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Cross-Cultural Assessment of the Five-Factor Model: The Revised NEO Personality Inventory

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The five-factor model (FFM) is a representation of the patterns of covariation of personality traits in terms of five broad factors. The Revised NEO Personality Inventory, a questionnaire measure of the FFM, has recently been translated into a number of different languages, permitting tests of its cross-cultural replicability. Data from Filipino and French translations are presented, showing clear and detailed replication of the American normative factor structure when targeted rotation is used. Results from these and other cross-cultural and behavior genetic studies suggest that the FFM is a biologically based human universal. Applications of trait psychology in clinical, educational, and organizational settings may prove generalizable across cultures, and cross-cultural psychologists can profitably explore the expression of the same personality traits in different cultural contexts.

CROSS-CULTURAL ASSESSMENT
OF THE FIVE-FACTOR MODEL
The Revised NEO Personality Inventory

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Throughout the European Middle Ages, the unknown corners of the world were presumed to be peopled by fabulous monsters (see Figure 1)—this was not a completely ridiculous presumption. After all, strange animals like camels and elephants were found in the lands adjacent to Europe, and stranger animals still (like the duck-billed platypus) would someday be discovered. Monsters were consistent with medieval theology, and in the absence of firsthand experience, why should they be doubted?

Figure 1:   Presumed Inhabitants of the Unexplored World
NOTE: From Hartmann Schedel's *Liber Chronicarum*, Nürnberg, Germany, 1493. Reproduced in Brown (1949), p. 86.

Until fairly recently, much the same might have been said about personality trait structure. In retrospect, even 20 years ago was a virtual Dark Ages. There was no consensus on the structure of personality, even in American college student samples, and only a handful of psychologists had ventured to explore the topic cross-culturally. The orthodoxy of social science in the 20th century has been distinctly environmentalistic, and from that perspective, the well-documented cultural differences of different human groups dictated the presumption of profound effects on personality traits and their structure.

Thus, it is probably not surprising that as recently as 1996 a *Mental Measurements Yearbook* review of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) expressed intense skepticism about the value of its translations:

> The simplistic (a posteriori) basis of [its] Five Factor Model, as it is derived from colloquial usage of language, makes the model and its tools intrinsically bound to the culture and language that spawned it. Different cultures and different languages should give rise to other models that have little chance of being five in number nor of having any of the factors resemble those derived from the linguistic/social network of middle-class Americans (Juni, 1996, p. 864).

Those same translations, however, have afforded an opportunity to test the reviewer's hypothesis by exploring factor structures in a number of widely different languages and cultures. The results are striking. Instead of fabulous factorial monsters, researchers have repeatedly found the familiar five-factor model (FFM). The implications for cross-cultural psychology are profound because these findings suggest that, in some respects, personality is more a matter of universal human nature than of cultural construction.

PERSONALITY STRUCTURE IN
CROSS-CULTURAL PERSPECTIVE

The FFM is an organization of personality traits, and traits in turn are "dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions" (McCrae & Costa, 1990, p. 23). The trait of *altruism* concerns helpfulness and generosity to others, *modesty* is seen in self-effacing attitudes and behaviors, and *trust* affects expectations and beliefs about others' actions and intentions. Because traits are psychological aspects of the person, they show some degree of consistency across situations (Funder, Kolar, & Blackman, 1995) and considerable stability over time (McCrae & Costa, 1990).

Hundreds of personality traits are represented in the natural language adjectives used by laypersons and questionnaire scales developed by psychologists. One of the major tasks of trait psychologists has been to find a way to organize traits in a meaningful system. Fortunately, there is considerable redundancy in trait terms and many traits, even though not semantically synonymous, empirically covary. In America, people who are altruistic also tend to be modest and trusting. The pattern of covariation of traits in a population is called *trait structure* and is usually described in terms of factors that represent the common variance among a group of traits. Altruism, modesty, and trust help define a factor generally called Agreeableness. In simple structure models, each trait is related to one and only one factor.

An alternative structural model is the circumplex, in which traits are described not by their loading on a single factor but by their position in a plane defined by the intersection of two factors. Interpersonal traits in particular seem to show a circular arrangement (Wiggins, 1979) with dominance, sociability, friendliness, modesty, submission, aloofness, coldness, arrogance, and dominance again forming a circle, with positive correlations between adjacent traits (e.g., dominance and sociability) and negative correlations between opposing traits (e.g., dominance and submission). Because the interpersonal circumplex occupies the plane defined by two FFM factors, Extraversion and Agreeableness, it can be construed as part of the FFM (McCrae & Costa, 1989b).

