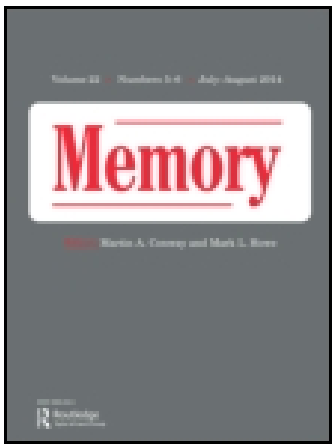

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Changing the working self alters the emotions prompted by recall

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Changing the working self alters the emotions prompted by recall

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Results from three studies indicated that emotional responses to memories can be changed by altering the working self. In particular, these results showed that emotional reactions to memories: (1) were especially positive when memories were perceived to be central to the working self (Experiment 1); (2) were muted when the working self was changed by adopting a third-person perspective during recall (Experiment 1); (3) of an event in the life of each participant's mother weakened when an individual was induced to experience a self that felt less close to their mother (Experiment 2) and (4) of a childhood event provoked especially positive emotional reactions after exposure to a mortality salience manipulation that increased perceived self-worth (Experiment 3). The extent to which mother was included in the self (Experiment 2) and self-worth (Experiment 3) plausibly mediated the effects of the manipulations on participants' emotional reactions to recalled events.

Keywords: Self; Autobiographical memory; Emotion; Mortality salience; Fading affect bias.

Memory research often documents self-related biases in recall. For example, as illustrated by *mnemic neglect* (Sedikides & Green, 2000), important positive self-relevant events tend to be better recalled than important negative self-relevant events (for similar findings, see D'Argembeau & Van der Linden, 2008). Memory is also characterised by positive distortions: individuals augment their current goodness by exaggerating personal failings overcome on the path to success (Dewhurst & Marlborough, 2003; Ross & Wilson, 2003). Finally, individuals frequently remember events as having been more positive than they actually were (Bahrick, Hall, & Da Costa, 2008; Croyle, Loftus, Barger, Sun, Hart, & Gettig, 2006; Levine, Lench, & Safer, 2009; Levine, Schmidt, Kang, & Tinti, 2012; but see Levine & Pizarro, 2004).

However, these self-related biases are not limited to the content of recall. Another research stream examines how individuals are induced to *feel* at the time they recall events. Here, too, a positivity effect often emerges. As Cason (1932) observed, at event recall, the intensity of positive affect (PA) prompted by recalling positive life events typically exceeds the intensity of negative affect (NA) prompted by recalling negative life events. This outcome, in part, reflects the *fading affect bias* (FAB; Gibbons, Lee, & Walker, 2011; Landau & Gunter, 2009; Walker, Skowronski, Gibbons, Vogl, & Ritchie, 2009; Walker, Skowronski, & Thompson, 2003; Walker, Vogl, & Thompson, 1997): NA generally

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fades faster from event occurrence to event recall than PA.

Considerable recent research has examined the FAB. It certainly is a methodologically robust phenomenon. The FAB occurs across several methods of harvesting autobiographical events (e.g., diaries, free retrospective recall and cued retrospective recall) and several ways of measuring the affect associated with events. The FAB cannot be accounted for by relatively uninteresting theoretical mechanisms. For example, mood moderates the FAB, but cannot fully explain it. In addition, individuals have expectations that event-prompted affect changes across time, but these expectations do not explain the FAB. The FAB occurs regardless of the activation level of the emotion prompted by events. Indeed, the FAB occurs even when many other event characteristics, such as an event's extremity, are accounted for. The FAB cannot be explained by the notion that positive events are often better recalled than negative events. Finally, the FAB does vary across individuals, but in sensible ways. For example, the FAB is diminished in dysphoric individuals largely because memory-prompted pleasant affect and memory-prompted unpleasant affect fade with equal rapidity. Similar findings emerge for those who are high in anxiety (for a comprehensive review of FAB research, see Skowronski, Walker, Henderson, & Bond, 2014).

