

Age Differences in Personality Traits Across Cultures: Self-Report and Observer Perspectives

ROBERT R. McCRAE^{1*}, PAUL T. COSTA, JR.¹, MARTINA HŘEBÍČKOVÁ²,
TOMÁŠ URBÁNEK², THOMAS A. MARTIN³, VALERY E. ORYOL⁴,
ALEXEY A. RUKAVISHNIKOV⁴ and IVAN G. SENIN⁴

¹National Institute on Aging, NIH, DHHS, Baltimore, MD, USA

²Institute of Psychology, Academy of Sciences of the Czech Republic, Brno, Czech Republic

³Susquehanna University, Selinsgrove, PA, USA

⁴Yaroslavl State University, Yaroslavl, Russia

Abstract

Using self-report measures, longitudinal studies in the US and cross-sectional studies from many cultures suggest that the broad factors of Neuroticism, Extraversion, and Openness to Experience decline from adolescence to adulthood, whereas Agreeableness and Conscientiousness increase. Data are inconsistent on the rate of change during adulthood, and on the generalizability of self-report findings to informant ratings. We analysed cross-sectional data from self-reports and informant ratings on the Revised NEO Personality Inventory in Czech (N = 705) and Russian (N = 800) samples. Some curvilinear effects were found, chiefly in the Czech sample; informant data generally replicated self-reports, although the effects were weaker. Although many of the details are not yet clear, there appear to be pan-cultural trends in personality development that are consistent with the hypothesis of intrinsic maturation. Copyright © 2004 John Wiley & Sons, Ltd.

INTRODUCTION

Recent findings suggest that the general pattern of adult age differences in the mean levels of personality traits may be a human universal (Costa, McCrae et al., 2000; Labouvie-Vief, Diehl, Tarnowski, & Shen, 2000; McCrae et al., 1999, 2000). Interpreted in terms of the Five-Factor Model of personality (FFM; McCrae & John, 1992), these studies show that between adolescence and later adulthood, the broad domains of Neuroticism (N), Extraversion (E), and Openness to Experience (O) decline, whereas Agreeableness (A) and Conscientiousness (C) increase. At the level of more specific traits, there are consistent and distinctive patterns of age differences. Cultures as diverse as China, Zimbabwe, and Estonia show relatively marked cross-sectional declines in Impulsiveness and Openness to Fantasy, and marked cross-sectional increases in Modesty and

*Correspondence to: Robert R. McCrae, Box No. 03, Gerontology Research Center, 5600 Nathan Shock Drive, Baltimore, MD 21224-6825, USA. E-mail: jeffm@ipc.grc.nia.nih.gov

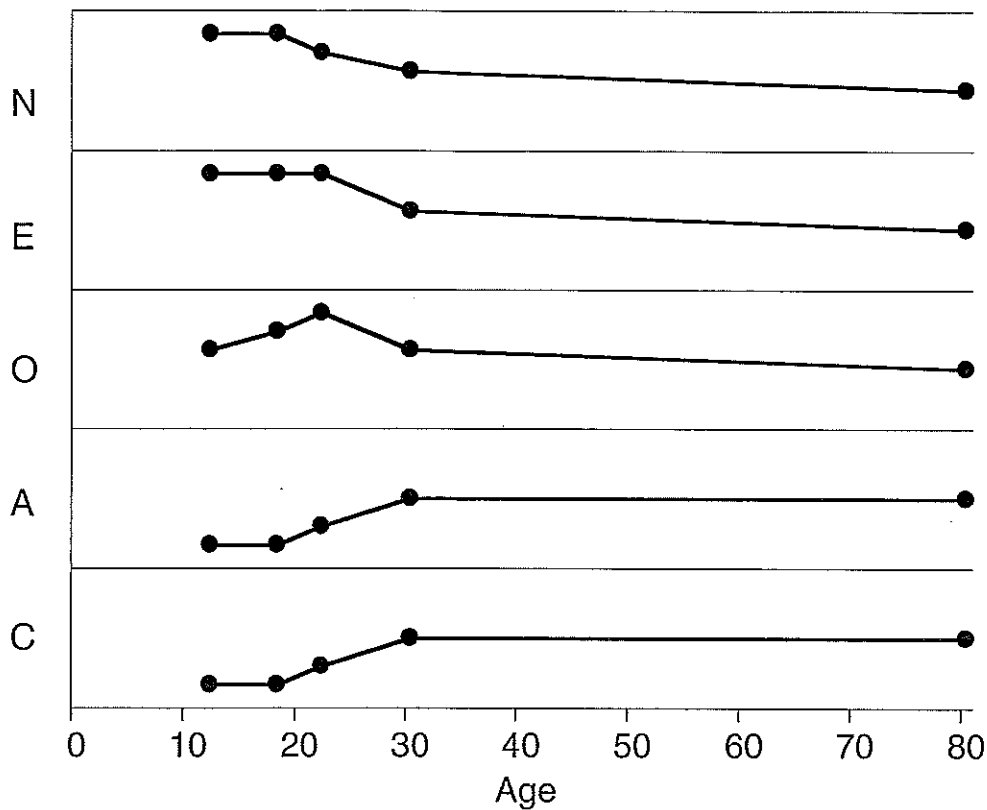


Figure 1. Schematic representation of mean levels of Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C) from age 12 to age 80. Adapted from Costa & McCrae, 2002.

Dutifulness; by contrast, few age differences are seen in Warmth or Activity (Costa, McCrae et al., 2000; Piedmont, Bain, McCrae, & Costa, 2002; Yang et al., 1999).

