Article

Cultural Differences in Susceptibility to the End of History Illusion

Brian W. Haas[1] [iD] and Kazufumi Omura[2]

Abstract
The End of History Illusion (EoHI) is the tendency to report that a greater amount of change occurred in the past than is predicted to occur in the future. We investigated if cultural differences exist in the magnitude of the EoHI for self-reported life satisfaction and personality traits. We found an effect of culture such that the difference between reported past and predicted future change was greater for U.S. Americans than Japanese, and that individual differences in two aspects of the self (self-esteem and self-concept clarity) mediated the link between culture and the magnitude of the EoHI. We also found a robust cultural difference in perceptions of past change; U.S. Americans tended to think about the past more negatively than their Japanese counterparts. These findings yield new insight onto the link between cultural context and the way people remember the past and imagine the future.

Keywords
culture, end of history illusion, self-enhancement, self-concept

> There is no history, only fictions of varying degrees of plausibility.
>
> —Voltaire

Introduction

Some have proposed that mental time travel, the ability to recollect the past and imagine the future, may be specific to the human species (Donald, 2001; Wheeler et al., 1997). Although mental time travel may be a uniquely human skill, this does not exclude the possibility that mental time travel is subjective and often fraught with error. Misperceptions of the past and future are exemplified by the End of History Illusion (EoHI) (Quoidbach et al., 2013). The EoHI is the tendency to believe that a disproportionally greater amount of change occurred in the past than is predicted to occur in the future. People often think that the current moment exists as watershed moment differentiating the past from the future. The EoHI may be one reason why people make decisions they later will regret. Better understanding the EoHI holds the potential to improve how people make decisions throughout their lives.

The EoHI occurs across a broad range of psychological domains that include life satisfaction, personality traits and values (Harris & Busseri, 2019; Quoidbach et al., 2013). The absolute value of the difference between past and current self-assessments tends to be larger than the difference between future and current self-assessments. One reason

why the EoHI may occur is to enhance notions that one is currently at a relatively good state or position within their lives, and will remain so moving forward in time (Quoidbach et al., 2013). Temporal self-appraisal theory explains that people tend to derogate their past selves to preserve or enhance their current self-concept (Ross & Buehler, 2001; Ross & Wilson, 2002; Wilson & Ross, 2001). Accordingly, people often narrate their life stories with themes involving growth and the development of positive characteristics over time (Bauer & McAdams, 2004; Ross & Wilson, 2003). The manifestation of the EoHI may occur, in part, to preserve peoples' beliefs that they have grown and improved considerably in comparison to their past self.

Culture and the End of History

Much of what is currently known about mental time travel is based on U.S. American, Canadian, or European samples. Furthermore, the entirety of empirical research to date documenting the existence of the EoHI has been limited to Western, Educated, Industrialized, Rich, and Democratic (WEIRD) (Henrich et al., 2010) cultural contexts. This

[1]University of Georgia, Athens, USA
[2]Yamagata University, Japan

Corresponding Author:
Brian W. Haas, Department of Psychology, University of Georgia, 125 Baldwin Ave., Athens, GA 30602, USA.
Email: bhaas@uga.edu

presents a clear limitation in terms of the generalizability of the EoHI. As such, it is currently unknown if people outside of WEIRD cultural contexts show a similar level of susceptibility to the EoHI. We therefore sought to investigate if the magnitude of the EoHI differs between two different cultural contexts (U.S. American and Japanese). We selected U.S. American and Japanese because they are two cultures that differ in constructs that may be linked to susceptibility to the EoHI; temporal orientation (current vs. past) and several aspects of the self (i.e., self-enhancement and self-concept clarity).

Many cross-cultural studies refer to broad differences between Eastern and Western cultural contexts by collapsing across several diverse countries that encompass large geographical areas. This approach relies on the assumption that cross-country differences within Western or Eastern geographical areas are smaller than those that exist between Eastern and Western geographical areas. In the current research, we draw some support for predicting how U.S. Americans think from findings from other countries such as Canada, and draw some support for predicting how Japanese think from findings from other countries such as China. Based on extant evidence that U.S. Americans and Japanese cultures differ in temporal orientation and many aspects of the self, we predicted that U.S. Americans would display a greater magnitude of the EoHI than Japanese.

Cultural and Temporal Orientation

The way people tend to focus on different specific temporal domains (i.e., temporal orientation) may, in part, be associated with susceptibility to the EoHI. One reason why culture may be linked to differences in the susceptibility to the EoHI is because of cultural differences in temporal orientation. Indeed, some research shows that cultural context is associated with the way people are oriented in time (Gao, 2016). Cultural differences in temporal orientation may manifest, in part, because of broad differences in cognitive styles (Nisbett et al., 2001). WEIRD cultural contexts (including U.S. Americans) are often characterized by an analytic cognitive style, which renders an affinity toward focusing on objects versus context. Conversely, some East Asian cultures, such as Japan, tend to have a more holistic analytic style. In terms of temporal orientation, WEIRD cultural contexts, such as U.S. Americans, are associated with a tendency to focus on the current temporal state, as a single moment of time. While for Japanese, the present and future may be informed by the "context" of what has occurred in the past.

Several empirical studies show that U.S. Americans (or Canadians) and some East Asian cultures show differences in temporal orientation. For example, Japanese tend to describe past proud or embarrassing events as being closer in time than Canadian counterparts (Ross et al., 2005). Some East Asians cultures (Chinese) tend to describe the causes of a crime using more descriptions of the past than Canadians

(Ji et al., 2009). Asian American's current well-being tends to be predicted by both past and present self-ratings, while European American's current well-being tends to be predicted by present, but not past, self-ratings (Kim et al., 2012). Because the EoHI involves misperceptions of reported past change and predicted future change, cultures that differ in temporal orientation, such as U.S. American and Japanese, may show differences in magnitude of the EoHI.

Culture and the Self

The way people think about themselves may be linked to susceptibility to the EoHI. Quoidbach et al. (2013) speculated that two reasons why the EoHI occurs may be (a) motivations to view one's self as admirable and (b) motivations to believe that one knows themselves' well. Studies based on temporal self-appraisal theory show that people (primarily those in WEIRD cultures) tend to derogate their past selves to preserve or enhance positive/admirable beliefs about their current selves (Wilson & Ross, 2001). The EoHI may also occur, in part, to preserve or enhance the belief that one knows themselves well. Predicting that one's self will remain stable in the future may aide in preserving confidence in self-knowledge. In this research, we sought to test the association between self-esteem (SE), confidence that one knows themselves well, and susceptibility to the EoHI. We used the Rosenberg SE Scale to measure SE, and the self-concept clarity (SCC) scale (Campbell et al., 1996) to measure confidence that one knows themselves well. We predicted that greater SE and SCC would be linked to increased susceptibility to the EoHI.

There is also reason to predict that differences in the magnitude of the EoHI between U.S. American and Japanese cultures may be mediated by individual differences in SE and SCC. Japanese and U.S. Americans tend to differ in self-enhancement motivation (Ross et al., 2005). Japanese tend to score lower on measures of SE (Kobayashi & Brown, 2003) and SCC (Campbell et al., 1996) as compared to U.S. Americans and Canadians. One way the EoHI may serve SE is by accentuating the belief that one has grown from a previous, relatively negative state. Because U.S. Americans tend to display more motivation to self-enhance, as compared to Japanese, SE may mediate the link between culture and thinking about the past in a relatively negative light (i.e., directional past change). One way the EoHI may contribute to self-knowledge confidence is by accentuating the belief that one is currently on solid ground and will remain stable moving forward (i.e., absolute future change). SCC may contribute to the EoHI by preserving the belief that one knows themselves well and will not change in the future. Thus, greater SCC may be associated with reduced predicted absolute future change and may mediate the link between culture and the magnitude of predicted absolute future change. In Study 2, we investigated the specific roles that SE and SCC play in mediating the link between culture and

reported past and predicted future change of personality traits. We predicted that SE would mediate the link between culture and the magnitude of reported directional past change and that SCC would mediate the link between culture and the magnitude of predicted absolute future change.

The Current Study

For the present research, we focused on two cultural contexts that differ in temporal orientation and self-enhancement motivation (U.S. American and Japanese). In two large independent studies, we compared the magnitude of the EoHI for a broad range of psychological domains (Study 1, *n* = 5,990: life satisfaction, marriage/family relationships, financial/career situation, and health; Study 2, *n* = 1,609: personality traits) between U.S. Americans and Japanese. For Hypothesis 1, we predicted that the magnitude of the EoHI would be greater for U.S. Americans than Japanese. In addition, based on evidence that U.S. Americans and Japanese differ according to several aspects of the self, we predicted that SE and SCC would be associated with the EoHI (Hypothesis 2) and would mediate observed cultural differences in the magnitude of the EoHI (Hypothesis 3).

The EoHI has been demonstrated by comparing the *amount* (absolute value) of reported past and predicted future change (Quoidbach et al., 2013). Absolute values inherently obscure the direction of change. Measuring and comparing absolute values between past and future conditions advances our understanding of the magnitude of the EoHI but does not elucidate the *pattern* of the EoHI. Thus, we also investigated the pattern of the EoHI by measuring and comparing directional change. That is, we quantified the tendency to think about reported past change as either "growing" or "declining" in comparison to one's past self, and quantified the tendency to think about predicted future change as either "growing" or "declining" in comparison to one's current self. By measuring directional change, we were able to also test the hypothesis that U.S. Americans would perceive the past more negatively (with respect to their current status) than Japanese (Hypothesis 4) and that SE and SCC would display unique roles as mediators on the link between culture and directional past change (Hypothesis 5) and absolute future change (Hypothesis 6), respectively. We tested each of the following specific hypotheses:

Hypothesis 1: U.S. Americans would display a greater magnitude of the EoHI than Japanese.
Hypothesis 2: Higher SE and SCC would be associated with a greater magnitude of the EoHI.
Hypothesis 3: SE and SCC would mediate observed cultural differences in the magnitude of EoHI between U.S. America and Japan.
Hypothesis 4: U.S. Americans would perceive the past more negatively (with respect to their current status) than Japanese.

Hypothesis 5: SE would mediate the link between culture and the magnitude of reported directional past change.
Hypothesis 6: SCC would mediate the link between culture and the magnitude of predicted absolute future change.

