

NEO Personality Inventory-Revised (NEO PI-R)

Paul Detrick

The NEO PI-R is one of a group of closely-related objective assessment instruments (NEO Inventories) designed to measure the Five-Factor Model (FFM) of personality (Digman, 1990; McCrae & John, 1992). The FFM has received widespread acceptance as a valid descriptor of normal personality (Mount & Barrick, 1998), as well as an organizing framework for the prediction of job performance (Barrick & Mount, 1991; Hurtz & Donovan, 2000; Mount & Barrick, 1995; Salgado, 1997; Tett, Jackson, & Rothstein, 1991). The FFM served as a framework for the Screening Dimensions developed for this manual; thus, FFM-derived objective inventories such as the NEO PI-R are especially well-suited for the psychological screening of peace officers.

The NEO Personality Inventory (NEO-PI), first published in 1985, was an adaptation of an earlier three-factor inventory (Costa & McCrae, 1985). The initial three-factor inventory included the domain scales Neuroticism, Extraversion, and Openness; Agreeableness and Conscientiousness domains were added several years later. The NEO-PI was succeeded by the NEO PI-R in 1992 (NEO PI-R; Costa & McCrae, 1992). The NEO PI-R differed from the earlier version primarily in the inclusion of facet scales for the Agreeableness and Conscientiousness domains. Recently, 37 items on the NEO PI-R were revised or edited to lower the required reading level and extend the age range downward in order to make the instrument appropriate for adolescents as young as 12 years of age (McCrae & Costa, 2010). This most recent revision, the NEO PI-3, retains the reliability and validity of the NEO PI-R, but is more appropriate for younger examinees or adults with lower educational levels.

The NEO Inventories are unique in that they include both traditional self-report assessment (Form S), as well as observer assessment (Form R). While self-report data are most commonly obtained in the personnel selection context, circumstances may arise where observer ratings can be an important

source of information. In some instances, observer ratings may even be more valid than self-report ratings in personnel selection, in part due to the reduction of positive response bias that often occurs on self-report measures under high demand conditions (Hogan, 1991; Mount, Barrick, & Strauss, 1994). Short forms of the NEO inventories are also available; however, they possess reduced validity and their use for personnel selection purposes is not recommended. In addition, the short forms yield only domain scores.

Although the NEO PI-3 supersedes the NEO PI-R, the current *NEO Inventories Professional Manual* (McCrae & Costa, 2010) notes that “Researchers and clinicians who have extensive experience with the NEO PI-R may wish to continue using that version and the norms with which they are familiar. The NEO PI-R will continue to be made available in both print and computer versions” (p. 1). The authors also note that the NEO PI-3 and NEO PI-R domain and facet scales are highly correlated. Since there is no need to extend the age range downward in the personnel selection context, and the literature pertaining to the construct validity of the NEO inventories for use in peace officer selection is based on the NEO PI-R, the NEO PI-R is featured in this section.

NEO PI-R description

The NEO PI-R (Costa & McCrae, 1992) is a 240-item objective inventory designed to operationalize the FFM. Examinees respond to items on a (1)-strongly disagree to (5)-strongly agree Likert-type scale, with the order of the labels balanced across items to control for acquiescence and nay-saying effects. The NEO PI-R yields five domain scores that represent the most basic personality dimensions of the five-factor model. These domains are: Neuroticism (N; the tendency to experience negative affects like sadness, anxiety, guilt, fear, anger, embarrassment; irrationality; impulsivity; poor coping), Extraversion (E; tendency toward assertiveness, high activity/energy level, sociability, optimism, positive emotions), Openness (O; tendency to be open to new experiences, intellectually curious, and aesthetically

imaginative and sensitive), Agreeableness (A; tendency toward trust, cooperation, altruism, sympathy/empathy), and Conscientiousness (C; tendency toward self control, organization, purposefulness, motivation, and reliability). Within each broad domain, there are six narrow traits (facets) that together represent a given domain score (Costa & McCrae, 1995). For example, the broad Neuroticism domain is composed of six facets: N1-Anxiety, N2-Angry Hostility, N3-Depression, N4-Self-Consciousness, N5-Impulsiveness, and N6-Vulnerability.

