

The NEO Personality Inventory: marking a paradigm shift in psychometric measurement

Author: Wendy Lord

Content: This white paper examines the field of psychometric personality assessment, with particular emphasis on the development of the NEO Personality Inventory. The NEO remains the 'gold standard' metric of choice in this field and has a strong reputation as a powerful predictor of individual differences in behavioural style. In research and practice, the NEO's reliability and predictive power are second to none across a range of HR applications including candidate selection, talent development, team-building and coaching.

Hogrefe Ltd

Hogrefe House
Albion Place
Oxford, OX1 1QZ, UK

Tel: 01865 797 920
Email: info@hogrefe.co.uk
Web: www.hogrefe.co.uk

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'The NEO PI is an empirically powerful instrument that has numerous applications in both [applied] and research contexts. The strength of the instrument is its foundation in the five-factor model of personality – a comprehensive taxonomy of personality traits.' (Piedmont, 1998)

Introduction

The model of personality measured by the NEO is widely accepted by the research community as incorporating all of the fundamentally important building blocks of human personality (Piedmont, 1998, p.vii). As the first comprehensive measure of this model, the NEO represents a significant evolutionary step in the field of personality assessment. Prior to the emergence of the model and the development of the NEO to measure it, the field of personality assessment was highly disorganised. There was no agreed taxonomy of personality traits, so test developers had no choice but to make their own decisions about which were the important traits to measure. Commercially available personality inventories were based on a wide variety of theoretical perspectives which served as the rationale for the range of traits they included. Such variety is a good thing, except that before the existence of an external taxonomy it was impossible to make objective comparisons between different inventories in terms of their relationship to the overall range of traits. This in turn made it hard to decide on the most suitable metric for a particular assessment application.

It was not until the 1980s that researchers in the field arrived at an agreement about what the most important personality traits actually are, and this was despite decades of empirical work dedicated to trying to find out. Finally, the research community as a whole came to acknowledge that the large body of accumulated scientific evidence clearly pointed to five broad underlying traits. In 1981, Goldberg invented the term 'Big Five' to represent these – the term was 'not chosen to reflect their intrinsic greatness but to emphasise that each of these factors is extremely broad' (John & Srivastava, 1999). It was agreed that these five broad traits are at the root of individual differences in how personality is characteristically expressed, and that together they account for all the variations across people in typical behavioural style (Table 1).

The nature of the Big Five traits

Individual differences in levels of the Big Five personality traits cannot be observed directly. Rather, they are inferred from the more observable behavioural characteristics that arise from them. Variations in the observable behaviours influenced by each of the Big Five are important because they make a difference to how the underlying traits are manifested. For example, two people who score average on Extraversion (one of the Big Five) are likely to express their average level of Extraversion in different ways. One person might be highly action oriented but not necessarily enthusiastic about social interaction, while the other might be socially enthusiastic while being low on action orientation. The combination of the Big Five personality traits with the observable behaviours to which they give rise became known as the Five Factor Model (FFM) of personality.

However, it is one thing to agree on the fundamental building blocks of personality and quite another to be able to measure them. Nine years elapsed after the phrase Big Five was coined before a comprehensive measure of the Big Five was developed. That measure was called 'The NEO Personality Inventory'. The NEO was the first personality inventory to be explicitly designed as a comprehensive assessment of the FFM. Evidence for its comprehensiveness is detailed across many sources, the most recent being the technical manual that accompanies the UK edition of the NEO-PI-3 (McCrae & Costa, 2015, pp. 41–46).

The NEO Personality Inventory as a measure of the five factors

During the 1990s, the NEO built up a reputation as a ‘gold standard’ among self-report personality inventories – largely due to its comprehensive measurement of the FFM and also because, for some years, it was the only available assessment of the FFM. These two features had important consequences for the field of personality research in general but also contributed much to the growth of the NEO’s pedigree. The impact on the NEO’s reputation happened in two ways. First, the NEO became the metric of choice for personality researchers, which meant that the body of empirical evidence for its predictive power against a broad range of criteria grew very quickly. Secondly, the NEO was increasingly used as a yardstick for analysing what other personality tests were tapping into and, more significantly, what they were leaving out, in terms of comprehensive coverage.

