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Temporal and social comparative self-assessments of physical health in young, middle-aged, and young-old adults in the MIDUS study

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Abstract This study examined temporal and social comparisons of physical health status. Participants in two waves of the MIDUS cohort ranging in age from young adult to young-old ($N = 2{,}408$) rated current, past, and future physical health, as well as peer health. Past health was generally rated as better than current health (particularly among young adults). Young adults expected better future health; young-old adults expected declining health. All groups recalled their health as better than they reported a decade earlier. Middle-aged and young-old respondents expected more decline than they reported ten years later; young adults' ratings were consistent. The two older groups believed they were healthier than same-age peers, whereas younger respondents believed they were less healthy (though as healthy as the other age groups). The nature and trajectories of temporal and social comparisons of physical health across the lifespan suggest the need to examine their consequences for health behaviors.

Keywords Physical health assessments · Temporal comparison · Social comparison · Comparative biases; lifespan development

Introduction

Self-assessments of physical health, reflected in response to questions such as "in general, would you say your physical health is excellent, very good, good, fair, or poor?" strongly predict morbidity and mortality independent of conventional risk factors such as weight, blood pressure, glucose tolerance, serum cholesterol, past smoking, alcohol consumption, and exercise (e.g., Idler & Benyamini, 1997). Estimates of personal health status may be based on comparisons of current health with past health or with expectations about health in the future (temporal comparisons), as well as comparisons of personal health with perceptions of how peers are faring (social comparisons) (Hooker, 1992; Suls, Marco & Tobin, 1991; Ryff, 1991). Temporal and social comparisons may have special significance because bodily function inevitably declines with age, unlike many other personal attributes. Furthermore, such comparisons should be relevant and salient across the (adult) lifespan because of the meaning these judgments have for feelings about morbidity and mortality.

Perceptions of comparative health also can have consequences for behavior. For example, comparative risk estimates (that is, risk relative to peers) often correlate with seeking health information and changing health behaviors (Schmeige, Klein, & Bryan, 2010; Lipkus & Klein, 2006; Klein & Weinstein, 1997). People led to believe that their risk is higher than that of their peers tend to expect changes in their behavior (e.g., Agostinelli, Brown, & Miller, 1995; Fagerlin, Zikmund-Fisher, & Ubel, 2007; Lipkus & Klein, 2006). Thinking that one's

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health is worse than same-age peers or that it may deteriorate over time could motivate protective strategies to slow physical declines.

The precise nature and trajectory of temporal and social comparisons of physical health across the adult lifespan, however, remain unknown because prior research, although suggestive, has several limitations. For example, some studies: (a) only assessed social or temporal comparison perceptions; (b) had cross-sectional designs and as a result were unable to assess change; (c) relied on a single age group; or (d) measured a related, but nonetheless, distinct domain (e.g., life satisfaction). The present study circumvented these limitations by taking advantage of the Midlife in the United States Study (MIDUS; Brim, Ryff, & Kessler, 2004), a longitudinal cohort study that included temporal and social comparison perception items administered to respondents, ranging in age from young adult to young-old ($N = 2408$).

Cognitive and Motivational Factors

Commonsense Models of Aging

Laypeople between ages 20–90 hold beliefs associating aging with increases in susceptibility to illness as well as physical and cognitive decline (e.g., Keller et al., 1989; McFarland, Ross, & Giltrow, 1992; Sarkisian, Hays, & Mangione, 2002). These beliefs arise from the subjective and physical experience associated with normal aging (e.g., Costa & McCrae, 1985; Mock & Eibach, 2011), cultural beliefs, and negative stereotypes about aging (Levy, 1996). These sources of information should lead people to expect physical health will decline later in life. The force of cultural beliefs and negative stereotypes of aging potentially might even cause people to exaggerate the extent of future physical decline (McFarland et al., 1992). According to affective forecasting theory (Wilson et al., 2000), people often overestimate their future responses to possible negative events (e.g., physical health declines) because they underestimate the powers of recovery or fail to take into account the fuller context of other future experiences.

Commonsense beliefs about aging, contemporary extensions of Social Comparison Theory (Festinger, 1954; Suls, Collins & Wheeler, 2000; Wills, 1981), Temporal Self-Appraisal Theory (Wilson & Ross, 2001), and related evidence offer insights about how laypeoples' cognitive and motivational processes may influence comparative perceptions of health across the lifespan. Unlike some domains, the formation of health perceptions is contingent on factors with differing and sometimes conflicting implications.

Social Comparison, Motivated Reasoning and Egocentrism

The commonsense model prediction overlooks that people may (implicitly or explicitly) guard against threats (e.g., declining health) to the self (e.g., Wood, 1989; Ross & Wilson, 2003). Downward comparison theory suggests that threats to self-esteem prompt people to make strategic comparisons or perceive their standing favorably (Wills, 1981). Judging self-attributes as better than the attributes of one's peers is one manifestation. This "better than average effect" (BTAE; Alicke, 1985; Weinstein, 1980) applies to many attributes (Alicke, 1985; Dunning, Heath & Suls, 2004; Zell, Strickhouser, Sedikides, & Alicke, 2020) and is thought to promote positive adjustment (Taylor & Brown, 1988; Dufner, Gebauer, Sedikides, & Denissen, 2019). Various aspects of health (e.g., personal risk, health behaviors, exposure to risk factors) exhibit the BTAE (e.g., Weinstein, 1980; Suls, Marco & Tobin, 1991).

