

## Openness to Experience: expanding the boundaries of Factor V

ROBERT R. McCRAE

*Gerontology Research Center, National Institute on Aging, NIH, Baltimore, MD, U.S.A.*

### *Abstract*

*The fifth factor in lexical studies of trait adjectives is commonly interpreted as Intellect, whereas the corresponding factor derived from questionnaire studies is typically identified as Openness to Experience. Intellect as a construct is problematic because it erroneously suggests an equivalence of Factor V with intelligence, describes aspects of Factor III (Conscientiousness) as well as of Factor V, and fails to suggest the diverse psychological correlates that Factor V is known to have. By contrast, Openness to Experience is a broader construct that implies both receptivity to many varieties of experience and a fluid and permeable structure of consciousness. Data from analyses of adjectives, established personality questionnaires, and Hartmann's (1991) new Boundary Questionnaire support these interpretations. The construct of Openness can be transported across geographical and cultural boundaries to function as a universal dimension of personality structure.*

[Goldmund] lived in this dream world more than in the real one. The real world: classroom, courtyard, library, dormitory, and chapel were only the surface, a quivering film over the dream-filled super-real world of images. The smallest incident could pierce a hole in this thin skin.

Hermann Hesse, *Narcissus and Goldmund* (1968/1930, p. 61).

The difference between most people and myself is that for me the 'dividing walls' are transparent. That is my peculiarity.

C. G. Jung, *Memories, Dreams, Reflections* (1961, p. 355).

### INTRODUCTION

Contemporary consensus on the five major factors of personality originated in the convergence of two lines of research: the lexical tradition, in which natural

\* Excerpts from *Narcissus and Goldmund* by Hermann Hesse, translated by Ursule Molinaro. Translation copyright © 1968 by Farrar, Straus & Giroux, Inc. Reprinted by permission of Farrar, Straus & Giroux, Inc.

Correspondence concerning this article should be addressed to Robert R. McCrae, Personality, Stress and Coping Section, Gerontology Research Center, 4940 Eastern Avenue, Baltimore, MD 21224, U.S.A.

language trait adjectives are taken to define the personality sphere (Goldberg, 1990; John, Angleitner and Ostendorf, 1988), and the questionnaire tradition, in which scales are developed to measure psychological constructs suggested by personality theories (e.g. Eysenck and Eysenck, 1975; Jackson, 1984). When a broad range of either adjectives or scales is sampled, their intercorrelations can usually be summarized by five recurrent factors (Digman and Inouye, 1986). Four of these—Extraversion, Agreeableness, Conscientiousness, and Neuroticism versus Emotional Stability—are very similar across the two traditions. The fifth factor, however, appears to be best described as *Intellect* when it is based solely on trait adjectives, but as *Openness to Experience* when it is derived from psychological constructs. A comparison of these two constructs and labels will be a major focus of this entire Special Issue.

For readers not already acquainted with the constructs, illustrative cases might be a useful starting point, and as personifications of Intellect and Openness one could hardly improve upon the protagonists of Hermann Hesse's (1930/1968) medieval novel, *Narcissus and Goldmund*. Both are recognized by their peers as extraordinary individuals, both share aspects of what Narcissus called 'the creative mind', (p. 272), yet they are in some respects very different. Narcissus is a monk; a brilliant scholar and thinker with penetrating insight into human character, he is also ascetic and self-disciplined, prepared to restrict his life to the library and monastery. Goldmund, the novel's real hero, is a sculptor, a lover of many women, and a wanderer, committed to nothing but seeking. As the epigraph shows, he is also distinguished by a particular style of consciousness that I hope to show is an important aspect of Openness. I will argue that it is the ability to accommodate such wide-ranging and non-obvious correlates that recommends the construct and label of Openness to Experience.

### FACTOR V IN THE LEXICAL TRADITION

Research in the lexical tradition began with the hypothesis that traits important in human interactions will have been encoded into natural languages, principally as trait-descriptive adjectives (Norman, 1963). An analysis of trait adjectives in the dictionary ought therefore to lead to an understanding of trait structure in human populations. Lexical analyses led to the Five-Factor Model (FFM; Goldberg, 1993), and the success of the FFM in mapping personality constructs (Ozer and Reise, 1994) might be seen as powerful support for the lexical hypothesis.

However, the lexical hypothesis has many forms. There are legitimate reasons to doubt that lay conceptions form a scientifically adequate basis for the study of personality (Tellegen and Waller, in press), so a weak form, in which lay trait language is held to provide merely a rough guide to the range of personality traits, is most plausible. In this view, lexical studies are only one of many sources of evidence on personality structure. Researchers adopting this weak version of the hypothesis might wish to consult the larger psychological literature in selecting adjectives to factor—a strategy used by Cattell (cf. John *et al.*, 1988) and McCrae and Costa (1985b, 1987).

Lexical purists argue, however, that deviations from a strong form of the lexical hypothesis lead to subjective biases in the selection of adjectives: 'To avoid arbitrary

preferences ... one should select personality variables to be representative of trait adjectives in the natural language' (Peabody, 1987, p. 59). Unfortunately, it is not self-evident what constitutes the body of trait terms in a language. Ought one to include every relevant entry in an unabridged dictionary, including terms like *acaroid*, *halituous*, and *raptril*, which are 'unknown even to most well-educated and intelligent persons' (Norman, 1967, p. 13)? Should the list be restricted to commonly used trait adjectives (Goldberg, 1990), or to terms spontaneously generated in self-descriptions (John, 1990)? And what precisely is a trait-descriptive adjective? Does this category include state terms (*angry*), abilities (*musical*), physical descriptors (*lean*)? Should both evaluative and descriptive terms be examined (Waller, in press), or should purely evaluative terms be discarded?

### Alternative lexical versions of Factor V

Different investigators have adopted different positions on these questions, with resulting differences in the structure of personality they report. It is a testimony to the robustness of the FFM that despite these differences most lexical studies have reported five rather similar factors (e.g. Goldberg, 1990; Ostendorf, 1990). But the differences are not trivial, and they are particularly consequential for the interpretation of Factor V. In creating the Dutch taxonomy, adjectives were rated by panels of judges to determine their relevance to personality; in one of these screenings, 'the intention was to select stable traits of *personality* only, rather than stable traits of capacity, ability, intelligence, or skill' (Brokken, 1978, p. 16). Presumably as a result, De Raad, Hendriks and Hofstee (1992) reported a fifth Dutch factor defined by *critical*, *mutinous*, *fierce* against *virtuous*, *meeke*, *docile* that bears little resemblance to either Intellect or Openness. In the German taxonomy, where ability traits were explicitly included, Factor V was interpreted as *Intelligence* or *General Ability*, with smaller loadings for terms like *creative* and *imaginative* (Angleitner and Ostendorf, 1989).

The German results thus parallel most English language studies, on which the Intellect interpretation was originally based. In 1983, Goldberg suggested using such bipolar terms as *stupid—intelligent*, *ignorant—knowledgeable*, and *unanalytical—analytical* to measure this factor; in 1990, he recommended a set of unipolar terms that included *intellectual* and *bright* versus *simple* and *unreflective*. John (1990) asked a panel of judges to review the literature on the FFM and select items from Gough and Heilbrun's (1983) Adjective Check List (ACL) to measure each of the five factors; at least 90 per cent of them agreed that Factor V was defined by such terms as *clever*, *ingenious*, *logical*, and *foresighted*. Given such a collection of adjectives, the label *Intellect* is certainly understandable.

But very different results emerge when a different strategy for sampling the lexicon is used. Tellegen and Waller (1987) varied the usual lexical approach in three ways: (i) they systematically sampled pages of the dictionary rather than attempting an exhaustive enumeration; (ii) they used phrases rather than single words to convey the meaning of the traits; and (iii) they made no attempt to eliminate mood terms or adjectives that might be considered primarily evaluative, such as *good* and *evil*. Factor analysis of the resulting items lead to a seven-factor solution, in which Positive Valence and Negative Valence factors supplemented five substantive factors. These latter five showed a one-to-one correspondence with the dimensions of the FFM,

but with notable alterations to Factor V. That factor, which they labelled *Conventionality*, contrasted *conservative; conventional; and thought of as old fashioned* with *curious, inquisitive; odd, peculiar; and progressive, favor social reform* (Waller, 1994). It is hard to recognize Intellect in either pole of this factor, but the low pole is recognizably a form of Openness.

This seven-factor model has been interpreted as a challenge to the comprehensiveness of the FFM (Waller, in press), but there are other ways to interpret the data. In a joint factor analysis with the Revised NEO Personality Inventory (NEO-PI-R; Costa and McCrae, 1992b) only five factors were found, the two evaluative factors splitting their loadings across several of the substantive factors (Costa and McCrae, 1994). The seven factors appear to tap interesting aspects of personality, but it cannot be concluded that they represent the basic structure of personality (Costa and McCrae, 1992a). The seven-factor solution does show, however, that not all lexical approaches emphasize the construct of Intellect.