THE FAB IN THE CONTEXT OF THE SELF

Collectively, these FAB results fit with the idea that individuals can self-regulate effectively by manipulating their affective states (Martin, Abend, Sedikides, & Green, 1997; Silvia & Eddington, 2012; Wranik, Barrett, & Salovey, 2007). Given the powerful mood-altering properties of autobiographical memories (Bryant & Veroff, 2007; Josephson, Singer, & Salovey, 1996; Kensinger & Leclerc, 2009; Philippe, Lecours, & Beaulieu-Pelletier, 2009; Raes, Hermans, Williams, & Eelen, 2006; Wildschut, Sedikides, Arndt, & Routledge, 2006), it makes sense that selective reminiscence is one tool that can be used in the service of effective emotion regulation.

Conceptions that explicitly link autobiographical memory to the self both reinforce this self-regulation idea and point to additional implications. For example, self-memory system theory (Conway, 2005; Conway & Pleydell-Pearce, 2000) postulates that individuals possess a current working self and an autobiographical knowledge base. This theory suggests that the working self searches the knowledge base for relevant past experiences that can ascribe meaning to the present (Conway, Singer, & Tagini, 2004; see also Bluck, Alea, Habermas, & Rubin, 2005). This is one way in which autobiographical memory may influence emotion regulation (Bluck, Alea, & Demiray, 2010; Demiray & Bluck, 2011; Pasupathi, 2003).

The notions that the working self influences what is accessed from long-term memory and how such information is related to current self-appraisals suggest that the working self is likely *crucial* to the responses that one has to recalled autobiographical memories. Thus, changes in the working self may be related to the kinds of affective responses that one has to one's memories. To put this more directly, if one changes their current working self, one may be able to change the FAB. This idea is at the core of the research that we describe in the present article.

Curiously, whereas both theory and data suggest a link between affect experienced at event recall and the self, only a few studies have probed this link. One example was reported by Ritchie et al. (2006) who showed that perceived event self-importance predicted the FAB: there was a smaller FAB for events perceived to be important to the self than for events perceived to be unimportant to the self. This pattern was largely due to the heightened NA that was prompted by recall of important negative autobiographical events. The relevance of the self to the affect prompted by recalled events was also suggested by the fact that the differential valence-related fading of affect was small when autobiographical events were either psychologically open (i.e., pertinent to the working self; Beike & Crone, 2008; Beike & Wirth-Beaumont, 2005) or were perceived to be caused by the rememberer. Such findings implicate the relevance of the self to affect that is associated with recall of personal events. However, although Ritchie et al.'s (2006) research explored the relation between the extent to which events were judged to implicate the self and the FAB, it did not directly examine the relation between the self and the FAB.

Ritchie, Sedikides, and Skowronski (2013a) and Ritchie, Skowronski, Cadogan, and Sedikides (2013b) conducted a series of studies that directly explored the links between the FAB and the self. These studies assessed the extent to which an individual's sense of self (as measured by various

scales assessing the self-concept or elements of the self-concept) was related to the magnitude of the FAB. Results suggested that the stronger or more positive the self, the greater the affect intensity provoked by positive memories of the personal past and the lower the affect intensity provoked by negative memories of the personal past. However, because of the correlational nature of such studies, the results raise a causal quandary: does a positive self produce the FAB or does the FAB produce a positive self?

In three experiments, we attempt to verify the idea that changes in the self alter the FAB. To our knowledge, these studies are the first to try to do so. The experimental logic is straightforward. First, the current working self is known to be malleable (Markus & Kunda, 1986), amenable to alteration via experimental manipulations. Second, a given event from the personal past can differ in importance to alternative constructions of the current working self (Robinson & Sedikides, 2009): Some events may be important to one current working self, but less important to another. Finally, if emotional responses to recalled events are determined by the importance of an event to a current self (as suggested by Ritchie, Sedikides, & Skowronski, 2013a), then the emotional reaction to recall of an event might change as the current working self changes.

