TOWARD A GEOGRAPHY OF PERSONALITY TRAITS
Patterns of Profiles Across 36 Cultures

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It has long been believed that personality traits vary by geographical location, but few studies have examined the worldwide distribution of personality profiles. Using the five-factor model of personality—a comprehensive and apparently universal trait structure—we conducted secondary analyses of data from 36 cultures. Distance from the equator and mean temperature were not meaningfully related to personality factors. However, cluster analysis showed that geographically proximate cultures often have similar profiles, and multidimensional scaling showed a clear contrast of European and American cultures with Asian and African cultures. The former were higher in extraversion and openness to experience and lower in agreeableness. A second dimension reflected differences in psychological adjustment. Observed differences between cultures may be the result of differences in gene pools or in features of culture; acculturation studies and the analyses of other natural experiments are needed to understand the origins of geographical differences in personality traits.

Keywords: five-factor model; cluster analysis; multidimensional scaling

> When they are not entering on war, they spend much time in hunting, but more in idleness . . . by that curious incongruity of temperament which makes of the same men such lovers of laziness and such haters of quiet.
>
> Tacitus (trans. 1970, pp. 153-155)

> Themselves they consider in every way superior to everyone else in the world, and allow other nations a share of good qualities decreasing according to distance, the furthest off being in their view the worst.
>
> Herodotus (trans. 1954, p. 97)

From antiquity to the present day (Berry, Jones, & Kuczaj, 2000), people have assumed that personality traits are distributed geographically. Where one lives reveals what one is like. In part, these beliefs refer to stereotypes of national character (Peabody, 1999) and may reflect judgments about ethnicity or culture. In part, they refer to broader geographical trends. Emotionality, for example, is widely held to be more strongly expressed in the South than in the North, both within (Pennebaker, Rime, & Blankenship, 1996) and across (Linssen & Hagendoorn, 1994) cultures. The distinction between Eastern and Western psychologies is

also widely noted (Markus & Kitayama, 1991); Westerners are often perceived as being more outgoing, independent, and competitive (Zhang, Lee, Liu, & McCauley, 1999).

It is by no means clear that such perceived differences in personality are veridical. For example, Pennebaker et al. (1996) found that North-South stereotypes were common across a wide range of countries, but the correlation of region of origin with self-reported emotional expressiveness was trivial ($r = .05$). The ethnocentrism Herodotus attributed to the Persians in our epigraph is also a likely source of bias in geographical stereotypes.

Personality similarities among people in close geographical proximity—if they exist—might have several causes. Shared culture, shared genes, and shared physical environment are all reasonable candidates. Unfortunately, these three classes of influence are usually confounded. People of a given culture also tend to constitute a single gene pool and to share many features linked to the physical environment, such as climate and diet. Geographically proximate cultures (such as China and Korea) also often share both genetic ancestry (Cavalli-Sforza, Menozzi, & Piazza, 1994) and, through cultural borrowing, customs and beliefs that might influence personality development. This article will attempt to describe geographical patterns in personality traits, although it cannot fully explain them.

COMPARING CULTURES: PROBLEMS AND POSSIBILITIES

To date, research linking psychological variables to geography has focused chiefly on emotion (Plaut, Markus, & Lachman, 2002; Scherer & Wallbott, 1994) and aggression (Anderson, 1989). There have been many studies in which pairs of cultures have been compared on personality measures (e.g., Hanin, Eysenck, Eysenck, & Barrett, 1991; Iwata & Higuchi, 2000), but there have only been only a few (e.g., Lynn & Martin, 1995) in which a sufficiently broad sample of cultures was obtained to allow a systematic investigation of geographic associations. Beyond the technical difficulties of translating inventories and gathering data around the world, such projects have been inhibited by the perceived difficulty of making meaningful comparisons.

Cross-cultural methodologists (e.g., Geisinger, 1994; van de Vijver & Leung, 1997) have pointed to a number of potential problems in comparing trait scores across cultures. Even when a translation is semantically accurate, it is possible that slight shifts in phrasing will increase or decrease endorsement of items. Individuals in different cultures may have different response styles, different self-presentational motives, or different standards of comparison. Unless probability samples are drawn in each country, it is possible that samples will not be representative of their culture as a whole, particularly if they are drawn from a narrow segment of society, such as college students. For all these reasons, thoughtful cross-cultural psychologists have approached such comparisons cautiously.

Two recent studies, however, provided the basis for a more optimistic assessment of the possibilities of cross-cultural comparisons. McCrae (2001) assembled data collected by other researchers from 26 cultures (that is, nations or ethnic groups) using translations of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992). McCrae (2002) added 10 more cultures. The original studies varied widely in sample size and composition and probably in the quality of the translation. However, McCrae (2001, 2002) provided several pieces of evidence suggesting that they could be meaningfully compared. Bilingual studies had been conducted in four of the cultures, and none had shown serious distortions as the result of translation. Similar profiles were seen when two independent Norwegian translations were administered to two different samples, and results from studies in the Philippines were similar whether English or Filipino versions of the NEO-PI-R had been used.