### The construct validity of Intellect

For lexicologists, the criterion for naming adjective factors might well be semantic: what label best captures the meaning of the defining terms? By this criterion, *Intellect* is certainly a reasonable choice for many versions of Factor V. But for personality psychologists who seek to understand dimensions of individual differences an entirely different criterion is appropriate, namely, construct validity. Here rational and semantic interpretations of factors must yield to evidence on the network of their empirical correlates. Does the term *Intellect* suggest the range of correlates that Factor V is known to have (McCrae and Costa, in press), or does it instead suggest attributes that are not strongly related to Factor V? What, in short, is the convergent and discriminant validity of the Intellect construct? From this perspective there are serious problems with the choice of *Intellect* as a label for Factor V.

First, and most obviously, the term suggests that high scorers on the factor should be intelligent. Goldberg (1981) argued that the social utility of trait terms related to Factor V was to convey whether 'X is *smart* or *dumb* (How easy will it be for me to teach X?)' (p. 161). If this claim were true, it would certainly establish Factor V as a major dimension of individual differences, because intelligence has always been a central concept in psychology.

But in fact high scorers on Factor V are only slightly more intelligent than low scorers when ability tests are used as measures of intelligence. For example, Goldberg's (1983) Intellect scale correlated only 0.27 with Vocabulary scores from the Wechsler Adult Intelligence Scales (WAIS; Wechsler, 1958), and a joint factor analysis of 80 bipolar trait adjectives with eight cognitive tests showed that Factor V and general intelligence formed separate factors (McCrae and Costa, 1985b). Although intellectual *interests* is a key definer of Factor V, intellectual *ability* is only a modest correlate.

Second, the construct of Intellect lacks discriminant validity with respect to Factor III, Conscientiousness. John's (1990) judges assumed that terms like *logical* and *foresighted* would be definers of Factor V—surely they are part of what laypersons mean by 'smart'—but these adjectives did not define that factor; instead, they loaded on the Conscientiousness factor (McCrae, 1990). Indeed, the term *intelligent* itself often shows as high or higher loadings on Factor III as on Factor V (McCrae and

Costa, in press). In an Abridged Big Five Circumplex (AB5C) analysis, terms like *intelligent* and *intellectual* were classified as as V+III+ rather than as V+V+ (Johnson and Ostendorf, 1993).

When laypersons use terms related to Intellect, they appear to mean something akin to *applied intelligence*, which would commonly be seen in academic achievement, a correlate of Conscientiousness (Digman and Inouye, 1986). Hesse's scholar Narcissus is prototypically intelligent, and he would have scored as high on Factor III as on Factor V (and perhaps highest of all on the sixth factor, *g*.)

Third and finally, Intellect fails to suggest the full range of attributes that are related to this factor: intellectual curiosity is an important part of Factor V, but only a part. With the construct of Intellect in mind, who would imagine that high scorers on Factor V would be easily hypnotized, or seek thrills and adventures, or be empathic, or cope by using regression in service of the ego, or believe in paranormal phenomena (McCrae and Costa, in press)? Such correlates are, however, predictable from the construct of Openness. The relations among Openness, Intellect, Conscientiousness, and measured intelligence are represented in Figure 1.

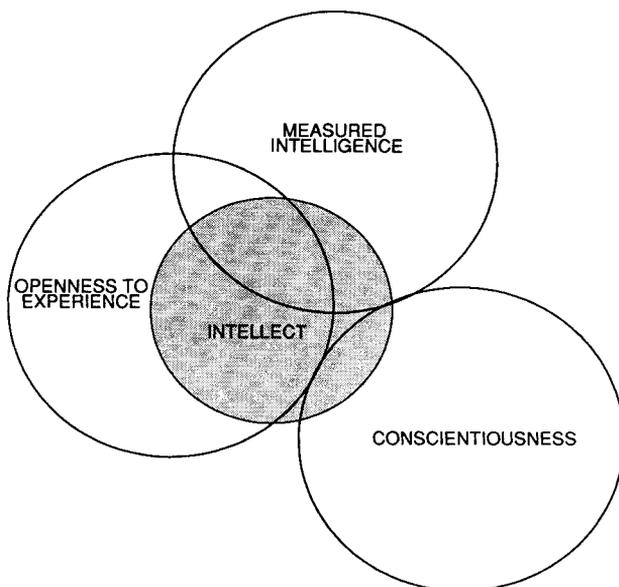


Figure 1. A schematic representation of relations among Openness to Experience, Intellect, Conscientiousness, and measured intelligence. Adapted from McCrae and Costa (in press).

Adopting a broader interpretation of Factor V leads to the selection of rather different adjectives to measure it, and a series of analyses stimulated by personal communications with L. R. Goldberg and O. P. John (July 13 to September 15, 1989) examined the empirical consequences of different item selections. Two seven-item scales were constructed from bipolar adjectives that defined Factor V in self-reports (McCrae and Costa, 1985b) and peer ratings (McCrae and Costa, 1987). The first scale was composed of items that appeared to represent Goldberg's construct of Intellect: *analytical, intelligent* versus *stupid, perceptive* versus *imperceptive, cur-*

ious, imaginative versus down-to-earth, creative, and cultured. The second scale (Non-Intellect) consisted of items related to Factor V but less obviously related to Intellect: original versus conventional, broad versus narrow interests, complex versus simple, daring versus unadventurous, liberal versus conservative, independent versus conforming, and prefer variety versus routine. Coefficient alphas for the two scales were similar: 0.68 and 0.66.

A variety of external criteria relevant to Factor V were examined; these measures had been collected over a period of years from participants in the Baltimore Longitudinal Study of Aging (BLSA; Shock, Greulich, Andres, Arenberg, Costa, Lakatta and Tobin, 1984). Among the criteria were years of education, divergent thinking scores from Guilford's battery (McCrae, 1987), and self-reports of personality and vocational interests. Correlations are reported in Table 1.

Table 1. Correlates of adjective Intellect (I) and Non-Intellect (Non-I) Factor V scales

Criterion	Self reports					
	Men		Women		Peer ratings	
	I	Non-I	I	Non-I	I	Non-I
Years of Education	0.32***	0.21**	0.19	0.28*	0.24***	0.15*** <sup>a</sup>
Divergent Thinking	0.25***	0.33***	—	—	0.21***	0.30***
GZTS Thoughtfulness	0.29***	0.23***	—	—	0.31***	0.15** <sup>a</sup>
CPS	0.54***	0.64***	0.44***	0.58*** <sup>b</sup>	0.24***	0.27***
CQS Openness <sup>c</sup>	0.27**	0.42*** <sup>b</sup>	0.42**	0.70*** <sup>b</sup>	0.32***	0.41***
SDS Artistic Interests	0.29***	0.20**	0.43***	0.37***	0.13**	0.22*** <sup>b</sup>
SDS Investigative Interests	0.27***	0.12 <sup>a</sup>	0.26**	0.27**	0.12**	0.04 <sup>a</sup>
SSS-V total	0.30***	0.41***	0.13	0.29** <sup>b</sup>	0.14**	0.27*** <sup>b</sup>
MBTI Intuition	0.36***	0.53*** <sup>b</sup>	0.40***	0.48***	0.32***	0.37***
NEO-PI Openness factor	0.46***	0.53***	0.47***	0.53***	0.31***	0.37***
Mean	0.34	0.37	0.35	0.45	0.23	0.26

Note: *N*s = 122–242 for men's self-reports, 46–152 for women's self-reports, and 267–588 for single peer ratings of men and women combined. Women's data were unavailable for Divergent Thinking and GZTS Thoughtfulness. GZTS = Guilford—Zimmerman Temperament Survey (Guilford, Zimmerman and Guilford, 1976). CQS = California Q-Set (Block, 1961). SDS = Self-Directed Search (Holland, 1985). CPS = Creative Personality Scale (Gough, 1979). SSS-V = Sensation Seeking Scales V (Zuckerman, 1979). MBTI = Myers—Briggs Type Indicator (Myers and McCaulley, 1985). NEO-PI = NEO Personality Inventory (Costa and McCrae, 1985). \* *p* < 0.05. \*\* *p* < 0.01. \*\*\* *p* < 0.001.

<sup>a</sup>Correlation with Intellect significantly higher than correlation with Non-Intellect.

<sup>b</sup>Correlation with Non-Intellect significantly higher than correlation with Intellect.

<sup>c</sup>Factor from McCrae, Costa and Busch, (1986).

These data merit several comments. First, both brief adjective scales show many significant correlations despite the fact that data administrations are separated by as much as 20 years for some subjects. The findings are unlikely to be due to method variance, because peer ratings predict self-reports, and both peer ratings and self-reports predict performance measures (education and divergent thinking). Supplemental analyses showed that these associations were essentially unchanged when measures of the other four factors were partialled, and were only slightly reduced when WAIS Vocabulary scores were controlled. Measures of Factor V—including

semantically narrow Intellect scales—thus have diverse and important psychological correlates, to whose interpretation we will turn in the next section.