Study 1: Cultural Differences in the EoHI for Life Satisfaction

Method

Participants. The data for study 1 were sourced from the Midlife in the United States (MIDUS) and Midlife in Japan (MIDJA) studies. These data and codebook are available for download from the Institute for Social Research at the University of Michigan (www.icpsr.umich.edu). The MIDUS and MIDJA projects include measures across a broad array of psychological and health-related outcomes and were collected to generate large-scale nationally representative data sets. The methods of MIDUS and MIDJA projects were formally designed to mirror one another to facilitate cross-cultural research. We selected participant responses from Wave 2 of the MIDUS study (*n* = 3,987, 2,205 females, mean age = 56.15 years, *SD* age = 12.35) and Wave 1 of the MIDJA study (*n* = 1,027, 522 females, mean age = 54.36, *SD* = 14.15) to best equate average age between cultures.

Measures. We focused our investigation on a set of items designed to measure life satisfaction currently, 10 years in the past, and 10 years in the future (Hong et al., 2019) and individual differences in SE. Participants were asked: "How would you rate your life overall these days?" "Looking back 10 years ago, how would you rate your life overall at that time?" and "Looking ahead 10 years into the future, what do you expect your life overall will be like at that time?" We also sourced participant responses for past, current, and future evaluations for four other psychological domains: family relationships, work situation, financial situation, and health. Across all psychological domains, participants used an 11-point Likert-type scale with 0 corresponding to "worst possible," and 10 corresponding to "best possible." Thus, across all domains, we had a measure for current rating, and ratings for 10 years reported in the past and 10 years predicted in the future. These data served as the primary means to characterize the EoHI for each participant and ultimately within each cultural context.

To quantify individual differences in SE, we sourced participant responses to the Rosenberg Self-Esteem Scale (Rosenberg, 2015). Participants responded to items on a 7-point Likert-type scale, with 1 corresponding to strongly agree and 7 corresponding to strongly disagree. Data were coded such that higher values corresponded to greater SE. The psychometric properties of the Rosenberg Self-Esteem Scale have been shown to be valid and reliable across U.S.

American and Japanese cultural contexts (Kobayashi & Brown, 2003). Internal consistencies for SE within both samples were within the acceptable range (Japan, $\alpha = .67$; US, $\alpha = .76$).[1] Multigroup confirmatory factor analysis (MGCFA) using AMOS 20 confirmed partial configural and metric, but not scalar, equivalence across cultures (Supplementary Table 1).

Statistical analysis. The EoHI is the tendency to believe that a greater amount of change occurred in the past than is predicted to occur in the future. For each participant, we operationally defined reported past change as the absolute value of the difference between current rating and the rating for 10 years in the past. We operationally defined predicted future change as the absolute value of the difference between current rating and the rating for 10 years in the future. We used a mixed model analysis of covariance (ANCOVA) to test for the effect of culture on the difference between reported past change and predicted future change (Hypothesis 1), with condition (past vs. future) entered as the within-subjects variable, culture (US vs. Japan) entered as the between-subjects variable, and age and sex entered as covariates. Age and sex were entered as covariates because they are associated with life satisfaction, perceptions of change, and the EoHI specifically (Harris & Busseri, 2019; Quoidbach et al., 2013). We report the results of this analysis for the EoHI for life satisfaction and subsequently for all of other domains (family relationships, work situation, financial situation, and health).

Our next goal was to investigate the link between SE and the magnitude of the EoHI for life satisfaction (Hypothesis 2). For this analysis, we calculated a new variable for each participant designed to represent individual differences in the magnitude of the EoHI. This variable was calculated by subtracting the absolute value of predicted future change from the absolute value of reported past change. Higher values of the EoHI variable correspond to reporting that a greater amount of change occurred in the past than is predicted to occur in the future. We then used the EoHI variable as an outcome variable within a series of regression and mediation analysis. First, we used multiple regression to test for associations between SE and the EoHI in each cultural context, by entering SE, age, and sex as predictor variables and EoHI values as the criterion variable. For multiple regression, we report the strength of the association between SE and EoHI within each culture and the significance of the interaction coefficient for culture. The interaction coefficient for culture tests if the relationship between SE and EoHI values is different according to cultural context (US vs. Japan). We then formally tested if SE mediates the link between culture and the EoHI for life satisfaction (Hypothesis 3). We used a path analysis and entered SE as the mediator between culture (US vs. Japan) and susceptibility to the EoHI, with age and sex entered as covariates using the PROCESS v3.5

macro in SPSS 26 (Model 4), and bootstrapping, with a total of 5,000 permutations (Preacher & Hayes, 2008).
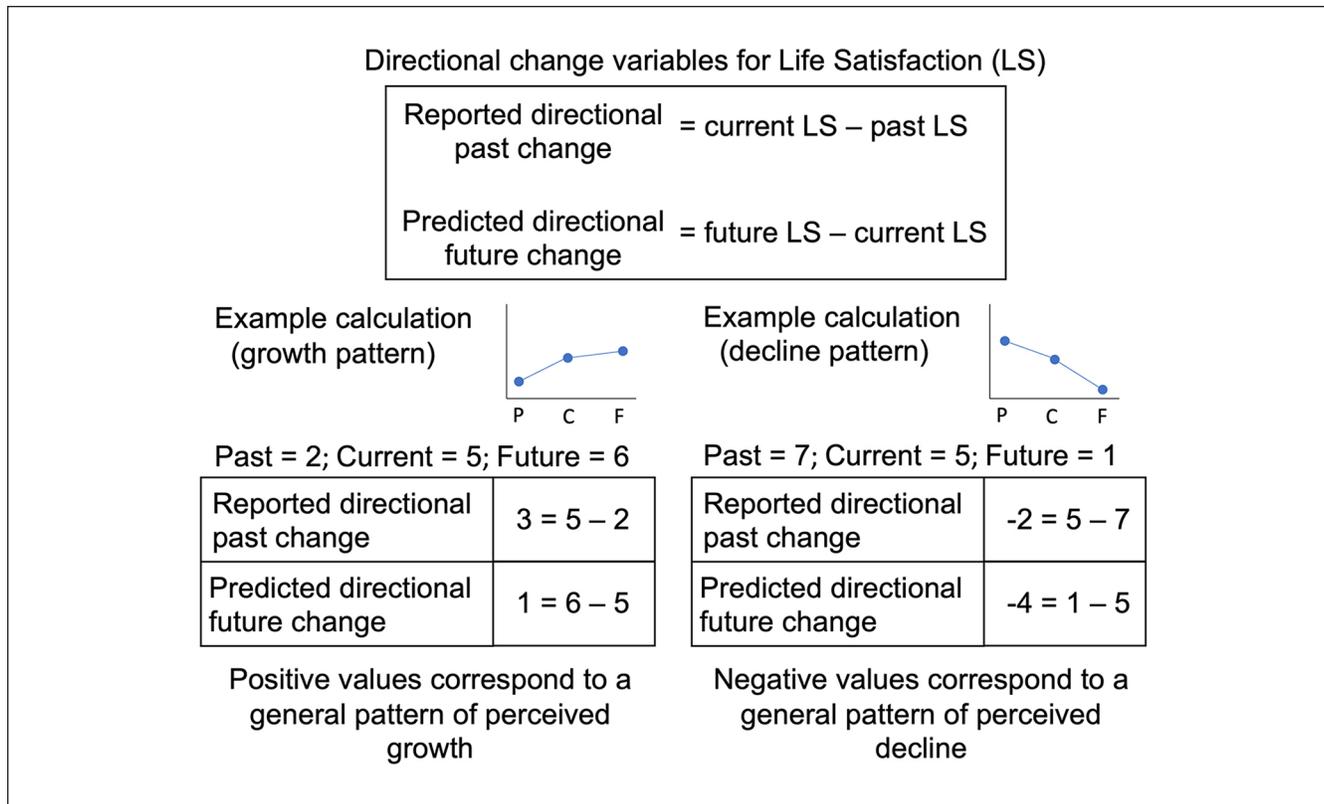
Our final goal for Study 1 was to compare the pattern and direction of reported past and predicted future change between cultures (Hypothesis 4). This analysis was motivated by prior evidence that those in WEIRD cultures tend to self-enhance more than Japanese (Kobayashi & Brown, 2003; Ross et al., 2005) and that derogating one's past self can serve to bolster one's current self-concept (Wilson & Ross, 2001). To characterize the direction of reported past and predicted future change, we calculated new past and future change variables (Figure 1). We operationally defined reported (directional) past change as the difference between current ratings and past ratings (current–past). We operationally defined predicted (directional) future change as the difference between future ratings and current ratings (future–current). Across both directional change variables, higher values correspond to the belief that one's status (i.e., life satisfaction) is "better off" as compared with an earlier point in time (i.e., growth pattern). Higher reported (directional) past change values represent the belief that one is currently "better off" than in the past, and higher predicted (directional) future change values represent the belief that one will be "better off" in the future than they currently are.

We used multiple regression to test for the effect of culture on directional change. We ran two sets of multiple regression analyses, one for reported past and one for predicted future change. Each multiple regression analysis was conducted with culture, age, and sex entered as predictor variables and change values entered as criterion variable. We report the significance of the coefficients for culture. The significance of the coefficient for culture indicates if directional change values differs according to cultural context (US vs. Japan), while controlling for age and sex.

Results

Because of heterogeneity across participants in responses to items, the sample sizes used within each statistical analysis are sometimes different from one another. The sample sizes and demographics for each variable are provided in Table 1.

Comparing the EoHI between cultures. We first tested for an interaction between culture and condition (past vs. future) for absolute change values for life satisfaction (Hypothesis 1). The results of a repeated measures ANCOVA, with condition entered as the within-subjects variable, and country entered as the between-subjects variable, with age and sex entered as covariates, revealed a significant interaction between culture and condition on absolute change values, $F(1,4959) = 12.08$, $p = .001$, partial $\eta^2 = .002$ (Figure 2). While both cultures showed an effect of condition on absolute change values, US: $F(1,3940) = 65.67$, $p < .001$, partial $\eta^2 = .016$, Japan:

Directional change variables for Life Satisfaction (LS)

| Reported directional past change | = current LS – past LS |
| Predicted directional future change | = future LS – current LS |

| Example calculation (growth pattern) | | Example calculation (decline pattern) | |

P   C   F

P   C   F

Past = 2; Current = 5; Future = 6

Past = 7; Current = 5; Future = 1

| Reported directional past change | 3 = 5 – 2 |
| Predicted directional future change | 1 = 6 – 5 |

| Reported directional past change | -2 = 5 – 7 |
| Predicted directional future change | -4 = 1 – 5 |

Positive values correspond to a general pattern of perceived growth

Negative values correspond to a general pattern of perceived decline

Figure 1. Equations used to calculate directional change variables.
Note. The resultant values represent the tendency to report and predict that one's life is generally improving as time moves forward (left panel) (growth: positive values), or to report and predict that one's life is generally declining as time moves forward (right panel) (decline: negative values). P = past; C = current; F = future; LS = life satisfaction.

