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Abstract

Aims—This article provides a brief review of recent cross-cultural research on personality traits at both individual and culture levels, highlighting the relevance of recent findings for psychiatry.

Method—In most cultures around the world, personality traits can be clearly summarized by the five broad dimensions of the Five-Factor Model (FFM), which makes it feasible to compare cultures on personality and psychopathology.

Results—Maturational patterns and sex differences in personality traits generally show cultural invariance, which generates the hypothesis that age of onset, clinical evolution, and sex differences in the prevalence of psychiatric disorders might follow similar universal patterns. The average personality profiles from 51 cultures show meaningful geographical distributions and associations with culture-level variables, but are clearly unrelated to national character stereotypes.

Conclusions—Aggregate personality scores can potentially be related to epidemiological data on psychiatric disorders, and dimensional personality models have implications for psychiatric diagnosis and treatment around the world.

Keywords

Personality; psychopathology; culture; personality disorders

The Five-Factor Model of Personality

One of the major catalysts for the advancement of research on personality in recent years has been the growing consensus for a personality model encompassing five broad dimensions, namely Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). These broad factors subsume most personality traits and are known as the Big Five or Five-Factor Model (FFM; Digman, 1990, McCrae & John, 1992). The FFM did not originate from a particular personality theory or clinical experience; instead, the FFM emerged as an empirical model from two independent research traditions. The first was the lexical analysis of personality terms that occur in natural languages. The underlying principle of the lexical approach is that the most important traits necessary to describe individual differences become encoded in natural languages. The second approach was the factor analysis of different theory-based personality inventories, which converged on the same five factors (Markon *et al.*, 2005).

Systematic research on the FFM has revealed a number of important features of personality traits. First, studies using the Revised NEO Personality Inventory (NEO-PI-R; Costa &

McCrae, 1992), and other measures have established that all five factors have strong genetic bases, with heritability estimates from twin studies indicating that about 50% of the variance in personality traits is accounted for by additive and non-additive genetic factors (Jang *et al.*, 1998, Bouchard & Loehlin, 2001). Second, given their genetic roots, it might not be surprising that personality traits are enduring dispositions, with a large body of literature showing high rank-order stability ($r \simeq .75$) in adulthood (Roberts & DelVecchio, 2000), even after decades (Terracciano *et al.*, 2006a). Third, although individual differences are substantially stable, personality traits show modest maturational changes, which can be briefly summarized by noting that most people tend to decline in N, E, and O, and to increase in A and C, throughout adulthood (McCrae & Costa, 2003; for a more nuanced picture, see Terracciano *et al.*, 2005, Terracciano *et al.*, 2006b). Fourth, personality traits can be validly assessed by self-reports or the ratings of knowledgeable informants (e.g., spouses or friends), with moderate agreement across these different sources (Funder *et al.*, 1995, McCrae & Costa, 2003). Finally, personality traits are predictors of important outcomes (Paunonen, 2003, Ozer & Benet-Martínez, 2006), including a variety of health risk behaviors (Trobst *et al.*, 2002, Terracciano & Costa, 2004), well-being (Costa & McCrae, 1980), emotional experience (Terracciano *et al.*, 2003a,b), academic performance (Chamorro-Premuzic & Furnham, 2003), vocational interests (Gottfredson *et al.*, 1993), job performance (Barrick & Mount, 1991), marital stability and satisfaction (Kelly & Conley, 1987), and political preference (Caprara & Zimbardo, 2004). Of most interest here, personality traits have been shown to be strongly related to a wide variety of psychiatric disorders, from schizophrenia (Camisa *et al.*, 2005) to borderline personality disorder (Trull *et al.*, 2003).

The FFM across Cultures

In recent years it also became feasible to address the important question of whether the FFM is universal. Are the same psychological constructs found in cultures as diverse as Argentina, Iran, Malaysia, New Zealand, and Zimbabwe? Are traits organized in a similar fashion across cultures?

Despite differences in language, history, religion, political systems, and other cultural features, the hypothesis that the FFM generalizes across cultures has been largely supported (Paunonen, 1996, McCrae & Costa, 1997). The Personality Profiles of Cultures (PPOC) Project has been one of the most extensive tests of this hypothesis, where McCrae and colleagues (2005a) examined factor replicability of the NEO-PI-R in 50 cultures using translations into several languages. The factor structure was clearly replicated in most cultures and was recognizable in all (McCrae et al., 2005a). Factor replicability indicates that the covariation among traits is similar across cultures, and that the 30 NEO-PI-R facets retain some measure of convergent and discriminant validity in translation. Thus, the FFM provides a way to assess broad personality dimensions in every culture examined so far. Potentially, there are also some culture-specific constructs, but the common FFM dimensions make cross-cultural comparisons feasible.

Sex differences

Some of the first cross-cultural comparisons using the NEO-PI-R tested whether gender and age differences in personality traits show pancultural patterns. Costa, Terracciano, and McCrae (2001) examined gender differences in personality traits using self-report data from adults and college-age respondents in 26 cultures. They found small gender differences, generally of less than one-half standard deviation. However, the same pattern was systematically found across cultures and was broadly consistent with the existing North-American literature and with pancultural gender stereotypes (Williams & Best, 1990). Women rated themselves consistently higher in facets of A (e.g., Tender-Mindedness and Altruism) and N (e.g., Anxiety and Vulnerability). A more varied pattern was found for the other three domains, with women

scoring higher on Warmth, Gregariousness, and Openness to Aesthetics and Feelings, and men higher in Assertiveness, Excitement Seeking, and Openness to Ideas.

This universal pattern of sex differences in personality traits is closely related to differences between men and women in the prevalence of different forms of psychopathology. Women score higher on facets of N, such as Depression, Anxiety, and Vulnerability, which reflect the higher prevalence of mood and anxiety disorders among women. Men's lower scores on A correspond to the higher prevalence of Antisocial Personality Disorder.

