

Work and Personality: Use of the NEO-PI-R in Industrial/Organisational Psychology

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L'inventaire NEO Révisé de la Personnalité (NEO-PI-R) est une mesure actuelle de 30 traits qui renvoient aux cinq facteurs de base de la personnalité normale. Il a fourni des preuves de sa fidélité et de sa validité aussi bien dans des recherches théoriques qu'appliquées et plusieurs études montrent qu'il contribue à prédire la performance professionnelle. Le domaine et les facettes du NEO-PI-R sont analysés avec quelques résultats issus de son application en psychologie des organisations.

The Revised NEO Personality Inventory (NEO-PI-R) is a contemporary measure of 30 traits that define the five basic factors of normal personality. In both research and applied samples it has shown evidence of reliability and validity, and several studies suggest that it has utility in the prediction of job performance. The domain and facet features of the NEO-PI-R are discussed along with some issues in its use in industrial/organisational psychology.

INTRODUCTION

Personality traits are pervasive styles of thinking, feeling, and behaving, and as such they are likely to affect vocational interests and choices, work styles (Hoekstra, 1993), job satisfaction, and the effectiveness of job performance. Although personality traits were once viewed as a key to selection and

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placement, they have been out of fashion in academic research and publication in industrial/organisational (I/O) psychology for the past 20 years. Now, however, there is a renewed enthusiasm about the value of personality assessment (Schmit, Guion, & Raymark, 1994) to which this Special Issue attests.

One of the reasons for the reconsideration of personality is a major advance in personality psychology: the discovery of the five-factor model (FFM) of personality or the "Big Five". The five factors—Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C)—are thought to account for most of the common variance in virtually all personality traits, from Adler's (1938/1964) social interest to Zuckerman's (1979) sensation seeking. Within the occupational arena, Saville, Holdsworth, Nyfield, Cramp, and Mabey (1984) have identified 30 substantive personality traits specifically for the world of work. Many of these have direct parallels with the scales of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992a) (e.g. OPQ Change-orientated with NEO-PI-R Openness to Actions; OPQ Worry with NEO-PI-R Anxiety). Further, Matthews and Stanton (1994, p.741) concluded that "the results of the factor analysis of the 31 OPQ scales were broadly supportive of the Big Five structural model of personality super-factors". The FFM thus provides a comprehensive framework for the organisation of occupationally relevant personality traits, and meta-analyses using this framework have demonstrated the importance of the five factors for work performance, particularly in situations in which employees have considerable autonomy (Barrick & Mount, 1991, 1993). Similarly, Tenopyr (1993) has argued that the FFM can be useful in interpreting research on job satisfaction and work adjustment.

Increasingly, I/O psychologists (Adler & Weiss, 1988; Hough & Paullin, 1994; Jackson & Rothstein, 1991, Robertson, 1993, Robertson & Kinder, 1993; Schneider & Hough, in press; Schmit et al., 1994) have come to recognise that personality assessments can be valuable only if they are meaningfully matched to occupational criteria. As Schneider and Hough (in press, p.22) sagely state, instead of "hurling all predictors against criteria in the hope that some will stick"—which Guion and Gottier (1965) criticised as a "broadside approach"—a theoretically and empirically driven "construct-oriented approach" should guide research in this area. An excellent illustration of this other approach is provided by Hough's Project A personality research. Job performance criterion taxonomies were developed along with a nine-construct personality predictor taxonomy (Hough et al., 1990) in the context of a sophisticated appreciation for discriminant validity as the cornerstone of a construct validity approach to advancing our understanding of the links between personality traits and job performance constructs.

