

Recalling Mixed Emotions

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In two longitudinal experiments, conducted both in the field and lab, we investigated the recollection of mixed emotions. Results demonstrated that the intensity of mixed emotions is generally underestimated at the time of recall—an effect that increases over time and does not occur to the same degree with unipolar emotions. Of note, the decline in memory of mixed emotions is distinct from the pattern found for memory of negative emotions, implying that the recall bias is diagnostic of the complexity of mixed emotions rather than of any association with negative affect. Finally, the memory decay effect was driven by the felt conflict aroused by the experience of mixed emotions.

Imagine you are at Disneyland about to board the Space Mountain ride. As you climb into your rocket, you feel joy and apprehension—a mixed feeling that persists even after the ride is over. You grip the safety bar, at once thrilled (the music is pumping, the lights are pulsing) and frightened (a semirational fear: people have been thrown from their rockets before). You leave the Space Mountain ride dizzy with mixed emotions. How will you recall your experience a week later? Will you remember the mixed emotions you experienced on the ride? Or will the memory of those mixed emotions fade?

Indeed, many of life's most important events are defined by a mix of emotions—both positive and negative. Consider graduation from college (“I’m making progress, but leaving my friends and family”), moving (“I’m starting a new life, but losing my old one”), or achieving major life goals (“I’m thrilled to have reached the destination, but am sad the journey is over”). Increasingly, researchers have begun to explore the nature of these mixed emotional experiences. One

stream of research has examined whether people can feel positive and negative emotions simultaneously. This research suggests that mixed emotions can be experienced jointly (e.g., Andrade and Cohen 2007; Larsen et al. 2004; Priester and Petty 1996; Thompson, Zanna, and Griffin 1995), particularly during periods of transition (e.g., moving out of a college dorm) and when exposed to specific stimuli (e.g., watching the film *Life Is Beautiful*; Larsen, McGraw, and Cacioppo 2001).

Another stream of research has explored when people are likely to experience mixed emotions (e.g., Fong and Tiedens 2002; Levav and McGraw 2008; Williams and Aaker 2002). This research reveals that cultural background, chronic individual differences, and situational factors can all moderate the likelihood that mixed emotions are felt. For example, cultures that embrace Confucian and Buddhist philosophies tend to foster more experiences of mixed emotions relative to cultures influenced by the Enlightenment and Christianity (Bagozzi, Wong, and Yi 1999).

However, neither stream of research has addressed the question of how mixed emotions (i.e., emotional states defined by both positive and negative emotions) are recalled, leaving unanswered many foundational questions regarding the nature of mixed emotional experiences. How are mixed emotions remembered? What distinguishes memory for mixed versus unipolar emotions? How does the memory of mixed emotions change over time?

These questions are important because decisions about the future are determined less by the online emotion experience than by the memory of the emotion experience (Wirtz et al. 2003). Indeed, people attempt to maximize “remembered utility” (defined as a retrospective report of total pleasure or displeasure associated with past outcomes) rather than “experienced utility” (Kahneman, Wakker, and Sarin 1997). This distinction emphasizes the fallibility of

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remembered emotions as markers of experience. Remembered utility can be measured by either (a) reports of past experience or (b) assessments of the current instantiation of past emotions. In this research, we focus on the first approach—exploring subjective reports as cognitive summaries of past experiences. However, we go beyond the reports of past pleasurable or painful experiences to include the recall of mixed emotional experiences. Our research explores why remembered emotions (or remembered utilities) are fallible, and why the recall of mixed emotions merits study in its own right.

RECALLING EMOTIONS

A truism of psychological theory is that memory is not a direct copy of the past but is reconstructive (Schacter 1996). To recall memories, people use a variety of cues that help them draw inferences about past experiences (Robinson and Clore 2002). For example, when people are asked to recall what their attitude toward a person or issue was 5 years ago, they ask themselves (a) What is their attitude now? and (b) Is there any reason to believe they felt differently then than they do now? If not, they assume their attitudes have not changed (Ross and Conway 1986).

A similar process has been demonstrated with respect to recalling emotions. To illustrate, women who currently believe that menstruation is particularly painful show a bias toward remembering more intense negative emotions during menstruation than they actually experienced (McFarland, Ross, and DeCourville 1989). Current beliefs (e.g., the belief that menstruation is associated with unpleasant physical and psychological symptoms) can color the memory of prior emotion experiences. Over time, people rely less on episodic memories of emotion experiences that link their recall to specific details of the situation and more on semantic cues that link their recall to general beliefs and theories (Robinson and Clore 2002).

Accordingly, memories of emotions are often inaccurate reflections of online experiences (Christensen, Wood, and Barrett 2003; Levine 1997; Thomas and Diener 1990; Wilson, Meyers, and Gilbert 2001; Wirtz et al. 2003). Sometimes, the distortion of past emotional events reflects a positive bias (i.e., a “rosy glow”), whereby the recall of emotions becomes more positive and less negative than the actual emotion experience was (Gilbert et al. 1998). One reason for the positive bias is that, although the disappointments felt during an experience can reduce the enjoyment of the moment, they may not reduce the enjoyment of the memory since those disappointments are fleeting (Mitchell et al. 1997). For example, parents remember time spent with their children as their happiest moments, even though online experience-sampling data suggest otherwise (Kahneman et al. 2004). Consider the aforementioned Space Mountain ride. The mixed emotions you experienced on the ride may not be well remembered. Rather, the memory of fearful elation may fade, replaced with the memory of the ride as the highlight of your Disneyland visit—perhaps colored by the last emotion you felt at the end of the ride (Lau-Gesk

2005) or because of the photos taken of you grinning ear to ear after exiting the ride (Sutton 1992).

