Personality, Self-Rated Health and Subjective Age in a Life-Span Sample: The Moderating Role of Chronological Age

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Abstract

The present study tested whether chronological age moderates the association between subjective age and self-rated health and personality in a community-dwelling lifespan sample (*N*=1,016; age-range: 18–91). Self-rated health, extraversion, and openness to experience were associated with a younger subjective age at older ages. Conscientious individuals felt more mature early in life. Conscientiousness, neuroticism, and agreeableness were not related to subjective age at older ages. These findings suggest that with aging self-rated health and personality traits are increasingly important for subjective age.

Keywords

subjective age; personality; self-rated health; lifespan

A growing body of research emphasizes the subjectivity of the aging process, as illustrated by the consistent finding that despite age-related changes, the majority of older adults feel younger than they actually are (Montepare, 2009; Mock & Eibach, 2011; Rubin & Berntsen, 2006). The tendency to feel younger or older than one's actual age is considered a crucial construct in old age, with implications for a variety of physical and psychological outcomes, including well-being (Stephan, Caudroit, & Chalabaev, 2011) and longevity (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009). Drawing upon a lifespan developmental view, researchers have emphasized that more than being just a phenomenon specific to older adults, the discrepancy between subjective and chronological age emerges early in adulthood and changes across the lifespan (Galambos, Turner, & Tilton-Weaver, 2005; Montepare, 2009; Rubin & Berntsen, 2006). For example, younger adults feel the same age or slightly older than their actual age but feel increasingly younger than their actual age as they grow older (Galambos et al., 2005; Rubin & Berntsen, 2006). As a result, researchers have called for a lifespan approach to the study of the determinants of subjective age, with the assumption that their contribution may vary as a function of individuals' chronological age (Montepare, 2009). Although a great deal of research has focused on the predictors of subjective age, relatively few studies have considered the moderating role of chronological age.

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Among a set of potential predictors, self-rated health has been consistently found to account for a substantial proportion of variance in subjective age, whereas sociodemographic factors such as gender and education play only a minor role (Barak & Stern, 1986; Barrett, 2003; Hubley & Russell, 2009; Infurna, Gerstorf, Robertson, Berg, & Zarit, 2010; Rubin & Berntsen, 2006). However, little research has examined the possibility that the self-rated health-subjective age relationship might vary as function of chronological age. The only exception is Hubley and Russell (2009), who found that self-rated health explained a slightly greater proportion of subjective age for individuals 70 to 97 years old than for 55 to 69 years old. From a lifespan perspective, there are reasons to expect that the relationship between self-rated health and subjective age may vary from early adulthood to old age. In particular, health becomes an increasingly important life goal with advancing age (Heckhausen, 1997; Smith & Freund, 2002), and favorable evaluations of health are highly valued as an indicator of youthfulness (e.g. Westerhof, Barrett, & Steverink, 2003). Taken together, these studies suggest that positive perceptions of one's health would be more closely related with a younger subjective age as people grow older.

In addition to self-rated health, subjective age may also reflect other individual difference variables, such as personality traits. Surprisingly, little research has considered the role of personality in shaping individuals' tendency to feel younger or older than their chronological age. Hubley and Hultsch (1994, 1996) found that Extraversion and Openness, but not Neuroticism, were related to younger subjective age among a sample of community dwelling adults aged from 55 to 85 years. Knoll, Rieckmann, Scholz, and Schwarzer (2004) examined the relationship between Conscientiousness and subjective age in a clinical sample of cataract surgery patients aged from 38 to 92 years, and found that highly conscientious individuals tended to feel younger before and after surgery. These previous studies involved only participants from middle to late adulthood and only assessed some of the five major factors of personality. Therefore, the personality-subjective age relationship remains relatively underexplored, and the extent to which the association between personality traits and subjective age changes across the lifespan has yet to be tested.

