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The Value-Congruence Model of Memory for Emotional Experiences: An Explanation for Cultural Differences in Emotional Self-Reports

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In 3 studies, the authors found support for the value-congruence model that accounts for cultural variations in memory for emotional experiences. In Study 1, the authors found that in the made-in-the- U.S. scenario condition, European Americans were more accurate than were Asian Americans in their retrospective frequency judgments of emotions. However, in the made-in-Japan scenario condition, European Americans were less accurate than were Asian Americans. In Study 2, the authors demonstrated that value orientation mediates the Culture = Type of Event congruence effect. In Study 3 (a daily event sampling study), the authors showed that the congruence effect was explained by the importance of parental approval. In sum, emotional events congruent with personal values remain in memory longer and influence retrospective frequency judgments of emotion more than do incongruent events.

Keywords: culture, emotion, well-being, frequency judgments

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During the last few weeks, how often did you feel happy? Questions like this are routinely used in personality research to assess individual differences in affective traits and subjective wellbeing (see Diener, Suh, Lucas, & Smith, 1999, for a review). These judgments provide some accurate information about people's actual emotional experiences in the past (e.g., Parkinson, Briner, Reynolds, & Totterdell, 1995). At the same time, these judgments are not perfect and are susceptible to potential biases (e.g., Kahneman, 1999). However, the discrepancy between actual emotional experience and retrospective judgments does not occur at random. Personality traits and stereotypic beliefs, for instance, are associated with the degree of bias in retrospective judgments of emotion (e.g., Robinson & Clore, 2002). Our goal in this article is to examine another source of bias in retrospective judgments of emotions that has profound implications for the interpretation of individual and cultural differences in emotion judgments: the type of emotional events. We report three studies that support the idea that value-congruent emotional events have a stronger influence on retrospective judgments of emotions than do value-incongruent events. As a result, judgments will be more accurate if an individual encounters more emotional events that are value-congruent than if an individual experiences more emotional events that are value-incongruent.

It is well established that schema-congruent and expected events are more memorable than are schema-incongruent and unexpected events in daily contexts (e.g., Bartlett, 1932; Neisser & Libby, 2000; Stangor & McMillan, 1992; see also Kashima, 2000). Values are closely associated with individuals' schemas and expectations about emotional experiences. For example, people who value power may expect to feel good after winning a competition, whereas people with egalitarian values may be surprised if they respond with positive emotions to the same event. We propose that the same event (e.g., feeling good after winning a competition) has different effects on retrospective judgments of emotions, even if the actual momentary experience is the same, because some events are more congruent with the experimenter's values than are others. We hypothesized (a) that retrospective frequency judgments of emotional experiences are more accurate when emotions are elicited in a manner congruent with an experimenter's values and (b) that, to the extent that cultural groups differ on value orientation (e.g., Schwartz, 1994; Singelis, 1994), the type of situation that leads to accurate judgments of emotional experiences is different across cultural groups.

A few studies provided preliminary support for this hypothesis. In some studies, it was found that experimental manipulations of the salience of a particular value (e.g., a sense of belonging) increased the recall of events consistent with that value (e.g., Gardner, Pickett, & Brewer, 2000). Other studies showed that chronic implicit values (e.g., power) were associated with recall of autobiographical memory consistent with that value (e.g., Woike, Gershkovich, Piorkowski, & Polo, 1999). However, these studies focused on explicit recall and not on examining frequency judgments of emotions. In addition, to our knowledge, the current study is the first to examine the implications of value-congruent memory processes in cross-cultural comparisons.

We conducted three studies to test our value-congruent model. In Studies 1 and 2, participants were randomly assigned to read either made-in-Japan scenarios or made-in-the-U.S. scenarios, and participants indicated whether they would feel various emotions in those situations. In these studies, participants were later asked to indicate the frequency with which they felt each emotion during the scenario rating task. The discrepancy between the actual frequency indicated during the scenario rating task and the retrospective frequency judgments made later provides an objective index of inaccuracy in retrospective reports of emotion. In Study 3, we extended the first two studies to a natural daily context, using a daily event sampling method. Participants recorded one positive and one negative event every day for 3 weeks and rated each event in terms of how much it would make their parents happy right after the event occurred. At the end of the 3-week period, participants were asked to recall all the events that they recorded during the 3-week period.

Furthermore, in both Studies 2 and 3, we directly tested the value-congruence model of memory for emotional experiences by examining whether the congruence effect between type of events and cultural backgrounds on memory was mediated by individuals' value orientation. This is an important departure from previous research on culture and emotion because previous research on this topic has not empirically identified a mediator of cultural differences. Identifying a mediator of cultural differences is a vital step toward a greater understanding of the sources of cultural differences. Together, these three studies provide important insight into fundamental questions in research on emotion and culture. What kinds of emotional events do people remember? When are retrospective judgments of emotion accurate? How are the answers to these questions different across cultures?