These comparisons suggested that the particular translation used, or even the language of administration, had little effect on the results. Perhaps most persuasive was the meaningful pattern of findings that emerged from culture-level analyses of these data. The five personality factors found at the individual level within each of the cultures were replicated at the culture level, and these factors showed evidence of convergent validity with culture-level variables such as national subjective well-being and Hofstede's (2001) dimensions of culture. In all these respects, the data appeared to yield coherent results and encouraged an examination of the geographical distribution of trait scores.

McCrae (2002) reported mean levels of the five personality factors for the 36 cultures. Most values (84%) were in the average range ($T = 45$ to 55) by American norms; thus, variation across cultures tends to be small compared to variation within cultures. This article examines those relatively subtle variations in mean trait level across cultures.

METHOD

SAMPLES

The available data (see Table 1) were from self-reports of college-age and adult men and women ($N = 27,965$). All were volunteers. The range of cultures was fairly broad, with samples from five continents and from Indo-European, Uralic, Dravidian, Altaic, Malayo-Polynesian, Sino-Tibetan, and Bantu language families. For most samples, cultures corresponded to nations; however, Hispanics and Black and White South Africans were treated as separate cultural groups. It should be noted that (with the exception of the Shona translation, which was provided by a nonpsychologist) translation and data collection were conducted by psychologists indigenous to each culture, who were presumably sensitive to cultural norms in the phrasing of items and familiar with the test-taking experience and motivation of the respondents (cf. Hambleton, 1994).

College students predominated in these studies, and college students may not be representative of their cultures. Particularly in less affluent countries, students may represent a socioeconomic elite, and some differences between cultures may be the result of these sampling differences. Conversely, in all cultures, students may be more Westernized than nonstudents. The effect of this bias is probably to attenuate cultural differences; in this respect, the present design is conservative, and representative samples might yield even greater cultural differences.

INSTRUMENT

The NEO-PI-R is a 240-item questionnaire that assesses 30 specific traits or facets that define the five basic factors of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. This factor structure provides a comprehensive mapping of personality traits (Goldberg, 1993; Ozer & Reise, 1994) and appears to be universal (McCrae & Costa, 1997); it was replicated in all 36 cultures examined in McCrae (2002). Thus, it is particularly well suited to an investigation of personality and geography.

Smith (2002) has noted that there are consistent cultural differences in acquiescent response biases, which are more pronounced in collectivistic cultures. NEO-PI-R scales are roughly balanced in keying, which should reduce the effect of acquiescence bias on the mean levels of traits, and thus make cross-cultural comparisons more meaningful.

TABLE 1
Characteristics of the Samples

		Subsample n			
		College Age		Adult	
Country	Language	Men	Women	Men	Women
Austria	German	28	110	120	186
Belgium	Flemish	34	68	527	490
Canada	English		282	566	
China	Chinese		115	86	
Croatia	Croatian	233	233	123	133
Czech Republic	Czech	90	152	161	167
Denmark	Danish	52	40	545	576
Estonia	Estonian	119	398	189	331
France	French	54	338	279	395
Germany	German	290	454	1185	1801
Hong Kong	Chinese	60	62		
Hungary	Hungarian	36	56	92	128
India	Marathi	107	107		
India	Telugu	157	102		
Indonesia	Indonesian	34	138		
Italy	Italian	26	41	315	308
Japan	Japanese	176	177	164	164
Malaysia	Malay	124	327		
Netherlands	Dutch	615	690		
Norway	Norwegian (1)	74	18	397	295
Norway	Norwegian (2)		148	210	
Peru	Spanish	274	165		
Philippines	English	152	236		
Philippines	Filipino	134	375		
Portugal	Portuguese	205	253	606	816
Russia	Russian	26	91	201	192
South Africa (Black)	English	19	46		
South Africa (White)	English	41	168		
South Korea	Korean (1)	1257	1096		
South Korea	Korean (2)		278	315	
Spain	Spanish		89	107	
Sweden	Swedish	21	30	286	383
Switzerland	German		44	63	
Zimbabwe	Shona	36	35	135	106
Taiwan	Chinese	173	371		
Turkey	Turkish	123	137		
United States	English	148	241	500	500
United States	Spanish	24	49		
Yugoslavia	Serbian	72	547	256	245

SOURCE: Adapted from McCrae (2002), where data sources are detailed.
NOTE: College age respondents are typically between the ages of 18 and 21 but vary somewhat across cultures. Adults are over age 21. Two independent translations of Korean and Norwegian were used.

