Aging Study. Costa and McCrae report that in looking at the competing factorially analyzed trait personality theories of the day, they noticed much more agreement at the level of the higher-order factors than at the lower order factors. Costa and McCrae report that they began by looking for the broad and agreed-upon traits of Neuroticism (N) and Extraversion (E), but factor analysis also led them to a third broad trait, Openness to Experience (O). The first version of the NEO only included those three factors, and was included in the Augmented Baltimore Longitudinal Study of Aging.

From this data, Costa and McCrae recognized two more factors: Agreeableness (A) and Conscientiousness (C). They then published the first manual for the NEO, which included all five factors. The assessment also included six "facet" sub-scales for the three original factors (N, E, &

O). As research began to accumulate that the five factors were adequately broad to be useful, there were also calls for a more detailed view of personality. In 1992 Costa and McCrae published a Revised NEO manual which included six facets for each factor (30 in total).

### **Forms and Administration**

In the most recent publication, there are two forms for the NEO, one for self report (form S) and one for observer rating (form R). Both forms consist of 240 items (descriptions of behavior) answered on a five point scale, ranging from "strongly disagree" to "strongly agree". Finally, there is a 60-item assessment of domains only called the "NEO FFI." There are paper and computer versions of all forms available.

The manual reports that administration of the full version should take between 30 and 40 minutes. Costa and McCrae report that the assessment should not be evaluated if there are more than 40 items missing. They also state that despite the fact that the assessment is "balanced" to control for the effects of acquiescence and nay-saying, that if more than 150 responses, or less than 50 responses, are "agree" or "strongly agree," the results should be interpreted with caution.

Scores can be reported to most test takers on "Your NEO Summary," which provides a brief explanation of the assessment, and gives the participants' domain levels and a strengths-based description of three levels (high, medium, and low) in each domain. For example, low N reads "Secure, hardy, and generally relaxed even under stressful conditions," whereas high N reads "Sensitive, emotional, and prone to experience feelings that are upsetting." For profile interpretation, Facet and Domain scores are reported in T Scores and are recorded visually as compared to the appropriate norm group, much like other measures of personality.

### **Reliability of the NEO**

The internal consistency information of the NEO presented in the manual was derived from the full job performance sample (n= 1,539). The internal consistency of the NEO was high, at: N= .92, E= .89, O= .87, A= .86, C= .90. The internal consistency of the facet scales ranged from .56-.81, although Costa and McCrae remind us that there are only 8 items on each facet. A recent article discussing personality and eating disorders reported an internal consistency of .69-.90 for the NEO PI-R facets. For the NEO FFI (the 60 item domain only version) the internal consistencies reported in the manual were: N= .79, E= .79, O= .80, A= .75, C= .83. In the literature, the NEO FFI seems to be used as a whole more often, with investigators using the NEO PI-R usually using the items from just the domains they are interested in. A recent article using the NEO FFI to study perfectionism had the internal consistencies at: N= .85, E= .80, O= .68, A= .75, C= .83.

The literature appears to support the internal consistencies listed in the manual, but more

interestingly, the NEO has been translated and evaluated in many different languages and cultures. A translation of the NEO to be used in the Philippines has the internal consistency of the domain scores from .78-.90, with facet alphas having a median of .61. The NEO was the assessment used in a recent study which involved using self report measures in 49 different cultures to assess whether individuals' perception of the "national character" of the culture accurately reflected the personality of the members of that culture (it did not).

Test retest reliability of the NEO PI-R is also good. The test retest reliability of an early version of the NEO after 3 months was: N= .87, E= .91, O= .86. The test retest reliability reported in the manual of the NEO PI-R over 6 years was: N= .83, E= .82, O= .83, A= .63, C= .79. Costa and McCrae point out that this not only shows good reliability of the domains, but also that they are stable over a long periods of time (past the age of 30), as the scores over 6 years are only marginally more different than the scores as measured a few months apart.

### **Consistency**

A study of German twins found that the correlation between two peer-raters were 0.63 for NEO FFI neuroticism. Correlation between self-rated neuroticism and peer-rated neuroticism was 0.55.

### **The effect of age on NEO PI-R**

The NEO PI-R traits are not necessarily stable across life. Based on cross-sectional and longitudinal studies researchers conclude that neuroticism and extraversion declines with age, whereas agreeableness and conscientiousness increase. A meta-analysis of 92 personality studies that used several different inventories (among them NEO PI-R) found that social dominance, conscientiousness, and emotional stability increased with age, especially in the age 20 to 40.

### **Validity of the NEO**

Costa and McCrae report in the manual extensive information on the convergent and discriminate validity of the NEO.

For the MBTI, Introversion is correlated with the NEO facet Warmth at -0.61, and with the NEO facet Gregariousness at -0.59. Intuition is correlated with the NEO facet Fantasy at 0.43 and with the NEO facet Aesthetics at 0.56. Feeling is correlated with the NEO facet Tender-mindedness at 0.39.