The BTAE also may arise from non-motivational factors, which include the selective recruitment of information about the self (Dunning, Meyerowitz, & Holzberg, 1989) or applying greater weight to one's own characteristics because they are more cognitively accessible (Chambers & Windschitl, 2004). People rate themselves more positively (in this case, healthier) because they fail to recognize that (many) other people also share these characteristics. The presence of self-esteem threat also may not be necessary to maintain this belief (Gerber, Suls & Wheeler, 2018). Alicke and Govorun (2005) explain it as an "automatic tendency to assimilate positively-evaluated social objects toward ideal trait conceptions" (p. 99). If you thought you were generally healthy, you would assimilate your view of your health to the ideal point on the healthiness scale, which would make you healthier than the average person.

Zell and Alicke (2011) observed, however, that there are domains such as physical health for which declines with age are particularly salient (e.g., decreased mobility and flexibility and increases in physical pain), consistent with commonsense models. They predicted older adults would show a worse-than-average effect (WTAE) in physical health because they fail to recognize the weaknesses of their peers when assessing themselves. Younger persons who have not yet experienced physical declines should exhibit the usual BTAE. In a cross-sectional study, young adults (18–39 yrs.), middle-aged adults (40–59 yrs.) and older adults (60–85 yrs.) rated themselves and same-age, same-gender peers on a series of attributes, including physical health. Aggregating the ratings of the three age groups yielded the typical BTAE for health. Separate analyses of each group indicated, however, that older adults rated their health as significantly lower than average, in contrast to robust BTAEs exhibited by the two younger groups. This is broadly consistent with a

recent meta-analysis showing that self-serving comparative biases are stronger in younger samples (Zell et al., 2020).

Another cross-sectional study (Madey & Gomez, 2003) recruited three similarly aged samples who rated their chances of getting several age-related medical conditions compared to their same-age, same-gender peers on a rating scale (on much below average [-3] to much above average [+3] scales). Middle-aged and older adults showed less optimism than the younger adults. Although below average judgments emerged here earlier than in Zell and Alicke's (2011) study, older persons made less positive judgments.

Temporal self-appraisal theory and motivated reasoning

Temporal Self-Appraisal theory (Wilson & Ross (2000); Ross and Wilson, 2003; Wilson & Shanihan, 2020) proposes individuals are motivated to evaluate their past self in such a way that they feel good about their present self. For the health domain, recollecting a higher level of past health problems might promote these feelings (McFarland et al., 1992). The theory also proposes that people are motivated to believe that life will follow a continuously improving trajectory with a future that will be better than the present. We note that, at some point, this tendency should diminish because commonsense beliefs and the aging experience should signal the inevitability of physical decline. The present study tested the predictions of temporal self-appraisal theory hitherto unexamined in the physical health domain.

We review prior research closest to our aims although it assessed three related, albeit distinct, domains limiting their applicability. In a cross-sectional study with young, middle-aged and older adults, Ryff (1991) found the two younger groups perceived improvement in psychological well-being from 10–20 years earlier; whereas the oldest group perceived their past well-being as close to their current ratings. Using a similar methodology, Fleeson and Heckhausen (1997) reported similar results for judgments of subjective personality. The younger age groups supported temporal appraisal's prediction about perceiving improvement, but the oldest respondents failed to perceive any change.

In a study that examined both temporal and social comparison perceptions held by young adults (college students) in a one-time survey, the students rated themselves as superior (i.e., BTAE) to their peers on a series of personality traits in the past, present and future (Kanten & Teigen, 2008). The temporal self-appraisal theory prediction about making self-serving judgments about the past and future comparisons received support. Students considered themselves more superior now than in the past and expected to become even more superior in the future. (Another study [Vogel, Rose, Aspiras, Edmonds, & Gallinari, 2020] is one of the few that examined the combination of temporal and social comparison, but their two experiments assessed the *effects* of receipt of comparison information and therefore is not relevant to our purposes.)

Three studies, using data from the MIDUS study, compared temporal comparison ratings about current, past (10 years ago) and future (10 years from now) subjective well-being. Rocke and Lachman (2008) found that absolute scores about current life satisfaction did not differ among young, middle-aged, and young-old individuals (see also Kunzmann, Little & Smith, 2000). In another analysis (Lachman, Rocke, Rosnick & Ryff, 2008), respondents under 65 years of age recalled past life satisfaction as lower than current satisfaction, whereas older respondents perceived the past and present as about the same (in a third analysis of MIDUS data, Staudinger, Bluck and Herzberg, 2003 replicated these effects with a composite well-being index). The younger groups also predicted their satisfaction would improve in the next decade; whereas respondents over 65 predicted a decline, which Lachman et al. (2008) attributed to older adults' greater realism stemming from having more experience.

A large sample, cross-sectional study with people ages 18–68 years had respondents rate how much they thought they had changed in the past decade and/or to predict how much they would change in personality, values, and preferences in the next decade (Quoidbach, Gilbert & Wilson, 2013). At all ages, people indicated they had changed a lot from the past but would change relatively little in the future. This phenomenon, referred to as the *End of History Illusion,* decreased in magnitude in older participants, but was present even in the oldest group of participants (aged 50 and up). One explanation for the illusion is that because most people believe that they have positive attributes, they may be reluctant to entertain the possibility of change. Perceiving the current self as different from the past self is consistent with a motivated reasoning explanation and temporal self-appraisal theory but believing the self will not change in the future is both inconsistent with the theory and results described earlier (e.g., Rocke & Lachman, 2008). The different personal attributes (e.g., values and predictions) assessed by Quoidbach et al. may account for the discrepancy.