Across all these cultures, college-age respondents differ systematically from adults in the mean levels of traits (cf. McCrae et al., 1999). Because some cultures are represented only by college-age samples whereas others include adult samples, averaging raw scores would confound culture with age. Each facet score was therefore standardized as a *T*-score (with a mean of 50 and *SD* of 10), using the appropriate American norms (college age or adult, male or female). Factor scores were calculated from these facet *T*-scores, and mean facet and factor scores were calculated for each culture. The resulting scores express trait levels relative to American norms and have been corrected for age and sex.

RESULTS

VARIATION WITHIN AND ACROSS CULTURES

Any meaningful comparison of mean levels across groups must take into account the range of variation within groups. In particular, cross-cultural comparisons must avoid what Bock (2000) called the uniformity assumption. That fallacy was at the heart of the classic but discredited concept of the modal personality (DuBois, 1944), which assumed that all members of a culture had internalized the same ethos and thus shared the same distinctive personality. Tests of that hypothesis (e.g., Wallace, 1952) soon revealed that there was typically more variation in any given characteristic within a single cultural group than between different groups.

To get a sense of intracultural variation in personality traits, we examined standard deviations for the 30 NEO-PI-R facets across the 36 cultures. All facet scales have a raw score range of 0 to 32. In the American normative sample (Costa & McCrae, 1992), the average standard deviation across the 30 scales is 4.39; the grand mean of standard deviations across all 36 cultures was 4.47 [JA1]. American normative standard deviations thus provide a serviceable metric for the magnitude of mean differences across cultures. However, it is also of interest to note that mean standard deviations are systematically lower among Asian and Black African cultures (range = 3.60 to 4.33) than among European cultures (range = 4.06 to 5.59 [JA2]). A tendency to avoid extreme responses might account for this effect (McCrae, 2002); another possible explanation is the operation of acquiescence bias among collectivistic cultures (Smith, 2002). When applied to the balanced scales of the NEO-PI-R, acquiescence biases would tend to reduce variance as the endorsement of both positive and negative items would lead to relatively neutral scores. Alternatively, it is possible that Asian and Black African cultures are, in fact, somewhat more homogeneous in personality traits than the more individualistic cultures of Europe (McCrae, 2002).

There is also another issue with regard to intracultural variation that must be considered. Different subgroups (defined by sex, age, social class, and so on) may show distinctive personality traits; indeed, it is conceivable that college students everywhere resemble each other more than college students resemble adults within any given culture. A researcher who wishes to draw conclusions about the personality profiles of cultures as a whole must either use representative samples, or demonstrate that the profiles are generalizable across subgroups. In the present study, most of the data are from convenience samples. But McCrae (2001, 2002) showed that the mean domain scores were indeed generalizable across both sex and age groups (*r*s = .48 to .88). It is thus meaningful to combine scores from subgroups to estimate the mean personality traits of the culture as a whole.

GLOBAL GEOGRAPHICAL ANALYSES: NORTH AND SOUTH, EAST AND WEST

There are two strategies that can be pursued in relating personality variables to geography. One can correlate culture-level personality scores with geographical features, or one can examine patterns of similarity across the cultures themselves to look for meaningful geographical associations. Our first analyses consider the basic distinctions of latitude and longitude.

Although there is a long tradition contrasting cultures of the North with those of the South (Pennebaker et al., 1996), the underlying distinction is usually between cold and warm climates, and North and South correspond to cold and warm only in the Northern Hemisphere. To assess the effects of climate, we therefore examined the degrees of latitude of each country's capital city from the Equator in either direction.[1] Cultures at higher latitudes tend to have more temperate climates.

Correlations of the five personality variables with latitude showed significant correlations for extraversion ($r = .59$, $N = 36$, $p < .001$) and conscientiousness ($r = .41$, $N = 36$, $p < .05$). These data suggest that people who live farther from the equator tend to be more outgoing but less dutiful. These findings certainly do not square with the usual stereotypes that suggest that colder climates should lead to emotional and interpersonal reserve. If latitude is merely a proxy for climate, then more meaningful associations might be found if average annual temperature were analyzed instead. We therefore correlated mean temperature (Source: http://www.washingtonpost.com/wp-srv/weather/historical/historical.htm) with personality factors. Somewhat stronger correlations were found. Temperature was significantly related to extraversion, openness, agreeableness, and conscientiousness (rs = 67, .35, .46, and .61, respectively, $N = 36$, all ps $< .05$). The strong association of average temperature with conscientiousness is puzzling; it does not fit well with findings that the pace of life is slower in tropical countries (Levine & Norenzayan, 1999).