Although the general pattern was the same everywhere, the magnitude of gender differences varied across culture. Surprisingly, gender differences were more pronounced among European than African and Asian cultures. (Stereotypes about gender were also most differentiated in Western cultures; see Williams & Best, 1990). Correlations with culture-level variables and national statistics indicated that self-reported gender differences were largest among wealthy Western cultures with individualistic and egalitarian values, where women have greater educational opportunities. The pancultural pattern of gender differences was replicated in a larger PPOC sample of 50 cultures using observer rating data (McCrae *et al.*, 2005a).

Age differences

As indicated above, cross-sectional and longitudinal studies in the U.S. suggest that there are modest mean level changes throughout adulthood in all five factors. Is the developmental course of personality traits similar across cultures? Cross-sectional tests of this hypothesis seem to support the view that there are comparable patterns across cultures. In a study that involved samples from 5 countries, McCrae and colleagues (2000) found self-reported N, E, O, A, and C scales to show median correlations with age of $-.17$, $-.21$, $-.08$, $.09$, and $.23$, respectively. These correlations are quite modest in magnitude, suggesting that personality change is almost imperceptibly gradual. New analyses of the PPOC observer ratings sample of 11,965 individuals from 51 cultures (McCrae et al., 2005a, 2005b) indicate that the five domain scores correlate $-.09$, $-.20$, $-.22$, $.09$, and $.29$ with age, all $p < .001$, essentially replicating the previous cross-cultural study. However, the effects of age on N and A were smaller than expected, and in many cultures were not replicated. The effects for E, O, and C showed a clear pattern in almost every culture.

As with sex differences, maturational trends in personality traits can be informative about the developmental course of psychopathology. It should be reassuring that for most people N declines steadily after adolescence and during young adulthood, whereas A and C increase. This corresponds to maturational declines in the prevalence of mood, anxiety, substance abuse, and personality disorders with age (Costa *et al.*, 1999).

Personality Traits at the Culture Level

Because the same traits can be found in every culture, intercultural comparisons and correlations are possible: Are Italians more extraverted than the British? Are aggregate (average) scores related to features of culture, to economic indicators such as per capita Gross Domestic Product (GDP), or to health-related variables such as smoking or HIV infection prevalence? In recent years we have addressed such questions with data from large cross-cultural studies, but we first were obliged to assess the comparability of cross-cultural data.

Cross-cultural comparisons present difficulties because of scale translation, cultural differences in response biases, and unfamiliarity with questionnaires in some cultures. But from an epidemiologist's perspective, perhaps the major limitation of our comparisons at the culture level was the use of convenience samples, which might not be representative of the entire population. Studies of self-reported personality traits were conducted through secondary

analyses of data collected from a variety of samples by different researchers. Our studies of observer-rated personality traits were based on data collected from college students, and students might represent an elite sample, especially in non-Western cultures. Because of the potential limitations of relying on non-representative samples, the culture-level data should be interpreted with caution for any particular culture.

However, several comparisons suggest that the data are robust. The aggregate data generalized across sex and age groups: Mean personality scores for male and female subsamples from the same culture were strongly correlated, and significant correlations were found also between college-age and adult subsamples. We gathered observer ratings from multiple sites in some countries, and in most there was good agreement among sites, although some significant differences were found in the U.S. Most convincingly, aggregate personality profiles based on self-reports from one sample in a country generally resembled aggregate personality profiles based on observer ratings from a different sample in that country (McCrae et al., 2005b). For example, the aggregate personality profiles from two independent Italian samples using two different methods of assessment (self-report and observer rating) showed a typical moderate agreement across the 30 facets (ICC = .44; p < .01). These data suggest that despite the use of non-representative samples, aggregate scores are meaningful.

Also persuasive were the geographical patterns of similarity (Allik & McCrae, 2004, McCrae et al., 2005b). Australians and New Zealanders, Burkinabé and Batswana, Germans and Austrians, Americans and Canadians, and Hong Kong and Taiwan Chinese had similar profiles. Multidimensional scaling analyses of the aggregate scores indicated that Asian and African cultures tended to cluster together and away from Europeans and Americans, a distribution essentially replicated across self-report and observer-rating datasets. This distribution also highlights the most prominent difference across the 51 cultures examined, that is, the higher scores on E of European and American compared to Asian and African cultures.

Although there are reliable differences across cultures in aggregate personality traits, the magnitude of these differences is very small when compared to the range of individual differences in any culture. An analysis of variance of the observer rating data from the 51 cultures indicated that about 95% of variation is within cultures and only about 5% across cultures (McCrae & Terracciano, 2008). Poortinga and van Hemert (2001) have reported somewhat larger effects for culture in studies of self-report personality scales, but it is clear that culture, ethnicity, and language have limited influence on personality traits.

Culture-level Associations

The construct validity of the culture-level scores was also supported by correlations with culture-level variables such as individualism/collectivism (McCrae et al., 2005b). Beyond their use as evidence of construct validity, such culture-level associations are of intrinsic interest. For example, cultures whose members (on average) score high on E have democratic values, an emphasis on individualism and self-expression, higher subjective well-being (McCrae *et al.*, 2005b), higher rates of obesity, and lower rates of suicide (McCrae & Terracciano, 2008).

In many cases, culture-level correlates can be understood as simple extensions of individual-level personality correlates. Low Openness to Values is associated with HIV stigmatization at the individual level, and countries such as Zimbabwe and South Africa, where governments have been reluctant to address the epidemic, score among the lowest on aggregate levels of Openness to Values (McCrae *et al.*, in press). Again, somatic complaints are associated with high N in individuals (Costa & McCrae, 1987), and cultures like Portugal and Italy, which are higher in aggregate N, have more inflammatory bowel disease patients than low-N cultures like Austria and Sweden (Levenstein *et al.*, 2001). However, individual associations do not invariably translate to the culture level; for example, prevalence of substance abuse is not

generally higher in cultures low in A and C (McCrae & Terracciano, 2008). There are a host of socioeconomic, political, religious, historical, and geographical factors that apparently have more weight than personality traits in shaping such outcomes.