TABLE 1: NEO PI-R Domain and Associated Facet Scales

DOMAINS	FACETS	
Neuroticism	<i>N1: Anxiety</i> <i>N2: Angry Hostility</i> <i>N3: Depression</i>	<i>N4: Self-Consciousness</i> <i>N5: Impulsiveness</i> <i>N6: Vulnerability</i>
Extraversion	<i>E1: Warmth</i> <i>E2: Gregariousness</i> <i>E3: Assertiveness</i>	<i>E4: Activity</i> <i>E5: Excitement Seeking</i> <i>E6: Positive Emotions</i>
Openness to Experience	<i>O1: Fantasy</i> <i>O2: Aesthetics</i> <i>O3: Feelings</i>	<i>O4: Actions</i> <i>O5: Ideas</i> <i>O6: Values</i>
Agreeableness	<i>A1: Trust</i> <i>A2: Straightforwardness</i> <i>A3: Altruism</i>	<i>A4: Compliance</i> <i>A5: Modesty</i> <i>A6: Tender-Mindedness</i>
Conscientiousness	<i>C1: Competence</i> <i>C2: Order</i> <i>C3: Dutifulness</i>	<i>C4: Achievement Striving</i> <i>C5: Self-Discipline</i> <i>C6: Deliberation</i>

Each facet is measured by eight items. Norms are established for men and women separately, and combined into non-gendered norms for use in personnel selection. Scores are reported as T scores (normative mean = 50, SD = 10). Definitions for the domains and associated facets are provided in the publication manuals (Costa & McCrae, 1992; McCrae & Costa, 2010). The NEO PI-R requires a 6th grade reading level and is appropriate for people age 17 and over. The NEO PI-R may be administered either individually or in a group. Hand-scoring and scannable answer sheets are available. The NEO PI-R can

also be scored and/or administered electronically using the NEO Software System™ (PAR; www.parinc.com).

Validity scales

The authors of the NEO PI-R maintain that empirical evidence does not support the use of validity scales (Costa & McCrae, 1992; McCrae & Costa, 2010). Instead, three simple items were included at the conclusion of the inventory asking examinees if they had tried to respond to items in an honest and accurate manner, if they had answered all items, and if responses had been entered in the correct space. In response to criticism of the lack of formal validity scales (Ben-Porath & Waller, 1992), three NEO PI-R research validity scales were developed by Schinka, Kinder, and Kremer (1997): the Inconsistent Responding scale, to assess random responding; the Negative Presentation Management scale, to assess negative response distortion/overreporting or “faking bad”; and the Positive Presentation Management (PPM) scale, to assess positive response distortion/underreporting or “faking good.” Demand-simulation and clinical studies have provided support for the validity of these scales in clinical applications (Ballinger, Caldwell-Andrews, & Baer, 2001; Caldwell-Andrews, Baer, & Berry, 2000; Morasco, Gfeller, & Elder, 2007; Morey et al., 2002; Sellbom & Bagby, 2008; Young & Schinka, 2001), and Reid-Seiser and Fritzsche (2001) offered qualified support for PPM validity in personnel selection contexts. The NEO PI-R items are non-invasive and possess face-validity, but like most objective inventories the items are also transparent and thus vulnerable to positive response bias. A recent study of NEO PI-R positive response bias, utilizing police officer applicants under high and low demand conditions, found that under the high demand condition of personnel selection, applicants denied/minimized traits associated with Neuroticism and accentuated traits associated with Agreeableness and Conscientiousness. In addition, although PPM (the validity scale of greatest relevance in the personnel selection context) was elevated under high as opposed to low demand

conditions, PPM was able to predict demand-induced variation for Neuroticism scores only, thus providing only limited support for PPM construct validity as a measure of positive response bias (Detrick, Chibnall, & Call, 2010).

Psychometric properties

As detailed in the NEO PI-R Professional Manual (Costa & McCrae, 1992), the NEO PI-R (and its direct predecessor, the NEO PI) has substantial psychometric research to support its use as a comprehensive measure of normal adult personality, and has been used in hundreds of clinical and basic research studies of personality. Costa and McCrae (1992) provide detailed information and references regarding the psychometric development of the NEO PI-R. Based on several large normative samples, internal consistency reliabilities ranged from 0.86 (Agreeableness) to 0.92 (Neuroticism) for the 48-item domain scores, and 0.56 (Tender-Mindedness) to 0.81 (Depression) for the 8-item individual facet scores. Similarly, retest reliabilities for the domain and facet scores ranged from 0.66 to 0.92 across various samples and time frames (ranging from weeks to years). The factor analytic structure of the NEO PI-R strongly supports a five-domain model with six facets per domain. Finally, a large number of studies have provided strong support for the content, criterion-related, and construct (convergence/discrimination) validity of the NEO PI domain and facet scores. Additional studies relating to the reliability and validity of the NEO PI-R are presented in the most recent *NEO Inventories* publication manual (McCrae & Costa, 2010). As a primary representative of the FFM, the NEO PI-R has been widely utilized in personality research across cultures. The five-factor structure of the NEO PI-R has been demonstrated in “dozens of studies” (p. 55), indicating that the traits assessed by the NEO Inventories are universal and can be validly assessed through use of these inventories. The factor structure of the NEO Inventories is also preserved across gender and age groups. A comprehensive online bibliography pertaining to the NEO PI-R is available at www.parinc.com in the *NEO PI-R Supplemental Product Resources* section.