One possible reason for these odd results is that in the present sample, latitude, as it were, is confounded with longitude. That is, most of the cultures at high latitudes are European, whereas most of the tropical cultures (Hong Kong, Malaysia, Indonesia) are found in Asia. When correlations of temperature with extraversion, openness, agreeableness, and conscientiousness are calculated separately for European and non-European cultures, only conscientiousness remained significant in the both sets (in European cultures, $r = .67$, $n = 19$, $p < .002$; in the non-European cultures, $r = .56$, $n = 17$, $p < .02$).

There are many other geographical features that might be related to personality—altitude, fertility of the soil, proximity to an ocean—but none of these has drawn much attention from psychologists. It is, however, instructive to consider a conceptual parallel. At the beginning of the 20th Century, geographers who embraced environmental determinism held that culture was a reflection of persistent geographical influences: "Man [sic] is a product of the earth's surface. . . . [Nature] has entered into his bone and tissue, into his mind and soul" (Semple, 1911, p. 1, cited in Mitchell, 2000). By the 1920s, however, environmental determinism had been largely abandoned because it did not appear successfully to explain variations in culture (Mitchell, 2000). Rather than pursue these unpromising leads, it may be better to work backward from personality to geography. What cultures have similar personality profiles, and how are they arrayed in space?

CLUSTER ANALYSIS

A simple way to summarize similarities between cultures across a range of variables is through hierarchical cluster analysis of a distance matrix (cf. Scherer, 1997). In this case, the
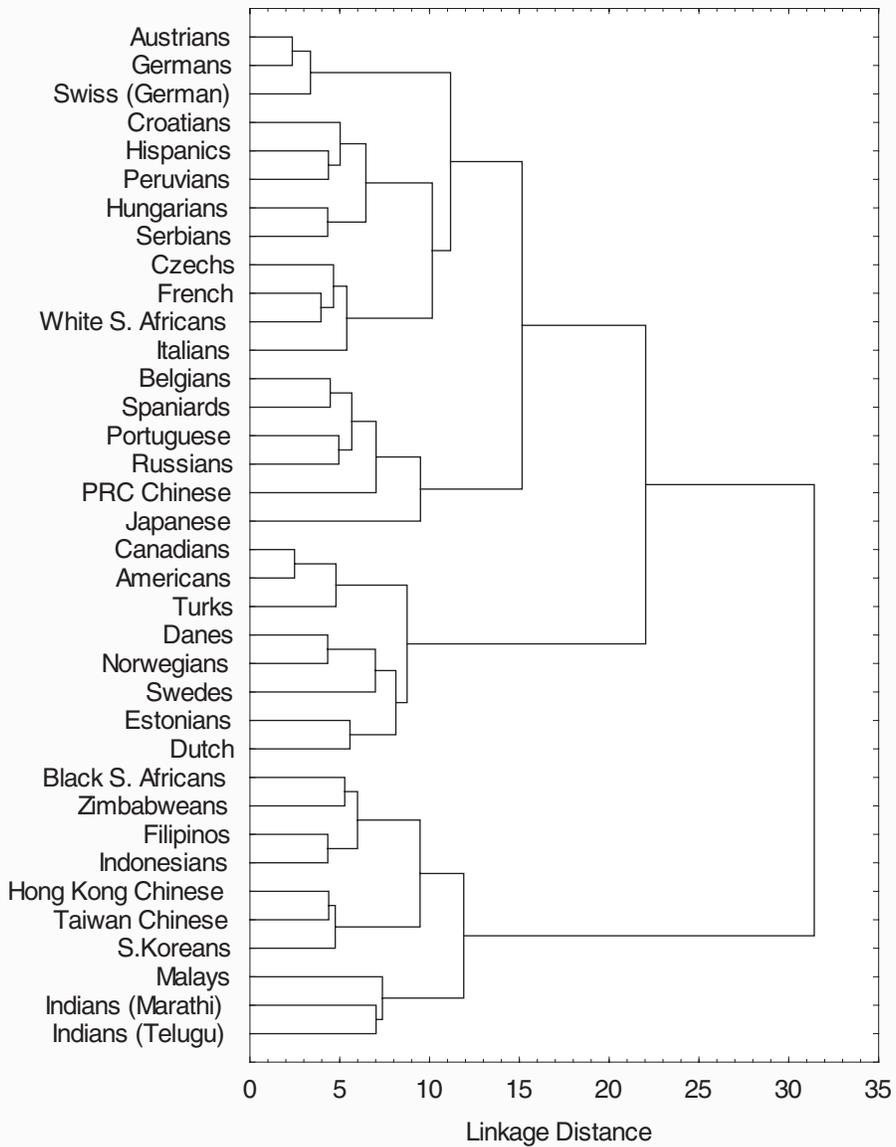
Figure 1:   Tree Diagram of Clusters of Cultures (Ward's Method)
NOTE: The horizontal axis represents the Euclidean distance between clusters; thus, cultures linked nearer the left side show closer resemblance on the 30 personality facets, standardized across cultures.