This new attention to differentiated criteria and to more precise specification of the linkages between personality and job constructs has led to interest in more detailed personality profiles than the five broad factors—the Big 5—offer. The issue of the proper level with which to measure personality is currently being heatedly discussed in I/O circles. Some advocates urge measurement and assessment at the very highest level of the hierarchy, emphasising extremely broad and superordinate constructs like Integrity (Ones, Viswesvaran, & Schmidt, 1993; Schmidt, Ones, & Hunter, 1992). Others advocate a lower but still broad level (e.g. that afforded by the Big 5, Barrick & Mount, 1993) or Hough's (1992) nine-factor taxonomy. We (Costa & McCrae, 1995) join others (Mershon & Gorsuch, 1988) in advocating a bottom-up approach. It is important to note that measuring 30 or so specific facets or traits at the lowest level of the trait hierarchy allows one to combine them into five broader domains, or even to combine the five domains into broader constructs such as Integrity (Ones et al., 1993) or Hogan's Sales Potential (Hogan & Hogan, 1992) or Gough's (1984) Managerial Potential (Costa & McCrae, 1995). The point is not to be forced by one's instrument to stay at only one level of the hierarchy, but to be able to go up and down the hierarchy depending on the assessment purposes, goals, and objectives.

For many applied purposes, the detailed information provided from first-order facets or more specific traits is crucial. As noted in Costa, McCrae, and Kay (1995, p.124), "both intellectual curiosity and aesthetic sensitivity are aspects of the domain of Openness to Experience, but the former is a better predictor of investigative vocational interests, the latter of artistic interests". This trade-off between broad, superordinate personality constructs and narrower, homogeneous and more specific traits is often referred to as the band width/fidelity dilemma (Cronbach & Gleser, 1965). As Ones and Viswesvaran (in press) write, "essentially the debate ... is whether broadly defined personality traits are better in predicting job performance as well as in explaining behaviors, than narrowly defined personality traits."

The NEO-PI-R provides validated measures of both the five factors and 30 specific traits (see Table 1) that define them, and thus should be a useful tool in I/O psychology. The NEO-PI-R has been adopted by a number of professionals in this field, and several studies have reported supporting evidence. This article reviews basic psychometric properties of the instrument, summarises some recent studies using the NEO-PI-R in organisational contexts, and discusses some practical issues in its use in applied settings.

TABLE 1
Internal Consistency and Factor Structure of NEO-PI-R Scales.

<i>NEO-PI-R Scale</i>	<i>Coefficient Alpha</i>		<i>N</i>	<i>E</i>	<i>Factor</i>		
	<i>Form S</i>	<i>Form R</i>			<i>O</i>	<i>A</i>	<i>C</i>
Domains							
Neuroticism (N)	0.92	0.93					
Extraversion (E)	0.89	0.90					
Openness (O)	0.87	0.89					
Agreeableness (A)	0.86	0.95					
Conscientiousness (C)	0.90	0.92					
Neuroticism facets							
N1: Anxiety	0.78	0.82	0.81	0.02	-0.01	-0.01	-0.10
N2: Angry Hostility	0.75	0.86	0.63	-0.03	0.01	-0.48	-0.08
N3: Depression	0.81	0.81	0.80	-0.10	0.02	-0.03	-0.26
N4: Self-Consciousness	0.68	0.73	0.73	-0.18	-0.09	0.04	-0.16
N5: Impulsiveness	0.70	0.69	0.49	0.35	0.02	-0.21	-0.32
N6: Vulnerability	0.77	0.81	0.70	-0.15	-0.09	0.04	-0.38
Extraversion facets							
E1: Warmth	0.73	0.81	-0.12	0.66	0.18	0.38	0.13
E2: Gregariousness	0.72	0.79	-0.18	0.66	0.04	0.07	-0.03
E3: Assertiveness	0.77	0.76	-0.32	0.44	0.23	-0.32	0.32
E4: Activity	0.63	0.77	0.04	0.54	0.16	-0.27	0.42
E5: Excitement-Seeking	0.65	0.74	0.00	0.58	0.11	-0.38	-0.06
E6: Positive Emotions	0.73	0.82	-0.04	0.74	0.19	0.10	0.10
Openness facets							
O1: Fantasy	0.76	0.72	0.18	0.18	0.58	-0.14	-0.31
O2: Aesthetics	0.76	0.81	0.14	0.04	0.73	0.17	0.14
O3: Feelings	0.66	0.69	0.37	0.41	0.50	-0.01	0.12
O4: Actions	0.58	0.60	-0.19	0.22	0.57	0.04	-0.04
O5: Ideas	0.80	0.87	-0.15	-0.01	0.75	-0.09	0.16
O6: Values	0.67	0.69	-0.13	0.08	0.49	-0.07	-0.15
Agreeableness facets							
A1: Trust	0.79	0.90	-0.35	0.22	0.15	0.56	0.03
A2: Straightforwardness	0.71	0.84	-0.03	-0.15	-0.11	0.68	0.24
A3: Altruism	0.75	0.80	-0.06	0.52	-0.05	0.55	0.27
A4: Compliance	0.59	0.78	-0.16	-0.08	0.00	0.77	0.01
A5: Modesty	0.67	0.83	0.19	-0.12	-0.18	0.59	-0.08
A6: Tender-Mindedness	0.56	0.69	0.04	0.27	0.13	0.62	0.00
Conscientiousness facets							
C1: Competence	0.67	0.73	-0.41	0.17	0.13	0.03	0.64
C2: Order	0.66	0.71	0.04	0.06	-0.19	0.01	0.70
C3: Dutifulness	0.62	0.70	-0.20	-0.04	0.01	0.29	0.68
C4: Achievement Striving	0.67	0.70	-0.09	0.23	0.15	-0.13	0.74
C5: Self-Discipline	0.75	0.82	-0.33	0.17	-0.08	0.06	0.75
C6: Deliberation	0.71	0.73	-0.23	-0.28	-0.04	0.22	0.57