The second noteworthy aspect of Table 1 is the comparison of the Intellect and Non-Intellect scales. In a few cases there are significant differences (Meng, Rosenthal, and Rubin, 1992), but the general conclusion is that these two scales (which themselves correlate from 0.54 to 0.65 in the different samples) are essentially interchangeable as predictors of this set of criteria. At least at a global level, it appears to be possible to measure Factor V quite adequately without the use of any Intellect-related terms (mean correlations actually show a slight advantage for the Non-Intellect scale). Some construct broader than Intellect is thus needed to encompass the full scope of the factor.

### OPENNESS IN THE PSYCHOLOGICAL LITERATURE

How might one characterize individuals who combine intellectual curiosity with broad interests, liberal views, adventurous tendencies, and a need for variety? We have argued that *Openness to Experience* is an apt label, because it suggests a preference for the new and different in many different aspects of life (McCrae, 1993–1994; McCrae and Costa, 1985a; 1994). The concept of Openness to Experience was not invented to describe the adjective definers of Factor V; it has long had currency among personality psychologists. Rogers (1961) wrote about openness to feelings, Rokeach (1960) about the open mind, Tellegen and Atkinson (1974) about openness to absorbing experience, and MacKinnon (1960) about openness to experience in general as a common feature of creative individuals. Kaplan and Singer (1963) conducted an experimental study of sensory acuity and concluded that ‘openness to sense impressions apparently runs parallel to openness to ideas’ (p. 490).<sup>1</sup>

Paul Costa and I borrowed the term most directly from the work of Coan (1974), whose Experience Inventory was the starting point for the development of the Openness scales in the NEO-PI-R. As Coan noted, ‘people vary considerably in the range and types of experience to which they are open’ (1972, p. 346), so our strategy, like his, was to measure Openness in many different areas. In the NEO-PI-R, facet scales measuring Openness to Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values are summed to measure total Openness.

Research using these scales has shown the extraordinary richness of the Openness construct. Here is a trait dimension that affects nearly every aspect of the individual’s life, from political attitudes (Riemann, Grubich, Hempel, Mergl and Richter, 1993; Trapnell, 1994) to musical preferences (Dollinger, 1993). Openness is seen as much in affective and sensory systems (McCrae, 1993–1994) as in cognitive systems. It is thus not surprising that sexuality—so central a part of the human experience—is pervasively influenced by Openness: open men and women have more information about sex, wider sexual experience, stronger sexual drives, and more liberal sexual attitudes (Costa, Fagan, Piedmont, Ponticas and Wise, 1992; Meston, Trapnell and Gorzalka, 1993). When Hesse depicts Goldmund’s absorption in erotic experience he illustrates an important manifestation of Openness.

<sup>1</sup> Related constructs occur much earlier in the literature, including Murray’s (1938) needs for change, sentiment, and understanding, and Adorno, Frenkel-Brunswick, Levinson and Sanford’s (1950/1969) authoritarian personality structure.

Reflection on the many correlates of Openness has suggested two complementary aspects of the dimension, motivational and structural. The motivational aspect is perhaps most easily conveyed. Although the word *openness* may suggest to some readers a kind of passive tolerance of new experience, in fact open people are characterized by an active pursuit of novelty, a quest to 'clarify, intensify, or otherwise enlarge our experience' (Canaday, 1980, p. 5). The need for novelty in experience is universal, ranked as such by anthropologist Ralph Linton (1945) alongside needs for emotional bonds and long-term security, and anticipated evolutionarily by the exploratory behavior of animals (Berlyne, 1955). Individual differences in so basic a need understandably have powerful consequences.

The structural aspect of Openness is less easily grasped; it refers not to the contents of consciousness so much as to the organization of the contents in a particularly fluid and permeable structure. As Rokeach (1960) argued, closed individuals have beliefs that are tightly compartmentalized, not easily affected by contradictory beliefs or by corrective information (Davies, 1993). Open individuals, by contrast, have more flexible attitudes. The same open style of consciousness can be seen in divergent thinking, in which remote associations are easily made, and in synesthesia, in which the distinctions between different sensory modalities are blurred (Rader and Tellegen, 1987).

Earlier, the label *Intellect* was criticized because it erroneously suggested that high scorers on Factor V would necessarily be high in cognitive ability. The label *Openness* is liable to a parallel criticism, because Openness is often mistakenly interpreted in interpersonal terms to refer to self-disclosure, a characteristic that is in fact more closely related to Extraversion and Agreeableness. Trusting and talkative people reveal much about themselves, they open themselves out to the world. Whether they are equally receptive to information and experience coming in from the world is something quite different, and depends on their standing on Factor V.

### Jung and his interpreters

The question then arose: 'Am I the one who is sitting on the stone, or am I the stone on which *he* is sitting?' This question always perplexed me, and I would stand up, wondering who was what now. The answer remained totally unclear, and my uncertainty was accompanied by a feeling of curious and fascinating darkness.

C. G. Jung, *Memories, Dreams, Reflections* (1961, p. 20)

It is difficult to determine who should be credited with the first identification of Openness as a major dimension of personality, but one name recurs throughout the history of the idea: C. G. Jung. In *Psychological Types* (Jung, 1923/1971) he suggested distinctions between introversion and extraversion, thinking and feeling, and sensation and intuition that have influenced researchers in this area for decades. As Coan (1974) wrote, 'for those who wish to extend our explorations to a broader range of human experience, [the Jungian system] is a fund of insights that we cannot afford to overlook' (p. 58).

Guilford began the tradition of factor analytic explorations of personality in the 1930s by showing the multidimensionality of purported measures of introversion–extraversion (e.g. Guilford and Guilford, 1934). Eventually he stressed the distinction

between social introversion and what he called *thinking introversion* (Guilford, 1977)—a factor reflected in the Thoughtfulness scale of the GZTS. Thoughtfulness is a correlate of Openness (McCrae, 1993–1994; see also Table 1), and the interpretation of Factor V as thinking introversion has recently been revived by Wolfe (1993), who proposed the label *Bookishness*. At least a part of what Jung meant by *introversion* seems to have been related to Openness, but it was confounded with the social introversion that is more commonly assessed in personality questionnaires.

The distinction between thinking and feeling functions has also been important for researchers on Openness. Jung believed that thinking and feeling were mutually exclusive approaches to rational decision-making, characterizing entirely different types of individual. Hesse (1930/1968), who was deeply influenced by Jung (and was even briefly his patient), set out more or less consciously to portray these types in the characters of Narcissus and Goldmund; the result, however, appears instead to have been the illustration of two different aspects of the single dimension of Openness. Costa and McCrae (1976) found a dimension in the Sixteen Personality Factor Questionnaire that appeared to show an integration of openness to both ideas and feelings, at least in the oldest age group; they interpreted this synthesis as the result of Jungian processes of individuation. However, when they subsequently created scales to measure explicitly these two facets of Openness, they showed that at all ages, individuals who were more open to ideas tended also to be more open to feelings (Costa and McCrae, 1978, 1980). In that research, as in Hesse's characterizations, openness to ideas and to feelings appear to be not polar opposites, but different facets of a single common factor.

Psychometrically, thinking and feeling can be placed at opposite poles of a dimension only if the former is interpreted as cold rationality, the latter as warm sentimentality. As warmth versus coldness, this contrast is closely related to Factor II, Agreeableness (McCrae and Costa, 1989).

Most important of the Jungian distinctions is that between sensation and intuition. Jung defined *intuition* as 'perception via the unconscious' (1923/1971, p. 538), and argued that it is incompatible with sensation, which is conscious perception: 'When I try to assure myself with my eyes and ears of what is actually happening, I cannot at the same time give way to dreams and fantasies about what lies around the corner' (p. 539). When MacKinnon began his studies of creativity in 1949 at the Institute of Personality Assessment and Research, he introduced an early version of the Myers–Briggs Type Indicator (MBTI; Myers and McCaulley, 1985), which measures Sensation versus Intuition and found a strong association of Intuition with creativity: 'We would expect creative persons not to be stimulus- and object-bound in their perceptions but ever alert to the as-yet-not-realized, and this is precisely what we find to be true of all our creative groups' (1960, pp. 377–378).

Yet Jung's dichotomy between sensation and intuition is in some ways flawed. Just as both breadth of thought and depth of feeling characterize the open individual, so too do both sensory acuity (Kaplan and Singer, 1963) and imagination (Saucier, 1992). The MBTI Sensation versus Intuition scale does not really contrast sense perceptions with hunches; in fact, none of its items deals directly with sensory input. Instead, this scale contrasts a preference for the factual, simple, and conventional with a preference for the possible, complex, and original. As such, it is a good measure of Openness (McCrae, 1993–1994).

