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Perceived Changes in Life Satisfaction from the Past, Present and to the Future: A Comparison of U.S. and Japan

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Abstract

The current study examined how perceptions of change in life satisfaction vary by age and culture. Perceptions of past, present, and future life satisfaction were examined in adults aged 33–79 from the Midlife in the United States Study (MIDUS; $N=4803$) and from the Survey of Midlife in Japan (MIDJA; $N=974$). Both cultures exhibited the same age-related pattern of change in perceptions of life satisfaction. Younger adults perceived improvement in life satisfaction from the past to present and from present to the future. The perceived improvement was more modest among middle-aged adults and then shifted to a decline among older adults. Despite the same curvilinear pattern in both cultures, the perceived improvement was not as positive, and the shift towards expecting declines occurred at an earlier age among Japanese adults compared to U.S. adults. Findings support existing theories of life-span development but suggest that cultural context may influence both the positive outlook and the timing of these processes across adulthood.

Keywords

age; culture; subjective well-being; life satisfaction

Life satisfaction is a subjective well-being measure that reflects a cognitive judgment of one's life (e.g., Diener, 1984). Current life satisfaction is strongly associated with adaptive functioning and longevity (Diener, 1984; Diener & Chan, 2011; Sin, 2016), but so is the perception of how life satisfaction is changing over time (e.g., Lachman, Röcke, Rosnick & Ryff, 2008; Lang, Weiss, Gerstorf & Wagner, 2013; Ryff, 1984; Staudinger, Bluck &

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Herzberg, 2003). Individuals use their view of how life satisfaction has changed from the past to the present and what they expect in the future to inform their overall well-being. Overall well-being, therefore, varies depending on whether people perceive their well-being as getting better or worse (Abramson, Seligman, & Teasdale, 1978; Cross & Markus, 1991; Okun, Dittburner & Huff, 2006; Ryff, 1991). This temporal view is strongly associated with psychological and physical health outcomes including levels of depressive symptoms, the degree of functional limitation, and number of chronic conditions (Cheng, Fung & Chan, 2009; Lachman et al., 2008; Lang et al., 2013).

Researchers using data from the Midlife in the United States (MIDUS) study find that younger and middle-aged adults perceive themselves as improving from the past to the present, and from the present to the future; in contrast, older adults perceive similar levels of past and present life satisfaction but anticipate declines in the future (Lachman et al., 2008; Röcke & Lachman, 2008). These findings are consistent with life-span developmental framework such as the model of Selection, Optimization and Compensation (SOC) and research findings where younger adults perceive greater future growth than do older adults (Baltes, Lindenberger, & Staudinger, 2006; Heckhausen, Wrosch, & Schulz, 2010; Taylor, Lichtman, & Wood, 1984; Taylor, Neter, & Wayment, 1995).

SOC and other motivational theories, such as the motivational theory of life span development, state that motivations change across the life-span in response to available opportunities and constraints (Baltes et al., 2006; Heckhausen et al., 2010). They further state that opportunities and constraints are largely shaped by cognitive and physical developmental (biological) trajectories and societal resources (e.g., societal norms, knowledge-based and psychological resources). Youth is a time focused on growth and preparing for a long future of opportunities, and older age is a time focused on limiting loss and bracing for declines at the end of life. This framework would seemingly apply to any long-lived society, yet few studies have empirically tested these theories outside of the Western countries where they originated. To test whether age-related patterns in perceived life satisfaction were similar across Western and non-Western cultures, we compared findings from a national sample of U.S. adults (Midlife in the United States Study; MIDUS) to those of a same-aged national Japanese sample (Midlife in Japan study; MIDJA).

Age Differences in Perceived Changes in Past, Present, and Future Life Satisfaction

Younger adults often report their current level of well-being as higher than what it had been in the past (e.g., Lachman et al., 2008; Ryff, 1991; Wilson & Ross, 2001). Older adults, in contrast, perceive their current level of well-being as either similar to or lower than what they had experienced in the past (Lachman et al., 2008; Ryff, 1991). When looking to the future, younger adults expect their well-being to increase, whereas older adults predict similar or declining levels (Cross & Markus, 1991; Lachman et al., 2008; Lang, Weiss, Gerstorf, & Wagner, 2013; McKee, Kostela, & Dahlberg, 2015). Studies that have examined age differences across past, present, and future life satisfaction show this same pattern. Younger and middle-aged adults perceive increases in life satisfaction from the past to the

present and future, whereas older adults perceive similar levels of past and current life satisfaction, but anticipate future declines (Gomez, Grob, & Orth, 2013; Lachman et al., 2008; Röcke & Lachman, 2008; Staudinger, Bluck, & Herzberg, 2003).

Age differences in perceived trajectories of change are predicted by life-span theories of motivation (Baltes, Lindenberger, & Staudinger, 2006; Heckhausen, 2000; McFarland, Ross & Giltrow, 1992; Ross, 1989). In these theories, younger and middle-aged adults focus on growth and self-development as they envision a long future full of opportunities. Perceiving improvement in life satisfaction from the past to the present and into the future (i.e., a positive trajectory) is in line with this forward-thinking attitude. In contrast, older adults are increasingly aware of declining biological functioning and limited resources and opportunities in the future (Cheng et al., 2009; Heckhausen, 2000). They focus their motivations on maintaining current levels of functioning and planning for future declines (e.g., see Heckhausen, 2000). In line with the theoretical framework of discounting, researchers have suggested that this pessimistic perception, or negative trajectory of perceived decline, better prepare older adults for the normative and unavoidable age-related losses that accompany the end of life (Cheng et al., 2009; Lachman, 2004).

Age-related Patterns of Perceived Changes in Life Satisfaction: the U.S. versus Japan

Life-span motivational theories that emphasize the trajectories of cognitive and physical development (e.g., Heckhausen, 2000), suggest that we would find few cultural differences in how people view their life satisfaction as changing over time. Only a few studies have examined personal attitudes about one's own aging outside of Western cultures, so it is unclear whether culture influences these seemingly cognitively and physically-defined trajectories of perceived growth or decline. Studies examining attitudes of aging between Eastern and Western cultures, however, suggest that Eastern cultures have more negative views of older adults, and that these views are strongly tied to economic and demographic trends more than differences in cultural values (for comprehensive reviews see Löckenhoff et al., 2015; North & Fiske, 2015). It is unclear how negative attitudes about older adults relate to attitudes about one's own trajectory of aging.

In a study specifically addressing perceptions of aging among older Hong Kong Chinese participants, researchers found that older adults expected decreases when asked to predict how their social and physical well-being would change in the future, consistent with the patterns observed among Western samples of older adults (Cheng et al., 2009). This study, coupled with findings from Europe and North America, suggests that most older adults expect declines in their foreseeable future. Yet, no one has examined whether the degree of expected change in one's life satisfaction is similar across countries, or whether some countries perceive age-related declines earlier, or later than others.

Appraisals of well-being are strongly influenced by one's situational and environmental context (Diener, Suh, Lucas, & Smith, 1999; Smith, 2001; Steptoe, Deaton, & Stone, 2015). In addition, culture may shape the degree to which people think their life satisfaction changes over time. For example, one study compared how perception of aging may vary

based on different national values, as assessed from international surveys (Löckenhoff et al., 2009). These national values include factors such as the degree of self-expression (emphasis on the self and individuality) and uncertainty tolerance (tolerance for ambiguity; Hofstede, 1980). First, cultures that emphasize *self-expression* show greater appreciation of older adults' wisdom from their past experiences. Greater respect for older adults' accumulated experiences and knowledge is often associated with more positive perceptions of aging trajectories and increased concerns for the well-being of older adults. High level of *uncertainty tolerance* is defined as low acceptance for future ambiguity and greater compliance with strict rules for stress reduction. Thus, cultures reporting high levels of uncertainty tolerance may be more threatened by the unknown future which may lead to a more negative trajectory of aging. In one study, college students from 26 countries predicted how certain psychological characteristics, including life satisfaction, would change with age (Löckenhoff et al., 2009). Students from nations scoring higher in self-expression and lower in uncertainty avoidance perceived greater life satisfaction in old age. In addition, students who came from countries that had a smaller percentage of older adults perceived that life satisfaction would be higher in old age. Given that Americans score higher in self-expression, lower in uncertainty avoidance, and live in a country that has a smaller proportion of older adults compared to the Japanese, they may also hold more positive attitudes about their own aging than do Japanese adults.

