Self-Perceptions of Aging: Do Subjective Age and Satisfaction With Aging Change During Old Age?

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The present study examined time-related change in felt age, physical age, and satisfaction with aging in old age and covariates of this change. Using 6-year-longitudinal data from the Berlin Aging Study (age range = 70–104 years), we found that individuals’ felt age remained on average about 13 years below their actual age over time, whereas they reported a decreasing discrepancy between physical and actual age and a decrease in aging satisfaction over time. After we controlled for level differences, a differential pattern of individual differences in change appeared for the three dimensions: Age contributed to a greater decline in aging satisfaction but an increase in the discrepancy of felt age. A higher number of illnesses at baseline attenuated change in felt age discrepancy. Future research on change of self-perceptions of aging will provide insight into mechanisms of resilience of the aging self in later life.

Key Words: Self-perception of aging—Subjective age—Age identity—Satisfaction with aging—Berlin Aging Study—Differential aging—Resilience of the older self.

Previous research suggests that, on average and despite the high prevalence of negative age-related changes, older people feel younger than they actually are and generally are satisfied with their aging (Gana, Alaphilippe, & Bailly, 2004; Montepare & Lachman, 1989; Rubin & Berntsen, 2006). Feeling younger and being satisfied with one’s own aging are expressions of positive self-perceptions of aging (Levy, 2003). They reflect age identity and the operation of self-related processes that enhance well-being. Although researchers have examined correlates of individual differences in subjective age and aging satisfaction, we found no studies that model individual differences in intraindividual change over time in these constructs. We propose that examining time-related change is important, as it might reflect individuals’ potential to adapt to age-related changes in different domains of functioning (e.g., health, cognition). Using 6-year longitudinal data from the Berlin Aging Study (BASE; Baltes & Mayer, 1999), we seek to fill this gap. We examine time-related change in subjective age and satisfaction with aging and explore potential sources of individual differences in change. Information about differential trajectories of stability and change in self-perceptions of aging in a heterogeneous sample of the very old may advance our understanding of resilience of the older self.

Subjective Age

Unlike chronological age, subjective age is a multidimensional construct that indicates how old a person feels and into which age group a person categorizes himself or herself (e.g., Barrett, 2005; Settersten & Mayer, 1997). After early adulthood, most people feel younger than their chronological age (Galambos, Turner, & Tilton-Weaver, 2005; Montepare & Lachman, 1989; Rubin, & Berntsen, 2006). Kastenbaum, Derbin, Sabatini, and Artt (1972; see also Barak, 1987) distinguish between felt age (psychological age) and the subjective age associated with one’s physical appearance (i.e., when looking in the mirror). Perceived physical age (sometimes called look age) is considered a self-appraisal of biological aging. To date, only a few studies have investigated whether these two dimensions of subjective age show different patterns of association with chronological age and other correlates. Findings are mixed. Whereas some studies find that physical age shows a less youthful deviation from actual age than felt age (e.g., Kastenbaum et al.; van Auken & Barry, 1995), others report no differences in discrepancies (e.g., Goldsmith & Heiens, 1992). Although momentary evaluations of felt and physical age are moderately correlated, in the present study we analyze individual differences in the change trajectories separately for each dimension, following proposals by Kastenbaum and colleagues that these dimensions reflect different aspects of age identity. It could be that youthful feelings of felt age are maintained during old age yet the discrepancy between physical and actual age diminishes in magnitude over time. Clarke (2001) found that older women frequently describe incontinuities between their felt age and the image of their body reflected in a mirror.

Satisfaction With Aging

Compared with subjective age, satisfaction with aging is conceptually a more explicit assessment of individuals’ evaluation of their age and aging. Items used to measure satisfaction with aging ask directly about perceived changes that occur with increasing age (e.g., changes in energy level, feelings of usefulness, and life quality; see Lawton, 1975). Although this concept has long been proposed as an aspect of subjective well-being (e.g., Neugarten, Havighurst, & Tobin, 1961), surprisingly little attention has been paid to it in the literature. In a large survey on the perceptions of aging in Americans older than 65 years of age, Harris (1975) found that, whereas 87%
were satisfied with life in general, fewer people (64%) reported that getting older was better than they had expected, and 46% indicated that they felt old and tired. Satisfaction with one’s own aging is associated with an overall sense of well-being, but this construct also exhibits unique variance (Liang & Bollen, 1983). To date, this has been the only construct used in studies of self-perceptions of aging (Levy, 2003).