It would be of great interest to examine the association of aggregate personality traits with the full spectrum of mental disorder prevalence rates, but there is a paucity of reliable cross-cultural epidemiological data on mental disorders. Indeed, we found no systematic cross-cultural studies of personality disorders (but see Loranger *et al.*, 1994), and for mood and anxiety disorders, the largest studies included only about ten countries (Weissman *et al.*, 1996, Weissman *et al.*, 1997, Demyttenaere *et al.*, 2004). Unfortunately, mental health is often neglected by WHO initiatives (Miranda & Patel, 2005). For schizophrenia, we analyzed prevalence rate from a meta-analysis (Saha *et al.*, 2005), but found no associations. The differences among countries in health care systems, in the cross-cultural manifestations of the disorder, and in diagnostic criteria, make such cross-cultural comparisons very difficult.

National Character Stereotypes

Perhaps one of the most scientifically and socially valuable contributions of aggregate personality scores has been their use as criteria to evaluate the accuracy of national character stereotypes. Many Europeans, and perhaps people from other parts of the world, seem to agree that Italians are passionate, the Swiss are punctual, and Germans are well-organized (Peabody, 1985). Similar ideas about the traits of the typical member of a culture can be found everywhere, but are these beliefs accurate? Are views of national character the result of direct observation of the members of a culture, or are they a reflection of the socioeconomic conditions, climate, history, customs, and values?

We recently addressed such questions by gathering data from 3,989 respondents in 49 cultures around the world who completed the National Character Survey (NCS), a new measure consisting of 30 bipolar scales corresponding to the facets of the NEO-PI-R (Terracciano *et al.*, 2005). In each culture, respondents described the typical member of their culture. Psychometric properties and factor structure indicated that NCS data replicated the FFM reasonably well, making comparisons with NEO-PI-R aggregate scores feasible. As in previous studies (Peabody, 1985), there was substantial agreement among raters, supporting the view that such beliefs are widely shared among members of a culture. The aggregate ratings were highly reliable, with men and women yielding essentially the same profile. In those few countries where adult ratings were available (Ethiopia, Italy, The Philippines), the NCS profile also generalized across age groups. In some cultures, data from multiple sites were collected, and in every case there was strong agreement.

Although reliable, the NCS ratings showed a greater range of variation across cultures than the aggregate observer ratings, which is consistent with the idea that stereotypes exaggerate differences among groups. Accuracy was assessed both within and across 49 cultures, and both sets of analyses clearly indicated that NCS scores do not reflect assessed personality traits. For example, within cultures, intraclass correlations between the aggregate facet scores of NEO-PI-R observer ratings and the NCS scales ranged from − .57 for the English to .40 for the Poles, with a median value of .00 (Terracciano *et al.*, 2005). The lack of agreement between national character stereotypes and assessed aggregate personality traits can be seen clearly in Figure 1, which illustrates the Italian findings.

Psychologists have a keen interest in stereotypes because of their influence on emotion, cognition, and behavior. Stereotype threat can negatively affect the performance and health of ethnic groups (Steele & Aronson, 1995, Blascovich *et al.*, 2001), women (Spencer *et al.*, 1999), and older adults (Levy *et al.*, 2006). Negative views of minority or national groups can exacerbate conflict and create or fuel prejudicial and discriminatory behaviors. As psychiatrists

know, stereotypes about mental illness reinforce stigma and discourage people from seeking appropriate treatment.

Cross-Cultural Perspectives on Personality and Psychopathology

There is solid evidence at the individual level that personality traits are predisposing factors for a wide variety of psychiatric disorders. Several studies have shown that normal personality traits are systematically related to the development of Axis I disorders, such as mood (Bagby *et al.*, 1995), anxiety (Krueger *et al.*, 1996), and substance abuse (Flory *et al.*, 2002). Even stronger are the conceptual and empirical links between the Axis II personality disorders (PDs) and the broad factors and specific facets of the FFM (Dyce & O'Connor, 1998, Costa & Widiger, 2002, Bagby *et al.*, 2005). These associations appear to be cross-culturally generalizable. For example, Yang et al. (2002) replicated relations between NEO-PI-R facets and PD scores in a sample of psychiatric patients in the People's Republic of China.

Prediction of Personality Disorders with the NEO-PI-R

Costa and McCrae (2005) have proposed simple formulas to identify possible DSM-IV PDs using NEO-PI-R scores. The formulas reflect the observation that each PD is associated with a distinctive personality profile, and correspond conceptually to the DSM diagnostic criteria (Widiger *et al.*, 2002a). The set of ten formulas combine the facet scores that are prototypically related to each PDs. For example, high scores on Angry Hostility and low scores on Trust, Straightforwardness, and Compliance predict Paranoid PD. High scores on Anxiety, Depression, Self-Consciousness, and Vulnerability, and low scores on Gregariousness, Assertiveness, and Excitement-Seeking predict Avoidant PD. Such predictions have found empirical support among North American populations (e.g., Bagby *et al.*, 2005), and also some cross-cultural support in a Chinese clinical sample (McCrae *et al.*, 2001). Given the cross-cultural validity of the NEO-PI-R, it is tempting to extend the prediction of PDs to the 51 cultures assessed in the PPOC Project.