squared Euclidean distance between two cultures is simply the sum of the squared differences between the 30 corresponding facet *T*-scores presented in McCrae (2002), standardized across the 36 cultures. Ward's hierarchical clustering regards each culture as an initial cluster. At each step, it identifies the two closest clusters and combines them into a new cluster until all are linked. Results can be portrayed as a tree diagram; Figure 1 gives this diagram for the 36 cultures. Similar solutions were obtained when the five factors were input instead

of the 30 facets and when different distance metrics (1 - Pearson's *r*, Chebychev distance) were used.

Cultures with the most similar personality profiles are linked closest to the left side of the figure. Austrians and Germans show the greatest similarity; other close pairs include Hispanics and Peruvians, Hungarians and Serbians, French and White South Africans, Belgians and Spaniards, Portuguese and Russians, Canadians and Americans, Danes and Norwegians, Estonians and Dutch, Black South Africans and Zimbabweans, Filipinos and Indonesians, Hong Kong and Taiwan Chinese, and Marathi- and Telugu-speaking Indians. Although some of these links may be chance, it seems clear from this listing that the data are not random. Canada and the United States are neighbors; Indonesia and the Philippines share Malayo-Polynesian languages; Black South Africa and Zimbabwe have common ancestry; Hong Kong and Taiwan share Confucian traditions.

The structure continues to make geographic sense at higher levels of clustering. For example, South Koreans are next added to the cluster of Hong Kong and Taiwan Chinese; Malays are added to the cluster of Marathi- and Telugu-speaking Indians. All three German-speaking cultures (Austria, Germany, and German-speaking Swiss) form a single cluster. Ultimately, two clusters of broadly similar personality profiles are formed; the top branch consisting of European and American cultures, the bottom of Asian and African cultures. White South Africa is assigned to the top branch, presumably because it shares ancestry and cultural heritage with Europeans. The classification is not perfect—Japan and the Peoples Republic of China are joined with a mixed group of European and Latin American cultures, and Turkey is linked to the United States and Canada—but it appears to make some geographical sense.

MULTIDIMENSIONAL SCALING

Multidimensional scaling (MDS) provides an alternative way of portraying relations between cultures. MDS begins with a matrix of distances and assigns coordinates that represent the relative distances in a reduced (usually two-dimensional) space.[2] In Figure 2, we show results obtained when distance between cultures was defined as 1 minus the Pearson correlation across the 30 facet scores.[3] Cultures that are close together in Figure 2 thus have similarly shaped personality profiles. As in factor analysis, the actual orientation of axes in MDS is arbitrary. For that reason, we choose an orientation that maximized the dimensions' correlations with the two strongest correlates, neuroticism and extraversion. Note that Figure 2 is a mapping of cultures in a two-dimensional personality space, but it shows some correspondence to the mapping of countries on the globe.

