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Forecasting Life Satisfaction Across Adulthood: Benefits of Seeing a Dark Future?

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Anticipating one's future self is a unique human capacity that contributes importantly to adaptation and health throughout adulthood and old age. Using the adult life span sample of the national German Socio-Economic Panel (SOEP; $N > 10{,}000$, age range 18 to 96 years), we investigated age-differential stability, correlates, and outcomes of accuracy in anticipation of future life satisfaction across 6 subsequent 5-year time intervals. As expected, we observed few age differences in current life satisfaction but stronger age differences in future expectations: Younger adults anticipated improved future life satisfaction, overestimating their actual life satisfaction 5 years later. By contrast, older adults were more pessimistic about the future, generally underestimating their actual life satisfaction after 5 years. Such age differences persisted above and beyond the effects of self-rated health and income. Survival analyses revealed that, in later adulthood, underestimating one's life satisfaction 5 years later was related to lower hazard ratios for disability ($n = 735$ became disabled) and mortality ($n = 879$ died) across 10 or more years, even after controlling for age, sex, education, income, and self-rated health. Findings suggest that older adults are more likely to underestimate their life satisfaction in the future and that such underestimation was associated with positive health outcomes.

Keywords: subjective well-being, future anticipation, optimism, health, mortality

Being able to anticipate one's own future state of mind is a hallmark of human cognitive capacity that may have a strong impact on health and longevity. However, most people are wrong when anticipating affective states or well-being in the future (Cheng, Fung, & Chan, 2009; Lachman, Röcke, Rosnick, & Ryff, 2008; Wilson & Gilbert, 2005). In fact, self-related forecasts are often biased in systematic ways (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). In this vein, there has been a debate about what is more adaptive in the process of aging—illusionary versus realistic thinking about the future (Colvin & Block, 1994; Jahoda, 1958; Langer, 1975; Taylor & Brown, 1988). For example, having positive illusions about the future may protect the self when things cannot be altered. On the other hand, pessimistic or realistic anticipations may help individuals to cope with anxiety or uncertainty (Norem & Cantor, 1986), and may serve in being well prepared (Rothbaum, Weisz, & Snyder, 1982). In this regard, chronological age plays a key role. A typical finding is that young adults are more likely to be overly optimistic, whereas older adults appear to be more realistic about the future (Lachman et al., 2008; Lang & Heckhausen, 2001). However, little is known about how such age-related differences in accurately anticipating the future evolve across adulthood. Do individuals gradually adapt over time in response to whether anticipations were accurate or not? Are individuals better off in terms of health outcomes when they can accurately forecast the future?

We address four intertwined questions revolving around the accuracy, predictors, and outcomes of forecasting future life satisfaction. First, we explored age differences in forecasts of life satisfaction. Second, we investigated the accuracy of anticipated future life satisfaction across a broad range of adulthood. A third question was aimed at possible age-differential effects of educational and health resources on the accuracy of anticipated future life satisfaction. Fourth, we explored functional outcomes of ac-

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curate or unrealistic forecasts of life satisfaction with regard to hazards of disability and mortality.

We used 11-year data from the German Socio-Economic Panel (SOEP), in which participants were asked, on an annual basis, to rate their current life satisfaction in the present and their expected life satisfaction in 5 years. This setup allowed us to compare anticipations of future life satisfaction against actual life satisfaction in the future across six repeated 5-year intervals. Thereby, we were able to repeatedly validate the accuracy of forecasted life satisfaction. In addition, we also included information on subsequent disability and mortality. This means that we were able to explore age differences in the accuracy of predicting future life satisfaction and possible functional consequences for morbidity and mortality.

Forecasts of Future Life Satisfaction: What Are the Adaptive Functions?

Since the early 1950s, there has been a debate in mental health research about the possible adaptive functions of future thinking. In general, two theoretical perspectives may be distinguished in this regard.

The first perspective suggests that accurately predicting the future reflects an individual's capacity to adapt the self to the world and thus gain predictive control (Morling & Evered, 2006; Rothbaum et al., 1982). According to this, accurate predictions of the future serve to render a person better prepared and able to adapt one's expectations to potential loss in the future. This is in accordance with the seminal work of Marie Jahoda (1958), who argued that a "perception of reality is called mentally health [sic] when what the individual sees corresponds to what is actually there" (p. 49; see also Maslow, 1950). For example, a person may realize that predictions about the future were wrong, and then become more and more realistic after some time. This implies that people want to be accurate and consistent about how satisfied they expect to be in the future (Brandtstädter & Greve, 1994; Brandtstädter & Rothermund, 2002). Recently, Ferrer et al. (2012) observed, in a sample of healthy older adults, that unrealistic optimism regarding health risks was associated with health declines across a 6-year time interval. In a study with cancer patients, Schulz, Bookwala, Knapp, Scheier, and Williamson (1996) observed that a pessimistic life orientation was associated with higher levels of mortality only among young and middle-aged patients but not among old patients. Such considerations entail several implications with respect to the role of realistic or pessimistic forecasts of life satisfaction in old age. One expectation is that as people get older, they will have had more opportunity to find out about the accuracy of earlier forecasts and, with time, become more realistic when anticipating future life satisfaction (Lachman et al., 2008; Lang & Heckhausen, 2001). Another implication is that anticipations of the future in old age may induce adaptation to potential loss (John & Lang, 2012). An accurate or pessimistic future anticipation may reduce anxiety and foster adequate preparation for the future. Accordingly, defensive pessimism has been described as setting low expectations to cope with fear or uncertainty (Norem & Cantor, 1986; Schulz et al., 1996). This implies that pessimistic forecasts may result in increased predictive control over one's future and thus have a positive effect on health outcomes and life expectancy.

The second perspective suggests that future forecasts serve to boost or protect one's current state of well-being, irrespective of what the future will bring (Taylor & Brown, 1988). According to such reasoning, future forecasts serve to protect current well-being. This emphasizes the adaptive function of illusionary future thinking for the current self and for protecting motivational resources (Nielsen, Knutson, & Carstensen, 2008; Taylor & Brown, 1988, 1994). For example, it was shown that anticipations of one's future self have an impact on how one feels in the present (Cheng et al., 2009; Heckhausen & Krueger, 1993). From this perspective, having positive illusions about one's future self may help one to be more proactive and more satisfied with one's current situation. In their seminal work, Taylor and Brown (1988) argued that when not much can be done to change the actual situation (e.g., cancer), forecasts of a rosy positive future, irrespective of what is realistic, may have a palliative effect in the present. Expecting that life will be better in the future means that there is hope now and that one's current self is amendable. According to this consideration, forecasts of the future reflect an attempt to stabilize the current self, irrespective of what the future will be like.

To be clear, the two theoretical perspectives on functions of affective future forecasts may not preclude each other. We argue, though, that the outcomes of optimistic, accurate, or pessimistic forecasts may depend on age-specific contexts and on available resources (e.g., education). In the following, we review considerations and findings on the age-differential antecedents and outcomes of optimistic versus accurate or pessimistic anticipation of future life satisfaction across adulthood. Although the literature on positive illusions or optimism may easily be separated from research on realistic or pessimistic forecasts, it is somewhat more difficult to separate realistic from (unrealistically) pessimistic forecasts.