Jung himself never wrote about Openness—that term does not appear in the index

to his collected works<sup>2</sup>—and as we have seen, his conceptualizations as often confused as clarified individual differences in this area. Why, then, has he had such influence on students of Openness? Perhaps because Jung himself was almost archetypally open to experience. How else can we characterize someone who first embraced the radical tenets of psychoanalysis and then rejected its dogmatic orthodoxy? Who travelled to India, Uganda, and New Mexico in search of spiritual insights? Who wrote volumes on the interpretation of alchemy and proposed that flying saucers were a modern myth? The spirit of Openness was beautifully illustrated in his ‘Foreword to the *I Ching*’, when Jung explained his decision to consult the Oracle itself on the wisdom of an English translation: ‘Not even the strangeness of insane delusions or of primitive superstition has ever shocked me. I have always tried to remain unbiased and curious—*rerum novarum cupidus*. Why not venture a dialog with an ancient book that purports to be animated?’ (Jung, 1958, p. 594).

In *Memories, Dreams, Reflections* Jung (1961) recounted a number of peculiar experiences that testify to a particular kind of mind. His dreams were vivid and real to him, so much that the boundary between dream world and reality was often tenuous. Similarly, his sense of identity was weak; he felt himself to have multiple identities, or to merge his own identity with his surroundings. Anyone who has read his works knows that his cognitive style is often tortuous, following a sweep of associations rather than a logical course of development. All of these features suggest a particular structure of consciousness, in which the rigid dichotomies between reality and fantasy, self and other, cause and effect are softened. In some individuals this may represent a form of psychosis; in others it is only the *modus vivendi* of an extremely open mind.

### OPENNESS AND BOUNDARIES IN THE MIND

The concept of permeability or fluidity in consciousness is certainly not new. In addition to research on dogmatism in attitudes and ideology, there have been studies of a number of phenomena related to the structure of mental contents. Cognitive psychologists have examined remote associates as predictors of creativity (Guilford, 1967). Rader and Tellegen (1987) developed a measure of synesthesia, which represents a kind of permeability across sensory modalities. Chapman, Chapman and Raulin (1978) assessed perceptual aberration, and Haan (1965) created a measure of regression in service of the ego; these two variables might be considered maladaptive and adaptive variants, respectively, of the tendency of primary process thinking to penetrate into consciousness.<sup>3</sup> But perhaps the most extensive and integrated consideration of the structure of consciousness in recent years has been in the work of Ernest Hartmann.

Hartmann is a psychoanalytically oriented psychiatrist with a long-standing interest in sleep, dreams, and nightmares (Hartmann, 1984). His studies of chronic nightmare sufferers (Hartmann, Russ, Oldfield, Sivan and Cooper, 1987) led him to some

<sup>2</sup> However, he did refer to *misoneism*, ‘a deep and superstitious fear of novelty’ (Jung, 1964, p. 31) that in his view characterized many of his contemporaries’ reactions to the idea of the unconscious.

<sup>3</sup> Both these scales are related to NEO-PI-R Openness (McCrae and Costa, in press), and the Perceptual Aberration scale is related to what might be viewed as permeability in handedness: high scorers are twice as likely as controls to be ambilateral rather than either right- or left-handed (Chapman and Chapman, 1987).

surprising observations. Individuals who frequently had nightmares did not show a high incidence of psychiatric disorder, nor were they able to identify traumatic incidents in their childhood that might have been responsible for the recurrent nightmares. They did, however, seem to share a set of personality characteristics: they could be described as “unguarded”, “undefended”, “fluid”, “artistic”, “vulnerable”, “open” (Hartmann, 1991, p. 16).

Hartmann interpreted these characteristics as signs of a particular structure of mind. Just as they were unable to screen out terrifying images and affects from their dreams, so these people appeared unable or unwilling to place barriers between their own identity and that of others, or between their established beliefs and unconventional ideas, or between one affect and another. The mental boundaries that separate the contents of consciousness were exceptionally thin.

This is precisely the phenomenon that Hesse describes in his characterization of the student Goldmund, for whom the real world and the dream world were separated only by ‘a quivering film’, a ‘thin skin’. Mundane reality was inundated by images and associations:

A Latin initial changed to his mother’s perfumed face, a long note in the *Ave* became the gate to Paradise, a Greek letter a galloping horse, a rearing serpent that quickly slithered off through the flowers, leaving the rigid page of grammar in its place (Hesse, 1930/1968, p. 62).

Hartmann (1991) came to regard thickness or thinness of boundaries as ‘a broad dimension of personality and an aspect of the overall organization of the mind’ (p. 49), and believed it to be ‘a new dimension of personality’ (p. 3). He traced its intellectual roots to such constructs as James’s tender-mindedness, Freud’s *Reizschutz* or stimulus shield, Blatt and Ritzler’s (1974) permeable ego boundaries, and Gardner, Holzman, Klein, Linton and Spence’s (1959) cognitive controls. (Rokeach (1960) is a striking omission from this list.)

Whether or not thickness versus thinness of boundaries is really a new dimension of personality, certainly Hartmann’s approach to measuring it is unique. In designing a questionnaire, he applied the metaphor of boundaries in a wide array of areas or categories, creating scales to measure thinness of boundaries with regard to sleep and waking, thoughts and feelings, persons, places, values. ‘I like heavy solid clothing’ would be a subtle item in most scales; here it is a literal operationalization of thick boundaries.

The Boundary Questionnaire (BQ; Hartmann, 1991) was administered to 124 men and women in the BLSA in 1993, together with Tellegen, Grove and Waller’s (1991) Inventory of Personal Characteristics #7 (Costa and McCrae, 1994). These subjects had previously completed the NEO-PI (Costa and McCrae, 1985) and MBTI in 1986, and the ACL (from which John’s (1990) Big Five prototypes could be scored) in 1987. Complete data on the BQ were available for 53 men aged 32–91, and 71 women aged 26–90.

Table 2 provides some descriptive information on the category scales of the BQ. For each of the 12 categories, the best item is given as an example. Most of the scales show adequate internal consistency, although Childhood/adolescence/adulthood and Interpersonal scales have psychometric problems. The category scores were correlated with the 18 facets of NEO-PI N, E, and O, and with the A and C domain scales; the single largest correlate is reported in the Table. In most cases

some facet of O shows the strongest association, although the BQ also has content related to N, E, and low C.

Table 2. Characteristics of Boundary Questionnaire category scales

Category/ Item example	Alpha coefficient	NEO-PI correlate	<i>r</i>
Sleep, wake, dream (14) 113. I awake from one dream into another.	0.74	01: Fantasy	0.49
Unusual experiences (19) 61. At times I have felt as if I were coming apart.	0.70	N3: Depression	0.42
Thoughts, feelings, moods (16) 62. My thoughts blend into one another.	0.70	02: Aesthetics	0.44
Childhood, adolescence, adulthood (6) 28. I had a difficult and complicated childhood.	0.27	N3: Depression	0.37
Interpersonal (15) 103. I am a very open person.	0.35	E1: Warmth	0.46
Sensitivity (5) 54. I am a very sensitive person.	0.56	O3: Feelings	0.29
Neat, exact, precise (11) 96. When I am working on a project, I make a careful detailed outline and then follow it closely. (R)	0.67	C Domain	-0.35
Edges, lines, clothing (20) 57. I like paintings and drawings with clean outlines and no blurred edges. (R)	0.75	O4: Actions	0.49
Opinions about children and others (8) 56. I think a good teacher must remain in part a child.	0.60	O2: Aesthetics	0.28
Opinions about organizations and relationships (10) 58. A good relationship is one in which everything is clearly defined and spelled out. (R)	0.68	O6: Values	0.50
Opinions about peoples, nations, groups (14) 124. A man is a man and a woman is a woman; it is very important to maintain that distinction. (R)	0.69	O3: Feelings	0.51
Opinions about beauty, truth (7) 24. There is a time for thinking and there is a time for feeling; they should be kept separate. (R)	0.47	O3: Feelings	0.38

Note:  $N = 124$ . All correlations significant at  $p < 0.01$ . The number of items in each scale is given in parentheses. The item with the highest corrected item-total correlation is given as the example. The highest NEO-PI correlate is reported. All scales are scored in the thin-boundary direction; items marked '(R)' are reverse scored.

There is considerable heterogeneity in BQ item content, and it is not immediately clear what the sum of these scales measures. (Note in particular that the Interpersonal category, typified by the item 'I am a very open person' is strongly related to E1: Warmth; it is unrelated to total Openness,  $r = 0.14$ , n.s. Self-disclosure should not be confused with Openness to Experience.) There is, however, a unifying theme across most of the items; the first general factor correlates 0.95 with the simple sum of items. To get a better sense of what that theme is, Table 3 presents the 10 items that correlate most highly with the total. A reading of these items suggests that Hartmann has succeeded quite well in measuring his concept of thin versus thick boundaries, from the preference for blurred edges in paintings to the categorical separation of the sexes, as cut-and-dried and rule-bound as 'a rigid page of grammar'.