From Costa & McCrae (1992a). *N* = 1539 for Form S alphas, 277 for Form R alphas, and 1000 for factor loadings.

RELIABILITY AND VALIDITY OF THE NEO-PI-R

The FFM is currently the most widely accepted model of personality structure (Goldberg, 1993), with a history going back at least to Fiske's 1949 publication. An operationalisation of the FFM, the NEO-PI-R is the result of over 15 years of research on volunteer samples. Details on the development of the instrument are given in the manual (Costa & McCrae, 1992a). This section summarises psychometric properties in both volunteer and I/O samples.

Reliability

The first two columns of Table 1 report internal consistency for the self-report (Form S) and observer rating (Form R) version of the NEO-PI-R. The five factors are approximated by domain scales that are the sum of six subscales (called facets). Reliabilities for the 48-item domain scales are excellent; reliabilities for the brief (8-item) facet scales are acceptable. Similar values have recently been reported in I/O samples (Costa et al., 1995; Piedmont & Weinstein, 1993). Traits measured by the NEO-PI-R show impressive long-term stability (Costa & McCrae, 1992b), implying high retest reliability.

Content Validity

In the NEO-PI-R, content validity is addressed by identifying six distinct facets to sample each domain, and by selecting nonredundant items to measure each facet. Because facets were selected by surveying the personality literature rather than the I/O literature, many I/O psychologists might not immediately grasp the content validity of the facet scales. It is commonly the case that the trait names of personality questionnaires derived from a literature different from the I/O literature do not easily or directly map on to the kind of competencies or attributes in which selection and assessment tasks are often described. Nevertheless, as Schmit et al. (1994) suggest, many of their 19 job requirement dimensions can be related to individual differences in personality, as measured by the FFM. For example, a particular position may require a dimension that they identified as Trustworthiness with Information or Cooperative Helping Tendencies. The former is related to C and the latter is related to A, but if they are not identified and measured they will be overlooked for selection. The 30 facets of the NEO-PI-R should cover many traits of interest to I/O psychologists.

Convergent and Discriminant Validity

Convergent validity is seen in the fact that NEO-PI-R facet scales are correlated with alternative measures of similar constructs (Costa & McCrae,

1992b). For example, N1:Anxiety is related to Anxiety as measured by Spielberger's State-Trait Personality Inventory ($r=0.55$) and Tension as measured by the Profile of Mood States ($r=0.54$). A1:Trust is related positively to the Trusting scale of the Interpersonal Style Inventory ($r=0.68$) and negatively to the Suspicion scale of the Buss-Durkee Hostility Inventory ($r=-0.46$).