Summary. Older persons' temporal judgments of life satisfaction, subjective well-being and personality do not "accentuate the positive" as much as younger adults (acknowledging inconsistency in middle-age adults, with their judgments sometimes resembling those of young adults and in other studies, resembling those of older adults). Social comparisons of health also showed less evidence of self-enhancement in older persons although available research relies on cross-sectional methods and relatively small samples. Whether the same patterns apply to temporal and social comparisons of physical health remain unclear. Unlike physical health, lay beliefs about the age trajectory

of subjective well-being include stability, improvement and decline (Diener, Suh, Lucas, & Smith Diener, 1999). Exploratory, post-hoc analyses will be presented later that support distinguishing between self-assessments of physical and subjective well-being.

Current study

Changes in temporal and social physical health comparisons across the life course were evaluated by capitalizing on two waves of data collection in the MIDUS cohort. Participants between 20 and 80 years of age rated their physical health at two times separated by a ten-year period, and also estimated their past and future health status at both times, as well as the health status of their peers. The latter permitted us to compute an indirect measure of how they believed their current health compared to that of their peers and compared to ratings made a decade earlier and a decade later.

Based on the classic BTAE (e.g., Alicke, 1985; Dunning et al., 2004; Zell et al., 2020), we predicted that respondents would overall estimate that they were physically healthier than their same-sex, same-age peers (focusing on them because they tend to serve as the most influential reference group; Festinger, 1954.) We also tested whether the magnitude of the BTAE decreases (or even reverses) as people age in this large, longitudinal sample (due to lay beliefs about aging).

Temporal self-appraisal theory predicts that past health should be perceived by younger adults as worse and future health as better than current health, but older adults should exhibit less optimism about the future because of commonly-held beliefs about the negative effects of aging. By comparing ratings from two successive waves of the MIDUS cohort, we determined whether participants' forecasts and recollections matched their corresponding ratings—e.g., whether predictions of physical health matched physical health ratings 10 years later, and whether memories of physical health ten years ago matched judgments at that time. Extrapolating from Lachman et al.'s life satisfaction results, we looked for more consistency between current physical health ratings and retrospective and anticipatory ratings among older adults (compared to younger adults). Finally, if the phenomenon of affective forecasting applies to health, people should overestimate their negative reactions to inevitable physical declines and consequently predict dire health in the future. Finally, we looked for any evidence for the end of history illusion although it seemed unlikely in the health domain. The longitudinal cohort of the MIDUS Study permitted us to assess all of these hypotheses.

Method

Participants

We utilized data from the Midlife in the United States (MIDUS) survey, which assessed psychosocial and behavioral predictors of health and well-being in a sample of U.S. adults. Additional details about the study design and sampling methodology are available at http://www.midus.wisc.edu/, including ethics approvals. For the present research, we examined data from MIDUS 1 (Wave 1 of the study, collected in 1995–1996; $n = 6320$) and MIDUS 2 Project 1 (collected in 2004–2006; $n = 4035$), as these particular assessments included all of the relevant dependent measures (i.e., present, past, and future self-ratings of physical health).

To examine temporal and social comparisons concurrently, we limited our analysis to age groups that also made social comparison judgments (i.e., *young adult*: 25–30, *middle-aged*: 45–50, and *young-old*: 65–70). The total number of respondents included in the social comparison analyses was 2,408 surveyed at Time 1 (i.e., the survey containing social comparison items). The total number of respondents completing the temporal comparison items (requiring data for all relevant measures at both Time 1 and Time 2) was 1,662. At Time 1, 34% of sub-sample respondents were young adults (age 25–30), 45% were middle-aged (age 45–50), and 21% were young-old adults (age 65–70). Fifty-two percent were female and 90% had at least a high school or equivalent degree. At Time 2, 53% were female, and 96% had at least a high school or equivalent degree. See Table 1 for detailed demographics in this sub-sample by wave.

Attrition between waves was predicted by several demographic factors. Individuals were less likely to be lost to attrition in Wave 2 if they were older (OR = 0.97, 95%CI: 0.97, 0.98, $p < 0.001$); female (OR = 0.63, 95%CI = 0.54, 0.74, $p < 0.001$); and at the highest level of education (OR = 0.92, 95% CI = 0.89, 0.95, $p < 0.001$). Attrition at Wave 2 was 56% in the young adult group, 38% in the middle-age group, and 39% in the young-old group. Importantly, number of chronic conditions at Wave 1 was unassociated with attrition (OR = 1.02, 95%CI = 0.99, 1.05, $p = 0.255$), suggesting that the sample included in the present analyses is not biased towards being healthier.