Table 3. Boundary Questionnaire items with highest item-total correlations

67.	I like paintings or drawings with soft and blurred edges.
100.	I have had <i>déjà vu</i> experiences.
62.	My thoughts blend into one another.
51.	At times I feel happy and sad all at once.
61.	At times I have felt as if I were coming apart.
63.	I had a difficult and complicated adolescence.
136.	I can easily imagine myself to be someone of the opposite sex.
versus	
48.	There is a place for everything, and everything should be in its place.
124.	A man is a man and a woman is a woman; it is very important to maintain that distinction.
58.	A good relationship is one in which everything is clearly defined and spelled out.

*Note:* All correlations are greater than 0.46 in absolute magnitude.

The BQ total score is somewhat higher in women than in men ( $r = 0.31$ ), and lower in older respondents than younger ( $r = -0.30$ ). It is significantly related to WAIS Vocabulary scores,  $r = 0.18$ ,  $p < 0.05$ , but not to years of education,  $r = 0.14$ , n.s. But the data in Table 2 suggest that its chief correlates should be with personality dimensions, and correlations with NEO-PI N, E, O, A, and C domains are 0.32, 0.27, 0.66, 0.01, and  $-0.05$ , respectively; the first three are statistically significant. The correlation of 0.66 between Openness and BQ total Score is remarkable given the independent origins of the instruments and the lapse of seven years between their administrations.

BQ Total Score is significantly related to all six facets of Openness,  $r_s = 0.37-0.58$ , but especially to Openness to Fantasy, Aesthetics, and Feelings. These are the facets that are most strongly related to Tellegen and Atkinson's (1974) Absorption (Glisky, Tataryn, Tobias, Kihlstrom and McConkey, 1991), so these data replicate Hartmann's (1991) own report of a moderately strong correlation (0.54) between BQ Total Score and Absorption.

Given Hartmann's background as a psychiatrist and his interest in nightmares, it is hardly surprising that many of the items in the BQ have a slightly psychopathological flavor, accounting for the modest correlation with NEO-PI N. Similar item content could be found in Coan's (1974) Experience Inventory, the direct precursor to the NEO-PI Openness scales. In creating the NEO-PI we chose to exclude some of the more eccentric and bizarre aspects of the domain that Coan had identified. Ironically, this has led some to suggest that Openness may not be relevant to personality psychopathology (Hyler and Lyons, 1988). Openness *per se* is not pathological, but some forms of psychopathology can be expressed in open or closed ways (Costa and Widiger, 1994).

### The five- (or six-) factor synthesis

Thus far I have discussed several approaches to personality measurement: the lexical approach, with its five-factor and seven-factor variants operationalized, respectively, by John's (1990) and Tellegen, Grove and Waller's (1991) instruments; the tradition of personality theory and research from which the NEO-PI-R and the concept of

Openness were derived; the Jungian typology assessed by the MBTI; and the 'new' dimension of personality offered by Hartmann. How can these approaches be integrated, and how should the integration be characterized?

A straightforward approach is a joint factor analysis. Complete data on each of these instruments, plus WAIS Vocabulary and years of education, were available for 85 participants, a rather small sample for the analysis of 24 variables. However, the results were clear. Six eigenvalues exceeded 1.0, with a break after the sixth. Table 4 reports factor loadings, which have been reordered and reflected into the standard lexical order. The identity of the factors is beyond doubt: they are the Big Five plus general intelligence. Note that all the subjects in this analysis joined the BLSA Stress and Coping project in 1986; thus, these data constitute an independent replication of the factorial separation of Openness from intelligence reported in McCrae and Costa (1985b). Both studies support Brand's (1984, 1994) view that intelligence is an independent sixth factor.

Table 4. Joint factor analysis of personality and cognitive ability measures

Scale	Varimax rotated principal component					
	I	II	III	IV	V	<i>g</i>
John's Adjective Check List Clusters						
Factor I	<b>79</b>	-04	-06	19	12	-22
Factor II	23	<b>73</b>	15	11	-04	-05
Factor III	13	03	<b>72</b>	04	01	-37
Factor IV	19	10	08	<b>62</b>	-02	20
Factor V	19	08	13	19	<b>64</b>	-10
Inventory of Personal Characteristics # 7						
Positive Emotionality	<b>82</b>	34	-06	16	20	-01
Agreeability	01	<b>81</b>	22	33	-01	-08
Dependability	-17	10	<b>73</b>	35	-01	-09
Negative Emotionality	-21	02	-05	<b>-87</b>	02	03
Conventionality	-26	30	26	21	<b>-70</b>	-02
Positive Valence	39	-23	21	24	<b>59</b>	04
Negative Valence	02	<b>-45</b>	-18	<b>-49</b>	-17	03
NEO Personality Inventory factors						
Neuroticism	-13	-01	08	<b>-89</b>	08	02
Extraversion	<b>84</b>	04	-07	05	12	07
Openness to Experience	-12	02	-04	-11	<b>84</b>	29
Agreeableness	00	<b>84</b>	-06	-02	-06	16
Conscientiousness	-02	07	<b>76</b>	-08	-04	25
Myers—Briggs Type Indicator						
Extroversion	<b>86</b>	10	-04	12	00	07
Intuition	-02	11	-21	-04	<b>86</b>	19
Feeling	13	<b>74</b>	-10	-38	13	-01
Judging	-26	07	<b>66</b>	-06	-38	19
Hartmann's Boundary Questionnaire						
Total Score	23	22	-22	<b>-44</b>	<b>63</b>	20
Years of Education	19	03	14	07	13	<b>80</b>
WAIS Vocabulary	-26	-01	-12	05	27	<b>73</b>

Note:  $N = 85$ . Loadings over 0.40 in absolute magnitude are given in boldface; decimal points are omitted.

The fifth factor is defined chiefly by NEO-PI Openness and MBTI Intuition, but also by thin boundaries, unconventionality, and John's Intellect-saturated version

of Factor V. Perhaps the only surprise is the high loading of Positive Valence. In this context, Positive Valence seems to measure not social desirability but distinctiveness, an extraordinary, remarkable quality that contrasts with the ordinary normality of average, conventional people. Among the phrases that high scorers used to describe themselves are *elegant, refined; gifted, talented; and exceptional, special*. Compare Hesse's description of Narcissus and Goldmund: 'Both were refined, both were different from the others because of obvious gifts and signs; both bore the special mark of fate . . . two exceptional human beings' (1930/1968, pp. 17, 36). MacKinnon (1960) also noted that 'the truly creative individual has . . . a sense of destiny . . . and almost inevitably a measure of egotism' (p. 375). Whether open individuals are indeed remarkable in some objective sense is debatable; it seems clear, however, that they regard themselves as special.

What label should be given to this factor? In particular, is it reasonable to regard it as a measure of Intellect? It would seem strange to have both Intellect and Intelligence factors in the same analysis, and surely the sixth factor is best interpreted as Intelligence. In addition, Intellect seems a poor choice for a factor that is defined by unconventionality, thin mental boundaries, and intuition.

Is *Imagination*, Saucier's (1992) candidate, a better label? Doubtless high scorers on this Factor V are imaginative, drawn to the 'dream-filled, super-real world of images', yet *Imagination*, too, seems too narrow a label. It does not convey the blurring of affects or identities that Hartmann (1991) noted, nor the liberal ideologies that Trapnell (1994) pointed out. *Openness* seems a better metaphor, conveying both the idea of welcoming new input—whether sensory, cognitive, or affective—and the notion of permeability that characterizes the structure and functioning of open minds (Rokeach, 1960).

## A JOURNEY TO THE EAST

From the wanderings of Goldmund to the Oriental Tour of 19th-century gentlemen, travel has always been regarded as a broadening experience, useful for putting one's accustomed ideas and values in perspective. Personality psychology can benefit in much the same way by pushing its constructs across geographical and cultural boundaries. Is there a Factor V in non-Indo-European cultures, and if so, is it best characterized by *Intellect*, or *Openness*, or some other term?

Surely there is some equivalent of Intellect in the Far East. As most Westerners know, the Confucian tradition placed great emphasis on scholarship, and academic achievement is still highly valued among Chinese and Japanese cultures at home and abroad (Bond, 1991). Yet China also has a mystical tradition, Taoism, that regards mere intellect as a distinctly limited approach to the world. Of Taoist Master Chuang Tzu's teachings it was said:

Thoughts such as his that can cross the Dark Streams of death, mount to the Royal Empyrean, that know neither east nor west, north nor south, but plunge into the bottomless chasm; thoughts from which all boundaries have loosened and dropped away . . . —how can you hope to reach them by the striving of a petty intelligence? (Waley, 1939, pp. 35–36).

