Age Differences in Adult Personality:
Findings From the United States and China

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This study used samples of adults from the United States (n = 285) and the People’s Republic of China (n = 450) to examine age, gender, and culture differences in personality. Participants in both samples ranged from 20 to 87 years of age and responded to the California Psychological Inventory (CPI). Factor analyses of the CPI resulted in 4 personality factors (i.e., extraversion, control/norm orientation, flexibility, femininity/masculinity), with high congruence across cultures after targeted rotation. Multivariate analyses of variance with scale scores revealed significant Age Group 3 Culture and Gender 3 Culture interactions, and significant main effects of age, gender, and culture. Specifically, negative age differences were found for scales that loaded on extraversion and flexibility, with older adults having lower scores on these scales. In contrast, positive age differences were found for scales indicative of control/norm orientation. In general, age differences were more pronounced for Chinese adults than for U.S. adults.

There has been considerable interest in whether personality displays change or stability as a function of age. One major position in the field has maintained that personality reflects a set of stable dispositions or traits that display little if any change over the adult life span (e.g., Costa & McCrae, 1988). In contrast, another major position (e.g., Bloom, 1964; Haan, Millsap, & Hartka, 1986; Helson, 1993) holds that personality is best examined from the perspective of change, with particular emphasis on how contextual variables affect the relationship between inner resources and outcomes.

A considerable body of research suggests that intra-individual stability is substantial, even over long time periods. Costa and McCrae (1980, 1988; McCrae & Costa, 1990), for example, have provided evidence in support of the position that personality traits show high intraindividual stability, even over intervals as long as 30 years (Costa & McCrae, 1994). These findings are complemented by a host of other studies on personality development in adulthood (Conley, 1984, 1985; Leon, Gillum, Gillum, & Gouze, 1979; Schaie, 1996; Schaie & Willis, 1991; Schmitz-Scherzer & Thomae, 1983; Stiegl, George, & Okun, 1979).

As far as mean age differences are concerned, several studies have reported consistent age differences on selected personality dimensions. For example, Eysenck and Eysenck (1975) reported that younger adults scored higher on measures of Neuroticism and Extraversion than older individuals. Older individuals, on the other hand, scored higher on scales of Social desirability. Costa and McCrae (1989) also provided cross-sectional confirmation of these trends: College students scored higher on measures of Neuroticism, Extraversion and Openness to Experience, and scored lower on Agreeableness and Conscientiousness than did older adults. Data from the Revised NEO-PI confirm these patterns (Costa & McCrae, 1992a). In contrast, these cross-sectional trends were not necessarily confirmed by longitudinal data (Helson, 1998). On one hand, longitudinal data confirmed that there were fairly substantial changes on such variables as responsibility, self-control, good impression—indices of the California Psychological Inventory (CPI) vector of norm orientation. However, changes related to extraversion and openness/flexibility may not parallel the age trends of cross-sectional studies. This suggests that cohort may play an important role in patterns of personality change across the life span.

As noted, among the best replicated age differences/age changes have been increases in well-controlled and pleasant behavior. For example, Helson and Wink (1992) reported increases from the 40s to the 50s in responsibility, self-control, and good impression as well as norm-orientation—the vector on which these three variables load. Cartwright and Wink (1994) similarly, reported changes related to norm orientation in a sample of women physicians: From their 30s to their 40s, these women also increased in responsibility, self-control, and good impression. In a similar vein, Jones and Meredith (1996) reported increases in dependability in young adults, whereas Field and Millsap (1991) reported increases in agreeableness in their very old sample from the Berkeley Older Generation Study. At the same time, individuals also have been reported to decrease in neuroticism (Costa & McCrae, 1988) and negative emotionality; increases have been shown in positive emotionality (Helson & Klohnen, 1998).

Such findings of self-reported increases in agreeable and well-controlled behavior have also been supported by cross-sectional studies. Because they confound individual and cohort-related change (Schaie, 1996), such studies do not permit us to speak to issues of change and stability in a non-ambiguous way. Still, congruence between longitudinal and cross-sectional results is particularly strong evidence relating to such issues. In this regard, Costa and McCrae (1992a) have shown in cross-sectional studies that the “Big Five” display a fairly consistent...
pattern of age differences across the adult life span: Small declines have been found for Neuroticism, Extraversion, and Openness to Experience, whereas Agreeableness and Conscientiousness have shown small increases.

In an indirect way, these studies are supported by research examining how older individuals regulate their behavior. In general, this literature suggests that as a group, older individuals regulate their behavior in well-socialized ways that place emphasis on the reinterpretation of negative situations and the transformation of negative into positive affect, rather than the dwelling on and acting out of negative affect (Aldwin, 1994; Brandstädter & Greve, 1994; Diehl, Coyle, & Labouvie-Vief, 1996). Again, however, there is some indication that different social contexts play a role in differentiating patterns of change in older individuals (e.g., Maas & Kuypers, 1974; Neugarten, 1968).