There is, however, still controversy about the rate of change at different ages across the lifespan. Based on a series of cross-sectional (Costa et al., 1986) and longitudinal (Costa, Herbst, McCrae, & Siegler, 2000) studies conducted over the past three decades, Costa and McCrae (2002) have suggested that there are specific age curves for each of the five major factors. As shown schematically in Figure 1, they hypothesized that the largest changes in the mean levels of traits occur in late adolescence and early adulthood, and that trait levels change very slowly after age 30—typically no more than one *T*-score point per decade. The general shape of age curves from age 12 on is thus non-linear, showing a bend around age 30.

By contrast, cross-cultural studies sometimes show substantial age differences among older cohorts (e.g., Labouvie-Vief et al., 2000), suggesting continuing linear trends. A recent longitudinal study employing hierarchical linear modeling in two samples followed over 40 years found modest age changes consistent in direction with Costa and McCrae's hypotheses, but with a different form: 'the idea that personality change is most pronounced before age 30 and then reaches a plateau received no support' (Helson, Jones, & Kwan, 2002, p. 752). It is not yet clear whether these differences in the literature are artifactual, reflecting sampling biases or cohort effects, or whether they accurately represent different developmental paths in different cultures and samples. A definitive answer would require studies with large, representative samples and sophisticated developmental designs (cf. Schaie, 1996) conducted in a wide variety of cultures. The present study provides a step toward that goal with cross-sectional analyses from two cultures.

A second major issue in the study of adult personality development concerns variation across different perspectives on personality. Most American—and virtually all cross-cultural—research on age differences in personality has used self-report personality questionnaires, and the exceptions are intriguingly inconsistent. McCrae et al. (2000) reported two age comparisons using peer ratings. In American samples, self-report results were replicated for all five factors (cf. Piedmont, 1994), but in a German sample of over 2000 twins each rated by two peers, there were no significant age associations for E or O, and the correlations for N and A were extremely small ($r = -0.05$ and 0.06 , respectively). Finally, unpublished analyses of spouse ratings of Chinese psychiatric patients aged 17–74 (Yang et al., 1999) replicated effects for N, O, A, and C ($r = -0.17, -0.28, 0.19, \text{ and } 0.26$, respectively, $N = 154, p < 0.05$), but not for E ($r = 0.03, \text{ n.s.}$).

The contrast between consistent self-report findings and inconsistent observer rating findings is puzzling. In general, observer ratings show the same correlates as self-reports (see e.g. Costa & McCrae, 1992), and Kolar, Funder, and Colvin (1996) have argued that observer ratings are as good as or better than self-reports when predicting external criteria. It is possible that observer ratings are insensitive to age differences, perhaps because raters implicitly compare the target to people of his or her own age, thus minimizing age effects. Alternatively, it might be argued that the effects seen in self-report data are artifacts: Perhaps people share age stereotypes and bias their responses to provide age-appropriate self-descriptions. It is clear that more studies of age differences in observer rated personality are needed to confirm the trend seen so far and to suggest possible interpretations. In the present article we present data from two cultures, the Czech Republic and Russia.

The present studies use the full NEO-PI-R in large samples on whom both self-reports and observer ratings are available. Because the same individuals serve as self-reporters and as targets of observer ratings, differences in age associations must be due to the perspective of the data source, not sampling. We address two major questions: do age differences show linear or non-linear curves? and to what extent are self-report findings replicated using observer ratings? The data analysed were originally collected for other purposes, so the age distribution may not be optimal, but a reasonably wide age range is included.

Cultural and historical context of age differences

Because personality trait levels may be influenced both by social organization and by historical events that leave their imprint on different birth cohorts, some attention to the cultural and historical context of the present data is needed. The Czech Republic and Russia share Slavic languages, and, from 1948 to 1989, political rule by the Communist Party, which controlled law, the economy, education, and the media. In terms of Hofstede's (2001) dimensions of culture, they are both less egalitarian, more collectivistic, and more rule-bound than the United States and most Western European countries. In other respects they are quite different.

Czechoslovakia is part of Slavia Romana, with historic ties to Catholic Europe. Until the end of World War I (when the oldest Czech participants in this study were born) it was part of the Austro-Hungarian Empire. Thereafter, two decades of democratic independence were followed by occupation by Germany and then domination by the Soviet Union. Since 1989, The Czech Republic has become one of the most prosperous of the post-Communist countries, although it has also seen problems of rising crime, unemployment, and divorce (Možný, 2002). About 40% of Czechs are Catholic; the same proportion claims no religious affiliation.

Russia is the core of Slavia Orthodoxae, long the centre of its own empire. At the end of World War I the Czarist monarchy was quickly replaced by the Communist Party, so that Russians had essentially no experience of democracy prior to 1991. The transition since to a free market economy has been difficult, leading to widespread poverty, crime, and public health problems. Although the Russian Federation includes sizeable Muslim and other minority groups, the Central Russian region in which data were collected for the present study is ethnically Russian, and the dominant religion is Russian Orthodox.

Age differences in both of these cultures have been examined before using self-report data. The NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992), a brief, 60-item version of the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) was administered to a Czech sample of 912 men and women aged 14 to 81 (McCrae et al., 2000). N, E, and O were significantly higher in younger groups, and A and C were lower. However, the effect for A was attributable almost entirely to very low A scores among the 14–17-year-olds; A did not show consistent cross-sectional increases after age 18.

Russian data from 297 college students and community residents aged 18–49 were obtained using a translation of the full NEO-PI-R (Costa, McCrae et al., 2000). Significant effects were seen for E, O, A, and C factors, but not for N.¹ If the failure to find age differences in N is replicated in the present, independent sample, cohort effects might be considered as possible explanations. Political oppression in the years prior to 1989 may have permanently elevated levels of Neuroticism, cancelling out maturational declines in that factor.

METHOD

Participants

The Czech self-report sample included 1241 respondents, recruited in a series of studies, who had complete data on age and personality. They ranged in age from 14 to 83 years, with a mean age of 30.9 ($SD = 13.6$ years). Information on education was provided by 1076 respondents: Of these, 16% had primary education (10 years of mandatory education in the Czech Republic), 60% had secondary, and 24% university education.

