

The Effect of Social Disclosure on the Intensity of Affect Provoked by Autobiographical Memories

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Affect associated with negative autobiographical memories fades faster over time than affect associated with positive autobiographical memories (the fading affect bias). Data described in the present article suggest that this bias is observed when people use their own words to describe both the emotions that they originally felt in response to events in their lives and the emotions that they feel when they recall those events. The data also suggest that the fading affect bias is not a consequence of distortion in memory for the emotions experienced at event occurrence, but instead reflects current affective responses to memories for those events. Moreover, this bias has a social component. Frequently disclosed memories evince a stronger fading affect bias than less frequently disclosed memories. Memories disclosed to many types of people evince a stronger fading affect bias than memories disclosed to few types of people. Finally, the relation between social disclosure and fading affect appears to be causal: the results of an experiment demonstrate that social disclosure decreases the fading of pleasant affect and increases the fading of unpleasant affect associated with autobiographical memories.

Everyday experience and empirical evidence suggest that the affect associated with autobiographical events fades over time. However, fading is greater for unpleasant emotions associated with autobiographical events than for pleasant emotions associated with such events. This pattern has been termed the *fading affect bias* (Walker, Skowronski, Gibbons, Vogl, & Thompson, 2003a; Walker, Skowronski, & Thompson, 2003c). Although the fading affect bias has been known for some time

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(Cason, 1932), it has been the focus of only a few studies (Holmes, 1970; Walker, Vogl, & Thompson, 1997; Walker et al., 2003a). Consequently, the boundary conditions and the mechanisms that underlie the fading affect bias have yet to be fully described. This paper explores some of those boundary conditions and mechanisms.

One claim that has been made, and discounted, is that the fading affect bias is a consequence of distortion in memory for the emotion that originally accompanied the event. This claim was derived from the fact that some studies exploring the bias (e.g., Cason, 1932) used a procedure in which participants first recalled autobiographical events and then rated both the emotions experienced when the events originally occurred and the emotions prompted by recalling the event. Obviously, in such a procedure, measures of the extent to which affect changes from occurrence to recall could be affected by distortions in recall for the affect that originally accompanied the event. For example, if people recall that their emotional response to a negative event was more extreme than it actually was, the apparent fading of emotion for the negative event would be exaggerated. Indeed, several studies have shown that memory for emotions can evince such retrospective distortion (Feldman-Barrett, 1997; Ross & Conway, 1986; Ross & Wilson, 2002; Safer, Levine, & Drapalski, 2002).

However, recent studies suggest that the fading affect bias is not a consequence of such retrospective distortion in memory for negative emotion. For example, in a study that obtained a fading affect bias, Walker et al. (2003a) compared the recalled intensity of the emotions that originally occurred in response to positive events and negative events. They found no intensity difference. If retrospective memory distortions were responsible for the fading affect bias, unpleasant events should have been rated as prompting more intense emotions at event occurrence than pleasant events. More persuasive evidence on this point comes from four fading affect bias studies that used a diary methodology (Holmes, 1970; Walker et al., 1997). Participants in these studies recorded unique personal events in a diary. They also recorded each event's valence and the intensity of emotion provoked by each event. Participants were later reminded of the events they had recorded and reported the valence and intensity of emotion provoked when remembering each event. All four studies yielded evidence of a fading affect bias. Because participants recorded the initial emotional intensity of events at the time of the event's occurrence, in these studies there can be no retrospective distortion in memory for those emotional reactions. Hence, retrospective memory biases for the emotional intensity of events cannot explain the fading affect bias observed in these studies.

The existing data, then, suggest that the fading affect bias is a product of the intensity of emotion prompted at the time that autobiographical memories are recalled. The typical pattern that emerges is that negative and positive events prompt equally extreme emotions at the time of event occurrence, but that, while the emotions associated with all events tend to fade over time, positive events prompt more extreme emotions than negative events when those events are later recalled. Study 1 attempted to provide additional convergent validity evidence for this bias by showing that it is not dependent on the use of self-report response scales to assess the intensity of emotion, but also emerges when people describe emotions in their own words. Participants in the study engaged in a retrospective recall task in which they recalled autobiographical events and described emotions associated with those events at both event occurrence and at event recall. A second group of participants then rated the emotional intensity of those emotion descriptions. These ratings were

then used to probe for evidence of a fading affect bias. The bias was expected to emerge, even using this alternative emotion-intensity measurement procedure.

Studies 2 through 4 pursued the extent to which the fading affect bias is related to an individual's tendency to relate memories of events to others. As people disclose memories to others they obtain support and camaraderie, which may help to preserve pleasant affect and minimize unpleasant affect. Moreover, as suggested by Pennebaker (1997a), the cognitive work involved in preparing social discourse may help to minimize the intensity of emotion associated with unpleasant events. Study 2 assessed the extent to which the magnitude of the fading affect bias is related to the frequency with which people disclose autobiographical events to others. Study 3 assessed the extent to which the fading affect bias is related to both the frequency of social discourse as well as to the number of different categories of people with whom autobiographical events are conveyed. Studies 2 and 3 were expected to show a positive relation between social discourse and the fading affect bias: When social disclosure frequency is high, pleasant events should be especially likely to maintain their emotional intensity over time, while unpleasant events should be especially likely to lose their emotional intensity.

Because Studies 2 and 3 used retrospective methodologies, they provide only correlational evidence describing the relation between social discourse and the fading affect bias. Study 4 attempted to show that the link between social disclosure and the fading affect bias is causal. Using an experimental manipulation of disclosure frequency, in Study 4 participants frequently or infrequently conveyed autobiographical events to an audience. Study 4 was expected to show that frequent social disclosure facilitates the fading affect bias, maintaining pleasant affect and accelerating the fading of unpleasant affect.

Study 1

Study 1 explored fading affect using a retrospective memory paradigm. The primary goal of Study 1 was to replicate the fading affect bias under conditions in which participants used their own words to describe both emotions associated with the occurrence of autobiographical events and those prompted by event recall. This deviates from the usual procedure in which participants use rating scales, not their own words, to describe their emotions. A secondary goal of Study 1 was to demonstrate that the locus of the fading affect bias is in emotions accompanying event recall, not in emotions recalled as accompanying event occurrence.

Method

Participants

Thirty-nine undergraduates at a historically African-American university participated in the first part of the experiment. An additional twenty undergraduates participated in the second part of the experiment. All undergraduates participated in groups of two to six and received extra credit for their participation.

Procedure and Measures

Memory retrieval. Participants were given 12 minutes to record detailed descriptions of four autobiographical memories. These were to have occurred within the past ten years. Participants were asked to recall two pleasant memories and two

unpleasant memories and were enjoined to recall a wide variety of events and to provide events that were unique. They were reminded that unique events happen at a particular time and place and are not events that happen all the time. They were also told to recall what happened, where it happened, who was there, and roughly when it happened.

Description of emotions. After generating memories, participants reported emotion words conveying the emotion experienced when they initially encountered the event. Participants also reported emotion words describing the emotion provoked when they recalled the event. Nine participants (23%) expressed some difficulty in providing these descriptions and were given a list of 56 emotion words to prompt them (see Appendix A). Participants who were shown this list were asked to use only those words that were meaningful to them. All participants were repeatedly reminded to focus on the emotion, and not other aspects of the memory.

Most of the descriptions that were provided were one-word descriptions. However, participants occasionally described their emotions using more than one word. In these cases, we used only the first emotion word that was listed by the participant in subsequent analyses.

Coding of emotional intensity. The emotion words that were generated by participants were compiled into a list of 81 items. This list was given to a group of 20 new participants who were unaware of the source of the words. These participants rated each emotion word on a 7-point scale ranging from -3 (*extremely unpleasant*) to $+3$ (*extremely pleasant*), with 0 being *neutral*. A mean rating for each emotion word was calculated from these responses (see Appendix B). This mean rating was then used to provide an estimate of the valence and intensity of feelings experienced by the original participants at both event occurrence and at event recall.

