

Adult Age Differences in Personality Traits in the United States and the People's Republic of China

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Life experiences for corresponding age cohorts in the United States (US) and the People's Republic of China (PRC) have been dramatically different. If cohort effects account for cross-sectional age differences in mean levels of personality traits, different patterns of age differences should be seen in samples from the US and the PRC. The present study examined scores on scales from the California Psychological Inventory (CPI; Gough, 1987) in US (N = 348, age = 19–92 years) and PRC (N = 2,093, age = 18–67 years) samples. Very similar patterns of age correlations were seen. To compare results to other cross-cultural studies, CPI scales were interpreted in terms of the Five-Factor Model (FFM) of personality; an FFM Age-Relatedness Index based on American data accurately predicted CPI age correlations not only in the US but also in the PRC sample. Results are consistent with the hypothesis that there are universal intrinsic maturational changes in personality.

CROSS-SECTIONAL studies of adult personality development are routinely criticized on the grounds that they confound true maturational changes with cohort differences. For example, men and women growing up during the Great Depression had very different life experiences from those who were raised in the 1960s, and any differences seen now between 70-year-olds and 40-year-olds might be due to those differences. Such an argument is based on the assumption that life experience, especially early life experience, is a major factor in shaping adult personality. Unfortunately, that assumption usually cannot be tested in cross-sectional studies, because cohort differences are confounded with maturational changes.

It is neither feasible nor ethical to manipulate the conditions of early life experience, but it is possible to estimate the effects of early environment on different age cohorts by comparative research in cultures with different recent histories. If cross-sectional age differences really reflect birth cohort effects, then to the extent that successive generations in two countries have had different collective experiences, the pattern of age differences (and thus age correlations) in the two countries might be expected to be different.

Consider the recent history of China. At the beginning of this century, most Chinese were poor, uneducated, and guided by centuries-old Confucian traditions. By 1925 (when the oldest participants in the present study were born), imperial rule had ended, some Western ideas had been introduced, and the country had been unified by the Nationalist party. The next quarter century was a time of conflict. Civil war between the Nationalist and Communist parties began in 1927. Invasion by the Japanese in 1937 led to the deaths of millions by disease, starvation, and warfare, vividly illustrated in the film *Red Sorghum*. It might be hypothesized that this prolonged period of stress would leave permanent psychological scars on those who experienced these events, and that today's older Chinese would be lower in measures of psychological adjustment and well-being.

After the defeat of Japan in 1945, the civil war resumed; peace came only with the establishment of the People's Republic of China (PRC) in 1949. In the period that followed, a new value system based on the thinking of Chairman Mao replaced Confucian values. Hard work, self-sacrifice, and social equality—especially for women—were emphasized. Although economic progress was slow, this was a period of hope, unity, and national pride. Children raised during this era might be hypothesized to be better adjusted and more altruistic than their parents.

Between 1959 and 1961, there were economic difficulties and food shortages. The Cultural Revolution began in 1966. This turbulent 10-year period was marked by intense criticism of status and authority. Power and prestige were given to laborers, peasants, and soldiers. The Red Guard overturned rules and customs in the service of the Revolution. Most books and films were banned. Children raised during this era—now in early middle age—might be expected to be low in norm adherence and achievement motivation, and intellectually closed.

The most recent period of Chinese history has seen the rise of new economic policies, increasing prosperity, and a return to respect for work and education. Because individual effort and initiative have been rewarded, one might hypothesize that today's young Chinese adults are high in achievement striving, but are also materialistic and individualistic.

The course of American history over the same time period was vastly different. The United States (US) began the twentieth century as one of the most prosperous and best-educated nations in the world, and remains so today. Although many Americans suffered during the Great Depression, the US has not seen any period of mass starvation. And although the US was involved in World War II, the Korean Conflict, and the Vietnam War, the US has not been invaded by foreign armies or torn by civil war in this century. In contrast to the violent political and ideological

shifts in China, the American tradition of democracy has been preserved as the government passed smoothly between Democrats and Republicans. Given the differences in the recent histories of the PRC and the US, it would not be surprising if the personality profiles of corresponding birth cohorts from these two cultures were very different.

The Nature and Form of Cohort Effects on Personality

By a *cohort effect* we mean a systematic variation in the mean level of a personality trait that characterizes people born in the same time and place and can be attributed to the environmental influences they have shared. Both personality theory and some research offer plausible reasons for thinking that collective historical experience might permanently affect individual personality. Sociological, psychoanalytic, and behavioristic approaches alike propose that personality is largely the result of life experience, and a number of theorists have attempted to show how large-scale sociological and cultural events can be translated into microenvironmental influences on the developing individual (e.g., Erikson, 1950; Fromm & Maccoby, 1970; Stewart & Healy, 1989). Patterns of child rearing, peer pressure, emotional trauma, educational styles, and vocational opportunities are among the mechanisms thought to influence personality.