Age-Differential Adjustments of Future Thinking Over Time

Being satisfied with one's life is a fundamental concern that guides thoughts and behavior across adulthood. It is a robust and well-known finding that subjective ratings of life satisfaction do not change much across adulthood (Kunzmann, Little, & Smith, 2000; Lang & Heckhausen, 2001; Staudinger, 2000), with the notable exception of a terminal decline in life satisfaction (Gerstorf et al., 2010; Mroczek & Spiro, 2005). Life satisfaction was long thought to be robust, even in the face of unpleasant life events or age-related losses (Brickman, Coates, & Janoff-Bulman, 1978; Headey & Wearing, 1989). However, recent findings question the idea that people always return to a prior level of life satisfaction after negative events such as divorce or unemployment occur (Diener, Lucas, & Scollon, 2006) or within the last year before death (Mroczek & Spiro, 2005). Such findings suggest that well-being indeed changes across adulthood, for example, when individuals suffer from negative life events or losses related to health. As a consequence, one might expect larger age differences in life satisfaction than those that are typically observed (Lang & Heckhausen, 2001; Mroczek & Spiro, 2005; Schilling, 2006). One explanation is that individuals manage to stabilize their subjective well-being as they adapt their personal standards of what may be expected in the future. For example, Freund (2006) argued that, in early adulthood, expecting more to come reflected an optimization

orientation, whereas, in later adulthood, expecting an increased risk of loss might reflect a compensation orientation.

In early adulthood, expecting to improve the self in the future entails an adaptive resource that enhances motivational resources and goal striving (Fleeson & Heckhausen, 1997; Lachman et al., 2008; Pavot, Diener, & Suh, 1998). When resources and potentials are blooming and vigorous, having illusions about future states of the self may encourage further investments and persistence (cf. Weinstein, 1980). Thus, young adults may feel more satisfied in the present as they anticipate further improvement and better times.

In later adulthood, future thinking may change and involve a greater awareness of only limited remaining time in life (Carstensen, 2006; Lang, Baltes, & Wagner, 2007). Older adults may feel more satisfied with their present life as they adapt their expectations to shrinking future potentials. Moreover, as people grow old, they are likely to expect physical, social, or cognitive losses and declines in their own future life (Heckhausen, Dixon, & Baltes, 1989). In this vein, we submit that a realistic or pessimistic forecast of the future may actuate preparedness and enhanced predictive control, and may entail positive health outcomes over time. Not much is known, though, about how anticipations of future life satisfaction change over time across adulthood.

The Present Research

In the present research, we examined associations of predicted future satisfaction (i.e., "How satisfied do you think you will be in 5 years?") and present life satisfaction, as well as intraindividual change in the accuracy of future predictions, across an 11-year period of annually repeated assessments. At each measurement occasion, participants rated their present life satisfaction and how satisfied they expected to be in 5 years. Our data came from the SOEP (Wagner, Frick, & Schupp, 2007; Headey, Muffels, & Wagner, 2010), which includes a representative national sample of adults ranging from 18 to 96 years. Figure 1 graphically depicts an overview of the SOEP data as used in this research. Due to the fact that assessments took place every year across an 11-year time interval, it was possible to identify the accuracy of expected future life satisfaction within six 5-year time brackets.

We conducted four sets of data analyses in order to pursue our research goals. To begin with, we made use of latent growth models to analyze 11-year change trajectories of current and expected life satisfaction and examined their age-differential nature. In this first analysis, we included the entire longitudinal data set of 11 annual assessments across a broad and heterogeneous age range from 18 to 94 years. This analysis contained those individuals who rated their future life satisfaction (in 5 years) and current life satisfaction at least three times out of the available 11 measurement occasions. With regard to *current* life satisfaction, and in line with previous research findings (Baltes, Lindenberger, & Staudinger, 2006; Schilling, 2006; Staudinger, 2000), we expected few or no age differences. However, we expected that older adults would anticipate a decrease in their future life satisfaction and that younger adults would expect an increase in life satisfaction in the future.

Our second analysis was aimed at the accuracy of anticipated future life satisfaction. This analysis included a subsample of participants who had participated in at least two consecutive measurement occasions across a 5-year interval. This involved six subsets of individuals who had reported future life satisfaction in 1993 through 1999 and current life satisfaction 5 years later (i.e., 1998 through 2004; see lower part of Figure 1). Thus, this study design allowed a comparison of the accuracy of anticipated future life satisfaction (e.g., future life satisfaction in 1993) with current

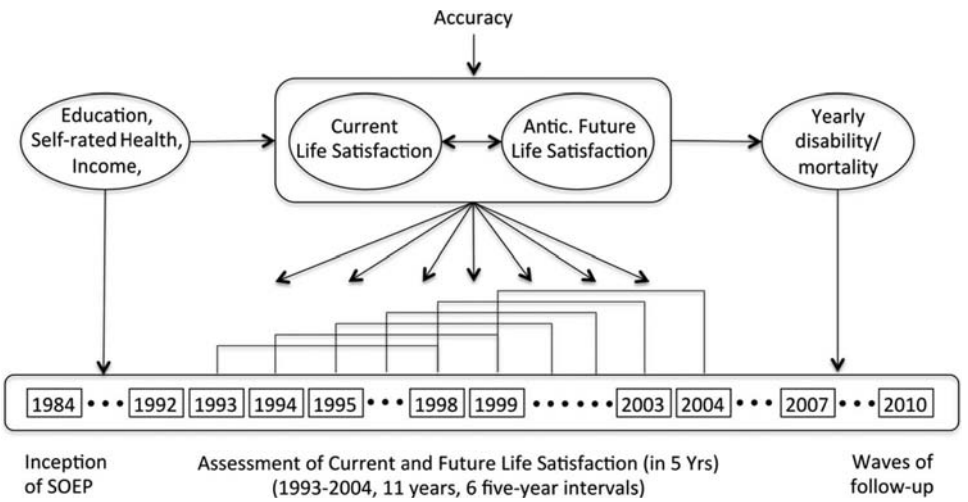

Figure 1. Overview of data collected in the German Socioeconomic Panel (SOEP) study as used in the present study. The SOEP began data collection in 1984. Current life satisfaction is assessed annually. Future life satisfaction as anticipated in 5 years was assessed yearly from 1993 to 2004. As antecedents, we used data on education (number of years of schooling), income (six occasions from 1993 to 1998), and self-rated health (five occasions from 1994 to 1998). For the outcomes, we used accuracy of future life satisfaction, as assessed between 1993 through 2004, to predict disability and mortality that were continually tracked from 1998 through 2010.

life satisfaction (e.g., current life satisfaction 5 years later in 1998) for six times across the entire 11-year longitudinal study. Again, we applied latent growth models and examined change in the accuracy of predicting future life satisfaction over time and also tested for possible age differences therein. With this analysis, we examined the ways in which the accuracy of anticipated future life satisfaction differed across adulthood and how stable such differences proved to be over time.

We expected substantive age differences in the accuracy of *anticipated* future life satisfaction. Young adults were hypothesized to overestimate their future life satisfaction, and older adults were expected to be more likely to underestimate their future life satisfaction. Not much is known about midlife. Therefore, we had no specific hypothesis for this age group, but expected middle-aged adults to be somewhere in between young and old adults. Because such forecasts are reflective of long-term adaptations, we expected the discrepancies (or accordance) between current and anticipated future life satisfaction to be relatively stable over time.