$F(1,1017) = 9.91$, $p = .002$, partial $\eta^2 = .01$, the difference between the past and future conditions was greater in the US ($\Delta = .338$) than in Japan ($\Delta = .156$). U.S. Americans tended to report a greater amount of past change, relative to the future change, than did Japanese.

We then tested for an interaction between culture and condition (past vs. future) on absolute change values for each of the other psychological domains. We found a significant Culture $\times$ Condition interaction on absolute change values for family relationships, $F(1,3587) = 26.41$, $p < .001$, partial $\eta^2 = .007$, and work situation, $F(1,4631) = 23.19$, $p < .001$, partial $\eta^2 = .005$, but not for financial situation, $F(1,4939) = .30$, $p = 58$, partial $\eta^2 = .000$, or health, $F(1,5012) = 1.91$, $p = .17$, partial $\eta^2 = .000$. Because the EoHI for life satisfaction has been shown to differ according to age group (Harris & Busseri, 2019), we also tested for a Culture $\times$ Condition interaction within younger (US: $n = 2,626$, mean age: US = 45.60, Japan: $n = 506$, mean age = 41.97) and older (US: $n = 2,334$, mean age: US = 66.51, Japan, $n = 521$, mean age = 66.97) cohorts within our sample. We found that the interaction between culture and condition remained significant in both younger, $F(1,2506) = 4.78$, $p = .03$, partial $\eta^2 = .00$, and older $F(1,2449) = 3.90$, $p = .048$, partial $\eta^2 = .002$ cohorts.

Self-esteem and the EoHI. For Hypothesis 2, we tested for associations between individual differences in SE and the EoHI for life satisfaction and subsequently for the other psychological domains (Table 2). We found that higher SE was associated with larger EoHI values for life satisfaction in U.S. America, but not in Japan. SE was also negatively associated with the EoHI values for health in U.S. America and EoHI values for financial situation in Japan.

Next, we investigated whether individual differences in SE mediated the link between culture and the EoHI for life satisfaction (Hypothesis 3). The mediation model was run with culture (Japan = 0, US = 1) entered as the predictor (x) variable, EoHI values entered as the criterion (y) variable, and SE entered as the mediator, with age and sex entered as covariates. We found a significant indirect effect of SE on the link between culture and the EoHI for life satisfaction (95% confidence interval [CI]: [.0031, .0981]) (Figure 3). Because we also found cultural differences in the EoHI for family relationships and work situation, we also tested for an indirect effect of SE on the link between culture and the EoHI for these domains. The results of these analyses showed that SE did not mediate the link between culture the EoHI for family relationships (95% CI: [−.0998, .0359]) or work situation (95% CI: [−.0694, .0691]).

Table 1. Sample Sizes and Demographics for Each Variable in Study 1.

Variables	US					Japan						
	M	SD	N	m/f	Age, M (SD)	M	SD	n	m/f	Age, M (SD)	t	p
EoHI												
Life satisfaction	0.338	1.71	3,943	1,771/2,172	55.99 (12.53)	0.156	1.77	1,020	503/507	54.30 (14.13)	3.01	<.001
Family relationships	0.779	1.99	2,952	1,450/1,502	55.14 (11.93)	0.319	1.63	639	335/304	56.18 (12.69)	5.45	<.001
Work situation	0.615	2.41	3,656	1,652/2,004	55.06 (11.88)	0.247	2.34	979	483/496	53.74 (14.02)	4.26	<.001
Financial situation	0.546	1.93	3,927	1,763/2,164	55.69 (12.26)	0.498	2.20	1,016	501/515	54.22 (14.12)	0.69	.492
Health	0.387	1.50	3,995	1,787/2,208	56.11 (12.30)	0.335	1.89	1,021	503/518	54.27 (14.09)	0.93	.351
Directional past change												
Life satisfaction	0.451	1.85	3,981	1,782/2,199	56.14 (12.35)	−0.236	2.09	1,025	504/521	54.37 (14.16)	10.30	<.001
Family relationships	0.693	2.27	2,980	1,458/1,522	55.25 (12.00)	−0.033	1.73	669	344/325	56.70 (12.86)	7.77	<.001
Work situation	0.371	2.79	3,730	1,680/2,050	55.31 (11.98)	−0.529	2.59	998	494/504	53.97 (14.07)	9.18	<.001
Financial situation	0.164	2.58	3,957	1,771/2,186	56.09 (12.33)	−0.871	2.63	1,020	503/517	54.30 (14.16)	11.37	<.001
Health	−0.815	1.84	4,018	1,795/2,223	56.21 (12.36)	−0.966	2.26	1,026	505/521	54.38 (14.14)	2.23	.026
Directional future change												
Life satisfaction	0.183	1.49	3,947	1,771/2,176	55.99 (12.26)	−0.081	1.84	1,020	503/517	54.30 (14.13)	4.80	<.001
Family relationships	0.423	1.05	3,003	1,471/1,532	55.04 (11.93)	0.069	1.23	697	370/327	54.59 (13.44)	7.78	<.001
Work situation	0.129	2.24	3,661	1,652/2,009	55.07 (11.89)	−0.363	2.27	982	483/499	53.74 (14.01)	6.09	<.001
Financial situation	0.638	1.97	3,930	1,764/2,166	55.97 (12.26)	−0.151	2.08	1,016	501/515	54.22 (14.12)	11.24	<.001
Health	−0.660	1.44	3,998	1,788/2,210	56.11 (12.31)	−1.048	1.63	1,022	503/519	54.25 (14.09)	7.46	<.001
Self-esteem	37.67	7.40	4,017	1,795/2,222	56.19 (12.39)	31.02	5.58	1,021	501/520	54.26 (14.13)	26.81	<.001

Note. EoHI values were calculated by subtracting the absolute value of perceived future change from the absolute value of perceived past change (past − future). Directional past change values were calculated by subtracting past from current evaluations (current − past). Directional future change values were calculated by subtracting current from future evaluations (future − current). m/f = male/female; EoHI = End of History Illusion.
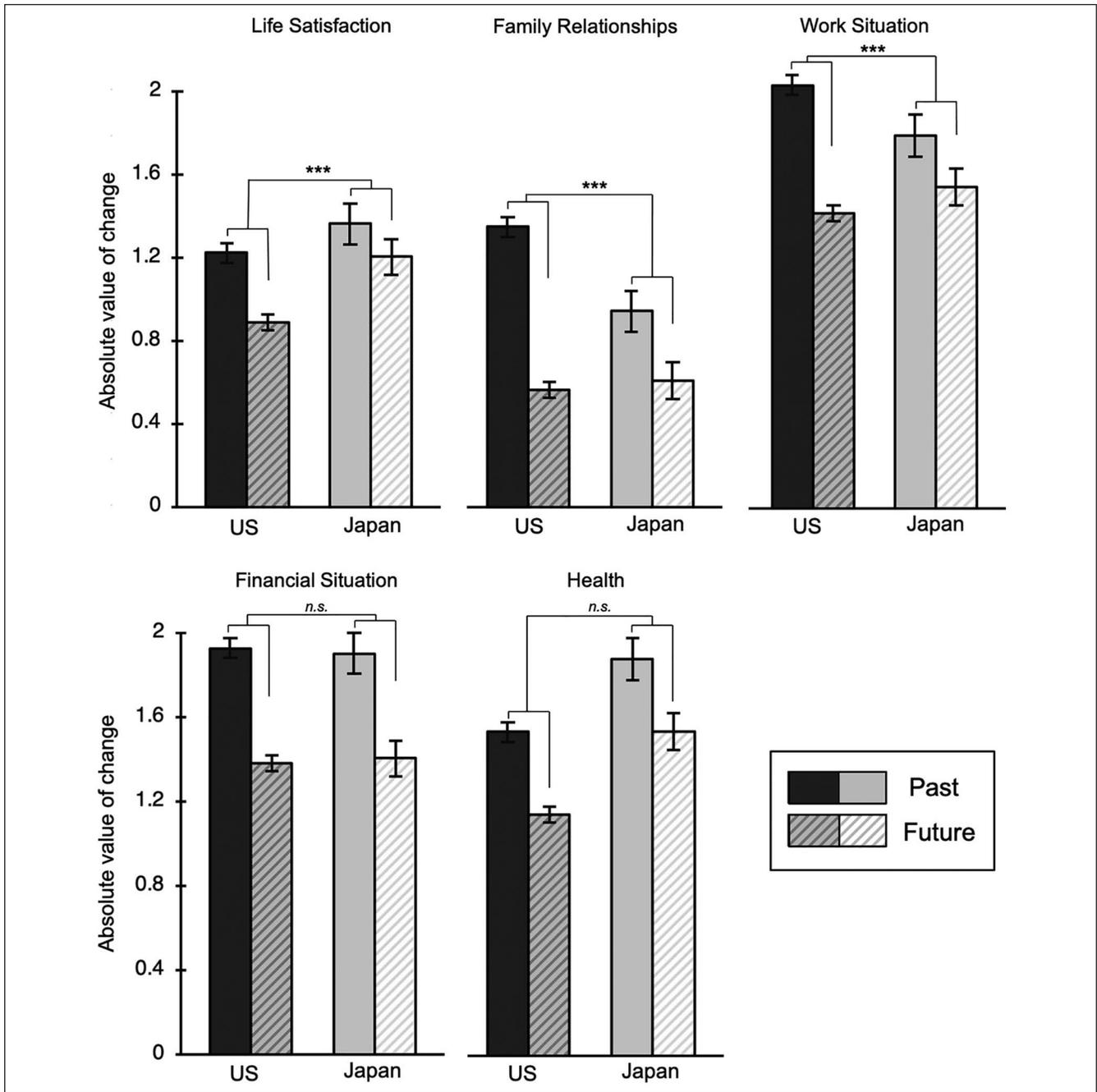
Figure 2. Average absolute reported past and predicted change for all psychological domains in study 1.
Note. Error bars indicate 95% confidence interval from the mean. *n.s.* = not signficant.
***$p < .001$.

Cultural differences in the pattern of the EoHI. We tested Hypothesis 4 by calculating the difference between current and reported past evaluations, and between predicted future and current evaluations. Thus, across all change scores, higher values represent growth toward becoming higher on each respective psychological domain as time moves from the past toward the future. Figure 4 displays the average pattern of the reported past and predicted future change for each psychological domain.

We conducted a series of multiple regression analyses, with culture, age, and sex entered as predictor variables, and directional past and future change values entered as the criterion variable (Table 3). For reported past change averaged all psychological domains, we found a significant effect of culture; U.S. Americans tended to report that the past was more negative than their current state (average directional change $= -.536$), while Japanese tended to report the past was more positive than their current state (average directional change

Table 2. The Association Between Self-Esteem and the End of History Illusion for Study 1.