As Juni (1996) noted, the FFM arose in the context of analyses of the "colloquial usage of language," specifically, from factor analyses of self- and other-descriptions using trait adjectives from the English lexicon (Goldberg, 1990; Tupes & Christal, 1992). This lexical model began to be generally accepted as a scientifically useful description of personality structure when a series of studies showed that the lexical dimensions of personality closely

resembled dimensions found in the analysis of questionnaire scales. Scales operationalizing the constructs of Jung, Murray, and Block could be interpreted within the framework of the FFM (Costa & McCrae, 1988; Lanning, 1994; McCrae & Costa, 1989a).

Consider as an example the NEO-PI-R. That instrument began with the observation that three broad factors— Neuroticism (N), Extraversion (E), and Openness to Experience (O)—seemed to recur in many different questionnaires, most notably those of Cattell (Conn & Rieke, 1994) and the Eysencks (Eysenck & Eysenck, 1975). Costa and McCrae (1980) examined the Western psychological literature to identify specific traits related to these factors, which they described as facets of the three broad trait domains. Six different facets were chosen for each, and 8-item scales were developed to measure them. For example, E was represented by facet scales measuring Warmth, Gregariousness, Assertiveness, Activity, Excitement Seeking, and Positive Emotions.

When NEO-PI scales were correlated with adjective measures of the FFM, straightforward correspondences were seen: N was the polar opposite of the lexical factor called Emotional Stability, E was strongly related to Surgency, and O resembled a factor that had been interpreted as Intellect (McCrae & Costa, 1985). That study showed that lexical and questionnaire-based factors were essentially similar. It also showed that the NEO Inventory (as it was then called) was incomplete. In subsequent revisions, scales were added to measure facets of the remaining factors: Agreeableness (A) and Conscientiousness (Costa & McCrae, 1992).

The resulting instrument was in some respects ideally suited to the cross-cultural study of personality structure. Translating a list of adjectives can be difficult because often there is not a single equivalent term in the second language (cf. Bond, Nakazato, & Shiraishi, 1975). The sentences that form questionnaire items are generally more concrete and contextualized than are adjectives and can usually be expressed in any language. But, factor analysis of items (e.g., Eysenck, 1983) is hazardous because single items are typically unreliable. Collectively, the eight items of each facet scale in the NEO-PI-R give the translator a better opportunity to convey the intended construct, and aggregating across items increases reliability.

Although cross-cultural psychologists often have legitimate concerns about importing etic constructs into new cultures, previous research provided some encouragement for translation of the NEO-PI-R. The two dimensions of N and E had been found in many cultures (Eysenck, 1983), although the statistical evaluation of the fit has been questioned (Bijnen & Poortinga, 1988). Factors resembling those of the FFM had been reported in German (Amelang & Borkenau, 1982), Dutch (De Raad, Hendriks, & Hofstee, 1992),

and French (Rolland, 1993). Using an early measure of the FFM (Norman, 1963), a pioneering set of studies conducted in the 1970s found similar factors in Japanese; Chinese; and, to a lesser extent, Filipino samples (Bond, 1979; Bond et al., 1975; Guthrie & Bennett, 1971).

In the earliest of these, Guthrie and Bennett (1971) asked Filipino college students to rate their classmates on 20 English-language rating scales; the pooled ratings were factored. The five resulting factors differed somewhat from those earlier reported in American studies, with two N factors and no clear O factor. Although Guthrie and Bennett interpreted this as a failure of the FFM to provide a universal model of personality (or implicit personality theory), their results might also be seen as a partial replication, with clear E and A factors. Using Filipino samples, Church and Katigbak (1989) studied the structure of an indigenous item pool and of trait descriptive adjectives in English and Tagalog, and were impressed by similarities to the FFM. In a more direct test of cross-cultural generalizability, Katigbak, Church, and Akamine (1996) administered the English version of the NEO-PI-R to a large sample of Filipino students and clearly replicated the American structure after targeted rotation.