Results

Calculating and Analyzing Fading Affect

The mean rating for the word used to describe the emotion experienced at event recall was subtracted from the mean rating for the word used to describe the emotion experienced at event occurrence (this difference is the *fading affect score*). For example, if the emotion word used at event occurrence were given a $+3$ rating by the coding sample and the word used to describe the emotion provoked at event recall were given a $+1$ rating, the fading affect score for the event would be $+2$. To facilitate comparison of the degree of affective fading characterizing pleasant and unpleasant events, the ratings for unpleasant events were multiplied by -1 after calculating the difference score.

Characterizing the Fading Affect Bias

The fading affect scores were entered into a repeated-measures ANOVA with event valence (unpleasant vs. pleasant) and time (event occurrence vs. event recall) as independent variables. A fading affect bias occurs when there is a greater decrease in emotional intensity from initial event occurrence to event recall for unpleasant events than for pleasant events, a pattern that emerged in Study 1 ($M_{\text{unpleasant}} = 2.05$; $M_{\text{pleasant}} = 0.93$), $F(1, 113) = 16.49$, $MSE = 2.36$, $p < .001$.

Because the dependent measure was a difference score, this result may reflect valence differences in the extremity of the words used to describe events either at occurrence or at recall (or both). The temporal locus is crucial: a retrospective memory bias explanation would be supported if the bias were caused by valence differences in the emotions reported for events at their occurrence. Instead, subsidiary analyses showed that the locus of the fading affect bias was in the intensity of emotions experienced at recall ($M_{unpleasant} = 0.15$; $M_{pleasant} = 0.88$), $F(1, 113) = 27.21$, $MSE = 0.26$, $p < .001$, not in the intensity of emotions experienced at event occurrence ($M_{unpleasant} = 1.90$; $M_{pleasant} = 1.81$), $F(1, 113) = 2.17$, $MSE = 0.42$, $p = .14$.

Discussion

The results of Study 1 yielded evidence for a fading affect bias. The intensity of emotions associated with unpleasant memories faded faster over time than the intensity of emotions associated with pleasant memories. This outcome provides convergent validity by showing that, in contrast with earlier studies in which participants reported their emotional experiences on pleasant–unpleasant rating scales, the bias occurs when people describe their emotions in their own words. The results of Study 1 also converge with the results of Holmes (1970), Walker et al. (1997), and Walker et al. (2003a) in suggesting that retrospective distortion in emotion recall is insufficient as an explanation for the fading affect bias. Instead, the bias is largely related to differences in emotions elicited when events are recalled.

This temporal locus finding also negates an explanation for the fading affect bias rooted in the idea that the negative motivational system might react more strongly to stimuli than the positive motivational system (Cacioppo, Gardner, & Berntson, 1997). This idea implies that the fading affect bias might occur because initial reactions to unpleasant events are stronger than initial reactions to pleasant events. In contrast, in Study 1 the rated initial intensity of emotions provoked by the unpleasant and pleasant events did not differ. Such equivalence has often emerged in other studies (Walker et al., 2003a; Walker et al., 1997). Hence, the motivational systems hypothesis insufficiently explains the fading affect bias.

Study 2

Now that the fading affect bias seems to be firmly established, attention can be turned to mechanisms that might underlie this bias. Social discourse may be one such mechanism. Two lines of research converge to suggest that describing events to others might be related to the fading affect bias. The first line ties the fading affect bias to social coping processes (e.g., Walker et al., 1997). This idea was inspired by Taylor's (1991) mobilization–minimization hypothesis, which suggests that social, biological and cognitive processes work to minimize the effects of unpleasant events across time. Consistent with this notion, a substantial body of evidence suggests that social disclosure of traumatic events has emotional and health benefits (e.g., Pennebaker, 1997a, 1997b). Social interactions may allow people to obtain social support and comfort in the face of unpleasant events or in times of pain. Input from other people can also help to solve those problems that had previously resulted in unpleasant emotion. Furthermore, social interactions

can provide alternative perspectives that might help people reinterpret negative events, lessening the emotional impact of those memories over time (Beike & Landoll, 2000). Finally, the effort involved in preparing event descriptions for public consumption might itself help to lower the intensity of affect associated with unpleasant event memories (Pennebaker, 1997a).

The second line of research suggesting that describing events to others might be related to the fading affect bias ties social discourse and autobiographical memory to the self. It might be expected that favorable self-concepts might be related to, or derived from, an individual's ability to minimize the affect associated with unpleasant events and to maximize the affect associated with pleasant events (e.g., Sedikides & Strube, 1997). Indeed, Walker et al. (2003a) showed that the fading affect bias diminished in individuals who were mildly depressed. One of the characteristics of mildly depressed individuals is that they tend to have low levels of social support and restricted interaction networks (Teasdale, 1983). One implication is that disclosing events to others might help to slow the fading of emotion associated with pleasant events and enhance the fading of emotion associated with unpleasant events. Consistent with this line of thought, the data from Walker et al. (2003a) showed that the fading affect bias was greater in non-dysphorics than in dysphorics both because unpleasant affect faded more for non-dysphorics and pleasant affect faded faster for dysphorics.

Although theoretical mechanisms have focused on why discourse can reduce the negative emotions associated with autobiographical memories across time, we see no reason why such mechanisms cannot also help to maintain the positive emotions associated with autobiographical memories. After all, when sharing positive events with others one might obtain social feedback that produces positive feelings that might become associated with the event memory. Moreover, positive current emotions about the self might enhance the positive emotional reactions that one has when relating autobiographical events. Hence, the studies that follow look for evidence that social disclosure not only helps to speed the decrease over time of negative emotions that are associated with unpleasant events, but also helps to slow the decrease in positive emotions.

Study 2 explored whether the magnitude of the fading affect bias is related to social discourse frequency. Participants in Study 2 recalled two events (one unpleasant and one pleasant) that they had frequently discussed with others and two events (one unpleasant and one pleasant) that they had not. Ratings of the emotional intensity prompted by each event's occurrence and ratings of emotions prompted by retrieval were obtained. The magnitude of the fading affect bias was expected to be greatest for frequently discussed events and smallest for infrequently discussed events. More specifically, the intensity of emotion associated with unpleasant events was expected to be dampened, and the intensity of emotions associated with pleasant events was expected to be maintained, when participants frequently related autobiographical events to others.

Method

Participants

Thirty-nine undergraduates at a historically African-American university participated in this experiment in exchange for extra credit. Three participants were excluded from the analyses because they failed to follow instructions.

Procedure and Measures

Memory retrieval. Participants were given 15 minutes to recall four autobiographical memories and to write down a brief description of each memory. As in Study 1, participants were enjoined to recall a variety of unique events that were ten years old or less and to recall what happened, where it happened, who was there, and roughly when the event happened. Two events, one positive and one negative, were to be events that participants had frequently talked about with other people (at least ten times). The other two events (one positive and one negative) were to be events that had not been frequently related to others (five times or fewer).

Although most participants provided all four of these different event types, four participants did not. Three of these participants reported two low-frequency/initially unpleasant events and omitted the low-frequency/initially pleasant event. One participant reported two low-frequency/initially pleasant events and omitted the low-frequency/initially unpleasant event. We accommodated the missing data by using within-subjects multiple regression (which treats each event as a separate observation) rather than ANOVA as our analytic technique. The advantage of within-subjects multiple regression is that one can include in the analysis the data for participants who provided incomplete data sets without the necessity of engaging in the awkward options that are required by ANOVA, such as imputation of missing values.

Event ratings. Participants rated how they felt when each event occurred on a 7-point scale ranging from -3 (*extremely unpleasant*) to $+3$ (*extremely pleasant*), with 0 being *neutral*. They used the same scale to provide an additional rating of the emotion they experienced when recalling the event. Finally, participants also rated how well they remembered each event on a 7-point scale ranging from 1 (*barely remember the event*) to 7 (*remember the event perfectly*). Participants were cautioned that a rating of 7 indicated verbatim memory, and it should only be used if the event could be precisely recalled.