Variables	Self-esteem			
	B	95% CI	t	p
Life satisfaction				
US	.011	[.00, .02]	3.00	.003
Japan	−.012	[−.03, .01]	1.26	.210
Interaction	.022	[.00, .04]	2.14	.033
Family relationships				
US	−.004	[−.01, .01]	.80	.426
Japan	−.008	[−.03, .01]	.73	.467
Interaction	.005	[−.02, .03]	.31	.755
Work situation				
US	.002	[−.01, .01]	.37	.713
Japan	−.008	[−.03, .19]	.27	.571
Interaction	.007	[−.02, .04]	.45	.651
Financial situation				
US	.000	[−.01, .01]	.11	.909
Japan	−.034	[−.06, −.01]	2.73	.007
Interaction	.033	[.01, .06]	2.79	.005
Health				
US	−.008	[−.01, −.00]	2.43	.015
Japan	−.014	[−.04, .01]	1.34	.179
Interaction	.007	[−.01, .03]	.78	.438

Note. Unstandardized parameter estimates (*B*) and 95% confidence intervals (CI) for linear effects.
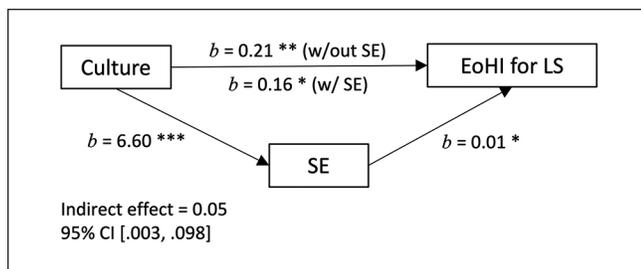
Figure 3. Results of mediation analysis for Study 1.
Note. The model depicts the indirect effect of SE on the link between culture (Japan = 0, US = 1), and the magnitude of the EoHI for LS.
SE = self-esteem; EoHI = End of History Illusion; LS = life satisfaction.
*p < .05. **p < .005. ***p < .001.

= .247) (lower right panel: Figure 4) (*B* = .742, 95% CI: [.63, .86], *t* = 12.66, *p* < .001). For predicted future change averaged across all psychological domains, we also found a significant effect of culture, U.S. Americans tended to predict the future would be more positive than their current state (average directional change = .197), while Japanese tended to predict the future would be more negative than their current state (average directional change = −.338) (lower right panel: Figure 4) (*B* = .533, 95% CI: [.46, .61], *t* = 13.42, *p* < .001).

Discussion

In Study 1, we found a cultural difference in the magnitude of the EoHI. When thinking about life satisfaction, U.S. Americans tended to report a greater amount of past change, relative to future change, than did Japanese. We also found that SE mediates the observed cultural difference in the magnitude of the EoHI for life satisfaction, indicating that one reason why U.S. Americans display a greater EoHI for life satisfaction than Japanese is because they show more self-enhancement motivation. We also found a robust and consistent cultural difference in directional reported past and predicted future change. While U.S. Americans consistently reported the past more negatively than their current state (with the exception of health), Japanese tended to think about the past in a more positive light. These findings suggest that one reason why the EoHI differs according to cultural context is because of differences in motivation to see one's current self in a positive light. In Study 2, we sought to build on these findings and investigate psychological constructs more closely linked to people's self-concepts (ie., personality). In Study 2, we measured the EoHI for Big-5 personality traits, SE, and confidence in how well people know themselves (i.e., self-concept clarity).

Study 2: Cultural Differences in the EoHI for Personality Traits

In Study 2, we sought to build on the findings from Study 1, by re-testing Hypotheses 1 to 4, and to test a series of additional specific Hypotheses (5 and 6). In Study 2, we measured the EoHI for personality traits within U.S. American and Japanese cultural contexts, based on samples with a lower average age than in Study 1. Prior research demonstrates the EoHI for personality traits within a WEIRD cultural context (Quoidbach et al., 2013), and extant evidence demonstrates that U.S. Americans and Japanese differ in many aspects of the self (Cousins, 1989; Kitayama et al., 1997). It is currently unknown how the EoHI for personality traits may manifest in non-WEIRD cultural contexts (Henrich et al., 2010).

One reason why the EoHI may manifest differently according to cultural context is because of cultural differences in self-concepts. Thus, because personality traits closely represent the way people think about themselves, the EoHI for personality traits may manifest differently within U.S. American and Japanese contexts. Furthermore, in Study 1 we found that SE mediated the link between culture and the EoHI for life satisfaction. In Study 2, we again tested for an indirect effect of SE on the link between culture and the magnitude of the EoHI. However, we also sought to build on our explanatory model by including a measure of confidence that one knows themselves well (SCC: Campbell et al., 1996). For personality traits, we predicted that both SE and SCC
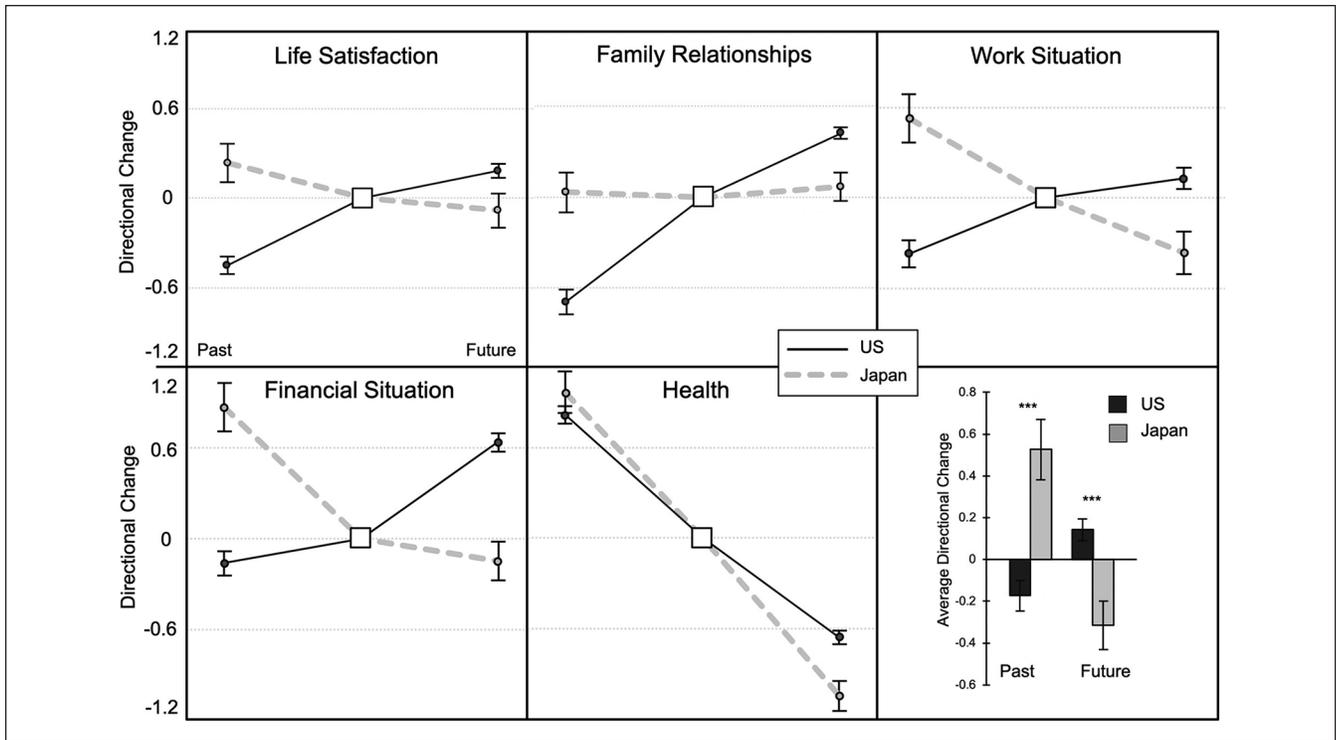
Figure 4. Reported past and predicted future directional change for each culture.

Note. Reported past change was calculated by subtracting past ratings from current ratings (current − past). Predicted future change was calculated by subtracting current ratings from future ratings (future − current). To optimally illustrate perceived past and predicted future change, each data series is anchored to the current evaluation, as indicated by the square data point in the center of each panel. Error bars indicate 95% confidence interval from the mean.

***p < .001.

Table 3. The Association Between Culture (United Sates vs. Japan) on Directional Reported Past and Predicated Future Change for Study 1.

| | Perceived directional change | | | | | | | |
| | Reported past | | | | Predicted future | | | |
Effect of culture on:	B	95% CI	t	p	B	95% CI	t	p
Life satisfaction	0.720	[0.59, 0.85]	10.90	.000	.354	[0.26, 0.45]	7.09	.000
Family relationships	0.693	[0.51, −0.88]	7.46	.000	.363	[0.28, 0.45]	8.22	.000
Work situation	0.914	[0.72, 1.11]	9.34	.000	.572	[0.42, 0.72]	7.46	.000
Financial situation	1.099	[0.92, 1.28]	12.19	.000	.895	[0.77, 1.02]	13.78	.000
Health	0.161	[0.03, 0.29]	2.38	.017	.446	[0.35, 0.54]	8.94	.000

Note. Unstandardized parameter estimates (*B*) and 95% confidence intervals (CI) for linear effects.

would mediate the link between culture and the magnitude EoHI (Hypothesis 3). Furthermore, as in Study 2, we also measured and compared reported past and predicted future directional change for personality traits between cultural contexts. Based on temporal self-appraisal theory (Wilson & Ross, 2001), and evidence that those in WEIRD cultures tend to self-enhance more than Japanese (Ross et al., 2005), we predicted that U.S. Americans would report that their past personality traits were more negative (i.e., less socially desirable) than their current personality traits, as compared with

Japanese (Hypothesis 4). Finally, we investigated the specific roles that SE and SCC play in the EoHI. One way that the EoHI may contribute to SE is by enhancing one's view of their current self by derogating their past selves. Thus, SE may be associated with greater directional past change and mediate the link between culture and the magnitude of reported directional past change (Hypothesis 5). One way that the EoHI may contribute to SCC is by preserving the belief that one knows themselves well, and will not change in the future. Thus, SCC may be negatively associated with

predicted absolute future change and mediate the link between culture and the magnitude of predicted absolute future change (Hypothesis 6).