In this article, we report the first data from a Filipino translation of the NEO-PI-R, currently in its preliminary version, as well as data from a French translation. The present results illustrate, with additional examples, that although linguistic and cultural differences may introduce some initial difficulties in the translation of the NEO-PI-R (cf. Brislin, 1980, 1986), they are easily overcome and do not affect the factorial validity of the instrument.

THE NEO-PI-R IN FILIPINO AND FRENCH

THE FILIPINO TRANSLATION

The NEO-PI-R was translated into Filipino in connection with dissertation research recently conducted in the Philippines (del Pilar, in press) under the supervision of the French translators of the NEO-PI-R (Rolland & Petot, 1994). Philippine languages belong to the Malayo-Polynesian or Austronesian family. Filipino was designated the Philippine national language in the 1970s. It has evolved from Tagalog, which held the status of national language during an earlier period and was the mother tongue in the large region around metropolitan Manila until recent times. Regional variants of Tagalog blend in grammatical, lexical, and phonetic features from other Philippine languages. Words and sounds have also been assimilated from Spanish and English, the two foreign languages associated with the country's

colonial history. These dialectal variants of Tagalog collectively constitute what Filipino linguists refer to as *Filipino*.

The liberal character of Filipino has allowed the use of borrowings from Spanish and English in the written language. Examples of these in the present translation are *mamantasya* (to fantasize), *magcomputer* (to work on a computer), and the not-yet standard *roller coaster* and *hobby*. These borrowings notwithstanding, Filipino retains its distance from English (and Spanish) with a grammar uninfluenced by Indo-European languages. An idea of this distance is suggested by comparing the Filipino and French translations of the NEO-PI-R. Brislin (1970) reported studies finding that translations from English to French occasioned very little distortion, less than translations into German. A quick comparison of the French and Filipino translations suggests that near word-for-word translation is frequently possible in French, but virtually never possible in Filipino.

An inspection of the first 30 items suggested that translation into Filipino required changes from a trait-like item in the original to a more behavioral exemplar-like item, which was not the case in French. For example, the item "I am known for my prudence and common sense" was translated into Filipino in such a way as to yield the back-translation "I can be relied on to decide carefully and well on matters," whereas the only change found in the French translation was an extra first-person possessive pronoun at the end (i.e., "par ma prudence et *mon* bon sens"). Taken together with word substitution ("happening" in the Filipino translation—quotation marks preserved, as this borrowing is far from being assimilated—for "excitement," "not too ambitious" in the French translation for "easy-going"), reversals of item phrasing (and keying), and item replacement, there are about five times more changes in the Filipino than in the French translation.

In the current Filipino translation, four of the NEO-PI-R items were replaced entirely. An item belonging to the A6: Tender-Mindedness scale expressed the belief that political leaders need to be more aware of the human side of their policies. This item was dropped because it may have suggested a lack of impartiality on the part of people in government of which Filipinos frequently complain. It was replaced by an item stating that understanding criminals should take precedence over punishing them. An English E5: Excitement-Seeking item states that the respondent would not enjoy vacationing in Las Vegas—an exotic location of questionable meaning to Filipinos. The substituted item, which reverses the keying, deals with being prepared to try almost anything. A third replaced item from the E2: Gregariousness scale, concerns vacationing at a popular beach resort rather than in an isolated cabin in the woods. The back-translation of the substituted item states a preference for large groups when going out. In the Philippines, people

usually go to beaches only for a day, and the Philippine equivalent of a place where people on vacation go to be alone probably does not yet exist. The fourth item substitution was necessitated by the difficulty of finding a Filipino equivalent for the phrase "problems and puzzles" in an O5: Ideas item. None of these items required changes in the French translation.

A back-translation of the first Filipino version was reviewed by the test authors, and revisions were made to 12 items. Empirical data on the resulting translation were obtained from 696 college students (237 males, 445 females, 14 not reporting) from the University of the Philippines and the Philippine School of Business Administration, both located in Quezon City, which has alternated with neighboring Manila as the national capital. Reported ages range from 15 to 32, with 665 (97%) falling within the 17 to 25 range. Students from the university were enrolled in the introductory psychology course and reported a variety of majors. Those from the business school were students in the behavioral science course and were all business majors.