Discriminant validity is seen by contrasting the correlates of different facets, particularly within the same domain. Consider the E facet correlates of scales in Jackson's Personality Research Form (PRF): E1:Warmth and E2:Gregariousness are strongly related to PRF Affiliation; E3:Assertiveness is related chiefly to PRF Dominance; E5:Excitement-Seeking is related to PRF Harm Avoidance; and E6:Positive Emotions is related to PRF Play.

Consensual Validation

One of the attractive features of the NEO-PI-R is the availability of both self-report and observer rating forms. There is strong evidence of convergence on domain scores between self-reports and spouse ratings, and between self-reports and mean peer ratings, with correlations typically ranging from 0.5 to 0.6 (Costa & McCrae, 1992a). Significant and substantial cross-observer agreement is also seen on the 30 facets of the NEO-PI-R. Spouses tend to agree with self-reports more strongly than do single peers, perhaps because spouses disclose more of themselves to each other than to friends and neighbours.

Factorial Validity

The NEO-PI-R is intended to represent the FFM, so a key test of its validity is how well its internal structure corresponds to the predictions of the model. As shown in the last five columns of Table 1, a factor analysis of the NEO-PI-R facets in the normative sample of 500 men and 500 women confirmed hypotheses. Each facet scale had its highest loading on the intended factor, and where secondary loadings appeared, they were appropriate and meaningful. The same five-factor structure has been found in self-reports and peer ratings, and in men and women, whites and nonwhites, and young adults and older adults (Costa & McCrae, 1992a).

However, all the research cited was conducted on volunteer samples who have relatively little reason to distort their responses. The NEO-PI-R will frequently be used in selection and placement contexts, in which respondents might wish to present themselves in an especially favourable light. Would such a bias affect the factor structure? Some evidence in support of that view was provided by Schmit and Ryan (1993, p.969), who examined the short form of the NEO-PI-R, the NEO Five Factor Inventory (NEO-FFI), in a sample of 293 job applicants "seeking employment

assistance at a midwestern branch of the United States Employment Service". The original 12 items for each of the five domain scores were randomly divided into three 4-item subsets. The 15 item subsets (3 subsets per factor \times 5 factors) were factor analysed. They reported that there was a sixth or general factor they interpreted as reflecting evaluation concerns. However, they did not report a 5-factor solution. Subsequently, Mark Schmit kindly provided the results of a five-factor solution shown in Table 2. As Table 2 shows, the Agreeableness factor was not very clearly defined, but the other four factors were easily recognised. This analysis suggests that any effects of evaluation bias on the structure of the NEO-FFI are relatively modest.

Two other studies have studied the factor structure of the full NEO-PI-R in applicant samples. Montag and Levin (1994) examined a Hebrew translation of the NEO-PI-R and extracted five varimax factors in a large female applicant sample ($n = 539$) and a smaller male applicant sample ($n = 396$). The congruence coefficients of the varimax-rotated factors for the females, with the American-normative structure for N, E, O, A, and C were 0.97, 0.92, 0.96, 0.95, 0.92, respectively. For males, the congruence coefficients with the American-normative structure were 0.94, 0.89, 0.87, 0.90, and 0.92 for N, E, O, A, and C, respectively. Montag and Levin

TABLE 2
NEO Five-factor Inventory (NEO-FFI) Item Parcel Factors in an Applicant Sample

<i>NEO-FFI Item Parcel</i>	<i>Varimax-Rotated Maximum Likelihood Factor</i>				
	<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>
N (i)	0.72				
N (ii)	0.80				
N (iii)	0.76				
E (i)		0.49			
E (ii)		0.67			
E (iii)		0.56			
O (i)			0.59		
O (ii)			0.53		
O (iii)			0.62		
A (i)				0.85	
A (ii)	0.43			(0.34)	
A (iii)				0.45	
C (i)				0.54	0.44
C (ii)				0.46	0.52
C (iii)					0.75

N = 293. All loadings greater than 0.40 in absolute magnitude are reported.