**Self-Perceptions of Aging as Indicators of Successful Aging**

Theoretically, positive self-perceptions of aging are viewed as indicators of successful aging, age identity, and self-regulation processes (e.g., Baltes & Smith, 2003; Heckhausen & Krüger, 1993; Sneed & Whitbourne, 2005). Although these perspectives propose different underlying processes, there is consensus that positive self-perceptions of aging serve to sustain levels of social activity and engagement, enhance self-esteem and well-being, and boost biophysiological functioning. Studies that address questions about successful aging find that youthful subjective age is associated with good health and high levels of well-being (Hubley & Hultsch, 1994; Westerhof & Barrett, 2005). High satisfaction with aging is associated with good health (Levy, Slade, & Kasl, 2002) and few daily health symptoms (Rakowski, Julius, Hickey, Verbrugge, & Halter, 1988), and it is uniquely related to living longer, after other predictors of mortality have been controlled for (Levy, Slade, Kunkel, & Kasl, 2002; Maier & Smith, 1999). Studies about age identity report that subjective age is associated with group differences in social roles and the experience of life course events (e.g., retirement or widowhood; see Barrett, 2005; Kim & Moen, 2002). Researchers who focus on self-regulation report the benefits to self-esteem and well-being, and boost biophysiological functioning of positive illusions: Accurate perceptions and seeming younger should increase and satisfaction with aging should not change. This expectation is qualified by theories of self-regulation (e.g., Baumeister, 1989), which suggest that there may be an optimal margin for positive illusions: Accurate perceptions and extremely positive biases may be equally detrimental to well-being (see also Taylor & Brown, 1994).

Rubin and Berntsen (2006) observed cross-sectionally that, from the point a person reaches the age of 40 onward, the gap between actual and subjective age appears to reach a plateau that is 20% of chronological age. They found no age differences in this proportional amount up to the point at which a person reaches his or her 70s: Older age is correlated with larger negative discrepancies between subjective and actual age but the relative ratio of subjective age to chronological age does not differ. In other words, the discrepancy must increase with age if the 20% plateau is to be maintained.

Cross-sectional studies of self-perceptions of aging report substantial individual differences, but findings about the sources of this heterogeneity are inconsistent. Whereas some researchers report significant differences in felt age discrepancy associated with socioeconomic status (Barrett, 2003; Westerhof & Barrett, 2005), others do not (Rubin & Berntsen, 2006). Women show greater subjective age discrepancies than men in some studies (Montepare & Lachman, 1989), but other studies find no gender differences (Rubin & Berntsen). Kim and Moen (2002) observed higher levels of aging satisfaction in men than in women. Most studies agree that health status is a significant source of variation.

Two studies of long-term change in subjective age focused on stability and change in individuals’ self-assignment to the age categories of “old” or “middle-aged” (Bultena & Powers, 1978; Markides & Boldt, 1983). These studies found that most people maintained a stable age identity over time. Change in the felt age discrepancy was examined over 8 years by Uotinen, Rantanen, Suutama, and Ruoppiä (2006) and over 6 months in the context of medical treatment by Knoll, Rieckmann, Scholz, and Schwarzer (2004), as well as by Boehmer (2008). Uotinen and colleagues reported that 52% of their sample increased or decreased in subjective age discrepancy, whereas Knoll and colleagues and Boehmer found no change. Kim and Moen (2002) studied change in satisfaction with aging over 2 years in subgroups who either entered retirement, remained working, or were retired for the entire period. In accord with life course models about the effects of social roles on age identity, only those who experienced a life transition increased their satisfaction.

**Hypotheses**

In the present study, we ask if felt age, physical age, and aging satisfaction change over 6 years during old age and whether there are individual differences in change. In line with proposals linked to successful aging and adaptive self-regulation, we hypothesized that the subjective age discrepancies would increase over time whereas there would be no change in aging satisfaction. We recognize that hypotheses based on the successful aging perspective may be overly optimistic given the advanced age of our sample ($M_{age} = 85$ years at baseline; age range = 70–104). Indeed, life span theory (e.g., Baltes & Smith, 2003) and recent evidence about decline in life satisfaction during old age (Gerstorf, Ram, Röcke, Lindenberger, & Smith, 2008; Mroczek & Spiro, 2005) suggest that there may be limits to aging successfully in very old age.