Dependent measures

MIDUS—both Wave 1 and Wave 2—included questions covering a wide array of self-evaluative and life domains. We focused on overall physical health, for which respondents provided three ratings at both waves in the following order (and consecutively in the overall instrument): their current standing (e.g., "How would you rate physical health overall these days?"), their standing 10 years in

Table 1 Demographic characteristics stratified by MIDUS wave 1 and 2

	Wave 1 ($n=2408$) *M* (*SD*)	Wave 2 ($n=1662$) *M* (*SD*)
Chronic conditions	2.32 (2.44)	3.67 (2.81)
Household total income	$70,638.90 ($60,728.49)	$71,979.90 ($62,530.63)
	n (%)	*n* (%)
Age 25–30	818 (34.0%)	–
Age 45–50	1093 (45.4%)	–
Age 65–70	497 (20.6%)	–
Male	1177 (48.9%)	790 (47.5%)
Female	1231 (51.5%)	872 (52.5%)
Less than high school	238 (9.9%)	94 (3.9%)
High school	623 (25.9%)	419 (25.2%)
Some college	741 (30.8%)	485 (29.2%)
College	803 (33.4%)	1540 (38.2%)

the past (e.g., "Looking back 10 years ago, how would you rate your physical health at that time?"), and their expected standing 10 years in the future (e.g., "Looking ahead 10 years in the future, what do you expect your physical health overall will be like at that time?"). The scales ranged from 0 (worst possible) to 10 (best possible). The phrasing of the current health question and the verbal labels are comparable to other self-reported health assessments in the literature (e.g., Au & Johnston, 2014; Idler & Benyamini, 1997).

Ratings of others' health were assessed at MIDUS Wave 1. Participants were asked: "Using a scale from 0 to 10 where 0 means 'the worst possible you can imagine' and 10 means 'the best possible you can imagine,' how would you rate most people in these age groups (late 20′s, late 40′s, and late 60′s, in that order, and consecutively) on the following: physical health."

Results

Preliminary analyses

Multiple regressions showed that women reported better present ($\beta=0.177$, $p<0.001$) and future health ($\beta=0.276$, $p<0.001$) relative to men, but they did not differ on past health ratings ($\beta=0.023$, $p=0.596$). Reporting having more chronic conditions was related to lower self-reported past ($\beta=-0.138$, $p<0.001$), present ($\beta=-0.276$, $p<0.001$), and future health ($\beta=-0.281$, $p<0.001$), not surprisingly. Because none of these associations significantly altered the patterns and significance of self-assessed health as a function of social and temporal assessments reported below, we collapsed across sex and chronic conditions.

Subjective well-being is not a proxy for physical health ratings

To check whether comparative ratings of physical health are duplicative of subjective well-being, correlations were computed between ratings of physical health and life satisfaction of the sample from MIDUS Waves 1 and 2. For Wave 1, *r*'s were 0.40, 0.28, and 0.49 for current health and satisfaction, past health and satisfaction, and future health and satisfaction, respectively (all *p*'s < 0.01). For Wave 2, *r*'s were 0.42, 0.27, and 0.49 for current health and satisfaction, for past health and satisfaction, and for future health and satisfaction (all *p*'s < 0.01). Thus, physical health is clearly not just a proxy for life satisfaction, given a maximum shared variance of 24%.

Temporal comparisons

Self-ratings of physical health were included in a 3×3 mixed Analysis of Variance (ANOVA) with age group as a between-group factor (young adult: 25–30, middle-aged: 45–50, or young-old: 65–70 years old) and temporal focus as a within-group factor (past health, present health, future health). Means and standard deviations are reported in Table 2. To facilitate interpretation, mean ratings are also displayed in Fig. 1. *F* values and corresponding statistics for main effects of temporal focus in each age group, and of age group at each level of temporal focus, appear in Table 2 (and thus are not repeated below). Post hoc comparisons reported below are significant at $p<0.05$ using the omnibus familywise error term.

Table 2 Ratings of perception of past, present, future, and peer personal health as a function of age group

		25–30 years		45–50 years		65–70 years				
		M	*SD*	*M*	*SD*	*M*	*SD*	Ratings main effect $F=$	Age main effect: $F=$	Age X Rating: $F=$
Self-ratings wave 1	10 years past	**8.39**^{a,1}	1.63	**8.08**^{a,2}	1.76	**8.15**^{a,2}	1.74	(2,2119) = 6.59, $p < .001$, $\eta^2 = .003$	(2,2119) = 371.39, $p < .001$, $\eta^2 = .149$	(4,2119) = 35.31, $p < .001$, $\eta^2 = .032$
	Present	**7.57**^{b,1}	1.46	**7.44**^{b,1}	1.57	**7.52**^{b,1}	1.59	(2,2119) = 1.48, $p = .227$		
	10 years future	**7.72**^{c,1}	1.49	**7.05**^{c,2}	1.84	**6.44**^{c,3}	2.18	(2,2119) = 68.28, $p < .001$, $\eta^2 = .03$		
	$F_{rating}=$	(2,661) = 68.43, $p < .001$, $\eta^2 = .172$		(2,1002) = 100.05, $p < .001$, $\eta^2 = .166$		(2,454) = 154.14, $p < .001$, $\eta^2 = .404$				
Self-ratings wave 2	10 years past	**8.22**^{a,1}	1.58	**8.06**^{a,1}	1.76	**8.20**^{a,1}	1.78	(2,1324) = 1.27, $p = .282$	(2,1324) = 392.77, $p < .001$, $\eta^2 = .229$	(4,1324) = 40.09, $p < .001$, $\eta^2 = .057$
	Present	**7.50**^{b,1}	1.33	**7.42**^{b,1}	1.60	**7.10**^{b,2}	1.74	(2,1324) = 5.88, $p = .003$, $\eta^2 = .004$		
	10 years future	**7.36**^{c,1}	1.57	**6.80**^{c,2}	2.02	**5.60**^{c,3}	2.40	(2,1324) = 65.08, $p < .001$, $\eta^2 = .05$		
	$F_{rating}=$	(2,356) = 33.15, $p < .001$, $\eta^2 = .157$		(2,675) = 106.02, $p < .001$, $\eta^2 = .239$		(2,291) = 160.88, $p < .001$, $\eta^2 = .525$				
Peer ratings wave 1	Late 20 s	**7.95**^{a,1}	1.48	**8.09**^{a,1}	1.74	**8.10**^{a,1}	1.96	(2,2099) = 1.53, $p = .217$	(2,2099) = 2200.51, $p < .001$, $\eta^2 = .512$	(4,2099) = 15.42, $p < .001$, $\eta^2 = .014$
	Late 40 s	**6.54**^{b,1}	1.40	**6.69**^{b,1}	1.41	**7.32**^{b,2}	1.46	(2,2099) = 44.69, $p < .001$		
	Late 60 s	**4.84**^{c,1}	1.79	**5.05**^{c,2}	1.77	**5.71**^{c,3}	1.90	(2,2099) = 33.39, p < .001		
	$F_{rating}=$	(2,657) = 707.90 $p < .001$, $\eta^2 = .683$		(2,991) = 756.38, $p < .001$, $\eta^2 = .604$		(2,449) = 212.01 $p < .001$, $\eta^2 = .486$				