The median internal consistency reliability of the 8-item Filipino facet scales was .70—almost identical to that of the American normative sample (median = .71) despite the differences in culture and language. However, an item analysis of individual scales suggests that further revision of the Filipino translation is advisable for 3 of the 30 facets: O3: Feelings, O4: Actions, and O6: Values (alphas = .30 to .48). In most cases, the problematic items apparently failed to retain their intended meaning when imported into Filipino culture.

FILIPINO PERSONALITY STRUCTURE

Table 1 presents results from a principal components analysis of the Filipino data. Five factors were suggested by a parallel analysis (Horn, 1965). Following the recommended steps for examining factor replications (McCrae, Zonderman, Costa, Bond, & Paunonen, 1996; see also van de Vijver & Leung, 1997), we first consider a varimax rotation. All five factors are recognizable, and the N, O, and C factors clearly replicate the structure seen in the American normative sample, with factor congruence coefficients all above .95. (Congruences above .90 are usually regarded as evidence of replication.)

The factors labeled E/L and A/S, however, are less clear. The former is chiefly defined by E1: Warmth; E2: Gregariousness; E6: Positive Emotions; A1: Trust; A3: Altruism; and A6: Tender Mindedness; and, within the interpersonal circumplex tradition (Wiggins, 1979), is what might be described as Extraversion/Love (E/L). The latter factor is chiefly defined by A4: Compliance, A5: Modesty, A2: Straightforwardness, A3: Altruism, low E3:

TABLE 1

Principal Component Analysis of the Filipino
NEO-PI-R with Varimax and Targeted Rotations

NEO-PI-R Facet Scale	Varimax Rotation					Procrustes Rotation[a]				
	N	E/L	O	A/S	C	N	E	O	A	C
N1: Anxiety	**75**	–12	08	00	–01	**76**	–08	00	00	06
N2: Angry Hostility	**62**	–38	06	–35	–19	**67**	–19	01	**–44**	–10
N3: Depression	**69**	–27	09	07	–31	**73**	–23	03	–02	–25
N4: Self-Consciousness	**69**	–09	–08	24	–07	**68**	–14	–15	22	–04
N5: Impulsiveness	34	02	05	–38	**–54**	**40**	20	04	–37	**–47**
N6: Vulnerability	**68**	–24	–17	13	–34	**70**	–22	–23	04	–30
E1: Warmth	–17	**76**	15	00	08	–21	**69**	17	28	08
E2: Gregariousness	–25	**65**	–05	–17	04	–29	**65**	–02	07	04
E3: Assertiveness	–27	30	21	**–45**	32	–28	**42**	23	–29	35
E4: Activity	–13	**41**	09	**–43**	21	–15	**51**	10	–24	25
E5: Excitement Seeking	–11	37	23	**–45**	–17	–08	**51**	26	–29	–12
E6: Positive Emotions	–13	**68**	12	–11	00	–16	**66**	14	15	01
O1: Fantasy	10	22	**47**	–14	–32	16	27	**47**	–06	–27
O2: Aesthetics	11	23	**67**	02	18	14	20	**65**	14	22
O3: Feelings	27	29	**56**	–12	08	30	32	**53**	03	12
O4: Actions	**–43**	00	**42**	02	06	–39	–03	**46**	01	04
O5: Ideas	–08	00	**70**	–02	27	–04	–01	**69**	01	30
O6: Values	–21	–06	**60**	–02	–17	–13	–06	**62**	–05	–16
A1: Trust	–17	**58**	07	34	–06	–20	**41**	09	**52**	–10
A2: Straightforwardness	00	01	00	**60**	16	–03	–22	–02	**57**	10
A3: Altruism	–06	**50**	13	**47**	35	–12	27	13	**65**	31
A4: Compliance	–14	20	–09	**73**	21	–20	–10	–09	**75**	12
A5: Modesty	19	–06	00	**62**	–09	18	–27	–03	**55**	–13
A6: Tender-Mindedness	26	**42**	13	32	20	22	27	09	**49**	20
C1: Competence	–33	20	15	–23	**69**	–38	22	16	–10	**69**
C2: Order	03	–10	–05	08	**74**	–04	–15	–08	10	**73**
C3: Dutifulness	–01	20	10	09	**70**	–08	12	07	21	**69**
C4: Achievement Striving	–04	11	04	00	**84**	–12	06	01	11	**83**
C5: Self-Discipline	–17	07	02	–01	**83**	–24	02	00	07	**81**
C6: Deliberation	–21	–08	04	24	**70**	–27	–20	03	24	**65**
Factor Congruence[b]	96	86	95	89	97	97	93	95	97	97

NOTE: $N = 696$. Decimal points are omitted; loadings greater than .40 in absolute magnitude are given in boldface. N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness, L = Love, S = Submission.
[a]Rotation targeted to American normative structure.
[b]With American structure.