The research reviewed so far suggests that there may be some fairly replicable patterns of cross-sectional and longitudinal personality differences and changes. Nevertheless, many authors have pointed out that the case for stability and replicable age-related patterns of mean differences should not be overstated. For example, on the side of intra-individual stability, contextually oriented personality psychologists have pointed out that though stability coefficients often are substantial, they tend to be moderate. Further, change patterns vary by personality characteristic and according to context. In that vein, Jones and Meredith (1996) showed, using participants in the Berkeley Guidance Study and Oakland Growth Study, that change was observed during specific time periods and was usually time limited. Similarly, Helson and her colleagues have reported that patterns of individual change often reflect a response to the social context as well as to different constellations of intrapersonal resources (Helson, Mitchell, & Moane, 1984; Helson & Moane, 1987; Helson, Stewart, & Ostrove, 1995; Helson & Wink, 1992; see also York & John, 1992). Thus, attempts to examine context-related variability in age-related personality patterns have begun to receive considerable attention.

In terms of contextual variations, those related to culture have begun to receive interest (cf., McCrae et al., 1999; Yang, McCrae, & Costa, 1998). For example, McCrae and colleagues (1999) have supported their position on personality stability across adulthood by presenting cross-cultural data, showing that a very similar pattern of age differences held for samples from Germany, Croatia, Italy, Portugal, and Korea. Specifically, this work showed that across cultures, older adults scored lower in Extraversion and Openness to Experience and higher in Agreeableness and Conscientiousness than younger adults. Recently, Yang and colleagues (1998) reported findings from comparisons of American and Chinese adults' scores on the CPI, concluding that the influences of culture on adults' personality were minimal and that the similar patterns of age differences were more indicative of maturational stability (see Yang et al., 1998).

In the present study, we examined patterns of cross-sectional age differences in two culturally diverse groups. One sample was composed of adults from the Midwestern United States, whereas the other sample was drawn from Beijing, China. Because of the vast differences between the U.S. and Chinese cultures one would expect to find significant cultural disparity in personality characteristics as well as their relation to age. For example, it has been suggested that the Chinese culture places more emphasis on communal processes, such as not wanting to stand out from the group, or denying individual talents in favor of contributions to the group or the common good (e.g., Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997; Markus & Kitayama, 1991; Morris & Peng, 1994). Thus, overall Chinese individuals would be expected to endorse values of community, affect restraint, and adhere to norms more strongly than U.S. individuals. In addition, as Yang and colleagues (1998) have pointed out, events related to the Cultural Revolution, which began in 1966, might make it particularly likely that individuals raised in that era achieve particularly high scores in norm adherence. Thus, on the CPI, they would be expected to show high scores on achievement via conformance, responsibility, self-control, and good impression. In contrast, more recent cohorts might be expected to display higher levels of individualism as reflected in lower scores on these dimensions.

In addition to culture, we also examined patterns related to gender. The most substantial body of research on age-related changes in personality has been presented by Helson and her colleagues (e.g., Helson, 1998). Because this research has focused exclusively on women's personality development, the issue of generalizability to samples of men is an important one. Some research suggests that patterns of personality change may be gender specific, reflecting the particular roles and adaptations of men and women (e.g., Block, 1994; Maas & Kuypers, 1974). Indeed, working with CPI-derived coping scales, Diehl and associates (1996) showed that the largest amount of variance in coping strategies was accounted for by gender rather than age. Moreover, research suggests that the effects of recent cultural changes, such as the women's liberation movement and the increased labor force participation of women, have been profound influences on women's personality development (e.g., Agronick & Duncan, 1998; Helson, Stewart, & Ostrove, 1995).

Although the present study was, in part, exploratory, several general expectations with regard to patterns of age difference were formulated. As indicated, it was expected that Chinese individuals overall would endorse scales related to norm-orientation and norm-favoring more strongly than U.S. adults. Beyond such age differences, however, our specific hypothesis concerned an interaction between age group/cohorts and culture. A rapid movement toward modernization, industrialization, and Westernization appears to be a strong cultural change process in China that would be expected to affect more recent cohorts of Chinese citizens more profoundly than older Chinese citizens. Thus, we expected that the overall personality self-reports of younger Chinese individuals would be more similar to the ones of young individuals in the United States, than to those of older Chinese persons and their U.S. counterparts. Thus, we predicted that age group differences on personality dimensions relating to norm adherence, and possibly flexibility of behavior, would be stronger in Chinese adults than in U.S. adults.

In this study, we explored these expectations by using the California Psychological Inventory (CPI; Gough, 1987). A few words are in order about the use of this instrument as opposed to other instruments, such as the NEO-PI. On one hand, the CPI has the potential problem of considerable item overlap among scales. On the other hand, however, it is a very comprehensive
measure that stays conceptually close to observable behaviors and operates at a fairly low level of abstraction. It is also a measure that has good reliability and has been examined extensively in terms of its validity. Also, because a substantial body of research on personality stability/change and context has been based on the CPI (see Helson, 1998), this instrument allows for easy comparability to a large body of research. Further, the CPI has been examined with regard to the Five Factor Model of personality (McCrae, Costa, & Piedmont, 1993; Yang et al., 1998), although such a comparison does not constitute an objective of our research.