Study 1: Scenarios Made in Japan and the United States

Method

Participants. At Time 1 (the first session), 74 students enrolled in an introductory psychology course at the University of Illinois at Urbana–Champaign took part in this study. Of these participants, 37 identified themselves as European Americans (19 men and 18 women), and 37 identified themselves as Asian Americans (18 men, 18 women, and 1 who did not report gender). At both Time 1 and Time 2 (the second session, 1 week after Time 1), 24 European Americans (10 men, 14 women) and 31 Asian Americans (16 men, 15 women) participated in the study. *Materials and procedure.* Participants were randomly assigned either to the made-in-the-U.S. scenario condition or to the made-in-Japan scenario condition. In preparing for Study 1, we asked 38 European American students at the University of Illinois at Urbana–Champaign to write about either a positive life event or a negative life event that had occurred during the past few months. After eliminating the similar events, we chose 20 final scenarios, 10 of which were positive, and 10 of which were negative (see Appendix, for examples). Similarly, we asked 63 Japanese students at Nihon University, in Tokyo, Japan, to write about a positive event or a negative event. Shigehiro Oishi translated the Japanese scenarios into English and modified the details to fit the context of American college life. Participants were asked to read 20 short scenarios, to imagine themselves in the situations, and to decide whether they would feel each of 12 emotions in each situation. We included various types of positive emotions (i.e., happiness, excitement, pride, love, a sense of belonging, and relief), and various types of negative emotions (i.e., sadness, anger, anxiousness, guilt, irritation, and fear). The actual frequency of each emotion was computed on the basis of the number of “yes” responses to 20 scenarios (following Schimmack & Hartmann, 1997). Participants came back to the same laboratory 1 week later, and they were individually seated at a computer. They were then asked to recall scenarios from the scenario rating task that they had performed in the previous week and to estimate in how many of the 20 scenarios they reported experiencing each emotion. Emotion words were presented in random order, one at a time. The absolute number estimated for each emotion was used as the index for retrospective judgments of emotional experiences. Internal consistency alphas were .94 for positive emotions at Time 1, .87 for positive emotions at Time 2, .95 for negative emotions at Time 1, and .88 for negative emotions at Time 2.

Results and Discussion

Our congruence hypothesis was supported: A repeated measures analysis of variance with scenario condition, cultural background, and sex as between-subjects variables and time of report as a within-subject variable revealed an expected three-way interaction among culture, type of scenario, and time of report for positive emotions, $F(1, 51) = 11.01, p = .01$ (see Table 1). European Americans were more accurate in retrospective judgments of positive emotions in the made-in-the-U.S. condition than were Asian Americans ($M_{\text{difference}} = 3.26$ and $M_{\text{difference}} = 6.42$, respectively), $t(24) = 2.70, p = .05, d = +1.10$, whereas Asian Americans were more accurate in retrospective judgments of positive emotions in the made-in-Japan condition than were European Americans ($M_{\text{difference}} = 3.71$ and $M_{\text{difference}} = 6.88$, respectively), $t(27) = 2.14, p = .05, d = -0.85$ (see Figure 1). Likewise, there was a significant three-way interaction among the culture, the type of scenario, and the time of report for negative emotions, $F(1, 51) = 7.01, p = .05$. European Americans were more accurate than were Asian Americans in retrospective judgments of negative emotions in the made-in-the-U.S. condition ($M_{\text{difference}} = 2.13$ and $M_{\text{difference}} = 4.36$, respectively), $t(24) = -2.19, p = .05, d = +0.90$, whereas Asian Americans tended to be more accurate than European Americans for these emotions in the made-in-Japan condition ($M_{\text{difference}} = 3.71$ and $M_{\text{difference}} = 6.88$, respectively), $t(27) = 1.68, p = .10, d = -0.67$. In contrast, there was no evidence for the alternative hypothesis that European Americans are more accurate about the frequency of positive emotions than are Asian Americans, regardless of the types of scenarios, as there was no two-way interaction between culture and time of report on positive emotions, $F(1, 47) = 0.02, ns$.

² Effect size d was computed with the procedures outlined by Rosenthal, Rosnow, and Rubin (2000). According to Rosenthal et al., a repeated measures analysis of variance can be reduced to a simpler model by creating a new outcome variability measure. Here, we first created the difference score from Times 1 and 2 frequency judgments, thereby reducing the model to a two-group comparison. We then computed a t value with unequal sample sizes (Rosenthal et al., 2000, Formula 2.20, p. 30) and finally converted it into an effect size d (Rosenthal et al., 2000, Formula 2.23, p. 31).

Table 1
 Mean Frequency Ratings of Emotional Experiences in the Scenario Rating Task: Study 1

	Time 1: Actual		Time 2: Retrospective	
	Asian American	European American	Asian American	European American
	Made-in-the-U.S. scenarios			
Positive emotions	9.42 (1.75)	9.27 (2.20)	3.00 (3.22)	6.01 (2.08)
Negative emotions	8.40 (2.09)	7.28 (2.27)	4.04 (3.61)	5.15 (1.99)
	Made-in-Japan scenarios			
Positive emotions	8.01 (2.30)	11.29 (4.13)	4.30 (2.92)	4.41 (1.93)
Negative emotions	8.12 (1.92)	10.12 (3.35)	4.39 (2.97)	4.23 (1.40)

Note. The numbers in the parentheses are standard deviations.