Method

Participants. A power analysis using an alpha level set to .05 indicated that a sample size of 592 per group was necessary to detect a small effect size ($f^2 = 0.04$) with a high level of power (99%) (Faul et al., 2007). We recruited 1,609 participants (US: $n = 815$, Japan: $n = 794$) using internet-based crowdsourcing websites in the United States (https://mturk.com) (301 females, mean age = 36.27 years, $SD = 10.89$) and Japan (https://lancers.jp) (368 females, mean age = 40.13 years, $SD = 10.37$) to take part in a study on "human characteristics and attributes."

Measures

Personality traits. Participants completed the English (Gosling et al., 2003) and Japanese (Oshio et al., 2012) versions of the Ten Item Personality Inventory (TIPI) for their current selves. Participants also completed the TIPI as if they were themselves 10 years in the past and as if they were themselves 10 years in the future. All participants first completed the TIPI for their current selves; however, the order for the past and future TIPI scales was counterbalanced across participants (US: 50.7% past-future, Japan: 50.0% past-future). The TIPI was originally developed for the English language but has been subsequently translated and validated for Japanese (Oshio et al., 2012, 2014). Relibility coeficients were within the accpetable range (averaged within trait and across time: US, $\alpha = .74$; Japan, $\alpha = .87$).

Self-esteem. Participants completed the English (Rosenberg, 2015) and Japanese (Mimura & Griffiths, 2007) versions of the Rosenberg self-esteem scale (US, $\alpha = .86$; Japan, $\alpha = .91$). Both versions have been shown to be valid and reliable within U.S. American and Japanese cultural contexts (Kobayashi & Brown, 2003). MGCFA confirmed partial configural and metric, but not scalar, equivalence across cultures (Supplementary Table 1).

Self-concept clarity. Participants completed the English (Campbell et al., 1996) and Japanese (Tokunaga & Horiuchi, 2012) versions of the self-concept clarity scale (US, $\alpha = .94$; Japan, $\alpha = .83$). Both versions have been shown to be valid reliable within U.S. American and Japanese cultural contexts (Tokunaga & Horiuchi, 2012). MGCFA confirmed partial configural and metric, but not scalar, equivalence across cultures (Supplementary Table 1).

Statistical analysis. As in Study 1, for each participant we operationally defined reported past change as the absolute value of the difference between current personality rating and their reported rating for themselves 10 years in the past.

We operationally defined predicted future change as the absolute value of the difference between current personality rating and their rating for themselves 10 years in the future. The absolute value of the difference for current–past or current–future was calculated for each of the 10 items within the TIPI, and then averaged across all Big-5 traits, and then for each trait.

Also, as in study 1, we used a mixed model analysis of covariance (ANCOVA) to test for the effect of culture on the difference between reported past change and predicted future change (Hypothesis 1). The mixed model ANCOVA was structured with condition (past vs. future) entered as the within-subjects variable, culture (US vs. Japan) entered as the between-subjects variable, and age and sex entered as covariates. Age and sex were entered as covariates because they are associated with personality change throughout the lifespan (Roberts et al., 2006). We report the results of this analysis for the EoHI across all personality traits, and subsequently for each of the Big-5 personality traits: emotional stability (inverse of neuroticism), extraversion, openness to experience, agreeableness, and conscientiousness. Neuroticism scores were inversed to represent emotional stability so that higher scores across all personality traits correspond to "higher standing" in the socially desirable direction.

We then investigated the link between SE, SCC, and the magnitude of the EoHI for personality traits (Hypothesis 2). We calculated a new variable for each participant to represent the magnitude of the EoHI based on the difference between predicted future and reported past change. The EoHI for personality traits variable was used as an outcome variable within a series of regression and mediation analysis. We used a path analysis for Hypothesis 3 to test the role of SE and SCC as mediators between culture (Japan vs. US) and magnitude of the EoHI for personality traits, with age and sex entered as covariates using the PROCESS v3.5 macro in SPSS 26 (Model 4), and bootstrapping, with a total of 5,000 permutations (Preacher & Hayes, 2008). In a similar fashion as Study 1 (see Figure 1 for calculation), we measured and compared past and future directional change for personality traits between cultural contexts (Hypothesis 4).

Finally, we used multiple regression analyses to investigate the specific roles that SE and SCC play in the EoHI. The reason why SE may be associated with the EoHI may be based on the tendency to derogate one's past self. WEIRD cultures are associated with an increased tendency to derogate past selves to preserve or enhance their current selves (Ross et al., 2005; Wilson & Ross, 2001). Thus, SE may be linked to directional past change. The reason why SCC may be associated with the EoHI may be based on the motivation to preserve the belief that one knows themselves well, and will not change in the future. Thus, SCC may be linked to absolute future change.

Because we were interested in understanding the unique effects for SE and SCC, for each regression where SE was

entered as a predictor, we entered SCC as a covariate, and for each regression where SCC was entered as a predictor, we entered SE as covariate. For SE, we entered SE as the predictor variable and reported directional past change as the criterion variable, with SCC, age, and sex entered as covariates. For SCC, we entered SCC as the predictor variable and predicted absolute future change as the criterion variable, with SE, age, and sex entered as covariates. Finally, we formally tested for the unique roles of SE and SCC as mediators between culture and directional past and absolute future, respectively, by conducting a series of path analyses (Preacher & Hayes, 2008) (Hypotheses 5 and 6). For each model with SE as the mediator, we controlled for SCC, and for each model with SCC as the mediator, we controlled for SE.

Results

Cultural differences in the EoHI for personality traits. We first tested for an interaction between culture and condition (past vs. future) for absolute change values averaged across all personality traits (Hypothesis 1). The results of a repeated measures ANCOVA, with condition entered as the within-subjects variable, and country entered as the between-subjects variable, with age and sex entered as covariates, revealed a significant interaction between culture and condition on absolute change values, $F(1,1654) = 8.96$, $p = .003$, partial $\eta^2 = .006$. While both cultures showed an effect of condition on absolute change values, US: $F(1,812) = 10.04$, $p = .002$, partial $\eta^2 = .012$, Japan: $F(1,791) = 12.95$, $p < .001$, partial $\eta^2 = .016$, the difference between the past and future conditions was greater in the US ($\Delta = .156$) than in Japan ($\Delta = .050$). U.S. Americans tended to report a greater amount of past change, relative to the future change, than did Japanese.

We then tested for an interaction between culture and condition (past vs. future) for change values for each of the Big-5 personality traits (Figure 5). This analysis revealed a significant Culture × Condition interaction for emotional stability (inverse of neuroticism), $F(1,1605) = 7.00$, $p = .008$, partial $\eta^2 = .004$, openness to experience, $F(1,1604) = 9.41$, $p = .002$, partial $\eta^2 = .006$, and conscientiousness, $F(1,1605) = 15.69$, $p < .001$, partial $\eta^2 = .010$, but not for extraversion, $F(1,1605) = 1.99$, $p = .159$, partial $\eta^2 = .001$, or agreeableness, $F(1,1605) = .18$, $p = .670$, partial $\eta^2 = .000$.

Self-esteem, self-concept clarity, and the EOHI for personality traits. We investigated whether individual differences in SE and SCC were associated with the magnitude of the EoHI for personality traits (Hypothesis 2) (Table 4).[2] We found that SE and SCC were positively associated with EoHI values for personality traits in the US, and SCC was positively associated with EoHI values for personality traits in Japan. We also observed a moderating effect of culture on the link between SE and EoHI values for personality traits.

We then conducted a path analysis to test for indirect effects of SE and SCC on the link between culture and magnitude of the EoHI for personality traits (Hypothesis 3). The model was run with culture (Japan = 0, US = 1) entered as the predictor (x) variable, EoHI values for personality traits entered as the criterion (y) variable, and SE and SCC entered as mediators, with age and sex entered as covariates. This analysis revealed significant indirect effects of both SE and SCC on the association between culture and the EoHI for personality traits (95% CI: [.0030, .0763]) (Figure 6).

Cultural differences in the pattern of the EoHI for personality traits. To test Hypothesis 4, we calculated difference scores between current and past evaluations, and between future and current evaluations. Thus, across all change scores, higher values represent growth toward becoming higher (in the socially desirable direction) on each personality trait as time moves forward (see Figure 1 for calculation). Figure 7 displays the average pattern of reported past and predicted future change for each personality trait. Table 5 presents the results of a series of multiple regression analyses, with culture, age, and sex entered as predictor variables, and directional past and future change values entered as the criterion variable. For reported past change, averaged across all personality traits, we found a significant effect of culture; U.S. Americans tended report their past selves more negatively than their current selves (average directional change = −.245), while Japanese tended to report their past selves relatively similar to their current selves (average directional change = .062) (Figure 7: lower right panel) ($B = .280$, 95% CI: [.22, .34], $t = 8.88$, $p < .001$). For predicted future change, averaged across all personality traits, we found a significant effect of culture; Japanese showed a stronger tendency to report their future selves' more positively than their current selves' (average directional change = .206), than did Americans (average directional change = .096) (Figure 7: lower right panel) ($B = −.139$, 95% CI: [−.19, −.08], $t = 4.99$, $p < .001$).

Next, we tested for the effect of culture on directional change for each personality trait (Figure 7 and Table 5). For reported past change, we found a robust and consistent pattern across all personality traits; Americans tended to evaluate their past selves relative to their current selves, more negatively than Japanese. For future change, we found an effect of culture on predicted future change for emotional stability, extraversion, and conscientiousness, but not for openness to experience of agreeableness.