A third analysis explored whether and how chronological age, gender, and personal resources such as education, income, and subjective health would contribute to between-person differences in the accuracy of anticipated life satisfaction in the future and in changes therein. We expected that age-related differences in over- or underestimation of future life satisfaction would be—at least partly—accounted for by differences in personal resources such as income and self-reported health. In detail, we expected that better health, more years of education, and higher income would be associated with less-pessimistic future anticipation.

In a fourth analysis, we included information on disability and mortality. We applied survival analyses to examine whether and how between-person differences in the accuracy of anticipated life satisfaction were predictive of hazard ratios for disability and mortality across 10 or more years. We expected that in old age, being more realistic or even pessimistic may entail better preparedness and predictive control and thus will be associated with maintaining functional health and lower mortality risks. Being overly optimistic may entail greater risks for disability and mortality among older adults relative to middle-aged and younger adults.

Taken together, these analyses allowed us to extend previous reports by examining hazard ratios over a very long time interval, exploring whether or not associations held after covarying for other pivotal predictors (including income, education, and self-rated health). In addition, the national representativeness of the SOEP allowed us to generalize to the larger population. Taken together, we were particularly interested in the age-differential antecedents, correlates, and outcomes of the accuracy of anticipated life satisfaction.

Method

We examined our research questions using data from the SOEP (e.g., Infurna, Gerstorf, Ram, Schupp, & Wagner, 2011). Detailed information about the design, participants, variables, and assessment procedures in the larger study is reported in Wagner et al. (2007). Next, we provide a brief overview of the details of the study, the data-analytical procedures, and the measures.

Participants

We used 11 waves of longitudinal data from the SOEP, collected annually between 1993 and 2003. The SOEP is a nationally representative annual panel study of private households. The participants included here were those who (a) responded to the life satisfaction measures in 1992 or before (however, we excluded respondents at the first occasion of measurement because people tend to overstate their life satisfaction at the beginning of a panel study, see Headey, 2006); (b) responded three times or more to the life satisfaction measure across the 11-year interval; and (c) were 18 years or older.

By now, the SOEP covers a participant base of approximately 40,000 individuals, including immigrants and resident foreigners, of former West and East Germany. Potential participants were randomly selected from a set of randomly selected geographic locations in Germany. Within each household, all family members older than 16 years of age were eligible for active participation. Data were primarily collected via face-to-face interviews, with the exception that about 10% of the individuals who had already participated several times provided data via self-administered questionnaires.

To optimize sample size and in order to include all available information in the data set, we decided *not* to use a consistent sample size throughout all analyses, but instead always included all participants who had provided data on the variables relevant for a given analysis. As a consequence, the sample sizes differed considerably between analyses. For the first research question, the inclusion criterion was to have provided data on ratings of both future life satisfaction in 5 years and current life satisfaction in 1993, resulting in a sample size of 11,131 participants, who provided 91,035 observations across a period of 11 years.

To calculate our accuracy measure for the second research question, we included all participants who had provided data for future life satisfaction (in 5 years) in 1993 as well as the corresponding rating of current life satisfaction in 1998. This resulted in a sample of 7,922 participants, who provided 40,220 observations across 6 years.

For our third research question, we used the same criterion as above (see second research question) and also required participants to have provided data on all between-person difference factors (e.g., income, self-reported health; $n = 7{,}828$ who provided 46,204 observations).

Finally, to examine the fourth research question, we again made use of all data from participants who provided data on accuracy and the correlates; an additional requirement was that we either had disability or mortality information available from 1998 onward (disability models, $n = 6{,}749$; mortality models, $n = 7{,}920$).

Selectivity

To quantify selectivity effects, we compared our largest subsample ($n = 11{,}131$) with the larger SOEP parent sample of some 40,000 participants. Analyses revealed that participants included in our report were younger at their first measurement occasion ($M = 37.36$, $SD = 16.01$ vs. $M = 40.18$, $SD = 18.74$), $F(1, 48{,}594) = 207.4$, $p < .01$, attained fewer years of education ($M = 11.40$, $SD = 2.53$ vs. $M = 11.76$, $SD = 2.70$), $F(1, 46{,}127) = 158.66$, $p < .01$, and reported slightly lower life satisfaction at their first wave ($M = 7.06$, $SD = 2.11$ vs. $M = 7.37$, $SD = 1.86$),

$F(1, 47{,}920) = 233.4$, $p < .01$, whereas no differences were found for gender. Although significant, the relatively small differences in substantive terms (Cohen's $d < .17$) suggest that the study samples were comparable with the study population from which they were drawn.

We also examined the effects of longitudinal attrition by using an effect-size metric indicating the degree to which individuals who survived and participated longitudinally differed from the initial sample at Time 1 (T1; for details, see Lindenberger, Singer, & Baltes, 2002). To do so, we compared the 6,185 participants who provided all data points across the 11-year observation period for life satisfaction with those who provided fewer life satisfaction ratings ($n = 4{,}946$). As one would expect, higher levels of life satisfaction at T1, younger age, more education, and perceiving oneself to be in better health were each associated with subsequently higher participation rates. However, the size of attrition effects was small and did not exceed a standard deviation of .10 (where the *SD* refers to that of the initial sample of $N = 11{,}131$) for any of the variables examined.

Measures

Current Life Satisfaction (CLS). As a measure of current life satisfaction, we used responses to the question, "How satisfied are you with your life currently, all things considered?" answered on a 0 (*totally unsatisfied*) to 10 (*totally satisfied*) scale. This item is considered a measure of cognitive–evaluative (as opposed to emotional) aspects of well-being and has been widely used in psychological research (Fujita & Diener, 2005; Gerstorf et al., 2008, 2010; Headey et al., 2010; Lucas, Clark, Georgellis, & Diener, 2003). For the purposes of the current study, we used ratings obtained annually between 1993 and 2003. Retest correlations of this item between two adjacent waves were $r = .55$ or higher.

Future Life Satisfaction (FLS). Subsequent to reporting their current life satisfaction, participants were also asked, in the years 1992 through 2003 (here, we used only 1993 through 2003), how they would rate their future life satisfaction ("And how do you think you will feel in 5 years?"), again using a scale from 0 (*totally unsatisfied*) to 10 (*totally satisfied*). This item showed a moderately positive association with a single optimism item ("When thinking about the future in general, how optimistic are you?" with a 4-point rating, assessed in 1999, $r = .41$, $N > 15{,}000$, $p < .001$). Retest correlations of FLS items between two adjacent waves were $r = .54$ or higher.

Accuracy of anticipated future life satisfaction. We used the overlapping ratings of future life satisfaction in 5 years and current life satisfaction to calculate the accuracy in predicting future life satisfaction as the difference between ratings of future life satisfaction in 5 years (e.g., obtained in 1993) and of current life satisfaction 5 years later (e.g., obtained in 1998). The structure of our data allowed us to calculate this accuracy index for six consecutive occasions: 1993 to 1998, 1994 to 1999, 1995 to 2000, 1996 to 2001, 1997 to 2002, and 1998 to 2003. The accuracy was computed as follows:

$$\Delta Accuracy = FLS_i - FLS_{i+5} \quad (1)$$

As a consequence, positive scores indicated that participants were overly optimistic in expecting their life satisfaction to be higher than it actually was 5 years later. By contrast, negative scores indicated that participants were more pessimistic and expected their life satisfaction to be lower than it turned out to be 5 years later. This means that we relied on a continuous variable, ranging from optimistic (overestimating) via realistic (accurate) to pessimistic (underestimating) future forecasts.