Although some studies have reported that personality changes in adulthood are normative, unrelated to the experience of discrete life events (Helson & Wink, 1992), other research has documented some effects of social influences on adult personality. Stewart and Healey (1989), for example, showed that the American women's movement of the 1970s affected women's subsequent identities and behavior, although chiefly when they experienced the movement during adolescence and early adulthood. Kohn and Schooler (1982) found that complex and self-directed work led to longitudinal increases in intellectual flexibility. Eberly, Harkness, and Engdahl (1991) documented persistent changes in personality associated with the trauma of being a prisoner of war.

Such studies indicate the potential complexity of cohort effects. Different events may be experienced differently by men and by women, and by younger or older groups, and the effects might be seen for some personality traits and not others. Because historical influences wax and wane, birth-cohort effects seen in cross-sectional age differences in personality might show distinctly nonlinear patterns. For example, openness to experience might be higher in Chinese who experienced early adulthood either before or after, but not during, the anti-intellectual Cultural Revolution.

The present study was not designed to test specific hypotheses about the influence of particular experiences on specific personality traits in predefined birth cohorts. Instead, we are concerned with the more general question of the extent to which patterns of adult age differences in personality traits vary across samples with different histories of life experience. Chinese and American samples differ dramatically in this respect, and to the extent that personality is shaped by life experience, it can be hypothesized that Chinese and American cohorts will show markedly different patterns of age differences.

Cross-Cultural Studies of Adult Personality Development

The expectation of different patterns was not confirmed by the only extant study comparing Chinese and American samples. Labouvie-Vief, Diehl, Tarnowski, and Shen (1997) examined adult age differences on the scales of the California Psychological Inventory (CPI; Gough, 1987) in American and Chinese samples. Age group by culture ANOVAs showed significant age effects for 12 of the 20 CPI scales. In seven of these, the same pattern was seen in both cultures, and in three more, a significant interaction term was attributable to the fact that the Chinese sample showed a more pronounced version of the same trend seen in the American sample. In the remaining two instances, only the Chinese sample showed significant age differences. The authors concluded that "the study produced a surprising and consistent pattern of age differences" (p. 21), which suggested lower levels of extraversion and higher levels of control or norm orientation in older respondents in both cultures. Further, most trends were monotonic—the interruption of life during the Cultural Revolution was apparently not mirrored in a generational discontinuity in age trends.

Labouvie-Vief and colleague's (1997) unexpected findings gain some credibility from other cross-cultural comparisons. Adult personality development has been studied extensively in the US (e.g., Helson & Wink, 1992; McCrae & Costa, 1990) and some European countries (e.g., Krueger & Heckhausen, 1993). Comparative cross-cultural studies that include non-Indo-European samples are now beginning to appear (e.g., Haapasalo, 1990). In one of these, McCrae and associates (in press) examined adult age differences in the dimensions of the Five-Factor Model (FFM) as measured by the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992).

The FFM is a widely accepted taxonomy that describes most personality traits in terms of five common factors (Digman, 1990; McCrae & John, 1992). *Neuroticism* is defined by such traits as anxiety and self-consciousness and forms a dimension of psychological distress. *Extraversion* includes sociability, cheerfulness, and energy level. *Openness to Experience* is a broad dimension defined by intellectual interests, aesthetic sensitivity, and unconventional values. *Agreeableness* contrasts prosocial traits with ego-centric traits, and *Conscientiousness* includes both adherence to norms and purposefulness. The FFM has proven to be exceptionally useful in personality research because most existing personality inventories and scales can be interpreted within its framework (McCrae, 1989); it also appears to be a universal structure of personality (McCrae & Costa, 1997).

The NEO-PI-R has been translated into a number of different languages, and analyses of data collected using these translations showed similar patterns of age associations in the United States, Germany, Italy, Portugal, Croatia, and Korea: Midlife adults scored higher on measures of Agreeableness and Conscientiousness and lower on measures of Neuroticism, Extraversion, and Openness than did 18–21-year-olds. McCrae and colleagues (in press) argue that these data suggest that age differences in personality reflect universal maturational processes; further support for this

hypothesis is offered by analyses of Russian, Estonian, and Japanese data (Costa et al., 1997).