Drawing upon the FFM (Digman, 1990; Costa & McCrae, 1992), the present study considers the intriguing possibility that chronological age moderates the relationship between personality and subjective age. Although studies have found either no influence of age on the relationships between personality and different outcomes (Isaacowitz, 2005; Nikitin & Freund, 2011; Sutin, Terracciano, Kitner-Triolo, Uda, Schlessinger, & Zonderman, 2011), or a stronger impact in younger compared to older adults (Ready & Robinson, 2008), some evidence suggests that aging exacerbates the risk or benefits conveyed by personality traits, such that they may become more relevant for physical and psychological outcomes as individuals age (Duberstein et al., 2003; Quinn, Johnson, Poon, & Martin, 1999; Sutin, Ferrucci, Zonderman, & Terracciano, 2011). Following this line of research, personality traits could be expected to be more closely associated with subjective age as individuals grow older. This hypothesis applies in particular to Conscientiousness and Neuroticism, which are often associated with better health, ranging from self-rated health to longevity (Chapman, Fiscella, Kawachi, & Duberstein, 2010, Löckenhoff, Terracciano, Ferrucci, & Costa Jr, 2012; Terracciano, Löckenhoff, Zonderman, Ferrucci, & Costa Jr, 2008). The compounding damaging effects of behaviours and emotional states associated with low Conscientiousness and high Neuroticism may contribute to individuals feeling older than some of their healthier peers of the same chronological age.

In addition to the above health-related hypothesis, personality traits such as extraversion and openness to experience might be associated with subjective age through a more basic process of comparison of one's own personality to the personality of different age groups. The implications of social comparison for subjective age have been recently emphasized

(Weiss & Freund, in press; Weiss & Lang, in press). Weiss and Lang (in press) found that, with advancing age and exposure to aging stereotypes, feeling younger reflects a tendency to distance oneself from one's age-group. Weiss and Freund (in press) further revealed that, after being confronted with negative age-related information, older adults distance themselves from their own age-group (i.e. they contrast themselves with their age-group) and simultaneously perceived themselves similar in age to middle-aged people (i.e. they assimilate to middle-aged adults). This social comparison process is also likely to involve beliefs about personality stereotypes of age groups. There is evidence that regardless of respondents' own age, older adults are typically viewed as less open and less extraverted than both young and middle-aged adults, with less marked perceived differences between middle-aged and older adults on neuroticism, agreeableness and conscientiousness (Haslam, Bastian, Fox, & Whelan, 2007; Igier & Mullet, 2003). In addition, these perceived age-related differences match real age-related differences reported by cross-sectional and longitudinal studies (e.g. Donnellan & Lucas, 2008; Terracciano, McCrae, Brant, & Costa, 2005). Therefore, with advancing age, extraverted and open individuals' characteristic way of thinking, feeling, and behaving may be closer to those of the typical younger adult than to those of the typical older adult. Building upon recent evidence (Weiss & Freund, in press; Weiss & Lang, in press), through social comparison of their own behaviors, thoughts and feelings with those of their age-peers and in response to personality stereotypes of aging, older extraverted and open people may be likely to distance themselves from their own age-group and to perceive themselves as being more similar to younger age-group. As a result, extraversion and openness to experience may be more strongly associated with a youthful subjective age in older age.

In brief, the present study tests whether the relationship between self-rated health or personality and subjective age across the lifespan varies depending on chronological age. Based on existing studies (Smith & Freund, 2002; Westerhof et al., 2003), it was hypothesized that positive perceptions of one's health are more strongly associated with a younger subjective age with advancing age. In addition, in line with previous research (Duberstein et al., 2003; Weiss & Freund, in press; Weiss & Lang, in press), personality was expected to be more closely related to subjective age as individuals grow older.

Method

Participants and procedure

Participants were recruited throughout France using print and web-based advertisements in internet forums, newsletters, occupational settings, and clubs. To be eligible, they had to be at least 18 years old, living in the community and free from severe functional, mental or cognitive impairment. The final sample consisted of 1,016 community-dwelling individuals aged from 18 to 91 years (*Mean age* = 49.50, *SD* = 22.13), 56% were female, and 54% had a partner. Concerning educational attainment, 1% had no education, 5% had basic school-leaving qualification, 17% of the sample had vocational training certificate, 31% had a high school diploma, and 40% had a university graduate degree. At the time of the study, 7% were unemployed, 24% of the participants were students, 32% were working for pay, and 37% were full-time retired.

Measures

Sociodemographic characteristics—Chronological age (in years), gender (coded as 0 for women and 1 for men), marital status (coded as 0 for living with a partner and 1 for living alone) and education, rated on a scale from 1 ("*did not finish school*") to 5 ("*graduated from university*"), were assessed and included in the present study. Employment

status indicated whether a participant was working for pay (coded as 1) or not (coded as 0, including participants who were students, unemployed, and retired).