METHOD

Participants

The study sample was composed of a total of 735 participants from the United States of America (n = 285) and the People’s Republic of China (n = 450). Data for the U.S. sample were taken from the second wave of testing of an ongoing longitudinal study. For a detailed description of the primary objectives of this study see Labouvie-Vief and coworkers (1995) or Diehl and colleagues (1996). Participants in the U.S. sample were randomly selected using 1990 census information to represent community-based adults in three suburban communities of a major Midwestern metropolitan area (U.S. Department of Commerce, 1994a, 1994b). The study sample also included participants ranging in age from 12 to 19 years. However, in order to provide an exact age match to the Chinese sample, individuals younger than age 20 were excluded from the analyses presented here. Participants in both cultures were classified into five age groups: Young adults (age 20–29; U.S.: n = 42; China: n = 106), adults (age 30–45; U.S.: n = 79; China: n = 115), middle-aged adults (age 46–59; U.S.: n = 66; China: n = 124), older adults (age 60–69; U.S.: n = 49; China: n = 82), and elderly adults (age 70 and older; U.S.: n = 49; China: n = 23). In each age group, men and women were about equally represented.

The mean age for American participants was 51 years (SD = 17 years), with the youngest participants being 20 years old and the oldest being 87 years old. The mean educational level was 15.9 years of formal schooling (range = 10–24 years). Participants’ average annual family income was $55,000, ranging from less than $10,000 to over $150,000. The majority of the participants (95%) were Caucasian.

Because sampling of Chinese participants could not rely on census information, we identified a method that would yield a Chinese sample that was community-based, fairly representative of an urban population, and stratified by age and gender. In order to obtain such a sample of adults, eight resident committees in Beijing and one resident committee in Tianjin, a neighboring city of Beijing, were contacted with a request for help with recruitment. Resident committees are the smallest governing body in the People’s Republic of China, and are similar in legal status to municipalities in the United States. Although resident committees can vary greatly from each other, they are the basic governmental structure encompassing several hundred citizens. In general, the communities overseen by resident committees are more heterogeneous in educational level and socioeconomic status than U.S. communities.

The resulting Chinese sample consisted of 450 individuals. The mean age for Chinese participants was 44 years (SD = 16 years) with the youngest participants being 20 years old and the oldest participants being 85 years old. The mean educational level was 13.8 years of schooling (range = 4–20 years).

Procedure

In the United States, the tests were administered in small groups of 2 to 10 participants by specially trained student assistants. Testing was conducted at locations in the participants’ communities. Participants received a reimbursement of $50. In China, testing was conducted individually at participants’ homes by specially trained student assistants. Participants received a reimbursement of 60 Chinese Yuan which is equivalent to about $7.

Measures

Each participant completed approximately 4 hours of testing which included measures of personality, coping styles, and other cognitive and emotional variables. This study reports on personality data as measured by the California Psychological Inventory (CPI; Gough, 1987). The CPI is a paper and pencil measure comprising 462 true and false items that assess 20 “folk concept” scales of personality. In particular, the CPI measures “the kind of everyday variables that ordinary people use in their daily lives to understand, classify, and predict their own behavior” (Gough, 1987, p. 1). Thus, compared to other personality inventories, the CPI assesses individuals’ personality at a rather low level of abstraction. Among the personality characteristics assessed by the CPI are dominance, independence, social presence, sociability, self-acceptance, self-control, socialization, good impression, tolerance, flexibility, psychological mindedness, and femininity/masculinity.

For the U.S. sample, the test was administered in its standard English format. For the Chinese sample, the CPI was translated from English to Mandarin by two Chinese graduate students in the psychology department of Beijing Normal University. The students’ translation was reviewed by a research committee and a professor of English language. The Mandarin translation was then translated back into English by two other Chinese psychology students. The resulting English translation was then reviewed and corrected by members of the American research team and necessary revisions were made to the Mandarin version. After a final check of these changes with the U.S. research team, the final measure that was administered to all Chinese subjects resulted.

RESULTS

Findings from this study are presented in two sections. In the first section, findings from factor analyses comparing the factor structure of the CPI across cultures are presented. The second section reports findings from a multivariate analysis of variance (MANOVA) examining the effects of age, gender, and culture on participants’ CPI scale scores.

Factor Analyses

Although there is considerable item overlap among the scales of the CPI, as a first analytical step separate factor analyses were performed on the U.S. and Chinese data sets. These factor analyses served solely descriptive purposes and examined the similarity of the factor structure across cultures. These analyses were important because a comparison across cultures would
not be meaningful if the factor solutions in the two cultures were not reasonably similar.

The correlation matrix of the 20 scales was factor analyzed using the maximum-likelihood estimation method. The resulting factors were rotated to simple structure using varimax rotation. (In a previous factor analysis [see Labouvie-Vief et al., 1995] we had used an oblique rotation which resulted in small to moderate factor intercorrelations \( r = -.08 \) to \( r = .32 \).) After inspection of the scree test, the eigenvalues for each factor, and the rotated factor pattern (Gorsuch, 1983), four factors were extracted within each culture. The resulting pattern of factor loadings for each culture is shown in Table 1.

In general, the loading patterns obtained from these analyses were similar to those obtained in previous factor analytic research with the CPI (see Gough, 1987; Labouvie-Vief et al., 1995). The first factor was defined by high loadings on the scales for dominance, self-acceptance, sociability, social presence, independence, capacity for status, and empathy. This factor is similar to Gough's (1987) and Labouvie-Vief and associates' (1995) extraversion factor. Individuals with a high score on this factor describe themselves as being assertive, ambitious, independent, capacity for status, and empathy.