The normative sample on which the NEO PI-R self-report form is based is a composite of 405 men and women from the Augmented Baltimore Study of Aging (ABLSA), 320 ABLSA participants who completed the NEO PI-R by computer administration between 1989 and 1991, and 1,539 participants in a national study of job performance. Five hundred men and 500 women were then selected from these groups to match U. S. Census projections for 1995 (Costa & McCrae, 1992). NEO PI-R norms for police officer applicants are also available and indicate that new recruits score high on Conscientiousness and Extraversion and low on Neuroticism (Detrick & Chibnall, 2013).

NEO PI-R construct validity for police officer selection

The NEO PI-R (Costa & McCrae, 1992; McCrae & Costa, 2010) is widely utilized in personnel selection and measures the FFM personality domains and facets. FFM personality domains (Neuroticism or Emotional Stability, Extraversion, Openness or Openness to Experience, Agreeableness, and Conscientiousness) have demonstrated validity for the prediction of work performance across job types (Barrick & Mount, 1991; Chiaburu, Oh, Berry, Li, & Gardner, 2011; Hurtz & Donovan, 2000; Mount & Barrick, 1995; Salgado, 1997; Tett, Jackson, & Rothstein, 1991). Meta-analyses have also supported the use of FFM measures as predictors of police officer job performance (Aamodt, 2004; Barrick & Mount, 1991; Salgado, 1997).

In addition to being widely used in personnel selection, a number of studies have provided general support for the construct validity of the NEO PI-R for police officer selection. Bishop et al. (2001) found relationships between coping styles and NEO PI-R personality measures for police officers in Singapore. Several studies have demonstrated associations between NEO PI-R domain and facet scales and police academy performance (Black, 2000; Detrick, Chibnall, & Luebbert, 2004). For example, Detrick et al (2004) found that after controlling for demographics, higher facet scores on Values ($\beta = .33$, $p \leq .05$) and lower scores on Excitement-Seeking ($\beta = -.29$, $p \leq .001$) were predictive of academic performance); firearms performance was predicted by lower scores on the facet Anxiety ($\beta = -.22$, p

≤.05); physical performance was predicted by low scores on the facet Deliberation ($\beta = -.43, p \leq .001$), lower scores on Fantasy ($\beta = -.43, p \leq .001$), and higher scores on Activity ($\beta = .31, p \leq .05$); absenteeism was predicted by lower scores on the facet Self-Consciousness ($\beta = -.30, p \leq .05$). The Minnesota Multiphasic Personality Inventory-2, Inwald Personality Inventory, and NEO PI-R have each been found to contribute significantly to the prediction of police academy performance. The NEO PI-R, however, was found unique in its ability to predict physical performance and demonstrated the greatest level of incremental validity of the three inventories (Chibnall & Detrick, 2003). Finally, police field training officers, using the Observer Form of the NEO PI-R, described the “best” entry-level police officers that they had supervised in the past as being low on Neuroticism, high on Conscientiousness, and high on Extraversion (Detrick & Chibnall, 2006).

With regard to police officer selection specifically, a number of meta-analyses have supported the use of FFM measures as predictors of job performance. Barrick and Mount (1991) found Conscientiousness to have the strongest estimated “true” correlation with police officer job performance as derived from performance ratings and productivity data ($\rho = .22$). More modest associations were reported for Neuroticism, Extraversion, and Agreeableness ($\rho = .10, .09$, and $.10$, respectively). Salgado (1997) reported a similar pattern of results for associations between Conscientiousness, Emotional Stability, and Extraversion and police officer job performance in Europe (estimated true validity coefficient, $\rho = .39, .22$, and $.20$, respectively). Contrary to Barrick & Mount (1991), however, Salgado reported a significant association between Openness and police officer performance ($\rho = .18$). In a meta-analysis by Aamodt (2004), Neuroticism, Openness, and Conscientiousness were each predictive of police academy grades, performance ratings, and discipline problems; Extraversion was associated with grades and discipline problems; and Agreeableness was associated with performance ratings and discipline problems. Of the FFM domains, Openness had the

strongest association with grades ($r = .22$), Conscientiousness with performance ratings ($r = .12$), and Neuroticism (Emotional stability) with discipline problems ($r = -.09$).