Results

Characterizing the Fading Affect Bias

The change in the intensity of affect associated with each event was determined by subtracting the affect intensity rating at event recall from the affect intensity rating at event occurrence. For unpleasant events, the difference scores were multiplied by -1 after the difference was calculated. Hence, regardless of item valence, positive difference scores reflect the extent to which the intensity of emotion decreased from event occurrence to event recall. These difference scores were entered into a hierarchical within-subject multiple regression analysis with initial event affect (unpleasant, pleasant) and social disclosure frequency (low, high) as predictors.

The results yielded a fading affect bias: events that were initially associated with unpleasant emotions showed a larger decrease in affective intensity from event occurrence to event recall ($M = 1.99$) than events that were initially associated with pleasant affect ($M = 0.78$), $F(1, 106) = 25.48$, $MSE = 2.01$, $p < .001$. Subsidiary analyses indicated that the locus of the fading affect bias was in the affect ratings associated with event recall ($M_{unpleasant} = 1.47$, $M_{pleasant} = 2.27$), $F(1, 106) = 21.41$, $MSE = 1.00$, $p < .001$, not in the ratings of the affect experienced at event occurrence ($M_{unpleasant} = 2.49$; $M_{pleasant} = 2.53$), $F(1, 106) = 0.08$, $MSE = 0.56$, ns.¹

The data also suggested that social disclosure frequency moderates the fading affect bias. The analyses of the difference scores yielded a significant initial event affect $\times$ social disclosure frequency interaction, $F(1, 105) = 3.99$, $MSE = 1.95$, $p = .05$. The means for this interaction, depicted in Figure 1, show that the fading affect bias was larger for events that were frequently described to others than for infrequently described events. Nonetheless, follow-up comparisons revealed that the fading affect bias was significant in both the high social disclosure frequency condition, $F(1, 35) = 22.37$, $MSE = 2.43$, $p < .001$, and the low social disclosure frequency condition, $F(1, 35) = 4.70$, $MSE = 1.66$, $p = .04$. Additional follow-up analyses showed that the frequency of social disclosure was significantly related to fading affect for unpleasant events, $F(1, 38) = 5.91$, $MSE = 2.36$, $p = .03$, but not for pleasant events, $F(1, 32) = 0.19$, $MSE = 1.17$, ns.

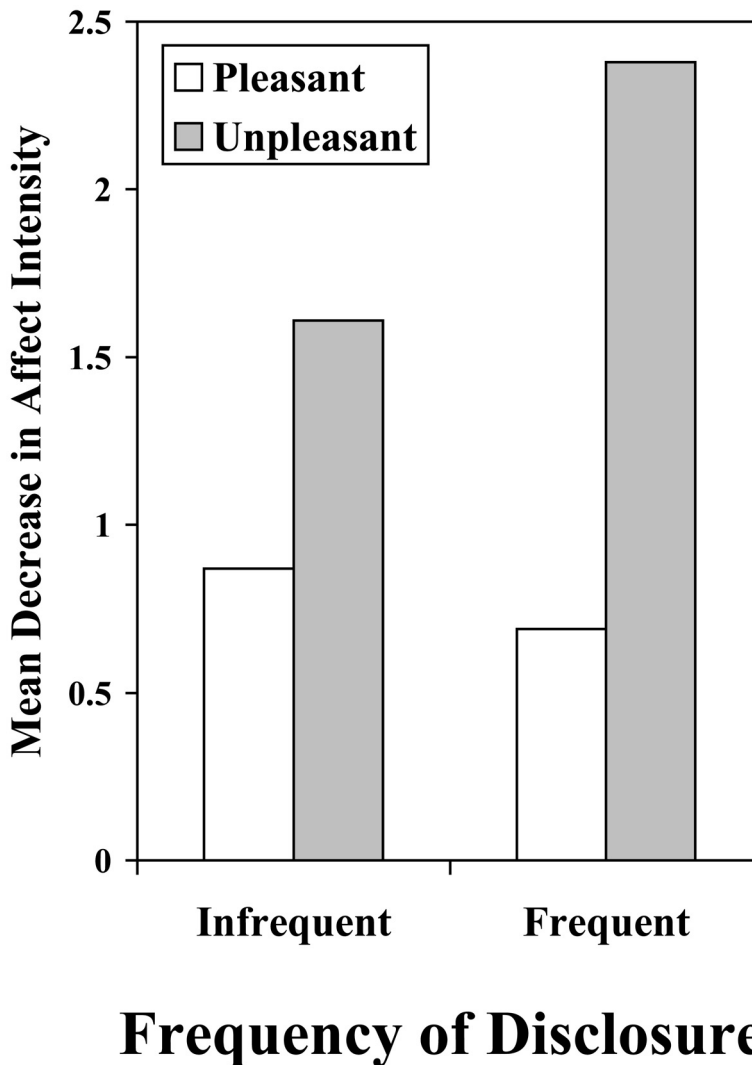


FIGURE 1 Changes in affect intensity (raw means) for frequently and infrequently disclosed pleasant and unpleasant events (Study 2).

Event Memory Does Not Mediate the Fading Affect Bias

It could be claimed that the fading affect bias can be explained by event memory strength: poorly remembered events might provoke smaller affective responses than well-recalled events. Two additional analyses tested this possibility. First, a set of hierarchical regression analyses was conducted in which social disclosure frequency, initial event affect, and the interaction between those two variables were used to predict event memory. For event memory to mediate the fading affect bias, initial event affect must predict event memory. In a second analysis the affect change data were reanalyzed, with the memory ratings assigned to each event entered as an additional variable in the regression analyses used to predict affective change. If event memory is a mediator of the fading affect bias, then insertion of the memory ratings into the regression model should eliminate the fading affect bias.

As expected, events that were frequently shared with others ($M = 5.74$) received higher memory ratings than events that were infrequently shared ($M = 5.27$), $F(1, 106) = 5.05$, $MSE = 1.52$, $p = .03$. However, neither initial event valence, $F(1, 106) = 0.22$, $MSE = 1.52$, ns., nor the interaction between initial event valence and social disclosure frequency, $F(1, 105) = 2.04$, $MSE = 1.51$, ns., significantly predicted the memory ratings. Further, the memory ratings were not a significant predictor of the fading affect bias, $F(1, 105) = 0.12$, $MSE = 2.03$, ns. Finally, both the initial event valence main effect, $F(1, 105) = 25.38$, $MSE = 2.03$, $p < .001$ and the initial event valence $\times$ social disclosure frequency interaction, $F(1, 104) = 4.25$, $MSE = 1.97$, $p = .04$, remained significant despite inclusion of the memory variable in the regression models predicting affect change. The results of these two analyses suggest that event memory does not mediate the fading affect bias.

Discussion

Two findings in Study 2 replicated results obtained in Study 1. The first was that a fading affect bias emerged in participants' affective judgments: The unpleasant emotions associated with autobiographical events faded more from event occurrence to event recall than the pleasant emotions associated with autobiographical events. The second finding showed that the locus of the fading affect bias was in the ratings of the affect associated with event recall rather than in the ratings of the affect associated with initial event occurrence. This finding contradicts the notion that the fading affect bias occurs as a result of reconstructive biases in memory.

Two findings were new to Study 2. The first finding showed that frequently described events exhibited the fading affect bias more strongly than infrequently described events. The data also showed that the effect of social disclosure on emotional fading was limited largely to unpleasant events. For unpleasant events, affect faded more strongly for frequently described events than for infrequently described events. Although, as predicted, affect faded less for frequently described pleasant events than for infrequently described pleasant events, this differential fading was not statistically significant. The second new finding from Study 2 was that ratings of how well participants remembered the events failed to mediate or predict the emergence of the fading affect bias. Hence, the bias cannot be attributed to differential memory for pleasant and unpleasant events.

Proponents of an explanation for the fading affect bias rooted in reconstructive memory biases might be tempted to argue that retrospective estimates of socially rehearsed events are suspect, thus invalidating the tests of memory as a mediator for

the fading affect bias. However, such an argument is difficult to make because social disclosure predicted event memory in a straightforward way: frequently disclosed events were associated with better memory regardless of whether the event was pleasant or unpleasant. Hence, if one is to argue that estimates of disclosure frequency are invalid for studying the fading affect bias, one must also explain why these disclosure frequency estimates predicted event memory in such a straightforward manner.