In addition, Japanese and Americans have different philosophies regarding the future, which may also contribute to differences in perceptions of aging. Japan, influenced by Taoism from China, is a country where people have a stronger sense of fatalism compared to the U.S. (Plath, 1996). Fatalism is the belief that life unfolds independent of one's actions, and this lower perception of control over the future may lead to less perceived change over time. Moreover, Americans are more likely to engage in self-enhancement, whereas Japanese are more likely to engage in self-criticism (e.g., Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997). Consistent with this view, younger Japanese adults score higher on measures of pessimism and lower in optimism than U.S. adults (Heine & Lehman, 1995; Lee & Seligman, 1997; Scheier & Carver, 1985), and the cultural differences become even more pronounced with increasing age (Fung, 2013). Given that optimism and pessimism are also constructs related to how people perceive the future, these findings suggest that Americans may be more optimistic about their change in life satisfaction compared to Japanese adults.

General attitudes about aging may also play a role in how people perceive their own aging process. Levy (2003) posits that most people have negative aging stereotypes from childhood that become internalized and develop into self-stereotypes in later adulthood. Despite stereotypes that Asian cultures hold their older adults in higher regard than do Western cultures, a recent meta-analysis found that attitudes about older adults were more negative among Easterners than Westerners (North & Fiske, 2015). These attitudes were linked to the rise in population aging, most likely leading to inter-group competition for resources. The authors further suggested that when inter-group competition arises among older and younger adults, collectivist orientations may backfire to create more negative views of older adults (North & Fiske, 2015). Alternatively, Japan has lower rates of morbidity and lower rates of mortality compared to the U.S. (see review by Avendano &

Kawachi, 2014). When thinking about their own life course, the Japanese may perceive themselves as having a longer and healthier life span than Americans based on these statistics, so they may envision a more attenuated decline than Americans. This difference may be strongest among the older age ranges, where people may look to their peers for information about their own aging process.

The Current Study

The current study examined how perceptions of past, present, and future life satisfaction among younger, middle-aged and older adults in Japan varied by age, and how they compared to those observed in a U.S. sample. We used two national data sets, one from the U.S. (MIDUS) and the other from Japan (MIDJA) that sampled a wide age range of adults. Based on prior research and life-span theories of motivation, we predicted that across both cultures, younger adults would show positive trajectories of change, perceiving the past as lower and the future higher than current levels of life satisfaction. We further predicted that middle-aged adults would perceive stability from their past to their future (i.e., flatter trajectories of perceived change). In contrast, older adults were predicted to show negative trajectories of perceived life satisfaction (where perceptions of past life satisfaction are similar to current life satisfaction, which in turn are higher than perceptions of future life satisfaction) across both cultures. Given the lack of cross-cultural research in this area, we explored whether age-related perceptions of change across past, present, and future life satisfaction differ between the Japanese and U.S. participants.

Method

Sample and Design

Participants in the current study were from Midlife in the United States (MIDUS II), a national sample of non-institutionalized, English-speaking U.S. adults ($N = 4963$), and from the Survey of Midlife in Japan (MIDJA), a national sample of Japanese adults living in the Tokyo metropolitan area ($N = 1,027$). Data from MIDUS II were used for the current analyses due to the proximate time of data collection as MIDJA data. Comprehensive details of the larger study design can be found in Brim, Ryff, and Kessler (2004).

Data for MIDUS were collected using telephone interviews and mailed self-administered questionnaires and data for MIDJA were collected through mailed self-administered questionnaires. Despite differences in mode of data collection, the current study used only two variables, gender and age, from the MIDUS telephone survey. All other variables of interest for the MIDUS sample were collected via mailed surveys, consistent with the data collection of the MIDJA sample. A key purpose of MIDJA was to compare associations between psychosocial variables and health outcomes found in MIDJA with those from MIDUS. Data for MIDUS II were collected in 2004–2006 and participants ranged in age from 28–84 ($M = 55.43$, $SD = 12.45$). MIDJA data were collected in 2008 and participants ranged from 30–79 years old ($M = 54.36$, $SD = 14.15$). Data collection for both studies were approved by the Education and Social/Behavioral Sciences and the Health Sciences IRBs at the University of Wisconsin-Madison.

To compare the same age range between the two data sets, we excluded people older than 79 and younger than 30 in MIDUS. In addition, the MIDUS sample only included one person in each of the following ages: 30, 31, and 32. As a result, we limited our analyses to people aged 33–79 in both samples. This new age range resulted in a final sample size of 4,803 MIDUS participants and 974 MIDJA participants. Thus, the final analytic sample of the current study was 5,777 adults from both nations who ranged in age from 33–79 years old ($M = 55.43$, $SD = 12.45$). Both samples had a similar percentage of males (MIDUS = 46.9%; MIDJA = 49.2%) and a greater proportion of individuals in the MIDUS sample reported more than a high school education (MIDUS = 67%; MIDJA = 43.3%).

Measures

The MIDJA questionnaires parallel those found in MIDUS, which assess various sociodemographic and psychosocial characteristics, mental health (e.g., affect, life satisfaction, depression), and physical health. All scales were coded so that higher numbers reflect greater levels of the construct being measured.

Nation.—Respondents from the MIDUS survey were coded as 0 (=U.S.) and respondents from MIDJA were coded as 1 (=Japan).

Life Satisfaction.—Using three separate items, participants rated their life *overall looking back ten years ago; these days; and looking ahead ten years* using a scale from 0 to 10 where 0 means “*the worst possible life overall*” and 10 means “*the best possible life overall*.” We used responses on these three items to examine the trajectory of past, present, future life satisfaction.

Age.—All participants reported their chronological age, which we divided into ranges to examine how trajectories of past, present, and future life satisfaction varied based on place in the life cycle. We assessed the last years of younger adulthood by people who were predominantly in their 30s who ranged from 33–40 (MIDUS & MIDJA Group 1, $n = 789$, 13.66%). The second two age ranges captured midlife, ranging from 41–65, with the first ranging from 41–53 (MIDUS & MIDJA Group 2, $n = 1971$, 34.12%), and the second from 54–65 (MIDUS & MIDJA Group 3, $n = 1756$, 30.40%). To examine perceptions in late life, we divided older adults into two age ranges, one aged 66–72 years-old (MIDUS & MIDJA Group 4, $n = 730$, 12.64%) and the other aged 73–79 years-old (MIDUS & MIDJA Group 5, $n = 531$, 9.19%). We report analyses using these age ranges because we think the results are more easily interpretable, but the results of models using continuous age variable revealed the same pattern of results and are presented in Appendix A.

Covariates.—Studies examining perceptions of change in well-being often adjust for demographic and personality factors such as marital status, physical health, education, and personality traits (Lachman et al., 2008; Röcke & Lachman, 2008). Extraversion and neuroticism are strongly associated with people’s cognitive evaluations of their lives and Western cultures often report higher levels of extraversion whereas lower levels of neuroticism compared to Eastern cultures (Diener, Oishi, & Lucas, 2003). Similarly, levels of life orientation are closely related to perceptions of change in life satisfaction and

research indicates higher levels of optimism future outlook among U.S. adults compared to Japanese adults (Heine & Lehman, 1995). Thus, we were interested in the following sociodemographic, psychological and health characteristics that have been associated with well-being outcomes in prior research: gender (1=*female*; 0= *male*), marital status (1=*married/partnered* and 0=*single*), number of current chronic illnesses which ranged from 0 (no *chronic illness*) to 3 (*more than three chronic illnesses*), and highest level of education (Z-scored due to different scales between two countries). Personality traits assessed in both samples included neuroticism (moody, worrying, nervous, and calm) (MIDUS alpha = .71; MIDJA alpha = .50) and extraversion (outgoing, friendly, lively, active, and talkative) (MIDUS alpha = .76; MIDJA alpha = .84), which were constructed by calculating the mean score across all the items; responses ranged from 1 (*not at all*) to 4 (*a lot*). Lastly, a life orientation test (LOT) score was calculated by summing the values of three optimism items (e.g., “*In uncertain times, I usually expect the best; I’m always optimistic about my future; I expect more good things to happen to me than bad*”) and three reverse-coded pessimism items (e.g., “*I rarely count on good things happening to me; I hardly ever expect things to go my way; If something can go wrong for me, it will*”) (MIDUS alpha = .80; MIDJA alpha = .62).