The elements of Factor V are thus clearly to be found in Asian cultures, but do they covary in the same way? In early studies using Norman's (1963) measure of the FFM, the status of Factor V was problematic. Bond, Nakazato and Shiraishi (1975) clearly replicated four of the five factors, with coefficients of congruence ranging from 0.87 to 0.93. Factor V, however, showed a very marginal congruence coefficient of 0.72. In this Japanese sample, the factor was defined by *artistically sensitive* and *polished, refined*, but not by *intellectual* and *imaginative*, which instead loaded chiefly on Factors III and II, respectively. In a sample of Chinese university students given the Norman instrument in English, Bond (1979) also replicated the FFM, but once again found that *intellectual* loaded on Factor III, Conscientiousness, instead of Factor V. Citing the Chinese saying, 'if people do not pursue their studies, they cannot know what is morally right', Bond concluded that for the Chinese, intellect is inextricably tied to 'moral integrity and social responsibility' (p. 53)—aspects of Conscientiousness.

Yet in other Chinese studies, *intellectual* does join other definers of Factor V.<sup>4</sup> Yang and Bond (1990) translated Norman's instrument into Chinese and administered it to large samples. In ratings of father, friend, and self, Factor V was defined by *artistically sensitive, intellectual, and imaginative. Polished, refined* loaded more consistently on Factor I, Extraversion.

One problem with all these studies is the instrument used. More contemporary measures, derived either from the lexical or the questionnaire tradition, might give more consistent results. Yik and Bond (1993) combined imported and indigenous lexical approaches to personality assessment in creating the Sino-American Person Perception Scales (SAPPS). Goldberg provided adjective markets for each of the five factors, including Intellect, and I suggested adjectives to measure non-Intellect-related aspects of Openness. When translated into Chinese and administered to 389 Hong Kong Chinese students, six, rather than five, factors emerged, with separate Intellect and (non-Intellect) Openness factors. Further, when another set of adjectives were selected to represent distinctly Chinese aspects of personality, a joint factor analysis in a new sample showed eight factors: the Western Intellect, Openness, Neuroticism, and Extraversion factors were joined by factors labelled *Application, Restraint, Assertiveness, and Helpfulness*. (It should be noted that in this instance, *Assertiveness* does not refer to social leadership, but rather to assertion of the self against social pressure; its best items are *determined, independent, strong in opinions, and individualistic*.)

These data might be interpreted to mean that the FFM is a strictly Western phenomenon, one that can be recovered in Chinese samples only when imported instruments impose their view of personality. However, it is also possible that some SAPPS scales may represent lower-level traits. For example, *Application* and *Restraint* appear to correspond to what McCrae and Costa (1987) called the 'proactive' and 'inhibitive' aspects of the broader factor of Conscientiousness.

It is possible to test this hypothesis through a joint factor analysis of the SAPPS scales with data from a Chinese translation of the NEO-PI-R. A small group of Chinese students completed both instruments, and the intercorrelations were reported

<sup>4</sup> C. H. Hwang (1982, personal communication, April 4, 1994) pointed out that 'hollow-mindedness', an intellectual humility that promotes openness to new ideas, was an important virtue for scholars in the Confucian tradition.

by Cheng, Cheng, Ng and Yip (1991) under the supervision of M. H. Bond. Table 5 reports an analysis of these intercorrelations.

Table 5. Joint factor analysis of NEO-PI-R and Sino-American Person Perception Scales (SAPPS)

Scale	Varimax rotated principal component				
	I	II	III	IV	V
<b>NEO-PI-R</b>					
Neuroticism	-0.17	-0.07	-0.34	<b>-0.82</b>	0.01
Extraversion	<b>0.82</b>	0.21	-0.05	0.28	0.02
Openness to Experience	0.26	0.22	0.01	0.03	<b>0.71</b>
Agreeableness	-0.09	<b>0.90</b>	-0.03	0.05	-0.10
Conscientiousness	0.14	-0.11	<b>0.79</b>	0.29	0.01
<b>SAPPS</b>					
Neuroticism	-0.06	-0.09	0.00	<b>-0.89</b>	-0.08
Extraversion	<b>0.82</b>	-0.19	0.00	-0.01	0.14
Openness	-0.01	-0.20	0.09	0.02	<b>0.82</b>
Application	0.02	0.21	<b>0.85</b>	0.03	-0.20
Assertiveness	0.25	-0.32	<b>0.48</b>	0.31	<b>0.42</b>
Restraint	-0.13	0.03	<b>0.80</b>	-0.01	0.25
Helpfulness	0.28	<b>0.50</b>	0.30	0.24	0.22
Intellect	-0.16	0.01	<b>0.63</b>	0.13	<b>0.47</b>

Note:  $N = 64$ . Loadings greater than 0.40 in absolute magnitude are given in boldface. Data are from Cheng, Cheng, Ng and Yip (1991), courtesy of M. H. Bond.

This is a clear replication of the FFM in Chinese, with Application and Restraint, as hypothesized, the chief definers of a Conscientiousness factor. And how is Factor V defined? Chiefly by NEO-PI-R Openness and by the non-Intellect Openness SAPPS scale, and secondarily by Assertiveness and Intellect. High scorers on Factor V in Chinese prefer variety and are eager to change, but they are also individualistic and analytical. It seems clear from the body of Chinese and Japanese research that Intellect in the East, even more clearly than in the West, combines Fiske's (1949) *Inquiring Intellect* with an applied Intellect that is chiefly related to Conscientiousness; within ABC systems that combination would probably be classified as III+V+. Once again Intellect appears to be a dubious label for Factor V.

When the facet scales of the NEO-PI-R are themselves analyzed in Chinese (McCrae, Costa and Yik, in press) and in Japanese (Gondo, Shimonaka, Nakazato, Ishihara and Imuta, 1993), a clear Openness factor emerges (although in both cases O4: Openness to Actions is a weak definer of the factor).<sup>5</sup> These data support the view that the FFM is a universal model of personality structure, and that in the East as in the West, Factor V is best construed as a broad dimension in which intellectual interests and imagination are joined by aesthetic sensitivity, affective responsiveness, and liberal attitudes.

Would high scorers on Factor V in China and Japan also show the permeability of consciousness that Hartmann's Boundary Questionnaire measures? No data have yet been collected on that question, nor have any Taoist sages or Zen masters com-

<sup>5</sup> All six O facets clearly define that factor in a Korean version of the NEO-PI-R (K. I. Lee, personal communication, March 31, 1994).

pleted the NEO-PI-R. But the essential message of Eastern mysticism is the loss of the bounded individual ego in an unbounded whole, a transcendental experience to which individuals with thin boundaries are especially likely to be open.

## CONCLUSION

Openness to Experience seems to be poorly represented in natural languages (McCrae, 1990). Aspects of Openness are so seldom expressed in Hungarian adjectives that no clear Factor V emerges in that language at all (De Raad and Szirmák, 1994; Szirmák and De Raad, 1994). In English, such familiar traits as 'prefers variety', 'has broad interests', and 'is aesthetically sensitive' are represented by no single adjective. This problem is probably even more acute for less observable traits that characterize the structure of consciousness—tendencies to experience synesthesia, isolation of affect, or fluid ego boundaries.

In an earlier article in this journal I urged those interested in personality structure to move 'beyond the confines of the dictionary' (McCrae, 1990, p. 127) to examine natural language in speech and literature. Speech in everyday life may be more rhetorical than descriptive (De Raad and Caljé, 1990), but literature can certainly be illuminating. Hesse's descriptions of Goldmund, for example, point to traits that would probably never be identified in a list of adjectives, yet are crucial to an understanding of individual differences in experiencing the world.

Perhaps it is unreasonable to ask researchers to review systematically the vast corpus of world literature in search of new traits. But it is not unreasonable to ask that they survey the psychological literature. If we wish to understand personality traits and their structure, it is time to move beyond the comfortable boundaries of the lexicon to consider also the constructs of such thinkers as Jung, Tellegen, and Hartmann. Research so far suggests that the FFM encompasses all these systems, and by encompassing them it is clarified and enriched.

## REFERENCES

- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J. and Sanford, R. N. (1969). *The Authoritarian Personality*, Norton, New York. (Original work published in 1950.)
- Angleitner, A. and Ostendorf, F. (1989). 'Personality factors via self- and peer-ratings based on a representative sample of German trait descriptive terms', paper presented at the *First European Congress of Psychology*, Amsterdam, July, 1989.
- Berlyne, D. E. (1955). 'The arousal and satiation of perceptual curiosity in the rat', *Journal of Comparative and Physiological Psychology*, **48**: 238–246.
- Blatt, S. and Ritzler, B. (1974). 'Thought disorder and boundary disturbance in psychosis', *Journal of Consulting and Clinical Psychology*, **42**: 370–381.
- Block, J. (1961). *The Q-sort Method in Personality Assessment and Psychiatric Research*, Charles C Thomas, Springfield, IL.
- Bond, M. H. (1979). 'Dimensions of personality used in perceiving peers: cross-cultural comparisons of Hong Kong, Japanese, American, and Filipino university students', *International Journal of Psychology*, **14**: 47–56.
- Bond, M. H. (1991). *Beyond the Chinese Face: Insights from Psychology*, Oxford University Press, Hong Kong.
- Bond, M. H., Nakazato, H. and Shiraishi, D. (1975). 'Universality and distinctiveness in dimensions of Japanese person perception', *Journal of Cross-Cultural Psychology*, **6**: 346–357.