The most notable feature of Figure 2 is the separation of European and American cultures (on the right) from Asian and African cultures (on the left). This generalization is not perfect. Croatia and Peru are isolated in the center of the figure, and, as in Figure 1, Japan appears closer to European than to other Asian cultures. At a purely descriptive level (and with several exceptions), it can be noted that the upper right quadrant includes chiefly Catholic cultures; the lower right, Protestant; the lower left, Muslim; and the upper left, Confucian cultures. By and large, cultures adjacent in the figure (such as France and Italy, Russia and Japan, or Canada and the United States) are geographically close; indeed, it appears that psychological distance in many cases parallels physical distance. Interestingly, these major cultural groups roughly correspond to similar clusters on a cultural map derived from the World Values Survey and defined by the two dimensions of traditional versus secular-rational values and survival versus self-expression values (Inglehart & Baker, 2000).
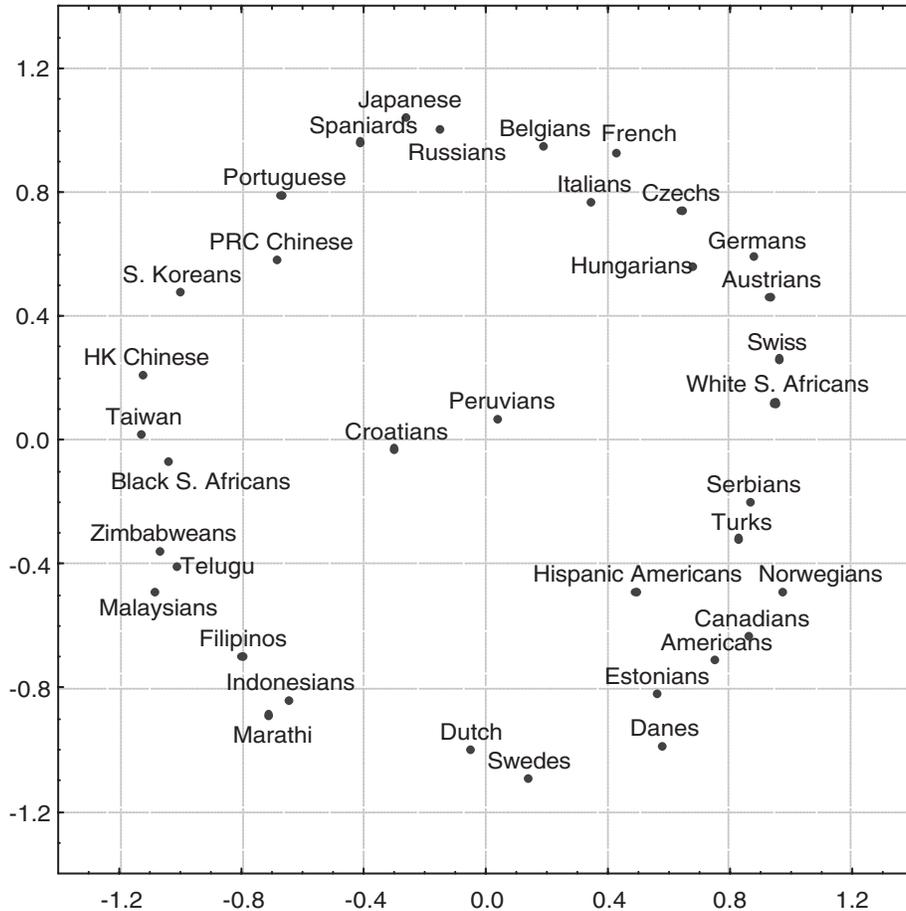
Figure 2: Multidimensional Scaling Plot of 36 Cultures
NOTE: As a mnemonic, it can be noted that North in the figure is associated with N (neuroticism) and East with E (extraversion; see Table 2).

Each culture has coordinates for the two axes in Figure 2, and these can be correlated with other variables to help interpret the figure. In Table 2, we present correlations of the two axes with the five personality factor scores, a set of socioeconomic indicators, and other culture-level variables.

As shown in Table 2, the horizontal axis in Figure 2 is positively associated with extraversion and openness and negatively associated with agreeableness. People from European and American cultures thus appear to be outgoing, open to new experience, and antagonistic, whereas people from Asian and African cultures are introverted, traditional, and compliant. Euro-American cultures are lower in power distance (i.e., they reject status hierarchies) and higher in individualism (i.e., they put self-interest before group interest); there is a trend ($p < .10$) for Euro-American cultures to be higher in postmaterialist values

TABLE 2.
Correlations of Multidimensional Scaling (MDS) Axes with
Personality Factors and Cultural Variables

Correlate	MDS Axis	
	Vertical (N)	Horizontal (E)
Personality factor (N = 36)		
Neuroticism	.86***	−.14
Extraversion	−.15	.82***
Openness	.24	.62***
Agreeableness	−.49**	−.48**
Conscientiousness	−.39*	−.34*
Hofstede dimension (N = 35)		
Power distance	.12	−.62***
Uncertainty avoidance	.69***	.14
Individualism	−.12	.62***
Masculinity	.40*	−.06
Inglehart cultural variable (N = 26)		
Post-materialist values	−.04	.36
Subjective well-being	−.28	.35
Interpersonal trust	−.44*	.07
Socioeconomic indicator		
GDP per capita, 1999 (N = 36)[a]	.10	.45**
Human Development Index[b] (N = 34)	.23	.53***
Gini Index[c] (N = 36)	−.14	−.40*
Subjective well-being (N = 23)	−.49*	.43*

SOURCE: Hofstede (2001); Inglehart (1997); Subjective well-being comes from Diener, Diener, and Diener (1995); Socioeconomic data come from Human Development Report (2001) and World Development Report (2002).
a. Taiwan data (2000) from http://www.hhs.se/personal/suzuki/a-English/Taiwan.html
b. This index is constructed from three components: life expectancy at birth, knowledge (literacy and school enroll-ment ratio), and GDP per capita.
c. A measure of income inequality.
*p < .05. **p < .01. ***p < .001.

such as self-actualization.[4] They also are generally wealthier, the income is more evenly distributed between members of the society, the quality of life is higher, and people are more satisfied with their lives. None of these findings is surprising.