Self-rated health—In line with existing research (e.g. Benyamini, Leventhal, & Leventhal, 2003; DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Phelan, Love, Ryff, Brown, & Heidrich, 2010), self-rated health was assessed with a single question: "As a whole, how do you rate your current health?" with a Likert-type answering scale ranging from 1 ("*poor*") to 6 ("*excellent*"). Higher scores indicate better perceived health.

Personality—The French version of the Big Five Inventory (BFI, Plaisant, Courtois, Reveillère, Mendelsohn, & John, 2010) initially developed by John, Donahue, and Kentle (1991) was used in the present study. Its 45 items are short, easy-to-understand phrases that assess the five personality traits of Extraversion, Neuroticism, Openness to experience, Agreeableness, and Conscientiousness. Each item was rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In previous research, the BFI domain scales have shown high reliability and strong convergence with longer Big Five measures (Soto & John, 2009; Soto, John, Gosling, & Potter, 2008). In the present study, Cronbach's coefficient alphas for the five factors ranged from .74 to .82.

Subjective age—In line with a well-established research tradition (Kleinspehn-Ammerlahn et al., 2008; Kotter-Grühn et al., 2009; Mock & Eibach, 2011; Rubin & Berntsen, 2006; Weiss & Lang, in press; Westerhof & Barrett, 2005), participants were asked to specify, in years, how old they feel most of the time. Participants' felt age was subtracted from their chronological age and this discrepancy, reflecting the tendency to feel either younger or older than one's chronological age, was used as the dependent variable (Mock & Eibach, 2011; Weiss & Lang, in press; Westerhof & Barrett, 2005). When a respondent's felt age is younger than his/her chronological age, a positive value is obtained, whereas a negative value reflects a tendency to feel older.

Data analysis

A multiple regression analysis predicting subjective age tested for an interaction between chronological age and self-rated health. Gender, education, occupational status, marital status were entered in a first step, self-rated health was entered in a second step, and age was added in a third step, followed by the self-rated health by chronological age interaction in a fourth step. A second set of analyses tested whether an interaction between personality and chronological age predicted subjective age. After controlling for the same covariates and self-rated health in a first step, for the main effect of personality in a second step and age in a third step, the personality by age interactions were entered in a fourth step. Collinearity diagnostics were run, and revealed no problem of multicollinearity. When significant interactions emerged, the simple slopes for the association between the predictor and subjective age at three levels of chronological age, i.e. middle age (the mean of the sample), younger age (1 *SD* below the mean) and older age (1 *SD* above the mean), were plotted and tested for significance (see Aiken & West, 1991). Continuous variables were mean-centered before running the analyses.

Results

Descriptive statistics and Pearson correlation coefficients among the variables of interest are presented in Table 1. The first set of regression analysis tested whether chronological age moderated the relationship between self-rated health and subjective age. After accounting for demographic covariates in a first step ($R^2 = .04$), the results revealed that self-rated health in a second step ($B = .68$, $p < .01$, $\Delta R^2 = .01$) and chronological age in a third step

(B= .16, $p < .001$, ΔR^2 = .25) were significant predictors of subjective age. In a fourth step, chronological age moderated the association between self-rated health and subjective age (B= .05, $p < .001$, ΔR^2 = .02) (see Table 2). Higher self-rated health was related to a younger subjective age among middle-aged, b= 1.31, $t(1008)$= 6.55, $p <.001$, and older adults, b= 2.53, $t(1008)$= 8.43, $p <.001$, whereas no significant relationship was found for younger individuals, b= 0.10, $t(1008)$= 0.36, ns. Among the middle-aged participants, those who scored high on self-rated health (1SD above the mean) felt about two years younger than those with low self-rated health (*1SD* below the mean), and the difference was more than 4 years in old age. Additional analyses found no significant interactions between chronological age and demographic variables.