Statistical Analyses

We first tested for measurement invariance (MI) on constructs with multiple-items (neuroticism, extraversion, and LOT) to ensure that the questionnaires are measuring the same constructs in the U.S. and Japan. A single factor CFA model was estimated for each covariate *separately* using full information maximum likelihood estimation with Mplus (Muthén & Muthén, 2008). After deleting one item (i.e., calm; New MIDUS alpha = .74; New MIDJA alpha = .61) from neuroticism and two items (i.e., friendly and active; New MIDUS alpha = .74; New MIDJA alpha = .75) from extraversion, results indicated evidence of metric MI for all three covariates (Model 2, Supplementary Tables 1, 2, and 3) across the U.S. and Japan.¹ Further, result for extraversion also satisfied scalar MI (Model 3, Supplementary Tables 3).² We included LOT and neuroticism in the analyses despite the lack of scalar invariance because our focus was to adjust for potential effects of these covariates on life satisfaction and not to compare mean levels of these covariates between the samples.

Following the measurement invariance tests, we used multilevel modeling (MLM) using SAS Proc Mixed to examine whether within-person perceived trajectories of life satisfaction vary by culture and age (Bryk & Raudenbush, 1992). MLM provides advantages over using a univariate analysis of variance (ANOVA) because it estimates the life satisfaction trajectory for each person (i.e., within-person changes in life satisfaction from the past-present-future) as opposed to averaging values across all individuals to calculate mean-levels for each of these variables. Each respondent provided three ratings of life satisfaction – one for the past, one present and one future -- resulting in 17331 repeated observations nested within 5,777 individuals. We created Time variable to represent the slope of life satisfaction

¹We concluded support for metric MI for life orientation, neuroticism, and extraversion based on a change in CFI score of .01 or less.

²We concluded support for scalar MI for extraversion based on a change in CFI score of .01 or less.

(0=*past*, 1=*present*, and 2=*future*), where a positive slope indicated a positive trajectory in which the responses were successively higher across the three ratings. A slope close to 0 represents a flat trajectory, where people rated past, present, and future satisfaction similarly, and a negative trajectory was one in which past life satisfaction was the highest rating, followed by current life satisfaction, and the lowest rating being future life satisfaction. To simplify the model structure, we used two-level models with level-2 indicating person-level. The intra-class correlation (*ICC*) of life satisfaction pooled across all three measures (past, present, future) indicated that 45% of the variance was attributable to between-person differences and the rest was due to within-person variations, justifying the use of multilevel modeling.

To examine age differences in trajectories of life satisfaction, we ran a model with age assessed by age ranges (ranging from 1–5). Doing so allowed us to assess the trajectories of life satisfaction within each age range across the two samples. We also conducted a sensitivity analysis with a continuous age variable (ranging from 33–79) and an age-squared variable. We ran all of these models first without covariates, and then with covariates. The below equation shows the model without the covariates:

$$\begin{aligned} \text{Life Satisfaction}_{ti} &= \beta_{0i} + \beta_1(\text{Nation}_i) + \beta_2(\text{Time}_i) + \beta_3(\text{Agerange}_i) \\ &+ \beta_4(\text{Nation}_i)(\text{Time}_i) + \beta_5(\text{Time}_i)(\text{Agerange}_i) \\ &+ \beta_6(\text{Nation}_i)(\text{Agerange}_i) + \beta_7(\text{Nation}_i)(\text{Time}_i)(\text{Agerange}_i) + u_{0i} + e_{bi} \end{aligned}$$

where β_0 represents the average value of overall life satisfaction (pooled across all three measures); β_1 represents cultural differences in overall life satisfaction; β_2 indicates within-person trajectories of life satisfaction from the past to the future; and β_3 indicates age differences in overall life satisfaction. β_4 – β_7 represent interaction terms between nation, time, and age ranges. Where significant interactions emerged, we conducted follow-up tests using the SAS Estimate command to evaluate the nature of the interactions. All continuous variables were centered at the sample means.

Results

Descriptive Results

Table 1 presents descriptive statistics and correlations of all variables used in the final models. Relationships between most sociodemographic variables and life satisfaction were in the expected directions in both the U.S. and Japanese samples, whereby being married and having fewer chronic illnesses, and having higher levels of extraversion and life orientation were related to higher levels of perceived past, present, and future life satisfaction. Higher levels of neuroticism were associated with lower levels of perceived past, present, and future life satisfaction. Higher education was associated only with higher levels of present and future life satisfaction in both nations whereas past life satisfaction showed no association. Being a woman was related to higher life satisfaction overall (past, current, and future) in Japan, but only related to lower past life satisfaction in the U.S. Of

note, the majority of these covariates appeared to have stronger associations with life satisfaction for MIDJA compared to MIDUS participants.

Given that a greater number of younger Japanese are either delaying marriage or not marrying relative to both the same-aged U.S. adults and earlier born Japanese cohorts (Ogawa 2003; Tsuya, 2015), we also examined marital status by age ranges. Fewer Japanese from the first two age ranges (60.7% and 68.9%, respectively) were married compared to Americans (72.3% and 73.9%). Among the older age ranges, rates were either similar or higher among MIDJA compared to MIDUS participants (MIDJA age ranges 3–5: 77.4%, 68.3%, and 73.8%, respectively; MIDUS age ranges 3–5: 71.7%; 69.9%, 62%, respectively).

For other demographic variables, national differences were consistent across the age ranges: Japanese participants had lower levels of education across all age ranges, (Age ranges 1–5: $t(320) = -3.12, p < .001$, $t(376) = -2.89, p = .004$, $t(408) = -6.07, p < .001$, $t(232) = -5.35, p < .001$, $t(213) = -4.81, p < .001$) and each age range had a similar percentage of women (MIDJA age ranges 1–5: 50.6%, 53.7%, 52.6%, 50.6%, 46.2%; MIDUS age ranges 1–5: 55.5%, 52.7%, 51.6%, 56.1%, 51.4%). Younger and middle-aged Japanese adults (Age ranges 1, 2 & 3) reported a greater number of chronic illnesses than U.S. adults. Japanese adults older than 65 years old, however, reported lower mean levels of chronic illnesses compared to the older U.S. adults (MIDJA age ranges 1–5: 1.55, 1.74, 1.90, 1.83, 1.98; MIDUS age ranges 1–5: 1.25, 1.52, 1.83, 2.07, 2.22).

Past, Present, and Future Life Satisfaction by Age Range and Culture

Table 2 shows results from multi-level models examining how trajectories of life satisfaction (captured by the variable time) were related to age range (captured by an interaction between age range and time), and whether this pattern varied by culture (captured by a three-way interaction between age ranges, time and nationality) with or without covariates.

Before adding interactions between nation, time, and age range, there were significant main effects of each construct (results not shown in Table 2, but available upon request). A significant main effect of nation indicated that Japanese adults reported lower life satisfaction, on average, than U.S. adults. In addition, a main, positive effect of time (past, present, and future) indicated that, independent of culture and age, individual perceptions of life satisfaction were successively higher from the past through the future ratings. A significant main effect of age range indicated higher levels of overall life satisfaction for older age ranges compared to younger age ranges.

All the interactions between nation, time, and age ranges were significant. With regard to the two-way interaction between time and age ranges, the post-hoc test indicated that the two oldest age ranges (66–72 and 73–79) showed negative trajectories of past, present, and future life satisfaction, whereas the three younger ranges (aged 33–40 to 54–65) showed positive trajectories. These post-hoc tests revealed a clear linear relationship between age and the perceived trajectory of life satisfaction, such that the youngest group exhibited the greatest increase from the past to future life satisfaction and the oldest group exhibited the greatest perceived decrease.

This significant two-way interaction between time and age ranges was further qualified by the significant three-way interaction between nationality, time and age ranges. This three-way interaction indicated that the relationship between age and trajectory of perceived change in life satisfaction varied by nationality. To examine this effect, we compared time slopes of life satisfaction (past-present-future) for the five different age ranges by nationality. Table 3 presents, for MIDUS and MIDJA separately, the estimated mean levels of perceived past, present, and future life satisfaction for each age ranges and the estimated trajectory slope for life satisfaction for each age range. Table 3 also includes the results of the contrast analyses comparing the slopes between Japan and US for each age range. Figure 1 illustrates these differences.