Memories of emotions can also become more negative over time. For example, individuals with low self-esteem (Christensen et al. 2003) or who describe themselves as neurotic (Barrett 1997) recall experiencing more negative emotions than they reported at the time. Accurate recall of past negative emotions is particularly difficult when one’s current belief system supports the negative bias. For instance, Gore supporters recalled that they were more unhappy right after the 2004 election than they actually were, perhaps because they were recalling how unhappy they were through the lens of their current, unrationalized view (e.g., “Gore would have been a much better president; I must have been really unhappy when he lost”; Wilson, Meyers, and Gilbert 2003). Further, in conditions where the “peak” or “end” of an online experience is negative, people often remember that overall experience as more negative than it actually was (Fredrickson and Kahneman 1993). In the context of Space Mountain, this research implies that your memory of the ride will be recalled more negatively if your current attitude toward Space Mountain is negative or the last emotion you felt when you exited Space Mountain was negative.

In sum, research on the memory of emotions indicates that, over time, people tend to provide more unipolar assessments of recalled emotions, either more negative or positive (Thomas and Diener 1990). And the tendency to provide more unipolar assessments of recalled emotions appears to be a function of the different kinds of information people attend to when making evaluations online versus retrospectively (Robinson and Clore 2002).

We build on this work by focusing on the memory of mixed emotional experiences. We predict that, relative to unipolar emotions, mixed emotions are difficult to recall accurately and are generally underreported at the time of recall. Underlying our prediction is the premise that, in the case of unipolar emotions, the information that people attend to online is uniform—mostly all positive or all negative. Thus, any information recalled to construct an evaluation should have the same valence.

The case of mixed emotions is different. With mixed emotion experiences, the information people attend to online is a blend of positive and negative information. When people consider such mixed information, they often react with feelings of conflict and discomfort (Cacioppo, Gardner, and Berntson 1997; Priester and Petty 1996). In fact, this discomfort can trigger coping strategies to reduce or resolve the feelings of conflict (Folkman et al. 1986). People often reappraise the elements that underlie their mixed emotions (Zanna and Cooper 1974), change certain emotions in real time via “deep acting” (Hochschild 1983), or recognize and accept the co-occurrence of positive and negative emotions (Larsen et al. 2001). In contrast, such felt conflict typically does not arise with unipolar emotions, even negative emotions (Williams and Aaker 2002).

However, it is important to note that not all people feel

conflicted when experiencing mixed emotions. The degree to which people are concerned with attitudinal consistency or the social desirability of their behaviors raises the likelihood that mixed emotions arouse discomfort (Festinger 1957/1962). More generally, whether a person feels discomfort when feeling mixed emotions appears to be contingent on a variety of individual differences (e.g., impulsivity [Ramanathan and Williams 2007]; proclivity to think in abstract ways [Hong and Lee 2007]). For example, Asian Americans are more likely to acknowledge and accept psychological contradiction compared to individuals from North America (Spencer-Rodgers et al. 2004). Consequently, Anglo-Americans are more likely to feel conflicted than Asian Americans are when viewing messages highlighting mixed emotions (e.g., both happiness and sadness; Williams and Aaker 2002).

Thus, we predict that, in comparison to unipolar emotions such as happiness or sadness, mixed emotions are more difficult to recall accurately. More specifically, we predict that the memory of mixed emotions fades over time—that mixed emotions are recalled as less intense than they were experienced. We believe that one underlying reason for this effect is that mixed (vs. unipolar) emotions are more likely to spur feelings of conflict, thereby increasing the chance that people will revise their views of their mixed emotional experiences. If so, we should be able to capture evidence of this mechanism both with tests of mediation relying on measures of felt conflict as well as tests of moderation relying on culture as an independent variable. Formally,

- H1:** Compared to unipolar emotions, mixed emotions are less likely to be recalled accurately and more likely to be recalled as less intense than they were experienced.
- H2:** Feelings of conflict resulting from a mixed emotional experience underlie the decreases in the intensity of mixed emotions in recall over time.
- H3:** Culture moderates the memory decay effect, whereby Anglo-Americans are more likely than Asian Americans to recall mixed emotions as less intense than they were experienced.

To test these hypotheses, we examined the recollection of mixed emotions in two longitudinal experiments. Study 1 was a field study demonstrating that the memory of mixed emotions fades over time (hypothesis 1), whereas the recall of unipolar emotions tends to become more intense over time. It also provides initial evidence that feelings of conflict resulting from a mixed emotional experience underlie the decreases in the intensity of mixed emotions in retrospect over time (hypothesis 2)—a pattern that does not occur for unipolar emotions. Then, utilizing both measures of felt conflict (hypothesis 2) and tests of moderation (culture as an independent variable; hypothesis 3), study 2 showed that the feelings of conflict resulting from a mixed emotional experience are indeed associated with the memory decay.

STUDY 1

The main objective of study 1 was twofold. First, we examined whether the memory for mixed emotions changes over time, and indeed does so more than that for unipolar emotions. Second, we explored whether such an effect might be associated with an increase in feelings of conflict when experiencing mixed emotions. Thus, we directly examined the recall bias present in the memory of mixed versus unipolar emotions, and whether mixed emotions may be associated with greater levels of felt conflict. However, first we conducted a pretest to inform stimuli selection and to gain insight into the most effective measures to assess mixed and unipolar emotions.