General Issues

The NEO PI-R, with its derivation in the FFM, is an attractive option for use as a measure of normal personality functioning in peace officer applicants. The constructs assessed by the NEO PI-R translate well to the Psychological Screening dimensions that are the focus of this manual. Despite widespread recognition that FFM measures, and the NEO PI-R in particular, are valid predictors of job performance, the NEO PI-R has had limited use in the selection of police officers. The lack of police officer applicant norms and lack of formal validity scales for the NEO PI-R are two significant factors that have hampered application. Recently, police officer applicant norms have become available (Detrick & Chibnall, 2013) and the Shinka et al. (1997) research validity scales are available as measures of response bias and inconsistent responding. As noted previously, the Shinka PPM validity scale is a moderately valid measure of positive response bias, although it appears to be most sensitive to the high demand effects associated with the Neuroticism domain, and less so with respect to demand effects associated with Agreeableness and Conscientiousness domains. It is also worth noting, as McCrae and Costa (2010) have, that encouraging examinee cooperation with testing, obtaining observer ratings, and comparing test results with other collateral sources of data are also important methods for managing and detecting positive response bias. As a measure of normal personality functioning, the NEO PI-R in principle could be utilized at the pre-conditional offer stage of the hiring process. The authors of this inventory note that high scores on the Neuroticism domain should not be interpreted as indicative of psychopathology, but rather high scorers on this domain may be simply at risk for certain types of disorders (Costa & McCrae, 1992). Nevertheless, there is a body of literature relating to clinical applications of this instrument (Costa & Widiger, 2002; Piedmont, 1998). Therefore, the NEO PI-R could

be considered a “medical” test as defined by the Americans with Disability Act of 2008 (ADA, 2009) and therefore caution is advised in consideration of administration of this instrument prior to receipt of a conditional offer of employment. There are no empirical data to support the use of cut-off scores on the NEO PI-R for police officer selection. Gender differences on the NEO PI-R are generally small in comparison to individual variation within genders. Women tend to describe themselves as higher on Neuroticism, Agreeableness, Warmth, and Openness to Feelings compared to men, while men score higher on Assertiveness and Openness to Ideas (Costa, Terracciano, & McCrae, 2001). The FFM and NEO Inventories in particular, have become the focus of personality research worldwide and have been translated into more than 50 languages (McCrae & Costa, 2010). Compared to other personality inventories commonly used in personnel selection, the NEO Inventories, including the NEO PI-R, are of relatively recent development. As an inventory that operationalizes the FFM, the NEO PI-R demonstrates significant value as a valid measure of psychological traits important in police officer selection and is a rich subject/tool for applied research.

References

- Aamodt, M. G. (2004). *Research in law enforcement selection*. Boca Raton, FL: Brown Walker.
- Americans with Disability Act of 2008. Pub. L. 110-325 (2009)
- Ballinger, J. F., Caldwell-Andrews, A., & Baer, R. A. (2001). Effects of positive impression management on the NEO Personality Inventory-Revised in a clinical population. *Psychological Assessment, 13*, 254-260.
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.
- Ben-Porath, Y. S., & Waller, G. (1992). "Normal" personality inventories in clinical assessment: General requirements and the potential for using the NEO Personality Inventory. *Psychological Assessment, 4*, 23-25.
- Bishop, G. D., Tong, E. M. W., Diong, W. M., Enkelmann, H. C., Why, Y. P., Khader, M., & Ang, J. C. H. (2001). The relationship between coping and personality among police officers in Singapore. *Journal of Research in Personality, 35*, 353-374.
- Black, J. (2000). Personality testing and police selection: Utility of the "Big Five." *New Zealand Journal of Psychology, 29*, 2-9.
- Caldwell-Andrews, A., Baer, R. A., & Berry, D. T. T. (2000). Effects of response set on NEO PI-R scores and their relations to external criteria. *Journal of Personality Assessment, 74*, 472-488.
- Chiaburu, D. S., Oh, I.-S., Berry, C. M., Li, N., & Gardner, R. G. (2011). The five-factor model of personality traits and organizational citizenship behavior: A meta-analysis. *Journal of Applied Psychology, 96*, 1140-1166.
- Chibnall, J. T., & Detrick, P. (2003). The NEO PI-R, Inwald Personality Inventory, and MMPI-2 in the prediction of police academy performance: A case for incremental validity. *American Journal of Criminal Justice, 27*, 233-248.