On the basis of the literature, we expected older chronological age and better health status at baseline to be related to larger discrepancies in felt and physical age. We also expected poor health at baseline to attenuate the rate of change, contributing to reduced increases in subjective age discrepancies and deviations from stability in satisfaction with aging. We added gender and socioeconomic status to the models but, following Rubin and Berntsen (2006), we did not expect them to significantly account for individual differences in level or change. We also explored the effects of perceived lack of social contact (indicated by social loneliness) and cognitive functioning. Thompson and Heller
(1990) found that socially isolated older adults report low satisfaction with aging.

**Methods**

**Sample and Procedure**

We used four-wave longitudinal data from the Berlin Aging Study (BASE), collected over 6 years (for detailed information about study design, longitudinal samples, and procedures, see Baltes & Mayer, 1999 and Smith, Maas, Mayer, Helmchen, Steinhagen-Thiessen, & Baltes, 2002). The first wave of data (T1) was collected between 1990 and 1993 (N = 516); the second (T2) was collected between 1993 and 1994 (N = 361); the third (T3) was collected between 1995 and 1996 (N = 206); and the fourth (T4) was collected between 1997 and 1998 (N = 132). Attrition over time was primarily due to death (Gerstorf, Herlitz, & Smith, 2006). Not all individuals participated on all four measurement occasions; however, we used all available data at each time point. Because subjective age was not assessed at T2, our analyses for these dimensions included only three measurement occasions (T1, T3, and T4). Consequently, the total number of observations differed for each construct: N = 846 for felt age, N = 822 for physical age (with fewer observations for physical age than for felt age because those participants who were severely visually impaired were not asked how old they looked in the mirror), and N = 1,285 for aging satisfaction.

At T1, researchers stratified the total cross-sectional sample (N = 516; M_age = 84.9 years, SD = 8.7; range: 70-104) by age and gender, with 43 women and 43 men in each of six age groups (70–74, 75–79, 80–84, 85–89, 90–94, and 95 and older). For recruitment, the researchers randomly drew 1,908 persons from the obligatory Berlin city registry and asked them to participate. Our longitudinal analyses deal with the sample of 516 individuals who completed a 14-session multidisciplinary protocol at T1. At T3 and T4, the survivors of the 516-person T1 sample completed at least six multidisciplinary sessions. Trained research assistants assessed each individual participant face to face. Each session lasted on average 90 minutes and, except for some medical assessments, took place at the participant’s place of residence (private home or institution). Individuals received 50 Deutsche Mark (approximately $25) for their participation in each session.

Selectivity analyses (following Lindenberger, Singer, & Baltes, 2002) indicated that individuals who contributed the most data (i.e., over four time points as compared with one time point) were on average younger (−0.76 SD), more satisfied with their aging (0.33 SD), and felt younger than the 516-person T1 baseline sample (−0.46 SD for felt age, −0.34 SD for physical age). Such a selection effect in BASE is expected given the average age of the baseline sample (M = 85 years), and the fact that attrition was primarily due to death (Gerstorf et al., 2006). Individuals who participated at T4 (N = 132) differed only slightly from persons who were alive at that time but did not participate fully in all levels of the T4 assessment protocol (N = 107); −0.20 SD for age, 0.12 SD for aging satisfaction, −0.13 SD for felt age, and −0.03 SD for physical age.

**Measures**

**Subjective age.**—We included two dimensions of subjective age. We assessed felt age with this item: “How old do you feel?” We assessed physical age with this item: “How old do you feel when you look at yourself in a mirror?” Researchers showed the participants an age scale ranging from 0 to 120 years and asked them to select a specific age for felt and physical age. For each dimension, we calculated the discrepancy between subjective age and chronological age as the dependent variable (i.e., discrepancy = subjective age − chronological age). Although felt and physical age were correlated at T1 (r = .54, p < .01), for the theoretical reasons already outlined, we analyzed both dimensions separately. Estimated individual time-related latent change in felt age was related to individual latent change in physical age (r = −.51, p < .01).

We acknowledge that difference scores are controversial (e.g., Cronbach & Furby, 1970; Rogosa, 1995). Our decision to use them was guided by three considerations. First, using difference scores rather than residuals enabled us to communicate directly how much younger individuals felt in years (e.g., 12 years younger). Second, this method has a long tradition in the literature on subjective age. Third, partialing chronological age from subjective age eliminates age-related variance and does not allow us to investigate age differences in change of self-perceptions of aging over time.