Pretest

Paid \$3 each, participants ($n = 96$; $M_{\text{age}} = 22$, 59% female) were asked to “recall one event in your own past that you would characterize as creating mixed emotions—i.e., combining positive (e.g., happy) and negative (e.g., sad) feelings.” After writing a short paragraph, they responded to the question: “To what degree did this event make you feel mixed emotions?” (0 = not at all; 7 = very much). Participants were then asked to circle how happy (happy, elated, upbeat, good, favorable, satisfied; $\alpha = .87$) and sad (unhappy, disappointed, depressed, bad, unfavorable, dissatisfied; $\alpha = .89$) they felt during this event. The emotion items were adapted from the PANAS scales (Watson, Clark, and Tellegen 1988), anchored by 0 (not at all) and 7 (very much), and were used in the main studies as well.

Reports of mixed emotions were relatively high on average ($M = 5.90$), with transitions (e.g., breakups, moving away from home), test-taking contexts (e.g., midterms, final exams), personal goals (e.g., health goals involving diet or exercise), and consumption contexts (e.g., both service encounters and product mentions involving expectation-reality discrepancies, and transgression and recovery efforts) being the most frequently cited mixed experiences.

To determine whether recalled mixed emotion is a discrete construct relative to more unipolar happy and sad emotions, we examined the interrelationship among the three emotion indexes. The correlation between degree of recalled mixed emotion and recalled happy emotions was modestly negative ($r(93) = -.28$, $p < .05$). The relation between degree of recalled mixed emotion and recalled sad emotions was modestly positive ($r(94) = .17$, $p < .10$). Thus, the recalled mixed emotions were largely, but not completely, independent of both happy and sad emotions, indicating discriminant validity for the mixed emotional reports. Of note, when we operationalized emotional ambivalence where the extent to which opposing reactions toward the event are (a) similar in degree (similarity) and (b) extreme (intensity) (Thompson et al. 1995), the results were not qualitatively different than the results found with the mixed emotion item. Thus, in the main studies, we focused on the mixed emotion item as the measure to assess mixedness.

The results of the pretest revealed that, after transitions,

test taking was the most commonly cited mixed emotional experience mentioned (e.g., “I got a high grade on my last midterm while my friend who is also in the class got a poor grade,” “Relieved that the test was over with and that I could either go home or relax, but disappointed or scared about exam results or tests coming up”). We therefore focus on a test-taking context in study 1, and then turn to a transition context (e.g., moving away) in study 2.

Method

One hundred and four MBA students ($M_{\text{age}} = 29$, 48% female) who were enrolled in a consumer behavior course at the University of California, Los Angeles, volunteered to take part in the study. A total of 14 individuals were absent during the follow-up dates. Thus, 90 participants completed the study, which stretched over 3 weeks ($M_{\text{age}} = 29$, 47% female).

In the middle of an 11-week course, students took a midterm exam. Grades were returned the following week. The first wave of data collection took place when the graded exam was returned. The instructor wrote three test score ranges on the board at the front of the class (range 1 = above average, range 2 = around average, range 3 = below average) and then handed back the exams. After reviewing their exams, students received a questionnaire in which they were asked to indicate the range that included their score as well as a code name (to preserve anonymity and to allow the data to be linked across weeks). Of the 86 students who reported their range, 43 scored within the average range, 23 scored better than average, and 20 scored worse than average. Next, participants rated the degree to which they felt mixed emotions (0 = not at all; 7 = very much) and completed the identical happy and sad emotions items asked in the pretest. Participants also rated the degree to which they “felt conflicted” when they received their midterm and saw their score (0 = not at all conflicted; 7 = very conflicted).

Time 2 took place 2 weeks after their graded exam was returned. Participants were asked to recall their exam range and then asked to “please circle how you felt when you got your midterm back and saw your score.” The same emotions measured at time 1 were measured at time 2. Participants were fully debriefed the following week.

Results and Discussion

Reliability of the multi-item scales was high for both reports of actual emotions at time 1 ($\alpha = .87$ for happy, $\alpha = .92$ for sad) and reports of recalled emotions at time 2 ($\alpha = .92$ for happy, $\alpha = .91$ for sad).

We began by examining the correlations between unipolar and mixed emotions. Once again, these correlations revealed that the mixed emotion report was distinct from the unipolar emotion reports. The unipolar emotions strongly reflect the relative “success” of the exam score. For example, experienced happy emotions correlated .74 with the actual score ($p < .001$) and experienced sad emotions correlated $-.66$ with

the score ($p < .001$). Further, recalled happy emotions correlated .74 with the score ($p < .001$) and recalled sad emotions correlated $-.67$ with the score ($p < .001$). However, mixed emotions were uncorrelated with success both immediately after the experience ($r(81) = .15$, NS) and when recalled after the delay ($r(81) = .09$, NS). Moreover, mixed emotions were only modestly correlated with the unipolar emotions at both the time of exam return ($r = -.17$, NS, for happy emotions, and $r = .37$, $p < .01$, for sad emotions) and at the time of recall ($r = -.15$, NS, for happy emotions and $r = .37$, $p < .01$, for sad emotions). At both the time of experience and the time of recall, positive and negative emotions were highly negatively correlated (r 's = $-.76$ and $-.75$, $p < .001$).