Observer ratings—with complete data on target age—were provided by 900 raters (372 men, 528 women) aged 14–83 years ($M = 35.9$, $SD = 14.3$ years) who participated in one of two research designs. In the self/other agreement studies ($N = 607$), each target provided a self-report and was rated by one informant. In the consensus study, 49 targets (26 men and 23 women aged 16–67 years) provided a self-report and were each rated by three informants. The target then rated each of the three informants. This design yielded $49 \times 6 = 294$ observer ratings, for one of which target age was missing.

For the primary analyses, the 607 targets from the Czech self/other agreement studies were supplemented by the 49 targets and one of their raters (who had also been rated by the target) from the consensus study. The rater chosen was a spouse if available; if not, a sibling; then another relative; then a friend. The resulting sample A ($N = 705$) consisted of 294 men and 411 women aged 15–81 ($M = 36.1$, $SD = 14.1$ years) on whom both self-

¹N was also unrelated to age in studies in three other European countries: Estonia, Croatia, and Italy. However, other European countries, including Germany, the Czech Republic, Spain, and Great Britain, did replicate the cross-sectional decline in N (Costa et al., 2000; McCrae et al., 1999, 2000).

reports and observer ratings were available. The remaining cases (sample B; $N = 536$ self-reports, 195 observer ratings) were used as a replication sample.

Data were collected with the help of psychology students who were paid for their work. The students were requested to ask their relatives, partners, friends, and acquaintances to take part in a psychological study designed to investigate the relationships among various personality questionnaires, or the convergence of personality ratings across self- and partner ratings. Subjects were not paid for their participation and all testing materials were answered at home. In cases where the participants expressed an interest in feedback, they were given *Your NEO Summary* (Costa & McCrae, 1992) in Czech translation.

The Russian sample consisted of 800 respondents (387 men and 413 women) ranging from 15 to 80 years of age ($M = 31.2$, $SD = 12.0$). All respondents were paired with a sibling ($n = 166$) or a spouse ($n = 634$). Of the respondents paired with siblings, 68% were paired with a sibling of the other sex, 24% were pairs of sisters, and 8% were pairs of brothers. No information on education was available.

Data for this study were collected in four Central Russian cities: Yaroslavl, Ivanovo, Vladimir, and Vologda. All examiners were psychologists who reside and teach in the city in which they recruited respondents; both examiners and respondents were paid modest stipends for their participation in this study. Examiners recruited individuals they knew and in turn solicited recommendations for additional contacts from respondents. Typically respondents filled out the questionnaires in their own homes. All respondents completed self-reports and were rated by their sibling or spouse, so each respondent simultaneously served as a target and an informant.

As shown in Table 1, participants were assigned to one of eight age groups: 15–18, 19–22, 23–25, 26–29, 30–39, 40–49, 50–59, and 60+. These grouping were chosen because in American data most changes occur in late adolescence (Costa & McCrae, 2002), and because in both the present samples a disproportionate number of participants were in their 20s. However, too few respondents were in the youngest Czech age group and in the oldest Russian age group to permit their inclusion in ANOVAs. Those respondents were, however, included in the correlations and regressions.

Instrument

The NEO-PI-R is a 240-item measure of the five basic personality factors: Neuroticism (N); Extraversion (E); Openness to Experience (O); Agreeableness (A); and Conscientiousness (C). Each factor is represented by six eight-item facet scales. Items are answered

Table 1. Composition of the samples by age group and gender

Age group	Czech sample A		Russian	
	Men	Women	Men	Women
15–18	(3)	(8)	40	63
19–22	12	42	63	83
23–25	44	80	48	44
26–29	74	92	55	55
30–39	56	46	69	62
40–49	39	68	71	71
50–59	42	47	36	32
60+	24	28	(5)	(3)

Cells with numbers in parentheses were not used in ANOVAs.

on a five-point Likert scale from *strongly disagree* to *strongly agree*; scales are balanced to control effects of acquiescence. Form S is the self-report version; a parallel, third-person Form R is used for observer ratings.² Evidence on the reliability and validity of the instrument is given elsewhere (Costa & McCrae, 1992; Costa, McCrae, & Jónsson, 2002).

Both Czech and Russian versions were translated by psychologists and back-translations were reviewed and approved by the test authors. Scales in both instruments replicated the American factor structure and gender differences. For the five domains, coefficient alphas ranged from 0.85 to 0.93, and cross-observer correlations ranged from 0.43 to 0.65 (McCrae et al., in press). For the present paper, all raw scores were converted to *T*-scores (with means of 50 and standard deviations of 10) using combined sex norms from each sample and form to facilitate interpretation and comparison across samples.

RESULTS

The five domains

Czech sample

Preliminary analyses showed no evidence of age \times gender interactions for any of the five domain scores, so men and women were combined for the major analyses. One-way ANOVAs on the Form S and Form R domain *T*-scores showed significant effects for age group for all five self-report scales. As shown in Table 2, the direction of age differences

Table 2. Mean levels of NEO-PI-R domain *T*-scores for self-reports and informant ratings in eight age groups