The intensity with which participants felt emotions at the time of encoding was not stronger in the culture-congruent condition than in the incongruent condition, as there was no two-way interaction between culture and type of scenarios in the intensity of either positive emotions, $F(1, 51) = 2.12, p = .15$, or negative emotions, $F(1, 51) = 2.57, p = .12$. Thus, our main findings cannot be due to cultural differences in encoding. There was a three-way interaction among sex, scenario condition, and time of report, both on positive emotions, $F(1, 47) = 6.23, p = .05$, and on negative emotions, $F(1, 51) = 7.23, p = .01$. Female participants were, on average, more accurate in the made-in-Japan condition than in the made-in-the-U.S. condition³. The pattern of the results were largely consistent with previous findings that women are, on average, more interdependent in their self-definition than are men (see Cross & Madson, 1997, for a review). Finally, when we examined the main hypothesis for each positive emotion, separately, we found the key three-way interaction in all of them, $F_s(1, 51) = 5.84, p_s = .02$, except for a sense of belonging, $F(1, 51) = 1.11, p = .30$. We also found the key three-way interaction in all negative emotions, $F_s(1, 51) = 3.13, p_s = .08$, except for anger, $F(1, 51) = 0.65, p = .43$. Thus, our findings were fairly consistent across various specific emotions.

Study 2: Finding a Mediator for the Congruence Effect

Although we found the expected congruence effect of cultural backgrounds and scenarios in Study 1, we did not examine exactly why we found the congruence effect. In Study 2, we sought to extend these two studies by exploring mechanisms underlying cultural differences. We postulated that (a) the European Americans and the Asian Americans would be different in their value orientations (Singelis, 1994), (b) the value orientations would influence the types of situations that elicit happiness and sadness (e.g., Oishi, Diener, Suh, & Lucas, 1999), and therefore, (c) the congruence effect between the cultural backgrounds and the type of scenario, with respect to the accuracy of retrospective frequency judgments of emotions, would be mediated by value orientations.

Method

Participants. Participants were students at the University of Illinois at Urbana–Champaign who were enrolled in an introductory psychology course. At Time 1, the participants were 43 self-identified Asian Americans (22 men, 21 women) and 50 self-identified European Americans (23 men, 27 women). At Times 1 and 2, the participants were 29 Asian Americans (15 men, 14 women) and 33 European Americans (15 men, 18 women).

Materials and procedure. The procedure used in Study 2 was the same as that used in Study 1, with one exception. Participants completed a value scale designed to assess the relative importance of Schwartz's (1994) 10 universal values: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. We presented each value with its defining characteristics, then asked participants to rank order the 10 values, from 1 (*the least important*) to 10 (*the most important*), as guiding principles of life.

Results and Discussion

Our congruence model was again supported, as the three-way interaction among the culture, the scenario, and the time of report for positive emotions was, again, significant, $F(1, 58) = 5.80, p = .05$ (see Table 2). European

³ Women tended to be more accurate in the made-in-Japan condition than men tended to be ($M_{\text{difference}} = 3.85$ and $M_{\text{difference}} = 5.78$, respectively) $t(27) = 1.27, p = .21, d = 0.49$, for positive emotions, and $M_{\text{difference}} = 3.86$ and $M_{\text{difference}} = 5.11$, respectively), $t(27) = 0.97, p = .34, d = 0.37$, for negative emotions. In contrast, men tended to be more accurate in the made-in-the-U.S. condition than women tended to be ($M_{\text{difference}} = 5.60$ and $M_{\text{difference}} = 3.63$, respectively), $t(24) = 1.51, p = .14, d = 0.62$, for positive emotions; ($M_{\text{difference}} = 4.25$ and $M_{\text{difference}} = 1.63$, respectively), $t(24) = 2.57, p = .05, d = 1.05$, for negative emotions.

Americans were more accurate in retrospective judgments of positive emotions in the made-in-the- U.S. condition than were Asian Americans ($M_{\text{difference}} = 2.32, SD = 4.91$, and $M_{\text{difference}} = 7.32, SD = 6.05$, respectively), $t(28) = 2.49, p = .05, d = 0.94$. In the made-in-Japan scenario condition, there was no difference between Asian American and European American participants ($M_{\text{difference}} = 4.08, SD = 3.69$, among Asian Americans; $M_{\text{difference}} = 5.00, SD = 4.43$, among European Americans), $t(30) = 0.64, p = .53, d = 0.23$ (see Figure 2). In addition, the corresponding three-way interaction for negative emotions was significant, $F(1, 58) = 5.00, p = .05$. Again, European Americans were more accurate in retrospective judgments of negative emotions in the made-in-the-U.S. condition than were Asian Americans ($M_{\text{difference}} = 4.09, SD = 3.88$, and $M_{\text{difference}} = 8.24, SD = 5.26$, respectively), $t(28) = 2.48, p = .05, d = 0.94$. In the made-in-Japan condition, there were no differences between Asian Americans and European Americans ($M_{\text{difference}} = 5.09, SD = 2.91$, and $M_{\text{difference}} = 5.46, SD = 3.60$, respectively), $t(30) = 0.32, p = .75, d = 0.12$.