EXPERIMENT 1

We used different manipulations in each of the three experiments described in this article to alter the working self experienced by participants. In Experiment 1, we altered participants' current self by varying *memory perspective* (Wilson & Ross, 2003). Individuals typically adopt a first-person perspective when recalling personal past events (Libby & Eibach, 2002). When taking a third-person perspective, they view their memories from an observer's viewpoint (Nigro & Neisser, 1983). Using the third-person perspective should increase psychological separation between the event and the current self. Thus, one might expect that a change in perspective from first person to third person should temper participants' emotional response to the recalled event (Robinson & Swanson, 1993). Thus, we hypothesise that participants should feel less affect in response to recalled events from the personal past when adopting a third-person perspective than a first-person perspective. However, based on the mnemic neglect view (Sedikides & Green, 2004, 2009), we also examined the possibility that this diminution of affect may occur only when events are important.

Let us clarify, and elaborate on, these hypotheses. We measured event-prompted affect using the positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS contains two subscales, one that assesses PA and the other that assesses NA. Participants completed both subscales in response to the event that they recalled. Our past research has shown that, when both forms of affect are assessed for an event, NA dissipates faster than PA, regardless of whether the assessed event is negative or positive (Ritchie et al., 2006, see footnote 4). Hence, in the present experiment, we expected to show that, at event recall, stronger emotions emerged on the PA scale than on the NA scale. Moreover, we expected that this effect would be stronger for events viewed in the first person than for events viewed in the third person, and would occur only when events were important and not when events were unimportant. In addition, we note that these hypotheses hold regardless of whether PA and NA are independent, as is often claimed for the PANAS (e.g., Egloff, 1998), or whether they are negatively correlated (e.g., Crawford & Henry, 2004).

Method

Participants

We individually tested 60 (40 females) Fudan University undergraduate volunteers in Shanghai whose ages ranged from 18 to 21 (M = 19.26, SD = .72). The experimental design contains four between-subjects conditions that were formed by crossing the memory importance variable (important memory and unimportant memory) with the visual perspective (first person and third person) variable. We used random assignments to place each participant into one of the four conditions.

Materials and procedures

Participants received one of four questionnaire versions. Each version requested that a participant recall events from their personal past. However, instructions differed across conditions. Some participants were asked to "remember an important event that happened to you personally last year"; others were asked to "remember an unimportant event that happened to you personally last year".

This manipulation has been successfully used in prior research (Ritchie, Skowronski, Cadogan, & Sedikides, 2013b). Participants then listed three keywords expressing the event's gist.

Next, mirroring Libby, Eibach, and Gilovich's (2005) procedures, different participants visualised the event from different perspectives. Instructions in the first-person condition were: "Please visualize the event from the same perspective that you originally had, that is, looking out at your surroundings through your own eyes. Please try to make your memory image as detailed as possible". Instructions in the third-person condition were: "Please visualize the event from an observer's visual perspective; in other words, so that you can see yourself in the memory, as well as your surroundings. Please try to make your memory image as detailed as possible".

To help participants maintain the specified visual perspective, three yes/no questions followed event recall. Questions in the first-person condition were: (1) "Can you see anyone else with you in this event?", (2) "If so, can you see what they are wearing?" and (3) "Can you see what their facial expressions were?". Questions in the third-person condition were: (1) "Can you see what you were doing?", (2) "Can you see what you were wearing?", and (3) "Can you see what your facial expression was?".

Finally, participants were asked to hold their memory image in mind while rating (1 = *not at all*, 5 = *extremely*) their memory on the 20 adjectives of the PANAS (Watson et al., 1988; positive adjective subscale α = .86, negative adjective subscale α = .87; subscale $r(58) = -.35$, $p = .006$).

Results and discussion

Ratings on the positive PANAS subscale and negative PANAS subscale were each averaged and entered into a mixed-model analysis of variance (ANOVA). Memory importance and visual perspective were between-subjects variables; PANAS subscale valence (positive and negative) was the within-subjects variable. Note that the use of the PANAS as an affect assessment tool is new to the FAB literature.