A second set of analysis tested whether chronological age moderated the relationship between personality traits and subjective age. After accounting for demographic covariates and self-rated health in a first step, we found a main effect of Openness (B= 1.19, $p < .001$), Extraversion (B= −.65, $p < .05$), and Conscientiousness (B= 1.50, $p < .001$) in predicting subjective age (ΔR^2 = .04, $p < .001$). In a third step, chronological age was significantly associated with subjective age (B= .16, $p < .001$, ΔR^2 = .21), and only Openness remained a significant predictor (B= .88, $p < .01$). Significant interactions of chronological age with Extraversion (B= .02, $p < .05$), Openness (B= .02, $p < .05$), and Conscientiousness (B= .03, $p < .01$) emerged in a fourth step (ΔR^2 = .02, $p < .001$) (see Table 2). As expected, high Extraversion was significantly associated with a youthful subjective age among older adults, b= 0.72, $t(999)$= 2.07, $p <.05$, whereas no associations were found among middle-aged, b= 0.21, $t(999)$= 0.87, ns, and younger adults, b= −0.29, $t(999)$= −0.94, ns. High Openness was associated with a younger subjective age in older adults, b= 1.29, $t(999)$= 3.59, $p <.001$, and middle-aged, b= 0.74, $t(999)$= 2.69, $p <.01$, but not among young adults, b= 0.18, $t(999)$= 0.51, ns. High Conscientiousness was negatively associated with subjective age among young adults, b= −0.80, $t(999)$= −2.28, $p <.05$, but no relation were found among middle-aged, b= −0.11, $t(999)$= −0.35, ns, and older adults, b= 0.57, $t(999)$= 1.39, ns.

Discussion

The present study tested whether the relationships between self-rated health, personality and subjective age varies across the lifespan as a function of chronological age. As expected, self-rated health was associated with subjective age in middle-aged and older adults, but was unrelated to subjective age among young adults. This finding illustrates the increasingly important role of a positive perception of health for a youthful subjective age with advancing age, and extends previous research that only compared late adulthood to very old age (e.g. Hubley & Russell, 2009). It also highlights the importance of the moderating role of chronological age in this relationship (e.g. Barrett, 2003).

This study is the first to examine the association between subjective age and all five major dimensions of personality in a lifespan sample, and to identify that this relationship depends upon chronological age. As expected, Extraversion was found to be associated with a youthful subjective age in older adults. Older extraverted people sociability, activity, assertiveness, energy, and propensity to seek out exciting environments may be closer to the personality characteristics of the typical younger individuals than to the typical older adult, resulting in a youthful subjective age. In the same vein, Openness to experience, was unrelated to subjective age among younger adults, but was both associated positively with a younger subjective age in middle-aged and older adults. From middle to old age, open individuals' tendency to search for a variety of new ideas, values and experiences could lead them to have interests and activities more indicative of younger people than of people their age, leading them to feel younger than their actual age. Building upon previous research (Weiss & Freund, in press; Weiss & Lang, in press), in response to personality stereotypes

of aging which associate growing older with low extraversion and openness, its is likely that extraverted and open older people may distance themselves from their age group and may perceive themselves more similar in age to younger age-group.

An interesting pattern was found for the moderating role of chronological age on the Conscientiousness-subjective age relationship. Conscientiousness is negatively related to a younger subjective age among young adults, and did not contribute to feeling younger in old age. The finding that conscientious young adults were less likely to report a younger subjective age is consistent with previous research that suggests psychosocial maturity in emerging adulthood is related to an older subjective age (Galambos et al., 2005). In addition, young adults are typically viewed as being low in conscientiousness (Haslam et al., 2007; Igier & Mullet, 2003). Therefore, conscientious younger people may think and act more mature than the typical member of their age-group, which may translate into feeling closer to their age or slightly older. However, contrary to our expectations, conscientiousness was not related to subjective age among middle-aged and older adults when considered simultaneously with the other personality traits defined by the FFM. One potential explanation concerns the fact that when conscientious people grow older, their typical way of thinking, behaving and feeling align with existing personality stereotypes of aging according to which conscientiousness is higher in middle and older age (Haslam et al., 2007; Igier & Mullet, 2003). Therefore, these individuals may feel similar to their own age-group and the stereotypical older adults.

Building on previous research (Hubley & Hultsch, 1994; Knoll et al., 2004) through a focus on a lifespan sample, the present study offers a more differentiated picture of the personality-subjective age relationship. Although Extraversion and Openness to experience share a positive relationship with a younger subjective age among older adults, they were also each characterized by specific associations at different age periods across the lifespan, while conscientiousness was only associated with subjective age among younger adults. These findings add to a scarce body of research having considered the role of some traits for subjective age only among middle-aged and older adults (Hubley & Hultsch, 1994; Knoll et al., 2004). However, despite its strengths, the current study has several limitations that should be considered. Because of the cross-sectional study design, age and cohort effects are confounded, thus requiring a cautious interpretation of differences between the age groups. In addition, this design precludes drawing causal inferences regarding the relationships between self-rated health, personality and the changes in subjective age. Longitudinal studies are required to disentangle age and cohort effects, and to test whether self-rated health and personality are related to an increase or a decrease in subjective age.