Correlates. Included in our models were sociodemographic variables (age, gender, education), self-rated health, and income as between-person difference predictors of future life satisfaction, current life satisfaction, and accuracy in predicting future life satisfaction. To examine age group differences, we compared young adults (18 to 39 years; $n = 5{,}145$; 50% women), middle-aged adults (40 to 64 years; $n = 4{,}588$; 49% women), and older adults (65+ years; $n = 1{,}398$; 61% women). Education was measured as the total number of years of schooling, ranging from 7 to 18 years. As a measure of self-rated health, we used responses to the question, "How would you describe your current health?" answered on a 1 (*very good*) to 5 (*bad*) scale, as assessed annually for 5 years between 1994 and 1998. In our analyses, we reverse-coded the item. Income was indexed as the corrected monthly household income in Euros, after tax, and was available for six occasions from 1993 to 1998. To accommodate the skewed distribution of the measure, we used the natural log (*ln*) of the monthly income.

Outcomes. We considered two outcome measures: disability incidence and mortality. Disability status at each wave and the timing of disability onset were measured with a single item asking participants whether they had been "officially certified as having a reduced capacity to work or as being severely handicapped" (see Lucas, 2007). To avoid possible confounds, we included disabled participants in the models only when the onset of disability occurred after 1999, which was the first observation after the rating of current life satisfaction was given. The comparison group was comprised of those who were not disabled across the study period; those who became disabled between 1993 and 1998 were not included. As a consequence, we included a total of 6,749 participants in our model, and we estimated risk ratios for disability incidence across the 11 years from 1999 to 2010. In total, 735 out of the 6,749 (or 11%) participants in our sample experienced disability. On average, participants with incident disability during the follow-up period were 46.99 years of age in 1993 ($SD = 12.79$, range 18 to 86) and became disabled at an average age of 58.14 years ($SD = 12.58$, range 25 to 96).

Information about mortality and time of death for deceased participants was obtained either by interviewers at yearly assessments (i.e., from household members, o, in the case of one-person households, neighbors) or from city registries (see Gerstorf et al., 2008). Of the 7,920 participants included in our mortality analyses, 879 (or 11%) were deceased by the year 2010. On average, deceased participants were 62.56 years of age in 1993 ($SD = 13.25$, range 18 to 94) and died at an average age of 73.19 years ($SD = 14.06$, range 29 to 110). At the time of death, 60 participants (7%) were in young adulthood (18 to 39 years), 384 participants (43%) were in midlife (40 to 64 years), and 441 participants were in old age (50%, 65 years or older). Cause of death is not available in the SOEP.

Data Preparation and Data Analysis

To illustrate the layout of the data, descriptive statistics for the measures under study are reported in Table 1. Of note is that, for example, future life satisfaction in 5 years and current life satisfaction were moderately intercorrelated ($r = .65$) but showed somewhat different associations with several of the correlates (e.g., age: $r = -.23$ for future life satisfaction; $r = -.04$ for current life satisfaction). Follow-up analyses also indicated that correlations between future life satisfaction in 5 years and current life satisfaction were more pronounced among older adults ($r = .74$) relative to both middle-aged adults ($r = .68$; $z = -3.61$) and young adults ($r = .60$; $z = -8.18$), who themselves also differed reliably from one another ($z = -6.73$, all $ps > .01$). This suggests that between-person differences in the two ratings were somewhat more closely tied at older ages.

To examine our research questions, we first fit separate growth curve models for future life satisfaction in 5 years and current life satisfaction across the time in the study (11 yearly occasions from 1993 to 2004). In a second step, we proceeded in an analogous fashion and fit a growth-curve model for our indicator of the accuracy in predicting future life satisfaction (i.e., the difference between future life satisfaction in 5 years and current life satisfaction 5 years later; 6 yearly occasions). To rule out possible more precipitous declines in old age or other accelerating factors, we also tested for nonlinear change trajectories in all the models. These models were specified as

$$\textit{life satisfaction}_{ti} = \beta_{0i} + \beta_{1i}(\textit{time}_{ti}) + \beta_{2i}(\textit{time}_{ti}^2) + e_{ti}, \quad (2)$$

where person i's life satisfaction at time t (either future life satisfaction in 5 years, current life satisfaction, or Δ future life satisfaction in 5 years and current life satisfaction 5 years later), *life satisfaction*$_{ti}$ is a combination of an individual-specific intercept parameter, β_{0i}, individual-specific linear and quadratic slope parameters, β_{1i} and β_{2i}, that capture the linear and quadratic rates of change per year, and residual error, e_{ti}. Following standard multilevel/latent growth modeling procedures (Ram & Grimm, 2007; Singer & Willett, 2003), individual-specific intercepts, β_{0i}, and slopes, β_{1i} and β_{2i}, (from the Level 1 model given in Equation 2) were modeled as

$$\beta_{0i} = \gamma_{00} + u_{0i}, \quad (3)$$

$$\beta_{1i} = \gamma_{10} + u_{1i}, \text{ and}$$

$$\beta_{2i} = \gamma_{20},$$

(i.e., Level 2 model) where γ_{00}, γ_{10}, and γ_{20} are sample means, and u_{0i} and u_{1i} are individual deviations from those means that are assumed to be multivariate normally distributed, correlated with each other, and uncorrelated with the residual errors, e_{ti}. Deviations for the quadratic slope, u_{2i}, were examined but were not reliably different from zero and were thus not included in the final models. To examine whether and how the between-person variance in individuals' change trajectories over time was associated with age, we expanded the model by adding age groups as predictors at the between-person level (Level 2). The largest group served as the reference group (young adults, 18 to 39 years; $n = 5{,}145$). The expanded model took the form

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{middle-aged group}_i) + \gamma_{02}(\text{older group}_i) + u_{0i}, \quad (4)$$

and

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{middle-aged group}_i) + \gamma_{12}(\text{older group}_i) + u_{1i}.$$

In a third step, the model was again expanded to additionally examine the role of sociodemographic covariates, self-rated health, and income as Level 2 predictors. These variables were treated in the same manner as age group in the preceding step. With the exception of age being centered at 70 years, all other predictors were effect-coded/centered so that the regression parameters indicated the average trajectory (across all individuals) and the extent of differences associated with a particular variable (rather than for a particular group). To derive estimates of change for self-rated health and income, we simply calculated the difference between scores obtained in 1993 (income) or 1994 (the first year in which

Table 1
Descriptive Statistics and Correlations for the Measures Under Study

			Intercorrelations								
	M	*SD*	1	2	3	4	5	6	7	8	9
1. Future life satisfaction in 5 years (0 to 10)	6.80	2.01	—								
2. Current life satisfaction (0 to 10)	6.79	1.88	.65	—							
3. Δ Future life satisfaction in 5 years − current life satisfaction 5 years later (−10 to 10)	0.18	2.18	.63	.22	—						
Correlates											
4. Age (18 to 98 years)	43.58	16.65	−.23	−.04	−.15	—					
5. Men	0.49	0.50	.01	.01	.01	−.05	—				
6. Education (7 to 18 years)	11.15	2.41	.06	.00	.03	−.06	.10	—			
7. Self-rated health level (1 to 5)	3.35	0.97	.32	.28	.04	−.41	.08	.09	—		
8. Self-rated health change (−4 to 3)	−0.08	0.90	−.04	−.05	−.13	−.03	−.02	.02	−.47	—	
9. Income level (0 to 21,750)[a]	2,136	1,274	.12	.16	.00	−.15	.07	.15	.10	.01	—
10. Income change (−19,684 to 8,539)	59.55	1,158	.02	−.04	−.02	−.02	.00	.09	.03	.01	−.52

Note. Statistics for future life satisfaction in 5 years and current life satisfaction, $n = 11{,}131$. Statistics for Δ Future life satisfaction in 5 years − Current life satisfaction 5 years later, $n = 8{,}182$. Intercorrelations greater than .03 were reliably different from zero at $p < .01$.
[a] Corrected monthly household income in Euro, after tax.

self-rated health was assessed), respectively, and 1998 as the end of the time series for predictions of future life satisfaction in 5 years. Models were fit to the data using SAS (Proc Mixed, Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006). Intercepts were centered at the T1 assessment and rates of change were scaled in raw units (on a scale from 0 to 10) per year. Missing data were accommodated using full information maximum likelihood under the usual missing at random assumptions underlying accelerated longitudinal designs (Little & Rubin, 1987).