Relevant to our hypotheses is the significant Visual Perspective × PANAS Subscale interaction, $F(1, 56) = 5.31$, $p = .025$, $\eta_p^2 = .087$. Positivity in response to memories was moderated by visual perspective: participants recalling from the first-person perspective (M = 3.23, SD = 1.09) expressed more positive emotional reactions to memories than those recalling from the third-person perspective (M = 2.74, SD = .87), $t(56) = 2.33$, $p = .023$, $\eta^2 = .038$. This effect did not extend to negative emotions experienced at event recall (first-person perspective: M = 1.60, SD = .53; third-person perspective: M = 1.89, SD = .91; $t(56) = 1.52$, $p = .134$, $\text{Stud}^2 = .026$). The significant PANAS subscale main effect, $F(1, 56) = 53.63$, $p < .001$, $\eta_p^2 = .489$, was qualified by this interaction. Nonetheless, the means for the main effect showed that emotional reactions to memories were more positive (M = 2.98, SD = 1.00) than negative (M = 1.74, SD = .75).

The mnemic neglect view offered by Sedikides and Green (2009) suggests that the FAB should depend on the importance of memories to the self. This idea was partially supported by the Memory Importance × PANAS Subscale interaction that was yielded by the ANOVA, $F(1, 56) = 7.38$, $p = .009$, $\eta_p^2 = .116$. The means for this interaction show that participants expressed stronger positive reactions to important (M = 3.51, SD = .83) than to unimportant (M = 2.46, SD = .90) memories, $t(56) = 5.01$, $p < .001$, $\eta^2 = .062$, but did not express stronger negative reactions to important (M = 1.81, SD = .77) than unimportant (M = 1.68, SD = .73) memories, $t(56) = .66$, $p = .514$, $\eta^2 = .01$.

Our hypotheses were also supported by the Memory Importance × Visual Perspective × PANAS Subscale interaction that approached significance, $F(1, 56) = 3.80$, $p = .056$, $\eta_p^2 = .064$. Especially high levels of positive emotion and especially low levels of negative emotion were reported following recall of important events (Table 1). However, positive emotions were especially strong, and negative emotions were especially weak, when events were recalled from a first-person perspective. Important events recalled from a third-person (than first-person) perspective prompted especially weak positive emotions and

TABLE 1
Means and standard deviations (in parentheses) for the Memory Importance × Visual Perspective × PANAS Subscale interaction in Experiment 1

	Positive emotion		*Negative emotion*	
	First person	*Third person*	*First person*	*Third person*
Important	3.98 (0.60)	3.03 (0.77)	1.56 (0.61)	2.05 (0.85)
Unimportant	2.47 (0.93)	2.45 (0.89)	1.63 (0.47)	1.73 (0.96)

especially strong negative emotions. The significant Visual Perspective × PANAS Subscale interaction obtained in a subsidiary analysis of emotions reported after recall of important events confirmed this interpretation, $F(1, 56) = 9.03$, $p < .005$, $\eta_p^2 = .311$. Simple-effect analyses revealed that important memories from the first-person perspective were more positive than those from the third-person perspective, $F(1, 28) = 14.13$, $p = .001$, but negative emotions in important memories were unaffected by perspective, $F(1, 28) = 3.35$, $p = .078$. This Visual Perspective × PANAS Subscale interaction was absent in reports of emotions experienced after recall of unimportant life events, $F(1, 56) = .06$, $p = .80$, $\eta_p^2 = .002$. In this unimportant event condition, participants reported stronger positive than negative recall-prompted emotion, regardless of perspective.

In all, the results were consistent with hypotheses. Emotional reactions to recalled events were more positive for important events than for unimportant events. Moreover, the effect magnitude depended on perspective: the effect of importance on positive emotional reactions to recalled events diminished when participants adopted a third-person perspective during recall. Such results imply that adoption of a third-person perspective changes the current working self that is active at recall. Moreover, the data suggest that adoption of this third-person perspective reduces the importance of events to the working self and consequently attenuates emotional reactions stemming from recall of events from each participant's personal past.

EXPERIMENT 2

Experiment 1's design allows for alternative explanations: We did not assess psychological constructs necessary to test directly the idea that the self mediates emotional responses to recalled events. For example, a third-person point of view (POV) may mute emotions regardless of whether the memory refers to the self or another person. Thus, the muted emotions in the third-person POV condition may have not been the result of change in participants' working selves, but instead may have been a general consequence of adopting a distant perspective to any event.