In the MIDUS sample, age ranges capturing people 33–65 years-old showed positive trajectories of change, whereas this same positive trajectory was only observed among MIDJA participants in the first two age ranges (33–40 year-old and 41–53 years-old). For age ranges 66–72 and 73–79, U.S. older adults perceived a linear decline in life satisfaction from the past to the future, whereas perceptions of decline in life satisfaction trajectory appeared one age range earlier in Japan. Tests of slope differences between the two nations revealed significant slope differences across all age ranges. For example, younger U.S. adults (age range 1; 33–40) perceived a steeper increasingly positive trajectory of life satisfaction compared to Japanese younger adults. In contrast, the oldest sample of Japanese adults (age range 5; 73–79) perceived greater decreases from past to future life satisfaction compared to their same-aged U.S. peers.

Sensitivity analysis.—Our supplementary analyses with a continuous age variable revealed a consistent pattern of results (Appendix A). Specifically, there were significant main effects of age-squared and interactions between age-squared, nation, and time, suggesting a polynomial pattern of trajectories of life satisfaction by age and by nation. Further, as shown in online Supplementary Table 4, the results of the main multilevel model analyses were the same when using the neuroticism and extraversion constructs with the original number of items, and thus changes to the composition of these measures did not alter the findings.

Exploratory analysis.—To examine whether the Japanese adults had profiles in life satisfaction that appeared at older ages among the Americans, we matched the Japanese adults with U.S. adults who were in the next older age range (e.g., compared 33–40 year-old Japanese with 41–53 year-old Americans, 41–53 year-old Japanese with 54–65 year-old Americans, 54–65 year-old Japanese with 66–72 year-old Americans, and 66–72 year-old Japanese with 73–79 year-old Americans), and ran a new multi-level model. Age range 1 in the U.S. and Age range 5 in Japan were not included in the analysis because they had no same-age comparison range after this artificial shift (e.g., Americans who were 33–40 did not have Japanese in their 20s who could be compared to them). Figure 2 presents these results. In this figure, we included means for the two age ranges that were not included in this new analysis (Age Range 1 in the U.S. and Age Range 5 in Japan) for illustrative purposes. The means for these two age ranges (presented by dotted lines) were estimated from the original analysis depicted in Figure 1. The means estimated for the other four age

ranges (displayed with solid lines) in Figure 2 are slightly different from those in Figure 1 because they were estimated using a different model (i.e., with fewer age ranges and realigning the age ranges from the two nations). The results indicated that the previous significant three-way interaction between the nationality, time, and age range no longer remained (Figure 2). Thus, when we shifted the Japanese participants to make them appear one age range older than they were, the overall age-related patterns in trajectories of life satisfaction did not significantly vary from one another.

Discussion

The current study examined age differences in perceived changes in life satisfaction, and whether these perceptions varied between the U.S. and Japanese participants. Consistent with life-span theories such as the theoretical framework of selection, optimization, and compensation (SOC; Baltes, 1997; Staudinger & Lindenberger, 2003) and motivational theory of life-span development (Heckhausen, 2000), both countries showed similar age-related patterns, whereby the youngest adults exhibited positive trajectories across perceived past, present, and future life satisfaction. The trajectory was flatter in later midlife and negative among older adults. There were slight differences in the curve of this trajectory by cultural group, however. The youngest U.S. adults had the steepest positive trajectory of all age ranges, and their trajectory was also steeper than their same-aged Japanese peers. The age at which people perceived a declining trajectory of life satisfaction was younger among the Japanese adults, and the decline was much steeper among the oldest Japanese compared to the oldest U.S. participants.

Similar Age-related Patterns of Perceived Changes in Life Satisfaction Across Cultures

Despite stability in ratings of current life satisfaction, individuals perceive changes in life satisfaction which may be explained by changing focus on growth to later maintenance and prevention of losses. The findings are consistent with implicit theories of motivation including the theoretical framework of selection, optimization, and compensation (SOC; Baltes, 1997; Staudinger & Lindenberger, 2003) and Motivational theory of life span development (Heckhausen, Wrosch, & Schulz, 2010). Both theories posit that younger adults, focused on development and growth, are motivated to perceive improvement from the past to the present and further anticipate future gains (Ebner, Freund at Baltes, 2006; Ross, 1989). As people age, however, they become more focused on maintenance and prevention of declines, and perceptions of their past, present, and future lives are adjusted accordingly (Ebner et al., 2006). The two theories vary yet they both emphasize that older age is related to greater expectancy of loss.

According to the SOC model, later adulthood entails greater proportion of losses compared to gains, often due to the age-related decrease in biological functioning and societal and culture-based resources (e.g., psychological, social, financial, knowledge-based; Baltes & Smith, 2003; Ebner et al., 2006). For example, younger adults perceive greater resources and time left in the life span (gains); thus, show greater motivation to focus on the growth-related processes such as pursuing and anticipating future growth. In contrast, older adults begin to perceive the decreasing opportunities and resources in addition to the shortening time left in

the life span. Older adults' recognition of decreasing resources, therefore, leads to motivational shift such that they anticipate decline in future well-being and focus on maintenance and prevention of losses. Successful aging, therefore, is determined by one's ability to effectively utilize (select and optimize) the available resources such that gains are maximized, and losses are minimized (compensation) (Baltes & Smith, 2003).

Motivational theory of life span (Heckhausen, Wrosch, & Schulz, 2010) also highlights the importance of changing context when examining people's motivations, goals, and well-being. Each stage of adulthood accompanies different constraints and opportunities (e.g., declines in biological and societal resources) such that certain goals can only be pursued in specific stages of the life span. Ultimately, congruence of goal and opportunity (e.g., physical and societal resources) is essential when individuals pursue their goals such that younger adults are focused on future growth in contrast to older adults who prioritize maintenance and prevention of future losses. For example, Ebner and colleagues (2006) found that focus on maintenance was associated with greater subjective well-being for older adults, whereas the reverse pattern was found for younger adults (Ebner et al., 2006). Thus, age differences in goal pursuits (e.g., growth focus or loss-prevention) may be one explanation for why older adults perceive declining trajectories of future life satisfaction despite stability in ratings of current life satisfaction.

Moreover, discounting process posits that anticipation of future losses allows older adults to better prepare for the unavoidable and normative declines (Cheng et al., 2009). Perceiving a decreasing trajectory of life satisfaction may mitigate the impact of losses because older adults prepare for potential future losses in both nations. Age differences across the two cultural groups are consistent with these life-span theories, showing an arc of perceived growth and continued growth for the future in relatively younger adults, and perceived stability and anticipated declines among relatively older adults.

Cultural Differences in Age-related Patterns of Past, Present, and Future Life Satisfaction

Although the overall arching age-related pattern was similar across both nations, the Japanese and U.S. participants differed in subtle ways. First, the U.S. sample had more positive views of their life course trajectory: younger U.S. adults were more positive, and older U.S. adults less negative, about changes in their life satisfaction trajectories compared to their same-aged Japanese participants. Second, middle-aged Japanese participants perceived future declines in life satisfaction, whereas anticipated declines in life satisfaction were only observed among relatively older participants in the U.S. (older adults over 65 years-old).

This study did not examine potential reasons why Japanese participants would perceive a less positive change in trajectories of life satisfaction, but we offer some possible explanations based on prior research. First, Japan is a country where national levels of uncertainty avoidance are higher and national levels of self-expression are lower than those of the United States (Hofstede, 1980). These nation-level characteristics are related to more negative views of life satisfaction in old age (Löckenhoff et al., 2015) and thus may contribute to the more negative perceptions of change in life satisfaction trajectory in Japan compared to the U.S. People high on uncertainty avoidance prefer structure and

predictability; the future, however, is uncertain. Self-expression, or greater importance placed on autonomy and a focus on the self, may lead to a greater sense of agency over changes in one's future life satisfaction. This greater perceived agency may also be related to other philosophical differences between Japan and the U.S.

In Japan, people often adopt the philosophy of fatalism, where life is viewed as predetermined and people have little control or power to influence their future (Plath, 1996). Further, Eastern cultures often employ secondary control strategies, whereby goals are adjusted to the environment (Lam & Zane, 2004). In contrast, people from Western cultures are more likely to endorse philosophies of free will and independence, and often view well-being as the result of one's effort and self-determination (Diener & Suh, 2000). Western countries also place strong value and belief on primary control strivings, where individuals strive to change the environment to satisfy one's needs (Langer, 1983). Belief in one's ability to change and control the future may explain perception of more positive trajectory of life satisfaction in the U.S, as less positive trajectories may be interpreted as a personal failure (Rothbaum, Weisz, & Snyder, 1982; Weisz, Rothbaum, & Blackburn, 1984). Finally, Eastern cultures exhibit greater dialectical thinking compared to Western cultures such that contradicting states (e.g., pleasant and unpleasant information) are tolerated and viewed as mutually dependent (Nisbett, Peng, Choi, & Norenzayan, 2001). Thus, more holistic cognitive processes in Japan, endorsing both positive and negative information, may explain the perception of more negative trajectories of change in life satisfaction compared to the U.S. adults.