Perceived change, self-esteem, and self-concept clarity. We conducted a series of analyses designed to investigate the specific roles that SE and SCC play in the EoHI for personality traits (Hypotheses 5 and 6). The reason why SE may be associated with the EoHI may be based on the tendency to derogate one's past self. As evidenced by research on temporal self-appraisal theory, people tend to derogate their past selves
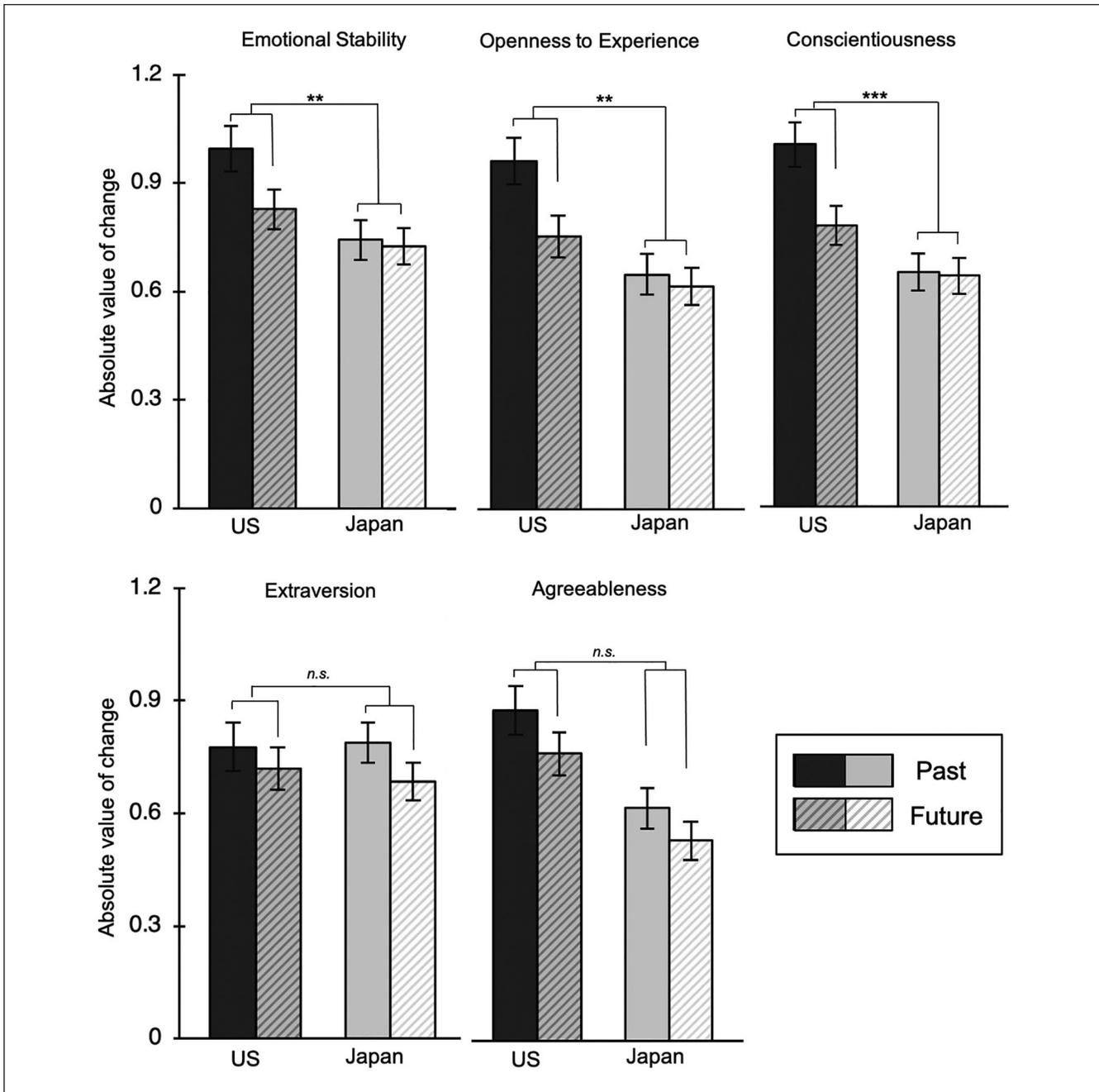
Figure 5. Average absolute reported past and predicted change for all personality traits in Study 2.
*Note.* Error bars indicate 95% confidence interval from the mean. *n.s.* = not signficant.
**$p < .005$. ***$p < .001$.

Table 4. The Association Between Self-Esteem, Self-Concept Clarity, and the End of History Illusion for Personality Traits.

EoHI for personality	Self-esteem				Self-concept clarity			
	B	95% CI	*t*	*p*	*B*	95% CI	*t*	*p*
US	.208	[.14, .28]	5.99	.000	.124	[.09, .16]	7.37	.000
Japan	.048	[−.01, .10]	1.69	.092	.080	[.02, .13]	2.67	.004
Interaction	.160	[.07, .25]	3.57	.000	.049	[−.02, .11]	1.48	.139

Note. Unstandardized parameter estimates (*B*) and 95% confidence intervals (CI) for linear effects.
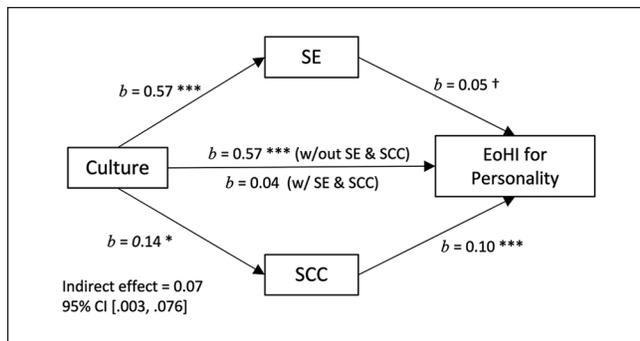
Figure 6. Results of mediation analysis for personality traits (Study 2).
Note. The model depicts the indirect effect of SE and SCC on the link between culture (Japan = 0, US = 1), and the magnitude of the EoHI for personality traits. SE = self-esteem; SCC = self-concept clarity; EoHI = End of History Illusion.
†*p* < .10. **p* < .05. ***p* < .005. ****p* < .001.

to preserve or enhance their current selves (Ross et al., 2005; Wilson & Ross, 2001). Thus, SE may be linked to directional past change. The reason why SCC may be associated with the EoHI may be based on the motivation to preserve the belief that one knows themselves well, and will not change in the future. Thus, SCC may be linked to any type of future change, irrespective of direction (i.e., absolute future change). These predictions were supported in our data for the EoHI for personality traits. Across both cultures, SE was associated greater directional past change, while controlling for SCC, age, and sex (*B* = .268, 95% CI: [.22, .32], *t* = 10.14, *p* < .001) and SCC was associated with reduced absolute future change, while controlling for SE, age, and sex (*B* = −.129, 95% CI: [−.16, −.10], *t* = 8.87, *p* < .001).

We then tested for the unique roles of SE and SCC as mediators on the link between culture and reported directional past and predicted absolute future, respectively, by conducting a series of path analyses. For each model with SE as the mediator, we controlled for SCC, and for each model with SCC as the mediator, we controlled for SE. For Hypothesis 5, we found that SE mediated the link between culture and reported directional past change (controlling for SCC, age, and sex) (95% CI: [.0745, .1477]) (Figure 8), while SCC did not (controlling for SE, age, and sex) (95% CI: [−.0329, −.0023]). For Hypothesis 6, we found that SCC mediated the link between culture and predicted absolute future change (controlling for SE, age, and sex) (95% CI: [.0259, .0606]), while SE did not (controlling for SCC, age, and sex) (95% CI: [−.0298, .0338]).

Together, the results of study 2 show that the EoHI for personality traits differs according to cultural context; U.S. Americans displayed a larger magnitude of the EoHI than their Japanese counterparts. We also found that individual differences in aspects of the self (self-esteem and self-concept clarity) mediated the link between culture and the magnitude of the EoHI, and that U.S. Americans think about their

past selves more negatively than Japanese. Finally, we found that SE and SCC play specific roles in the EoHI. SE is associated with greater directional past change and mediates the link between culture and the magnitude of reported directional past change, while SCC is associated with predicted absolute future change and mediates the link between culture and the magnitude of predicted absolute future change.

General Discussion

These findings advance the understanding of EoHI in several important ways. First, we show the magnitude of the EoHI differs according to cultural context. Although both U.S. Americans and Japanese tend to display the EoHI, the magnitude of the illusion is greater for U.S. Americans than Japanese. We provide empirical support for the theory that the why the EoHI occurs, is in part, in order to preserve positive current self-concepts (SE), and confidence that one knows themselves well (SCC). We also provide new information about the EoHI by measuring and comparing directional change. This analysis yielded robust and consistent evidence that culture is associated with differences in the way the past is remembered. Across a broad range of psychological domains, U.S. Americans think about the past in a more negative light than Japanese. Cultural context was also associated with some differences in the way the future is imagined. Finally, we demonstrate that SE plays an important specific role in explaining cultural differences in directional past change for personality traits, and SCC plays an important specific role in explaining cultural differences in predicted absolute future change for personality traits.

The EoHI serves as a proxy to how many aspects of one's life story is construed. In spite of recognizing that a great deal of flux occurred in the past, people show a tendency to believe that they have reached a moment in time where things will now be more stable. The affinity toward stability and confidence to predict the future is likely present, although variable, across many different cultural contexts. By also analyzing our data using a directional approach, we were able to show that in many cases, people construe their past as largely comprised of growth and improvement, as opposed to decline. This finding supports temporal self-appraisal theory (Wilson & Ross, 2001) and that people are drawn toward stories involving personal growth and redemption. People within WEIRD cultural contexts (especially U.S. Americans) show a particularly high affinity toward life stories involving redemption and rags-to-riches experiences (Guo et al., 2016; McAdams, 2013).

Cultural Differences in Temporal Orientation

These findings compliment prior evidence of cultural differences in temporal orientation. Several empirical studies show that several East Asian cultures including Japan are more orientated toward the past than U.S. Americans (Gao,
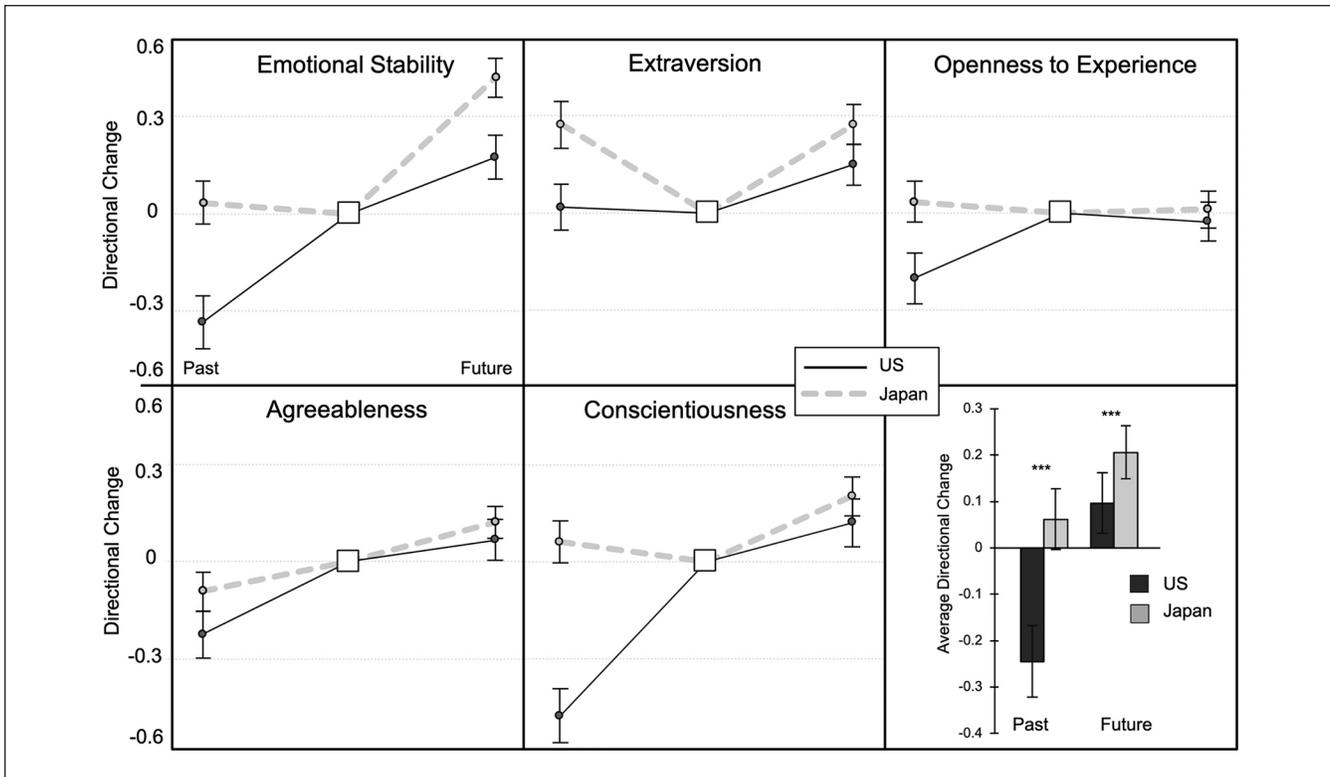
Figure 7. Reported past and predicted future directional change for personality traits for each culture.