Assertiveness, low E4: Activity, and low E5: Excitement Seeking, and might be interpreted as an Agreeableness/Submission (A/S) factor.

Before concluding that there are significant cross-cultural differences in at least two of the factors of the FFM—an issue to which we will return—it must be recalled that varimax rotation is designed to optimize simple structure and is not necessarily appropriate for the analysis of variables that show a circumplex ordering, as do the facets of E and A. An alternative is orthogonal Procrustes rotation, in which the factors are rotated to best approximate the structure one seeks to replicate. This is a form of confirmatory factor analysis in which rotation is theoretically guided, and Monte Carlo simulations have shown that it is relatively immune to capitalization on chance in this application (McCrae, Zonderman, et al., 1996).

Results of a Procrustes rotation of the Filipino data are given in the last five columns of Table 1. All five factors are unmistakable, with congruence coefficients exceeding .93. All variables load on their intended factors and (with the exception of N5: Impulsiveness) all have their highest loading on that factor. Even secondary and tertiary loadings (such as the loading of A3: Altruism on E) are very similar in American and Filipino versions, as shown by significant variable congruence coefficients (McCrae, Zonderman, et al., 1996) for 29 of the 30 facets. These findings imply that Filipino personality structure replicates in detail the standard FFM.

FRENCH AND OTHER REPLICATIONS

Although less distant culturally than the Philippines, France also provides an illustration of the cross-cultural replicability of the FFM. A French translation of the NEO-PI-R, revised after consideration of a back-translation, was administered to a sample of 447 university students (see Rolland, Parker, & Stumpf, 1997, for details). Internal consistencies for the domain scales ranged from .83 to .90; for the facet scales, coefficient alphas ranged from .48 to .81 (median = .73). When the 30 facet scales were factored, parallel analysis suggested that five factors should be retained. After varimax rotation, the structure closely resembled that seen in American adults, with congruence coefficients ranging from .93 to .97. Because the French E and A factors were tilted slightly in the direction of the Filipino E/L and A/S factors, congruences with the varimax Filipino structure were also high, ranging from .92 to .97. After Procrustes rotation, the French/American factor congruences all exceeded .94, and all variable congruences were significant. Finally, after aligning both the French and Filipino structures with the American normative structure through Procrustes rotation, the Filipino/French factor congruences

were .97 for N, .94 for E and O, .95 for A, and .96 for C; all 30 variable congruences were significant. In both the number and nature of the factors, the American adult and French and Filipino student sample structures are essentially identical.

These results are consistent with several other recent studies that have replicated the structure of the NEO-PI-R as translated into Spanish, Portuguese, Italian, Dutch, German, Croatian, Russian, Hebrew, Japanese, Korean, and Chinese (Hoekstra, Ormel, & De Fruyt, 1996; Martin et al., 1997; McCrae & Costa, 1997; McCrae, Costa, et al., 1996; Piedmont & Chae, 1997; Psychological Assessment Resources, 1994). Perhaps more important, we are unaware of any study using an authorized translation, adequate sample size, and targeted rotation that has failed to find the intended structure. The hypothesis that the FFM is a human universal has thus far survived every attempt at falsification.

ROTATION RECONSIDERED

The one intriguing possibility for cultural variation in personality structure appears in the position of the axes that define the interpersonal plane (McCrae & Costa, 1989b). Factor plots of the interpersonal facets of the NEO-PI-R—those that define the E and A domains—form a rough semicircle. (They would form a complete circle if the low poles of the scales were also plotted.) Figure 2 illustrates this fact by plotting the American, Filipino, and French A and E facets after Procrustes rotation. It is clear from this figure that corresponding facets in all three languages occupy similar positions in the interpersonal plane.

Yet, the three factor solutions are not identical, and when the varimax criterion is used to select the optimal placement of the axes, somewhat different positions are chosen. The French varimax factors (dotted lines) are about 15° from the American position; the Filipino factors (dashed lines) are about 23° away. In a Japanese student sample, the varimax factors were a full 35° away from the American position and were better described as Love (L) versus Hate and Submission (S) versus Dominance (McCrae, Zonderman, et al., 1996).