Source: Personal communication, M. Schmit, 6 July 1994.

concluded (1994, p.8) that their study “extends the factorial validity of the NEO-PI-R to non-volunteer subjects in selection settings, where the situation evokes a strong motivation to obtain positive results, which might slant the response pattern”. Similar results were obtained by Costa et al. (1995) in a police selection sample.

ILLUSTRATIVE I/O APPLICATIONS

Personality and Vocational Interests

In 1984 Costa, McCrae, and Holland published an analysis of personality and vocational interests using an early version of the NEO Personality Inventory which measured only Neuroticism, Extraversion, and Openness. The measure of vocational interests was Holland’s Self-directed Search (Holland, 1985), which is based on a hexagonal model for defining the psychological resemblances among types and environments and their interactions.

N was largely unrelated to interests as measured by the Self-directed Search, but E was strongly related to interest in Social and Enterprising vocations, and O was positively related to Artistic and Investigative interests and negatively related to Conventional interests. When the same data were reanalysed using measures of Agreeableness and Conscientiousness obtained later on the same adult sample, A was found to be related to Social (but not Enterprising) interests. C, like N, was not related to occupational interests.

The associations between O and vocational interests was replicated by Holland, Johnston, Hughey, and Asama (1991), who also showed that O was associated with a measure of creativity, the Preconscious Activity Scale, in both men ($r = 0.50$, $P < 0.01$) and women ($r = 0.61$, $P < 0.001$). This suggests that individuals who score high in O will be more successful in occupations that require original thinking.

The partial overlap between measures of personality and measures of vocational interest suggest that these two kinds of instruments may serve complementary functions in career assessment and counselling. A fuller discussion of the use of the NEO-PI-R in career assessment is provided by Costa et al. (1995).

Validity in Vocational Settings

When employees or job applicants complete a personality questionnaire, there is always some possibility that they will distort their responses to make themselves look good. If all respondents shifted equally in a favourable direction, there would be no net effect on the validity of the scores (although new, applicant norms might be needed). But if some respondents report

honestly whereas others grossly falsify their answers, the validity of the test would suffer.

There is reason to believe that concerns about the fakeability of personality tests have been exaggerated. Simulation studies, in which subjects are asked to “fake good” or “fake bad” give some information on how responses *might* be distorted, but no information whatsoever on whether or how frequently they actually are distorted in real life situations. The few studies that have examined this question find little evidence that job applicants seriously misrepresent themselves on personality inventories (Hough et al., 1990; Michaelis & Eysenck, 1971). Thus, there is reason to believe that personality scores will be valid even in selection settings. Two studies have examined the validity of NEO-PI-R self-reports in I/O settings.

Piedmont and Weinstein (1993) administered the NEO-PI-R to a sample of 52 women and 159 men employed in a wide range of occupations including sales, customer service, management positions (lower, middle, and upper), and finance. They also asked supervisors to complete the Adjective Check List (ACL; Gough & Heilbrun, 1983) to describe the employee's personality. Correlations between A and C facet scales and supervisor ratings on the ACL showed evidence of cross-method validity. Overall self-reported A was positively associated with rated Self-Control, Abasement, and Deference, and negatively correlated with Aggression, Autonomy, and Creative Personality; employees who described themselves as high in A were thus seen by their supervisors as being mild-mannered and compliant, though perhaps lacking independence and originality. Overall self-reported C was positively associated with supervisor-rated needs for Achievement, Endurance, and Order, and negatively related to rated need for Succorance.

Although these data from Piedmont and Weinstein do not directly address the susceptibility or lack of susceptibility to faking, they nevertheless show that the consensual validation of employees' self-reports and supervisors' ratings cannot be due to a shared method variance, nor can whatever degree of faking in the NEO-PI-R self-reports influence or manipulate the supervisor's ratings. If people who describe themselves as being cooperative and agreeable were merely faking, then there ought not to be agreement with supervisors' ratings. If the self-reported NEO-PI-R scores in the Piedmont and Weinstein study were faked, then supervisors should not have rated high Agreeableness scorers as mild-mannered and compliant. Indeed, if they were faking, they should be rated as having the opposite characteristics. However, we must acknowledge that these data come from incumbents who presumably have less motivation or pressure to fake their responses.