Study 3

The frequency of social disclosure is only one disclosure-related variable that might moderate the fading affect bias. Another important factor might be breadth of dissemination. Some events that occur in a person's life might be disclosed repeatedly, but only to a few select individuals. For example, worrisome results of a medical test might be extensively discussed with a spouse or with family members, but they might not be widely shared outside the family unit. On the other hand, some autobiographical events, even those that were extremely unpleasant when they occurred, might later be deemed as acceptable for wide public dissemination. For example, when seen recovering from injuries, a person might be willing to disclose the details of an automobile accident to any who inquire about the cause.

The fact that social disclosures can vary both in frequency and in the diversity of dissemination leads to the question of whether these two factors have independent relations to the fading affect bias. Several mechanisms argue for a diversity effect that is independent of frequency. Disclosing pleasant events to a variety of people allows the storyteller to repeatedly re-experience past accomplishments, whereas disclosing unpleasant events to many people gives the storyteller multiple opportunities to gain advice from others and to obtain different forms of social support. Certainly, a friend is likely to view and respond to an event quite differently from a parent or a supervisor. Moreover, compared to events that are not widely disseminated, sharing an event with several people affords the storyteller a wider range of information that might be useful in bringing an event to psychological closure. Thus, we reasoned that both high social disclosure rates and wide dissemination would be independently related to the magnitude of the fading affect bias.

Method

Participants

Forty-four undergraduates at a historically African-American university participated in this experiment in exchange for extra credit. All participants were tested in small groups containing no more than six participants per session.

Procedure and Measures

Memory retrieval and pleasantness ratings. Participants were given 15 minutes to recall six (three positive and three negative) autobiographical memories. The memory generation instructions given to participants were similar to those used in Study 1. They were told to report pleasant and unpleasant events that had occurred within the last ten years and to think about the specific details of the events.

Retrospective ratings of the pleasantness experienced at event occurrence and ratings of pleasantness at event recall were obtained as described in Study 1.

Social disclosure frequency estimate. Participants were asked to estimate the number of times they had disclosed each memory to others. The instructions emphasized that participants were to focus on instances of social disclosure, not simply when they had thought about the event. Participants were cautioned not to give unrealistic estimates (e.g., 1 million disclosures).

Number of different listener types. Participants were given a list of 15 different categories of people to whom they may have disclosed each memory. This list of categories included: *mother, father, sibling, grandparents, friend (same sex), friend (opposite sex), friends (group), significant other, acquaintance, stranger, teacher, psychologist/counselor, clergy, coach, and other*. Participants were asked to circle any and all of those categories of people to whom they had disclosed that memory. The number of listener categories circled by the participants constituted the measure of audience diversity for each autobiographical memory.

Results

Characterizing the Fading Affect Bias

The change in affect for events was determined using the same method described in Study 1. These affect change scores were entered into a hierarchical within-subject regression analysis. To obtain the predictors for this analysis, we used results from two separate median splits. One median split was derived from the number of times an event was discussed. Events that were discussed five or fewer times were classified as low-frequency events and events that were discussed six or more times were classified as high-frequency events. A second median split was based on the diversity of dissemination. Events that were discussed with five or fewer different types of people were placed into the few listener types category and events that were discussed with six or more different types of people were placed into the many listener types category. Hence, the within-subject hierarchical regression analyses examined the extent to which the affect change scores were predicted by main effects and interactions among the variables of event affect, social disclosure frequency, and audience diversity.²

As in Studies 1 and 2, the results of the regression analyses yielded evidence of a fading affect bias. The affect associated with events that were initially unpleasant showed a greater decrease from event occurrence to event recall ($M = 1.50$)³ than the affect associated with pleasant events ($M = 0.68$), $F(1, 178) = 14.43$, $MSE = 2.22$, $p < .001$. As in the first two studies, subsidiary analyses indicated that this bias was due largely to effects that emerged at event recall. That is, the extremity of the affect ratings did not differ across unpleasant and pleasant events at event occurrence ($M_{unpleasant} = 2.57$, $M_{pleasant} = 2.59$), $F(1, 178) = 0.04$, $MSE = 0.36$, ns., but the extremity of the affect ratings did significantly differ for unpleasant and pleasant events at event recall ($M_{unpleasant} = 1.07$, $M_{pleasant} = 1.91$), $F(1, 178) = 14.14$, $MSE = 2.36$, $p < .001$. These findings suggest that the fading affect bias cannot be attributed to either the greater initial reactivity of the unpleasant motivational system than the pleasant motivational system or to reconstructive biases in recall. Instead, the fading affect bias reflects differential changes over time in the affect associated with unpleasant event memories and pleasant event memories.

Social Disclosure Frequency Moderates the Fading Affect Bias

As in Study 2, the magnitude of the fading affect bias was related to the frequency with which events were discussed with others. The means for the significant event affect $\times$ social disclosure frequency interaction, $F(1, 175) = 12.63$, $MSE = 1.93$, $p < .001$, are presented in Figure 2. These means show that the fading affect bias was large when the events were frequently disclosed and the bias was minimized when the events were infrequently disclosed. A subsidiary analysis conducted on the data for unpleasant events showed that affective fading was significantly greater for frequently disclosed events than for infrequently disclosed events, $F(1, 65) = 4.00$, $MSE = 1.87$, $p = .05$. In contrast, the subsidiary analysis for pleasant events showed that affective fading was greater for infrequently rehearsed events than for frequently

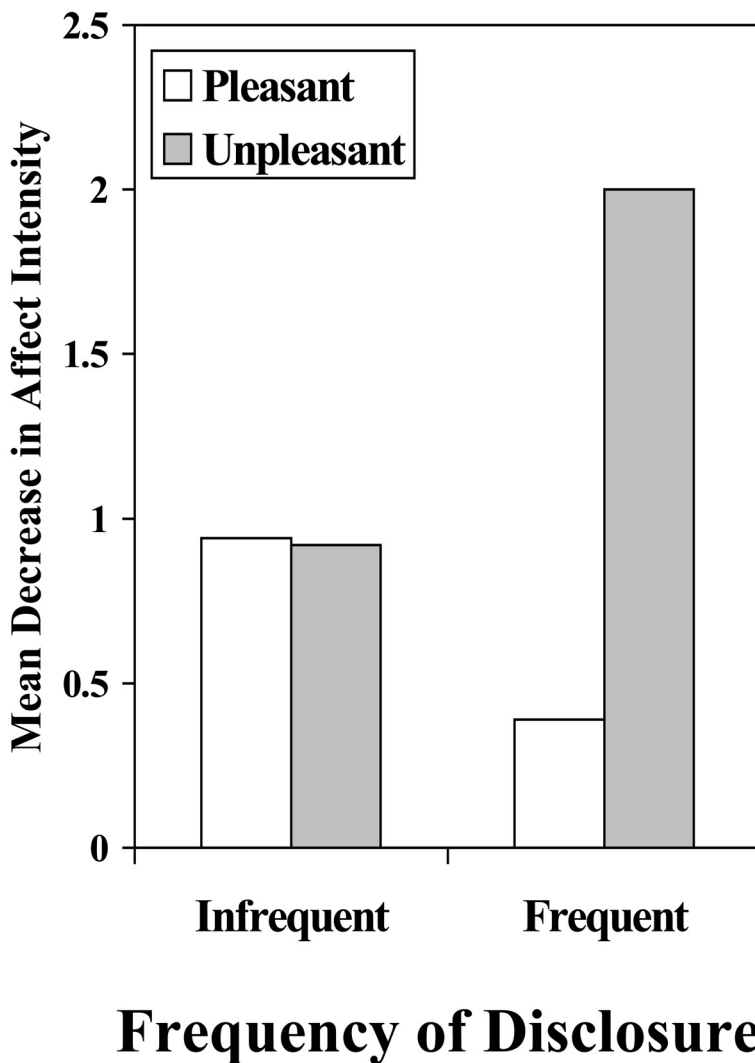


FIGURE 2 Changes in affect intensity (least-squares means) for frequently and infrequently disclosed pleasant and unpleasant events (Study 3).

rehearsed events, but this difference was not statistically significant, $F(1, 75) = 0.28$, $MSE = 1.01$, ns.