**Satisfaction with aging.**—We assessed satisfaction with aging by using the Attitudes Toward Own Aging subscale from the Philadelphia Geriatric Center Morale Scale (Lawton, 1975). The scale consists of five items: “Things keep getting worse as I get older,” “I have as much pep as I had last year,” “As I get older, I am less useful,” “As I get older, things are better than I thought they would be,” and “I am as happy now as I was when I was younger.” Research assistants read items aloud and participants rated how much they agreed with each statement on a 5-point scale (1 = low, 5 = high). Interitem consistencies were acceptable: Cronbach’s α = .75 at T1. At T1, aging satisfaction was significantly correlated with felt age discrepancy (r = −.26, p < .01) but not with physical age discrepancy (r = −.17, p = .06). Estimated individual time-related change in aging satisfaction was not significantly correlated with individual estimates of change in felt age or physical age (all ps > .12).

**Covariates.**—To examine sources of interindividual differences in change in self-perceptions of aging, we included the following T1 covariates: age, gender, socioeconomic status (SES), number of illnesses, cognitive functioning, and social loneliness. Age was a continuous variable, centered at the T1 mean (85 years). We coded gender as 0 = men and 1 = women. We measured SES with a unit-weighted composite, which included (a) net household income weighted by the number of persons per household; (b) occupational prestige; and (c) years of education (Mayer, Maas, & Wagner, 1999). We operationalized health by the number of moderate to severe chronic illnesses (e.g., diabetes mellitus, coronary heart disease), diagnosed by a physician in clinical assessments in BASE (Steinhagen-Thiessen & Borchelt, 1999). To measure cognitive functioning,
we assessed participants’ performance on 14 tasks. These tasks could be described by five first-order factors representing five intellectual abilities (Lindenberger & Baltes, 1997) and one second-order factor representing general intelligence. In our analyses, we use the second-order factor as a unit-weighted composite of cognitive functioning. We measured social loneliness by using four items from the UCLA-Loneliness Scale (Cronbach’s α = .70; Russell, Peplau, & Cutrona, 1980; see also Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). The items were as follows: “There are people I feel close to,” “There are people I can turn to,” “I feel part of a group of friends,” and “There are people I can talk to.” Participants rated each statement on a 5-point scale (1 = “There are people I can talk to,” 2 = “I feel part of a group of friends,” and 3 = “There are people I feel close to,”). The items were as follows: “There are people I feel close to,” “There are people I can talk to,” “I feel part of a group of friends,” and “There are people I can talk to.” Participants rated each statement on a 5-point scale (1 = low, 5 = high; note that all intercorrelations between the covariates at T1 were below r = .46).

**Data Analysis**

We used individual growth (i.e., multilevel) modeling as implemented in SAS PROC MIXED (Littell, Miliken, Stroup, & Wollenberg, 1996) to examine change in self-perceptions of aging and predictors of interindividual differences in change. In all models, we designated measurements collected on four occasions (T1, T2, T3, and T4) as the time variable and we centered time at T1. At Level 1, we parameterized the baseline models as follows:

$$\text{SPA}_t = L_i + S_i(t - t_0) + \epsilon_i$$

(1)

The self-perception of aging, SPA$_t$ (either felt age, physical age, or aging satisfaction), of person $i$ at time $t$ is a function of an individual-specific intercept parameter, $L_i$ (level at T1), an individual-specific slope parameter, $S_i$ (change over time), and a residual error, $\epsilon_i$. In our models, fixed effects define the overall trajectory (intercept/level and slope) for the sample and random effects define the within-person trajectory (i.e., each person’s deviation from the overall trajectory). Random effects over time (i.e., variance of change) and the 95% plausible value range of individuals’ change scores are indicative of interindividual differences in intraindividual change trajectories ($S_i \pm 2 \times \sqrt{\text{VarChange}}$).

We used an unstructured covariance matrix to specify the random effects. At Level 2, we introduced the T1 covariates of age, gender, SES, number of illnesses, cognitive functioning, and social loneliness to explain interindividual differences in the trajectories of self-perceptions of aging.

**RESULTS**

As we expected, participants generally felt younger than they actually were (i.e., discrepancy with chronological age) and showed relatively high levels of aging satisfaction over time. Table 1 includes descriptive information for felt and physical age and satisfaction with aging on all measurement occasions.