There is little empirical work on the cross-cultural epidemiology of PDs. It is not known whether the same PDs are generally applicable across cultures, although findings in China are encouraging (Yang *et al.*, 2000). In cultures where the PD constructs are relevant, it is reasonable to expect that the same prototypical personality trait patterns should be found, and most likely these might be associated with similar problems of living. A major advantage of relying on traits instead of symptoms for PD diagnosis is that the latter are by definition culture bound (see *DSM-IV*), which makes cross-cultural comparisons more difficult. But everywhere, personality traits are likely to be good predictors of the types of problems a person might experience, although the specific maladaptive behaviors are defined by cultural expectations.

In applying the NEO-PI-R PD scales, additional issues emerged, especially about the cut-off criteria. Costa and McCrae (2005) generated cut-off criteria in accordance with DSM prevalence estimates in the general population, working with adult normative self-report NEO-PI-R data. For example, DSM-IV suggests that the prevalence of Schizotypal PD in the U.S. is about 3%; a cut-off score on the NEO-PI-R Schizotypal PD scale was therefore selected that identified the top 3% of the normative sample. However, adolescents and college students tend to score substantially higher on N, E, and O, and lower on A and C facets compared to adults, which make college students much more likely to reach these cut-off criteria. Given that in the PPOC Project we had roughly equal numbers of adult and college-age targets, the proportion of people meeting the cut-off would be inflated using the existing criteria (Costa & McCrae, 2005). Further, it is not clear that it is appropriate to evaluate observer-rating data using cut-offs based on self-report data.

In Table 1 we provide new cut-off scores derived from the 919 observer rating assessments from the U.S. sample in the PPOC Project, which had roughly equal numbers of adult and college age men and women. These more stringent cut-offs are designed to obtain proportions of each PD in the U.S. sample that are consistent with the DSM-IV estimated U.S. prevalence. Because college-age targets are overrepresented in these data, the cut-offs in Table 1 should be considered preliminary, only illustrative of the approach.

Cross-cultural comparisons are also complicated by the influence of the sample variability on the proportion of people that meet the cut-off criteria, because meeting PD cut-offs usually requires extreme scores. In Asian and African samples where the variability of NEO-PI-R scores was reduced, fewer people would meet the cut-off criteria for any PD. Among European, American, and Australian samples the variability and thus the PD prevalence estimates were higher. These differences in rates of predicted PDs could reflect real cross-cultural differences in prevalence, but unfortunately scale variability is also related to quality of the data (McCrae et al., 2005a), so lower variability can result in underestimation of PDs. With the cut-off criteria from the U.S., cross-cultural comparisons are thus most suitable among Western cultures that showed a similar degree of variability.

Hypotheses about Personality Disorders in an Italian Sample

To provide an example using the new cut-off criteria, we predicted the prevalence of PDs among Italians rated in the PPOC Project. The variability of the NEO-PI-R in this Italian sample was almost identical to that in the American sample. About 13% of the Italian sample was predicted to have one or more PD, compared to 12% in the American sample. High proportions of this Italian sample were predicted to have Schizotypal (6.7%) and Avoidant (3.1%) PDs, whereas very low proportions were predicted for Antisocial (0% among women), Histrionic (0.5%), and Obsessive Compulsive (0%) PDs. These values may be counterintuitive, perhaps because our expectations are based on unfounded national character stereotypes of Italians.

There is nothing mysterious about these predictions; they merely quantify the observation that PDs are related to specific traits, and that nations differ in the average levels of these traits. Compared to the international norms, Italian score slightly higher on N and O and lower on E, A, and C. Thus, the high proportion of predicted Schizotypal PD is in part explained by the high N and O and low E, whereas the low proportion of Obsessive Compulsive PD is explained by the low C.

If these hypotheses were supported by epidemiological studies in Italy and a few other cultures, we would have much greater confidence in their utility; they might, for example, provide theoretical guidelines for power analysis in designing PD studies around the world. But appealing as it might be to epidemiologists, this entire approach has several weaknesses. In addition to the sampling and technical issues discussed above, a large literature undermine the scientific and clinical validity of DSM-IV PD categories themselves (McCrae et al 2005).

Dimensional Approaches to Personality Disorders

The assessment of personality traits is likely to be most useful in diagnoses of PDs that move beyond the categories of the DSM-IV or ICD-10. The many interconnections between personality traits and psychopathology suggest that they are part of a continuum (Krueger, 2005), and there is empirical evidence in support of an unifying dimensional model. In fact, a single integrated five-factor structure emerged from factor analyses of measures of normal and abnormal personality (Markon *et al.*, 2005), and behavior genetic studies show that they share a common five-factor genetic architecture (Jang & Livesley, 1999). These findings, along with evidence and arguments that undermine the notion of discrete categories that qualitatively distinguish between normal and abnormal (Widiger, 1993), support a new, empirical approach

to PDs that uses individual differences in personality traits to guide diagnosis and to tailor therapy to the specific needs and resources of the client.

Widiger, Costa, and McCrae (2002) proposed that the categories of Axis II be replaced by a four step process for the diagnosis of PDs. Step 1 consists of the assessment of FFM personality traits, which provides the client's personality profile and suggests potential areas of problems in living. At Step 2, actual personality-related problems are identified by reviewing lists of potential problems associated with each factor and facet (McCrae *et al.*, 2005c). At Step 3 a clinical evaluation of the severity of the client's maladaptations determines whether the diagnosis of a personality disorders is warranted. For example, an individual who cannot get along with co-workers to such an extent that he cannot hold a job might be given a diagnosis of Low Agreeableness-related PD. An optional Step 4 examines whether the personality profile fits nosological patterns identified by the DSM-IV, ICD-10, or other classifications. This last step provides a link to the current PD terminology for use in clinical, research, and legal settings. The assessment of personality in Step 1 is universally applicable; the specific lists of personality-related problems used in Step 2 might need to be modified to fit the cultural context.