Age group	NEO-PI-R domain									
	N	E	O	A	C	N	E	O	A	C
	<i>Czech self-reports</i>					<i>Czech informant ratings</i>				
19–22	54.1	52.5	57.9	48.5	46.0	51.8	52.2	57.0	50.6	49.4
23–25	50.5	52.5	53.4	48.0	48.3	50.1	53.0	53.9	50.4	48.6
26–29	51.1	51.1	51.5	47.9	49.1	50.4	50.8	51.8	49.0	49.3
30–39	48.9	50.3	47.7	49.6	49.6	47.4	50.8	48.5	50.6	50.1
40–49	48.3	49.2	48.3	51.0	52.3	51.0	48.4	47.5	50.8	51.9
50–59	49.0	44.2	45.2	53.9	52.0	50.4	44.0	44.3	49.5	50.7
60+	48.4	46.7	43.6	55.5	55.3	50.3	47.7	44.3	50.7	52.3
	<i>Russian self-reports</i>					<i>Russian informant ratings</i>				
15–18	52.5	54.1	52.3	46.3	46.7	51.2	51.8	50.4	46.5	47.5
19–22	51.3	53.4	52.5	47.4	49.8	49.4	52.7	52.4	48.3	49.1
23–25	52.3	48.5	52.1	47.1	47.4	52.4	50.2	52.2	48.9	47.6
26–29	48.6	49.0	51.2	48.4	51.0	50.6	50.5	51.3	48.6	50.4
30–39	48.0	50.0	49.3	51.0	50.9	48.9	49.9	48.8	49.8	52.3
40–49	48.6	47.6	47.0	54.1	50.7	49.4	47.4	47.8	53.8	50.5
50–59	49.4	45.7	45.0	56.8	53.6	49.1	46.1	47.1	54.9	52.5

These are *T*-scores calculated within sample and form. Standard deviations of individual cells range from 8.3 to 12.5.

²In the Russian sample, observer ratings were obtained using first-person items administered with instructions to the respondent to rephrase each item in the third person; see McCrae et al. (in press).

Table 3. Unstandardized linear regression coefficients predicting NEO-PI-R domain *T*-scores from age in decades

Domain	Five cultures ^a	Czech sample A		Russian	
		Form S	Form R	Form S	Form R
N	-0.56	-0.90 ^b	0.06 n.s.	-0.95 ^b	-0.52 n.s.
E	-1.73	-1.79 ^b	-1.70 ^b	-2.02	-1.66
O	-2.08	-2.49 ^b	-2.54 ^b	-2.24	-1.54
A	1.70	1.78	0.24 n.s.	2.77	2.16
C	2.20	1.78	0.91	1.35	1.17

Except as noted, all Czech and Russian regression coefficients are significant at $p < 0.05$.

^aMean of regression coefficients predicting self-report NEO-PI-R factors in Germany, Italy, Portugal, Croatia, and South Korea (McCrae et al., 1999).

^bA quadratic age term is also significant.

was consistent with previous results: N, E, and O decreased across age groups, whereas A and C increased. In this Czech sample—in contrast to earlier findings (Costa, McCrae et al., 2000)—A appears to increase throughout adulthood. The same age differences were found for observer-rated E and O, but there were no significant age group differences for observer-rated N, A, or C. A similar pattern was found in Czech sample B, where significant correlations with age were found for all domain scales except observer-rated N and A.

The magnitude of age effects can be seen in Table 3, which reports the results of linear regressions predicting domain *T*-scores from age in decades (i.e. age in years/10), along with mean unstandardized regression coefficients from five cultures analysed by McCrae et al. (1999). The rate of age changes in the Czech data—modest in absolute terms—is generally comparable to that seen in other cultures. The regression analyses show a significant effect for observer-rated C, perhaps because data from the 15–18-year-olds, who are quite low in C, are included. Except in the case of O, self-report data show stronger effects than observer rating data. For most samples, the rate of change is less than two *T*-score points per decade.

The linear effects of age account for from 1.6% (for self-reported N) to 12.7% (for observer-rated O) of the variance in domain scores. As noted in Table 3, several domains also showed small but significant quadratic age effects, accounting for an additional 0.6–1.6% of domain score variance. The predicted curves based on these regressions are presented in Figures 2–4. Figure 2 shows self-reported N in the Czech (and Russian) sample; Figures 3 and 4 show Czech results for E and O, respectively, on both forms. In Figures 3 and 4, virtually identical curves are found when self-report and observer-rating data are analysed. All three figures show a relatively steep cross-sectional decline between adolescence and middle adulthood, and slower change thereafter. There is some suggestion of an increase in N in later life in Figure 2.

Russian sample

Two-way ANOVAs were conducted on Form S and Form R domains, with age group and gender as classifying factors. There were significant age \times gender interactions for observer-rated E and O: men showed a more pronounced linear decline in both domains than did women. However, these effects accounted for less than 3% of the variance, and no

