Personality Assessment White Paper

In partnership with Psycholate

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Introduction

Arguably, people differ in terms of how they feel, think and act. Personality testing, as a systematic practice started around 100 years ago, initially as a means to identify soldiers prone to mental breakdowns during battle (Gibby and Zickar; 2008), and a little later as a means to predict maladjusting employees who could contribute to workplace disturbances (Gibby and Zickar; 2008).

Currently, according to Weiner and Greene (2008), research on personality testing seems intensified. Perhaps this would not have been possible without the reliability and validity some personality tests seem to have. A good example of this consistency is that several tests provide support for a five factor personality model.

The Big Five personality model was initiated through a lexical approach. Klages (1929) suggested that personality aspects are encoded and labeled in language and more precisely in words. In that vein, Klages identified and created lists with thousands of words labeling aspects of personality. Later, Allport employed a similar research paradigm in the English language (Nicholson; 1998). Cattell's work used statistical procedures involving factor analyses in order to meaningfully group these lexical terms, resulting in a 16-factor model of personality (Boyle et. al; 2016). A factor analysis is a statistical tool that finds correlations between variables (words) and latent variables (personality traits and scales). So, Cattell was able to find which words were related to what traits of personality, and go on to perform a data reduction on these words. Through this data reduction, he was able to find big aspects of personality.

Using the same methodology, Fiske (1949) suggested that only five factors could be replicated statistically. Tupes and Christal (1957) also found five factors, and these findings were confirmed by numerous other studies (Sold; 1999). Finally, McCrae and Costa (1987) labeled the five dimensions as they are used today. The work of McCrae and Costa is focused on measuring the Big Five personality model using a questionnaire called NEO. Several revisions of NEO were created over the decades, with adaptations made for differing environments and practices.

Costa and McCrae (2008) report that the NEO scales correlate with scales from the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1983; Siegler et al., 1990), the Millon Clinical Multiaxial Inventory (Lehne, 2002), and other questionnaires.

Costa and McCrae (2008) also report that the NEO scales have been proven useful in predicting vocational interests (De Fruyt & Mervielde, 1997), attachment styles (Shaver & Brennan, 1992), and psychiatric diagnoses of personality disorders (McCrae, Yang, et al., 2001).
A search of the term NEO-PI alone in Google Scholar, returns around 65,000 articles. Therefore, an extensive review of its reliability, validity, and practical use, is beyond the scope of this document, although further reading is available.

The IPIP Repository

The suggestion that personality can be described in a meaningful way by five big aspects, is based on work performed over many decades. The labels of these five aspects are:

1. **Extraversion** vs **introversion**

2. **Agreeableness** vs **criticality**

3. **Openness to experience** vs **cautiousness, consistency**

4. **Conscientiousness** vs **carelessness, extravagance**

5. **Neuroticism** vs **resilience, confidence, emotional stability**

As mentioned, several questionnaires were developed in order to measure these five aspects. The International Personality Item Pool (Goldberg 1999; Goldberg et. al. 2006), commonly referred to as IPIP, is an ongoing research program set up to generate and empirically evaluate open source items that can be used to test models of personality using established scales and traits. These tests include the NEO and the NEO-PI scales. The NEO-PI should not be confused with the IPIP NEO-PI-R. The first uses proprietary items, whilst the second uses public domain items. The Workable personality assessment is based on the IPIP NEO-PI-R.

The IPIP NEO-PI-R test, like the NEO-PI or the NEO-PI-R, measures personality traits, and each trait has several scales. For instance, the measurement of neuroticism depends on the measurements of anxiety, anger, depression, self-conscientiousness, immoderation and vulnerability. This assumes that neuroticism, like any other higher order factor, is a complex aspect in personality which is in turn based on other sub factors, and these sub factors are in turn measured through several questions.