Future studies can examine how different philosophical and personality-related constructs influence people's perceptions of their aging processes. Researchers have examined age-related trends of well-being among people who differ in traits such as optimism and pessimism (Chopik, Kim, & Smith, 2015). Additional characteristics aligned with tolerance for ambiguity and uncertainty avoidance, however, may be particularly germane to how people perceive their trajectories of well-being across adulthood.

In addition, older adults comprise a greater percentage of the population in Japan than in the U.S (United Nations, 2013). In 2010, for example, 23% percent of Japanese were 65 and older, versus 13.1% in the U.S. (United Nations, 2013). Attitudes about older adults have grown more negative in Japan for years, and researchers attribute this negativity to increasing percentages of older adults in their society (Ogawa & Retherford, 1993). Researchers who reviewed the literature in attitudes of aging across Western and Eastern cultures stated that demographic and economic trends may play a larger influence than cultural values in explaining East-West differences (Löckenhoff et al., 2015; North & Fiske, 2015). Each of these factors, thus, may contribute to the more negative perceptions of change in life satisfaction trajectory in Japan compared to the U.S. (see meta-analysis by North & Fiske, 2015), and future studies can examine the interactive effects among cultural values and economic and demographic factors that contribute to self-perceived changes across adulthood.

Perceptions of Change are More Negative at Earlier Ages in Japan

Above, we discuss possible reasons why U.S. adults view trajectories of aging as more positive than Japanese adults when considering their life satisfaction. The current study, however, also found that Japanese adults start having less positive views of changes in life satisfaction trajectory (i.e., slopes that were close to zero or even negative in value) at earlier ages than the Americans. We offer potential reasons for these differences. This discussion is speculative, as this study did not examine mechanisms that would explain why Japanese adults in their 40s endorsed negative views (as indicated by a negative slope for life satisfaction) and not the same-aged middle-aged Americans.

Midlife is a period of balancing multiple roles and responsibilities in various domains of life such as work and family (Lachman, 2004). Societal responsibilities may lead to greater feelings of burden and pressure for the middle-aged Japanese adults as filial obligation (i.e., the duty to one's parents) is more strongly engrained in their culture compared to Western cultures (Elmelech, 2005; Schwarz & Strack 1999; Usita & DuBois, 2005). Ultimately, Japanese middle-aged adults may be more heavily impacted by the increased demands and responsibilities in midlife, leading to a more negative trajectory of life satisfaction earlier in adulthood. In addition, people increasingly internalize cultural norms and values (Fung et al., 2013; Heckhausen & Schulz, 1995) with age. Close social relationships are posited to become more salient and more prioritized with age across all cultures (Carstensen, 2006 & Fung, 2013), but this value may be even more important in Japan, such that the demands of a more collectivist orientation may conflict with economic demands of an aging society (North & Fiske, 2015). This combination of increasing value on social relationships and demanding roles and duties in Japan may explain the perception of decline in life satisfaction occurring at earlier ages among the Japanese adults.

Some social scientists, however, suggest that economic and demographic factors are even more important for explaining East-West differences (Löckenhoff et al., 2015; North & Fiske, 2015). These reasons may also contribute to why declines in trajectories of life satisfaction are observed at earlier ages in Japan. Although both nations have high Gross Domestic Product (GDP) rankings (World Economic Outlook Database, 2012), Japan experienced a relatively stagnant economy throughout the 1990s and into the 2000s. Concerns about the economic future may be particularly stressful for Japanese middle-aged adults who are a sandwiched generation tasked with caring for both younger and older adults.

Limitations and Future Directions

Findings from the current study must be qualified by several limitations. First, life satisfaction was measured by one item asking about overall life satisfaction. Although research has shown that a single measure of overall life satisfaction is useful when comparing population samples (Andrews & Withey, 1976), future research should examine potential differences across specific life domains. Further, our study examined age-related differences in the cognitive perception of life satisfaction. Focusing illusion theory (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006) posits that judgment of one's cognitive life satisfaction is often biased as people are focused on specific events or aspects

of well-being. Thus, when assessing trajectories of a more general affective life satisfaction, individuals may be less prone to such biases. In addition, data collection in both cultures was limited to people who were willing to fill out lengthy questionnaire surveys and return them to the researchers. Further, the two data sets had methodological differences in their collection methods, such that data were collected approximately three years apart (2004–2006 for MIDUS and 2008 for MIDJA). The largest historical effect that occurred during this time was the world's financial recession, although ironically this recession did not affect Japan as much as other countries (Fackler, 2008). However, other historical influences that occurred during those three years could contribute to differences that we interpret in the current study as cultural differences. Finally, the current study used cross-sectional data, but future research can examine longitudinal change in life satisfaction in addition to anticipated change.

The current study established whether hypotheses about age-related change in perceptions of life satisfaction observed in the U.S. generalized to participants in Japan. These hypotheses were based on life-span theories of motivation that originated and have been tested in Western cultures. Age-related patterns are similar across both the Japanese and U.S. participants, yet important differences by culture also emerged. Future studies need to examine mechanisms that account for these cultural differences, and to focus on specific age ranges. One group of particular importance for future research is middle-aged adults. Studies can examine reasons why perceptions of aging are negative for Japanese who are in their mid-50s but positive among Americans. We discuss several possible explanations, but future studies can examine societal and psychosocial factors that may be particularly important for people in midlife. Future studies can also examine age and cultural differences in how people perceive different domains of their life, such as their cognitive functioning, or their relationships with friends and family members. It is unclear from this study whether Japanese adults perceive less positive trajectories of change across multiple aspects of their lives, or just in their overall life satisfaction.

Conclusion

The perceptions people have regarding whether their life is getting better or worse are associated with a number of health and well-being indicators (Lachman et al., 2008; Lang et al., 2013; Cheng et al., 2009). The current study examined age differences in perceived changes in life satisfaction in Japan and the U.S. Both nations showed similar age-related patterns of perceived changes in life satisfaction, suggesting that life-span developmental theories of motivation apply to both Eastern and Western cultures. We also found, however, that U.S. adults had more positive views of their aging process. Moreover, anticipated declines in life satisfaction were observed at younger ages for the Japanese participants. Results suggest that current life-span theories of aging predict age differences in how people perceive their own aging, yet cross-cultural differences exist in the extent to which people perceive increases or decreases in their life satisfaction over time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Appendix A

Multilevel Models Predicting Past, Present, and Future Life Satisfaction by Age, Age Squared, and Nationality

Variable	Perceived Life Satisfaction without Covariates		Perceived Life Satisfaction with Covariates	
	<i>b</i> (<i>SE</i>)	<i>df</i>	<i>b</i> (<i>SE</i>)	<i>df</i>
Intercept	7.34(0.04)**	4842	6.85 (0.06)**	4751
Gender, female (ref=male)			0.18 (0.04)**	4751
Number of Chronic Conditions			-0.10 (0.02)**	4751
Marital Status, married (ref=Single)			0.61 (0.04)**	4751
Education (Z-score)			0.04 (0.02)*	4751
Centered Neuroticism			-0.16 (0.03)**	4751
Centered Extraversion			0.36 (0.03)**	4751
Centered Life Orientation			0.09 (0.005)**	4751
Nationality, Japan (ref=U.S.)	-0.87 (0.09)**	4842	-0.38 (0.08)**	4751
Time	0.46 (0.02)**	9630	0.46 (0.02)**	9465
Nationality*Time	-0.6 (0.05)**	9630	-0.6 (0.05)**	9465
Cage	0.05 (0.002)**	4842	0.05 (0.002)**	4751
Cage*Nationality	-0.02 (0.005)*	4842	-0.02 (0.004)*	4751
Cage*Time	-0.04 (0.001)**	9630	-0.04 (0.001)**	9465
Cage*Nationality*Time	0.002 (0.003)	9630	0.001 (0.003)	9465
Cage^2	0.001 (0.0002)*	4842	0.001 (0.0002)**	4751
Cage^2*Nationality	-0.001 (0.0004)*	4842	-0.001 (0.0004)*	4751
Cage^2*Time	-0.001 (0.0001)**	9630	-0.001 (0.0001)**	9465
Cage^2*Nationality*Time	0.001 (0.0002)*	9630	0.001 (0.0002)*	9465

Note.