Non-common letter superscripts indicate differences across columns, $p < .05$; non-common number superscripts indicate differences across rows, $p < .05$. Means are boldfaced to distinguish them from standard deviations in the table, for purposes of readability.

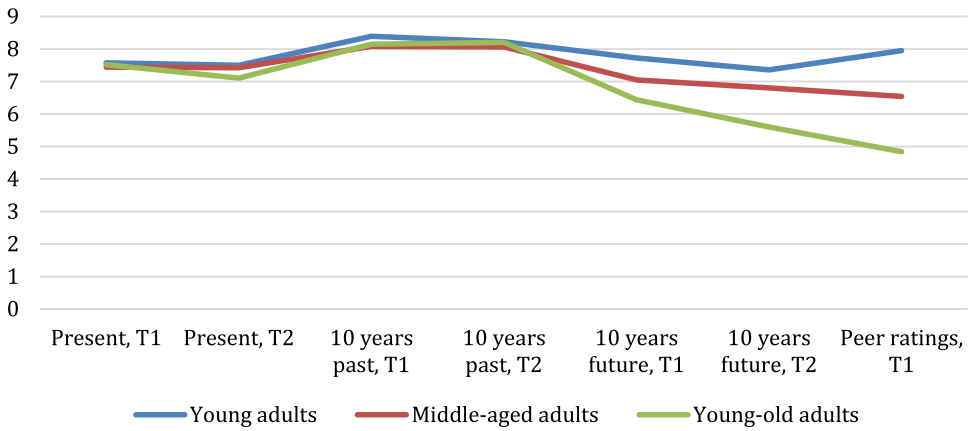

Fig. 1 Wave 1 and Wave 2 physical health assessments by age group

The omnibus analysis yielded a main effect of age group, F (2, 2119) = 371.39, $p < 0.00001$, $\eta^2 = 0.149$ as well as a significant age group x temporal focus interaction, $F(4, 2119) = 35.31$, $p < 0.00001$, $\eta^2 = 0.032$. These overall effects include several important findings. Health assessments at Wave 1 were positive and consistent across the 25–30, 45–50 and 65–70 year-old age groups (*M*s [*SD*s] = 7.57[1.46], 7.44[1.57], 7.52[1.59], respectively). However, the three age groups differed in recollections of their health ten years earlier and predictions about health ten years in the future. Young adults rated their past health ($M = 8.39$, $SD = 1.63$) significantly (albeit slightly) higher than did middle-aged ($M = 8.08$, $SD = 1.76$), $t(1909) = 3.93$, $p < 0.001$, $d = 0.18$), or young-old adults (M = 8.15, SD = 1.74; $t(1313) = 2.52$, $p = 0.012$, $d = 0.14$). Ratings of past-self did not differ between middle-aged and young-old adults, $t(1468) = -0.66$, $p = 0.510$, $d = -0.03$. Young-old adults indicated that their personal health would be lower in the next decade ($M = 6.44$, $SD = 2.18$) than did middle-aged adults ($M = 7.05$, $SD = 1.84$), $t(1588) = -5.77$, $p < 0.001$, $d = -0.30$), whose

ratings were in turn lower than young adults' ratings of future health ($M = 7.72$, $SD = 1.49$), $t(1909) = -8.52$, $p < 0.001$, $d = -0.40$).