To test whether mixed emotions are recalled less accurately than the two unipolar emotions, we relied on an ANOVA with two fixed repeated factors: one two-level factor (time: response at time of exam return or recall) and one three-level factor (emotion: mixed, happy, and sad emotional responses). Although the ANOVA revealed no main effect of time ($F(1, 164) = .88$, $p > .35$) or emotion ($F(2, 164) = .72$, $p > .40$), it did reveal the hypothesized interaction ($F(2, 164) = 5.51$, $p < .001$). A planned set of Helmert contrasts on the emotions factor showed that the interaction was driven by the comparison between the mixed emotion measures, which decreased between times 1 and 2 ($M = 3.97$ at exam return vs. $M = 3.43$ at recall), and the two unipolar emotion measures, which both increased slightly between times 1 and 2 ($M = 3.38$ at exam return vs. 3.50 at recall for happy emotions, and $M = 3.02$ at exam return vs. 3.14 at recall for sad emotions). The contrast representing this comparison was highly significant ($F(1, 82) = 7.43$, $p < .001$), thereby supporting hypothesis 1.

In contrast, the orthogonal contrast comparing the degree of change in the two unipolar measures was not significant ($F(1, 82) = 0.01$, $p > .90$). Simple effects tests revealed that both the reduction in mixed emotions and the increase in unipolar emotions were significant ($t(82) = 2.24$, $p < .05$, for mixed emotions, and $t(81) = 2.15$, $p < .05$, for the combined measure of unipolar emotions). Note that none of the above results were qualified by any interaction with a three-level between-participants factor indicating how well participants had actually scored on the exam (worse, average, and better), an effect that dovetails with prior findings (e.g., Jones, Yurak, and Frisch 1997, study 3). There were no differences in variances of the reported mood measures across time, allowing a clear interpretation of the mean differences.

So far, our analysis has focused on accuracy at a mean level. We also compared the accuracy of recall from a correlational perspective. If recall perfectly mirrors actual experience, the regression equation predicting recalled level from actual level would have an intercept of 0 and a slope coefficient of 1. In fact, results of the over-time regressions for the two measures of unipolar emotions were very close to this pattern of accurate recall. In particular, for happy emotions, the intercept was .27 (NS) and the slope was .96

($p < .001$). For sad emotions, the intercept was .21 (NS) and the slope was .97 ($p < .001$). In contrast, for mixed emotions the intercept was 1.11 ($p < .001$) and the slope was .54 ($p < .001$), indicating considerably reduced accuracy and more noise than that found for the unipolar emotions.

Finally, we examined the correlation between the felt conflict measure and mixed emotions, as well as that of the felt conflict measure and unipolar emotions, all at time 1. The correlation between conflicted and mixed emotions was significant ($r = .90, p < .001$). Dramatically lower were the correlations between conflicted and happy emotions ($r = -.19, p < .07$) and between conflicted and sad emotions ($r = .39, p < .001$). These results suggest a tight link between mixed emotions and felt conflict, suggesting close proximity on the causal chain. More important, however, they provide initial support for the premise that mixed emotions are in fact more highly associated with felt conflict than are unipolar emotions.

In sum, regardless of how participants actually did on the exam, they reported moderately high levels of mixed emotions when their graded exam was returned to them. However, their memory of those mixed emotions faded over time. This pattern did not occur with unipolar emotions. Further, empirical support was found for the premise that people feel more conflicted when experiencing mixed emotion experiences versus unipolar emotion experiences.

We next examined whether the recall bias for mixed emotions was mediated by changes in perceived conflict, using the within-participant mediation test (Judd, Kenny, and McClelland 2001). This test determines whether the change from experience to recall in mixed emotions is accounted for by a concomitant change in felt conflict. The test for within-participant mediation regresses change on the dependent variable on change in the mediator and the sum of the mediator values at time 1 and time 2. Full mediation is indicated by a significant coefficient for the mediator coefficient (indicating that change in conflict indeed predicts change in mixed emotions) accompanied by a nonsignificant coefficient for the intercept term (indicating that changes in conflict predict all of the change in mixed emotions). As predicted, both conditions were met in our data: the change coefficient for the presumed mediator (felt conflict) was .77, $p < .001$, and the coefficient for the intercept was .21, $p > .15$, consistent with hypothesis 2. In contrast, perceived conflict was largely unrelated to change in positive emotions ($r = .01$) or change in negative emotions ($r = -.09$).

Even with this evidence of mediation, one limitation of study 1 is that it provides only correlational support for the link between mixed emotions and felt conflict. The revealed mediational link between the decay of memory for mixed emotions and felt conflict was established on a longitudinal, but not experimental, basis. Thus, to gain a deeper understanding into this process, we made two changes to the experimental paradigm used in study 1. First, we recruited participants with theoretically relevant cultural backgrounds (but who had similar knowledge of the English language): Asian Americans and Anglo-Americans. Our premise was

that if mixed emotions are difficult to recall accurately (relative to unipolar emotions) due to the conflict or discomfort that is felt when the mixed emotions are experienced (Hong and Lee 2007; Spencer-Rodgers et al. 2004; Williams and Aaker 2002), we should observe distinct memory effects across cultural backgrounds. Specifically, since individuals with an East Asian (vs. North American) background experience less conflict due to mixed emotions, they should demonstrate greater accuracy in their memory for mixed emotions (hypothesis 3). Second, rather than relying on measures to capture the degree to which an emotion experience was mixed or unipolar, we experimentally manipulated the emotion experience. This change allows us to make stronger causal inferences with respect to both our moderating (culture) and our mediating (felt conflict) hypotheses.