Whether dealing with Axis I or Axis II pathology, and whether categorical or dimensional models are used, understanding the personality profile of the patient can help the clinician in establishing rapport, anticipating the course of therapy, providing useful feedback, and selecting optimal therapeutic techniques (Miller, 1991, Harkness & McNulty, 2002). The clinical utility of the FFM has been demonstrated chiefly in American practice, but research on the universality of personality traits summarized in this article suggests that personality assessment is likely to be relevant to psychiatry around the world.

Acknowledgments

References

Allik J, McCrae RR. Toward a geography of personality traits: Patterns of profiles across 36 cultures. Journal of Cross-Cultural Psychology 2004;35:13–28.

Bagby RM, Costa PT, Widiger TA, Ryder AG, Marshall M. DSM-IV personality disorders and the five-factor model of personality: A multi-method examination of domain- and facet-level predictions. European Journal of Personality 2005;19:307–324.

Bagby RM, Joffe RT, Parker JDA, Kalemba V, Harkness KL. Major depression and the five-factor model of personality. Journal of Personality Disorders 1995;9:224–234.

Barrick MR, Mount MK. The Big Five personality dimensions and job performance: A meta-analysis. Personnel Psychology 1991;44:1–26.

Blascovich J, Spencer SJ, Quinn D, Steele C. African Americans and high blood pressure: The Role of stereotype threat. Psychological Science 2001;12:225–229. [PubMed: 11437305]

Bouchard TJ, Loehlin JC. Genes, evolution, and personality. Behavior Genetics 2001;31:243–273. [PubMed: 11699599]

Camisa KM, Brockbrader MA, Lysaker P, Rae LL, Brenner CA, O'Donnell BF. Personality traits in schizophrenia and related personality disorders. Psychiatry Research 2005;133:23–33. [PubMed: 15698674]

Caprara GV, Zimbardo PG. Personalizing politics: A congruency model of political preference. American Psychologist 2004;59:581–594. [PubMed: 15491254]

Chamorro-Premuzic T, Furnham A. Personality Traits and Academic Examination Performance. European Journal of Personality 2003;17:237–250.

Costa PT Jr, McCrae RR. Influence of Extraversion and Neuroticism on subjective well-being: Happy and unhappy people. Journal of Personality and Social Psychology 1980;38:668–678. [PubMed: 7381680]

Costa PT Jr, McCrae RR. Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? Journal of Personality 1987;55:299–316. [PubMed: 3612472]

Costa, PT., Jr; McCrae, RR. Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual. Psychological Assessment Resources: Odessa, FL; 1992.

Costa, PT., Jr; McCrae, RR.; Siegler, IC. Continuity and change over the adult life cycle: Personality and personality disorders. In: Cloninger, CR., editor. Personality and psychopathology. American Psychiatric Press: Washington, DC; 1999. p. 129-154.

Costa, PT., Jr; McCrae, RR. A Five-Factor Model perspective on personality disorders. In: Strack, S., editor. Handbook of personology and psychopathology. John Wiley & Sons: Hoboken, NJ; 2005. p. 257-270.

Costa PT Jr, Terracciano A, McCrae RR. Gender differences in personality traits across cultures: Robust and surprising findings. Journal of Personality and Social Psychology 2001;81:322–331. [PubMed: 11519935]

Costa, PT., Jr; Widiger, TA., editors. Personality disorders and the Five-Factor Model of personality. American Psychological Association; Washington, DC: 2002.

Demyttenaere K, Bruffaerts R, Posada-Villa J, Gasquet I, Kovess V, Lepine JP, Angermeyer MC, Bernert S, de Girolamo G, Morosini P, Polidori G, Kikkawa T, Kawakami N, Ono Y, Takeshima T, Uda H, Karam EG, Fayyad JA, Karam AN, Mneimneh ZN, Medina-Mora ME, Borges G, Lara C, de Graaf R, Ormel J, Gureje O, Shen Y, Huang Y, Zhang M, Alonso J, Haro JM, Vilagut G, Bromet EJ, Gluzman S, Webb C, Kessler RC, Merikangas KR, Anthony JC, Von Korff MR, Wang PS, Brugha TS, Aguilar-Gaxiola S, Lee S, Heeringa S, Pennell BE, Zaslavsky AM, Ustun TB, Chatterji S. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. Jama 2004;291:2581–90. [PubMed: 15173149]

Digman JM. Personality Structure: Emergence of the Five-Factor Model. Annual Review of Psychology 1990;41:417–440.

Dyce JA, O'Connor BP. Personality disorders and the Five-Factor Model: A test of facet-level predictions. Journal of Personality Disorders 1998;12:31–45. [PubMed: 9573518]

Flory K, Lynam D, Milich R, Leukefeld C, Clayton R. The relations among personality, symptoms of alcohol and marijuana abuse, and symptoms of comorbid psychopathology: results from a community sample. Experimental and Clinical Psychopharmacology 2002;10:425–34. [PubMed: 12498340]

Funder DC, Kolar DC, Blackman MC. Agreement among judges of personality: Interpersonal relations, similarity, and acquaintanceship. Journal of Personality and Social Psychology 1995;69:656–672. [PubMed: 7473024]

Gottfredson GD, Jones EM, Holland JL. Personality and vocational interests: The relation of Holland's six interest dimensions to the five robust dimensions of personality. Journal of Counseling Psychology 1993;40:518–524.

Harkness, AR.; McNulty, JL. Implications of personality individual differences science for clinical work on personality disorders. In: Costa, PT., Jr; Widiger, TA., editors. Personality disorders and the Five-Factor Model of personality. American Psychological Association: Washington, DC; 2002. p. 391-403.