To establish a standard against which to evaluate the models of change, we fitted random intercept-only models initially for each construct. These analyses revealed considerable amounts of between- and within-individual variance over time: 65% of the total variance in the felt age discrepancy (54% for physical

| Table 1. Descriptive Information for Chronological Age, Felt Age, and Physical Age Discrepancies, and Satisfaction With Aging |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Item            | M (SD)          | M (SD)          | M (SD)          | M (SD)          |
| Chronological age | 84.92 (8.66)    | 85.26 (8.41)    | 84.34 (7.30)    | 84.07 (6.33)    |
| Felt age discrepancy | -12.96 (12.66) | -11.56 (11.00) | -12.54 (13.90) | -12.45 (13.90) |
| Physical age discrepancy | -9.51 (10.37)  | -7.19 (8.96)    | -6.84 (7.62)    | -6.84 (7.62)    |
| Satisfaction with aging (T scores) | 50.00 (10.00)   | 46.91 (9.36)    | 46.36 (9.27)    | 45.34 (8.33)    |

Note: For chronological age and satisfaction with aging, $N = 516$, 361, 244, and 164 for Times 1, 2, 3, and 4, respectively. For felt age, $N = 509$, 205, and 132 for Times 1, 3, and 4, respectively. For physical age, $N = 493$, 200, and 129 for Times 1, 3, and 4 respectively. For satisfaction with aging, T scores were standardized to the cross-sectional Berlin Aging Study sample at Time 1 ($N = 516, M = 50, SD = 10$).

<table>
<thead>
<tr>
<th>Table 2. Linear Growth Models for Felt Age and Physical Age Discrepancies and Satisfaction With Aging Over Time</th>
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</thead>
<tbody>
<tr>
<td>Parameter</td>
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<tr>
<td></td>
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<tr>
<td>Fixed effects</td>
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<tr>
<td>Intercept</td>
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<tr>
<td>Time</td>
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<tr>
<td>Random effects</td>
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<tr>
<td>Variance of intercept</td>
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<tr>
<td>Variance of change over time</td>
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<tr>
<td>Covariance intercept, change</td>
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<tr>
<td>Residual variance</td>
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</tbody>
</table>

Notes: For felt age discrepancy, physical age discrepancy, and satisfaction with aging, the Akaike Information Criterion (AIC) was 6,489, 5,997, and 8,963 respectively; the -2 Log Likelihood (-2LL; relative model fit statistics) for the same items was 6,477, 5,985, and 8,951 respectively. Unstandardized estimates and standard errors are presented. For felt age, $N = 846$ provided observations; for physical age, $N = 822$ provided observations; and for satisfaction with aging, $N = 1,285$ provided observations. For satisfaction with aging, T scores were standardized to the cross-sectional Berlin Aging Study sample at Time 1 ($N = 516, M = 50, SD = 10$). Discrepancy = subjective age - chronological age.

* $p \leq .05$; ** $p < .001$. 

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Table 3. Linear Growth Models for Felt Age and Physical Age Discrepancies and Satisfaction With Aging Over Time: Predictors of Level and Change Over 6 Years

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Felt Age Discrepancy</th>
<th>Physical Age Discrepancy</th>
<th>Satisfaction With Aging</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>SE</td>
<td>Estimate</td>
</tr>
<tr>
<td>Fixed effects</td>
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<td></td>
<td></td>
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<tr>
<td>Intercept</td>
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<td>0.75</td>
<td>−11.11***</td>
</tr>
<tr>
<td>Time</td>
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<td>0.75</td>
<td>−0.21</td>
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<td>Predictors of level (intercept)</td>
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<tr>
<td>Age</td>
<td>−0.29***</td>
<td>0.07</td>
<td>−0.38***</td>
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<tr>
<td>Women</td>
<td>1.38</td>
<td>1.07</td>
<td>2.85***</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>−0.03</td>
<td>0.06</td>
<td>−0.02</td>
</tr>
<tr>
<td>Number of illnesses</td>
<td>1.13*</td>
<td>0.05</td>
<td>0.11*</td>
</tr>
<tr>
<td>Social loneliness</td>
<td>−0.15**</td>
<td>0.05</td>
<td>−0.09*</td>
</tr>
<tr>
<td>Cognitive functioning</td>
<td>0.01</td>
<td>0.07</td>
<td>0.12*</td>
</tr>
<tr>
<td>Predictors of change over time</td>
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<td></td>
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</tr>
<tr>
<td>Age</td>
<td>−0.20**</td>
<td>0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>Women</td>
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<td>0.85</td>
<td>0.39</td>
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<td>Socioeconomic status</td>
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<td>−0.02</td>
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<tr>
<td>Number of illnesses</td>
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<td>0.04</td>
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<td>Social loneliness</td>
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<tr>
<td>Cognitive functioning</td>
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<td>0.06</td>
<td>0.05</td>
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<tr>
<td>Random effects</td>
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<tr>
<td>Variance of intercept</td>
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<td>39.72***</td>
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<tr>
<td>Variance of change over time</td>
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<tr>
<td>Covariance intercept, change</td>
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<td>5.60</td>
<td>−7.22***</td>
</tr>
<tr>
<td>Residual variance</td>
<td>50.78***</td>
<td>6.09</td>
<td>48.22***</td>
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</table>