STUDY 2

We have argued that feelings of conflict are one reason why memory for mixed emotions fades with time. Accordingly, study 2 included both a measure of conflict for tests of mediation as well as an independent variable (culture) for a test of moderation of our effects. Our theorizing suggests that felt conflict will be experienced primarily for the Anglo-American respondents, and that the magnitude of felt conflict will predict the degree of bias for recalling mixed emotions. To shed more light on the pattern of memory for emotions over time, we included two time periods at which mixed emotions were recalled, measuring the memory of the emotions 1 week after the experience occurred and again 2 weeks later.

Method

Participants were MBA students at Stanford University and the University of California, Los Angeles, who volunteered to take part in a study over the course of 3 weeks ($n = 45$; $M_{\text{age}} = 28$, 54% female). Students were categorized into two cultural groups based on self-ratings. Anglo-American participants were those who had indicated their ethnic background to be "Caucasian" and their main spoken language to be English. The Asian American participants were those who had indicated their ethnic background to be Asian or Asian American and their main spoken language to be English. The students with complete data included a total of 16 Asian American and 29 Anglo-American participants. (Unfortunately, the demographic data in study 1 were sparse; there was no ethnicity or cultural background collected.)

As a cover story, participants were told that researchers were conducting a study to assess consumer responses to potential advertisements. Participants read: "On the next page you will see an example of a potential print advertising message created for a new brand of moving company. Please look at this advertisement and then answer the questionnaire that follows it about that ad and the brand it features." The stimuli involved two advertisements for the fictitious Transporex Moving Company. The ads were adapted from Wil-

liams and Aaker (2002) and were pretested to evoke either happy or mixed emotions (both happy and sad).

Participants in the happy emotion condition read: “You’ve been looking forward to this moment for so long. A new chapter in your life is just beginning, and the future is full of exciting possibilities. You are looking forward to moving to a new neighborhood and the new friends you’ll make. It’s a happy and exhilarating time—you want movers who understand this. Movers who will make the move fun. Movers you can trust. Let Transportex handle the details—and all you have to do is enjoy the ride!” The participants in the mixed emotion condition read a slightly different story: “The moment has finally arrived. A chapter in your life is ending, but another one is beginning. You’ll miss the neighborhood and the friends you’ve made, but you’re also looking forward to the future and the exciting possibilities it holds. It’s such a sad and a happy time, but it doesn’t have to be stressful, too—you want movers who understand this. Movers you can trust. Let Transportex handle the details—all you have to do is look back on your old life, and look forward to your new one.”

Next, all participants read: “When you read the advertisement for Transportex Movers, please circle the emotion that best describes how you felt. If you felt the feeling very strongly, circle the 7, if you felt it somewhat strongly circle the 4, if you did not feel it at all, circle the 0.” Relying on the same emotions as in study 1 (i.e., felt conflict, mixed emotions, happy emotions, and sad emotions), emotion indexes were created for each of the three measurement occasions. Reliability was high for both happy (α ’s ranged from .93 to .95) and sad emotions (α ’s ranged from .78 to .87).

At time 2 (1 week after time 1), participants were recontacted in a classroom setting and read the following: “Last week, you saw an example of a potential print advertising message created for a new brand of moving company: Transportex. We wanted to ask some additional questions. Using the scales below, please circle how you felt 1 week ago (when you viewed the ad for Transportex Movers).” Again, we clarified that the ratings were not of current emotions but rather of memories of last week’s emotions. Participants provided their recollections of their emotions. Finally, they were asked to report their free recall of the content of the message: “Finally, please try to recall as much as you can of the original description of the Transportex appeal. Write down all that you can recall.”

Finally, at time 3 (2 weeks after time 1), participants were recontacted and read the same instructions as those given in time 2, except that they were reminded that they had seen an example of a potential print advertising message 2 weeks ago and “to please circle how you felt 2 weeks ago (when you viewed the ad for Transportex Movers).” Again, they reported their free recall of the advertising appeals. Participants were then fully debriefed.

Results and Discussion

To determine the extent to which different emotional experiences were evoked from the ads, an overall 2 (emotional ad condition: happy or mixed) \times 2 (culture: Asian or Asian American or Anglo-American) ANOVA was conducted on repeated measures across the happiness index, the sadness index, and reports of mixed feelings at time 1. Gender and age were used as control variables. As expected, there was a highly significant interaction between the emotional ad condition and the repeated-measures factor ($F(2, 84) = 8.99, p < .001$), such that reported happiness ($M = 3.53$) was notably higher than either mixed feelings ($M = 2.86$) or reported sadness ($M = 1.84$) in the happy ad condition, whereas mixed feelings ($M = 4.50$) were much higher than either reported happiness ($M = 2.91$) or reported sadness ($M = 2.97$) in the mixed ad condition. These results demonstrate that the ads both conveyed the intended emotional content and evoked the intended emotional responses between conditions.