* $p < .05$

** $p < .001$.

Standard Errors are indicated by the parentheses.

References

- Abramson LY, Seligman ME, & Teasdale JD (1978). Learned helplessness in humans: critique and reformulation. *Journal of Abnormal Psychology*, 87, 49–74. doi: 10.1037/0021-843X.87.1.49 [PubMed: 649856]
- Andrews FM, & Withey SB Social indicators of well-being: Americans' perceptions of life quality New York: Plenum, 1976.

- Avendano M, & Kawachi I (2014). Why do Americans have shorter life expectancy and worse health than do people in other high-income countries?. *Annual Review of Public Health*, 35, 307–325. doi: 10.1146/annurev-publhealth-032013-182411
- Baltes PB, Lindenberger U, Staudinger UM (2006). Life span theory in developmental psychology. In Damon W, Lerner RM (Series & Vol. Eds), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp. 569–664). New York: Wiley.
- Baltes PB, & Smith J (2003). New frontiers in the future of aging: From successful aging of the young old to the dilemmas of the fourth age. *Gerontology*, 49, 123–135. doi: 10.1159/000067946 [PubMed: 12574672]
- Brim OG, Ryff CD, & Kessler RC (2004). *How healthy are we: A national study of well-being at midlife* Chicago: University of Chicago Press.
- Bryk AS, & Raudenbush SW (1992). *Hierarchical linear models: Applications and data analysis* Newbury Park: Sage.
- Carstensen LL (2006). The influence of a sense of time on human development. *Science*, 312, 1913–1915. doi: 10.1126/science.1127488 [PubMed: 16809530]
- Cheng ST, Fung HH, & Chan A (2009). Self-perception and psychological well-being: The benefits of foreseeing a worse future. *Psychology and Aging*, 24, 623–633. doi: 10.1037/a0016410 [PubMed: 19739918]
- Chopik WJ, Kim ES, & Smith J (2015). Changes in optimism are associated with changes in health over time among older adults. *Social psychological and personality science*, 6, 814–822. doi: 10.1177/1948550615590199 [PubMed: 27114753]
- Cross S, & Markus H (1991). Possible selves across the life span. *Human Development*, 34, 230–255. doi: 10.1159/000277058
- Diener E (1984). Subjective well-being. *Psychological Bulletin*, 95, 542–575. doi: 10.1037/0033-2909.95.3.542 [PubMed: 6399758]
- Diener E, & Chan MY (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being*, 3, 1–43. doi:10.1111/j.1758-0854.2010.01045.x
- Diener E, Oishi S, & Lucas RE (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, 54, 403–425. doi: 10.1146/annurev.psych.54.101601.145056
- Diener E, & Suh EM (2000). *Culture and Subjective Well-being* Cambridge, MA: MIT Press.
- Diener E, Suh EM, Lucas RE, & Smith HL (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276–302. doi: 10.1037/0033-2909.125.2.276
- Ebner NC, Freund AM, & Baltes PB (2006). Developmental changes in personal goal orientation from young to late adulthood: from striving for gains to maintenance and prevention of losses. *Psychology and Aging*, 21, 664–678. doi: 10.1037/0882-7974.21.4.664 [PubMed: 17201488]
- Elmelech Y (2005). Attitudes toward Familial Obligation in the United States and in Japan. *Sociological Inquiry*, 75, 497–526. doi: 10.1111/j.1475-682X.2005.00134.x
- Fackler M (2008, 9 19). In Japan, financial crisis is just a ripple New York Times Retrieved from <http://www.nytimes.com/2008/09/20/business/worldbusiness/20yen.html>
- Fung HH (2013). Aging in culture. *The Gerontologist*, 53, 369–377. doi:10.1093/geront/gnt024 [PubMed: 23585454]
- Gomez V, Grob A, & Orth U (2013). The adaptive power of the present: Perceptions of past, present, and future life satisfaction across the life span. *Journal of Research in Personality*, 47, 626–633. doi: 10.1016/j.jrp.2013.06.001
- Heckhausen J (Ed.). (2000). *Motivational Psychology of Human Development: Developing Motivation and Motivating Development* (Vol. 131). Elsevier.
- Heckhausen J, & Schulz R (1995). A life-span theory of control. *Psychological Review*, 102(2), 284–304. doi: 10.1037/0033-295X.102.2.284 [PubMed: 7740091]
- Heckhausen J, Wrosch C, & Schulz R (2010). A motivational theory of life-span development. *Psychological Review*, 117, 32–60. doi: 10.1037/a0017668 [PubMed: 20063963]

- Heine SJ, & Lehman DR (1995). Cultural variation in unrealistic optimism: Does the West feel more vulnerable than the East? *Journal of Personality and Social Psychology*, 68, 595–607. doi: 10.1037/0022-3514.68.4.595
- Hofstede G (1980). *Culture's Consequences: International Differences in Work-related Values* Beverly Hills, CA: Sage.
- Kahneman D, Krueger AB, Schkade D, Schwarz N, & Stone AA (2006). Would you be happier if you were richer? A focusing illusion. *Science*, 312, 1908–1910. doi: 10.1126/science.1129688 [PubMed: 16809528]
- Kitayama S, Markus HR, Matsumoto H, & Norasakkunkit V (1997). Individual and collective processes in the construction of the self: self-enhancement in the United States and self-criticism in Japan. *Journal of personality and social psychology*, 72, 1245–1267. doi: 10.1037/0022-3514.72.6.1245 [PubMed: 9177018]
- Lachman ME (2004). Development in midlife. *Annual Review of Psychology*, 55, 305–331. doi: 10.1146/annurev.psych.55.090902.141521
- Lachman ME, Röcke C, Rosnick C, & Ryff CD (2008). Realism and Illusion in Americans' Temporal Views of Their Life Satisfaction Age Differences in Reconstructing the Past and Anticipating the Future. *Psychological Science*, 19, 889–897. doi: 10.1111/j.1467-9280.2008.02173.x [PubMed: 18947354]
- Lam AG, & Zane NW (2004). Ethnic differences in coping with interpersonal stressors: A test of self-construals as cultural mediators. *Journal of Cross-Cultural Psychology*, 35, 446–459. doi: 10.1177/0022022104266108
- Lang FR, Weiss D, Gerstorf D, & Wagner GG (2013). Forecasting life satisfaction across adulthood: Benefits of seeing a dark future? *Psychology and Aging*, 28, 249–261. doi: 10.1037/a0030797 [PubMed: 23421319]
- Langer EJ (1983). *The psychology of control* Beverly Hills, CA: Sage.
- Lee YT, & Seligman ME (1997). Are Americans more optimistic than the Chinese?. *Personality and Social Psychology Bulletin*, 23, 32–40. doi: 10.1177/0146167297231004
- Little TD (2013). *Longitudinal structural equation modeling* Guilford press.
- Levy BR (2003). Mind matters: Cognitive and physical effects of aging self-stereotypes. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 58, 203–211. doi: 10.1093/geronb/58.4.P203
- Löckenhoff CE, De Fruyt F, Terracciano A, McCrae RR, De Bolle M, Costa PT, ... & Allik J (2009). Perceptions of aging across 26 cultures and their culture-level associates. *Psychology and Aging*, 24, 941–954. doi: 10.1037/a0016901 [PubMed: 20025408]
- Löckenhoff CE, Lee DS, Buckner KM, Moreira RO, Martinez SJ, & Sun MQ (2015). Cross-cultural differences in attitudes about aging: moving beyond the East-West dichotomy. In *Successful Aging* (pp. 321–337). Springer, Dordrecht.
- McFarland C, Ross M, & Giltrow M (1992). Biased recollections in older adults: The role of implicit theories of aging. *Journal of Personality and Social Psychology*, 62, 837–850. doi: 10.1037/0022-3514.62.5.837 [PubMed: 1593423]
- McKee KJ, Kostela J, & Dahlberg L (2015). Five years from now: Correlates of older people's expectation of future quality of life. *Research on Aging*, 37, 18–40. doi: 10.1177/0164027513520329 [PubMed: 25651549]
- Milfont TL, & Fischer R (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, 3, 111–130. doi: 10.21500/20112084.857
- Muthén LK, & Muthén BO (2008). *Mplus (Version 5.1)* Los Angeles, CA: Muthén & Muthén.
- Nisbett RE, Peng K, Choi I, & Norenzayan A (2001). Culture and systems of thought: holistic versus analytic cognition. *Psychological Review*, 108, 291–310. doi: 10.1037/0033-295X.108.2.291 [PubMed: 11381831]
- North MS, & Fiske ST (2015). Modern attitudes toward older adults in the aging world: A cross-cultural meta-analysis. *Psychological Bulletin*, 141, 993–1021. doi: 10.1037/a0039469 [PubMed: 26191955]