While there is no requirement for a personality inventory to be comprehensive, it is important to know what it is leaving out, because what is left out may have relevance to a particular assessment context. These correlational studies between the NEO and other personality tests further increased the research base underpinning the NEO and the reputation of the metric as a powerful predictor of individual differences in behavioural style. In particular, such comparative studies provide evidence that the NEO accounts for and goes beyond what is measured by a wide range of other personality inventories developed from diverse theoretical orientations including, for example, the Myers-Briggs Type Indicator® (MBTI; Briggs-Myers & Briggs, 1985), the Hogan Development Survey (HDS; Hogan & Hogan, 2009), the 16pf® Questionnaire (Cattell, R. B., Cattell, A. K., & Cattell, H. E. P. (1993). *16PF Fifth Edition Questionnaire*. Champaign, IL: IPAT), the SHL Occupational Personality Questionnaire (OPQ; Saville, Holdsworth, Nyfield, Cramp, & Mabey, 1984) and Holland’s measure of occupational themes (Holland, 1959). For more information on these overlaps, the reader is referred to the technical manuals that accompany the metrics listed above, manuals for similar personality tests, and broader reviews (e.g. McCrae & Costa, 2010, pp. 74–77). For the practitioner, an important implication of these studies is the breadth of the NEO’s application and utility across different assessment objectives.

Of course, as a dominant model in the field, the FFM has not been without its challengers; and when the FFM is challenged, so too is the NEO as a comprehensive measure of personality. One such challenger is the HEXACO model (Ashton & Lee, 2005) which contends that six rather than five broad factors are required for comprehensive measurement. However, this proposed sixth factor is somewhat arbitrary in that it arises from the splitting of the Agreeableness domain into two separate factors. Interestingly, work by DeYoung, Quilty, & Peterson (2007) has shown that the content of this apparent sixth factor is covered by a subset of facets in the NEO Agreeableness domain, suggesting that the six-factor model is simply a less concisely structured measure of the FFM.

The research underpinning the NEO continues to grow. For example, a relatively new branch of psychology referred to as personality neuroscience has used the NEO inventory to investigate the relationship between personality traits and the biology of the brain (DeYoung et al., 2007; DeYoung, 2015). This research has not only increased understanding of the neurological origins of personality traits but has at the same time reinforced the NEO’s reputation as a measure of personality that can be relied upon to provide valid results which reflect how people characteristically understand the world and operate within it.

This has implications for the kinds of environments and the sorts of activities for which a person is more or less suited – implications that are invaluable in the selection or development of people for specific job roles. Once a job analysis has been conducted to understand how personality traits impact on effectiveness in the job role, the NEO, given its comprehensiveness measurement of the full range of personality traits, can be relied upon to assess those aspects of a person’s functioning that are relevant to effectiveness in the role.

How the NEO assesses the five factors of personality

The NEO provides a norm-referenced score indicating the overall level of each of the Big Five factors which the NEO refers to as 'domain scores'. Each of the Big Five domains is further assessed by scales which measure the six most salient behaviours arising from them. These additional scales are referred to as 'facets'. In total, 30 facet scores are provided. Each NEO domain has a unique influence on the expression of personality (as outlined in Table 1). The six facets within each NEO domain are all related to the core meaning at the heart of the construct being measured by the domain but, at the same time, each facet represents a different aspect of the relationship between the domain and behavioural style. In other words, the facets give information on what is driving the overall score on the domain. For example, all the facets of the Conscientiousness domain on NEO relate to behaviours that make a difference between the potential to achieve and actual accomplishment.