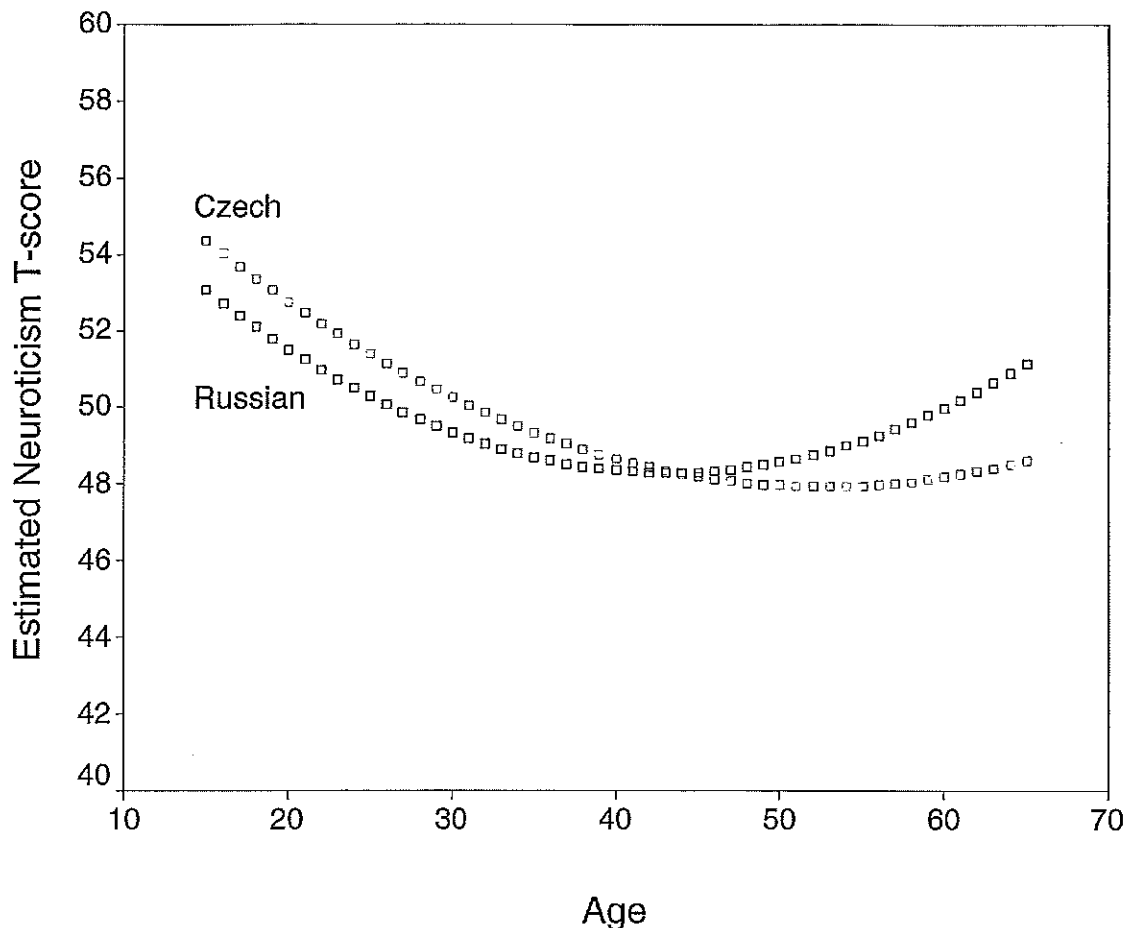


Figure 2. Quadratic regression curves predicting Neuroticism *T*-scores in Czech (light squares) and Russian (dark squares) self-reports.

other interactions were significant, so the major analyses were conducted on the full sample.³ Means are presented in Table 2.

The main effect for age group was significant for all the self-report scales—including *N*—and for *E*, *O*, *A*, and *C* observer ratings scales. Effect sizes (partial η^2) ranged from 0.031 for self-reported *N* to 0.116 for self-reported *A*. As Table 2 shows, all age differences are in the expected direction, and observer-rating data closely parallel self-report data. The self-report *N* data show the pattern typically seen in American data, with some levelling off after age 30. By contrast, all the other domains appear to have linear associations with age. Regressions predicting NEO-PI-R domain scores from age and age squared confirmed that, with the exception of self-reported *N*, the effects are linear: age squared did not add significantly to the prediction of personality scores. Linear regression coefficients are reported in Table 3. Russian values are comparable to Czech and other cultures'. In every case, Russian self-report data show stronger effects than observer rating data.

A significant quadratic effect was seen for self-reported *N*. The regression curve is plotted in Figure 2; it shows a decline from age 15 to about age 45, with an increase thereafter. The sharp cross-sectional decline from adolescence into adulthood is consistent

³The present age \times gender interaction for *O* was replicated in the study by Srivastava, John, Gosling, and Potter (2003) study, although the effect was extremely small. In contrast to the present study, Srivastava et al. showed that with greater age, men increased in *E* relative to women. The present data did not replicate the interaction for *N* they reported.