In a final step, we applied hierarchical Cox proportional hazard regression models (Cox, 1972) to examine whether and how the accuracy in predicting life satisfaction 5 years later was predictive of 11-year risk ratios for disability incidence (between 1999 and 2010) and 12-year risk ratios for mortality (between 1998 and 2010) using SAS PROC PHREG (see Allison, 1995). All models also included age, gender, education, income, and self-rated health (and disability in the mortality model). Because accuracy scores (as well as income and self-rated health) were z standardized ($M = 0$, $SD = 1$), the hazard ratios expressed effect sizes in standard deviation units. With low prevalence rates of disability and mortality among younger and middle-aged adults, we centered age in both models at 70 years. Gender and education were effect-coded. To examine age-differential associations, we also included interaction terms of age with all other predictors; only statistically significant terms were retained in the final models. The disability model was specified as

$$\log h(t_{ij}) = \log h_0(t_j) + \beta_1(\text{age}_i) + \beta_2(\text{gender}_i) + \beta_3(\text{education}_i) + \beta_4(\text{income}_i) + \beta_5(\text{self-rated health}_i) + \beta_6(\text{accuracy}_i) + \beta_7(\text{age x predictor}_i) \quad (5)$$

where $\log h(t_{ij})$ is the log of individual i's risk of becoming disabled or dying (or log hazard; $\log h$) at time t; $\log h_0$ (t_j) is the general baseline log hazard function indicating the risk of becoming disabled or dying at each time when all other predictors are set to 0; β_1 through β_6 are the independent effects of age, gender, education, income, self-rated health, and accuracy on the hazard of becoming disabled or dead, and β_7 indicates whether or not age moderates one of the effects of the predictors. The mortality model was specified in analogous form with disability added as another predictor.

Results

As a preliminary check for the longitudinal change analyses, we estimated the relative amount of between-person and within-person variance by considering models that allowed random effects only for the intercept. The intraclass correlation revealed by these models was .53 for future life satisfaction, suggesting that 53% of the total variation in future life satisfaction was between-person variance and the remainder (47%) was within-person variation. Similar intraclass correlations were found for future life satisfaction in 5 years (.53) and for the accuracy of future life satisfaction (.35), suggesting that each variable exhibited substantial variability within persons across time. With the indication that there was indeed intraindividual variation to model, we proceeded to evaluate how longitudinal changes were structured over time.

Longitudinal Changes in Future Life Satisfaction and Current Life Satisfaction

In a first step, we explored whether and how ratings of future life satisfaction in 5 years and current life satisfaction changed over time and evinced an age-differential pattern. Participants aged 18 to 39 years (young adults) were the largest of the three age groups, and thus served as reference groups in the statistical analyses (as reported in Tables 2 and 3).

As expected, age group differences in current life satisfaction were minimal. The right-hand panel of Table 2 indicates that younger adults, on average, rated their current life satisfaction to be 6.844 on the scale from 0 to 10. Although the linear rate of change was not reliably different from 0 (0.003, $p > .10$), the quadratic component of change was (−0.002), resulting in some very minor declines in current life satisfaction among young adults.

Relative to young adults, middle-aged adults reported, at baseline, an average of about a quarter of a scale-unit lower current life satisfaction (−0.221), but no differences were found for older adults (0.019, $p < .10$). Over time, young and middle-aged adults experienced similarly small declines (−0.006, $p < .10$), whereas declines in current life satisfaction were more pronounced among older adults (−0.070).

Age group differences in future life satisfaction were sizable. As seen in the left-hand panel of Table 2, young adults (the reference group), on average, rated their future life satisfaction at 7.269 on a 0 to 10 scale and declined at a linear rate of 0.018 per year. In comparison, middle-aged adults anticipated their future life satisfac-

Table 2
Growth Models for Future Life Satisfaction and Current Life Satisfaction Over Time-In-Study in the SOEP by Age Groups

	Future life satisfaction in 5 years		Current life satisfaction	
	Estimate	*SE*	Estimate	*SE*
Fixed effects				
Intercept[a]	7.269*	(0.024)	6.844*	(0.023)
Linear change[b]	−0.018*	(0.006)	0.003	(0.005)
Quadratic change[b]	−0.001	(0.001)	−0.002*	(0.000)
Middle-aged group	−0.821*	(0.034)	−0.221*	(0.032)
Old group	−1.128*	(0.051)	0.019	(0.049)
Middle-Aged Group × Linear Change	−0.015*	(0.004)	−0.006	(0.004)
Old Group × Linear Change	−0.060*	(0.007)	−0.070*	(0.007)
Random effects				
Variance intercept	2.131*	(0.038)	1.986*	(0.035)
Variance linear change	0.019*	(0.001)	0.018*	(0.001)
Covariance intercept, linear change	−0.070*	(0.004)	−0.078*	(0.004)
Residual variance	1.692*	(0.009)	1.485*	(0.008)
AIC	336,802		325,071	

Note. Unstandardized estimates and standard errors are presented. Participants aged 18 to 39 years served as the reference. A total of 11,131 participants provided 91,035 observations over 11 years. Young adults (18 to 39 years), $n = 5{,}145$; middle-aged adults (40 to 64 years), $n = 4{,}588$; older adults (65+ years), $n = 1{,}398$. AIC = Akaike Information Criterion, a relative model fit statistic.

[a] Intercept is centered at Time 1. [b] Changes or rates of change are scaled in raw units (on a scale from 0 to 10) per year.

* $p < .01$.

tion to be, on average, about three quarters of a scale-unit lower (−0.821) and older adults even more than a full scale-unit lower (−1.128). Over time, the rates of decline for both groups were also steeper than those found among young adults −0.018 − 0.015 = −0.033 for middle-aged adults, and −0.018 − 0.060 = −0.078 for older adults).

The differential age pattern for the two life satisfaction ratings are illustrated in Figure 2. The figure shows that predictions about future life satisfaction were different across age groups and evinced age-differential changes, whereas age differences in current life satisfaction were comparably smaller and evinced somewhat stronger decrements in old age only. To illustrate, differences between young and older adults using the raw scores at T1 for future life satisfaction in 5 years were in the medium range of effect sizes (Cohen's $d = 0.53$), whereas these differences for current life satisfaction were negligible (Cohen's $d = 0.02$). In the next step, we brought future and current ratings of life satisfaction together.