Table 2
Mean Frequency of Emotional Experiences in the Scenario Rating Task: Study 2

	Time 1: Actual		Time 2: Retrospective	
	Asian American	European American	Asian American	European American
	Made-in-the-U.S. scenarios			
Positive emotions	12.25 (5.02)	9.69 (3.05)	4.93 (2.71)	7.37 (3.52)
Negative emotions	12.76 (4.88)	10.80 (2.83)	4.52 (1.50)	6.71 (2.91)
	Made-in-Japan scenarios			
Positive emotions	10.99 (3.28)	11.71 (3.49)	6.91 (3.31)	6.71 (2.17)
Negative emotions	10.84 (3.07)	11.57 (3.19)	5.76 (2.64)	6.11 (2.92)

Note. The numbers in the parentheses are standard deviations.

In contrast, the alternative hypothesis that European Americans are more accurate than Asian Americans Americans in positive emotional experiences, regardless of type of scenarios, was not supported, as we did not find a two-way interaction between culture and the time of report on positive affect, $F(1, 58) = 2.74, ns$. We also examined sex differences. Unlike Study 1, we did not find any main effects for sex or interaction effects on frequency judgments. Thus, we did not include sex in the above analyses. When we examined each emotion separately, we found the key three-way interaction in all positive emotions, $F_s(1, 58) = 3.78, ps = .06$, except for a sense of belonging, $F(1, 58) = 2.25, p = .14$. We also found the key three-way interaction in all negative emotions, $F_s(1, 58) = 3.51, ps = .066$, except for irritation, $F(1, 58) = 2.07, p = .16$. Again, our findings were fairly consistent across various specific emotions.

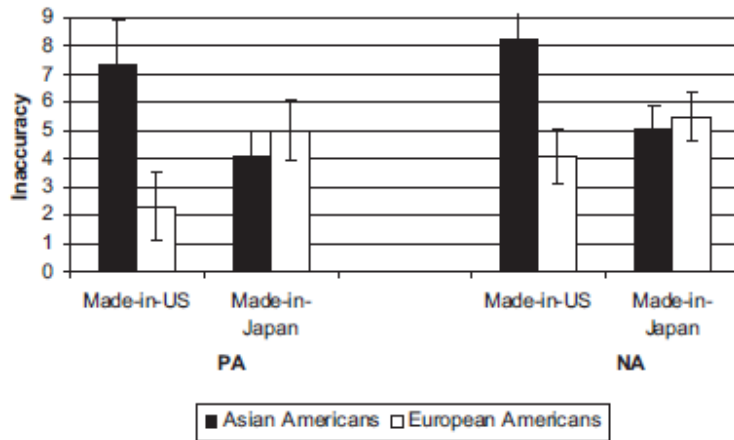


Figure 2. Inaccuracy in retrospective judgments of emotions in Study 2, by scenario conditions. Inaccuracy is the discrepancy between Time 1 and Time 2 frequency judgments. The larger number indicates a greater degree of inaccuracy. The error bars indicate standard error. PA = positive affect; NA = negative affect.

Unlike Study 1, in Study 2, we found a two-way interaction between the culture and the type of scenario in the intensity of positive emotions at Time 1, $F(1, 58) = 4.16, p = .05$. Specifically, Asian Americans in the made-in-Japan condition tended to feel positive emotions more intensely than did Asian Americans in the made-in-the-U.S. condition ($M_s = 3.26$ and 2.96 , respectively), whereas European Americans tended to feel positive emotions more intensely in the made-in-the-U.S. condition than in the made-in-Japan condition ($M_s = 3.39$ and 3.10 , respectively). Thus, we conducted a three-way (culture, scenario, time of report) repeated measures analysis of covariance with the intensity of positive emotions at Time 1 as covariate. This analysis revealed that the three-way interaction among culture, scenario, and time of report remained marginally significant for positive emotions, controlling for the intensity of positive emotion, $F(1, 57) = 3.04, p = .087$. We examined this possibility with negative emotions, as well. There was no interaction between the culture and the type of scenario in the intensity of negative emotion, $F(1, 58) = 2.10, ns$. In short, the relative accuracy of the retrospective frequency judgments in the culture-consistent scenario condition is not due to the higher intensity in the culture-consistent scenario condition.

Mediation Analysis: How Can We Explain the Culture-Scenario Congruence Effect?

Finally, we conducted a mediation analysis to test our central hypothesis. We created an outcome variable by taking the average of two discrepancy measures: the difference between actual and retrospective frequency judgments of positive and negative emotions (the correlation between these two discrepancy variables was $.90, p = .01$). Following Baron and Kenny (1986), we first examined the direct link between cultural groups and inaccuracy of retrospective judgments, using Amos version 5.0 (Arbuckle, 2003). Cultural group was coded as follows: European American = 0, Asian American = 1. Because there were two types of scenarios, we treated the two scenario conditions as two groups in the structural equation modeling. We compared the constrained model in which the direct link between culture and inaccuracy was set to be the same between the two types of scenarios (goodness of fit index [GFI] = $.920$, normed fit index [NFI] = $.111$, comparative fit index [CFI] = $.000$), with the unconstrained model in which the link between culture and inaccuracy was allowed to differ between the two scenario conditions, GFI = 1.000 , NFI = 1.000 , CFI = 1.000 (Figure 3, top). As in the earlier analyses, the fit was significantly poorer in the constrained than in the unconstrained model, $\chi^2(1, N = 62) = 5.51, p = .02$, indicating that the accuracy of retrospective frequency judgments of emotion differed between the two cultural groups, depending on the type of scenarios (i.e., Culture = Scenario interaction effect).