The second factor was defined by high loadings on the self-control, achievement via conformance, responsibility, good impression, socialization, well-being, tolerance, intellectual efficiency, and communality scales. This factor was also consistent with the work of Gough (1987) and Labouvie-Vief and associates (1995) and can be considered a control or norm orientation factor. Individuals with high scores on this factor display a strong sense of self-control and a distinct orientation towards convention and accepted norms. In particular, they describe themselves as self-disciplined individuals who prefer clearly structured tasks over unstructured situations and take their duties seriously. In addition, individuals who score high on this factor try to please others, accept and easily conform to rules and regulations, are optimistic, and get along easily with others.

The third factor had its highest loadings on the achievement via independence and flexibility scales. For the U.S. sample, secondary loadings of this factor were also found on tolerance, intellectual efficiency, psychological mindedness, empathy, and capacity for status. A similar pattern of secondary loadings, however, was not found for the Chinese sample. This factor also replicates earlier work by Gough (1987) and Labouvie-Vief and colleagues (1995) and is indicative of flexibility as a personality characteristic. Individuals with high scores on this factor describe their work style as based on individual initiative. In general, they like change and variety and welcome challenges.

The fourth factor was least congruent with Gough's work but replicated the factor structure reported by Labouvie-Vief and coworkers (1995). With moderate negative loadings on the dominance, social presence, capacity for status, and independence.

### Table 1. Factor Loading Pattern for the California Psychological Inventory (CPI) in the U.S. and China

<table>
<thead>
<tr>
<th>Scale/Variable</th>
<th>Factor 1 U.S.</th>
<th>Factor 1 China</th>
<th>Factor 2 U.S.</th>
<th>Factor 2 China</th>
<th>Factor 3 U.S.</th>
<th>Factor 3 China</th>
<th>Factor 4 U.S.</th>
<th>Factor 4 China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominance</td>
<td>.85</td>
<td>.57</td>
<td>.28</td>
<td>.29</td>
<td>.01</td>
<td>-.28</td>
<td>.19</td>
<td>.40</td>
</tr>
<tr>
<td>Self-Acceptance</td>
<td>.84</td>
<td>.80</td>
<td>.05</td>
<td>-.07</td>
<td>.15</td>
<td>.09</td>
<td>.02</td>
<td>.24</td>
</tr>
<tr>
<td>Sociability</td>
<td>.84</td>
<td>.82</td>
<td>.21</td>
<td>.22</td>
<td>.14</td>
<td>-.16</td>
<td>.01</td>
<td>.19</td>
</tr>
<tr>
<td>Social Presence</td>
<td>.78</td>
<td>.82</td>
<td>.00</td>
<td>-.11</td>
<td>.35</td>
<td>.22</td>
<td>.04</td>
<td>.11</td>
</tr>
<tr>
<td>Independence</td>
<td>.69</td>
<td>.47</td>
<td>.23</td>
<td>.39</td>
<td>.25</td>
<td>.15</td>
<td>.40</td>
<td>.57</td>
</tr>
<tr>
<td>Capacity for Status</td>
<td>.67</td>
<td>.74</td>
<td>.25</td>
<td>.24</td>
<td>.41</td>
<td>.21</td>
<td>.07</td>
<td>.16</td>
</tr>
<tr>
<td>Empathy</td>
<td>.64</td>
<td>.72</td>
<td>.05</td>
<td>-.01</td>
<td>.47</td>
<td>.16</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Self-Control</td>
<td>-.32</td>
<td>-.41</td>
<td>.85</td>
<td>.82</td>
<td>.02</td>
<td>-.16</td>
<td>.29</td>
<td>.05</td>
</tr>
<tr>
<td>Achievement via Conformance</td>
<td>.31</td>
<td>.20</td>
<td>.81</td>
<td>.76</td>
<td>.02</td>
<td>-.21</td>
<td>-.05</td>
<td>.09</td>
</tr>
<tr>
<td>Responsibility</td>
<td>.21</td>
<td>.01</td>
<td>.79</td>
<td>.72</td>
<td>.13</td>
<td>-.19</td>
<td>-.07</td>
<td>-.14</td>
</tr>
<tr>
<td>Good Impression</td>
<td>-.05</td>
<td>-.24</td>
<td>.76</td>
<td>.81</td>
<td>.04</td>
<td>-.30</td>
<td>.37</td>
<td>.12</td>
</tr>
<tr>
<td>Socialization</td>
<td>.06</td>
<td>.09</td>
<td>.75</td>
<td>.64</td>
<td>-.04</td>
<td>-.21</td>
<td>-.21</td>
<td>-.05</td>
</tr>
<tr>
<td>Well-Being</td>
<td>.26</td>
<td>.01</td>
<td>.74</td>
<td>.73</td>
<td>.26</td>
<td>.11</td>
<td>.12</td>
<td>.32</td>
</tr>
<tr>
<td>Tolerance</td>
<td>.20</td>
<td>.01</td>
<td>.59</td>
<td>.79</td>
<td>.57</td>
<td>.27</td>
<td>-.08</td>
<td>-.03</td>
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<tr>
<td>Intellectual Efficiency</td>
<td>.44</td>
<td>.41</td>
<td>.55</td>
<td>.54</td>
<td>.50</td>
<td>.27</td>
<td>.09</td>
<td>.30</td>
</tr>
<tr>
<td>Communality</td>
<td>.32</td>
<td>.23</td>
<td>.51</td>
<td>.53</td>
<td>.01</td>
<td>-.04</td>
<td>-.17</td>
<td>-.03</td>
</tr>
<tr>
<td>Achievement via Independence</td>
<td>.35</td>
<td>.38</td>
<td>.39</td>
<td>.56</td>
<td>.69</td>
<td>.44</td>
<td>.10</td>
<td>.22</td>
</tr>
<tr>
<td>Flexibility</td>
<td>.14</td>
<td>.25</td>
<td>-.22</td>
<td>-.31</td>
<td>.68</td>
<td>.71</td>
<td>-.02</td>
<td>.03</td>
</tr>
<tr>
<td>Psychological Mindedness</td>
<td>.40</td>
<td>.28</td>
<td>.41</td>
<td>.58</td>
<td>.52</td>
<td>.19</td>
<td>.26</td>
<td>.21</td>
</tr>
<tr>
<td>Femininity/Masculinity</td>
<td>-.34</td>
<td>-.33</td>
<td>.08</td>
<td>.11</td>
<td>-.02</td>
<td>-.01</td>
<td>-.45</td>
<td>-.57</td>
</tr>
</tbody>
</table>