There is some reason to believe that these are not simply random fluctuations. In American, Canadian, and German samples—all from individualistic cultures (see Diener, Diener, & Diener, 1995)—the standard E and A factors almost invariably emerge from varimax rotations (e.g., Jang, McCrae, Angleitner, Riemann, & Livesley, in press). By contrast, Affiliation (or Love) and Surgency (vs. Submission) factors were found by Katigbak et al. (1996) when the English version of the NEO-PI-R was completed by college
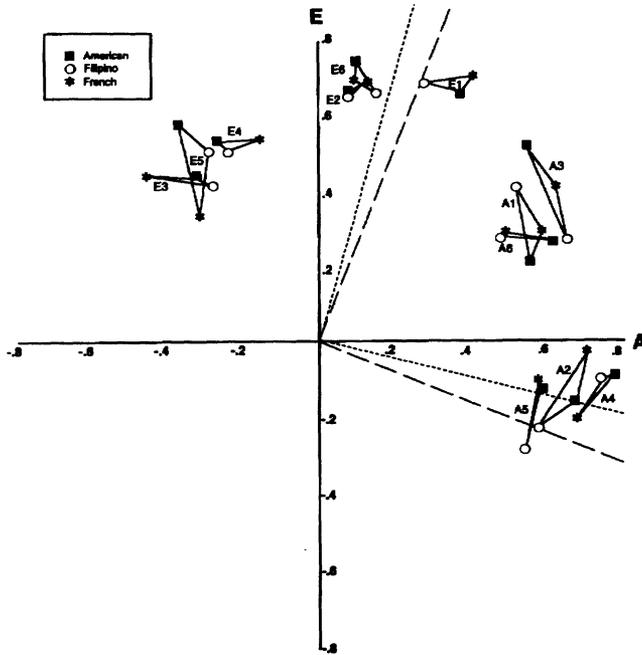
**Figure 2:   Factor Plot of the Revised NEO Personality Inventory (NEO-PI-R) Extraver-
sion (E1 to E6) and Agreeableness (A1 to A6) Facets in American, Filipino, and
French Samples**
NOTE: See Table 1 for facet scale labels. The dashed lines represent the position of the varimax
axes (E/L and A/S) in the Filipino data; the dotted lines represent the varimax axes in the French
data.

students in the Philippines. L and S factors also emerged in one Korean
sample (Piedmont & Chae, 1997), although E and A factors were found in
another (McCrae & Costa, 1997). It is possible that in collectivistic societies
like Korea, Japan, and the Philippines (Diener et al., 1995), status and
affiliation are more salient than they are in individualistic societies and
individual differences in personality are accentuated along these lines.

Attractive as that hypothesis may be, it does not account for all the data.
Chinese society is also highly collectivistic, yet data from Hong Kong
showed E and A factors in varimax rotation (McCrae, Zonderman, et al.,
1996). Italian society, at least moderately individualistic, yielded L and S
factors (McCrae, Costa, et al., 1996). Even in the present Filipino sample,
analysis of data from the university student subsample yielded standard E

and A factors, although the business school subsample showed the E/L and A/S pattern seen in Table 1. Recall also that Guthrie and Bennett (1971) found clear E and A factors in their Filipino sample.

This is an issue on which additional thought and research are needed. It should not, however, overshadow the basic similarity of personality across cultures. Even without venturing beyond varimax rotation, we can assert that personality, as measured by the NEO-PI-R, can be characterized in every culture so far examined in terms of N, O, and C factors plus the interpersonal circumplex; and Procrustes rotation shows that the circumplex can always be interpreted in terms of E and A factors.

The fact that the FFM is replicable across many cultures does not mean that it necessarily constitutes the optimal description of personality in all of them. Indigenous personality factors have been reported by Yang and Bond (1990), Katigbak et al. (1996), and Cheung et al. (1996), which show only partial overlap with the dimensions of the FFM, and it is possible that these would have unique or superior power in predicting external criteria of interest. Although the universality of the FFM does not preclude some cultural diversity in personality, it does show that many aspects of personality are transcultural.