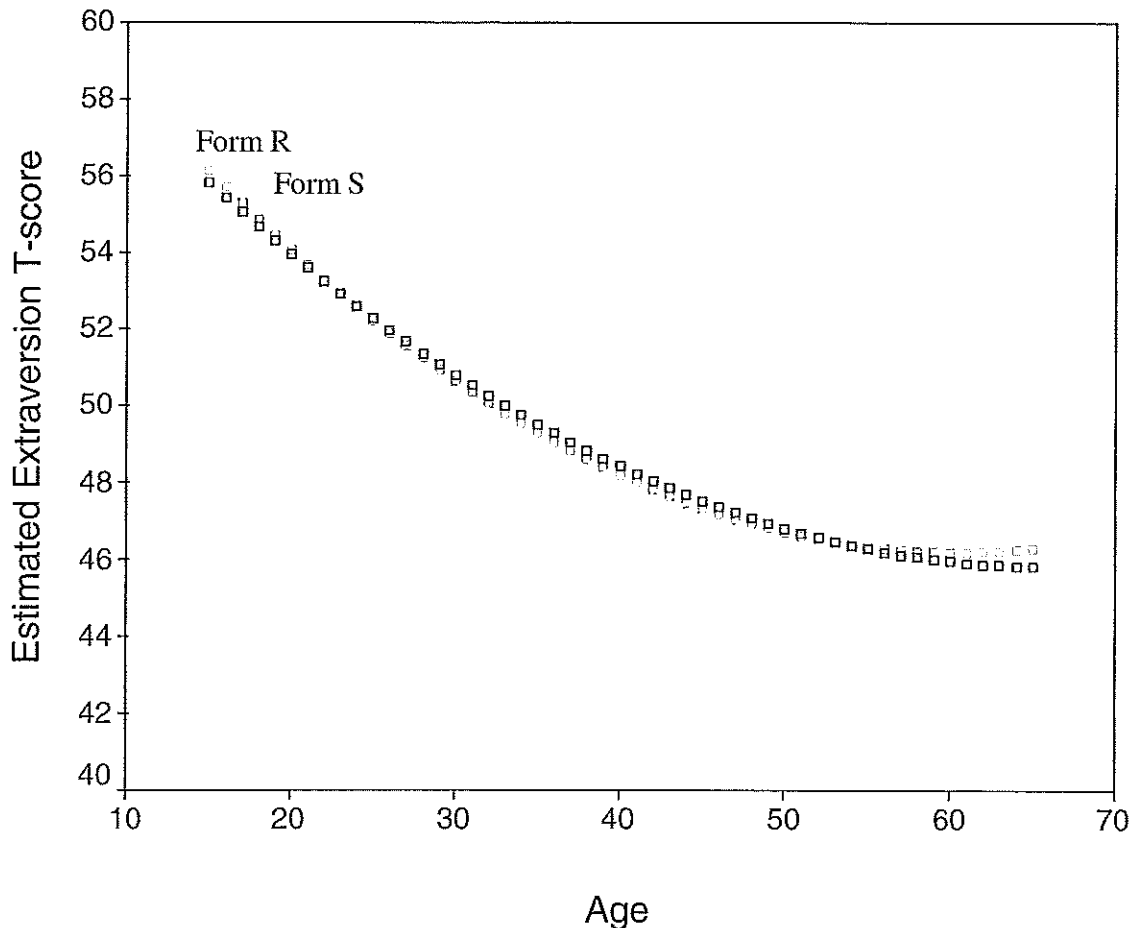


Figure 3. Quadratic regression curves predicting Extraversion *T*-scores for Czech observer ratings (Form R; light squares) and self-reports (Form S; dark squares).

with previous research, but American data typically do not show any increase in *N* in later life (e.g. Costa et al., 1986).

In some previous research (McCrae et al., 2000) a curvilinear trend had been seen for *O*, with highest scores found in late adolescent groups. An examination of Table 2 shows that this pattern is seen in observer ratings of *O* in the Russian data, but it is not statistically significant. There is no suggestion of a curve in the self-report *O* data.

The 30 facets

Because these age effects are generally linear, they can be reasonably portrayed by simple correlations. Table 4 reports correlations of the 30 NEO-PI-R facets with age. For comparison, the second column summarizes results of previous research (Costa et al., 2000b; McCrae et al., 1999; Piedmont et al., 2002; Yang et al., 1999). For example, *N5*: Impulsiveness had a significant negative correlation with age in all 11 cultures previously studied, whereas *E4*: Activity had small negative correlations in three cultures and small positive correlations in two, giving a net trend down by one culture.

These pan-cultural trends are closely followed by both the Czech and Russian correlations, and by both NEO-PI-R forms. When the second column is coded as a variable ranging from -11 to $+11$, the rank order correlations across the seven columns range from 0.66 to 0.97, $N = 30$, $p < 0.001$. *N5*: Impulsiveness; *E5*: Excitement Seeking; *O1*: Fantasy;

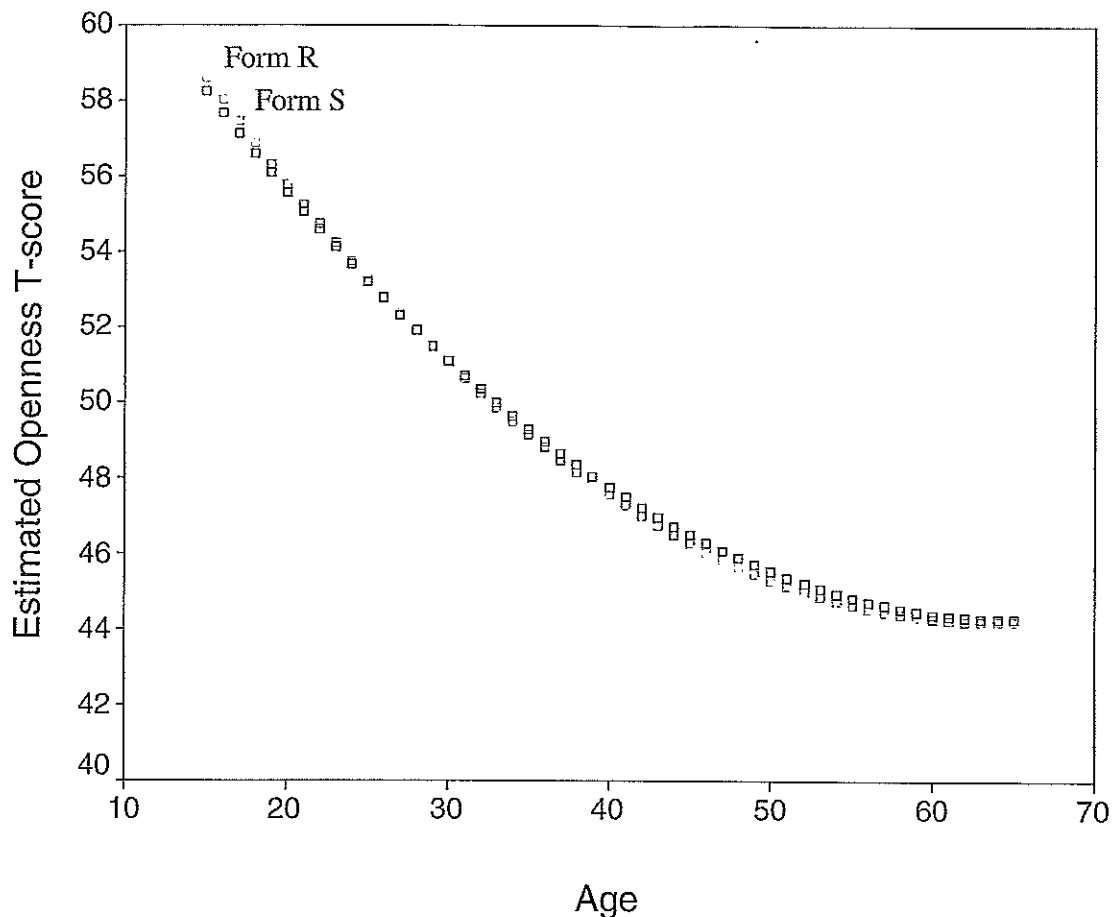


Figure 4. Quadratic regression curves predicting Openness *T*-scores for Czech observer ratings (Form R; light squares) and self-reports (Form S; dark squares).