**Note:** Boldface loadings are those that are substantial.
femininity/masculinity scale and moderate positive loadings on the independence scale, this factor is indicative of a femininity/masculinity dimension. Persons who score high on this factor describe themselves as appreciative, patient, gentle, respectful of others, whereas low scorers describe themselves as active, robust, restless, opportunistic, blunt, and impatient with delay and criticism.

Together, the four extracted factors accounted for 75.4% of the variance in the U.S. sample and for 64.4% of the variance in the Chinese sample (see Table 1). To examine the congruence between the two factor loading patterns, we calculated factor congruence coefficients (Tucker, 1951; Wrigley & Neuhaus, 1955) using the formula provided by Gorsuch (1983, p. 285). A value of .90 is typically considered necessary to define a matching factor (Barrett, 1986; Mulaik, 1972), although this is only a rule of thumb as McCrae, Zonderman, Costa, Bond, and Paunonen (1996) have pointed out. The resulting congruence coefficients were .96 for extraversion (i.e., factor 1), .98 for control/norm orientation (i.e., factor 2), .77 for flexibility (i.e., factor 3), and .87 for femininity/masculinity (i.e., factor 4). Thus, using the rule of thumb suggested above, the factor congruence coefficients indicated that the loading patterns for extraversion and control/norm orientation were very similar across the two cultures, but the loading patterns were not as congruent for flexibility and femininity/masculinity.

McCrae and associates (1996) have argued that failures to replicate a factor structure in different samples and across cultures may be attributable to relatively arbitrary differences in factor rotation. These authors suggested that a targeted orthogonal rotation (i.e., Procrustes rotation; Gorsuch, 1983; Sch nemann, 1966) should be used to see if new sample data can be lined up with an established factor solution. We used the computer program provided by McCrae and colleagues (1996) and performed a targeted rotation in which the factor solution for the Chinese sample was rotated toward the U.S. factor target. We used the factor solution for the U.S. sample as the target solution, because there have been more factor analyses performed with U.S. data which have mostly converged in their factor solutions. When the U.S. factor solution was rotated toward the Chinese target, the factor congruence coefficients were slightly different but also high. The factor loading pattern, the factor congruence coefficients, and variable congruence coefficients resulting from this analysis are shown in Table 2.

As can be seen in Table 2, the targeted rotation yielded factor congruence coefficients that ranged from .86 for femininity/masculinity to .98 for extraversion. This suggests that the factor structures were very similar in the U.S. and Chinese data.

Table 2 also displays the variable congruence coefficients. This coefficient was proposed by McCrae and coworkers (1996) to examine the replicability of factor loadings for individual variables across different samples. This coefficient is computed with the same formula as the factor congruence coefficient, applied across the rows rather than down the columns of the factor pattern matrix (cf. Kaiser, Hunka, & Bianchini, 1971). McCrae and colleagues (1996) note that "to the extent that variables show the same pattern of loadings across factors, they will tend to have high variable congruence coefficients, although no rule of thumb can yet be proposed to assess a good fit" (p. 559). The variable congruence coefficients resulting from the targeted rotation were all larger than .90, suggesting that the variables loaded very similarly across the factors within the two cultures.

Effects of Age and Culture on CPI Scale Scores
A 5 (age group) X 2 (gender) X 2 (culture) MANOVA was performed using individuals' CPI scale scores as dependent variables. Multivariate and univariate main effects and interactions are reported if they were significant at p < .01.

This analysis revealed significant multivariate main effects of age group, Wilks’s lambda = .59, F(80,2748) = 4.83, gender, Wilks’s lambda = .68, F(20,696) = 16.52, and culture, Wilks’s lambda = .30, F(20,696) = 80.33, all ps < .001. In addition, the multivariate Age Group X Culture interaction, Wilks’s lambda = .70, F(80,2748) = 3.19, and the multivariate Gender X Culture interaction, Wilks’s lambda = .90, F(20,696) = 3.81, both ps < .001, were statistically significant, indicating that the pattern of age and gender differences varied by culture for some of the CPI scales.