Notes: For felt age discrepancy, physical age discrepancy, and satisfaction with aging, the Akaike Information Criterion (AIC) was 6,445, 5,904, and 8,855, respectively; the −2 Log Likelihood (−2LL; relative model fit statistics) for the same items was 6,409, 5,870, and 8,819, respectively. Unstandardized estimates and standard errors are presented. For felt age, N = 846 provided observations; for physical age, N = 822 provided observations; and for satisfaction with aging, N = 1,285 provided observations. For satisfaction with aging, T scores were standardized to the cross-sectional Berlin Aging Study sample at Time 1 (N = 516, M = 50, SD = 10). Covariates were mean-centered to the sample at Time 1. For gender, 0 = men and 1 = women. Higher values on the covariates indicate higher socioeconomic status (composite score of household income, occupational prestige, and years of education), higher number of illnesses, higher social loneliness, and higher cognitive functioning. Discrepancy = subjective age - chronological age.

*p ≤ .05; **p < .01; ***p < .001.

age; 57% for aging satisfaction) was related to differences between individuals, and thus 35% was within-person variance (46% for physical age; 43% for aging satisfaction). The fact that there was considerable intraindividual variation in the data warranted further modeling of time-related change and its underlying covariates.

In a second step, we analyzed change over 6 years (Table 2). A subsequent set of multilevel models included six indicators (i.e., age, gender, SES, number of chronic illnesses, social loneliness, and cognitive functioning at baseline) to predict interindividual differences in level of self-perceptions of aging and its change over 6 years (Table 3). Results from the respective analyses are reported separately for subjective age and satisfaction with aging. Figure 1 illustrates the different trajectories found for the three constructs.

The multilevel modeling indicated that there were significant interindividual differences in the average discrepancy (intercept random effect) of felt age from chronological age over time but, on average, felt age did not change over time (nonsignificant fixed effect for time; refer to first column of Table 2). On average, individuals felt 12.86 years younger than their actual age over time. There was some variance around the slope but the effect did not reach significance. However, significance tests of variance components in multilevel modeling have long been questioned with regard to their utility. Because of their sensitivity to departures from normality and imbalance (unequal numbers of observations per individual), results have to be examined with extreme caution (e.g., Singer & Willett, 2003). Following the recommendations of Snijders and Bosker (1999), we calculated the 95% plausible value range to describe individual differences in change. This indicated that the direction and amount of change in felt age discrepancy varied between individuals from −3.88 (i.e., discrepancy increased by 3.88 years between two measurement points) to 4.32 (i.e., discrepancy was reduced by 4.32 years between two measurement points). Some participants felt even younger over time, whereas others reduced the gap between their felt and actual age. A second set of models examined potential factors underlying interindividual differences in level and change over time (Table 3). Several factors were related to mean-level (intercept) differences in felt age discrepancy: Individuals who were 1 year older at the first measurement occasion reported a felt age that was more discrepant (−0.29) from their actual age, indicating that they felt an additional 0.29 years younger than the sample average. (Intercept average sample = −13.58; Intercept, year older than average = −13.58 −0.29 = −13.87).

Having a higher number of illnesses and reporting less social loneliness compared with the average sample was associated with a smaller discrepancy between felt and actual age. After
taking into account predictors of mean-level differences, we found that age at baseline also functioned as predictor of interindividual differences in change of felt age: The felt age discrepancy of participants who were 1 year older at T1 increased on average 0.20 years more between two measurement occasions than the discrepancy of the average sample. This means that the older participants were, the younger they tended to feel over time. There was a counteracting effect associated with the number of illnesses: Increases in felt age discrepancy were attenuated for participants with more chronic illnesses.