We then tested the critical mediation model depicted in Figure 3 (bottom). To empirically identify the values that distinguish the two cultural groups the most, we conducted a discriminant function analysis. Among Schwartz’s (1994) 10 universal values, tradition, conformity, and stimulation discriminated the two groups best, as seen by the highest discriminant function coefficients in the structure matrix (all greater than $.36$). We formed the value score by subtracting stimulation from the average of the tradition and conformity scores so that higher scores indicate a greater orientation toward tradition and conformity. As expected, Asian American participants were more oriented toward tradition and conformity, relative to stimulation, than were European American participants ($M = 0.57, SD = 3.70$, and $M = -1.32, SD = 3.20$, respectively), $t(91) = 2.64, p = .01$.

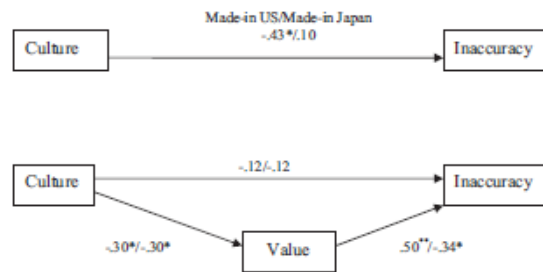


Figure 3. The mediation model in Study 2. The first standardized regression coefficient is for the made-in-the-U.S. condition, and the second coefficient is for the made-in-Japan condition. Culture = cultural group (0 = European American; 1 = Asian American); Inaccuracy = discrepancy between the online report and the retrospective report of positive and negative emotion; Value = [(Tradition + Conformity)/2] – Stimulation. * $p < .05$; ** $p < .01$.

Most important, the moderation effect (i.e., the difference in the link between culture and inaccuracy between scenario conditions; β s = -.43 and .10, respectively) disappeared once the mediator was included ($\beta = -.12$ in both scenario conditions, see Figure 3b). The overall fit of the final model was also acceptable, $\chi^2(2, N = 62) = 2.67$, $p = .26$, GFI = .972, CFI = .958, and RMSEA = .075. Thus, the interaction between the cultural groups and the scenario conditions on the accuracy of retrospective frequency judgments of emotions was accounted for by cultural differences in value orientations.

Study 3: Daily Event Sampling Study

One limitation of the scenario rating task used in Studies 1 and 2 is that emotional experiences assessed by this method were somewhat artificial because they were based on hypothetical situations. To address this limitation, in Study 3 we sampled the daily events that happened to participants in their lives and tested their memory for these real events. Participants recorded one positive and one negative event each day, as soon as the emotional episode ended, and rated how much they thought the event would make their parents happy and would lead to fulfillment of their parents' goals for them. We expected that the events that Asian Americans recalled later would be the events related to the fulfillment of their parents' goals for them, whereas the events that European Americans recalled would not be the events related to the fulfillment of their parents' goals for them. Furthermore, we examined whether the congruence effect between the cultural backgrounds and the type of events would be mediated by the individuals' value orientations, their independent and interdependent selves, and the importance of parental approval.

Method

Participants. Participants were 73 University of Illinois at Urbana-Champaign students who responded to the announcement of our study on campus. Of the original 73 participants, 29 self-identified European Americans (17 males, 12 females) and 26 self-identified Asian Americans (13 males, 13 females) completed the 3-week daily event study and recalled data at the end of the daily event study.

Materials and procedure. Participants first completed a short survey that assessed their cultural backgrounds and value orientations. We measured value orientations, using the same scale used in Study 2 (i.e., rank order the 10 values, from 1 = *the least important* to 10 = *the most important*, as guiding principles of life) and the Self-Construal Scale (Singelis, 1994). The Self-Construal Scale consists of two 12-item subscales, the Independent Self ($\alpha = .72$) and the Interdependent Self ($\alpha = .64$), on which participants responded by using the 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Finally, participants rated the importance of each of the following domains on a 7-point scale (1 = *not at all important*; 7 = *extremely important*): happiness, life satisfaction, money, physical attractiveness, education, excitement, peace of mind, and parents' approval. The experimenter then explained to each participant how to use a personal digital assistant (PDA) to record each event and to complete a survey. Participants carried the PDA for 3 weeks and recorded one positive and one negative event each day, as soon as the event occurred. They briefly described what each event was and indicated the degree to which "this event will lead to fulfilling my parents' goals for me" and "this event will make my parents happy," on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). We took the average of responses to these two items to form the parental happiness score ($\alpha = .90$). All the entries were time-stamped. Thus, we were able to verify that each event was indeed entered every day.