For the MMPI (a personality inventory used in mental health), the Compulsive scale is correlated with the NEO facet Anxiety at 0.51, the Borderline scale is correlated with the NEO facet Angry hostility at 0.47, the Avoidant scale is correlated with the NEO facet of Self-consciousness at 0.58, and the Schizoid scale is correlated with the NEO facet Gregariousness at 0.66.

For the Self-Directed Search (a personality inventory developed by John L. Holland for careers

work), Artistic is correlated with the NEO facet Aesthetic at 0.56, Investigative is correlated with the NEO facet Ideas at 0.43, and Social is correlated with the NEO facet Tender-mindedness at 0.36.

In terms of criterion validity there have been the following recent studies. Conard, 2005, found that Conscientiousness significantly predicted the GPA of college students, over and above using SAT scores alone. Cano-Garcia and his two colleagues in 2005 correlated a Spanish version of the NEO to predictors of teacher burnout in Sevilla, Spain. Neuroticism was related to the "emotional exhaustion" factor of burnout at 0.44, and Agreeableness related to the "personal accomplishment" factor of burnout (which is negatively scored when predicting burnout) at 0.36. Wang, Jome, Haase, & Bruch, in 2006, found that in and minority students Extraversion was correlated to Career Decision Making Self-Efficacy (CDMSE) at 0.30, and that Neuroticism was strongly related to Career Commitment while controlling for CDMSE ( $r=0.42$ ). Finally, Korukonda reported in 2007 that Neuroticism was positively related to computer anxiety, while Openness and Agreeableness was negatively related.

### **NEO-FFI: the shortened version**

A cut-down version of NEO PI-R exists called the NEO Five-Factor Inventory (NEO-FFI) with 60 items and designed to take 10-15 rather than 45-60 minutes to administer. This test was revised in 2004.

### **Cross-Cultural Research on NEO-PI-R**

Cross-cultural stability of an instrument can be considered evidence of its validity. A huge amount of cross-cultural research has been carried out on the Five-Factor Model of Personality by utilizing the NEO-PI-R and the shorter version, the NEO-FFI. McCrae and Allik (2002) have presented a collection of selected invited papers from various researchers across the globe covering various issues in cross-cultural research on the FFM. This volume has also presented data about the FFM from several cultures. The robustness of the FFM has been proven across different cultures; for example, Chinese (McCrae, Costa, & Yik, 1996; Yik & Bond, 1993), Estonian & Finnish (Pulver, Allik, Pulkkinen, & Hämäläinen, 1995), Filipino and French (McCrae, Costa, del Pilar, Rolland, & Parker, 1998), India (Lodhi, Deo, & Belhekar, 2002), Portuguese (Lima, 2002), Russian (Martin, Oryol, Rukavishnikov, & Senin, 2000), South Korean (Piedmont & Chae, 1997), Turkish (Gülgöz, 2002), Vietnamese (Leininger, 2002), sub-Saharan cultures like Zimbabwe (Piedmont, Bain, McCrae, & Costa, 2002), etc. Angleitner and Ostendorf (2000) presented the evidence for robustness of the FFM in German speaking countries like Austria, former East and West Germany, and Switzerland. Rolland (2000), on the basis of the data from sixteen cultures, asserted that the neuroticism, openness, and conscientiousness dimensions are cross-culturally valid. Rolland further states that extraversion and agreeableness dimensions that are components of interpersonal circumplex are more sensitive to cultural context. McCrae, Costa, Lima, Simões,

Ostendorf, Angleitner, Marušić, Bratko, Caprara, Barbaranelli, Chae, and Piedmont (1999) showed that the age differences in the five-factors of personality across the adult life span are parallel in samples from Germany, Italy, Portugal, Croatia and South Korea. McCrae (2001) examined the data from 26 cultures and showed that the age and gender differences resembled those found in the American sample. The intercultural factor analysis yielded a close approximation to the five-factor model and the factor scores were meaningfully related to other cultural level variables. McCrae (2002) extended earlier data to 36 cultures and the analysis of age and gender differences, the generalizability of culture profiles across gender and age groups, and culture level factor structure and correlates were replicated. McCrae, Terracciano et al. (2005) further reported data from 51 cultures and presented findings that supported the rough scalar equivalence of NEO-PI-R five factors and facets across cultures, suggesting that aggregate personality profiles provide insight into cultural differences.

### **Brain and genetics**

The NEO PI-R has been used in numerous research studies that investigate a link between genotype and personality or brain and personality -- as in the competing personality inventory of C. Robert Cloninger. Such studies are not always conclusive; for example, one study found some evidence for an association between NEO PI-R facets and polymorphism in the tyrosine hydroxylase gene, while another study reported that they could not confirm the finding.

In a classic study published in Science in 1996, a relationship between the serotonin transporter gene regulatory region (5-HTTLPR) and the neuroticism subscale was found. Individuals with a shorter allele version had higher neuroticism scores. The effect was significant for heterozygotes and even stronger for people homozygous for the allele. Although this is an important finding, this specific gene only contributes 4% of the overt variation in the neuroticism trait, and only 8% of the genetic variation. The authors conclude that "if other genes were hypothesized to contribute similar gene dosage effects to anxiety, approximately 10 to 15 genes might be predicted to be involved."

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