Contrasts of ratings within each age group (i.e., within columns of Table 2) showed that young adults recalled personal health as better ($M = 8.39$, $SD = 1.68$) ten years earlier than current health ($M = 7.57$, $SD = 1.46$), $t(662) = 11.70$, $p < 0.001$, $d = 0.91$), but predicted their health would improve in the next decade (when they were 35–40 years old) ($M = 7.72$, $SD = 1.49$), $t(662) = 2.76$, $p = 0.006$, $d = 0.21$). Middle-aged (M = 8.08, SD = 1.76) and young-old-adults (M = 8.15, SD = 1.74) also rated their health as better in the prior decade than current health (*M*s = 7.44, SD = 1.57 and 7.52, SD = 1.59, respectively) (Middle-aged $t(1005) = 10.94$, $p < 0.001$, $d = 0.69$, Young-old $t(459) = 8.24$, $p < 0.001$, $d = 0.77$), which, in turn, was expected to be better than health in the next decade (*M*s = 7.05, SD = 1.84 and 6.44, SD = 2.18, respectively; Middle $t(1005) = -8.38$, $p < 0.001$, $d = -0.53$, Young-old $t(459) = -16.53$, $p < 0.001$, $d = 1.54$).

Contrary to temporal self-appraisal theory, then, all age groups perceived their health was better in an earlier time. Only young-adults perceived they would be in better health in a decade.

Are health projections and retrospections consistent with actual ratings?

We then compared predicted and recalled ratings with comparable ratings at Wave 1 and Wave 2, respectively (i.e., comparisons of ratings made in the two different waves as reported in the top two row clusters in Table 2). These comparisons are depicted graphically in Fig. 2.

Retrospections

All three age groups recalled personal health as better in the past than they actually had reported at that earlier time; (young-adults: *M* recalled = 8.22(1.58) vs. *M* actual = 7.57(1.46), paired $t(343) = 7.83$, $p < 0.001$, $d = 0.85$; middle-aged: *M* recalled = 8.06(1.76) vs. *M* actual = 7.44(1.57), paired $t(663) = 8.04$, $p < 0.001$ $d = 0.62$; young-old-adults: *M* recalled = 8.20(1.78) vs. *M* actual = 6.44(2.18), paired $t(287) = 4.82$, $p < 0.001$, $d = 0.57$).

Projections

Young-adults' predictions at Wave 1 did not differ from their actual current ratings at Wave 2 (*M* predicted = 7.72(1.49) vs. *M* decade later = 7.50(1.33), paired t (342) = 1.50, *ns*, $d = 0.16$). They expected they would be healthier, and they were. On the other hand, middle-aged and young-old adults predicted their health would be worse a decade later, although the decline was not as steep as they expected (middle-aged, *M* predicted = 7.05(1.84) vs. *M* decade later = 7.42(1.60), paired $t(663) = 4.30$, $p < 0.001$, $d = 0.33$; young-old-adults, *M* predicted = 6.44(2.18) vs. *M* decade later = 7.10(1.74), paired $t(285) = 3.60$, $p < 0.001$, $d = 0.43$). In short, middle-aged and young-old adults at Wave 1 predicted that their health would be worse than they actually rated it ten years later (Wave 2). Our earlier idea that expected physical health declines might be exaggerated – perhaps because of the combined effects of beliefs and negative stereotypes about aging, and affective forecasting—was therefore supported.

Social comparative health judgments

Examining the peer ratings as a whole, all three age groups believed that peers' health would decline over time (F (2,

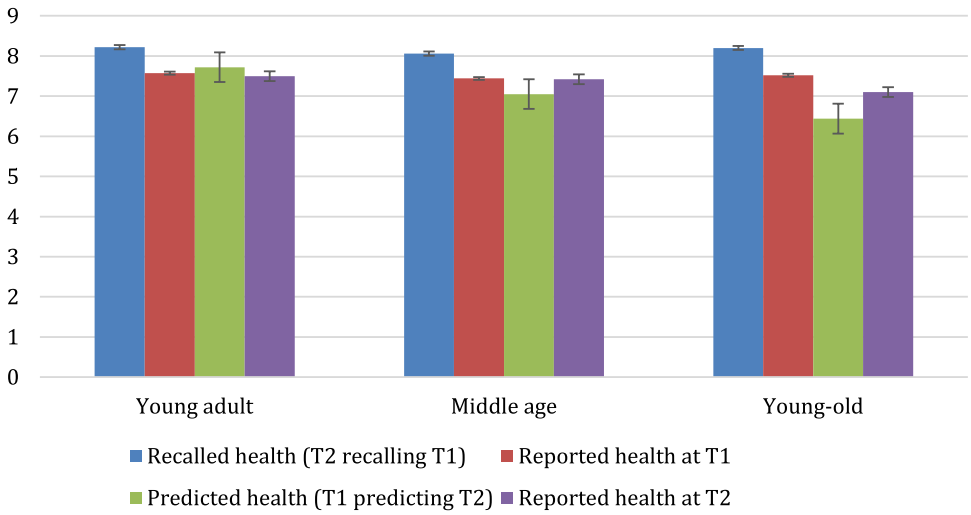

Fig. 2 Recalled and predicted health assessments relative to actual ratings at Wave 1 and Wave 2

2099) = 2200.5, $p < 0.00001$, $\eta^2 = 0.51$). However, these expectations depended on age group; young- and middle-aged adults foresaw a larger decline for peers in their late 60′s (F (2,2099) = 65.10, $p < 0.0001$, $\eta^2 = 0.76$) than did young-old-adults.