- Brand, C. R. (1984). 'Personality dimensions: an overview of modern trait psychology'. In: Nicholson, J. and Beloff, H. (Eds), *Psychology Survey 5*, pp. 175–209, British Psychological Society, Leicester.
- Brand, C. R. (1994). 'Open to Experience—closed to intelligence: why the "Big Five" need to be converted back into the "Capacious Six" ', *European Journal of Personality*, **8**: 299–310
- Brokken, F. B. (1978). *The Language of Personality*, Doctoral dissertation, University of Groningen.
- Canaday, J. (1980). *What is Art?*, Knopf, New York.
- Chapman, J. P. and Chapman, L. J. (1987). 'Handedness of hypothetically psychosis-prone subjects', *Journal of Abnormal Psychology*, **96**: 89–93.
- Chapman, L. J., Chapman, J. P. and Raulin, M. L. (1978). 'Body-image aberration in schizophrenia', *Journal of Abnormal Psychology*, **87**: 399–407.
- Cheng, C., Cheng, P. Y. L., Ng, C. M. A. and Yip, J. J. F. (1991). *Validation of the Eight-Factor Model of Chinese Personality across Instruments*, unpublished manuscript, Chinese University of Hong Kong.
- Coan, R. W. (1972). 'Measurable components of openness to experience', *Journal of Consulting and Clinical Psychology*, **39**: 346.
- Coan, R. W. (1974). *The Optimal Personality*, Columbia University Press, New York.
- Costa, P. T., Jr., Fagan, P. J., Piedmont, R. L., Ponticas, Y. and Wise, T. N. (1992). 'The Five-Factor Model of personality and sexual functioning in outpatient men and women', *Psychiatric Medicine*, **10**: 199–215.
- Costa, P. T., Jr. and McCrae, R. R. (1976). 'Age differences in personality structure: a cluster analytic approach', *Journal of Gerontology*, **31**: 564–570.
- Costa, P. T., Jr. and McCrae, R. R. (1978). 'Objective personality assessment'. In: Storandt, M., Siegler, I. C. and Elias, M. F. (Eds), *The Clinical Psychology of Aging*, pp. 119–143, Plenum, New York.
- Costa, P. T., Jr. and McCrae, R. R. (1980). 'Still stable after all these years: personality as a key to some issues in adulthood and old age'. In: Baltes, P. B. and Brim, O. G., Jr. (Eds), *Life Span Development and Behavior*, Vol. 3, pp. 65–102, Academic Press, New York.
- Costa, P. T., Jr. and McCrae, R. R. (1985). *The NEO Personality Inventory Manual*, Psychological Assessment Resources, Odessa, FL.
- Costa, P. T., Jr. and McCrae, R. R. (1992a). 'Four ways five factors are basic', *Personality and Individual Differences*, **13**: 653–665.
- Costa, P. T., Jr. and McCrae, R. R. (1992b). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*, Psychological Assessment Resources, Odessa, FL.
- Costa, P. T., Jr. and McCrae, R. R. (1994). 'Positive and negative valence within the five-factor model of personality', paper presented at the *Annual Convention of the American Psychological Association*, Los Angeles, CA, August, 1994.
- Costa, P. T., Jr. and Widiger, T. A. (1994). 'Summary and unresolved issues'. In: Costa, P. T., Jr. and Widiger, T. A. (Eds), *Personality Disorders and the Five-Factor Model of Personality*, pp. 319–327, American Psychological Association, Washington, DC.
- Davies, M. F. (1993). 'Dogmatism and the persistence of discredited beliefs', *Personality and Social Psychology Bulletin*, **19**: 692–699.
- De Raad, B. and Caljé, H. (1990). 'Personality in the context of conversation: person-talk scenarios replicated', *European Journal of Personality*, **4**: 19–36.
- De Raad, B., Hendriks, A. A. J. and Hofstee, W. K. B. (1992). 'Towards a refined structure of personality traits', *European Journal of Personality*, **6**: 301–319.
- De Raad, B. and Szirmák, Z. (1994). 'The search for the Big Five in a non-Indo European language: the Hungarian trait structure and its relationship to the EPQ and the PTS', *European Review of Applied Psychology*, **44**: 17–26.
- Digman, J. M. and Inouye, J. (1986). 'Further specification of the five robust factors of personality', *Journal of Personality and Social Psychology*, **50**: 116–123.
- Dollinger, S. J. (1993). 'Personality and music preference: extraversion and excitement seeking or Openness to Experience?', *Psychology of Music*, **21**: 73–77.
- Eysenck, H. J. and Eysenck, S. B. G. (1975). *Manual of the Eysenck Personality Questionnaire*, EDITS, San Diego, CA.

- Fiske, D. W. (1949). 'Consistency of the factorial structures of personality ratings from different sources', *Journal of Abnormal and Social Psychology*, **44**: 329–344.
- Gardner, R., Holzman, P., Klein, G., Linton, H. and Spence, D. (1959). 'Cognitive control: a study of individual consistencies in cognitive behavior', *Psychological Issues*, Monograph 4, International Universities Press, New York.
- Glisky, M. L., Tataryn, D. J., Tobias, B. A., Kihlstrom, J. F. and McConkey, K. M. (1991). 'Absorption, openness to experience, and hypnotizability', *Journal of Personality and Social Psychology*, **60**: 263–272.
- Goldberg, L. R. (1981). 'Language and individual differences: the search for universals in personality lexicons'. In: Wheeler, L. (Ed), *Review of Personality and Social Psychology*, Vol. 2, pp. 141–165, Sage, Beverly Hills, CA.
- Goldberg, L. R. (1983). 'The magical number five, plus or minus two: some considerations on the dimensionality of personality descriptors', paper presented at a research seminar, Gerontology Research Center, Baltimore, MD, June, 1983.
- Goldberg, L. R. (1990). 'An alternative "description of personality": the Big-Five factor structure', *Journal of Personality and Social Psychology*, **59**: 1216–1229.
- Goldberg, L. R. (1993). 'The structure of phenotypic personality traits', *American Psychologist*, **48**: 26–34.
- Gondo, Y., Shimonaka, Y., Nakazato, K., Ishihara, O. and Imuta, H. (1993). 'Preliminary study for the standardization of the Japanese version of NEO-PI-R', paper presented at the 57th Meeting of the Japanese Psychological Association, Tokyo, September, 1993.
- Gough, H. G. and Heilbrun, A. B., Jr. (1983). *Adjective Check List Manual*, Consulting Psychologists, Palo Alto, CA.
- Guilford, J. P. (1967). *The Nature of Human Intelligence*, McGraw-Hill, New York.
- Guilford, J. P. (1977). 'Will the real factor of extraversion-introversion please stand up? A reply to Eysenck', *Psychological Bulletin*, **84**: 412–416.
- Guilford, J. P. and Guilford, R. B. (1934). 'An analysis of the factors in a typical test of introversion-extroversion', *Journal of Abnormal and Social Psychology*, **28**: 377–399.
- Guilford, J. S., Zimmerman, W. S. and Guilford, J. P. (1976). *The Guilford-Zimmerman Temperament Survey Handbook: Twenty-five years of Research and Application*, EdITS, San Diego, CA.
- Haan, N. (1965). 'Coping and defense mechanisms related to personality inventories', *Journal of Consulting Psychology*, **29**: 373–378.
- Hartmann, E. (1984). *The Nightmare*, Basic Books, New York.
- Hartmann, E. (1991). *Boundaries in the Mind: A New Psychology of Personality Differences*, Basic Books, New York.
- Hartmann, E., Russ, D., Oldfield, M., Sivan, I. and Cooper, S. (1987). 'Who has nightmares? The personality of the lifelong nightmare sufferer', *Archives of General Psychiatry*, **44**: 49–56.
- Hesse, H. (1968). *Narcissus and Goldmund* (U. Molinaro, Trans.), Farrar, Strauss and Giroux, New York. (Original work published 1930.)
- Holland, J. L. (1985). *Self-Directed Search—1985 Edition*, Psychological Assessment Resources, Odessa, FL.
- Hwang, C. H. (1982). 'Studies in Chinese personality: a critical review', *Bulletin of Educational Psychology*, **15**: 227–242.
- Hyler, S. E. and Lyons, M. (1988). 'Factor analysis of the DSM-III personality disorder clusters: a replication', *Comprehensive Psychiatry*, **29**: 304–308.
- Jackson, D. N. (1984). *Personality Research Form Manual*, 3rd edn, Research Psychologists, Port Huron, MI.
- John, O. P. (1990). 'The "Big Five" factor taxonomy: dimensions of personality in the natural language and in questionnaires'. In: Pervin, L. A. (Ed), *Handbook of Personality Theory and Research*, pp. 66–100, Guilford, New York.
- John, O. P., Angleitner, A. and Ostendorf, F. (1988). 'The lexical approach to personality: a historical review of trait taxonomic research', *European Journal of Personality*, **2**: 171–203.
- Johnson, J. A. and Ostendorf, F. (1993). 'Clarification of the five-factor model with the abridged Big Five dimensional circumplex', *Journal of Personality and Social Psychology*, **65**: 563–576.