Significant univariate main effects of age group were found for the following CPI scales: Social presence, self-acceptance, empathy, achievement via conformance, responsibility, socialization, self-control, good impression, tolerance, flexibility, well-being, and communality. The main effect of age group, however, was qualified for self-acceptance, self-control, good impression, tolerance, and flexibility by an Age Group X Culture interaction. Table 3 shows the means and standard deviations by age group for those scales for which the main effect was not qualified by a significant interaction with culture. Table 3 indicates the pairwise mean differences that were significant based on Tukey’s HSD method (p < .05).

Table 2. Factor Loadings and Congruences for Factors and Variables in the Chinese CPI Rotated to the American Pattern

<table>
<thead>
<tr>
<th>Scale/Variable</th>
<th>E</th>
<th>C/N</th>
<th>F</th>
<th>F/M</th>
<th>Congruence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominance</td>
<td>.70</td>
<td>.30</td>
<td>-.09</td>
<td>.24</td>
<td>.98</td>
</tr>
<tr>
<td>Self-Acceptance</td>
<td>.80</td>
<td>-.15</td>
<td>.21</td>
<td>.03</td>
<td>.97</td>
</tr>
<tr>
<td>Sociability</td>
<td>.86</td>
<td>.19</td>
<td>.05</td>
<td>-.03</td>
<td>.99</td>
</tr>
<tr>
<td>Social Presence</td>
<td>.76</td>
<td>-.22</td>
<td>.32</td>
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Note: E = Extraversion, C/N = Control/Norm Orientation, F = Flexibility, F/M = Femininity/Masculinity. Boldface loadings are those that are substantial.
ps < .001. The main effect for femininity/masculinity, however, was qualified by a significant Gender × Culture interaction. Follow-up tests showed that men had a significantly higher mean score on independence compared to women, $t(733) = 4.22$, whereas the opposite was true for socialization, $t(733) = -4.10$, both $ps < .001$.

Interpretation of the main effect of culture rests on the assumption that raw scores on the American and Chinese versions of the CPI are comparable (i.e., assumption of scalar equivalence). Although there may be factors that can change the nature of the instrument in a different culture (e.g., Chinese respondents may have different response sets or they may be more modest than Americans in answering questions of a personal nature), in the absence of such evidence we interpret the findings regarding cultural differences in a preliminary and cautionary way. Future work will have to examine whether the assumption of scalar equivalence is justified.

Thus, under the assumption that the raw scores of American and Chinese adults are at least roughly comparable, significant univariate main effects of culture were found for the following scales: Dominance, capacity for status, sociability, social presence, self-acceptance, self-control, good impression, tolerance, intellectual efficiency, empathy, achievement via conformance, responsibility, socialization, well-being, communality, achievement via independence, and psychological mindedness. The main effect of culture, however, was qualified by a significant Age Group × Culture interaction for the scales self-acceptance, self-control, good impression, and tolerance. Table 4 shows the means and standard deviations for those scales for which the main effect of culture was not qualified by a significant Age Group × Culture interaction.
As can be seen from Table 4, U.S. adults had higher mean scores than Chinese adults on the following scales: Dominance, capacity for status, sociability, social presence, intellectual efficiency, empathy, achievement via conformance, responsibility, communality, well-being, achievement via independence, and psychological mindedness. In contrast, Chinese adults had a significantly higher mean score for socialization than U.S. adults.

The significant multivariate Age Group \( \times \) Culture interaction was due to significant univariate interactions for self-acceptance, \( F(4,715) = 7.99 \), self-control, \( F(4,715) = 8.51 \), good impression, \( F(4,715) = 11.38 \), tolerance, \( F(4,715) = 4.63 \), and flexibility, \( F(4,715) = 7.14 \), all \( p < .001 \). Post-hoc tests using Tukey’s HSD-method (Howell, 1997) showed for self-acceptance that in the U.S. sample none of the mean level differences among age groups reached the .05 level of statistical significance. In contrast, in the Chinese sample, young adults’ and adults’ mean scores for self-acceptance were significantly higher than middle-aged and older adults’ mean scores. In addition, Chinese young adults had higher mean scores for self-acceptance than elderly adults (see Figure 1).

For self-control, follow-up tests showed a similar pattern of age differences for both samples; however, the age differences were more pronounced in the Chinese sample. Specifically, in the U.S. sample, significant mean differences were found between elderly adults, young adults, and adults, with elderly adults having significantly higher mean self-control scores. In addition, older adults’ mean scores were also significantly higher than young adults’ mean scores (see Figure 2). In contrast, in the Chinese sample elderly and older adults’ mean scores were significantly higher than the mean scores in the three younger age groups. Furthermore, middle-aged adults’ mean scores were significantly higher than young adults’ and adults’ mean scores, and adults’ mean scores were significantly higher than young adults’ scores (see Figure 2).