Table 3 presents ratings of how the three age groups perceived the health of their same-age peers (i.e., comparisons with bottom row cluster in Table 2 and the significance of pairwise differences). Middle-aged ($M = 7.44$, $SD = 1.57$) and young-old adults ($M = 7.52$, $SD = 1.59$) assessed their current health as better than that of their same-age peers (Ms = 6.69, $SD = 1.41$ & 5.71, $SD = 1.90$; t (991) = 12.40, $p < 0.001$, $d = 0.79$ and t (448) = 17.20, $p < 0.001$, $d = 1.63$, respectively). The finding contrasts strikingly with two studies (Zell & Alicke, 2011; Madey & Gomez, 2003) reporting that older adults rated their health as worse than their peers. An explanation is presented later. A second surprise was that young adults ($M = 7.57$, $SD = 1.46$) rated their health *less positively* than their same-age peers' ($M = 7.95$, $SD = 1.48$; paired t (658) = 5.20, $p < 0.001$, $d = 0.41$). On an absolute basis, young adults rated their current health as positively as middle-aged or young-old adults did, but they perceived their peers to be even healthier. This finding is also discussed below.

Discussion

Analyses from a longitudinal study that had been conducted over a ten-year period provided an in-depth look at how people in three distinct age groups across the lifespan think about their past, current and future health, and about how their health compares to that of their peers. We tested whether respondents would rate that they were physically healthier than their same-sex, same-age peers, based on the classic BTAE (e.g., Alicke, 1985; Dunning et al., 2004; Zell et al., 2020); and whether the magnitude of the BTAE decreases (or even reverses) as people age due to lay beliefs about the effects of aging. We compared how younger adults perceived past health and future health relative to their current health, and tested whether older adults show less optimism about the future. The two successive waves of the MIDUS cohort allowed us to assess whether participants' forecasts and recollections matched their corresponding ratings made in the future or in the past. Finally, we assessed whether the phenomenon of affective forecasting and the end of history illusion applies to health.

First, self-reported absolute scores of physical health among young-, middle-, and young-old adults were very similar (and positive). A similar pattern with respect to life satisfaction emerged in previous research (e.g., Rocke & Lachman, 2008), but as shown earlier, life satisfaction is a poor proxy for subjective ratings of physical health (with a maximum of 24% shared variance). We predicted perceived health declines would be more prominent, especially for the young-old adults. Of note, Au and Johnston (2014) reported an effect of age on judged health, but acknowledged it was modest.

Individuals perceived current health within a shifting trajectory (retrospectively and prospectively) as a function of age group. Adults in all three age groups rated their health a decade earlier to be better than at the current time (consistent with temporal self-appraisal theory). When predicting the future, middle-aged and especially young-old adults estimated their health would decline (inconsistent with temporal self-appraisal theory), whereas young adults predicted their health in the next decade would improve. As noted earlier, life satisfaction and judged physical health appear not to follow the same trajectories. Whereas later decades are more consistently perceived as ones of physical decline (Sarkisian et al., 2002), beliefs about life satisfaction in older adulthood probably are more complex, as they likely are based on time to relinquish employment and savor past experiences, or to bemoan poor choices and anticipate mortality. Consistent with this idea, Mock and Eibach (2011) found that MIDUS participants who had favorable attitudes about aging did not exhibit an association between subjective age (how old one feels) and life satisfaction, whereas the association was negative among those who had less favorable attitudes about aging. As expected, our findings regarding self-assessed physical health diverge from patterns seen previously for global life satisfaction (Lachman et al., 2008) and a composite index of six domains of well-being (Staudinger et al., 2003).

The degree of congruency between past and predicted health probably reflects the distinctiveness of health from other personal domains. All three age groups recalled health a decade earlier to be better than it had been reported at the

Table 3 Physical health ratings of self and same-age peers

	25–30 years olds	45–50 years olds	65–70 years olds
	M	M	M
Current self-rating	7.57_a (1.46)	7.44_b (1.57)	7.52_b (1.59)
Ratings of same-age peers	7.95_b (1.48)	6.69_a (1.41)	5.71_a (1.90)

Subscripts indicate differences between row means, $p < .05$

time. This pattern is counter to Ross and Wilson's (2003) proposal that people are motivated to recall the past negatively to enhance feelings about the present, although much of their work focused on evaluative dimensions such as intellectual ability. The observed inconsistency may be a function of focalism – ratings at a given time may focus on specific events such as a recent health challenge, whereas retrospective judgments may take greater advantage of a wider swath of experiences. (Similarly, affective forecasting has been attributed to an inability to consider the full context of future experiences; Wilson et al., 2001.)

With respect to how well predictions about future health matched health assessments a decade later, middle- and young-old-adults appeared more pessimistic about their health in the next decade than what they actually reported in the future. Young adults' predictions better matched actual ratings. In contrast, Lachman et al. (2008) found older adults' ratings matched better how they had judged the past and projected about the future with respect to personal life satisfaction. These conflicting patterns again suggest that physical health beliefs are not proxies for beliefs about life satisfaction. As described earlier, projections of physical health declines might be exaggerated because of the combined effects of beliefs and negative stereotypes about aging, and affective forecasting. Exaggeration of a more negative future has practical implications because it could potentially lead to symptom misperception and unneeded health care utilization.

Middle-aged and young-old adults perceived same-age peers as worse in current physical health, consistent with research on downward comparisons, egocentrism and the BTAE observed in much previous work (e.g., Dunning et al., 2004; Zell et al., 2020). Thus, although these individuals foresaw their health declining over time, they still believed their health was better than that of their peers, raising the important theoretical and practical question of whether temporal or social comparisons are differentially impactful with respect to subsequent behavior. The BTAE exhibited by the young-old adults does conflict with reports from two prior studies reporting "worse than average effects" in older adults (Zell & Alicke, 2011; Madey & Gomez, 2003). We think the most likely explanation is that our young-old MIDUS participants ranged in age from 65 to 70 years; whereas the participants in those studies ranged from 58 to 89 years—representing a potential 20-year difference. In the advanced years, physical limitations, medical visits, etc., become more frequent and reinforce perceptions of physical decline. As the MIDUS cohort ages, a worse-than-average effect might emerge.