Experimental studies are also needed to further explore the mechanisms explaining why older extraverted and open people hold younger subjective age whereas younger conscientious individuals may feel slightly older, with a focus on contrast and assimilation processes to same-aged and younger people. For example, these studies could manipulate the perceived similarity of these individuals with the personality profile of a typical younger or older adult, and test subsequent effects on subjective age. In addition, the findings of the present study are based on a French sample and other studies have reported cross-cultural differences in the discrepancy between chronological and subjective age (Westerhof et al., 2003). Future studies are needed to test whether our findings generalize to samples from other countries, and whether culture influences the association between personality and subjective age. In addition, personality traits explained only small incremental variance to the prediction of subjective age. Finally, further research is needed to explore the behavioural, emotional and/or cognitive mediators of the personality-subjective age relationship.

In sum, the present study indicates that the relationships between self-rated health, personality traits, and subjective age across the lifespan vary depending upon individuals' chronological age. Feeling younger at older ages was more common among individuals with good self-rated health, and with a youthful personality (i.e., extrovert and open to experience). Therefore, this study contributes to existing knowledge and paves the way for future research aiming at a better understanding of the sources of subjective age from early adulthood to old age.

Acknowledgments

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Table 1

Means, Standard Deviations, and Correlations for the Variables Under Study

Variables	M/%	SD	1.	2.	3.	4.	5.	6.	7.
1. Gender (% female)	56%	-	-						
2. Employment (% employed)	32%	-	-.02	-					
3. Marital Status (% living with a partner)	54%	-	-.10**	-.28***	-				
4. Age	49.50	22.13	-.10**	-.12***	-.18***	-			
5. Education	4.09	0.97	.04	.37***	-.11***	-.30***	-		
6. Self-rated health	4.73	0.85	.04	.10**	-.03	-.17***	.14***	-	
7. Subjective age [a]	4.71	6.42	-.09**	.01	-.10**	.52***	-.14***	.07*	-
8. Extraversion	3.19	0.77	-.02	-.00	-.03	-.15***	.02	.20***	-.01
9. Neuroticism	2.74	0.80	-.16***	.06*	-.02	-.01	.01	-.27***	-.04
10. Openness to experience	3.36	0.66	.06*	.16***	-.09**	-.03	.27***	.10**	.09**
11. Agreeableness	4.02	0.53	-.13***	-.03	-.02	.22***	-.11***	-.01	.12***
12. Conscientiousness	3.73	0.64	-.20***	.14***	-.18***	.31***	-.02	.11***	.21***

Note. $N=1016$.

*
$p<.05$,

**
$p<.01$,

***
$p<.001$;

[a] Higher values represent youthful subjective age.

Table 2

Results of Regression Analysis Predicting Subjective Age from Demographic Variables, Self-Rated Health and Personality Traits

Variables	*B*	*SEB*	*β*	*Adjusted R²*
Model 1				
Age	.16	.01	.55***	.32
Gender	−.48	.34	−.03	
Marital status	.13	.36	.01	
Employment	.85	.39	.06*	
Education	−.23	.19	−.03	
Self-rated health	1.31	.20	.17***	
Self-rated health × Age	.05	.01	.15***	
Model 2				
Age	.16	.01	.57***	.32
Gender	−.49	.36	−.04	
Marital status	.24	.37	.02	
Employment	1.12	.41	.08**	
Education	−.34	.20	−.05	
Self-rated health	1.20	.21	.16***	
Extraversion	.21	.24	.02	
Neuroticism	.14	.24	.02	
Openness to experience	.74	.27	.07**	
Agreeableness	−.18	.34	−.01	
Conscientiousness	−.11	.31	−.01	
Extraversion × Age	.02	.01	.06*	
Neuroticism × Age	−.00	.01	−.02	
Openness to experience × Age	.02	.01	.06*	
Agreeableness × Age	−.00	.01	−.00	
Conscientiousness × Age	.03	.01	.07**	

Note. N= 1016.

*
p<.05,

**
p<.01,

***
p<.001