Although Labouvie-Vief and associates (1997) and McCrae and colleagues (in press) both found evidence for the cross-cultural generalizability of age differences in personality, it is not immediately clear whether the substantive findings from the two studies are consistent. Scales in the CPI and NEO-PI-R represent different constructs, developed for different purposes by different methods of scale construction. CPI scales, many developed by criterion-group item-selection methods, are supposed to assess folk concepts, "the kind of everyday variables that ordinary people use in their daily lives to understand, classify, and predict their own behavior and that of others" (Gough, 1987, p. 1). Because of the CPI's pragmatic, empirical basis, some of the CPI scales are quite heterogeneous in psychological content. By contrast, NEO-PI-R scales were developed through factor-analytic techniques to operationalize the FFM, a hierarchical taxonomy of personality traits.

The present article has two purposes. The first is to replicate Labouvie-Vief and colleagues' (1997) findings with the CPI; the second is to determine whether those findings can be interpreted in terms of common age trends in the dimensions of the FFM. The data to be used were collected earlier for other purposes (McCrae, Costa, & Piedmont, 1993; Yang & Gong, 1993), making a strict replication of the Labouvie-Vief study impossible. In particular, the US sample includes very few young respondents, so age group by culture ANOVAs with the same age groupings are not feasible. Instead, we will compare linear trends in the two cultures by examining correlations of age with CPI scales. If these correlations are significantly different, and especially if they are opposite in sign, it will suggest an interaction of age with culture that could probably be attributed to cohort effects.

A comparison of simple correlations is appropriate only if the relations between age and personality traits are linear. The fact that most of the effects reported by Labouvie-Vief and associates (1997) were monotonic makes this assumption plausible; however, a first step in the analysis will be to ascertain whether there are significant curvilinear effects.

Predicting Age Correlations: The FFM Age-Relatedness Index

The second purpose of the present study is to test the hypothesis that age differences on CPI scales can be explained in terms of the age differences in FFM factors consistently seen in other samples (McCrae et al., in press). Specifically, we hypothesize that CPI scales will be positively correlated with age if they are positively related to Agreeableness and Conscientiousness factors or negatively related to Neuroticism, Extraversion, and Openness factors.

Despite the differences in rationale and development between the CPI and measures of the FFM, meaningful associations between CPI scales and the factors measured by the NEO-PI-R have been reported (McCrae et al., 1993). Knowledge of these associations makes it possible to interpret CPI scales in terms of the FFM and thus to hypothesize age differences in CPI scales on the basis of age differences in the five factors. For example, CPI Good Impression is inversely related to FFM Neuroticism, and Neuroticism ap-

pears to decline with age; thus, it can be hypothesized that Good Impression scores should increase with age.

Instead of one-to-one correspondences, however, most CPI scales appear to be complex blends of two or more of the five FFM factors. For example, CPI Social Presence and CPI Independence are positively correlated with both Extraversion and Openness; in addition, Independence shows a substantial negative correlation with Neuroticism. (These correlations are reproduced in the Appendix.) The multidimensionality of CPI scales complicates the prediction of age correlations. Because CPI Social Presence is positively correlated with both Extraversion and Openness, and because both Extraversion and Openness were found by McCrae and colleagues (in press) to show cross-sectional declines with age, it is relatively straightforward to predict that Social Presence will also decline with age. But the case of CPI Independence is more complex. It, too, is positively related to Extraversion and Openness and thus might be expected to show a negative correlation with age. But Independence is also negatively related to Neuroticism, which McCrae and colleagues found to be inversely related to age. That fact suggests that Independence should show a positive correlation with age. Together, these conflicting predictions imply that on balance, Independence should not be strongly related to age.

Predictions about CPI age trends can be quantified by the use of an FFM Age-Relatedness Index that predicts the strength and direction of a scale's correlation with age on the basis of the scale's correlations with the FFM factors. For each CPI scale, that index is formed by adding the scale's correlations with Agreeableness and Conscientiousness (which increase with age), and then subtracting its correlations with Neuroticism, Extraversion, and Openness (which decrease with age). In the US sample studied by McCrae and associates (1993), correlations of Social Presence with Agreeableness, Conscientiousness, Neuroticism, Extraversion, and Openness were $-.14$, $-.18$, $-.17$, $.49$, and $.42$, respectively. The FFM Age-Relatedness Index for this scale is thus $(-.14) + (-.18) - (-.17) - .49 - .42 = -1.06$. Similarly, the FFM Age-Relatedness Index for Independence is $(-.22) + .10 - (-.42) - .35 - .35 = -.40$. Thus, Social Presence should show a stronger negative correlation with age than Independence does. FFM Age-Relatedness Index values for all CPI scales are presented in the Appendix. The hypothesis that CPI age trends can be accounted for by age differences in the factors of the FFM can be tested by calculating rank-order correlations between observed age correlations and the FFM Age-Relatedness Index.