Audience Diversity Mediates the Fading Affect Bias

As indicated by a significant event affect $\times$ audience diversity interaction, $F(1, 175) = 4.31$, $MSE = 1.93$, $p = .04$, the magnitude of the fading affect bias was also related to the number of different listener types with whom an autobiographical memory was shared. The means for this interaction are depicted in Figure 3, and show that for unpleasant events the fading affect bias was relatively unrelated to the number of different listeners to whom the event was described, $F(1, 65) = 0.24$, $MSE = 1.87$, ns. In comparison, initially pleasant events faded less when they were shared with a diverse audience than when the audience was not diverse, but this

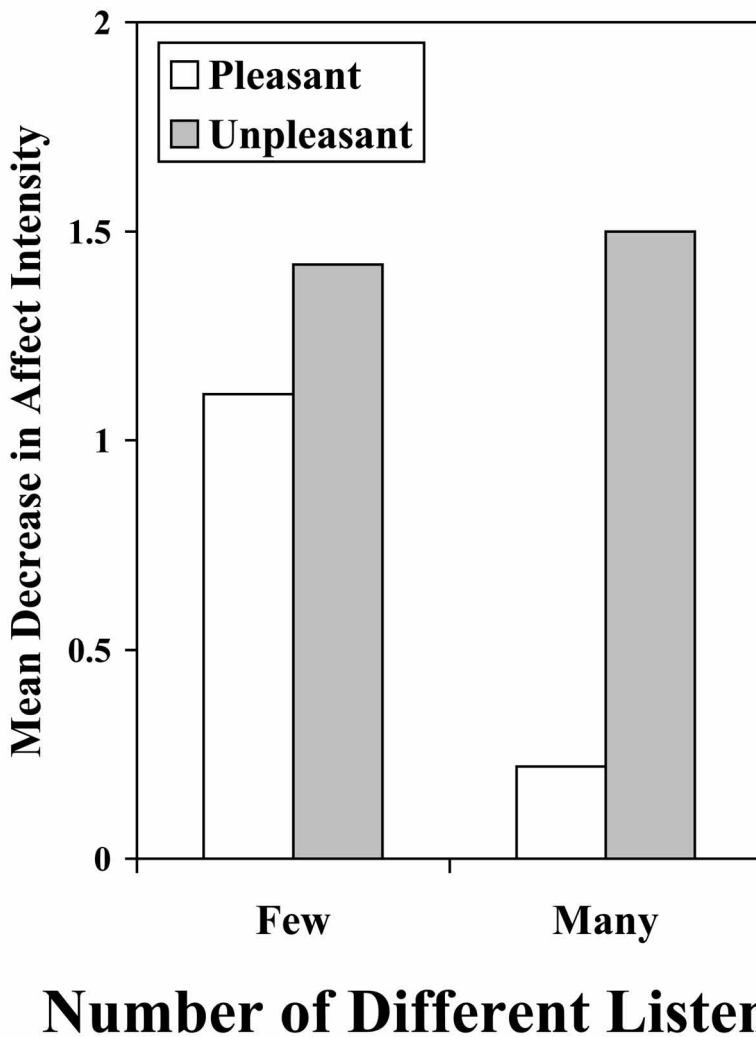


FIGURE 3 Changes in affect intensity (least-squares means) for pleasant and unpleasant events disclosed to many or few different listeners (Study 3).

difference merely approached statistical significance, $F(1, 75) = 2.30$, $MSE = 1.01$, $p = .13$.

Discussion

Replicating the results of prior studies, the data in Study 3 evinced a fading affect bias. Moreover, the absence of a valence difference in the extremity of affect associated with events at their occurrence suggests that this bias cannot be attributed to either the greater reactivity of the unpleasant motivational system than the pleasant motivational system, nor can it be attributed to reconstructive biases in recall. The results of Study 3 also showed that, as in Study 2, the affect associated with unpleasant events, but not pleasant events, faded more when those events were frequently shared than when they were infrequently shared.

A finding unique to Study 3 was that the fading of affect for positive events, but not negative events, was related to audience diversity. Because of our use of simultaneous regression procedures, this social diversity effect is independent of the disclosure frequency effect. Hence, there are at least two moderators of the fading affect bias: the frequency with which an event is disclosed and the number of different categories of people to whom the event is disclosed.

Study 4

Although disclosure frequency and audience diversity were both shown to be related to fading affect in Study 3, because of the observational design used in the study one cannot confidently conclude that those variables causally alter affective fading. Study 4 was designed to allow the derivation of stronger causal conclusions. Study 4 again asked participants to engage in a retrospective recall task and to rate the intensity of affect experienced at event occurrence and the intensity of affect experienced at event recall. We expected these ratings to reflect the usual fading affect bias. However, after event recording, participants engaged in conversations with other participants in a group discussion setting. Each participant engaged in three conversations. Prior to each conversation, some participants were told to disclose some autobiographical events to others. The instructions were manipulated so that participants disclosed each event a different number of times (0, 2 or 3) over the course of the conversations.

After the conversations, participants were again asked to report how they felt about the autobiographical events that they had recalled for the study. We expected that the social disclosure frequency manipulation would enhance the fading affect bias, such that increased social disclosure frequency should increase affective fading for unpleasant events and decrease affective fading for pleasant events.

Method

Participants

Seventy-five undergraduates from two universities participated in the experiment to fulfill a course requirement or to obtain course extra-credit.

Procedure

The experiment involved three sessions. In the first session participants were given approximately 20 minutes to recall six unique emotional events (three unpleasant and three pleasant events) that had occurred within the past 12 months. In addition,

participants were asked to forego reporting events that occurred within the seven days prior to the experiment. Each participant also provided a brief one-to-four word “title” for each memory. These titles were used as memory cues later in the experiment. The experimenter announced the time periodically so that the participants could pace themselves. After the participants had completed the recall sheets, they were given a memory questionnaire asking them to make a series of judgments for each event. These judgments included a pleasantness rating for the event at the time that it occurred and a current pleasantness rating for the event. The scales used for the pleasantness ratings were the same as described for Study 1. In addition, subjects also provided a rating of the extent to which they rehearsed an event.⁴ Participants were told that a “rehearsal” referred to each separate occasion on which they thought about the event, regardless of whether they thought about the event in preparation for public discussion or whether they thought about the event privately. Prior research suggests that such overall rehearsal ratings are not related to the fading affect bias (Walker, Skowronski, Gibbons, & Vogl, 2003b).

During the second session, which occurred two days after session one, the participants shared with other participants the events that they had recorded during the first phase of the experiment. Participants were provided with a series of information sheets, each of which listed the title of the event to be disclosed (this title was earlier provided by the participants themselves) and a number designating the person in the group who was to be the target of the disclosure. Disclosure frequencies for each event were determined by first assigning a number between one and three to each positive event and to each negative event. The experimenter then used rolls of a die to randomly determine which positive event, and which negative event, was assigned to be disclosed three times, twice, or not at all. Hence, two events (one unpleasant and one pleasant) were not shared with other participants, two events (one unpleasant and one pleasant) were shared twice with other participants, and two events (one unpleasant and one pleasant) were shared thrice with other participants. Rolls of a die were also used to determine which of the other participants was the recipient of the disclosure.

Participants were given three minutes to convey their memory for the first event. Participants were instructed to give the listener the opportunity to ask questions about each story if they finished telling their story before time had been called. After this initial three-minute period had elapsed, participants were given another three minutes to share a second event with the same listener. After time was called, participants rotated to a new partner based upon their assigned number. This process was repeated until participants had cycled through all required disclosures.