SOME PRACTICAL AND
THEORETICAL IMPLICATIONS

Convincing failures to replicate the FFM, conducted with careful transla-tions, adequate samples, and appropriate analyses, would have been im-mensely informative. They would have revealed that personality trait struc-ture is a cultural construction, and an analysis of the cultural context of varying models might have suggested mechanisms by which culture shapes personality traits.

However, the discovery of such fabulous factorial monsters would have been a nightmare to psychologists with practical aspirations. Although repli-cating factor structure is only a first step in showing the cross-cultural construct validity of a set of measures, it is an essential one. If entirely new factors appeared, the process of interpreting them, validating the interpreta-tion, and showing their relevance for clinical, educational, or organizational purposes would have to start from scratch. The entire body of findings of trait psychologists would need to be re-created in each culture.

Fortunately, the FFM is replicable, not only in different languages but in languages from entirely different families (McCrae & Costa, 1997), including Sino-Tibetan, Hamito-Semitic, Uralic, and now Malayo-Polynesian. This

universality of structure provides reason to suspect that other aspects of personality—its development, heritability, and correlates—may also be broadly generalizable across cultures. For example, a body of research in the United States suggests that between adolescence and middle adulthood there are systematic declines in the mean levels of N, E, and O, and increases in A and C (McCrae & Costa, 1990). Cross-sectional analyses in Italy, Croatia, and Korea showed similar patterns (McCrae, Costa, et al., 1996). As another example, biometric structural equation models show that the heritability of NEO-PI-R facets is equivalent in German and Canadian samples (Jang et al., in press). Salgado and Rumbo (1994) showed that C is as useful a predictor of job performance in Spain as it is in the United States (Barrick & Mount, 1991), and Hoekstra, Ormel, and De Fruyt (1996) showed that in the Netherlands, too, NEO-PI-R N is inversely related to measures of mental health. Such similarities ought to be encouraging to those who wish to apply psychology across cultures (e.g., Lonner & Ibrahim, 1996).

But these examples should not give the impression that American research findings can necessarily be exported wholesale. Personality traits may have a different significance in different cultural contexts. For example, Bond and Forgas (1984) showed that Chinese students were more likely to respect and rely on individuals high in C, whereas Australians trusted people high in E. Personality-trait relations reported in Western studies should be considered promising hypotheses to be tested in new cultures. Research findings from non-Western cultures are equally relevant to Western psychologists. The universality of the FFM makes applied trait psychology an international enterprise.

Theoretical implications of a universal personality structure are equally profound. It is a truism to say that human behavior patterns result from the actions of a particular culture at a particular period in history on the givens of human nature. But, the findings reviewed in this article suggest that much more is given in human nature than has often been supposed. Societies may reward innovation and change, or tradition and conformity, but they cannot eliminate individual differences in O; they may stress competition or cooperation, but they cannot completely override innate tendencies toward agreeableness or antagonism.

It is becoming increasingly clear from studies of behavior genetics (Jang et al., in press; Riemann, Angleitner, & Strelau, 1997) and molecular genetics (Lesch et al., 1996) that personality traits have a strong biological basis. The universality of the FFM is thus, in some sense, a reflection of the fact that all human beings are of one species. But, recent evidence suggests that the explanation may go even deeper. King and Figueredo (1997) claim to have found something resembling the Big Five in consensually validated observer

ratings of chimpanzees. The structure of personality may turn out to be part of our primate, or even our mammalian, heritage.

These biological bases do not mean that culture has no effect on personality. The mean levels of personality traits may be influenced by culture—although mean level differences in personality scale scores may also be due to the translation used, differing styles of self-presentation, or even the different genetic composition of the groups compared (McCrae, Yik, Trapnell, Bond, & Paulhus, in press). Where culture is undeniably relevant is in the development of characteristic adaptations (McCrae & Costa, 1996) that guide the expression of personality in thoughts, feelings, and behaviors. Extraverts around the world enjoy companionship, but with whom they socialize, when, and where is usually dictated by local custom. Individuals high in N are often deeply distressed, but whether they blame their suffering on their own sinfulness, evil spirits, or a traumatic childhood is a reflection of the "learned meanings" (Rohner, 1984, pp. 119-120) of a particular human group. Understanding the interaction of personality traits with the cultural environment should constitute a major agenda for cross-cultural psychology, and the FFM provides a framework for its systematic pursuit.

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