Jang KL, Livesley WJ. Why do measures of normal and disordered personality correlate? A study of genetic comorbidity. Journal of Personality Disorders 1999;13:10–17. [PubMed: 10228923]

Jang KL, McCrae RR, Angleitner A, Riemann R, Livesley WJ. Heritability of facet-level traits in a cross-cultural twin sample: Support for a hierarchical model of personality. Journal of Personality and Social Psychology 1998;74:1556–1565. [PubMed: 9654759]

Kelly EL, Conley JJ. Personality and compatibility: A prospective analysis of marital stability and marital satisfaction. Journal of Personality and Social Psychology 1987;52:27–40. [PubMed: 3820076]

Krueger RF. Continuity of axes I and II: toward a unified model of personality, personality disorders, and clinical disorders. Journal of Personality Disorders 2005;19:233–61. [PubMed: 16175735]

Krueger RF, Caspi A, Moffitt TE, Silva PA, McGee R. Personality traits are differentially linked to mental disorders: a multitrait-multidiagnosis study of an adolescent birth cohort. Journal of Abnormal Psychology 1996;105:299–312. [PubMed: 8772001]

Levenstein S, Li ZM, Almer S, Barbosa A, Marquis P, Moser G, Sperber A, Toner B, Drossman DA. Cross-cultural variation in disease-related concerns among patients with inflammatory bowel disease. American Journal of Gastroenterology 2001;96:1822–1830. [PubMed: 11419836]

Levy BR, Slade MD, Gill TM. Hearing decline predicted by elders' stereotypes. Journal of Gerontology: Psychological Sciences 2006;61:P82–87.

Loranger AW, Sartorius N, Andreoli A, Berger P, Buchheim P, Channabasavanna SM, Cold B, Dahl A, Diekstra RFW, Ferguson B, Jacobsberg LB, Mombour W, Pull C, Ono Y, Regier D. The International Personality Disorder Examination (IPDE): the World Health Organization/Alcohol, Drug Abuse, and Mental Health Administration International Pilot Study of Personality Disorders. Archives of General Psychiatry 1994;1994:215–224. [PubMed: 8122958]

Markon KE, Krueger RF, Watson D. Delineating the structure of normal and abnormal personality: An integrative hierarchical approach. Journal of Personality and Social Psychology 2005;88:139–157. [PubMed: 15631580]

McCrae RR, Costa PT Jr. Personality trait structure as a human universal. American Psychologist 1997;52:509–516. [PubMed: 9145021]

McCrae, RR.; Costa, PT, Jr. Personality in adulthood: A Five-Factor Theory perspective. Guilford Press: New York; 2003.

McCrae RR, Costa PT Jr, Martin TA, Oryol VE, Senin IG, O'Cleirigh C. Personality correlates of HIV stigmatization in Russia and the United States. Journal of Research in Personality. in press

McCrae RR, Costa PT Jr, Ostendorf F, Angleitner A, Hrebrickova M, Avia MD, Sanz J, Sanchez-Bernardos ML, Kusdil ME, Woodfield R, Saunders PR, Smith PB. Nature over nurture: Temperament, personality, and lifespan development. Journal of Personality and Social Psychology 2000;78:173–186. [PubMed: 10653513]

McCrae RR, John OP. An introduction to the Five-Factor Model and its applications. Journal of Personality 1992;60:175–215. [PubMed: 1635039]

McCrae RR, Löckenhoff CE, Costa PT Jr. A step towards DSM-V: Cataloging personality-related problems in living. European Journal of Personality 2005c;19:269–270.

McCrae, RR.; Terracciano, A. The Five-Factor Model and its correlates in individuals and cultures. In: van de Vijver, FJR.; van Hemert, DA.; Poortinga, YH., editors. Multilevel Analysis in Individuals and Cultures. Erlbaum: Mahwah, NJ; 2008.

McCrae RR, Terracciano A. 78 Members of the Personality Profiles of Cultures Project. Universal features of personality traits from the observer's perspective: Data from 50 cultures. Journal of Personality and Social Psychology 2005a;88:547–561. [PubMed: 15740445]

McCrae RR, Terracciano A. 79 Member of the Personality Profiles of Cultures Project. Personality profiles of cultures: Aggregate personality traits. Journal of Personality and Social Psychology 2005b; 89:407–25. [PubMed: 16248722]

McCrae RR, Yang J, Costa PT Jr, Dai XY, Yao SQ, Cai TS, Gao BL. Personality profiles and the prediction of categorical personality disorders. Journal of Personality 2001;69:155–174. [PubMed: 11339794]

Miller T. The psychotherapeutic utility of the five-factor model of personality: A clinician's experience. Journal of Personality Assessment 1991;57:415–433. [PubMed: 1757869]

Miranda JJ, Patel V. Achieving the Millennium Development Goals: does mental health play a role? PLoS Medicine 2005;2:e291. [PubMed: 16156692]

Ozer DJ, Benet-Martínez V. Personality and the prediction of consequential outcomes. Annual Review of Psychology 2006;57:8.1–8.21.

Paunonen SV. Big five factors of personality and replicated predictions of behavior. Journal of Personality and Social Psychology 2003;84:411–424. [PubMed: 12585813]

Paunonen SV, Keinonen M, Trzebinski J, Forsterling F, Grishenko-Roze N, Kouznetsova L, Chan DW. The structure of personality in six cultures. Journal of Cross-Cultural Psychology 1996;27:339–353.

Peabody, D. National characteristics. Cambridge University Press: New York; 1985.

Poortinga YH, van Hemert DA. Personality and culture: Demarcating between the common and the unique. Journal of Personality 2001;69:1033–1060. [PubMed: 11767817]

Roberts BW, DelVecchio WF. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. Psychological Bulletin 2000;126:3–25. [PubMed: 10668348]

Saha S, Chant D, Welham J, McGrath J. A systematic review of the prevalence of schizophrenia. PLoS Medicine 2005;2:e141. [PubMed: 15916472]

Spencer SJ, Steele CM, Quinn DM. Stereotype threat and women's math performance. Journal of Experimental Social Psychology 1999;35:4–28.