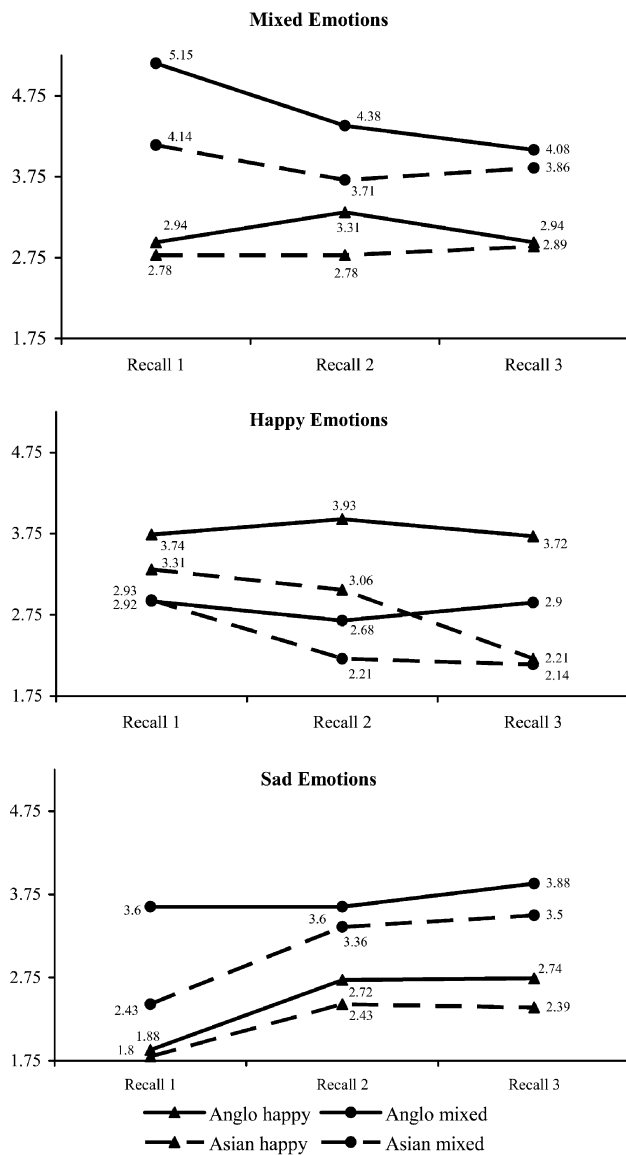
Next, we tested the proposition that only Anglo-American participants who experienced mixed emotions would feel conflicted and hence show a recall bias that systematically diminished their levels of recalled mixed emotions over time. In contrast, Asian American participants who experienced mixed emotions should not feel conflicted, thereby eliminating the memory decay for mixed emotions. (Nor should such a recall bias occur with anyone who experienced happy emotions.) We first examined this premise with a series of contrasts within a mixed-model ANOVA with two between-participants factors (emotion and culture) and one within-participant factor (three levels of time: experience and two follow-up recall measures). Means presented in figure 1 show support for our central prediction. Indeed, the only sizable negative trend across time found was for the linear decline in the mixed emotion measurement for the Anglo-American participants exposed to the mixed emotion ad (simple effects linear trend: $F(1, 12) = 8.56, p < .02$; quadratic trend: $F(1, 12) = 0.62, p < .40$). The declines in negative emotions seen in the figure were significant for both Anglo-American participants facing the happy message and Asian American participants facing the mixed message (both p ’s $< .01$); no other simple effects were significant.

Next, we tested via two stages the hypothesis that the declining pattern was unique to the Anglo-Americans who read the mixed emotion message. In the first-stage analysis, the negative linear trend for the mixed emotions reported by the Anglo-American participants in the mixed emotional ad condition was contrasted with the linear trend for the mixed emotions reported in the other three conditions (Anglo-American participants facing the happy ad, the Asian American participants facing the mixed ad, and the Asian American participants facing the happy ad). The Helmert contrast was highly significant ($F(1, 39) = 8.59, p < .01$).

In the second-stage analysis, parallel to the approach taken in study 1, we contrasted the time trend of the mixed and unipolar emotions. In a second-level Helmert contrast, we compared whether the initial Helmert contrast across the

FIGURE 1

SUMMARY OF STUDY 2 RESULTS ACROSS TIME



four conditions differed for mixed versus the two unipolar emotions. Again, consistent with the patterns shown in the figure, this cross-emotional contrast was significant ($p < .02$). These results are consistent with hypothesis 1 and set the stage for examining hypotheses 2 and 3.

Our theorizing predicts that conflict will be felt primarily by the Anglo-American respondents, and that the magnitude of this conflict will predict the degree of recall bias for mixed emotions—a form of mediated moderation. In support, a Helmert contrast comparing the degree of conflict experienced in the Anglo-American respondents compared to the other three conditions was significant ($F(1, 42) = 4.10$, $p < .05$). As predicted, the conflict experienced by the An-

glo-American respondents facing the mixed ad was markedly greater ($M = 3.77$) than that experienced by any other group (Anglo-Americans facing the happy advertisement, $M = 2.75$; Asian American respondents facing the mixed ad, $M = 3.00$; Asian American respondents facing the happy ad, $M = 2.98$).

Consistent with the next step in a mediating model, felt conflict at time 1 predicted the degree of recall bias across the three times ($B = .32$, $p < .01$). Further, it continued to predict the recall bias even when the contrast coding to represent the condition differences was entered ($B = .29$, $p < .01$). When felt conflict was added, the coefficient for the Helmert contrast used above declined (from $B = .85$, $p < .05$ to $B = .61$, $p > .12$). A Sobel test (using the modified criterion suggested by MacKinnon et al. [2002]) was significant ($z = 1.41$, $p < .05$). In summary, felt conflict differed predictably by condition, predicted the degree of memory bias, and the pattern of effects found for felt conflict was consistent with a model in which felt conflict mediated the moderating effect of culture on the recall bias.