Accuracy of Predicting Future Life Satisfaction: Long-Term Longitudinal Changes

In a second step, we directly linked future and current ratings of life satisfaction. To do so, we calculated the difference in ratings of future life satisfaction in 5 years (e.g., obtained in 1993) and current life satisfaction 5 years later (e.g., obtained in 1998), and used growth curve models to examine long-term longitudinal changes in this discrepancy index. Results are reported in Table 3.

As would be expected based on the age trends observed in Step 1, findings revealed that, among young adults, discrepancy scores were, on average, positive and reliably different from zero (0.449), suggesting that younger adults overestimated their actual life satisfaction 5 years later by about half a scale point. Over time, this overestimation remained stable (−0.005, $p > .10$). For middle-aged adults, by contrast, average discrepancy between the two ratings was about half a scale point less than for younger adults (−0.532), indicating a future life satisfaction rating that was more realistic and very close to their actual current life satisfaction 5 years later (0.449 − 0.532 = −0.083). For older adults, the discrepancy was, on average, about three-quarters of a scale point less than for younger adults (0.449 − 0.771 = −0.322) and indicated that older adults underestimated their future life satisfaction. Over time, the average discrepancy for middle-aged adults became slightly more negative (−0.005 − 0.038 = −0.043) and remained stable for older adults (−0.005 − 0.013 = −0.018, $p > .10$).

Table 3
Growth Models for Difference Between Future Life Satisfaction and Current Life Satisfaction 5 Years Later Over Time-In-Study in the SOEP by Age Groups

	Δ Future life satisfaction in 5 years − Current life satisfaction 5 years later	
	Estimate	*SE*
Fixed effects		
Intercept[a]	0.449*	(0.031)
Linear change[b]	−0.005	(0.009)
Middle-aged group	−0.532*	(0.044)
Old group	−0.771*	(0.073)
Middle-Aged Group × Linear Change	−0.038*	(0.014)
Old Group × Linear Change	−0.013	(0.024)
Random effects		
Variance intercept	1.886*	(0.057)
Variance linear change	0.125*	(0.005)
Covariance intercept, linear change	−0.316*	(0.015)
Residual variance	2.831*	(0.025)
AIC	168,179	

Note. Unstandardized estimates and standard errors are presented. Participants aged 18 to 39 years served as the reference. A total of 7,922 participants provided 40,220 observations over 6 years. AIC = Akaike Information Criterion, a relative model fit statistic.
[a] Intercept is centered at Time 1. [b] Changes or rates of change are scaled in raw units (on a scale from 0 to 10) per year.
* $p < .01$.

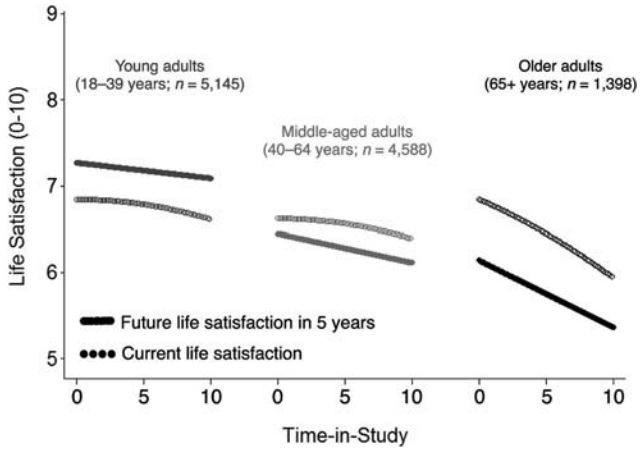

Figure 2. Model-implied average 11-year change trajectories of future life satisfaction in 5 years (solid lines) and current life satisfaction presented separately for young, middle-aged, and older adults. Predictions about future life satisfaction are different across age groups and evince age-differential change, whereas age differences in current life satisfaction are comparably smaller and evince somewhat stronger decrements in old age only.

As illustrated in Figure 3, younger adults were optimistic in expecting their life satisfaction to be better as it turned out to be 5 years later. By contrast, older adults were more pessimistic overestimating their life satisfaction 5 years later. Middle-aged adults made the most accurate predictions initially but became more pessimistic over time. Using the raw scores at T1, age group differences were in the small range of effect sizes (e.g., young vs. old adults, Cohen's $d = 0.33$). Most older adults underestimated future life satisfaction (43%), 25% made accurate forecasts, and 32% overestimated future life satisfaction.

Accuracy of Predicting Future Life Satisfaction: Predictors and Correlates

In a third step, we examined the role of sociodemographic variables, self-rated health, and income in predicting between-person differences in the level and change of accuracy. Results are shown in Table 4\ and reveal that the average accuracy at age 70 was −0.649, so the typical 70-year-old underestimated his or her

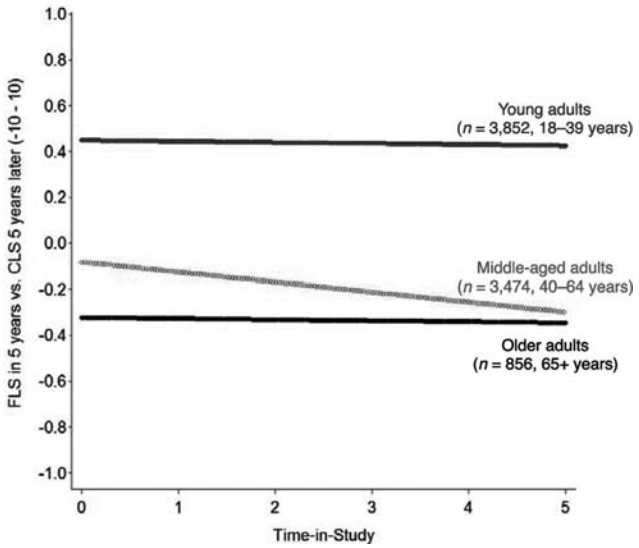

Figure 3. Model-implied average 5-year change trajectories of accuracy of anticipated future life satisfaction, as defined by the difference between future life satisfaction (FLS) in 5 years minus current life satisfaction (CLS) 5 years later presented separately for young, middle-aged, and older adults. Younger adults are optimistic in expecting their life satisfaction to be higher than it actually is 5 years later. By contrast, older adults are more pessimistic and expect their life satisfaction to be lower than it turns out to be 5 years later. Middle-aged adults make the most accurate predictions initially but get more pessimistic over time.

future life satisfaction 5 years later by some two-thirds of a scale point. We also observed that older age (−0.029) and less education (0.041), higher levels of and less decline in subjective health (−0.187 and −0.340), as well as higher income and increases in income (−0.186 and −0.340) were each associated with underestimating levels of future life satisfaction (i.e., a negative difference between ratings of future life satisfaction in 5 years and current life satisfaction 5 years later).

Across time, on average, individuals remained stable in underestimating their future life satisfaction with a few exceptions: Older participants less strongly underestimated the future (0.001), and those who reported less declines in health (0.087) or income (0.070) became a little more accurate over time (i.e., less underestimating future life satisfaction).

In addition, three age interaction effects emerged. Specifically, the effects of education (−0.002), self-rated health (−0.005), and the linear change by self-rated health (−0.001) were somewhat less pronounced in old age. One way to interpret these findings is that once (changes in) resource variables such health and income were taken into account, older adults became less pessimistic about their future life satisfaction.