The third session occurred after a one-week retention interval. Participants were provided with the titles for the six events that they had recorded during the first phase of the experiment and were given approximately 20 minutes to recall the six memories. After the participants had finished writing their descriptions of the events, they were given a questionnaire asking them to provide the current pleasantness ratings for each event.⁵

Results

Characterizing the Fading Affect Bias Prior to the Disclosure Frequency Manipulation

The ratings provided by participants for affect experienced at event occurrence and affect experienced at event recall (but prior to the disclosure manipulation) provide

an opportunity to again observe a “naturalistic” fading affect bias. The change in affect for events was determined using the method described in Study 1. These difference scores were entered into a hierarchical within-subject regression analysis. The predictors in the analysis were event valence (unpleasant vs. pleasant), initial event extremity (low, moderate, or high), and disclosure frequency (low vs. high). The disclosure frequency categories were derived from participants’ frequency ratings (two or below = low; three or above = high).⁶ The initial event extremity ratings were derived from the absolute value of participants’ initial event affect ratings (zero or one = low; two = moderate; three = high). Extremity was included in the analysis for two reasons. First, it was expected that the extremity of the initial affective response would be related to fading affect (as in Walker et al., 2003). Second, it was expected that the fading affect bias would emerge even when the extremity of the initial affective response was statistically accounted for in the regression analyses.

Replicating Studies 1 through 3, the affect associated with unpleasant events faded more from event occurrence to event recall ($M = 0.68$) than the affect associated with pleasant events ($M = 0.19$), $F(1, 363) = 37.12$, $MSE = 0.723$, $p < .001$. This fading affect bias was almost entirely due to the affect experienced at recall ($M_{unpleasant} = 1.52$; $M_{pleasant} = 1.98$), $F(1, 371) = 28.26$, $MSE = 0.830$, $p < .001$, and not to the affect reported at event occurrence ($M_{unpleasant} = 2.29$; $M_{pleasant} = 2.30$), $F(1, 368) = 0.02$, $MSE = 0.673$, ns.

The only other effect that emerged from these analyses reflected the initial extremity of the event: affective fading increased with greater initial event extremity ($M_{low} = 0.11$; $M_{moderate} = 0.37$; $M_{high} = 0.84$), $F(2, 363) = 18.58$, $MSE = 0.723$, $p < .001$. Participants’ overall rehearsal estimates did not predict fading affect, nor did they interact with the other two variables in the analyses. This result replicated the finding obtained by Walker et al. (1997, 2003a) and it highlights the unique relation between social disclosure (as opposed to other forms or event rehearsal) and the fading affect bias.

The Effect of Social Disclosure on the Fading Affect Bias

A new difference score was calculated to evaluate the effects of the disclosure frequency intervention. The affect rating prompted by recall of an event after the group discussions had been completed was subtracted from the affect rating prompted by recall of the event prior to the group discussion. The difference scores for the initially unpleasant events were multiplied by -1 . The resulting scores were entered into a hierarchical within-subject multiple regression analyses. The variables that we used in these analyses were event valence (unpleasant vs. pleasant) and disclosure frequency (zero, two or three disclosures).

It should be noted that the disclosure manipulation occurred after a fading affect bias had already occurred: Prior to the discussion manipulation, the mean intensity for the unpleasant and pleasant events were 1.52 and 1.98, respectively. These different starting points work against the hypothesis that social discourse affects the fading affect bias: to work, the manipulation must produce accelerated fading for the event type (pleasant) that has less room to fade. Nevertheless, the data were consistent with expectations. The analysis again revealed a fading affect bias, such that affective fading was greater for unpleasant events ($M = .37$) than for pleasant events ($M = 0.10$), $F(1, 369) = 10.26$, $MSE = 0.781$, $p < .001$. Moreover, the social disclosure frequency $\times$ initial event affect interaction was statistically significant, $F(2, 367) = 3.46$, $MSE = 0.771$, $p = .03$. The means in Figure 4 show that, for

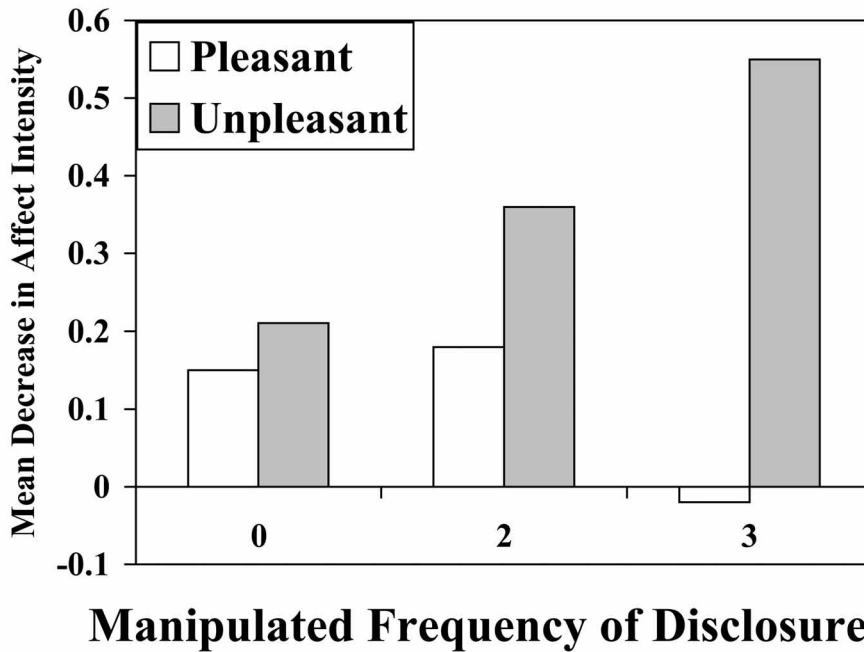


FIGURE 4 Changes in affect intensity (least-squares means) as a function of the manipulated frequency of social disclosure (Study 4).

positive events, affective fading decreased as the number of social disclosures increased. In fact, after three social disclosures participants actually reported feeling more positive about these events than they did before disclosure. Although follow-up tests on the pleasant events revealed that the effect was not significant, $F(2, 147) = 1.47$, $MSE = 0.51$, ns., this trend is noteworthy, especially considering the fact that pleasant events were initially less emotionally extreme than unpleasant events. The pattern of means for unpleasant events was also consistent with expectations: affective fading increased with increasing numbers of social disclosures. However, a follow-up test again revealed that this decrease merely approached statistical significance, $F(2, 147) = 1.87$, $MSE = 0.924$, $p = .16$, as did a subsidiary pairwise Tukey test comparing only the data from the no-disclosure and three-disclosure conditions, $p = .11$.

Discussion

The results of Study 4 showed that social disclosure alters the affect provoked by autobiographical memories. Specifically, high social disclosure frequency increased the affect associated with positive events and decreased the affect associated with negative events. It is true that while neither of these individual trends was statistically reliable, both were roughly equivalent in magnitude and in combination they yielded a significant interaction between initial event affect and social disclosure frequency. Hence, a reasonable conclusion is that the fading of both positive affect and negative affect are altered by social discourse.

However, skeptics may claim that there are limitations on the strength of the cause-and-effect conclusions to be derived from Study 4. After all, one of the characteristics of autobiographical memory experiments is that one gives up control over the stimuli used in the experiments. Hence, it may be the case that these cause-and-effect conclusions about the effect of social disclosure on memory might apply only to the kinds of stimuli that people are likely to report when initially generating autobiographical memories in these kinds of studies (e.g., the things they are willing to disclose to experimenters). However (as advocates of the glass being half-full), one should not ignore that we have demonstrated the cause-and-effect consequences of social disclosure on the fading affect bias for this subclass of events. It remains to other studies that generate autobiographical events in different ways (e.g., from second-hand diaries or public records) to advance the generality of the cause-and-effect conclusions derived from Study 4.

Study 4 also yielded two other notable effects. First, the fading affect bias cannot be attributed to the initial extremity of events. Although the extremity of affect initially associated with an event is related to the magnitude of fading affect, it does not account for the fading affect bias: the bias occurs, even when initial event extremity is accounted for in the analyses. Second, people's estimates of overall event rehearsals in Study 4 were unrelated to the fading affect bias, even though the frequency of social disclosure was clearly related to the fading affect bias in Studies 2, 3, and 4. This null effect replicates an earlier outcome suggesting that the relation between social disclosure frequency and affective fading differs from the relations between other rehearsal types, or overall rehearsal, on affective fading (Walker et al., 2003b). Hence, social disclosure may be uniquely related to the fading affect bias. Whether that uniqueness stems from the feedback received from others in social interactions or the cognitive work required to prepare social communications is a topic to be investigated in future research.