- Jung, C. G. (1958). *Psychology and Religion: West and East*, 2nd edn, Princeton University Press, Princeton, NJ.
- Jung, C. G. (1961). *Memories, Dreams, Reflections* (R. Winston and C. Winston, Trans.), Random House, New York.
- Jung, C. G. (1964). 'Approaching the unconscious'. In: Jung, C. G. (Ed), *Man and his Symbols*, pp. 18–103, Doubleday, New York.
- Jung, C. G. (1971). *Psychological Types* (H. G. Baynes, Trans., revised by R. F. C. Hull), Princeton University Press, Princeton NJ. (Original work published 1923.)
- Kaplan, M. F. and Singer, E. (1963). 'Dogmatism and sensory alienation: an empirical investigation', *Journal of Consulting Psychology*, **27**: 486–491.
- Linton, R. (1945). *The Cultural Background of Personality*, Appleton–Century–Crofts, New York.
- MacKinnon, D. W. (1960). 'The highly effective individual', *Teachers College Record*, **61**: 367–378.
- McCrae, R. R. (1987). 'Creativity, divergent thinking, and openness to experience', *Journal of Personality and Social Psychology*, **52**: 1258–1265.
- McCrae, R. R. (1990). 'Traits and trait names: how well is Openness represented in natural languages?', *European Journal of Personality*, **4**: 119–129.
- McCrae, R. R. (1993–1994). 'Openness to Experience as a basic dimension of personality', *Imagination, Cognition, and Personality*, **13**: 39–55.
- McCrae, R. R. and Costa, P. T., Jr. (1985a). 'Openness to experience'. In: Hogan, R. and Jones, W. H. (Eds), *Perspectives in Personality*, Vol. 1, pp. 145–172, JAI, Greenwich, CT.
- McCrae, R. R. and Costa, P. T., Jr. (1985b). 'Updating Norman's "adequate taxonomy": intelligence and personality dimensions in natural language and in questionnaires', *Journal of Personality and Social Psychology*, **49**: 710–721.
- McCrae, R. R. and Costa, P. T., Jr. (1987). 'Validation of the five-factor model of personality across instruments and observers', *Journal of Personality and Social Psychology*, **52**: 81–90.
- McCrae, R. R. and Costa, P. T., Jr. (1989). 'Reinterpreting the Myers–Briggs Type Indicator from the perspective of the five-factor model of personality', *Journal of Personality*, **57**: 17–40.
- McCrae, R. R. and Costa, P. T., Jr. (in press). 'Conceptions and correlates of Openness to Experience'. In: Hogan, R., Johnson, J. A., and Briggs, S. R. (Eds), *Handbook of Personality Psychology*, Academic Press, New York.
- McCrae, R. R., Costa, P. T., Jr. and Busch, C. M. (1986). 'Evaluating comprehensiveness in personality systems: the California Q-Set and the five-factor model', *Journal of Personality*, **54**: 430–446.
- McCrae, R. R., Costa, P. T., Jr. and Yik, M. S. M. (in press). 'Universal aspects of Chinese personality structure'. In: Bond, M. H. (Ed), *The Handbook of Chinese Psychology*, Oxford University Press, Hong Kong.
- Meng, X. L., Rosenthal, R. and Rubin, D. B. (1992). 'Comparing correlated correlation coefficients', *Psychological Bulletin*, **111**: 172–175.
- Meston, C. M., Trapnell, P. D. and Gorzalka, B. (1993). 'Sex and the five-factor-model of personality', paper presented at the *Annual Meeting of the International Academy of Sex Research*, Pacific Grove, CA, June, 1993.
- Murray, H. A. (1938). *Explorations in Personality*, Oxford University Press, New York.
- Myers, I. B. and McCaulley, M. H. (1985). *Manual: A Guide to the Development and Use of the Myers–Briggs Type Indicator*, Consulting Psychologists, Palo Alto, CA.
- Norman, W. T. (1963). 'Toward an adequate taxonomy of personality attributes: replicated factor structure in peer nomination personality ratings', *Journal of Abnormal and Social Psychology*, **66**: 574–583.
- Norman, W. T. (1967). *2800 Personality Trait Descriptions: Normative Operating Characteristics for a University Population*, University of Michigan, Ann Arbor, MI.
- Ostendorf, F. (1990). *Sprache und Persönlichkeitsstruktur: Zur Validität des Fünf-Faktoren-Modells der Persönlichkeit (Language and Personality Structure: Towards Validation of the Five-Factor-Model of Personality)*, S. Roderer, Regensburg.
- Ozer, D. J. and Reise, S. P. (1994). 'Personality assessment', *Annual Review of Psychology*, **45**: 357–388.

- Peabody, D. (1987). 'Selecting representative trait adjectives', *Journal of Personality and Social Psychology*, **52**: 59–71.
- Rader, C. M. and Tellegen, A. (1987). 'An investigation of synesthesia', *Journal of Personality and Social Psychology*, **52**: 981–987.
- Riemann, R., Grubich, C., Hempel, S., Mergl, S. and Richter, M. (1993). 'Personality and attitudes towards current political topics', *Personality and Individual Differences*, **15**: 313–321.
- Rogers, C. R. (1961). *On Becoming a Person: A Therapist's View of Psychotherapy*, Houghton Mifflin, Boston, MA.
- Rokeach, M. (1960). *The Open and Closed Mind*, Basic Books, New York.
- Saucier, G. (1992). 'Openness versus intellect: much ado about nothing?', *European Journal of Personality*, **6**: 381–386.
- Shock, N. W., Greulich, R. C., Andres, R., Arenberg, D., Costa, P. T., Jr., Lakatta, E. G. and Tobin, J. D. (1984). *Normal Human Aging: The Baltimore Longitudinal Study of Aging (NIH Publication 84-2450)*, National Institutes of Health, Bethesda, MD.
- Szirmák, Z. and De Raad, B. (1994). 'Taxonomy and structure of Hungarian personality traits', *European Journal of Personality*, **8**, 95–117.
- Tellegen, A. and Atkinson, G. (1974). 'Openness to absorbing and self-altering experiences ("Absorption"), a trait related to hypnotic susceptibility', *Journal of Abnormal Psychology*, **83**: 268–277.
- Tellegen, A., Grove, W. M. and Waller, N. G. (1991). *Inventory of Personal Characteristics # 7 (IPC7)* unpublished material, University of Minnesota.
- Tellegen, A. and Waller, N. G. (1987). 'Reexamining basic dimensions of natural language trait descriptors', paper presented at the *Annual Convention of the American Psychological Association*, New York, August 1987.
- Tellegen, A. and Waller, N. G. (in press). 'Exploring personality through test construction: development of the Multidimensional Personality Questionnaire'. In: Cheek, J. M. and Donohue, E. (Eds), *Personality Measures: Development and Evaluation*, Plenum, New York.
- Trapnell, P. D. (1994). 'Openness versus intellect: a lexical left turn', *European Journal of Personality*, **8**, 273–290.
- Waley, A. (1939). *Three Ways of Thought in Ancient China*, Doubleday, Garden City, NY.
- Waller, N. G. (in press). 'Evaluating the structure of personality'. In: Cloninger, R. (Ed), *Personality and Psychopathology*, American Psychiatric Association, Washington, DC.
- Wechsler, D. (1958). *The Measurement and Appraisal of Adult Intelligence*, 4th edn, Williams & Wilkins, Baltimore, MD.
- Wolfe, R. N. (1993). 'A commonsense approach to personality measurement'. In: Craik, K. H., Hogan, R. and Wolfe, R. N. (Eds), *Fifty Years of Personality Psychology*, pp. 269–290, Plenum, New York.
- Yang, K. and Bond, M. H. (1990). 'Exploring implicit personality theories with indigenous or imported constructs: the Chinese case', *Journal of Personality and Social Psychology*, **58**: 1087–1095.
- Yik, M. S. M. and Bond, M. H. (1993). 'Exploring the dimensions of Chinese person perception with indigenous and imported constructs: creating a culturally balanced scale', *International Journal of Psychology*, **28**: 75–95.
- Zuckerman, M. (1979). *Sensation Seeking: Beyond the Optimal Level of Arousal*, Erlbaum, Hillsdale, NJ.