An alternative explanation for these effects merits mention, however. It may be that the recall bias for mixed emotional experiences is only one indicator of a more general conceptual difficulty in remembering emotionally mixed content. In other words, the recall bias may be a result of some general denial of the co-occurrence of positive and negative events. As mentioned above, at each follow-up time point, participants not only recalled how they felt in response to the Transportex appeals, but also what they recalled about the message itself. Thus, an analysis of these free-recall data provides a test of the alternate “general mixed forgetfulness” explanation for our findings. Two coders blind to participants’ condition or status reviewed all written recollections and counted the number of chunks that contained mixed emotional content. According to the “general mixed forgetfulness” alternative hypothesis, Anglo-American participants exposed to the mixed emotional appeal should demonstrate a general decline in reported recall of mixed content. Inconsistent with this hypothesis, the same Anglo-Americans who showed a bias to underreport their own felt mixed emotions displayed a higher level of mixed content in their free recall than the Asian Americans exposed to the mixed appeal (means of .52 vs. .10; $t = 2.22$, $p < .05$). In other words, those who tend to forget the degree of mixed emotions they experienced are well able to remember the presence of mixedness in the original situation—a result that is generally congruent with those of Williams and Aaker (2002) in distinguishing between felt emotions and the perception of depicted emotions.

GENERAL DISCUSSION

The results of two longitudinal studies show that mixed emotion experiences are more difficult to recall accurately compared to unipolar emotion experiences: over time, people remember mixed emotion experiences as less mixed—a memory decay effect that does not occur with unipolar emotion experiences. Moreover, this decline in memory appears

to be driven by the felt conflict that arises from the experience of mixed emotions. The memory bias is particularly pronounced for Anglo-Americans, who tend to feel conflicted when experiencing mixed emotions and, correspondingly, are more motivated to resolve the conflict. The recall bias did not appear for Asian Americans, who are less likely to feel conflicted when experiencing mixed emotions (and thus less motivated to reduce that conflict). Together, these results indicate that as time passes, mixed emotions are increasingly difficult to recall, that memory for them fades, and that felt conflict underlies this recall bias.

By documenting the systematic underestimation of prior mixed emotions in particular, our research contributes to a growing body of work on the general difficulty people have recalling emotions. Our findings fit well with a number of studies documenting that the memories of emotions are often inaccurate reflections of online experiences (e.g., Christensen et al. 2003; Gilbert et al. 1998; Thomas and Diener 1990; Wilson et al. 2001; Wirtz et al. 2003). However, our research departs from this stream. We demonstrate a directionally distinct effect (memory decay) and a mechanism whereby the mixed emotions give rise to feelings of conflict. The recall of mixed emotions is quite distinct from the pattern typically found for that of unipolar emotions.

Delving deeper into the distinctions between mixed emotion and unipolar emotion experiences is still necessary, however. Even if meta-emotional experiences such as the feelings of conflict that arise from having mixed feelings account for the effects found in this research, there may be other reasons why recall patterns differ for mixed versus unipolar emotions. For example, people may have implicit theories or cultural scripts about mixed emotions. Consider a general lay theory suggesting that mixed emotions must fade over time. In defining memories, people may believe that any emotionally ambiguous occurrences must eventually be “decided.” To illustrate, in recalling your wedding day, you may come to think that it was a wholly happy day. After all, you married your true love on that day. Any mixed feelings you may have had at the time have since been resolved or can be attributed to relatively unimportant things (e.g., wedding-day jitters or the fact that the photographers’ camera was stolen during the wedding). In this view, individuals may hold implicit theories of mixed emotions that involve the general belief that, as time passes, emotional truth is learned and mixed feelings may be (or should be) forgotten. Alternatively, people may be more motivated to protect more unipolar happy or sad memories (Zauberman, Ratner, and Kim 2007). Future work is needed to investigate whether people hold implicit theories of mixed emotions that might reflect social beliefs or self-deception, and whether such implicit theories might influence memory decay.

The results of this research speak to several domains of research. For example, the results imply that individuals who are comfortable with inconsistency should recall mixed emotions more accurately. Relatedly, if there is an increased propensity to resolve the meta-emotion of felt conflict, the

effects documented here should be mitigated for individuals who are not disturbed by the ambiguity associated with mixed emotions (Hong and Lee 2007). Similarly, the effects should be muted if the mixed emotions experienced are comprised of a dominant emotion (e.g., strong feelings of anger), thereby reducing the felt conflict experienced (Priester and Petty 1996). An empirical examination of these possibilities would more fully illuminate the boundary conditions of memory decay, as well as the developmental changes in the understanding, experience, and acceptance of mixed emotions (Larsen, To, and Fireman 2007). Of particular promise would be the examination of the neural substrates of emotion processes and identification of the key structures in the brain involved in mixed emotional experiences and the memory of them (Davidson, Fox, and Kalin 2007).

This research has several limitations that highlight opportunities for future research. For example, this research did not consider when and why mixed emotions might be resolved in favor of positive or negative memories. Most of the work on the memory of emotions focuses on experiences where people have distinct theories that “pull” their reconstruction one way or another (Thomas and Diener 1990). This is not the case in the current research. If motivation to pull the memory of mixed emotions toward the positive or negative were present, we might have observed a more polarizing set of results whereby recall of mixed emotions still fades but is replaced by positive (or negative) memories. Indeed, future work examining when memories are pulled in a positive versus negative direction is needed.