A2: Straightforwardness; and C3: Dutifulness show strong age correlations in Czech and Russian data, as they do in most of the world.

The few anomalies deserve mention. In most cultures, older people are less responsive to art and more focused on achievement than are younger people. However, O2: Aesthetics is not related to age in the Russian sample; and C4: Achievement Striving is associated with age in neither the Czech nor the Russian sample. This might perhaps be attributed to the life experience of the older generations in Soviet countries, where artists and musicians were regarded as state heroes, but individual economic achievement was taboo. Young Czechs and Russians today may be under greater social pressure to achieve economically. Universal maturational trends and local cohort effects may cancel out.

In general, correlations of age with self-reported facets are somewhat larger than correlations with observer-rated facets. Using the Meng, Rosenthal, and Rubin (1992) test in Czech sample A and the Russian sample showed significant differences in favor of self-reports for 15 facets (see table notes). However, in three cases (Czech Anxiety, Angry Hostility, and Positive Emotions) larger age correlations were found for Form R. Particularly striking is the positive correlation of observer-rated N1: Anxiety with age in Czech sample A, which was replicated in sample B. In many cultures, a significant negative correlation is found between self-reported Anxiety and age (although this was not replicated in either the Czech or Russian data). It is unclear why older Czechs would be perceived as more anxious than younger Czechs.

Table 4. Correlations of age with NEO-PI-R facet scales

Facet	11 cultures ^a	Czech sample A		Czech sample B		Russian sample	
		Form S	Form R	Form S	Form R	Form S	Form R
N1: Anxiety	down (5)	-0.02	0.11** ^b	-0.03	0.15*	-0.02	0.00
N2: Angry Hostility	down (6)	0.00	0.12** ^b	-0.08	0.01	-0.08*	-0.06
N3: Depression	down (7)	-0.07	-0.03	-0.14**	-0.03	-0.09*	0.03 ^c
N4: Self- Consciousness	down (7)	-0.02	0.03	-0.05	-0.06	0.02	0.08*
N5: Impulsiveness	down (11)	-0.40***	-0.25*** ^c	-0.27***	-0.11	-0.27***	-0.21***
N6: Vulnerability	down (8)	-0.08*	0.04 ^c	-0.16***	-0.01	-0.07	-0.09*
E1: Warmth	down (2)	-0.07	-0.09*	-0.02	-0.14	0.08*	0.08*
E2: Gregariousness	down (7)	-0.15***	-0.12**	-0.08	-0.18*	-0.21***	-0.23***
E3: Assertiveness	down (3)	-0.08*	-0.03	0.00	0.00	-0.12***	-0.05
E4: Activity	down (1)	-0.10**	-0.06	-0.02	-0.17*	-0.11***	-0.06
E5: Excitement Seeking	down (10)	-0.33***	-0.31***	-0.28***	-0.36***	-0.39***	-0.34***
E6: Positive Emotions	down (9)	-0.26***	-0.35*** ^b	-0.18***	-0.29***	-0.22***	-0.23***
O1: Fantasy	down (11)	-0.38***	-0.33***	-0.30***	-0.33***	-0.34***	-0.25*** ^c
O2: Aesthetics	down (8)	-0.14***	-0.18***	-0.11*	-0.16*	-0.02	-0.01
O3: Feelings	down (11)	-0.26***	-0.23***	-0.15***	-0.17*	-0.20***	-0.11*** ^c
O4: Actions	down (9)	-0.32***	-0.36***	-0.05	-0.42***	-0.27***	-0.24***
O5: Ideas	down (9)	-0.16***	-0.19***	-0.06	-0.19**	-0.14***	-0.04 ^c
O6: Values	down (10)	-0.24***	-0.30***	0.01	-0.12	-0.13***	-0.09*
A1: Trust	up (9)	0.06	-0.05 ^c	0.07	-0.10	0.17***	0.12***
A2: Straight- forwardness	up (11)	0.18***	-0.01 ^c	0.17***	-0.05	0.33***	0.25*** ^c
A3: Altruism	up (7)	0.14***	-0.01 ^c	0.10*	-0.03	0.15***	0.16***
A4: Compliance	up (10)	0.14***	0.00 ^c	0.11**	0.05	0.26***	0.21***
A5: Modesty	up (11)	0.33***	0.13*** ^c	0.13**	0.05	0.25***	0.19***
A6: Tender- Mindedness	up (10)	0.09*	0.09*	0.08	0.09	0.15***	0.16***
C1: Competence	up (9)	0.09*	0.04	0.13**	0.09	0.11**	0.10**
C2: Order	up (8)	0.12**	0.11**	0.11*	0.09	0.10**	0.10**
C3: Dutifulness	up (11)	0.37***	0.20*** ^c	0.23***	0.26***	0.24***	0.21***
C4: Achievement Striving	up (8)	0.00	0.02	0.04	-0.03	-0.04	-0.01
C5: Self-Discipline	up (11)	0.26***	0.14*** ^c	0.16***	0.19**	0.18***	0.16***
C6: Deliberation	up (11)	0.24***	0.09* ^c	0.14**	0.20**	0.18***	0.11***

$N=800$ for Russian, 705 for Czech sample A, 536 for sample B Form S, and 195 for sample B Form R data.

^aTrend shows the direction and net number of significant age associations in 11 cultures. Cultures are Germany, Italy, Portugal, Croatia, South Korea, US, Russia, Japan, Estonia, China, and Zimbabwe.

^bForm R correlation larger in absolute magnitude than Form S correlation, $p < 0.05$.