Note that the FFM Age-Relatedness Index is based on correlations of CPI scales with NEO-PI factors in the US. Using the index to predict age correlations in the PRC depends upon the assumption that personality structure and measurement is essentially equivalent in the two cultures (cf. McCrae & Costa, 1997). The present study thus provides a stringent test of the hypothesis of universals in both adult personality structure and adult development.

Inferring Maturation From Cross-Sectional Data

The present study is limited to the analysis of cross-sectional data, and as such it offers no direct evidence on

changes in personality, and still less on changes due to intrinsic maturation. But, in fact, maturation is never directly observable and must always be inferred from a pattern of results (Costa & McCrae, 1982). Cross-sectional age differences might be due to maturation, but in most studies generational cohort effects offer a powerful alternative hypothesis. In the present study, the very different histories of the US and the PRC make it unlikely that the same pattern of cohort effects would be seen in the two countries. If the same cross-sectional age differences are seen, it is correspondingly more likely that they are due to maturation.

That interpretation would be bolstered by a broader pattern of results. Secular changes, such as the women's movement in the US and the even more dramatic change in the status of women in China during this century, might be expected to have different effects on men and women, leading to different age correlations when men's and women's data are analyzed separately. If instead the pattern of age correlations is very similar for men and women, the data are more consistent with the hypothesis of universal maturational processes.

Again, inferring universal maturation from a comparison of two cultures, however different, is highly speculative. But if the age correlations of CPI scales are predictable from their FFM Age-Relatedness Index scores, then these results will be consistent with a broader pattern of findings from 10 different cultures (Costa et al., 1997). Longitudinal research using direct measures of the FFM in China and other cultures would, of course, provide the ideal test of these maturational interpretations.

METHOD

Participants

Data analyzed in the present study are from two samples. The Chinese sample consists of 1,159 men and 934 women selected from 14 cities in the PRC. Data were collected by the first author and colleagues (psychologists and psychiatrists) in a collaborative team in the PRC from 1989 to 1991. Participants were recruited by word of mouth, but an effort was made to obtain a sample with proportional representation of the population of men and women aged 18–67 years (Yang & Gong, 1993). The mean age of the group was 34.3 years. Analyses of the Chinese data are the major focus of this article; because the sample size is large, only effects significant at $p < .001$ are considered significant.

For comparison, data from a US sample are also examined. The sample consisted of volunteer participants in the Baltimore Longitudinal Study of Aging (BLSA; Shock et al., 1984) or adults originally recruited as peer raters of BLSA participants (see McCrae et al., 1993). Sampling in the BLSA was by a snowball technique, in which most new participants were recruited by friends or relatives already in the study; peer raters were friends or neighbors nominated by the targets. Both groups consisted of generally healthy, well-educated volunteers (McCrae & Costa, 1987). Although formal comparisons have not been made for all five factors, BLSA participants are known to resemble the general population in levels of Neuroticism, Extraversion, and Openness (Costa et al., 1986). The 153 men ranged in age

from 27–92 years; the 195 women were aged 19–89 years at the time the CPI was administered in 1987. With a mean age of 59.1 years, the US sample was nearly 25 years older than the PRC sample. Differences between the US and PRC samples in terms of age, education, and sampling method tend to work against the hypothesis of common age trends and make any similarities in the pattern of age differences more remarkable.

Measures

The California Psychological Inventory (CPI; Gough, 1987) has 20 folk-concept scales and three vectors that summarize major themes underlying the scales (see Appendix). Scales related to the Internality vector (such as low Dominance and low Sociability) measure aspects of social orientation. Scales related to the Norm-Favoring vector (e.g., Socialization and Achievement via Conformance) are concerned with self-discipline and rule-following. Finally, scales related to the Self-Realization vector (e.g., Achievement via Independence and Well-Being) contain themes of self-actualization and psychological adjustment. Detailed descriptions of the individual scales are given in the manual.

For the US sample, the inventory was administered in the original English format. For the Chinese sample, the CPI was translated into Mandarin Chinese and adapted by Yang and Gong (1993). Internal consistencies for the Chinese CPI scales ranged from 0.45 (for Femininity) to 0.84 (for Self-Control), with a mean of 0.67; these values are comparable to those from the original English version for the US normative sample. Evidence on the construct validity of the Chinese scales is presented elsewhere (Yang & Gong, 1993). Note that a different translation was used by Labouvie-Vief and colleagues (1997).