General Discussion

In a recent article, Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) proclaimed that "bad is stronger than good." The data presented in the present article suggest that *the fading affect bias* is at least one substantial limitation to that claim. Belying the claim of Baumeister et al., unpleasant events tend to lose their emotional "punch" over time faster than pleasant events. The fading affect bias suggests that "good can be stronger than bad," at least when one is assessing the persistence of the intensity of emotions associated with autobiographical events.

Several studies, including those described in this article, have now discounted many artifact-based explanations for this bias. One artifact-based explanation that has been suggested is retrospective distortion in memory for emotional intensity. Belying this explanation, the results from all studies conducted to this point suggest that the fading affect bias is primarily driven by differences in how people feel about unpleasant and pleasant autobiographical events at event recall, not by how they feel about those events at event occurrence (see Study 1). Both diary studies in which emotion ratings are collected contemporaneously with event occurrence (Walker et al., 1997) and retrospective studies (Cason, 1932; Holmes, 1970; Walker et al., 2003a) find evidence of the fading affect bias. The diary studies are important because they eliminate the possibility that the fading affect bias is a function of retrospective biases. The fact that the retrospective studies (including those described in the present paper) routinely find no differences in the emotions associated with initial

event occurrence also makes it difficult to argue that retrospective memory distortion can explain the fading affect bias. These data make it similarly difficult to explain the fading affect bias by attempting to claim that the bias is an illusion based on a differential ceiling for the emotions provoked by the occurrence of unpleasant and pleasant events. Finally, Study 1 in the present paper showed that the bias even emerged when people freely describe their emotions in their own words, ruling out explanations for the bias that are rooted in participants' use of rating scales to judge their own emotions.

The existing studies also make it difficult to claim that the bias is due to: (1) initial differences in unpleasant and pleasant events (e.g., age, extremity); (2) biases in the types of events recalled in retrospective studies; (3) the tendency for pleasant events to be recalled slightly better than unpleasant events; or (4) the implicit or explicit theories that participants may have about affect changes in memory. In the Walker et al. (1997) diary studies, participants typically recorded both trivial and non-trivial events, and the fading affect bias emerged regardless of event type. A similar outcome emerged in the present paper. Likewise, event ages were precisely known in the Walker et al. (1997) studies, and the fading affect bias occurred regardless of the age of the events. Walker et al. (2003a) similarly showed that the fading affect bias emerged when controlling for the judged age of events. Finally, Walker et al. (1997) and Study 2 in the present paper produced evidence for the fading affect bias controlling for event memory strength. Hence, the fading affect bias is unlikely to be the result of differential forgetting of the details of pleasant and unpleasant events.

The differential-forgetting explanation is further weakened by the results obtained from Studies 2 through 4 in the present paper. Frequently discussed events ought to be better remembered than infrequently discussed events, a fact that was confirmed by the results of Study 2. However, the data from Studies 2 through 4 also showed that there was a high degree of affective fading for unpleasant events that were frequently rehearsed. This finding is exactly the opposite of the outcome that one would expect based on the differential-forgetting explanation for the fading affect bias.

However, one might speculate that the magnitude of the fading affect bias might be moderated by specific characteristics of events. For example, Beike and Landoll's (2000) research suggests that the affect associated with events might change as a result of whether events are psychologically "open" or "closed." Open events feel currently relevant; closed events are those that have been put in the past. Psychologically open events may be less likely to be associated with fading affect. Other event characteristics may similarly moderate the fading affect bias and can be fruitful targets of subsequent research.

One of those moderators, as demonstrated by the results of Studies 2 through 4, is social disclosure, an outcome that is consistent with the results provided by Pennebaker (1997a, 1997b) and Walker et al. (2003b). In these studies, talking frequently about unpleasant autobiographical events is associated with lowered unpleasant affect for those events at event recall. Thus, disclosing unpleasant events with another person may be a healthy response to those events. Certainly, one might speculate that the reluctance or inability of depressives to discuss events with others might contribute to the lowered fading affect bias evinced by depressives (Walker et al., 2003a). However, our data also suggest that the amelioration of unpleasant affect associated with events is not the only result of social disclosure. In Studies 2 through 4, as well as in Walker et al. (2003b), affect faded less for pleasant events when those events were frequently discussed. In fact, social disclosure reversed the course of

affective fading for pleasant events in Study 4. While it is true that social disclosure was not significantly related to affective fading for pleasant events in any of these studies, the consistency of this result across studies suggests that the non-significance of this effect may be a matter of low statistical power, a condition that we intend to remedy in future research.

Ultimately, the specific mechanisms that underlie these disclosure effects are of interest. Several possibilities seem reasonable. For example, as one retells a particularly negative story about oneself, one might become desensitized to the negative aspects of the story. Hence, the story may come to lose its power to provoke negative emotions with increased retelling. By the same token, many of the positive stories that one tells about oneself might engender positive emotions from one's audience, helping to maintain the emotion associated with those events.

Moreover, consideration of disclosure-related issues has led us to think about other ways in which social interaction might be related to autobiographical memory. Certainly, research suggests that real-world memory can be affected by the roles that one occupies in relationships (e.g., Wegner, Erber, & Raymond, 1991). Clearly, research on self-worth suggests that people often take into account the feedback of others when regulating their own self-image (Bosson & Swann, 1999). This notion can be extended so that one might consider the impact of society in general on autobiographical memory. Social norms certainly govern whether a topic is appropriate for a group of target listeners at a particular place and time. If social norms affect disclosure frequency by skewing the content of these interactions with others, then social norms might affect aspects of social memory, including those that are related to the fading affect bias.

For example, one social norm is that one should not prematurely disclose sensitive details about oneself to strangers. Because unpleasant information might be considered to be particularly sensitive, this social norm might guide individuals to focus on pleasant information when discussing life events with strangers. This idea has at least two implications. First, this social norm might contribute to the fading affect bias via its effects on disclosure frequency. Second, the fact that people may disclose pleasant events to strangers and disclose unpleasant events to friends suggests one explanation for Study 3's finding that disclosure breadth had more of an impact on the fading of positive events than on the fading of negative events. Future research could test the influence of social norms on the fading affect bias by manipulating the recipient type as well as the number and type of social disclosures.

Moreover, such conversational biases might also be partially responsible for altering the content of autobiographical memory itself, causing pleasant events to be better recalled over time than unpleasant events (see Thompson, Skowronski, Larsen, & Betz, 1996). That is, pleasant events may simply be more socially acceptable to share, rendering them more available in memory than unpleasant events. This line of reasoning suggests that the content of autobiographical memory may be different when the social norms for groups or cultures differ (see Pasupathi, 2001). One possible example of this idea lies in gender differences in autobiographical memory. Women more often recall the exact dates of autobiographical events better than men (Skowronski & Thompson, 1990) and they tend to be more likely to recall events that reflect interpersonal relationships rather than group memberships (Gardner et al., 2002). These findings seem to correspond to the social norms that apply to gender roles: Women are often assigned the role of "calendar keeper" in social relationships and it is often assumed that the pressures of socialization push women to be relationship-oriented. One's gender may impose a set of social norms

that influence the fading affect bias, as well. For example, the fading affect bias may be stronger for women than for men because women more often disclose in an effort to maintain relationships. Of course, because women tend to express higher levels of depression than men and because the fading affect bias differs in depressives than in non-depressives (Walker et al., 2003a), studies exploring gender differences in the fading affect bias should control for depression (Nolen-Hoeksema, 1990) and vice-versa.