When participants completed the event sampling part of the study, they came back to the laboratory and performed a surprise recall test. At this time, they were asked to recall as many of the events they recorded during the 3-week period as possible. Two independent judges who were blind to our hypotheses compared the list of recalled events with the events actually recorded. They were instructed to give a 0 for an event that was not recalled later, a 1 for an event that was recalled, and a .5 for an event that was recalled but for which the description was brief and was missing critical information (e.g., "I did poorly on my midterm exam" for the event originally described as "I did really bad on my chemistry midterm"). After achieving consensus on the first 20 events, two judges coded the rest of the 2,341 events independently. They reached a very high level of agreement (over 99%). Because the distribution of the recall score was highly skewed, we created a dichotomous score by classifying events with an average recall score of .75 or higher as 1 and classifying events with an average recall score of less than .75 as 0. In the following analyses involving the recall score, we used the Bernoulli model that has a binomial sampling model and a logit link in the model estimation.

Results

As seen below, our central hypothesis was supported: The events that Asian Americans recalled were the events that were higher in the parental happiness score (events that "will lead to fulfilling my parents' goals for me" and that

“will make my parents happy”), whereas the events that European Americans recalled were no different in their parental happiness score than the events unrecalled. Because the daily event sampling data consisted of two levels (i.e., within-individual, or event, level and between-individuals level), we used multilevel random coefficient models with the Hierarchical Linear Modeling (version 5.04) program (Raudenbush, Bryk, Cheong, & Congdon, 2001). The Level 1 (within-individual) model was as follows:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Parental Happiness}) + r_{ij}$$

where Y_{ij} is the memory score for an event for person j on day i ; r_{ij} is an error term. The parental happiness score was centered on each individual’s mean.

Cultural differences in the average within-person association between parental happiness and memory were tested at Level 2. The Level 2 (or between-individuals) model was specified as follows:

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

and

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{Culture}) + u_{1j}$$

where $1j$ (or the within-person association between parental happiness and memory) was predicted by cultural group membership (0 for Asian Americans, 1 for European Americans); u_{0j} and u_{1j} are error terms. Before we conducted this analysis, we examined sex difference in within-person associations between daily events and daily well-being. There were no sex differences. Thus, we did not include sex in the following analyses. In addition, because there were no cultural differences in the overall recall score (Asian Americans = 0.25, $SD = 0.11$; European Americans = 0.24, $SD = 0.13$), $F(1, 53) = 0.10$, ns , we did not include culture as a predictor for β_{0j} .

As expected, the events that received higher parental happiness scores were more likely to be recalled later than were other events, among Asian Americans. γ_{11} was significantly negative ($\gamma_{11} = -0.178$; $SE = 0.087$, $t = -2.04$, $p = .05$), indicating that the degree of within-person association between the parental happiness score and memory was significantly smaller among European American participants than among Asian American participants. Indeed, the average association between parental happiness and recall score was nearly zero among European Americans (0.042), whereas it was 0.22 among Asian Americans (i.e., the strength of association was 5.2 times larger among Asian Americans than among European Americans).

Do Values Mediate Cultural Differences?

We examined the mediating role of values in the cultural differences observed. Following Study 2, we created the value score by subtracting stimulation from the average of the tradition and conformity scores (i.e., a higher number indicates greater orientation toward tradition and conformity). As in Study 2, our Asian American participants in Study 3 were more traditional ($M = -0.30$, $SD = 2.89$) than were European Americans ($M = -2.52$, $SD = 3.58$), $t(53) = 2.49$, $p = .05$, $d = 0.68$. Similarly, Asian Americans scored higher in interdependent self-construal ($M = 5.01$, $SD = 0.50$) than did European Americans ($M = 4.63$, $SD = 0.56$, $t = 2.57$, $p = .05$, $d = 0.71$). There were no differences between Asian Americans ($M = 4.74$, $SD = 0.49$) and European Americans ($M = 4.89$, $SD = 0.78$) in independent self-construal ($t = 0.82$, ns , $d = 0.22$). Group differences in values and interdependent self-provided support for the first step of mediational analyses laid out in Study 2. When values and interdependent self-construal were included as the only Level 2 predictors, however, they did not moderate the within-person association between parental happiness and recall score (γ_{11} was non-significant). Thus, value orientation and interdependent self-construal were unable to mediate the moderating role of culture.

Next, we tested whether a more specific value (i.e., importance of parental approval) would mediate the cultural differences we found in the previous section. As predicted, Asian American participants stressed the importance of parental approval more than did European Americans ($M = 4.96$, $SD = 1.34$, and $M = 4.07$, $SD = 1.07$, respectively), $t(53) = 2.42$, $p = .05$, $d = 0.66$. Next, we included the importance of parental approval as the only Level 2 predictor and found that the higher the importance of parental approval, the higher the within-person association between parental happiness and recall score ($\gamma_{11} = 0.072$, $SE = 0.028$, $t = 2.61$, $p = .01$). Finally, we included both culture and importance of parental approval as predictors at Level 2 (see Table 3, for the complete model). Consistent with the value-congruence model, once importance of parental approval was included as a predictor cultural differences became nonsignificant ($\gamma_{11} = -0.121$, $SE = 0.088$, $t = -1.38$, $p = .175$), whereas importance of parental approval remained significant ($\gamma_{12} = 0.061$, $SE = 0.029$, $t = 2.09$, $p = .05$). Once individual differences in the importance of

parental approval were taken into account, cultural differences in the within-person association between parental happiness and recall for emotional events were reduced by one third (coefficients from $=.178$ to $=.121$; Goodman test = 1.68, $p < .10$).