A second line of research might focus on the exact nature of the felt conflict (Priester, Petty, and Park 2006). Is the felt conflict associated with discomfort, disharmony, or confusion? How do individuals interpret this felt conflict? Preliminary research suggests that felt difficulty appears to be part and parcel of the conflicted experience. For example, in a longitudinal field study, we asked participants ($n = 58$) to select and pursue a health-related goal (e.g., improve their diet or reduce stress) for 1 week. At time 2 (1 week later), participants rated their emotions after pursuing their health-related goal. Most of the participants reported feeling happy ($n = 23$) or mixed ($n = 28$); few reported feeling sad ($n = 7$). At time 3 (2 weeks after time 1), participants recalled their memories of their emotions at time 2. An ANOVA on the Recall Difficulty Index at time 3 confirmed that those who felt mixed said it was “difficult to remember their feelings” from time 2 ($M = 4.14$) relative to those who reported feeling happy ($M = 2.96$) or sad ($M = 2.00$; Helmert contrast $F(1, 55) = 5.27, p < .01$). Of note, self-rated importance of the health goal did not differ across the three cells ($M_{\text{mixed}} = 5.34, M_{\text{happy}} = 5.63, M_{\text{sad}} = 5.00$; $F < 1$), suggesting that the relative difficulty people have recalling mixed emotions is not driven by differential levels of importance for the distinct types of emotion experiences.

Also, the results here suggest that the felt conflict underlying the results is a subjective experience (Williams and Aaker 2002, study 2), created by opposing but coexisting

emotions (e.g., happiness and sadness). One direction of future research would be to explore whether, indeed, the effects documented here still hold if the mixed emotions are of the same (rather than opposing) valence (e.g., happiness and pride). Theoretically, mixed emotions of nonopposing valence should reduce the subjective experience of felt conflict, thereby moderating the results found in the current research.

Perhaps most interestingly, future research is needed to more fully flesh out the causal chain. The high correlation between felt conflict and mixed emotions suggests that (a) the two constructs are closely located on the causal chain, and (b) other possible links between felt conflict and memory deserve examination. Three causal avenues seem particularly promising to explore. First, future research might examine the possible downstream effects of felt conflict. Indeed, felt conflict might be so aversive that individuals are motivated to resolve the conflict quickly. Hence, it may be more difficult to recall mixed emotional experiences because they do not last as long as unipolar experiences. In this explanation, feelings of conflict still drive recall bias for mixed emotions; however, the consequences of felt conflict have to do with amount of processing. However, given that people are likewise motivated to resolve negative emotions and yet the pattern of results for negative emotions differs, this explanation is somewhat unconvincing.

A second causal avenue to explore is based on the coping research that suggests that people engage in a primary appraisal of stressful events followed by a secondary appraisal (Folkman et al. 1986). For Anglo-Americans, mixed emotions could be classified as a stressful event, but not so for Asian Americans. Thus, our findings may have less to do with memory per se and more to do with the fact that people reappraise their emotions as the eliciting events fade in intensity. Furthermore, many argue that felt conflict often leads to meaningful progress in sense making, whereby memories change in positive directions as a result of finding coherence and benefit in a situation (Davis, Nolen-Hoeksema, and Larson 1998). Future study is needed to explicate the activated affective and cognitive constructs that lie between felt conflict and memory, and how sense making may differ for mixed emotional experiences versus negative emotion experiences.

A third causal path to explore would involve an examination of when mixed emotions are accurately encoded versus retrieved (Braun, Ellis, and Loftus 2001) and whether motivation (e.g., dissonance reduction) versus ability (e.g., lack of the linguistic repertoires to make sense of mixed emotions) differentially affects the recall bias. For example, although the results of our research suggest that the successful encoding of mixed emotions occurred, research would still benefit from methodologies that allow more careful study of (a) the encoding processes and (b) the degree to which mental taxation due to emotion complexity may result.

Before closing, several new insights merit mention as they are particularly relevant for understanding consumer behavior.

Our results speak to ongoing research in marketing suggesting that emotional experiences can affect purchase intent as well as foster brand loyalty. For example, the amount of warmth that emanates from a brand or the fun enjoyed by a brand (e.g., iPhone) can fundamentally influence relationship trajectories (Aaker, Fournier, and Brasel 2004). However, in reality, most consumer-brand relationships are defined, at some point or another, by a transgression that gives rise to negative feelings among consumers (Grayson and Ambler 1999). Our research suggests that the degree to which a negative event is categorized as part of a mixed experience (vs. standing alone as a single negative event; Lau-Gesk 2005) affects the probability that the consumer will remember that experience and be influenced by it. If the transgression is mentally clumped together with positive interactions with the brand, the memory of the mixed emotional experience may indeed fade, which would not be the case if the transgression stood alone as an isolated negative event.

Finally, several interesting questions arise when considering the current findings in light of past research. Are there conditions under which mixed emotional states are remembered as exactly that—mixed in nature? And how might such insights affect the anticipation of future emotional states (Priester et al. 2006) and behavior? Newby-Clark and Ross (2003, study 1) showed that people spontaneously recall an affectively mixed past containing both positives and negatives. In contrast, people anticipate homogeneously positive futures. Follow-up research might explore whether the memory for mixed emotions wanes when the experience is mundane or ordinary (as may be the case with the events in the current studies) but is more resistant when it is significant in meaning (Newby-Clark and Ross 2003). Further, if mixed emotions are generally difficult to remember, do people tend to repeat behaviors that, in some normative sense, they should not? That is, if mixed emotions wane and hope springs eternal, is the past particularly likely to repeat itself? Will you ride Space Mountain again?

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