Note. Reported past change was calculated by subtracting past ratings from current ratings (current − past). Predicted future change was calculated by subtracting current ratings from future ratings (future − current). To optimally illustrate perceived past and predicted future change, each data series is anchored to the current evaluation, as indicated by the square data point in the center of each panel. Error bars indicate 95% confidence interval from the mean.

***p < .001.

Table 5. The Association Between Culture (United Sates vs. Japan) on Directional Reported Past and Predicated Future Change for Personality Traits.

	Perceived directional change							
	Reported past				Predicted future			
Effect of culture on:	*B*	95% CI	*t*	*p*	*B*	95% CI	*t*	*p*
Emotional stability	.361	[.25, .47]	6.55	.000	−.258	[−.35, −.17]	5.57	.000
Extraversion	.236	[.13, .34]	4.48	.000	−.163	[−.25, −.07]	3.58	.000
Openness to experience	.189	[.09, .29]	3.63	.000	−.067	[−.15, .02]	1.56	.118
Agreeableness	.128	[.03, .23]	2.60	.009	−.071	[−.15, .01]	1.69	.091
Conscientiousness	.487	[.38, .60]	8.77	.000	−.138	[−.23, −.04]	2.81	.005

Note. Unstandardized parameter estimates (*B*) and 95% confidence intervals (CI) for linear effects.

2016). One possible interpretation of prior evidence of cultural differences in temporal orientation and our current findings is that culture is associated with differences in the accuracy of remembering the past. Although there is some evidence that cultural differences in memory accuracy do sometimes occur, the accuracy advantage shifts between cultures according to what is being remembered, how it was encoded, and how it is being measured (Gutchess & Huff,

2016). For example, some research shows that Chinese show improved memory accuracy for contexts, while U.S. Americans show improved memory accuracy for objects (Chua et al., 2005). Other research shows no effect of culture for general item level memory but improved accuracy of European Americans for objects when shown in isolation (Millar et al., 2013). For episodic memory, there exists some evidence of Chinese having an advantage (Ji et al., 2000),
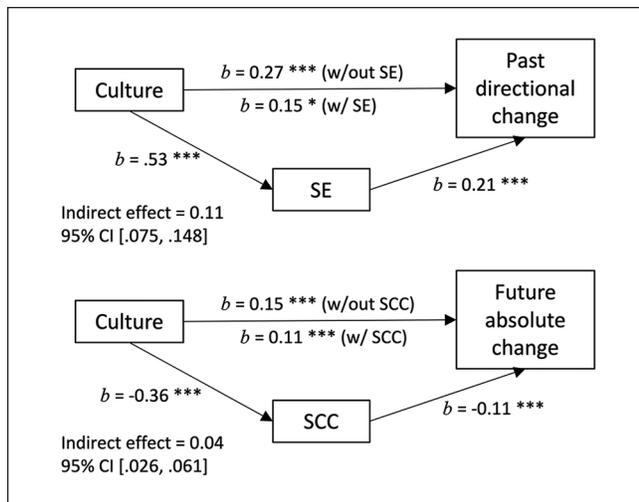
Figure 8. Results of time specific mediation analysis for personality traits (Study 2).
Note. The top model depicts the indirect effect of SE on the link between culture (Japan = 1, US = 2) and reported directional past change. The bottom model depicts the indirect effect of SCC on the link between culture (Japan = 0, US = 1) and predicted absolute future change. SE = self-esteem; SCC = self-concept clarity; CI = confidence interval. *$p < .05$. **$p < .005$. ***$p < .001$.

while other evidence that U.S. Americans have an advantage (Wang, 2009; Wang et al., 2011).

In the context of the EoHI, we found consistent evidence of cultural differences in the way the past is remembered but also in the way the future is predicted. In Study 1, we found that U.S. Americans predicted the future more positively, than Japanese, and in Study 2, we found Japanese predicted more socially desirable personality growth in the future than U.S. Americans. The observation that culture is associated with differences in the way the future is predicted does not support the interpretation that memory accuracy strongly impacts the current findings. Furthermore, the mediation analyses in both studies support the interpretation that SE mediated the links between culture and EoHI magnitude. If memory accuracy strongly influenced observed cultural differences in the EoHI, the path between culture and EoHI magnitude would likely remain statistically significant when SE is entered as a mediator. Taken together, there is little empirical support that observed differences in the EoHI are based on any generalized cultural differences in memory accuracy.

Culture and Life Satisfaction

We found cultural differences in the magnitude and pattern of the EoHI for life satisfaction. U.S. Americans tended to show a larger EoHI, reported their past more negatively and predicted their future more positively than Japanese. This finding is consistent with other research showing cultural differences in perceived changes (reported and predicted) in

life satisfaction (Löckenhoff et al., 2009) and that Japanese tend to predict less positive change in the future for life satisfaction than Americans (Hong et al., 2019).

In terms of actual life satisfaction, some large-scale studies show that culture is associated with mean level differences in current life satisfaction (Cheng et al., 2016; Diener & Diener, 1995) but tends to change in a similar way throughout the lifespan across different cultures (Blanchflower & Oswald, 2008). There also exists a growing consensus that the way life satisfaction is measured is often through an individualistic lens. Several studies show that cultural differences in life satisfaction can be accounted for by the way life satisfaction is being measured (Kwan et al., 1997; Oishi et al., 1999). For example, Krys and colleagues (2019, 2021) showed that when well-being is measured using the family as the key reference group (as opposed to the individual), the association between individualism and well-being is attenuated. These findings highlight the importance of characterizing life satisfaction and well-being using a broad array of measures. In Study 1 we also found cultural differences in the EoHI for family relationships and work situation. However, the mediation analysis demonstrated that SE mediated the link between culture and life satisfaction, but not family relationships or work situation. The observation of cultural differences in the EoHI for family relationships and work situation may, in part, reflect how relational (Schug et al., 2009) and career (Clark & Ogawa, 1992) mobility tend to differ in the United States and Japan.

Culture and Perceived Personality Change

We found cultural differences in the magnitude of the EoHI for emotional stability, openness to experience and conscientiousness, but not for extraversion or agreeableness. Across all Big-5 personality traits we found that U.S. Americans tended to report their past selves more negatively than Japanese. These findings support the theory that the link between temporal self-appraisal and self-enhancement is greater in WEIRD cultures than in East Asian collectivistic cultures, such as Japan. In terms of actual change of personality traits, some research shows that U.S. Americans display less long-term absolute changes of their personality traits than Japanese (Chopik & Kitayama, 2018; Haas & vanDellen, 2020). Interestingly, in terms of perceived changes, we found that U.S. Americans tended to report greater reported past (.928) and predicted future (.772) change than Japanese (past = .692, future = .642). This is a particularly important distinction, in that actual personality change negatively impacts well-being more for U.S. Americans than Japanese (Haas & vanDellen, 2020). Thought of together, cultural context is likely differentially associated with actual and perceived personality changes.

For the future, we found that Japanese tended to predict that they would be higher in emotional stability, extraversion, and conscientiousness than U.S. Americans. This pattern may

reflect cultural differences in the trajectory of personality development throughout the life span. Chopik and Kitayama (2018) found that actual changes in emotional stability, extraversion and conscientiousness differ between U.S. American and Japanese cultures, but actual changes in agreeableness and openness did not.

Self-Enhancement and Self-Concept Clarity

We found consistent evidence that two aspects of the self, positive self-views (self-esteem) and knowing one's self well (self-concept clarity) were important in explaining observed cultural differences in the magnitude of the EoHI, and that SE and SCC were linked with specific aspects of the EoHI for personality traits. SE mediated the link between culture and reported directional past change, and SCC mediated the link between culture and predicted absolute future change. These findings show that U.S. Americans view of their personality development is, in part, driven by their motivation to believe that they have grown and improved in relation to the past and that they will be stable moving forward in the future. These findings support the possibility that other constructs that share variance with SE and SCC, such as overconfidence and other forms of self-serving bias, may also mediate the link between culture and the EoHI. Our finding also builds on a growing body of research showing that self-enhancement motivation is greater in WEIRD cultures than in many other parts of the world (Heine, 2005) and that self-enhancement motivation comes with many direct and indirect consequences (Alicke & Sedikides, 2011).

Limitations and Conclusion

This study is limited in several ways. First, our findings are based solely on perceived change and not actual change. A longitudinal study on actual change based on the parameters in this study would take a total of 20 years. Across studies, we found evidence of partial configural and metric invariance, but not scalar invariance (cross-group equality of intercepts). Although full (strict) scalar invariance is rarely achieved in large-scale cross-cultural research (Marsh et al., 2018), we acknowledge this as an important limitation to the current report. This study is also limited in that we did not collect any other measures on temporal orientation. It will be valuable for future studies to explicitly test for links between individual differences in temporal orientation and susceptibility to the EoHI. These findings are also limited in terms of the scope of culture. The current findings are thus only generalizable to U.S. American and Japanese cultural contexts. Future research is required to test for evidence that country and culture-level metrics, such individualism/collectivism, cultural tightness-looseness (Gelfand et al., 2011), and self-construals, are linked to susceptibility of the EoHI. Finally, this study brings up new important questions about the EoHI. For example, do people tend to believe that the human species has changed more in the past than will change in the future?