Steele CM, Aronson J. Stereotype threat and the intellectual test performance of African Americans. Journal of Personality and Social Psychology 1995;69:797–811. [PubMed: 7473032]

Terracciano A, Abdel-Khalek AM, Adam N, Adamovova L, Ahn CK, Ahn HN, Alansari BM, Alcalay L, Allik J, Angleitner A, Avia MD, Ayearst LE, Barbaranelli C, Beer A, Borg-Cunen MA, Bratko D, Brunner-Sciarra M, Budzinski L, Camart N, Dahourou D, De Fruyt F, de Lima MP, del Pilar GE, Diener E, Falzon R, Fernando K, Fickova E, Fischer R, Flores-Mendoza C, Ghayur MA, Gulgoz S, Hagberg B, Halberstadt J, Halim MS, Hrebickova M, Humrichouse J, Jensen HH, Jocic DD, Jonsson FH, Khoury B, Klinkosz W, Knezevic G, Lauri MA, Leibovich N, Martin TA, Marusic I, Mastor KA, Matsumoto D, McRorie M, Meshcheriakov B, Mortensen EL, Munyae M, Nagy J, Nakazato K, Nansubuga F, Oishi S, Ojedokun AO, Ostendorf F, Paulhus DL, Pelevin S, Petot JM, Podobnik N, Porrata JL, Pramila VS, Prentice G, Realo A, Reategui N, Rolland JP, Rossier J, Ruch W, Rus VS, Sanchez-Bernardos ML, Schmidt V, Sciulna-Calleja S, Sekowski A, Shakespeare-Finch J, Shimonaka Y, Simonetti F, Sineshaw T, Siuta J, Smith PB, Trapnell PD, Trobst KK, Wang L, Yik M, Zupancic A, McCrae RR. National character does not reflect mean personality trait levels in 49 cultures. Science 2005;310:96–100. [PubMed: 16210536]

Terracciano A, Costa PT Jr. Smoking and the Five-Factor Model of personality. Addiction 2004;99:472–481. [PubMed: 15049747]

Terracciano A, Costa PTJ, McCrae RR. Personality Plasticity After Age 30. Personality and Social Psychology Bulletin. 2006a

Terracciano A, McCrae RR, Brant LJ, Costa PT Jr. Hierarchical linear modeling analyses of NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. Psychology and Aging 2005;20:493–506. [PubMed: 16248708]

Terracciano A, McCrae RR, Costa PTJ. Longitudinal trajectories in Guilford-Zimmerman Temperament Survey data in the Baltimore Longitudinal Study of Aging. Journal of Gerontology: Psychological Sciences 2006b;61B:P108–P116.

Terracciano A, McCrae RR, Hagemann D, Costa PT. Individual difference variables, affective differentiation, and the structures of affect. Journal of Personality 2003a;71:669–703. [PubMed: 12932207]

Terracciano A, Merritt M, Zonderman AB, Evans MK. Personality traits and sex differences in emotion recognition among African Americans and Caucasians. Annals of the New York Academy of Sciences 2003b;1000:309–312. [PubMed: 14766644]

Trobst KK, Herbst JH, Masters HL III, Costa PT Jr. Personality pathways to unsafe sex: Personality, condom use, and HIV risk behaviors. Journal of Research in Personality 2002;36:117–133.

Trull TJ, Widiger TA, Lynam DR, Costa PT. Borderline personality disorder from the perspective of general personality functioning. Journal of Abnormal Psychology 2003;112:193–202. [PubMed: 12784828]

Weissman MM, Bland RC, Canino GJ, Faravelli C, Greenwald S, Hwu HG, Joyce PR, Karam EG, Lee CK, Lellouch J, Lepine JP, Newman SC, Oakley-Browne MA, Rubio-Stipec M, Wells JE, Wickramaratne PJ, Wittchen HU, Yeh EK. The cross-national epidemiology of panic disorder. Archives General of Psychiatry 1997;54:305–9.

Weissman MM, Bland RC, Canino GJ, Faravelli C, Greenwald S, Hwu HG, Joyce PR, Karam EG, Lee CK, Lellouch J, Lepine JP, Newman SC, Rubio-Stipec M, Wells JE, Wickramaratne PJ, Wittchen H, Yeh EK. Cross-national epidemiology of major depression and bipolar disorder. Jama 1996;276:293–9. [PubMed: 8656541]

Widiger TA. The DSM-III-R categorical personality disorder diagnoses: A critique and an alternative. Psychological Inquiry 1993;4:75–90.

Widiger, TA.; Costa, PT., Jr; McCrae, RR. A proposal for Axis II: Diagnosing personality disorders using the Five-Factor Model. In: Costa, PT., Jr; Widiger, TA., editors. Personality disorders and the Five-Factor Model of personality. American Psychological Association: Washington, DC; 2002. p. 431-456.

Widiger, TA.; Trull, TJ.; Clarkin, JF.; Sanderson, C.; Costa, PT, Jr. A description of the DSM-IV personality disorders with the Five-Factor Model of personality. In: Costa, PT., Jr; Widiger, TA., editors. Personality Disorders and the Five-Factor Model of personality. American Psychological Association: Washington, DC; 2002. p. 89-99.

Williams, JE.; Best, DL. Sex and psyche: Gender and self viewed cross-culturally. Sage: Newbury Park; 1990.

Yang, J.; Dai, X.; Yao, S.; Cai, T.; Gao, B.; McCrae, RR.; Costa, PT, Jr. Personality disorders and the Five-Factor Model of personality in Chinese psychiatric patients. In: Costa, PT., Jr; Widiger, TA., editors. Personality disorders and the Five-Factor Model of personality. American Psychological Association: Washington, DC; 2002. p. 215-221.