The categorization of cultures along the vertical axis in Figure 2 is less familiar. Although adjacent cultures in the figure are often geographically close, the pattern as a whole does not correspond to any obvious geographical region or grouping. As Table 2 shows, cultures toward the top of the figure are high in neuroticism and low in conscientiousness; they are also high in uncertainty avoidance—that is, they adopt rules and routines to guard against stress and uncertainty. (The Japanese policy of national seclusion prior to 1853 is perhaps the most dramatic historical example of that strategy.) They are also low in interpersonal trust and subjective well-being. These findings are consistent with some other empirical literature (Iwata & Higuchi, 2000); for example, neuroticism in the Lynn and Martin (1995) study

correlates .62, $N = 20$, $p < .001$, with values on the vertical axis of Figure 2 in the subset of cultures common to the two studies. Because neuroticism and low conscientiousness are associated with many psychiatric diagnoses at the individual level (Watson & Clark, 1984; Yang et al., 2002), psychiatric epidemiologists might wish to examine the prevalence of psychiatric disorders with respect to variations along this axis (cf. Cohen, Slomkowski, & Robins, 1999).

DISCUSSION

These data are certainly not definitive. The number of cultures sampled is relatively small, and none of the samples was strictly representative of its culture. The scalar equivalence of most of the translations was assumed, not demonstrated, and all of the usual reasons for caution in cross-cultural comparisons apply. Yet, the results make it clear that culture-level self-report personality data show some regularity. Despite different investigators, translations, and sampling strategies, mean values from adjacent cultures show distinct similarities in personality profiles. That fact greatly simplifies the search for associations between personality traits and culture (McCrae, 2000) because it is now possible to group cultures together in meaningful ways that may suggest broad themes.

The present analyses offer little support for the age-old notion that climate is a major determinant of personality traits. Distance from the equator and temperature were associated with conscientiousness (although not in the expected direction); for all other personality factors, correlations were confounded with other variables. The primacy of human groups over geophysical locations is illustrated by the fact that Black and White South Africans had very different personality profiles, despite living in the same country for many generations. This conclusion would not surprise cultural geographers (Mitchell, 2000), who long ago gave up the hypothesis of environmental determinism.

This study's major contribution is the identification of a phenomenon not previously recognized—that is, the distribution of self-reported personality traits is organized geographically. Schwartz (1999) had previously shown a similar geographical grouping of cultures in a culture-level study of values, with European cultures in general high in affective and intellectual autonomy and Asian cultures high in conservatism and hierarchy. These findings appear to be consistent with the differences in extraversion and openness seen in Table 2.

However, two very large questions remain. The first is whether the patterns seen here represent real differences in personality or merely differences in self-reports. Cultures may differ in response styles or self-presentational strategies, conceivably giving rise to the differences seen here. Sagiv and Roccas (2000) noted an association at the individual level between traits and values. It is possible that traits like extraversion and openness are more valued and thus more readily endorsed in Western cultures, whereas cooperation and tradition are more valued in non-Western cultures. Such systematic biases could produce at least the horizontal axis in Figure 2. Observer ratings studies, perhaps using observers from outside the culture, might be necessary to resolve this issue. It is of interest, however, that in one such study (McCrae, Yik, Trapnell, Bond, & Paulhus, 1998), self-reports and observer ratings showed similar profiles.

The observed systematic pattern also calls into question social comparison theory, according to which people evaluate themselves relative to similar others (Heine, Lehman,

Peng, & Greenholtz, 2002). If self-reports in every culture were made relative to the norms of that culture, the mean differences between cultures should have diminished or disappeared completely. Although the reference group effect may potentially attenuate cross-cultural comparisons, it cannot explain the systematic variation and pattern of personality differences across the world.

If we assume that the personality differences discussed here are veridical, the last major question concerns their origin. Most psychologists would probably assume that geographical effects on personality profiles are the result of culture.[5] Cultural differences represent a wide array of environmental features, including language, customs, and beliefs, that separately, or in concert as an overarching ethos, might systematically shape traits. That is a powerful and plausible hypothesis because there are surely cultural differences between Eastern and Western countries—as the correlations with the Hofstede dimensions in Table 2 showand we know that these are associated with differences in numerous psychological processes (Kağıtçıbaşı & Berry, 1989). Further, acculturation studies (Heine, Lehman, Markus, & Kitayama, 1999; McCrae et al., 1998) show that immigrant groups sometimes come to resemble their hosts in the level of personality traits and self-esteem.