In summary, life stories are central to how people think about who they are moving along in time. The EoHI helps to paint a picture that one has changed substantially in the past and is now in a relatively stable good position. Although the illusion seems to exist across different cultures, U.S. Americans seem to paint the picture of the EoHI with relatively more vivid colors than Japanese.

ORCID iD

Brian W. Haas ⓘD https://orcid.org/0000-0002-6860-448X

Supplemental Material

Supplemental material is available online with this article.

Notes

1. Some of the participants SE scores were calculated based on imputed data (see documentation of scales for MIDUS and MIDJA). We found that the pattern of all results in this study that included SE remained essentially the same when the presence of imputed data (or not) was controlled for.
2. SE and SCC were positively correlated (U.S. American: $r = .62$, $p < .001$; Japanese: $r = .43$, $p < .001$).

References

Alicke, M. D., & Sedikides, C. (2011). *Handbook of self-enhancement and self-protection*. Guilford Press.

Bauer, J. J., & McAdams, D. P. (2004). Personal growth in adults' stories of life transitions. *Journal of Personality*, *72*(3), 573–602.

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, *66*(8), 1733–1749.

Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavalle, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, *70*(1), 141–156.

Cheng, C., Cheung, M. W. L., & Montasem, A., & International Network of Well Being Studies. (2016). Explaining differences in subjective well-being across 33 nations using multilevel models: Universal personality, cultural relativity, and national income. *Journal of Personality*, *84*(1), 46–58.

Chopik, W. J., & Kitayama, S. (2018). Personality change across the life span: Insights from a cross-cultural, longitudinal study. *Journal of Personality*, *86*(3), 508–521.

Chua, H. F., Boland, J. E., & Nisbett, R. E. (2005). Cultural variation in eye movements during scene perception. *Proceedings of the National Academy of Sciences*, *102*(35), 12629–12633.

Clark, R. L., & Ogawa, N. (1992). Employment tenure and earnings profiles in Japan and the United States: Comment. *The American Economic Review*, *82*(1), 336–345.

Cousins, S. D. (1989). Culture and self-perception in Japan and the United States. *Journal of Personality and Social Psychology*, *56*(1), 124–131.

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, *68*, 653–663.

Donald, M. (2001). *A mind so rare: The evolution of human consciousness*. WW Norton & Company.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191.

Gao, X. (2016). Cultural differences between East Asian and North American in temporal orientation. *Review of General Psychology*, *20*(1), 118–127.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabecinhas, R., Chan, D., Chhokar, J., D'Amato, A., Ferrer, M., Fischlmayr, I.C., . . . Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, *332*(6033), 1100–1104.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, *37*(6), 504–528.

Guo, J., Klevan, M., & McAdams, D. P. (2016). Personality traits, ego development, and the redemptive self. *Personality and Social Psychology Bulletin*, *42*(11), 1551–1563.

Gutchess, A. H., & Huff, S. (2016). Cross-cultural differences in memory. In J. Y. Chiao, S.-C. Li, R. Seligman, & R. Turner (Eds.), *The Oxford handbook of cultural neuroscience* (pp. 155–169). Oxford University Press.

Haas, B. W., & vanDellen, M. R. (2020). Culture is associated with the experience of long-term self-concept changes. *Social Psychological and Personality Science*, *11*(8), 1047–1056.

Harris, H., & Busseri, M. A. (2019). Is there an "end of history illusion" for life satisfaction? Evidence from a three-wave longitudinal study. *Journal of Research in Personality*, *83*, Article 103869.

Heine, S. J. (2005). Where is the evidence for pancultural self-enhancement? A reply to Sedikides, Gaertner, & Toguchi. *Journal of Personality and Social Psychology*, *89*, 531–538.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, *466*(7302), Article 29.

Hong, J. H., Charles, S. T., Lee, S., & Lachman, M. E. (2019). Perceived changes in life satisfaction from the past, present and to the future: A comparison of US and Japan. *Psychology and Aging*, *34*(3), 317–329.

Ji, L.-J., Guo, T., Zhang, Z., & Messervey, D. (2009). Looking into the past: Cultural differences in perception and representation of past information. *Journal of Personality and Social Psychology*, *96*(4), 761–769.

Ji, L.-J., Schwarz, N., & Nisbett, R. E. (2000). Culture, autobiographical memory, and behavioral frequency reports:

Measurement issues in cross-cultural studies. *Personality and Social Psychology Bulletin*, *26*(5), 585–593.

Kim, Y.-H., Cai, H., Gilliland, M., Chiu, C.-Y., Xia, S., & Tam, K.-P. (2012). Standing in the glory or shadow of the past self: Cultures differ in how much the past self affects current subjective well-being. *Emotion*, *12*(5), 1111–1117.

Kitayama, S., Markus, H. R., 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*(6), 1245–1267.

Kobayashi, C., & Brown, J. D. (2003). Self-esteem and self-enhancement in Japan and America. *Journal of Cross-cultural Psychology*, *34*(5), 567–580.

Krys, K., Park, J., Kocimska-zych, A., Kosiarczyk, A., Selim, H. A., Wojtczuk-turek, A., Haas, B. W., Uchida, Y., Torres, C., Capaldi, C. A., Bond, M. H., Zelenski, J. M., Lun, V. M., Maricchiolo, F., Vauclair, C., Poláčková Šolcová, I., Sirlopú, D., Xing, C., Vignoles, V. L., . . . Adamovic, M. (2021). Personal life satisfaction as a measure of societal happiness is an individualistic presumption: Evidence from fifty countries. *Journal of Happiness Studies*, *22*(5), 2197–2214.

Krys, K., Zelenski, J. M., Capaldi, C. A., Park, J., van Tilburg, W., van Osch, Y., Haas, B. W., Bond, M. H., Dominguez-Espinoza, A., Xing, C., Igbokwe, D. O., Kwiatkowska, A., Luzniak-Piecha, M., Nader, M., Rizwan, M., Zhu, Z., & Uchida, Y. (2019). Putting the "We" into well-being: Using collectivism-themed measures of well-being attenuates well-being's association with individualism. *Asian Journal of Social Psychology*, *22*(3), 256–267.

Kwan, V. S., Bond, M. H., & Singelis, T. M. (1997). Pancultural explanations for life satisfaction: Adding relationship harmony to self-esteem. *Journal of Personality and Social Psychology*, *73*(5), 1038–1051.

Löckenhoff, C. E., De Fruyt, F., Terracciano, A., McCrae, R. R., De Bolle, M., Costa, P. T., Aguilar-Vafaie, M. E., Ahn, C. K., Ahn, H. N., Alcalay, L., Allik, J., Avdeyeva, T. V., Barbaranelli, C., Benet-Martinez, V., Blatný, M., Bratko, D., Cain, T. R., Crawford, J. T., Lima, M. P., . . . Yik, M. (2009). Perceptions of aging across 26 cultures and their culture-level associates. *Psychology and Aging*, *24*(4), 941–954.

Marsh, H. W., Guo, J., Parker, P. D., Nagengast, B., Asparouhov, T., Muthén, B., & Dicke, T. (2018). What to do when scalar invariance fails: The extended alignment method for multigroup factor analysis comparison of latent means across many groups. *Psychological Methods*, *23*(3), 524–545.

McAdams, D. P. (2013). *The redemptive self: Stories Americans live by-revised and expanded edition*. Oxford University Press.

Millar, P. R., Serbun, S. J., Vadalia, A., & Gutchess, A. H. (2013). Cross-cultural differences in memory specificity. *Culture and Brain*, *1*(2–4), 138–157.

Mimura, C., & Griffiths, P. (2007). A Japanese version of the Rosenberg self-esteem scale: Translation and equivalence assessment. *Journal of Psychosomatic Research*, *62*(5), 589–594.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, *108*(2), 291–310.

Oishi, S., Diener, E., Lucas, R. E., & Suh, E. (1999). Cross-cultural variations in predictors of life satisfaction: Perspectives from

needs and values. *Personality and Social Psychology Bulletin*, *25*(8), 980–990.

Oshio, A., Abe, S., Cutrone, P., & Gosling, S. D. (2014). Further validity of the Japanese version of the Ten Item Personality Inventory (TIPI-J). *Journal of Individual Differences*, *35*(4), 236–244.

Oshio, A., Shingo, A., & Cutrone, P. (2012). Development, reliability, and validity of the Japanese version of Ten Item Personality Inventory (TIPI-J). *Japanese Journal of Personality*, *21*(1), 40–52.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891.

Quoidbach, J., Gilbert, D. T., & Wilson, T. D. (2013). The end of history illusion. *Science*, *339*(6115), 96–98.

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*(1), 1–25.

Rosenberg, M. (2015). *Society and the adolescent self-image*. Princeton University Press.

Ross, M., & Buehler, R. (2001). Identity through time: Constructing personal pasts and futures. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 518–544). Blackwell.

Ross, M., Heine, S. J., Wilson, A. E., & Sugimori, S. (2005). Cross-cultural discrepancies in self-appraisals. *Personality and Social Psychology Bulletin*, *31*(9), 1175–1188.

Ross, M., & Wilson, A. E. (2002). It feels like yesterday: Self-esteem, valence of personal past experiences, and judgments of subjective distance. *Journal of Personality and Social Psychology*, *82*(5), 792–803.

Ross, M., & Wilson, A. E. (2003). Autobiographical memory and conceptions of self: Getting better all the time. *Current Directions in Psychological Science*, *12*(2), 66–69.

Schug, J., Yuki, M., Horikawa, H., & Takemura, K. (2009). Similarity attraction and actually selecting similar others: How cross-societal differences in relational mobility affect interpersonal similarity in Japan and the USA. *Asian Journal of Social Psychology*, *12*(2), 95–103.

Tokunaga, Y., & Horiuchi, T. (2012). Development of a Japanese version of the Self-Concept Clarity (SCC) Scale. *Japanese Journal of Personality*, *20*(3), 193–203.

Wang, Q. (2009). Once upon a time: Explaining cultural differences in episodic specificity. *Social and Personality Psychology Compass*, *3*(4), 413–432.

Wang, Q., Hou, Y., Tang, H., & Wiprovnick, A. (2011). Travelling backwards and forwards in time: Culture and gender in the episodic specificity of past and future events. *Memory*, *19*(1), 103–109.

Wheeler, M. A., Stuss, D. T., & Tulving, E. (1997). Toward a theory of episodic memory: The frontal lobes and autonoetic consciousness. *Psychological Bulletin*, *121*(3), 331–354.

Wilson, A. E., & Ross, M. (2001). From chump to champ: People's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology*, *80*(4), 572–584.