For physical age, there were also significant interindividual differences (intercept random effect) in the average discrepancy from actual age (see the second column of Table 2). In contrast to felt age, the main effect for change over time was significant. On average, participants reduced their subjective discrepancy between physical age and actual age over time (0.85 years from one measurement occasion to the next). Although variance in change was not significant in the model, follow-up analyses suggested individual differences in the direction and rate of change. Change ranged between an increase of −2.44 and a decrease of 4.14 years in the discrepancy from one measurement point to the next. Smaller mean-level discrepancies (i.e., a physical age that is closer to the actual age) in this dimension were associated with being a woman, as well as being younger, suffering from a higher number of illnesses, lower social loneliness, and higher cognitive functioning than the average sample. However, none of the covariates accounted for differences in change in physical age discrepancy.

Participants differed significantly from each other in satisfaction with their own aging (see the third column of Table 2). On the sample level, mean aging satisfaction decreased by 2.28 points from one measurement occasion to the next (i.e., 6.84 points or 0.68 SD units over the 6-year interval). Individuals differed in their change trajectories over time, ranging from a decrease by −6.15 points to an increase by 1.60 points. Several predictors explained mean-level differences between individuals (Table 3): On average, higher satisfaction with aging was reported by men, participants with a smaller number of illnesses, lower social loneliness, and higher cognitive function. After controlling for covariates of mean-level differences, we found that three predictors could further explain change in aging satisfaction over 6 years: Satisfaction with aging decreased more in men, and in participants who were older or had lower SES than the sample average.

**Discussion**

Consistent with the literature (e.g., Gana et al., 2004; Rubin & Berntsen, 2006), participants in the present study reported feeling and looking younger than their chronological age and being relatively satisfied with their own aging. We extended previous findings by examining intrapersonal change over time in these constructs and asking about sources of individual differences in change. Our hypotheses that subjective age discrepancies would increase over time and that satisfaction with aging would show no change were not confirmed. They had been derived from proposals about successful aging and the continuity of self-enhancement processes in old age. Instead, we found that there was no time-related change in the felt age discrepancy on average, whereas the gap between physical age and actual age was reduced over time and satisfaction with aging decreased.

The lack of an overall main effect of time on felt age discrepancy was surprising. Because we modeled the discrepancy between felt age and chronological age, the lack of change does not mean that people nominated a particular age on the first measurement occasion (say age 60) and continued to feel that age
for the next 6 years. Rather, no change in felt age discrepancy means that, over time, people always felt 13 years younger on average. On the one hand, this can be interpreted as a positive outcome. It might be, for example, that a 13-year discrepancy is an optimal illusion about age during old age that enhances well-being (e.g., Baumeister, 1989; Taylor & Brown, 1994). The margin found here is similar to the average discrepancies reported in cross-sectional samples with similar age distributions in the United States (Hubley & Hultsch, 1994) and Switzerland (Gana et al., 2004). The maintenance of this felt age margin over 6 years is indicative of the resilience of the older self. On the other hand, this finding represents a reduction in the proportional discrepancy of felt to actual age, using Rubin and Berntsen’s (2006) terminology, from approximately 11% to 8.5% and is much less than the 20% plateau that they found. From this viewpoint, the lack of change in felt age discrepancy suggests that old age constrains the efficacy of processes associated with sustaining positive self-perceptions of aging.

When the differential trajectories found across felt age, physical age, and satisfaction with aging are considered together (see Figure 1), a picture emerges of the adaptive challenges faced by the aging self. Regardless of the interpretation of the lack of change in felt age, the reduced discrepancy between physical and actual age over time and decreased satisfaction with aging are less-than-desirable outcomes; poor health exacerbated these patterns.

The differential patterns also suggest variations in the vulnerability of each of these self-perceptions of aging. One scenario might be that satisfaction with aging changes first, followed by a reduction in feeling that one looks younger than one’s age and subsequently a decrease in felt age discrepancy. An alternative scenario is that individuals may show different dynamics of change in subjective age and satisfaction with aging that are dependent on their age, gender, social embeddedness, cognitive status, and health. Our finding that women are less satisfied with their aging and have a more accurate perception of their physical age suggests that the tension between physical age and satisfaction with aging may be more salient for women than for men (Clarke, 2001). Further studies with larger samples and more measurement points are needed to investigate these scenarios.