- Costa, P.T., Jr., & McCrae, R. R. (1985). *The NEO Personality Inventory manual*. Odessa, FL: PAR
- Costa, P. T., Jr., & McCrae, R. R. (1992). *NEO PI-R professional manual*. Odessa, FL: PAR.
- Costa, P. T., Jr., & McCrae, R. R. (1995). Domains and facets: Hierarchical personality assessment using the revised NEO Personality Inventory. *Journal of Personality Assessment, 64*, 21-50.
- Costa, P.T., Jr., Terracciano, A. , & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology, 81*, 322-331.
- Costa, P.T., Jr., & Widiger, T. A. (2002). *Personality disorders and the five-factor model of personality (2nd ed.)*. Washington, D. C.: American Psychological Association.
- Detrick, P., & Chibnall, J. T. (2006). NEO PI-R personality characteristics of high performing entry-level police officers. *Psychological Services, 3*, 274-285.
- Detrick, P., & Chibnall, J. T. (2013). Revised NEO Personality Inventory normative data for police officer selection. *Psychological Services, 10*, 372-377.
- Detrick, P., Chibnall, J. T., & Call, C. (2010). Demand effects on positive response distortion by police officer applicants on the Revised NEO Personality Inventory. *Journal of Personality Assessment, 92*, 410-415.
- Detrick, P., Chibnall, J. T., & Luebbert, M. C. (2004). The Revised NEO Personality Inventory as predictor of police academy performance. *Criminal Justice and Behavior, 31*, 676-694.
- Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41*, 417-440.
- Hogan, R. T. (1991). Personality and personality measurement. In M. D. Dunnette & L. M. Hough (Eds.). *Handbook of industrial and organizational psychology (2nd ed., pp. 873-919)*. Palo Alto, CA: Consulting Psychologists Press.
- Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The big five revisited. *Journal of Applied Psychology, 85*, 869-879.

- McCrae, R.R., & Costa, P. T., Jr. (2010). *NEO Inventories professional manual for the NEO Personality Inventory-3, NEO Five-Factor Inventory-3, and NEO Personality Inventory-Revised*. Lutz, FL: PAR.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60*, 175-215.
- Morasco, B. J., Gfeller, J. D., & Elder, K. A. (2007). The utility of the NEO PI-R validity scales to detect response distortion: A comparison with the MMPI-2. *Journal of Personality Assessment, 88*, 276-283.
- Morey, L. C., Quigley, B. D., Sanislow, C. A., Skodol, A. E., McGlashan, T. H., Shea, M. T., Stout, R. L., Zanarini, M. C., & Gunderson, J. G. (2002). Substance or style? An investigation of the NEO PI-R validity scales. *Journal of Personality Assessment, 79*, 583-599.
- Mount, M. K., & Barrick, M. R. (1995). The Big Five personality dimensions: Implications for research and practice in human resource management. *Research in Personnel and Human Resource Management, 13*, 153-200.
- Mount, M. K., & Barrick, M. R. (1998). Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human Performance, 11*, 145-165.
- Mount, M.K., Barrick, M. R., & Strauss, J. P. (1994). Validity of observer ratings of the big five personality factors. *Journal of Applied Psychology, 79*, 272-280.
- Piedmont, R. L. (1998). *The Revised NEO Personality Inventory: Clinical and research applications*. New York: Plenum.
- Reid-Seiser, H. L., & Fritzsche, B. A. (2001). The usefulness of the NEO PI R positive presentation management scale for detecting response distortion in employment contexts. *Personality and Individual Differences, 31*, 639-650.
- Salgado, J. F. (1997). The five-factor model of personality and job performance in the European community. *Journal of Applied Psychology, 82*, 30-43.

- Schinka, J. A., Kinder, B. N., & Kremer, T. (1997). Research validity scales for the NEO PI-R: Development and initial validation. *Journal of Personality Assessment, 68*, 127-138.
- Sellbom, M., & Bagby, R. M. (2008). The validity and utility of the positive presentation and negative presentation management scales for the Revised NEO Personality Inventory. *Assessment, 15*, 165-176.
- Tett, R. P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology, 44*, 703-740.
- Young, M. S., & Schinka, J. A. (2001). Research validity scales for the NEO PI-R: Additional evidence for reliability and validity. *Journal of Personality Assessment, 76*, 412-420.