We addressed this problem in Experiment 2. First, we pursued convergent validity by using a manipulation of the working self active at recall—a manipulation not involving POV. We relied on findings that individuals can variably think of themselves in a collectivistic fashion (as part of a group/society) or an individualistic fashion (as unique individuals; Kashima, Hardie, Wakimoto, & Kashima, 2011; Sedikides, Gaertner, Luke, O'Mara, & Gebauer, 2013). We implemented a priming manipulation to alter participants' individualistic/collectivistic self-view.

Second, we examined emotional reactions to memories about others who are close to the self. Mental representation of the self incorporates knowledge about close others (Decety & Sommerville, 2003). Hence, despite a participant not recalling information about one's past but instead recalling information about a close other's past, this latter recall may produce effects similar to the former recall. Results from the only known relevant study (Hepper, Ritchie, Sedikides, & Wildschut, 2012) are consistent with this contention.

Finally, we capitalised on the availability to us of East-Asian participants, whose default self-setting is collectivistic and who hold particularly intimate bonds with their mothers. In East-Asians, the words "self" and "mother" activate the same brain region (medial prefrontal cortex; Zhu, Zhang, Fan, & Han, 2007). Moreover, Chinese university students display an equally strong self-reference and mother-reference effect when primed with Chinese culture icons (Sui, Zhu, & Chiu, 2007). However, this effect is not fixed. When primed with American culture icons, East-Asians display a stronger self-reference than mother-reference effect (Sui et al., 2007).

We applied a similar manipulation to alter the working selves of East-Asians and we assessed how this manipulation changed emotional responses prompted by memories of participants' mothers. Given that the construct "mother" is more likely to be regarded as part of the self in Chinese than American culture, we hypothesised that Chinese students primed with Chinese culture icons should show more PA towards their memories of their mother's past than when primed with American culture icons, which would shift them towards an individualistic working self.

Method

Participants

We individually tested 69 (40 female) Sun Yat-Sen University undergraduate volunteers in Guangzhou, China, whose ages ranged from 18 to 20 ($M = 19.21$, SD = .79).

Materials and procedures

Participants were asked to recall any childhood story/event from their mother's childhood. Most participants (n = 63) recorded such an event and listed three keywords capturing the event's gist. Six participants could not report a childhood event; they were excluded from the experiment.

Afterwards, participants were randomly assigned to one of three priming conditions. They were led to believe that the priming task was unrelated to the mother memory task. Those in the *Chinese culture priming condition* viewed five Chinese culture icons (the Great Wall, the Forbidden City, the Chinese dragon, the moon cake and chopsticks; Hong, Benet-Martinez, Chiu, & Morris, 2003). Those in the *American culture priming condition* viewed five American culture icons (Hollywood, the White House, the American Flag, McDonald's and Coca Cola; Hong et al., 2003). In the neutral priming condition, participants viewed five pictures of skies and clouds and wrote a sentence describing each picture.

Participants then recalled their mother memory and rated (1 = *not at all*, 5 = *extremely*) the event on four positive adjectives (happy, pleasant, positive and sweet; α = .79) and four negative adjectives (sad, upset, negative and bitter; α = .91). We combined these ratings by valence (Martin et al., 1997) into separate scales assessing emotional responses to the memory [subscale $r(61) = -.42$, $p = .001$].

Finally, each participant completed a manipulation check assessing closeness with their mothers. They encountered a straight line spanning 15 cm. The leftmost end of the line was labelled "Yourself". Each participant marked on the line the perceived closeness of their mothers to their self.