At the level of individual adjectives, supervisors described employees as being *dependable, logical, efficient, mature, clear-thinking, alert, mannerly,*

resourceful, and *precise*—traits that perhaps explain why Barrick and Mount (1991, 1993) found C to be a predictor of superior performance across a wide range of jobs.

Costa et al. (1995) reported a study of police selection. Entry-level police officer candidates completed the NEO-PI-R and were also interviewed by trained psychologists (blind to NEO-PI-R scores) who subsequently rated them as Highly Recommended or Recommended ($n=188$) or Recommended with Reservations or Not Recommended ($n=31$). A comparison of NEO-PI-R scores for these two groups showed significant differences on 23 of the 30 facet scales. In particular, candidates who were recommended scored higher on all six NEO-PI-R Conscientiousness facets, and lower on all six Neuroticism facets; they also reported themselves to be higher on E1:Warmth and A3:Altruism.

Personality and Job Performance

Costa (1992) reported correlations between supervisor ratings of job performance and NEO-PI-R scores in a national sample of over 1500 men and women (see Gandy, Dye, & MacLane, 1994). The subjects were in general successful, long-term employees. A single supervisor provided ratings, so interrater reliability could not be estimated. Both the restricted range of actual job performance and the probably limited reliability of the single supervisor ratings tended to restrict the magnitude of the significant correlations, which ranged from 0.05 to 0.12 ($P < 0.05$). Nevertheless, the pattern of associations clearly supported the validity of NEO-PI-R scales as predictors of actual job performance.

N was not significantly related to any rating, but E was positively related to versatility and to oral expression—hardly surprising, given the consistent loading of the trait *talkative* on the E factor (e.g. Norman, 1963). Individuals who were open to experience—that is, imaginative, curious, and unconventional—were rated high in oral and written expression, but low on conforming to conventional standards. People who described themselves as agreeable on the NEO-PI-R were judged to be skilled at working with others and to comply with standards of behaviour. Although meta-analytic studies have not found Agreeableness to be a predictor of job performance across all categories, it may be related to skill and/or ease at working with others. The meta-analytic approach has proved useful in identifying personality dimensions of predictive significance. But this approach should not be regarded as the ultimate or only way to determine what aspects of personality are of importance. Although they are considerably more sophisticated and objective than earlier subjective box-score approaches, meta-analyses are still constrained by any limitations or flaws in the studies they seek to meta-analyse.

The strongest pattern of correlations was with Conscientiousness, which was related to the amount, quality, and accuracy of work, and to overall judgements of competence. It was also related to supervisor's appraisal of abilities in the areas of oral expression and written comprehension, reasoning and ability to recall job-related information, conformance with rules, ability to overcome obstacles, and ability to adapt to new work demands. Further, the association of C with superior performance was significant in both men and women, and was significant in the full sample even after controlling for age, sex, and years of education. Five of the six C facets—Competence, Order, Dutifulness, Achievement Striving, and Self-discipline—were related to superior performance ratings.

In a later analysis of their 1993 data, Piedmont and Weinstein (1994) examined NEO-PI-R scores as predictors of job performance ratings. Respondents' supervisors were asked to rate the employees on a 5-point scale ranging from unsatisfactory to excellent on 12 relevant performance items that constituted three performance scales, labelled *Interpersonal Relations* (communicates ideas clearly, relates well to supervisors, team player and service minded), *Task Orientation* (self-starter, hard-working, detail skills, and gets things done), and *Adaptive Capacity* (learns and adapts readily, copes effectively with setbacks, functions well in unstructured situations, and plans, coordinates, and follows up on the work of others). Alphas were good.

Piedmont and Weinstein (1994) found a number of significant correlations. In this group of sales and service employees, E scores were significantly correlated with success ratings on the Interpersonal Relations ($r=0.20$), Task Orientation ($r=0.16$), and Adaptive Capacity ($r=0.19$) scales. N emerged as a significant predictor of ratings concerning Interpersonal Relations ($r=-0.16$) and Adaptive Capacity ($r=-0.17$). The strongest predictor of job performance was C and its facets ($r_s = 0.15$ to 0.28). The authors noted that competence, achievement striving, and self-discipline appear to be qualities that underlie successful performance in all the areas rated.