All CPI scales and vectors are scored from a pool of 462 items, and there is substantial item overlap. Consequently, CPI scales are not statistically independent. Because different scales may be of interest to different readers, we present analyses of all 23 scales and vectors; the reader is cautioned, however, that these do not constitute 23 independent tests of age trends.

RESULTS

Changing historical circumstances might create nonlinear cohort effects: for example, Chinese children raised in the 1950s might be better adjusted than those raised either before, in the period of civil war, or after, during the Cultural Revolution. The first analysis, therefore, examined the shape of the age/personality associations. As a check on curvilinearity, scores on each of the 23 CPI scales were predicted from age and age-squared in 46 separate multiple regressions in Chinese men and women. The age-squared term did not contribute significantly to the prediction of any of the CPI scales among women, implying that relations were essentially linear. Among men, there was a significant effect on the Internality vector, as well as on five scales related to (low) Internality: Dominance, Sociability, Social Presence, Self-Acceptance, and Independence. Examination of means within successive age groups showed similar patterns for all these scales; Figure 1 illustrates these findings by plotting means for the Internality vector. Internality

was lowest (and Dominance, Sociability, etc., were highest) in the group aged 22–30 years. In contrast to late adolescents in the US, Italy, Croatia, and Korea, Chinese men aged 18–21 appear to be slightly more introverted than young adults. The effect is not large, however—they are still more

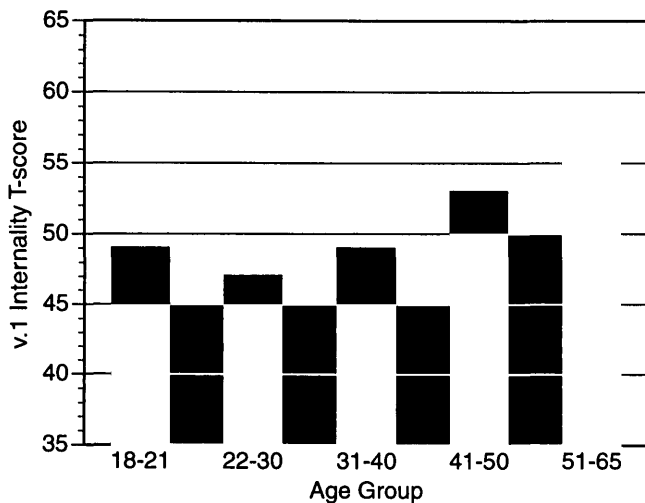


Figure 1. Mean CPI v.1 Internality scores for five groups of Chinese men. *T* scores have a mean of 50 and a standard deviation of 10.

extraverted than Chinese men over age 40—and the remainder of the analyses are based on linear correlations.

Table 1 presents correlational results. The first two columns summarize findings reported by Labouvie-Vief and colleagues (1997); the next two show correlations with age in the present US sample for men and women, and the next two columns report correlations with age in the PRC sample. The CPI scales have been arranged in descending order of their FFM Age-Relatedness Index value, which is presented in the last column. Inspection of the table shows that Labouvie-Vief and colleagues' (1997) results are generally robust: With only four exceptions (Communality in men and women and Realization and Tolerance in women), every effect reported by Labouvie-Vief and associates is replicated by significant correlations in Chinese men and women, and most are also replicated in the US sample.

Further, the results are generalizable across gender. In neither the US nor the PRC samples were there any significant ($p < .001$) differences between the age correlations of men and women. A comparison of age correlations for the combined male and female samples in the US and the PRC did show some significant sample differences (indicated by a footnote in Table 1), which might be attributable to cultural differences or to the mean age difference of nearly 25 years. Age effects are smaller (though in the same direction) in the US sample for Self-Control, Good Impression,

Table 1. Age Effects on CPI Scales in Labouvie-Vief and Colleagues (1997) and Correlations With Age in the Present Samples