Results and discussion

Manipulation check

We measured how far mother was placed relative to the self on the response line. This distance ranged from 1 to 11 cm (M = 6.25, SD = 2.21). The ANOVA used to analyse these responses yielded a significant condition effect, $F(2, 60) = 4.16$, $p = .02$, $\eta_p^2 = .122$. Participants in the Chinese culture priming condition (M = 5.76, SD = 2.36) placed themselves significantly closer to their mothers than those in the American priming condition (M = 7.33, SD = 2.03), $t(40) = 2.31$, $p = .026$, $\eta^2 = .051$. Participants in the neutral priming condition (M = 5.67, SD = 1.88) also placed themselves significantly closer to their mothers than those in the American priming condition, $t(40) = 2.76$, $p = .009$, $\eta^2 = .058$. Participants in the Chinese and neutral priming conditions did not differ in placements of mothers relative to the self, $t(40) = .14$, $p = .84$, $\eta^2 = .003$. These results confirm that the American cultural priming manipulation decreased perceived psychological distance between participants and mothers.

Analysis of memory-prompted emotions

We entered the average of positive emotion ratings and negative emotion ratings into a mixed-model ANOVA. Priming condition was the between-subjects variable, whereas emotion valence was the within-subjects variable.

Emotional reactions to memories of mothers were more positive (M = 3.81, SD = .77) than negative (M = 2.04, SD = 1.00), $F(1, 60) = 101.94$, $p < .001$, $\eta_p^2 = .629$. Importantly, this effect was qualified by a Priming Condition × Emotion Valence interaction, $F(2, 60) = 5.78$, $p = .005$, $\eta_p^2 = .162$. Participants in the Chinese priming condition (M = 4.00, SD = .77) reported stronger positive emotional responses to their memories of mothers than those in the American priming condition (M = 3.46, SD = .71), $t(60) = 2.33$, $p = .02$, $\eta^2 = .042$. Participants in the neutral priming condition (M = 3.98, SD = .75) reported stronger positive emotional responses to their memories of mothers than those in the American priming condition, $t(60) = 2.23$, $p = .03$, $\eta^2 = .034$. The positive emotion means in the Chinese priming condition and the neutral priming condition did not differ, $t(60) = .096$, $p = .92$, $\eta^2 = .002$.

A pattern with similar implications emerged for negative emotion ratings. Participants in the Chinese priming condition (M = 1.76, SD = .92) reported weaker negative emotional reactions to their memories of mothers than those in the American priming condition (M = 2.53, SD = .91), $t(60) = 3.19$, $p = .01$, $\eta^2 = .045$. Participants in the neutral priming condition (M = 1.83, SD = 1.00) reported weaker negative emotional reactions to their memories of mothers than those in the American priming condition, $t(60) = 2.40$, $p = .02$, $\eta^2 = .036$. The negative emotion means in the Chinese priming condition and the neutral priming condition did not differ, $t(60) = .24$, $p = .81$, $\eta^2 = .004$.

Mediational analyses

Two prominent approaches to mediational analyses are the older approach proposed by Baron and Kenny (1986) and a more-recently proposed approach derived from Preacher and Hayes (2008). The Baron and Kenny approach has long been the standard. As Zhao, Lynch, and Chen (2010) wrote, for many "the journey from project conception to publication is not over until seeing the outcome of a mediation test of the effect of independent variable X on dependent variable Y through mediator M". However, the procedure has been criticised (Zhao, Lynch, & Chen, 2010). For example, Preacher and Hayes' (2008) bootstrapping approach to mediation is often seen as more conservative than that of Baron and Kenny.

We were torn between selecting the "standard" approach because it is the one that most have come to expect, and the newer approach that might be less well known, but that has advantages over the older one. In the end, we chose to present results from both.

Assessing mediation seemed plausible (Zhao et al., 2010). In comparison to the other conditions used in Experiment 1, the American priming manipulation both lowered perceived closeness to mothers and muted positivity of emotional reactions to memories about mothers. Mediational analyses explored whether the emotional muting could have been plausibly triggered by psychological distancing. We excluded the control condition from these analyses and dummy-coded the experiment's two priming conditions. We conducted analyses separately by emotion valence.