McDaniel (1992) conducted a study of personality and organisational change. He administered the NEO-PI to 62 individuals identified as change leaders in a large electronics firm. The success of the change effort was rated by the change leader and by between one and three other knowledgeable raters. As hypothesised, the most effective change leaders were those who were highest in Openness. Individuals who were rated as being flexible and innovative, and preferred novelty and variety, were the most able to coordinate structural changes in a large organisation.

Finally, Salgado and Rumbo (1994), using a Castilian version of the NEO-FFI, found that Conscientiousness predicted ratings of job aspiration, attitude, and performance among financial service managers in

Spain. Such data suggest that the same traits may be related to occupational success in many different (Western or Westernised) cultures.

INDUSTRIAL/ORGANISATIONAL APPLICATIONS OF THE NEO-PI-R

Strategies for Selection and Placement

Given that the NEO-PI-R may provide valid assessments of personality even in job selection conditions, how should the instrument be used? The most frequent application is likely to be in placement and selection, that is, in finding the optimal match between the person and position. Both empirical and rational strategies might be used.

A purely empirical strategy, useful especially when many employees are to be placed on an ongoing basis, would be to administer the NEO-PI-R to a group of candidates and subsequently evaluate the performance of those who were hired. Ratings of job performance could then be predicted from NEO-PI-R scores using multiple regression or a similar technique; the prediction equation (ideally cross-validated on a second group) could then be applied to the NEO-PI-R scores of new candidates to estimate their likely future performance. (Other indicators, such as cognitive ability tests and biographical data, might also be included in the prediction equation.) The NEO-PI-R is ideally suited for this purely empirical approach because the comprehensiveness of the FFM ensures that any personality trait relevant to job performance is likely to be measured by one or another of the 30 facet scales.

Rational strategies require that the I/O psychologist determine the optimal personality profile for a particular position, and seek candidates who have such a profile. This strategy is perhaps most appropriate when too few candidates are to be screened to allow empirical approaches. Based on many studies reviewed earlier, it would be reasonable to look for high scores on Conscientiousness in candidates for almost any job. Beyond that, however, the particular personality traits relevant to a particular position are likely to vary with the nature of the job, and a conceptual job analysis is needed. Extraversion might be desirable in a flight attendant; introversion might be more desirable in a night security guard.

Beyond the simple identification of traits, more sophisticated profile interpretations are possible and indeed often necessary to fully exploit the personality information derived from most assessments. The profile, or patterning, of the various traits condition and contextualise the meaning of a particular trait score when considered in isolation. For example, a T-score of 58 on the Achievement Striving facet of the NEO-PI-R may lead to greater expectations of industriousness and drive to succeed when accompanied by equally high activity level (E4) and high self-discipline (C5). Conversely, the

same Achievement Striving score seen in context of high anxiety (N1) and vulnerability to stress (N6), low warmth (E1) and high excitement-seeking (E5), low trust (A1) and modesty (A5) would lead to quite different predictions about success and/or the expression of that achievement striving disposition. To take another example, a person may have generally low or average scores on Neuroticism facets except for high N2 or Angry Hostility score, indicating that such a person is impatient and quick to become frustrated and irritated especially when things are not to their liking. However, if they have low assertiveness (E4) or high Tendermindedness (A6) scores they are unlikely to express their frustration directly. Obviously there are any number of such important interactions among facets or traits that could be taken into consideration in making specific predictions about job behaviour and performance.