^cForm S correlation larger in absolute magnitude than Form R correlation, $p < 0.05$.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

DISCUSSION

Self-report and observer rating data from two Slavic countries confirm and qualify previous research on age differences in personality traits. Pan-culturally, N, E, and O appear to decrease with age after late adolescence, whereas A and C increase. These global trends, however, mask considerable variation in the developmental curves of different

Table 5. Summary of curvilinear effects

Country	Personality factor				
	N	E	O	A	C
Czech Republic (Form S)	✓	✓	✓		
Czech Republic (Form R)		✓	✓		
Russia (Form S)	✓				
Russia (Form R)					
Germany ^a	✓				
Italy ^a		✓			
Portugal ^a	✓	✓			✓
Croatia ^a		✓	✓	✓	✓
South Korea ^a	✓	✓		✓	✓
United States ^b					✓

Checkmarks indicate statistical evidence of a non-linear pattern in which rate of change is less pronounced after age 30.

^aFrom McCrae et al., 1999.

^bFrom Srivastava et al. (2003).

facets of the five domains. Some traits, such as Impulsiveness and Openness to Fantasy, are more strongly related to age, whereas other traits, such as Anxiety and Warmth, show weaker associations. These findings were replicated in both Czech and Russian data.

One focus of the present study was the shape of age curves. Costa and McCrae (2002) predicted that rates of change would decrease after age 30. That hypothesis was tested using curvilinear regressions, and was partially supported for N, E, and O, but not for A or C. Two other articles have formally tested this model, with somewhat different methods. McCrae et al. (1999) used planned comparisons in five cultures to contrast adolescents with adults, and younger adults with older. They identified 13 instances in which adolescents differed from adults, but older adults did not differ from younger adults. Srivastava et al. (2003), using a large, Internet-based sample of Americans, compared regression slopes before and after age 30, and found that the cross-sectional rate of change was higher before age 30 only for Conscientiousness. (For Agreeableness, they found that the increase was more pronounced after age 30.) These results are summarized in Table 5, which shows that 40% of the tests supported the hypotheses, and that all five factors showed at least some evidence of the expected pattern. The hypothesis of decelerated change remains viable, though it has clearly not yet been established.

The studies in Table 5 are all cross-sectional, however, and cohort differences or sampling biases may account for some of the findings (cf. Twenge, 2000). The relatively large, linear effects of age on Openness to Experience, for example, may reflect the increasing availability of formal education to later birth cohorts. Perhaps older Czechs and Russians 'find philosophical arguments boring' (as one O item states), not because they are truly closed to experience, but only because they are academically unprepared to follow the arguments.

A second focus of this study was an examination of the effects of data source on age associations. Previous research had shown inconsistent results when observer ratings of personality traits are correlated with age. In the present study, age associations based on observer ratings were consistently smaller than those based on self-reports, and in the Czech sample ANOVAs showed no significant age differences for N, A, or C. These findings cannot be attributed to sampling bias, because the same individuals who showed no effect when rated by informants did show the expected age effects in self-reports.

In some respects, age associations with rated personality appear to be random. In a large German sample (McCrae et al., 2000), the expected correlations were seen for N, A, and C, but not for E and O. In the Czech sample, exactly the opposite pattern was found, with significant effects only for E and O. In other respects, there seem to be consistent within-culture effects, because the pattern of results for Czech sample A was replicated in sample B. Perhaps some complex interaction of culture by trait by data source accounts for these results.

However, the more basic finding is that, whenever significant age differences in observer-rated personality traits appear, they follow the same direction as self-reports. There are 54 significant correlations of age with Form R traits in Table 4, and 51 (94%) of them are consistent with prevailing pan-cultural trends. One interpretation of this finding is that the age differences are veridical, but that observer ratings systematically underestimate them. A likely explanation for this bias is the implicit use of age norms: some raters may compare the target to others of the target's own age, thus eliminating age differences. Future research⁴ might test this hypothesis by making the comparison groups explicit, with instructions to compare the target to 'people of all ages' versus 'people his/her own age.'

Across a wide range of cultures, age differences are very similar at the level of both factors and facets; there is some evidence that the rate of change decreases in adulthood in many cultures. There are three plausible interpretations for such uniform results. Age differences may reflect the environmental impact of historical changes that are common to virtually all cultures in the world, such as the rise of the mass media. They may be due to uniform social requirements of all human societies, such as the need for adults to be responsible and nurturing parents. Alternatively, they may reflect biologically based processes of intrinsic maturation, which in turn may have evolved to meet the needs of the species. Historical, cultural, and biological explanations are not mutually exclusive—for example, the failure to find an association of age with Achievement Striving might have resulted from opposing maturational and cohort effects.

However, in Five-Factor Theory, McCrae and Costa (1999, 2003) take a strong biological position, arguing that environmental influences on personality traits are minimal. In part, that position is based on evidence for the heritability of age changes (McGue, Bacon, & Lykken, 1993) and for similar changes in chimpanzees (King, Landau, & Guggenheim, 1998). In part, it is based on the stability of individual differences in personality, despite the potential influence of life events (McCrae & Costa, 2003). It is also based on cross-cultural evidence. The respondents in the present study were raised in a social environment that was very different from that of Americans. Soviet ideology pervaded educational practices, economics, and the media during most of their lives, and political oppression was a continuing stressor. Yet Czechs and Russians today show the same general pattern of age differences that are to be found in the US and Western Europe. In this larger sample, the Russians even showed age differences in N, which were not seen in a prior study (Costa, McCrae et al., 2000). A lifetime of divergent experience apparently had little effect on personality development, East or West.

Recent research efforts have emphasized the need to trace developmental curves back into childhood (McCrae et al., 2002), but we are also largely ignorant of the course of personality trait development in advanced age. Only a handful of subjects in the present study were over age 70, and the same is true of most cross-cultural studies of age

⁴It would also be of interest to vary systematically the age of the rater.

differences. There are surely major differences in the phenomenon of aging in different cultures—the life expectancy of Russians is ten years less than that of Czechs (McKnight, 2001)—and it remains to be seen whether these differences affect personality traits.

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