Why did older individuals in our sample report larger discrepancies between subjective and chronological age than the sample average? One explanation may lie in selective mortality: The participants older than the BASE mean age of 85 years are positively selected survivors of their birth cohorts. This is especially true for men older than 85 years of age. Many of the oldest-old participants in this study may indeed experience delayed (or slowed) rates of decline in functioning compared with those in their mid-70s who may not survive to be 85. The different experience of oldest-old survivors, especially those in relatively good health, may contribute to their feeling much younger than their chronological age. Another explanation for this effect could be that the loss of social roles and first diagnosis of a chronic illness have a dampening effect on positive self-perceptions of aging in the young-old adults, whereas the oldest-old adults have had time to adapt to these life changes. We were not able to distinguish among these interpretations in the present study.

Another interesting finding, which requires replication, involved the effects associated with social loneliness. This construct is generally associated with poor health and the loss of significant others (Cacioppo et al., 2006). In the present study, it was related to higher subjective age discrepancies and lower levels of aging satisfaction. Perhaps individuals who experience social loneliness attribute it to aging and are dissatisfied with their age-related changes.

The differential patterns of change may also reflect different viewpoints on self-perceptions of aging. Satisfaction with aging is measured by concrete questions about the cognitive-emotional experience of age-related change. The items prime temporal comparisons about changes in energy level, perceived usefulness, happiness, and life quality (Lawton, 1975). Other studies find that temporal comparisons about age-related change are negatively related to well-being and self-esteem (e.g., Filipp, Ferring, Mayer, & Schmidt, 1997). In contrast, no specific comparison context is primed in the question about felt age. The instruction for physical age cues a comparison between subjective appearance and a less malleable mirror image. These different methods may partly explain differential patterns of change over time.

Partly consistent with former research, women reported higher physical age and lower aging satisfaction than men did (Kim & Moen, 2002; Montepare & Lachman, 1989). Women older than 70 years of age might experience changes in their physical appearance more negatively than older men do, and this might contribute to less positive self-perceptions of aging (Clarke, 2001). Given the inconsistent findings in current studies of midlife and older age, further research is needed to address these questions.

Several limitations of the present study should be acknowledged. More measurement points and a longer time period are needed in order to determine if change is robust and differs from linearity. It would also be worthwhile to assess change in individuals who, as a result of frailty, transit from high functioning to frailty and increasing health problems. This transition may accelerate negative changes in self-perceptions of aging. Models that estimate the dynamics of change over time in self-perceptions of aging and related covariates would provide information that could be used to disentangle conflicting interpretations.

Taken together, the present results demonstrate the value of investigating subjective perceptions of one’s aging. In particular, our study suggests that an examination of changes in self-perceptions of aging over time in very old age provides information about the resilience and vitality of the older self. Future research should examine whether and how changes in self-perceptions of aging are associated with survival. Initial insight into the importance of maintaining a sense of positive well-being during old age has been gained from findings that satisfaction with aging and emotional vitality predict mortality (e.g., Levy et al., 2002; Maier & Smith, 1999; Penninx et al., 2000), and that negative changes in life satisfaction are more associated with distance to death than age per se (Gerstorf et al., 2008).

The extent to which feeling younger and being satisfied with one’s aging translates into behavior and physiological parameters on a daily basis is also intriguing. The experimental literature suggests that priming a sense of “feeling younger"
contributes to improvements in memory (e.g., Levy, 2003). It is not known whether an older adult who feels younger also behaves accordingly and is perceived by others to be younger than his or her actual age. The interpersonal interactions that occur in such a scenario may facilitate positive well-being and also contribute to better health. Such a scenario is consistent with evidence that higher levels of subjective well-being are associated with better health in old age. Thus, studies on self-perceptions of aging can contribute to our understanding of potential indicators of resilience in older adults and the aging self.

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**End Note**

1 In addition to these 516 persons, 412 individuals participated in a single 90-minute multidisciplinary assessment and 336 persons participated in a single 30-minute interview. Previous selectivity analyses showed that, compared with the $N = 1,908$ sample, the $N = 516$ sample is positively selected regarding psychological, social, and medical characteristics, but selection effects did not exceed 0.5 $SD$.

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