Workable Personality Assessment

The Workable personality assessment, based on the IPIP NEO-PI-R, was further customized for the needs of Workable. Table 1 shows a concise summary of what was done. In this table, column n shows the number of questions from the IPIP NEO-PI-R that were used verbatim in the modified questionnaire. In our customization, we used the Big Five personality traits, as in IPIP NEO-PI-R, along with most of the scales from the IPIP NEO-PI-R. In some scales, due to changes in the questions, we could not retain the same scale labels, and changes in scale labels were made for that reason. Overall, the changes were made to the IPIP NEO-PI-R to improve brevity and focus on personnel selection.

In order to test for reliability of the modified questionnaire, two pilot studies were performed with 215 and 1497 participants respectively. The Crombach alpha values for both studies are shown in Table 1 in columns α1 and α2. In the second pilot study, the Kaiser Criterion suggested the extraction of one factor only, suggesting that the dimensions could not be further broken down.

Table 1. IPIP NEOPIR scales and Workable scales

Trait		Scale IPIP NEO-PI-R	a	Scale Workable test	n	a1	a2
Agreeableness	A1	Trust	.82	Trusting	2	.81	.76
	A2	Morality	.75	Moral	0	.64	.63
	A3	Altruism	.77	Caring	3	.77	.60
	A4	Cooperation	.73	Compromising	0	.41	
	A5	Modesty	.77	Modest	4	.76	.68
	A6	Sympathy	.75				
Conscientiousness	C1	Self-efficacy	.78	Self-efficient	3	.71	.76
	C2	Orderliness	.82	Orderly	0	.78	
	C3	Dutifulness	.71	Reliable	0	.55	.65
	C4	Achievement-striving	.78	Achievement-striving	3	.76	.60
	C5	Self-discipline	.85	Self-disciplined	4	.66	.66
	C6	Cautiousness	.76	Cautious	0	.76	
Extraversion	E1	Friendliness	.87	Friendly	4	.81	.72
	E2	Gregariousness	.79				
	E3	Assertiveness	.84	Assertive	1	.78	.76
	E4	Activity level	.71	Industrious	2	.50	.53
	E5	Excitement-seeking	.78				
	E6	Cheerfulness	.81	Optimist	1	.70	.71

Trait		Scale IPIP NEO-PI-R	a	Scale Workable test	n	a1	a2
Neuroticism	N1	Anxiety	.83	Calm	4	.75	.72
	N2	Anger	.88	Even-tempered	4	.88	.78
	N3	Depression	.88				
	N4	Self-consciousness	.80	Socially confident	2	.80	.72
	N5	Immoderation	.77				
	N6	Vulnerability	.82	Relaxed	4	.71	.76
Openness-to-experience	O1	Imagination	.83	Imaginative	3	.78	.66
	O2	Artistic interests	.84				
	O3	Emotionality	.81	Empathetic	0	.66	
	O4	Adventurousness	.77	Creative / Innovative	4	.70	.62
	O5	Intellect	.86	Theoretical	4	.71	.68
	O6	Liberalism	.86				

Conclusion

The questionnaire developed for Workable has consistent traits with the Big Five personality model. We adopted the majority of scales used in IPIP NEO-PI-R, and changed the phrasing of some questions. After making these changes, the results suggested acceptable reliability, however work is underway to improve those results.

Personality tests may be employed or tested in clinical settings and situations where people are not incentivized to provide favorable responses. In this case, the test is used for personnel selection. For that reason, relevant changes were made to the phrasing of questions, so that each item is still normally distributed. This allows us to retain good discriminability in participant scores. Nonetheless, the results are still monitored and relevant changes will be performed if the need arises.

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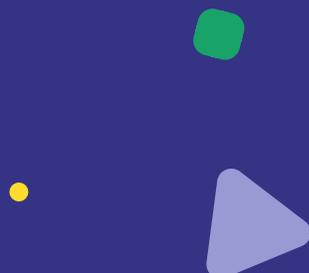
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