Yang J, McCrae RR, Costa PT Jr, Yao S, Dai X, Cai T, Gao B. The cross-cultural generalizability of Axis-II constructs: An evaluation of two personality disorder assessment instruments in the People's Republic of China. Journal of Personality Disorders 2000;14:249–263. [PubMed: 11019748]
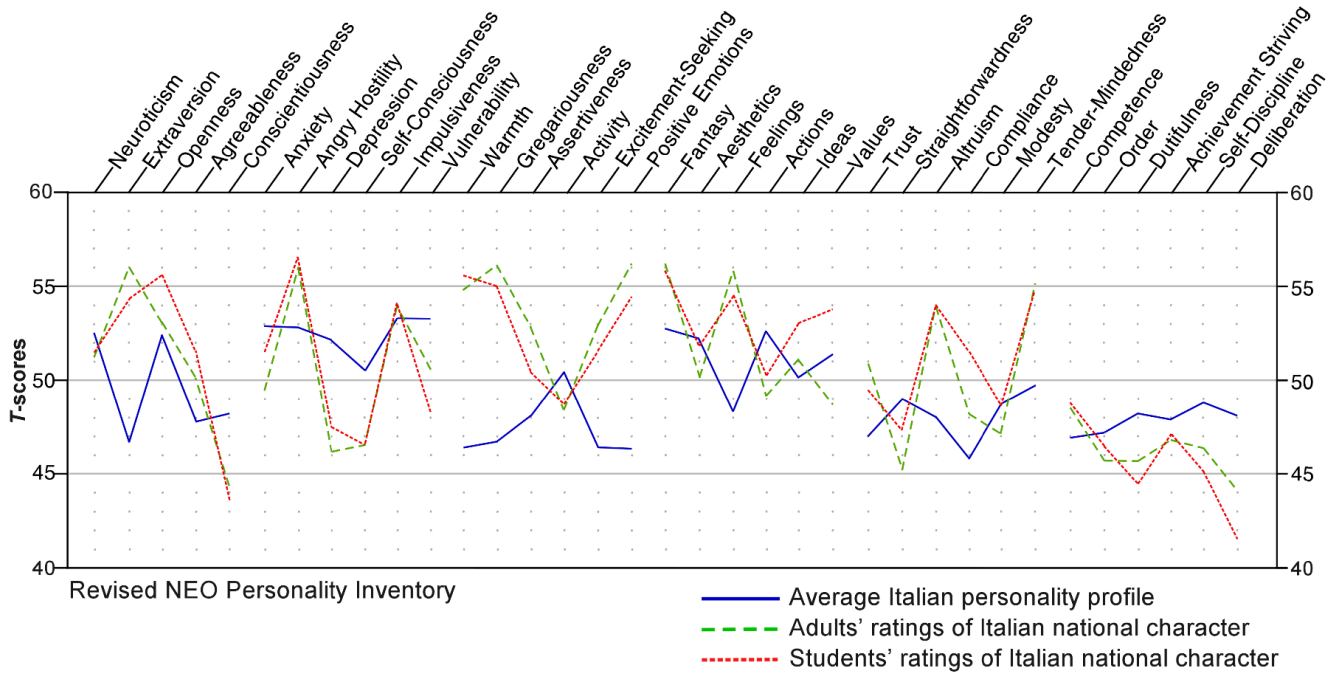
Figure 1.
Mean personality profile for Italians from observer ratings and perceived national character from adults and students. NEO-PI-R profile form reproduced by special permission of the Publisher, Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida 33549, from the Revised NEO Personality Inventory by Paul T. Costa, Jr., and Robert R. McCrae. Copyright 1978, 1985, 1989, 1991, 1992 by Psychological Assessment Resources, Inc. (PAR). Further reproduction is prohibited without permission of PAR.

Table 1

Illustrative NEO-PI-R PD Scale Cut-off Scores for Observer Ratings.

Disorder	NEO-PI-R PD scale formula	*M (SD)*	US%	Cut
Paranoid	$96 + N2 - A1 - A2 - A4$	58.9 (18.2)	2.5	96
Schizoid	$128 - E1 - E2 - E6 - O3$	46.5 (16.6)	1.0	88
Schizotypal	$128 + N1 + N4 - E1 - E2 - E6 + O1 + O4 + O5 - A1$	127.8 (20.2)	3.0	169
Antisocial (Male)	$224 + N2 + E5 - A2 - A3 - A4 - A6 - C3 - C5 - C6$	129.5 (33.1)	3.0	199
Antisocial (Female)	$224 + N2 + E5 - A2 - A3 - A4 - A6 - C3 - C5 - C6$	122.9 (31.2)	1.0	207
Borderline	$96 + N1 + N2 + N3 + N5 + N6 - A1 - A4 - C1$	114.4 (28.2)	2.0	180
Histrionic	$N3 + N4 + E1 + E2 + E5 + E6 + O1 + O3 + A1$	163.8 (24.8)	3.0	209
Narcissistic	$96 + N2 + N4 + O1 - A3 - A5 - A6 + C4$	104.2 (17.6)	1.0	150
Avoidant	$96 + N1 + N3 + N4 + N6 - E2 - E3 - E5$	95.6 (25.0)	1.0	157
Dependent	$32 + N1 + N4 + N6 + E1 - E3 + A1 + A3 + A4 + A5$	151.5 (23.9)	3.0	198
Obsessive-Compulsive	$64 + E3 - O6 - A4 + C1 + C2 + C3 + C4$	125.2 (20.4)	1.0	173

Note. Formula elements are raw Revised NEO Personality Inventory (Costa & McCrae, 1992) facet scores. *M (SD)* are observer rating scores from a U.S. sample (*n* = 919; McCrae et al., 2005a, b). US% = estimated prevalence in the U.S. population (American Psychiatric Association, 1994). Cut = illustrative cut-off score.