Accuracy of Predicting Future Life Satisfaction: Implications and Outcomes

In a fourth and final step, we investigated whether or not the underestimation of future life satisfaction was predictive of key outcomes of successful aging, namely, the 11-year risk ratio for disability incidence and the 12-year risk ratio for mortality.

As can be observed in the left-hand panel of Table 5, older age (relative risk [*RR*] = 1.025), less education (*RR* = 0.950), higher income (*RR* = 1.150), and lower self-rated health (*RR* = 0.718) were each associated with a higher relative risk of developing a disability. Most important for our question, overestimating one's future life satisfaction (*RR* = 1.095) was also uniquely related to higher disability risks. Each one-standard-deviation increase in overestimating one's future life satisfaction was related to a 9.5% increased likelihood of facing disability.

None of the age interactions examined was reliably different from zero. The right-hand panel of Table 5 shows that advancing age (*RR* = 1.088), being a man (*RR* = 1.483), lower income (*RR* = 0.884), having a disability (*RR* = 1.354), and lower self-rated health (*RR* = 0.897) were each associated with increased mortality risks. Again, overestimating one's future life satisfaction (*RR* = 1.103) uniquely predicted mortality hazards above and

Table 4
Growth Models for Difference Between Future Life Satisfaction and Current Life Satisfaction 5 Years Later Over Time-In-Study in the SOEP: The Role of Between-Person Difference Factors

	Δ Future life satisfaction in 5 years − Current life satisfaction 5 years later	
	Estimate	*SE*
Fixed effects		
Intercept[a]	−0.649*	(0.045)
Linear change[b]	0.018	(0.013)
Age	−0.029*	(0.001)
Men	0.039	(0.041)
Education	0.041*	(0.016)
Self-rated health level	−0.187*	(0.028)
Self-rated health change	−0.586*	(0.041)
Income level	−0.186*	(0.050)
Income change	−0.340*	(0.054)
Age × Linear Change	0.001*	(0.000)
Men × Linear Change	−0.015	(0.012)
Education × Linear Change	−0.005	(0.002)
Self-Rated Health Level × Linear Change	0.024	(0.012)
Self-Rated Health Change × Linear Change	0.087*	(0.008)
Income Level × Linear Change	0.030	(0.014)
Income Change × Linear Change	0.070*	(0.016)
Age × Education	−0.002*	(0.000)
Age × Self-Rated Health	−0.005*	(0.001)
Age × Linear Change × Self-Rated Health	−0.001*	(0.000)
Random effects		
Variance intercept	1.961*	(0.053)
Variance linear change	0.130*	(0.004)
Covariance intercept, linear change	−0.248*	(0.013)
Residual variance	2.353*	(0.019)
AIC	185,611	

Note. Unstandardized estimates and standard errors are presented. A total of 7,828 participants provided 46,204 observations over 6 years. To estimate self-rated health change and income change, linear slopes were obtained from each participant using Bayes empirical score estimates as calculated in SAS PROC MIXED (see Littell et al., 2006). Correlates were effect-coded and age was centered at 70 years. AIC = Akaike Information Criterion, a relative model fit statistic.

[a] Intercept is centered at Time 1. [b] Changes or rates of change are scaled in raw units (on a scale from 0 to 10) per year.

* $p < .01$.

Table 5
Mortality Hazard Ratios for Differences Between Future Life Satisfaction in 5 Years and Current Life Satisfaction 5 Years Later Over Time-In-Study in the SOEP

	Disability		Mortality	
	Hazard ratio	95% CI	Hazard ratio	95% CI
Age	1.025*	1.020, 1.030	1.088*	1.082, 1.094
Men	1.116	1.000, 1.345	1.483*	1.289, 1.707
Education	0.950*	0.920, 0.981	0.997	0.966, 1.030
Income	1.150*	1.067, 1.240	0.884*	0.824, 0.947
Disability	—	—	1.354*	1.157, 1.584
Self-rated health	0.718*	0.664, 0.777	0.897*	0.836, 0.962
Δ Future life satisfaction in 5 years − Current life satisfaction 5 years later	1.095**	1.018, 1.178	1.103*	1.038, 1.172
Age x Disability	—	—	0.972*	0.963, 0.982
χ^2 (*df*)	230 (6)		1,710 (8)	

Note. Disability model, n = 6,749 (disabled, n = 735). Mortality model, n = 7,920 (deceased, n = 879). Correlates were effect-coded and age was centered at 70 years. CI = 95% confidence interval.
* $p < .01$. ** $p = .0150$.

beyond the other variables in the model. Each one-standard-deviation increase in overestimating one's future life satisfaction was related to an approximately 10% increase in risk of death. In addition, the Disability × Age interaction also reached statistical significance ($RR = 0.972$), suggesting that the predictive effects of disability for mortality decreased with advancing age.

Figure 4 illustrates the predictive effects of the accuracy of predicting future life satisfaction. Foreseeing a dark future is beneficial for survival. Taken together, results suggest that the accuracy of predicting future life satisfaction indeed has functional implications and consequences for successful aging outcomes, even after further important predictors were taken into account.[1]

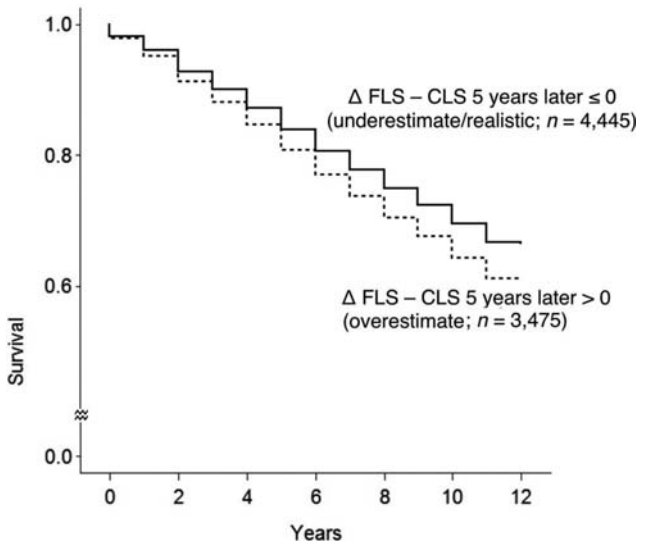

Figure 4. Illustrating the predictive effects of anticipated future life satisfaction for survival over 12 years. Socioeconomic panel (SOEP) participants who foresee a dark future were at lower risks for mortality. The hazard regression model for mortality was residualized for age, gender, education, disability, and the Age × Disability interaction. FLS = future life satisfaction; CLS = current life satisfaction.

Discussion

We found that from early to late adulthood, individuals adapt their anticipations of future life satisfaction from optimistic to accurate, and from accurate to pessimistic. Only in midlife do we find that adults are generally more likely to make accurate anticipations of how satisfied they will be 5 years later. However, we find that such age differences are partly dependent upon differences in self-rated health and income. When holding health and income resources statistically constant, older adults make more accurate forecasts of their future life satisfaction. Moreover, we observed that in old age, greater underestimation of anticipated life satisfaction is associated with lowered hazard rates of disability and mortality.

Findings show that with age, individuals become more accurate or pessimistic about their anticipated future life satisfaction. Pessimistic accuracy appears to be linked with preserved functional health and better chances to survive. We discuss the findings of this research first with regard to age-related patterns of stability and accuracy of anticipated life satisfaction, and second, with a focus on health outcomes with regard to decreases in the hazards of disability and mortality when foreseeing a dark future.