However, in an age when the human genome has been mapped, it has become necessary to consider seriously the possibility that some national differences in personality traits may have a genetic basis. Behavior genetic studies conducted within cultures have shown that much of the reliable variance in personality traits can be accounted for by genetic influences (Riemann, Angleitner, & Strelau, 1997). Of course, these studies do not logically entail that differences between cultures are necessarily the result of genetic influences, because behavior genetic studies speak only to the relative importance of different sources of variation within a population. However, evidence for a genetic basis of traits means that cultural differences might be the result of variation in the distribution of alleles of trait-related genes. Ethnic variations have already been reported for one gene thought to be related to personality (Gelernter et al., 1997).

Some evidence for this possibility is provided by studies of genetic distances, which reflect the extent of shared ancestry (Cavalli-Sforza et al., 1994). Genetic distances are given by Cavalli-Sforza et al. for 16 European cultures included in McCrae (2002); the correlation between genetic and personality profile distances across the 120 pairs of cultures was $r = .19$, $p < .05$ (Allik & McCrae, 2002). This correlation is modest in part because there is relatively little genetic differentiation within European countries and correspondingly little variation in mean personality levels. If the analysis were conducted on samples from around the world, larger associations would probably be found. Recall, however, that these correlations do not necessarily reflect causation; genetic similarity might simply be a marker of cultural similarity.

Acculturation studies and other natural experiments offer the only feasible way to disentangle genetic from cultural effects. Relatively few such studies have yet been conducted, but the preliminary results are intriguing. In a study of Hong Kong Chinese immigrants to Canada, McCrae et al. (1998) found that differences between Chinese and Canadians of European ancestry were progressively attenuated with longer residence in Canada; in particular, Canadian culture appeared to increase openness and agreeableness. But even Chinese born and raised in Canada were more introverted than Canadians of European ancestry, suggesting a possible inborn difference in temperament (cf. Prior, Kyrios, & Oberklaid, 1986).[6]

Another natural experiment was analyzed by Angleitner and Ostendorf (2000), who compared personality traits in residents of the former East and West Germanys. Between 1945

and 1989, these two groups had lived under radically different social and political systems, and they retain to this day significant differences in attitudes and values (Adler & Brayfield, 1997). Yet, personality profiles for the two samples were virtually identical. Former East Germans scored about a one-quarter standard deviation lower in openness than former West Germans, but they did not differ in neuroticism, extraversion, agreeableness, or conscientiousness. Those aspects of culture that were controlled by the political system did not appear to affect basic personality traits. These findings are consistent with the postulates of five-factor theory (McCrae & Costa, 1999), which distinguishes between personality traits —considered to be biologically-based basic tendencies—and attitudes and values, which are culturally-influenced characteristic adaptations.

CONCLUSION

Merely as description, complete and accurate assessments of mean personality profiles for all the cultures of the world would be of value to travelers, businesspersons, and diplomats. These mean values do not, of course, characterize each individual, but they do provide a sense of the typical personality that could facilitate cross-cultural interactions. Beyond that, the data would also provide important clues to the origin of personality traits and their interactions with culture in shaping both individual behavior and the collective ethos. We are still far from a complete geography of personality, in which the distribution of traits might be mapped like rainfall or population density. But the present analyses suggest that it is possible to move beyond stereotypes and ethnocentrism in characterizing the personality profiles of different cultures and regions. Continued research should provide not only more accurate descriptions but also eventually real explanations for these intriguing and important group differences.

NOTES

1. The latitude of Hong Kong was used for Hong Kong Chinese data; the latitude of Miami (where the data were collected) was used for Hispanic American data.

2. We examined 1- through 5-dimensional solutions. Although the stress value for the 2-dimensional solution (.19) was rather high, it appeared to offer a simple and meaningful model of the data. In solutions with more dimensions, the first two factors were essentially unchanged.

3. Facet T-scores are available from McCrae (2002). For the multidimensional scaling (MDS) analysis in Figure 2, facet scales were first standardized as z-scores across the 36 cultures. In preliminary analyses on the 26 cultures in McCrae (2001), we also examined solutions with a distance metric based on a profile-agreement statistic (McCrae, 1993) and on Euclidean distance. We considered profiles across the five factors and across the 30 facet scales. Finally, we also examined principal components analysis as an alternative to MDS. For these exploratory analyses, we elected to examine only the two largest dimensions. After alignment of the axes, all the MDS and principal components solutions were similar, with most congruence coefficients well in excess of .90. The MDS solution in this subset of 26 cultures is closely replicated in Figure 2, with congruence coefficients (across the 26 cultures in both analyses) of .97 and .98.

4. These associations resemble the personality/culture dimensions correlations reported in McCrae (2002) because the axes in Figure 2 are defined on the basis of those personality traits.

5. For example, Uba (1994) wrote that "people from different racial or cultural backgrounds presumably have the same potential range of personalities, but different cultures reinforce different personality traits" (pp. 60-61).

6. These effects might also be the result of the persistence of Chinese cultural influences in the families of Canadian-born Chinese.

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