CPI Scale	Age Effect ^a		Correlation With Age				FFM Index
	US (285)	PRC (450)	US		PRC		
			Men (153)	Women (195)	Men (1159)	Women (934)	
Sc (Self-Control) ^b	up	up	.26	.15	.45	.45	1.47
Gi (Good Impression) ^b	up	up	.21	.14	.40	.40	1.18
v.1 (Internality) ^c	—	—	.25	.19	.18	.22	1.10
v.2 (Norm-Favoring) ^c	—	—	.40	.22	.36	.36	.93
So (Socialization)	up	up	.33	.02 n.s.	.34	.28	.84
Re (Responsibility)	up	up	.23	.17	.26	.17	.60
Wb (Well-Being) ^b	up	up	-.01 n.s.	-.13 n.s.	.19	.18	.55
Ac (Achievement via Conformance) ^b	up	up	.21	.02 n.s.	.36	.33	.55
v.3 (Realization) ^c	—	—	-.01 n.s.	-.19	.10	.08 n.s.	.25
F/M (Femininity/Masculinity)			.30	.14 n.s.	.31	.23	.19
To (Tolerance)		up	.03 n.s.	-.14 n.s.	.13	.05 n.s.	.18
Py (Psychological Mindedness) ^b			.03 n.s.	-.22	.12	.17	-.04
Ie (Intellectual Efficiency)			-.12 n.s.	-.17	.05 n.s.	-.03 n.s.	-.08
Ai (Achievement via Independence) ^b			-.10 n.s.	-.21	.02 n.s.	.01 n.s.	-.23
Cm (Communality) ^b	up	up	-.12 n.s.	-.25	.04 n.s.	.02 n.s.	-.26
In (Independence) ^b			-.23	-.16	.03 n.s.	-.02 n.s.	-.40
Cs (Capacity for Status)			-.04 n.s.	-.17	-.17	-.14	-.47
Do (Dominance) ^b			-.22	-.14 n.s.	.08 n.s.	.03 n.s.	-.65
Sy (Sociability)			-.11 n.s.	-.17	-.11	-.15	-.70
Em (Empathy)	down	down	-.20	-.28	-.25	-.30	-.82
Fx (Flexibility)	down	down	-.22	-.23	-.32	-.30	-.84
Sa (Self-Acceptance)		down	-.31	-.17	-.11	-.20	-.97
Sp (Social Presence)	down	down	-.36	-.29	-.31	-.32	-1.06

Notes: Except as indicated, all correlations are significant at $p < .05$ in the US sample and $p < .001$ in the PRC sample. CPI = California Psychological Inventory. FFM Index = Five-Factor Model Age-Relatedness Index (see text). *Ns* are given in parentheses.

^aDirection of significant age-difference effects in Labouvie-Vief and colleagues (1997).

^bCorrelations in the total US and PRC samples differ significantly, $p < .001$.

^cNot analyzed in Labouvie-Vief and colleagues (1997).

and Achievement via Conformance; significant negative correlations with age are seen for Dominance, Independence, Communion, and Achievement via Independence in the US sample but not the Chinese; and Well-Being and Psychological Mindedness show opposite trends, with lower scores in older Americans and higher scores in older Chinese.

Despite these significant differences, the overall pattern is one of striking similarity: The six rank-order correlations between pairs of the four columns of correlations in Table 1 range from .77 to .98, all $p < .001$. To test the hypothesis that these consistent age trends on CPI scales reflect the universal influence of age on the factors of the FFM, we examined relations between the observed CPI correlations with age and the FFM Age-Relatedness Index (see the last column of Table 1). The index clearly orders the age correlations: In general, significant positive correlations are found at the top of the table, significant negative correlations at the bottom, and nonsignificant correlations in the middle. Self-Control, with the largest FFM Age-Relatedness Index, shows the strongest age correlation in Chinese men and women. Across all 23 scales, rank-order correlations between the observed CPI/age correlations and the FFM Age-Relatedness Index were .89, .80, .93, and .94 for American men and women and Chinese men and women, respectively, all $p < .001$. Even though the FFM Age-Relatedness Index was based on American data, it works better in predicting Chinese than American age correlations—presumably because the much larger Chinese samples yield more accurate age correlations. These data from a Chinese sample are consistent with the hypothesis of universal age changes in Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness.

DISCUSSION

Although culture and history doubtless affect attitudes, beliefs, and habits, our analyses offered little support for the view that historical cohort effects are major determinants of cross-sectional age differences in personality traits. Despite their stressful early lives, older Chinese were higher, not lower, in CPI Well-Being than younger Chinese. Despite the anti-intellectual climate of the Cultural Revolution, there were no curvilinear effects for Openness-related CPI scales such as Psychological Mindedness and Flexibility. Despite the recent rise of private enterprise and the encouragement of individual effort, the youngest Chinese cohort is lower than older cohorts in Achievement via Conformance, and no different in Achievement via Independence. Despite dramatic changes in the status of women relative to men across this century, there were no differences in age correlations for men and women. Chinese history does not seem to have made a unique imprint on the personality traits of these successive cohorts; instead, the same pattern of age differences is seen as that reported in the United States.

In 2 of 23 comparisons—for Well-Being and Achievement via Independence—correlations for American and Chinese samples showed opposite signs. These might be considered as evidence of a culture by age group interaction, perhaps attributable to culture-specific cohort effects.

But it is also possible that they are due to chance: Comparable disordinal interactions for these two scales were not found by Labouvie-Vief and colleagues (1997).