General Discussion

We conducted three studies to investigate the role of culture on the frequency judgments of emotions and the types of emotional events later accurately reported. As seen in Figures 1 and 2, European Americans were more accurate in retrospective frequency judgments of emotions when they read scenarios created by European Americans, whereas Asian Americans were more accurate when they read scenarios created by Japanese. The present research provides the first evidence for a reliable interaction between cultural background and emotion-eliciting conditions on memory for emotional experiences, thereby extending the emerging literature on retrospective judgments of emotion (Robinson & Clore, 2002) that has thus far focused on the main effect of personality traits and gender stereotypes on retrospective bias in emotion self-reports. It should be also noted that we eliminated a viable alternative explanation for the culture-congruence effects on retrospective judgments of emotions (i.e., an intensity and encoding hypothesis). Moreover, in Studies 2 and 3 we demonstrated that value orientation accounted for the congruence effect between cultural background and emotion-eliciting conditions on accuracy in retrospective frequency judgments. Thus, we identified one important source of cultural differences in memory for emotional experiences.

Table 3
Hierarchical Linear Modeling Analysis With Bernoulli Model in Study 3: Importance of Parental Approval for Cultural Differences in the Within-Person Association Between Parental Happiness and Memory for Emotional Events

Fixed effect	Coefficient	SE	t ratio	p
Intercept 1, β_0				
Intercept 2, γ_{00}	-1.167	0.084	-13.90	.000
Parental happiness slope, β_1				
Intercept 2, γ_{10}	0.182	0.067	2.71	.010
Culture, γ_{11}	-0.121	0.088	-1.38	.175
Parental approval, γ_{12}	0.061	0.029	2.09	.041

Note. γ_{00} indicates the average recall rate (log) across all participants, whereas γ_{10} indicates the average β_j for Asian Americans.

Our findings have an important implication for the literature on well-being. We found a systematic discrepancy between the actual frequency and the retrospective frequency judgments of emotions. Hence, we cannot consider these measures to be equivalent indicators of well-being. The nature of the two tasks implies that one measure is more accurate in a normative sense. If an individual reports happiness in a situation but later does not recall this situation, the memory measure provides a false impression of objective happiness (Kahneman, 1999). However, the notion of objective happiness implies that all experiences of happiness are equal. Our findings suggest that this may not be the case. For instance, suppose a person whose value orientation lies in Universalism received a large sum of inheritance and saw her investment grow rapidly. She could check the investment status once a week for 4 weeks, see the current net worth grow every week, and experience happiness many times during that period, according to objective happiness. Yet, when looking back later, this person might not feel she had experienced happiness many times during the 4-week period because what makes her happy are typically things, like recycling and volunteering, that are more congruent with a Universalist orientation (cf. Oishi et al., 1999; Tsai, Knutson, & Fung, 2006). Our findings suggest that even if an individual experienced happiness many times, unless these experiences are consistent with their values, they do not retain much meaning and will not influence the individual's well-being judgments (cf. Sumner, 1996).

Before closing, the limitations of our studies should be described. First, Studies 1 and 2 focused on frequency judgments of emotion, whereas Study 3 focused on memory for emotional events. We assumed that the underlying mechanisms are similar in these two phenomena, and indeed, we found similar results. However, it is premature to treat these two phenomena as equivalent. Second, although tradition, conformity, and stimulation explained cultural differences in Study 2, they did not do so in Study 3. The retrospective judgments of emotion in Study 2 covered diverse contents (20 different emotion-eliciting situations). In contrast, in Study 3, we focused on one specific

emotion-eliciting situation (i.e., the degree to which emotional events were perceived to make participants' parents and friends happy). We suspect that one reason that the global values mediated cultural differences in Study 2, whereas the specific value mediated cultural differences in Study 3, is the different degrees of specificity in the materials to be recalled later. This possibility needs to be examined explicitly, in the future. Third, it is well-known that even when researchers identify a mediator, mediation can be caused by other related but unmeasured variables (Kenny, Kashy, & Bolger, 1998). Our findings in Studies 2 and 3 are no exception. As criticized by Matsumoto (2000), however, many previous cross-cultural studies have failed to measure and to identify any mediators underlying cultural group differences. The present research is an important first step toward greater understanding of the mediators of cultural group differences in emotion and well-being (see Oishi & Sullivan, 2005, for a similar effort). Finally, on a related note, although we identified value orientation as explaining cultural differences in memory for emotional experiences, the underlying mechanisms are unclear. In the future, researchers should attempt to identify specific factors that give rise to the congruence effect (e.g., schemas, expectancy, familiarity).