Accomplishment requires three key attributes; the belief that one can do it, the desire to do it, and the capacity to remain focused on the goal. Four of the facet scales in NEO Conscientiousness measure different behaviours that impact on the capacity to focus, namely: self-discipline; dutifulness; careful consideration about how to approach things; and personal organisation. The other two facets in NEO Conscientiousness measure self-belief and achievement striving.

Table 1: The core meanings of the Big Five domains

Big Five domain	Core meaning
Extraversion	The amount of energy directed outwards into the external environment and the preferred level of energy coming back from the environment.
Agreeableness	The extent to which an individual's judgements and behaviour are influenced by the perspectives and concerns of others.
Openness	The tendency to proactively seek and appreciate new experience for its own sake and the inclination to explore what is novel or unfamiliar.
Conscientiousness	The degree to which the individual shows behaviours that are compatible with goal accomplishment.
Emotional Reactivity	The frequency and intensity of emotions, thoughts and behaviours associated with feeling under threat in some way.

Three FAQs about the NEO

(1) *Can people cheat on the NEO?*

Whenever assessment requires self-evaluation there will always be some potential for respondents to create a particular impression of themselves which is different from how they really are. And it is useful to consider why a person might try to 'cheat'. It may be because they are resistant to the whole idea of being tested. Or it could be because they think there is a 'right' way to answer the questions and they are trying to get it right. Both these reasons suggest that the respondent has not been properly briefed.

The test administration process is crucial to ensure that the individual enters into the assessment with the intention of being open and candid about themselves. In terms of detection of such 'cheating', the NEO incorporates a number of checks to identify styles of responding which raise the possibility that the results are not a valid reflection of the individual.

(2) *The NEO norm group referred to as the 'UK working population' consists of 656 people. Is this a big enough sample to represent the UK working population?*

Yes, there are two criteria for establishing the representativeness of the comparison group used to interpret the results of a personality inventory.

- The first criterion is entirely based on whether the size of the sample is large enough for us to be confident that the mean score obtained by the sample on a scale is a good enough approximation to the mean score that would have been achieved if we had tested every single member of the population from which the sample was drawn. Statistics suggest that a sample of at least 200 is required to achieve this criterion and the approximation gets closer as the sample size approaches 300.
- The second criterion is based on the extent to which the comparison group is representative of the population from which it was drawn on the basis of demographics. Research suggests that once the sample exceeds 300, what matters is demographic representativeness rather than the size of the sample per se. In terms of the NEO in relation to the UK working population, the relevant demographic characteristics of the sample were considered to be gender, age, education level, ethnic group, occupation, industry sector, region of the UK, and current employment status. The percentage of people included in the sample in relation to all of these demographic characteristics reflects the results of the 2011 census on the percentage of people in the UK falling into the subdivisions of these characteristics in the population as a whole.

(3) *I'm already TUOP trained so do I need specific training in the NEO?*

While you do not necessarily need specific training to administer the NEO, given the variation across personality inventories referred to earlier, there is a need for experienced users of one metric to understand the different models on which other measures are based and how scales that may seem the same on the surface (in terms of the labels they are given) actually differ in terms of the definition of what they are measuring. The BPS endorses this specificity, which is why it offers a national qualification in additional instruments, if desired, after your initial TUOP training.

Summary

The NEO Personality Inventory comprehensively measures the underlying building blocks of human personality and provides a clear structure for the interpretation of individual differences in how people typically understand the world and operate within it. The combination of comprehensiveness and structural clarity that the NEO provides allows deep insights to be gained in relation to individual differences in the characteristic expression of personality, which have implications for the kinds of environments and the sorts of activities to which a person is more or less suited. The research underpinning the reliability of the NEO's measurement and its predictive power is vast and wide-ranging. A good starting point for an overview of this research is a bibliography compiled by the authors of the NEO (Costa & McCrae, 2011), which has details of some of the many thousands of articles related to the NEO that are now available.

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