With a few exceptions (such as the significant age effects for Communion in the Labouvie-Vief study), results are strikingly consistent across samples and cultures. The similar age correlations might possibly be attributable to cohort effects common to the US and the PRC, such as the rise of the mass media or advances in medical health. This century has seen the development of a global culture, at least among industrialized nations, and many environmental influences are now shared worldwide. But it is not immediately clear how such influences would account for the observed pattern of age differences, and it would be difficult to explain why environmental influences common to the US and the PRC affect personality traits, whereas those that are unique to one country or the other seem to have so little effect. Common sampling biases or selective mortality might also, in principle, account for the similar age correlations, but a more parsimonious and plausible explanation is that these age differences are normative (cf. Helson & Wink, 1992), reflecting universal and intrinsic maturational processes.

The idea that there might be intrinsic, biologically based changes in adult personality is consistent with recent evidence from two quite different sources. Comparative animal studies have shown cross-sectional age difference in chimpanzees (King, Landau, & Guggenheim, 1998) and longitudinal changes in rhesus monkeys (Suomi, Novak, & Well, 1996) that follow trends similar to those seen in humans. For example, paralleling the human decline in Extraversion and increase in Agreeableness, Suomi and colleagues (1996) noted that “the rhesus monkeys in [their] study became less physically active and more affiliative with advanced age” (p. 1121). In human behavior genetics studies, McGue, Bacon, and Lykken (1993) reported data suggesting that personality changes in early adulthood are in part genetically determined; genes might provide a mechanism to explain age changes and differences.

More direct evidence for true maturational effects in human beings comes from longitudinal studies. Helson and colleagues (Helson & Moane, 1987; Helson & Wink, 1992) examined CPI scale scores at ages 43 and 52 in a sample of college women initially studied at age 21. Some of the significant changes they found, such as declines in Socialization and Femininity, were inconsistent with our cross-sectional findings. But most of the changes they reported—including increases in Self-Control, Psychological Mindedness, Responsibility, Good Impression, and Norm-Favoring, and a decline in Flexibility—follow the same pattern seen in Chinese men and women cross-sectionally. Dudek and Hall (1991) reported 25-year retest data for a sample of 48 male architects and showed small decreases in Social Presence, Self Acceptance, and Flexibility, and increases in Socialization, Self-Control, and Good Impression—all consistent with the cross-sectional age trends in the present study.

Other longitudinal studies, using different instruments, have shown similar changes in related variables. For example, McGue and colleagues (1993) found increases in scales measuring achievement and control, and Mortimer, Finch,

and Kumka (1982) reported a decline in sociability. By interpreting these scales in terms of the FFM—the former as measures of Conscientiousness and the latter as a measure of Extraversion—these data can be seen to support the present findings.

The FFM has often proven useful as a framework for integrating studies that use different trait constructs and different instruments (McCrae & John, 1992). Results of the present study suggest that it can also be used to organize findings about adult age differences. The FFM Age-Relatedness Index developed here to interpret CPI scales may have wider applicability: If age changes in personality are replicable across instruments as well as cultures, then the correlation, among adults, of age with any personality scale ought to be predictable from an index based on the correlations of that scale with the five FFM factors.

The Rate and Extent of Personality Change Across Cultures

Previous summaries of the American research literature (Costa & McCrae, 1994) have concluded that most personality changes occur before age 30, with only very modest changes thereafter. That generalization is only partially consistent with the Chinese data examined here. Age correlations were generally linear, not only from ages 18–30, but beyond age 30 as well. These results are consistent with Gong's (1984) work in a Chinese sample showing lower Neuroticism and Extraversion scores in each successive age group across the age range from 20–60 years. It is possible that there are reliable cultural differences in the rate of change of personality traits in later adulthood. Longitudinal studies would be particularly useful in testing that hypothesis.

In general, the largest age correlations in the Chinese sample are with scales known to be related to Conscientiousness: Self-Control, Good Impression, Achievement via Conformance, (low) Flexibility, and Norm-Favoring (see Appendix). Age correlations for these scales in the American sample are generally lower, significantly so in the cases of Self-Control, Good Impression, and Achievement via Conformance. That difference might be due to the fact that the US sample is almost 25 years older than the Chinese sample, covering a portion of the lifespan in which personality change occurs at a slower rate.