Conclusion

In the present studies, we demonstrated that value-congruent emotional experiences are more likely to remain in memory for a longer period of time and are therefore easier to retrieve than value-incongruent emotional experiences. As a result, the frequency of value-congruent emotional events influences the retrospective frequency estimates of emotional experiences rather than the actual frequency. In our mediation analyses, we elucidated a possible source of cultural differences. Although some leading cultural psychologists are pessimistic about the measurement approach to unpacking cultural differences (e.g., Heine, Lehman, Peng, & Greenholtz, 2002), we believe that explicit values, when measured properly and/or at the appropriate level of specificity, could provide important information for solving the mysteries of cultural differences in emotion and subjective well-being.

References

- Arbuckle, J. L. (2003). Amos 5.0 [Computer software] Chicago: Smallwaters.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. New York: Cambridge University Press.
- Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin, 122*, 5–37.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276–302.
- Gardner, W. L., Pickett, C. L., & Brewer, M. B. (2000). Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin, 26*, 486–496.
- Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference-group effect. *Journal of Personality and Social Psychology, 82*, 903–918.
- Kahneman, D. (1999). Objective happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 3–25). New York: Russell Sage Foundation.
- Kashima, Y. (2000). Maintaining cultural stereotypes in the serial reproduction of narratives. *Personality and Social Psychology Bulletin, 26*, 594–604.
- Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 1, pp. 233–265). Boston: McGraw-Hill.
- Matsumoto, D. (2000). *Culture and psychology: People around the world* (2nd ed.). Belmont, CA: Thomson Learning.

- Neisser, U., & Libby, L. K. (2000). Remembering life experiences. In E. Tulving & F. I. M. Craik (Eds.), *The Oxford handbook of memory* (pp. 315–332). New York: Oxford University Press.
- Oishi, S., Diener, E., Suh, E., & Lucas, R. E. (1999). Value as a moderator in subjective well-being. *Journal of Personality, 67*, 157–184.
- Oishi, S., & Sullivan, H. W. (2005). The mediating role of parental expectations in culture and well-being. *Journal of Personality, 73*, 1267–1294.
- Parkinson, B., Briner, R. B., Reynolds, S., & Totterdell, P. (1995). Time frames for mood: Relations between momentary and generalized ratings of affect. *Personality and Social Psychology Bulletin, 21*, 331–339.
- Raudenbush, S., Bryk, A., Cheong, Y. F., & Congdon, R. (2001). *HLM5: Hierarchical linear and nonlinear modeling*. Chicago: Scientific Software International.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin, 128*, 934–960.
- Rosenthal, R., Rosnow, R. L., & Rubin, D. B. (2000). *Contrasts and effect sizes in behavioral research: A correlational approach*. New York: Cambridge University Press.
- Schimmack, U., & Hartmann, K. (1997). Interindividual differences in the memory representation of emotions: Exploring the cognitive processes in repression. *Journal of Personality and Social Psychology, 73*, 1064–1079.
- Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human values? *Journal of Social Issues, 50*, 19–45.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin, 20*, 580–591.
- Stangor, C., & McMillan, D. (1992). Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and social developmental literature. *Psychological Bulletin, 111*, 42–61.
- Sumner, L. W. (1996). *Welfare, happiness, and ethics*. Oxford, England: Clarendon Press.
- Tsai, J. L., Knutson, B. K., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology, 90*, 288–307.
- Woike, B., Gershkovich, I., Piorkowski, R., & Polo, M. (1999). The role of motives in the content and structure of autobiographical memory. *Journal of Personality and Social Psychology, 6*, 600–612.

Appendix

Scenarios

Made in Japan and Modified for an American Context

We had the training camp in Florida. At night, we all drank and played with fireworks on the beach.

On my birthday, my friends baked a cake for me.

I had an important job to do in my student organization. Last night, after having worked almost day and night for about a week, I finally finished my part.

I was shopping in the mall and unexpectedly met a good friend of mine from high school.

I went to bar with my friends last night. It had been a long time since we had been together.

A friend of mine asked me to play the trumpet for his band because his trumpet player could not play that day. So, I went to help him. I soon realized, however, that I was the worst player in the band and was not really helping him at all.

Last night, my mom said something about my boyfriend [girlfriend]. She does not like him [her].

A friend of mine and I decided that we would go to a movie, but my friend forgot about it and didn't show up.

Made in the United States

I worked very hard in a chemistry class because I really wanted to do well in this class. In the first midterm exam, I got an A.

I went to Europe over the summer vacation by myself. I did not know the language over there, and I did not have anyone to help me. I was still able to get around and see the stuff I wanted to see.

I found a summer job that would look really good on my resume. Getting a good summer job was really important to me because I am graduating this December, and I need good experiences to get a good full time job.

My boyfriend [girlfriend] and I got into an argument today because he [she] did not let me use his [her] discount card when we were shopping.

I wanted to get an A, or even a B, but I got a C on the first midterm.

I found out last night that my mother was in the hospital. My sister said her (my mom's) nose would not stop bleeding since that morning.

My boyfriend [girlfriend] broke up with me to date another person.

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