One neat feature of the fading affect bias is that a theoretical analysis of the phenomenon can proceed at many different levels. For example, some might argue that the fading affect bias is a consequence of evolution. The basic notion is that, averaged across circumstances, rapid avoidance of threat is desirable to an organism's survival. From this perspective, intense negative reactions to events allow organisms to avoid danger. However, negative affect fades quickly because its greatest value is to prompt avoidance; once that avoidance has been accomplished, that negative affect is no longer necessary.

The fading affect bias also is consistent with a motivational view. One might postulate that people are generally motivated to avoid or reduce negativity in their lives and to maintain or enhance positivity. This may be especially true when events relate to the self (see Sedikides & Strube, 1997). Hence, individuals who experience negative events should be motivated to reduce or eliminate the negative emotions that accompany those events; people who experience positive events ought to be motivated to maintain or enhance positivity.

Various strategies, both conscious and unconscious, might be employed to achieve these motivational goals. One of these is the reappraisal of an event. Negative events that may have seemed tremendously important at the time they occurred may no longer seem to be important, and hence, the negative affect associated with those events when they are remembered may be mild. For example, a person may think that the day he got dumped by his first love in high school (a terribly negative event at the time) is irrelevant in the context of his current happily married existence. Similarly, positive events that may not have seemed to be very important at the time that they occurred can, in retrospect, take on great importance. For example, a person may think positively about the day he met his wife (which may have been only a brief and unremarkable encounter), in part because that event is a strong contributor to his current happily married existence. Thus, the "meaning" of events changes as one's life story unfolds, and one might hypothesize that such changes may serve to minimize the affect associated with negative events and enhance the affect associated with positive events.

Future research needs to more intensely investigate which of these mechanisms (if not others) contribute to the fading affect bias. Critics of research in some areas of social psychology, particularly critics of social cognition, would claim that such integrative research is long overdue. These critics (e.g., Forgas, 1983) claim that research in social cognition has been overly concerned with the cognitive underpinnings of social thought and social action and has not been concerned enough with how social factors, such as norms and roles, contribute to thought. The research presented in this paper seems to take us on a path toward a melding of such ideas. Specifically, this research links ideas about affect to cognitive processes (e.g., rehearsal) and to social norms. This linkage is most strongly made in the final study of this paper, which demonstrated that the relation between disclosure and changes in event affect is causal. Although it is likely that the fading affect bias is affected by other factors (individual differences, physiological

mechanisms, social motives, and cognitive motives), we hope that this research will serve as a springboard to more research aimed at understanding how social and cognitive variables affect the emotions provoked by recall of autobiographical memories.

Notes

1. In the regressions conducted for Study 2, we report the raw means rather than the least-squared means. Because the design was nearly balanced (with only three missing data points) the least-squares means were nearly identical to the raw means. Also note that manually subtracting the final emotion rating means from the initial emotion rating means does not equal the means that we report for the difference score. This anomaly occurs because of those few events in which an event switches valence from emotion to recall. Because the absolute value of the occurrence-to-emotion difference score is reported, such events affect the fading affect score differently (e.g., $|3 - (-2)| = 5$) than they do the individual means that contribute to that score (e.g., the -2 reduces, not enhances, the mean positivity of the event when calculating the affect provoked at recall).
2. We recognize that some researchers have objections to using median splits on continuous variables in regression analyses. However, the median-split technique has an advantage in the ease with which the data can be described, so we have chosen to use it here. Those who have concerns about the use of the median-split technique will be comforted by the fact that we conducted a set of analyses that used the fully continuous variables as predictors in the regression equations and these analyses led to conclusions similar to those derived from the median-split analyses.
3. Least-squares means are reported for Studies 3 and 4. These means reflect adjustments made for the other variables entered into the regression models. Because of the correlation between the number of times the memories were discussed and the number of people with whom the memories were discussed, the least-squared means were sometimes fairly different from the raw means. It was our judgment that the least-squares means more accurately reflect the results of the regression analyses.
4. In Study 4, subjects also completed a number of other measures. Among them were a measure of depression as well as a measure assessing perceived event age. These measures are irrelevant to the purposes of the present research so results involving them are not discussed.
5. There were minor differences in the procedures used at the second university ($N = 32$) used to collect the data. The first difference was that session one (recording the event memories) and session two (forced disclosure) were not separated by a retention interval. Instead, after recalling six memories participants completed a packet of unrelated survey materials. While participants completed these materials, the event memories and the participants were assigned random numbers to facilitate the disclosure task. The second difference was that in Replication 2 a four-day retention interval rather than a seven-day retention interval separated Session 2 (disclosure) from Session 3 (final ratings). Results of preliminary analyses suggested that that patterns of data that emerged were not significantly related to the data collection site. Hence, the analyses that are reported collapse across replication.
6. We again conducted a set of analyses that used the fully continuous variables as predictors in the regression equations. Results from these analyses led to conclusions similar to those derived from the median-split analyses. The median-split technique has an advantage in the ease with which the data can be described, so we have again chosen to use it here.

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Appendix A

List of Emotion Words Given to Participants in Experiment 1 to Help Them Describe the Emotions Associated with Event Memories

Bored	Desire	Irate	Excited
Melancholy	Anxious	Delighted	Quiet
Delirious	Exhausted	Eager	Dejected
Relaxed	Rage	Blissful	Panic
Tedious	Love	Anticipation	Sad
Upset	Mellow	Glad	Passion
Dull	Peaceful	Hostile	Joy
Slow	Calm	Fear	Terrified
Exhilarated	Despondent	Warmth	Mad
Worried	Cheerful	Downhearted	Thrilled
Irritated	Affection	Apathetic	Unhappy
Frightened	Tranquility	Happy	Angry
Enthusiastic	Monotonous	Dread	Expectant
Furious	Scared	Mundane	Fondness

Appendix B

Emotion Words Generated by Participants and the Mean Emotional Intensity Rating Calculated for Each Word from Study 1 (−3 = *Extremely Unpleasant*; +3 = *Extremely Pleasant*)

Emotion Word	Mean Rating	Emotion Word	Mean Rating	Emotion Word	Mean Rating
Affection	2.43	Fear	−2.03	Shocked	−0.67
Agitated	−1.67	Fondness	0.93	Silly	1.13
Amazed	1.93	Free	2.20	Slow	−1.13
Amused	1.70	Frightened	−2.27	Stress	−2.27
Angry	−2.33	Frustration	−1.93	Surprised	1.23
Anguish	−1.17	Funny	.93	Terrified	−2.17

(continued overleaf)

(continued)

Emotion Word	Mean Rating	Emotion Word	Mean Rating	Emotion Word	Mean Rating
Anticipation	0.23	Furious	-2.37	Thrilled	1.30
Anxious	-0.03	Glad	1.93	Tranquility	0.70
Apathetic	-0.30	Good	1.67	Uncertain	-1.50
Awkward	-1.23	Happy	2.27	Unhappy	-2.10
Betrayed	-2.70	Hopeful	1.70	Upset	-2.27
Bittersweet	-0.37	Hostile	-2.03	Warmth	2.00
Bored	-1.30	Humorous	1.83	Worried	-2.17
Bothered	-1.60	Hurt	-2.13		
Calm	1.80	Irritated	-2.00		
Cheerful	2.13	Joy	2.07		
Confused	-1.53	Lifeless	-1.33		
Curious	0.73	Love	2.50		
Dejected	-1.50	Mad	-2.27		
Delighted	2.10	Melancholy	-0.03		
Delirious	-0.33	Mellow	1.13		
Depressed	-2.43	Nonchalant	0.03		
Devastated	-1.90	Numb	-0.80		
Disappointed	-2.20	Painful	-2.30		
Distraught	-1.97	Panic	-2.17		
Downhearted	-1.80	Passion	2.43		
Dread	-1.83	Peaceful	2.40		
Dull	-1.20	Proud	2.43		
Elated	0.47	Puzzled	-0.97		
Embarrassed	-2.10	Quiet	0.83		
Enjoyed	2.30	Rage	-2.03		
Enthusiastic	2.20	Regretful	-1.67		
Excellent	2.50	Relaxed	2.27		
Excited	2.30	Sad	-1.97		
Exhilarated	1.43	Satisfied	1.60		
Expectant	0.87	Scared	-1.67		

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