Anticipated Life Satisfaction: Becoming More Pessimistic Across Adulthood

Although there were no strong age differences in current life satisfaction, we found support for age differences in the anticipation of future life satisfaction across six subsequent 5-year time intervals. Such age differences showed much stability across time. Young adults expected overly optimistic improvements of their life satisfaction in 5 years, middle-aged adults expected stable levels of life satisfaction, whereas older adults anticipated declines in life satisfaction in the future.

[1] In follow-up analyses, we examined whether the effects observed hold in samples for whom hazard ratios of the events under study are sizeable. To do so, we restricted the sample to those aged 50 years or older for the disability model and aged 65 years or older for the mortality model. The substantive pattern of results remained unchanged from what we report in the main text.

Such observations are consistent with previous findings pointing to the possible benefits of foreseeing a dark future. For example, Cheng et al. (2009) argued that pessimistic views of the future follow a pattern of future discounting that serves to protect the self against potential losses when they actually occur. Our findings regarding the health outcomes (i.e., lower hazard of disability and higher survival rate) of pessimistic future views corroborate such ideas.

Furthermore, we found that the trajectories of current and anticipated life satisfaction showed a general and steady decrease over time across 11 years. In this regard, however, older adults showed the steepest decline with regard to both current life satisfaction and future life satisfaction.

We also found that more favorable change trajectories on income and health (i.e., higher levels and less decline) were associated with underestimates of future life satisfaction. One implication is that pessimistic views may be more likely in old age among those who have a relative high income and are thus more likely to expect things to get worse. By contrast, we found that higher education was related to increased optimism over time (i.e., overestimating life satisfaction). Such findings point to the crucial role of personal resources for accurately predicting one's future life satisfaction. Some older adults who are healthy and wealthy may be more concerned about likely declines in the future. As a consequence, our findings shed some new light on the literature on future discounting (Cheng et al., 2009). Having more health and income resources in old age may involve a life-pragmatic understanding that declines in the future are likely to come. Educational resources may buffer such effects. Generally, we found that such pessimistic outlooks were relatively stable over time, even when life satisfaction was better than expected after 5 years. Such stability of unrealistic pessimism appears to be associated with positive health outcomes.

Finally, we observed age-related differences in the accuracy of future life satisfaction. Results demonstrate that an increased proportion of middle-aged and especially older adults were more likely to underestimate their future life satisfaction. Thus, older individuals were unrealistically pessimistic regarding the risk of future loss and declines in well-being. By contrast, younger adults are more likely to display an optimistic outlook on their future life satisfaction, suggesting that they are more likely to overestimate their future well-being. The discrepancies between current and anticipated future life satisfaction 5 years later remained fairly stable over time across six subsequent 5-year intervals. However, the most realistic forecasts of future life satisfaction were observed in midlife, but forecasts of middle-aged adults became more pessimistic over time. This finding underscores suggestions that in midlife, individuals are likely to understand that there may be limits to future growth in life satisfaction (Brandtstädter & Greve, 1994; Heckhausen & Krueger, 1993; Lachman, 2004).

In later adulthood, more individuals expressed a pessimistic future outlook. Such defensive pessimism may protect motivational resources in situations of increased risk of loss (Norem & Cantor, 1986). In accordance with this perspective, we found that when losses in resource variables such as self-rated health and income were statistically taken into account, older adults became less pessimistic about their futures.

Health Benefits of Foreseeing a Dark Future in Old Age

In the unique data set of the SOEP, we were able to relate our findings on the stability, robustness, and accuracy of anticipated future life satisfaction to healthy aging outcomes of functional disability and mortality. We are confident that our findings are the first to directly relate the issue of the accuracy of future forecasts to health outcomes in a nationally representative and predominantly nonclinical life span sample of adults ranging from 18 to 96 years of age. We observed that being overly optimistic in predicting a better future than actually observed was associated with a greater risk of disability and a greater risk of mortality within the following decade.

In our research, under- and overestimation of future life satisfaction were included as a continuous linear variable. Our analyses suggest that, in old age, any increase of unit toward greater underestimation of future life satisfaction is associated with better health outcomes. Because the quadratic trend was not reliably different from zero, there was no evidence that this trend was getting stronger or weaker the more pessimistic people were. However, several notes of caution need to be kept in mind. For example, sample sizes did not allow further testing of whether health outcomes differed between groups of older adults with realistic and with pessimistic forecasts. Separating realistic from optimistic, and realistic from pessimistic, views may also be complicated by individual differences in judgment anchors in life satisfaction ratings (Diener et al., 2006; Headey et al., 2010; Lucas et al., 2003).

We contend that these findings shed new light on the adaptive role of accurate and pessimistic future perspectives throughout adulthood and old age. Perceiving a dark future may foster positive evaluations of the actual self and may contribute to taking improved precautions. In line with this perspective, we observed that, when holding self-rated health and income constant, older adults made more accurate predictions of their future life satisfaction over time. Unexpectedly, we found that stable and good health or income were associated with expecting a greater decline compared with those in poor health or at low levels of income (or for whom decline may have set in somewhat earlier). Moreover, we found that higher income was related to a greater risk of disability. It may be the case that high-income groups have greater benefits when their disability is officially notified, as they become eligible for tax benefits with such notification.

Becoming more pessimistic over time, when health and income are stable and good, may point to a flexible adaptation process in old age: When things are going well and resources prevail, expecting declines in the future may involve taking greater precautions. Accepting or even foreseeing future loss potentials may serve to immunize the self against possible threats in the future and thus serve as a secondary control mechanism in terms of predictive control (Morling & Evered, 2006; Rothbaum et al., 1982). Foreseeing a dark future may also serve protective functions for the self and contribute to better health (Brandtstädter & Greve, 1994). Older adults may be better able to estimate the risks of potential losses that undermine their future life satisfaction (Ferrer et al., 2012), and have a greater sense of predictive control (Infurna et al., 2011).

One caveat when interpreting our findings is that the observed health outcomes of the forecasts may actually also be driven by external factors, for example, those related to health events, medical treatment, or personal losses. However, more thorough measures of these constructs are not yet available in our data set. We contend that more mechanism-oriented research is needed to better understand what predicts changes in optimistic or pessimistic forecasts and in health outcomes across adulthood.

In sum, our findings suggest that when individuals are young, they may not have much experience with what the future will bring. Young adults are likely to expect continued growth in life satisfaction and thus maintain positive illusions about their life situation in the future. Positive illusions in young adulthood may serve personal growth and foster the pursuit of goals with regard to future investments, for example, in education. From our data, we cannot draw inferences about the potential health risks of optimistic forecasts of life satisfaction in early or middle adulthood because the base rates of disability and mortality are low in these age groups. In this context, it is obvious that in young adulthood, health outcomes may be less critical than, for example, outcomes related to family and career success (Weinstein, 1980). In midlife, we found that adults change from a more optimistic to a more realistic anticipation of their future life satisfaction. Middle-aged adults may experience a turning point with regard to what they can expect from the future.

Finally, older adults are more pessimistic, but such pessimism is related to better subjective health and higher income. It may be the case that, in old age, individuals are more likely to consider that their time in life will be limited (Carstensen, 2006) and that this entails a closer look at savoring the present rather than expecting things to get better in the future. We contend that such findings serve to underscore the critical role of realistic views on the future when having to cope with the challenges of aging.

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