But similar results in age-matched samples were reported by Labouvie-Vief and colleagues (1997), suggesting that, in addition to intrinsic maturational effects, there may also be small cohort differences. Perhaps older Chinese raised under Confucian precepts of duty and modesty and middle-aged Chinese raised under Maoist ideals of hard work and self-sacrifice internalized those values, and thus score higher on measures related to Conscientiousness (and Agreeableness) than do younger Chinese, who have lived much of their lives in a consumer-oriented, individualistic society. Some evidence in support of this cohort hypothesis is provided by a study comparing younger and older Chinese adults in rural and urban areas (Ying & Zhang, 1992). Younger Chinese from urban areas—where most modernization has occurred—scored lower than older urban Chinese on Norm-Favoring, but no significant age differences were found for the rural Chinese.

Even if cohort differences are added to maturational changes, it is important to note that few of the age correlations are large in magnitude. Across the span from 18–65 years, age never accounts for more than one fifth of the variance in CPI scale scores; the median absolute correlation is only .18, accounting for 3% of the variance. In US samples, stable individual differences are much more important than age in predicting adult personality scores (McCrae & Costa, 1990); longitudinal studies of personality stability are needed to determine whether that is also true in the PRC.

Conclusion

Like other recent studies, the present research demonstrates cross-cultural similarities in patterns of adult age differences in personality traits. Although age correlations are not large, they are consistent across samples differing dramatically in culture, language, and recent history. Agreeableness and Conscientiousness are higher in older groups whereas Neuroticism, Extraversion, and Openness are higher in younger groups. Although these effects might be due to historical trends of modernization shared by many nations, culture-specific cohort effects, long thought to be a major determinant of cross-sectional age differences, seem here to be relatively unimportant.

It cannot be seriously maintained that life experiences—and the collective experiences of different age cohorts—do not have major effects on every individual. People who grew up during the Great Depression (Elder, 1974) or the Cultural Revolution retain vivid memories of the era; their politics, vocations, tastes, interpersonal relationships, and other characteristic adaptations (McCrae & Costa, 1996) are all likely to have been influenced by these events. But personality traits like those measured by the CPI appear to represent a deeper level of the person and might better be construed as endogenous basic tendencies (McCrae & Costa, 1996). Personality traits influence habits, tastes, and values, but they themselves do not appear to be greatly influenced by normal life experience. Instead of assuming that history shapes personality traits, it may be more fruitful to hypothesize that history and personality traits interact in shaping characteristic adaptations and the course of each person's life.

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Appendix.

Calculation of the FFM Age-Relatedness Index

CPI Scale	Correlation With NEO-PI Factor					FFM Index
	A	C	N	E	O	
Do (Dominance)	-.23	.13	-.25	.55	.25	-.65
Cs (Capacity for Status)	.04	.02	-.21	.36	.38	-.47
Sy (Sociability)	-.02	.01	-.23	.64	.28	-.70
Sp (Social Presence)	-.14	-.18	-.17	.49	.42	-1.06
Sa (Self-Acceptance)	-.15	.00	-.07	.56	.33	-.97
In (Independence)	-.22	.10	-.42	.35	.35	-.40
Em (Empathy)	.07	-.08	-.12	.51	.43	-.83

continues next page

Appendix (continued)

CPI Scale	Correlation With NEO-PI Factor					FFM Index
	A	C	N	E	O	
Re (Responsibility)	.19	.28	-.20	-.01	.08	.60
So (Socialization)	.14	.25	-.27	.01	-.19	.84
Sc (Self-Control)	.28	.31	-.37	-.25	-.26	1.47
Gi (Good Impression)	.22	.32	-.48	-.02	-.14	1.18
Cm (Communality)	-.14	.07	-.03	.23	-.01	-.26
Wb (Well-Being)	.08	.18	-.45	.16	.00	.55
To (Tolerance)	.28	.10	-.08	.07	.21	.18
Ac (Achievement via Conformance)	.02	.37	-.36	.18	.02	.55
Ai (Achievement via Independence)	.06	.01	-.17	.07	.41	-.24
Ie (Intellectual Efficiency)	.05	.03	-.30	.14	.32	-.08
Py (Psychological Mindedness)	-.04	.07	-.31	.05	.33	-.04
Fx (Flexibility)	.17	-.40	.06	.13	.42	-.84
F/M (Femininity/Masculinity)	.45	.13	.40	-.03	.01	.20
v.1 (Internality)	.26	.05	.12	-.57	-.34	1.10
v.2 (Norm-Favoring)	-.02	.39	-.27	-.02	-.27	.93
v.3 (Realization)	.18	.09	-.37	.14	.26	.24

Note: The FFM Age-Relatedness Index is calculated for each CPI scale by combining its correlations with the five NEO-PI factors in McCrae and colleagues (1993; adapted here) according to the formula. FFM Age-Relatedness Index = $r_A + r_C - r_N - r_E - r_O$.

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