Positive emotion. We began by assessing mediation with Baron and Kenny's (1986) approach. Closeness with mothers predicted positive emotions prompted by memories about mothers ($\beta = -.42$, $t = -3.57$, $p = .004$). The cultural priming manipulation predicted responses both to closeness with mothers ($\beta = .31$, $t = 2.55$, $p = .013$) and to positive emotions prompted by memories of mothers ($\beta = .27$, $t = -2.21$, $p = .031$). When we used both the cultural priming manipulation and responses to closeness with mothers to predict positive emotions prompted by memories of mothers, the cultural priming manipulation was eliminated as a significant predictor of emotion ($\beta = -.15$, $t = -1.30$, $p = .20$). Moreover, after controlling for the cultural priming manipulation, closeness with mothers remained significant ($\beta = -.37$, $t = -3.0$, $p = .004$). Further, a Sobel test indicated that closeness with mothers was a significant mediator of the influence of cultural priming on positive emotion ($Z = 2.08$, $p = .037$).[1] This pattern is consistent with mediation.

However, the more conservative bootstrapping procedure (1000 bootstraps; Preacher & Hayes, 2008) assessing this mediational effect yielded a 95% confidence interval (bias-corrected and accelerated) containing 0 (−.265, .006). This result is inconsistent with mediation. Hence, evidence is mixed on whether the relation between the priming condition and positive emotional responses to memories of mothers was plausibly mediated by closeness to mothers.

Negative emotion. Analyses using Baron and Kenny's (1986) approach showed that closeness with mothers predicted NA associated with memories about mothers ($\beta = .35$, $t = 2.34$, $p = .005$). The cultural priming manipulation predicted both closeness with mothers ($\beta = .31$, $t = 2.55$, $p = .013$) and NA associated with memories about mothers ($\beta = .29$, $t = 2.37$, $p = .021$). When we used both the cultural priming manipulation and closeness with mothers to predict NA associated with memories about mothers, the cultural priming manipulation was no longer a significant predictor ($\beta = .20$, $t = 1.61$, $p = .11$). Moreover, after controlling for the cultural priming manipulation, closeness with mothers remained significant ($\beta = .29$, $t = 2.34$, $p = .023$). Finally, a Sobel test indicated that closeness with mothers was a marginal mediator of the influence of cultural priming on negative emotion ($Z = 1.72$, $p = .085$). This pattern is consistent with mediation.

The bootstrapping procedure (1000 bootstraps) similarly indicated that the mediational effect of closeness with mothers yielded a 95% confidence interval (bias-corrected and accelerated) that excluded 0 (.010, .242). This pattern is also consistent with mediation. Thus, the results of both mediational analyses converged on the conclusion that closeness with mothers plausibly mediated the effect of the cultural priming manipulation on negative emotions associated with mothers' memories.

[1] Note that research suggests that our small sample size may not yield a reliable Sobel test result (Preacher & Hayes, 2008). Hence, there is some reason to suspect that the bootstrapping technique may be the more appropriate test for our data.

EXPERIMENT 3

In Experiment 3, we additionally sought convergent validity for the results of Experiments 1 and 2 by using a mortality salience manipulation to alter the working self active at recall. Activating mortality constructs causes people to place a high value on the self and entities strongly linked to it, including relationships (Cox & Arndt, 2012; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Such effects should also affect emotional responses that people have to their memories. Assuming the recall of positive memories from the personal past, emotional reactions to those memories should become even more positive after participants are exposed to a mortality salience manipulation. We tested this hypothesis in Experiment 3.

In Experiment 3, we also checked the replicability of Experiment 2's mediation results. We examined whether participants' self-worth differed across mortality salience conditions. Mediational analyses assessed whether self-worth plausibly mediated the effect of the mortality salience manipulation on emotions prompted by event recall.

Method

Participants

We individually tested 58 (40 female) Sun Yat-Sen University undergraduate volunteers in Guangzhou, China, whose ages ranged from 17 to 20 (M = 18.41, SD = .77).

Materials and procedure

Participants recalled a childhood event that occurred before they went to elementary school and wrote three keywords summarising the event. For half of the participants (randomly assigned to condition), a mortality salience induction (taken from Greenberg, Pyszczynski, & Solomon, 1997) followed. Those in this condition described (in up to 100 words) their feelings if they were to face death and what would happen to them physically as they died in a hospital. Those in the control condition described (up to 100 words) their feelings if they were to have a toothache and what would happen to them physically as they received treatment at a dentist's office.