A similar pattern of mean differences was obtained for good impression. In particular, for the U.S. sample the only significant mean difference was found between elderly adults and young adults, with elderly adults having significantly higher mean scores (see Figure 3). In contrast, in the Chinese sample elderly and older adults’ mean scores were significantly higher than young adults’, adults’, and middle-aged adults’ mean scores.
scores. Furthermore, middle-aged adults' mean scores were significantly higher than young adults' and adults' scores, and adults had significantly higher scores than young adults (see Figure 3). Thus, the pattern of age differences was more pronounced in the Chinese sample.

As can be seen in Figure 4, for tolerance none of the pairwise mean comparisons for the U.S. sample reached the .05 level of statistical significance. In contrast, significant age group differences were found for the Chinese sample. Specifically, elderly, older, and middle-aged adults had significantly higher mean scores on tolerance compared to young adults and adults. Furthermore, older adults' mean scores were also significantly higher than middle-aged adults' mean scores (see Figure 4).

Finally, with regard to flexibility, for the U.S. sample significant mean differences were found between young adults and the two oldest age groups, with young adults having significantly higher mean scores than older and elderly adults (see Figure 5). In contrast, the pattern of age differences was more pronounced in the Chinese sample. Specifically, young adults' and adults' mean scores were significantly higher than middle-aged, older, and elderly adults' mean scores. In addition, middle-aged adults' mean scores were significantly higher than older adults' mean scores, and young adults' mean scores were significantly higher than adults' mean scores.

The hypothesis that more recent cohorts of Chinese adults (i.e., younger adults) should be more similar in their personality profile to U.S. adults was supported for two CPI scales when the significant Age Group x Culture interactions were followed up by culture comparisons within age groups. These analyses showed that for young adults and adults there were no significant culture differences for self-control. In addition, young Chinese and U.S. adults also did not differ with regard to good impression. Thus, for young adults and adults significant culture differences were only found for self-acceptance (U.S.: M = 18.9, SD = 3.9; China: M = 15.5, SD = 3.8; t(146) = 4.93, p < .001), tolerance (U.S.: M = 21.1, SD = 4.8; China: M = 17.5, SD = 3.8; t(146) = 4.69, p < .001), and flexibility (U.S.: M = 14.0, SD = 4.1; China: M = 12.5, SD = 4.0; t(146) = 2.09, p < .05). For adults, a significant culture difference was found for good impression (U.S.: M = 18.0, SD = 6.4; China: M = 20.7, SD = 5.6; t(192) = -3.04, p < .01). On the other hand, a consistent pattern of culture differences was found for middle-aged,
Figure 3. Age Group × Culture interaction for good impression.

older, and elderly adults. Specifically, across these three age groups, U.S. adults scored significantly higher on self-acceptance, tolerance, and flexibility, whereas Chinese adults scored significantly higher on self-control and good impression.

The significant multivariate Gender × Culture interaction was due to a significant univariate interaction for femininity/masculinity, \( F(1,715) = 26.03, p < .001 \). The gender difference on the femininity/masculinity scale was more pronounced for the U.S. sample compared to the Chinese sample.

**DISCUSSION**

The present study examines age differences in personality in two different cultural contexts, the United States and the People’s Republic of China. The results suggest clear age differences across the two cultures. Across the adult life span, older individuals scored significantly higher on dimensions related to the factor of control/norm orientation (i.e., achievement via conformance, responsibility, socialization, well-being, and communality) and lower on CPI scales related to the factors of extraversion (i.e., social presence, empathy) and flexibility. At the same time, these patterns did vary by culture. For example, the pattern of age differences for self-control and good impression—both scales loaded on the control/norm orientation factor—was more pronounced in the Chinese sample than the U.S. sample. Similarly, age differences for tolerance and flexibility were more pronounced in Chinese adults.

As mentioned earlier, interpretation of culture differences rests on the assumption that raw scores of the American and Chinese CPI are comparable. Assuming that such comparability is possible, at least in a rough way, this research indicates substantial differences related to culture. In general, U.S. adults scored higher on the six CPI scales related to the factor of extraversion (i.e., dominance, capacity for status, sociability, social presence, independence, and empathy) and on the two CPI scales related to the factor of flexibility (i.e., achievement via independence and flexibility). Similarly, on four of the CPI scales related to the factor of control/norm orientation (i.e., achievement via conformance, responsibility, well-being, and communality), U.S. adults showed higher mean scores than Chinese adults.
However, the pattern of findings for the CPI scales related to the control/norm orientation factor were more differentiated as indicated by Age Group $\times$ Culture interactions. For example, across the different age groups, Chinese participants scored higher on self-control and good impression, yet they scored lower on self-acceptance, tolerance, and flexibility (see Figures 1, 4, and 5). These data seem to suggest that the personality dimension of control/norm orientation may reflect somewhat different mechanisms for the two cultures. For Chinese participants, the pattern appears to involve stronger reliance on accepting social norms and creating a good impression, whereas for U.S. individuals tolerance and well-being appear to play a stronger role. However, as we indicated previously, these results should be interpreted with caution, as little is known about the scalar equivalence of the measures in the two cultures at the current time.