- Ogawa N (2003). Japan's changing fertility mechanisms and its policy responses. *Journal of Population Research*, 20, 89–106. doi: 10.1007/BF03031797
- Ogawa N, & Retherford R (1993). Care of the Elderly in Japan: Changing Norms and Expectations. *Journal of Marriage and Family*, 55, 585–597. doi:10.2307/353340
- Okun MA, Dittburner JL, & Huff BP (2006). Perceived changes in well-being: The role of chronological age, target age, and type of measure. *The International Journal of Aging and Human Development*, 63, 259–278. doi: 10.2190/87XT-R7RV-BGLF-7DHW [PubMed: 17191434]
- Plath DW (1966). Japan and the Ethics of Fatalism. *Anthropological Quarterly*, 39, 161–170. doi: 10.2307/3316801
- Röcke C, & Lachman ME (2008). Perceived trajectories of life satisfaction across past, present, and future: profiles and correlates of subjective change in young, middle-aged, and older adults. *Psychology and Aging*, 23, 833–847. doi: 10.1037/a0013680 [PubMed: 19140654]
- Ross M (1989). Relation of implicit theories to the construction of personal histories. *Psychological Review*, 96, 341–357. doi: 10.1037/0033-295X.96.2.341
- Rothbaum F, Weisz JR, & Snyder SS (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, 42, 5–37. doi: 10.1037/0022-3514.42.1.5
- Ryff CD (1984). Personality development from the inside: The subjective experience of change in adulthood and aging. In Baltes PB & Brim OG Jr. (Eds.), *Life-span development and behavior* (Vol. 6, pp. 243–279). Orlando, FL: Academic Press.
- Ryff CD (1991). Possible selves in adulthood and old age: a tale of shifting horizons. *Psychology and Aging*, 6, 286–295. doi: 10.1037/0882-7974.6.2.286 [PubMed: 1863398]
- Scheier MF, & Carver CS (1985). Optimism, coping, and health: assessment and implications of generalized outcome expectancies. *Health Psychology*, 4, 219–247. doi: 10.1037/0278-6133.4.3.219 [PubMed: 4029106]
- Schwarz N, & Strack F (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. *Well-being: The Foundations of Hedonic Psychology*, 7, 61–84.
- Sin NL (2016). The protective role of positive well-being in cardiovascular disease: review of current evidence, mechanisms, and clinical implications. *Current Cardiology Reports*, 18, 106. doi: 10.1007/s11886-016-0792-z [PubMed: 27612475]
- Smith J (2001). Well-being and health from age 70 to 100: findings from the Berlin Aging Study. *European Review*, 9, 461–477. doi: 10.1017/S1062798701000424
- Staudinger UM, Bluck S, & Herzberg PY (2003). Looking back and looking ahead: adult age differences in consistency of diachronous ratings of subjective well-being. *Psychology and Aging*, 18, 13–24. doi: 10.1037/0882-7974.18.1.13 [PubMed: 12641309]
- Steptoe A, Deaton A, & Stone AA (2015). Subjective wellbeing, health, and ageing. *The Lancet*, 385, 640–648. doi: 10.1016/S0140-6736(13)61489-0
- Taylor SE, Lichtman RR, & Wood JV (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology*, 46, 489–502. doi: 10.1037/0022-3514.46.3.489 [PubMed: 6707865]
- Taylor SE, Neter E, & Wayment HA (1995). Self-evaluation processes. *Personality and Social Psychology Bulletin*, 21, 1278–1287. doi: 10.1177/01461672952112005
- Tsuya NO (2015) Below-Replacement Fertility in Japan: Patterns, Factors, and Policy Implications (pp. 87–106). In: Rindfuss R, Choe M (eds) *Low and Lower Fertility* Springer, Cham.
- United Nations, Department of Economic and Social Affairs, Population Division (2013). *World Population Prospects: The 2012 Revision, Highlights and Advance Tables Working Paper No. ESA/P/WP.228*.
- Usita PM, & Du Bois BC (2005). Conflict sources and responses in mother-daughter relationships: perspectives of adult daughters of aging immigrant women. *Journal of women & aging*, 17, 151–165. doi: 10.1300/J074v17n01_11 [PubMed: 15914425]
- Vandenberg RJ, & Lance CE (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3, 4–70. doi: 10.1177/109442810031002

- Weisz JR, Rothbaum FM, & Blackburn TC (1984). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist*, 39, 955. doi: 10.1037/0003-066X.39.9.955
- Wilson AE, & Ross M (2001). From chump to champ: people's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology*, 80, 572–584. doi: 10.1037/0022-3514.80.4.572 [PubMed: 11316222]
- World Economic Outlook Database. (2012, October). Retrieved January 3, 2018, from <http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/index.aspx>

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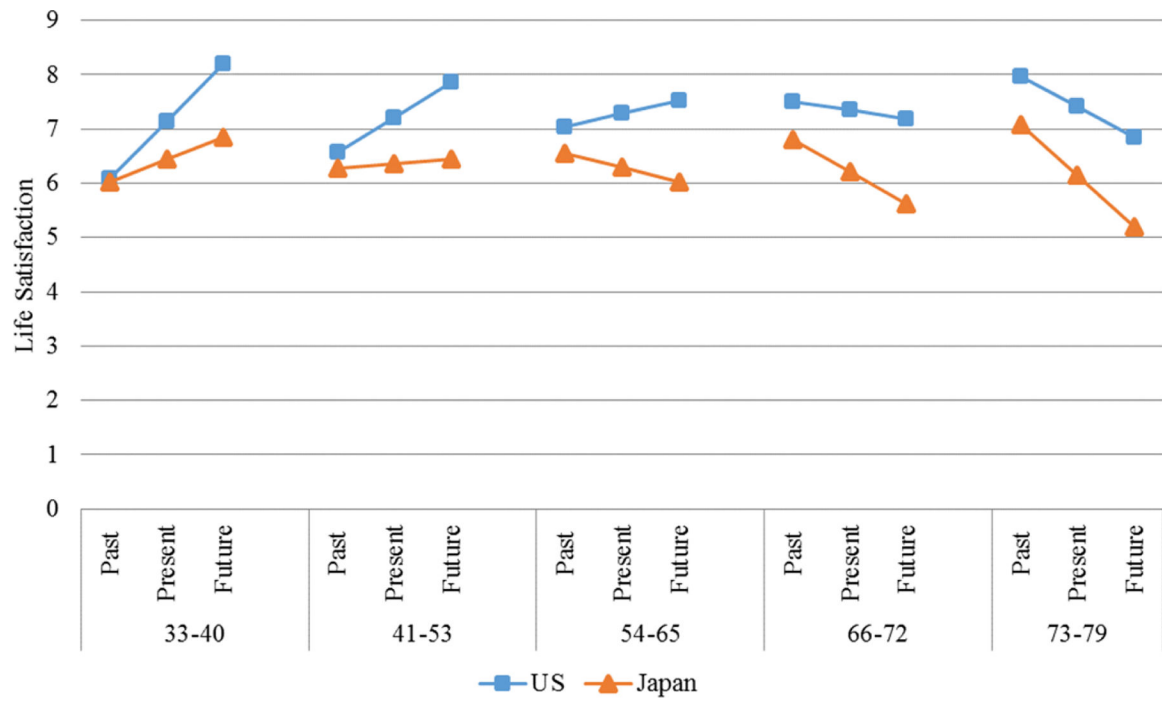


Figure 1. Perceived past, present, and future life satisfaction by age range and nationality.