The selection of desirable traits might be based on a job analysis or a review of the published literature. One alternative is to consult local experts: supervisors, successful job incumbents, perhaps customers. The NEO Job Profiler (available from the author) was designed to elicit this information from lay judges. For example, judges are asked if it is *very undesirable*, *undesirable*, *desirable*, or *very desirable* for a candidate for the position to be described as “energetic, lively, high activity level; may find sedentary work unappealing” (Costa et al., 1995). If that trait is desirable, then individuals scoring high on NEO-PI-R E4:Activity should be favoured in selection procedures. The NEO Job Profiler contains descriptions of each of the 30 facets, with an emphasis on their work-related implications; in a study of police selection, high inter-judge agreement was found and job profiles matched traits found in candidates whom interviewers recommended (Costa et al., 1995). Schmit et al. (1994) have offered an alternative instrument for personality-related job analysis that is also keyed to NEO-PI-R facet scales.

It is, of course, possible to combine rational and empirical approaches, by conducting empirical validation studies on the subset of NEO-PI-R facet scales hypothesised to be relevant to job performance prediction.

Using the Revised NEO-PI for FFM Measurement

The distinctive fact that accounts for the success of the FFM is that it accounts for dimensions of personality found in almost every major instrument. And one consequence of this is that research using any particular instrument can be generalised to other instruments. This is exceptionally good news for I/O psychologists who have a diverse literature on personality tests that can be integrated by the FFM: it allows psychologists to optimise the use of whatever instrument they choose. For example, the J-P scale of the Myers-Briggs Type Indicator (MBTI; Myers & McCaulley, 1985) is known to be related to measures of C, which are

predictors of vocational success in many occupations. Consequently, this MBTI dimension might be a useful predictor of vocational success or job performance. Consider another example. Jackson's (1984) PRF, one of the best measures of Murray's system of needs, has two scales, Achievement and Order, which measure the C factor. In addition, other PRF scales mark each of the remaining Big 5 dimensions (Costa & McCrae, 1988).

The traits of the FFM are ubiquitous, so many different personality questionnaires might be used effectively in I/O applications. Although the NEO-PI-R is my preferred instrument, other FFM-based personality measures that might be considered include the Hogan Personality Inventory (Hogan & Hogan, 1992) and Goldberg's adjective markers (Goldberg, 1992). There are, however, some strengths of the NEO-PI-R that recommend its use, beyond the fact that it is a well-validated operationalisation of a comprehensive model. It is relatively brief, acceptable to job applicants, available in both self-report and observer rating versions, and increasingly available in translation.

The full NEO-PI-R has 240 items and requires about 30 minutes to complete; it can of course be administered to groups. Where time is an important factor, the 60-item NEO-FFI might be used to gain global information on the five factors. Alternatively, professionals might wish to license use of a subset of relevant facet scales from the publisher. The NEO-PI-R provides a large yield of information for a relatively small investment of time.

I/O psychologists are properly concerned about how job applicants will react to psychological tests; questionnaires that seem to invade the respondent's privacy are likely to interfere with a productive rapport between applicant and evaluator. A recent study by Rosse, Miller, and Stecher (1994) showed that most applicants for seasonal jobs in a property management firm had generally favourable reactions to completing a shortened form of the NEO-PI-R as part of the selection process, a result that the authors attributed to the fact that the instrument was "designed to be as nonoffensive as possible" (1994, p.990).

Although data suggest that in most cases self-reports of personality obtained in I/O settings are valid, there may certainly be some instances in which that conclusion may be questioned. The use of the observer rating form of the NEO-PI-R provides an alternative in such cases. When very sensitive positions are being filled, background checks with informants are often utilised; Form R of the NEO-PI-R might be a useful part of this process.

Finally, in the context of an increasingly global world economy, it is reassuring to know that research on personality and vocational behaviour is not entirely culture-bound. The structure of personality itself seems to be universal, as studies using translations of the NEO-PI-R have suggested (e.g.

McCrae, Costa, & Yik, 1996; Montag & Levin, 1994), and the same qualities that predict successful job performance in America (Barrick & Mount, 1991) predict job performance in Spain (Salgado & Rumbó, 1994). With minor modifications ("vacation" becomes "holiday") the NEO-PI-R has been adapted for use in the United Kingdom by The Test Agency. A German edition of the NEO-FFI by Borkenau and Ostendorf (1993) has been published, and translations of the NEO-PI-R into a dozen other languages are in progress. These translations provide new tools for understanding the role of personality in the world of work, and the work of the world.

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