Overall, the study produced a surprising and consistent pattern of age differences. For three of the CPI scales related to extraversion (i.e., social presence, self-acceptance, and empathy), there were small age-related decreases from the younger to the older age groups. However, the oldest age group did not continue this pattern, scoring somewhat higher than the middle-aged and older adults. This pattern held for the scales of social presence and empathy for both cultures, whereas for self-acceptance, it held for the Chinese sample only. Because these three scales loaded on a factor that we interpreted as extraversion, these data support those of Costa and McCrae (1988, 1992a), suggesting age-related decreases in extraversion.

Consistent age differences were also found on CPI scales related to the factor of control/norm orientation. Nine of the scales related to this factor indicated mean level age differences. These age differences consistently indicated a positive age trend. For the scales self-control, good impression, and tolerance, significant Age Group $\times$ Culture interactions were obtained. Specifically, the patterns of age differences were more pronounced for the Chinese adults for self-control and good impression compared to the U.S. adults, and significant age differences for tolerance were only obtained for the Chinese sample.

In general, these results are consistent with Costa and McCrae's (1992a, 1992b) findings. These authors reported that with increasing age, individuals scored higher on agreeableness and conscientiousness and lower on neuroticism. Because the control/norm orientation factor of the present study assesses a
similar combination of traits, our data are quite compatible with these findings. Specifically, older individuals described themselves as more optimistic, more serious about duties and responsibilities, more eager to fit in smoothly with others, and more willing to conform with and accept rules. Because effects of age and cohort are confounded in our study, these differences may, in part, reflect different socialization and historical experiences within different generations. The extent of such cohort effects cannot be estimated from the current data set. However, whereas Costa and McCrae usually stress that these patterns appear to characterize young adult samples, and that these age differences appear to stabilize by around the age of 30, our data indicate that the age differences continue to hold across the whole adult life span and into late life.

Interestingly, some of these age differences were moderated by cultural differences as well. Specifically, in all cases where Age Group × Culture interactions were found, the pattern of age differences was more pronounced in the Chinese sample than in the U.S. sample—and, they uniformly indicated that across the two cultures, cultural differences were smallest for the youngest age group, and largest for the oldest age group. This finding suggests that younger Chinese are much more influenced by Westernization than previous generations. Over the last two decades, China has increasingly abandoned its isolationistic political tendencies and the country as a whole has become increasingly more open toward the rest of the world. Thus, it is possible that influences from outside influence the personality of more recent cohorts in such a way that cultural differences become smaller. If this interpretation is correct, it would suggest that differences related to culture and to cultural change are involved in producing the current pattern of age differences in personality. Thus, it would be extremely important to follow up the current results with cohort-sequential extensions in order to compare the relative importance of ontogenetic and cultural change in producing the patterns of age differences observed here.

On a substantive level, the pattern of age-related increases for the scales related to the factor of control/norm orientation...
Although the fourth factor extracted in the present study was least well defined, it produced fairly expected findings: Overall, women scored higher on this dimension, indicating that they rated themselves as appreciative, patient, helpful, gentle, and respectful of others, whereas men were more likely to describe themselves as active, robust, restless, opportunistic, blunt, and impatient with delay and criticism. However, a Gender × Culture interaction indicated that U.S. men scored considerably lower on femininity than their Chinese counterparts. We suggest that this finding probably indicates the fact that gender definitions are culturally quite malleable and that Chinese men’s higher femininity scores may not represent a different orientation. Rather, these higher scores may reflect the more communal and collective orientation of East Asian cultures (Kitayama et al., 1997; Markus & Kitayama, 1991). Thus, this latter finding should be interpreted with caution.

Although the current study revealed some intriguing findings with regard to age differences and Age × Culture interactions in adult personality, several limitations need to be acknowledged. First, this study used a single self-report questionnaire to assess adults’ personality. Whether similar findings can be obtained with a different personality inventory and whether the results from different measures and different studies converge is a question that warrants further investigation.

Second, additional work is needed with regard to the systematic evaluation of the comparability of personality inventories across cultures. Although the utmost care was used in this study in the translation of the CPI items into the Chinese language, current information on the cross-cultural validity of the instrument is limited. Given that the CPI was designed for use in the American culture, some of its items may not carry the same importance in the Chinese culture. Although the factor analyses conducted in the context of this study suggest a very similar factor structure for the CPI across cultures, future studies need to address this question in a systematic manner.

In conclusion, this study presents findings suggesting that some reported age differences in personality have a robust quality and generalize across cultural settings. At the same time, the data also indicate that culture plays an important role. Indeed, the Age × Culture interactions found in our study suggest that cultural climate and cultural change seem to be important in shaping the relationship between age and personality. Although we agree, in general, with the position of Yang and associates (1998) who argue that, within the context of cross-sectional studies, a curvilinear pattern of age differences would provide strong evidence for cohort changes, we would like to suggest that such curvilinear patterns are most likely to happen if historical events and processes affected different cohorts in dramatically different ways. In contrast, the pronounced linear patterns found in the current study would be more likely to result from relatively continuous and cumulative cohort changes such as those that have been demonstrated in world-wide cohort changes in intellectual functioning (Flynn, 1984, 1987) and that may be related to the emergence of a global community. Thus, it appears to be reasonable to assume a position similar to the one held by Jones and Meredith (1996) and Nelson (1993) who argue for the simultaneous examination of change and stability in adults’ personality and for the study of the personal and sociocultural conditions under which change and stability can be observed.
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