A surprising finding was that young adults rated their same-age peers as better in health than themselves (counter to the BTAE). But young adult respondents anticipated their health would improve in the next decade (in contrast to the middle- and older-adult respondents who believed their health would decline). As noted above, the "worse-than-average" effect has empirical precedents (Kruger, 1999); it tends to be exhibited for very difficult tasks because individuals may not fully take into account of how such difficulty affects their peers. Young adults may find it challenging to maintain positive health practices at this time of life and fail to consider that this may be true of their peers as well, especially in the face of extensive media coverage devoted to exercise and sport.

These findings have potentially important implications for health messaging and other health interventions. Attempts to correct peer misperceptions have been shown to influence health behaviors such as alcohol use in college students (Miller & Prentice, 2016); conceptually similar attempts to persuade individuals in older age groups that their health is not necessarily better than that of their peers may have similarly salutary effects. Other work attempting to decrease biases in affective forecasting (Ellis et al., 2018) might also be adapted to help people calibrate their predictions regarding future health in ways that encourage health-promoting behaviors and also reduce anxiety about future health that might impair functioning in other life domains. One clear implication of these findings is that interventions may need to be age-targeted given the complex arc of self-rated health assessments and peer comparisons that appear to emerge across the lifespan.

Limitations and strengths

This study has several limitations, owing largely to the fact that the data were taken from the much larger MIDUS project. All items were self-reported, although it is reassuring that self-assessed health has been found to predict health outcomes over and above other measures that may be regarded as more direct (Idler & Benyamini, 1997). A general limitation of MIDUS is that although it is designed to be nationally representative, the majority of participants are Caucasian and biased toward higher socioeconomic status. Ratings of health might therefore be biased in a positive direction, although it is less clear how SES might influence the specific temporal and social comparisons explored here. One consideration is that the BTAE could be overestimated if the sample was healthier than the average peer. Of course, this would not easily explain the complex pattern of findings with these measures, particularly different expectations of the rapidity of decline across age groups. We also note that attrition between waves was higher in the young adult group than in the other two age groups, although it is difficult to imagine that those lost at follow-up would necessarily have exhibited stronger BTAEs. Moreover, there was no association between attrition and number of reported medical

conditions, suggesting that attrition was not a function of declining health status.

Another potential limitation is that self-assessments were always answered in the same sequence: present, past and future, introducing the possibility that past and future ratings could be informed (or primed) by present ratings. Respondents might, however, have difficulty making ratings about the past and future without first evaluating their present status (e.g., Fleeson & Baltes, 1998). We note that systematically varying the order of assessment with similar measures found no significant order effects (Wilson et al., 2000). Nevertheless, we cannot discount that the degree of mismatch between ratings at different times might be affected by the proximity and temporal precedence of current ratings. Participants also responded to the peer items in age order (late 20′s, late 40′s, late 60′s) introducing the possibility that ratings of physical health of people in their 20′s could have served as an anchor for the other two assessments. Counterbalancing these items as part of the larger MIDUS survey was not feasible.

Another limitation is that we assessed temporal consistency of ratings by comparing participants' own health ratings with their ratings in the past and in the future, without any reference to objective measures of health status. People may consider different dimensions when evaluating health at different ages (e.g., energy and vitality at younger ages—although Au & Johnson [2014] suggest that vitality perceptions are important across the lifespan—and absence of health conditions in older ages), thereby explaining differences in judgments (including retrospective judgments) at different ages. The differing reference points people use when making health assessments at progressive life stages might be explored in future research.

These limitations are offset by several unique strengths of the study. The current analysis represents the first investigation of temporal and social comparisons of physical health in a large, multi-age sample over a ten-year period. The findings build on extant literature and theory in self-judgment, self-assessed health, social comparison, and temporal comparison. For example, findings help elucidate the extent to which people exhibit comparative biases when comparing their health with that of same-sex peers in other age groups, a comparison not often examined in research but nevertheless one that can have important behavioral implications if individuals in other age groups—such as older individuals—serve as models for lifestyle decisions and health behaviors.

The design of this study allowed an assessment of two types of comparisons—temporal and social. We observed potentially consequential patterns in both types of health comparisons, patterns that appear to differ in direction and magnitude at different stages of the lifespan. What this work does not tell us is whether the nature and trajectories of these types of comparisons have differential consequences for behavior and long-term health. For example, believing that one's health will decline in the future might motivate positive health practices such as increased exercise and improved diet, whereas a concomitant belief that one's health is better than one's peers could demotivate such behavior. Future research should consider the relative impact of these comparisons over time, and the ways in which they may combine or interact to influence important outcomes.

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Compliance with ethical standards

Conflict of interest Jerry Suls, Rebecca A. Ferrer, and William M. P. Klein declare that they have no conflict of interest.

Human and animal rights This was a secondary data analysis of data collected by others (MIDUS). Are these statements still necessary in the paper? All info can be obtained at the MIDUS website.

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