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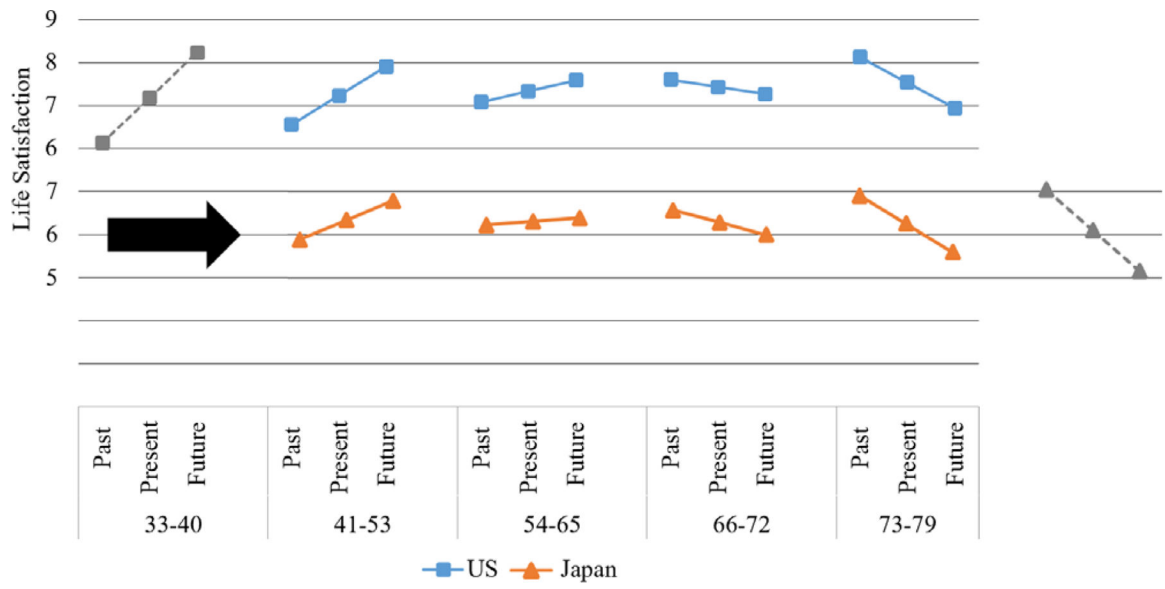


Figure 2. Japanese perceived past, present, and future life satisfaction pushed forward by one age range.

Table 1

Correlations Among All Variables of Interest for U.S. and Japan.

Variable (Mean, SD or %)	1	2	3	4	5	6	7	8	9	10	11	12
	(49.18%=Male)	(16.04%=No illness)	(29.73%=Single)	(Z-score)	(1.98, 0.66)	(2.37, 0.72)	(19.41, 3.57)	(55.64, 13.39)	(18.28%=Youngest)	(6.36, 2.01)	(6.14, 2.05)	(6.00, 2.39)
1. Gender (Ref=Male, 46.87%)	-	0.08 *	-0.09 *	-0.22 **	-0.11 *	0.05	0.07 *	-0.03	-0.04	0.08 *	0.14 **	0.11 *
2. Chronic Cond. (Ref=None, 22.71%)	0.12 **	-	-0.06	-0.07 *	0.17 **	-0.03	-0.18 **	0.11 *	0.11 *	-0.06	-0.13 **	-0.16 **
3. Marital Status (Ref=Single, 28.48%)	-0.14 **	-0.07 **	-	0.09 *	-0.06 *	0.09 *	0.16 **	0.08 *	0.08 *	0.20 **	0.28 **	0.19 **
4. Highest Education (Z-score)	-0.10 **	-0.13 **	0.05 *	-	0.06	0.08 *	0.13 **	-0.27 **	-0.27 **	0.06	0.16 **	0.23 **
5. Neuroticism (2.08, 0.69)	0.12 **	0.18 **	-0.05 *	-0.11 **	-	0.02	-0.29 **	-0.26 **	-0.25 **	-0.15 **	-0.23 *	-0.09 *
6. Extraversion (2.93, 0.70)	0.09 **	-0.05 *	-0.02	-0.06 *	-0.09 **	-	0.35 **	-0.06	-0.04	0.21 **	0.32 **	0.32 **
7. Life Orientation (23.12, 4.80)	-0.02	-0.17 **	0.11 **	0.21 **	-0.44 **	0.29 **	-	0.03	0.04	0.24 **	0.41 **	0.41 **
8. Age (54.61, 11.72)	-0.004	0.25 **	-0.06 **	-0.14 **	-0.16 **	0.04 *	0.11 **	-	0.97 **	0.16 **	0.02	-0.25 **
9. Age Ranges (Ref=Youngest, 12.72%)	-0.005	0.24 **	-0.06 **	-0.14 **	-0.16 **	0.04 *	0.09 **	0.96 **	-	0.14 **	0.02	-0.23 **
10. Past Life Satisfaction (7.40, 1.85)	-0.03 *	-0.02	0.15 **	-0.03	-0.16 **	0.16 **	0.19 **	0.28 **	0.27 **	-	0.48 **	0.29 **
11. Present Life Satisfaction (7.86, 1.54)	0.01	-0.15 **	0.20 **	0.06 *	-0.29 **	0.25 **	0.44 **	0.14 **	0.13 **	0.41 **	-	0.67 **
12. Future Life Satisfaction (8.10, 1.78)	0.02	-0.20 **	0.14 **	0.12 **	-0.17 **	0.20 **	0.35 **	-0.22 **	-0.23 **	0.13 **	0.64 **	-

Note:

* $p < 0.05$.

** $p < .001$.

Lower triangle comprises of correlations for the U.S. sample. Upper triangle comprises of correlations for the Japanese sample.

Table 2
 Multilevel Models Predicting Past, Present, and Future Life Satisfaction by Five Age Ranges and Nationality

Variable	Perceived Life Satisfaction without Covariates		Perceived Life Satisfaction with Covariates	
	b(SE)	df	b(SE)	df
Intercept	6.57 (0.05) **	4844	6.13 (0.06) **	4753
Gender, female (ref=male)			0.17 (0.04) **	4753
Number of Chronic Conditions			-0.10 (0.02) **	4753
Marital Status, married (ref=Single)			0.61 (0.04) **	4753
Education (Z-score)			0.04 (0.02) *	4753
Centered Neuroticism			-0.17 (0.03) **	4753
Centered Extraversion			0.37 (0.03) **	4753
Centered Life Orientation			0.09 (0.005) **	4753
Nationality, Japan (ref=U.S.)	-0.71 (0.11) **	4844	-0.18 (0.1)	4753
Time	1.06 (0.03) **	9632	1.05 (0.03) **	9467
Nationality*Time	-0.65 (0.06) **	9632	-0.63 (0.06) **	9467
Age Range	0.49 (0.02) **	4844	0.49 (0.02) **	4753
Nationality*Age Range	-0.22 (0.05) **	4844	-0.21 (0.05) **	4753
Time*Age Range	-0.41 (0.01) **	9632	-0.4 (0.01) **	9467
Nationality*Time*Age Range	0.07 (0.03) *	9632	0.06 (0.03) *	9467

Note.

* $p < .05$

** $p < .001$.

Standard Errors are indicated by the parentheses.

Table 3
 Mean, Slope, and Slope Differences of Life Satisfaction Ratings in the Past(10 years ago), Present(current), Future(10 years in the future) by Age Groups and Nationality

Age Ranges	U.S.				Japan				U.S. vs. Japan	
	Past LS	Present LS	Future LS	Slope	Past LS	Present LS	Future LS	Slope	Slope	Slope Difference
Age Range 1	6.13(.06)**	7.18(.06)**	8.23(.06)**	1.05(.03)**	5.95(.10)**	6.37(.08)**	6.79(.10)**	0.42(.05)**		0.63(.06)**
Age Range 2	6.61(.05)**	7.26(.05)**	7.91(.05)**	0.65(.02)**	6.22(.08)**	6.30(.07)**	6.38(.08)**	0.08(.04)*		0.57(.04)**
Age Range 3	7.10(.05)**	7.34(.05)**	7.59(.05)**	0.25(.02)**	6.49(.07)**	6.23(.06)**	5.97(.07)**	-0.26(.03)**		0.51(.04)**
Age Range 4	7.59(.06)**	7.43(.06)**	7.27(.06)**	-0.16(.02)**	6.76(.09)**	6.16(.08)**	5.56(.09)**	-0.60(.04)**		0.44(.05)**
Age Range 5	8.07(.08)**	7.51(.07)**	6.95(.08)**	-0.56(.04)**	7.03(.12)**	6.09(.10)**	5.15(.12)**	-0.94(.06)**		0.38(.07)**

Note.

* $p < 0.05$

** $p < .001$.

Standard errors are presented in parentheses.