Next, participants completed a two-min arithmetic filler task, providing a necessary delay between mortality salience induction and collection of measures (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Subsequently, participants rated (1 = *not at all*, 5 = *extremely*) emotions prompted as they thought about the childhood event previously recalled. Ratings were made on the same 20 PANAS adjectives used in Experiment 1 [positive subscale α = .86; negative subscale α = .85; subscale $r(56) = -.39$, p = .003].

Finally, participants indicated how many points they would give themselves if the least worthy member of their society was valued at 0 points and the most worthy member was valued at 100 points. This was the self-worth manipulation check.

Results and discussion

Manipulation check

Self-worth scores ranged from 56 to 99 (M = 78.33, SD = 10.49). Mortality salience condition participants (M = 81.10, SD = 10.72) assigned higher scores (saw themselves as worthier society members) than control condition participants (M = 75.36, SD = 9.55), $F(1, 56) = 4.61$, p = .036, $\eta_p^2 = .077$. Thus, the mortality salience manipulation changed participants' working selves, leading them to perceive themselves as having higher value. We note that our results fit with other findings indicating that mortality salience is related to the self. For example, mortality salience increases self-esteem (Sowards, Moniz, & Harris, 1991) and explicit self-esteem is a buffer to mortality threat (Routledge et al., 2010). Moreover, many other studies have found that mortality salience influences the interpretation of specific self-relevant information (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). That our results converge with these other findings lends support to our assertion that we successfully manipulated the self via the mortality threat manipulation.

Emotional reactions to recalled memories

We entered the averages of responses to the positive PANAS items and the negative PANAS items into a mixed-model ANOVA. The mortality salience manipulation was the between-subjects variable, whereas the PANAS subscale (positive emotion and negative emotion) was the within-subjects variable.

Positive emotional reactions (M = 3.45, SD = .83) to the childhood memory were stronger than

the negative ones (M = 1.98, SD = .80), $F(1, 56)$ = 73.90, $p < .001$, $\eta_p^2 = .569$, but this effect was qualified by a Mortality Salience × PANAS subscale interaction, $F(1, 56) = 5.49$, $p = .023$, $\eta_p^2 = .089$. Mortality salience condition participants (M = 3.75, SD = .83) experienced stronger positive emotions in reaction to their memories than control condition participants (M = 3.15, SD = .72), $t(56) = 2.93$, $p = .005$, $\eta^2 = .053$, conceptually replicating Experiment 2's results. However, mortality salience (M = 1.87, SD = .63) and control (M = 2.08, SD = .95) condition participants did not differ in strength of negative emotional reactions to memories, $t(56) = .98$, $p = .33$, $\eta^2 = .017$. This latter result failed to duplicate the corresponding pattern observed in Experiment 2, but did replicate the pattern observed in Experiment 1. This differing pattern of results across studies may reflect the use of a response scale in Experiment 2 that differed from the PANAS used in both Experiments 1 and 3.

Mediational analyses

In comparison to those in the control condition, mortality salience condition participants increased both perceptions of self-worth and strength of PA in reactions to memories of childhood events. Mediational analyses of the PA data assessed whether the affective strengthening produced by the mortality salience manipulation was plausibly triggered by the self-worth increase.

Following Baron and Kenny's (1986) approach to mediation analysis, self-worth scores were correlated with PA prompted by childhood memories, $\beta = .40$, $p = .002$: the worthier participants considered themselves, the more positive they perceived their memories. The mortality salience manipulation predicted both self-worth scores ($\beta = .28$, $t = 2.16$, $p = .035$) and PA for childhood memories ($\beta = .36$, $t = 2.92$, $p = .005$). When both the mortality salience manipulation and self-worth scores were used to predict PA for memories, though reduced in magnitude, the mortality salience manipulation remained a significant predictor of memory positivity ($\beta = .27$, $t = 2.22$, $p = .03$). Moreover, after controlling for the mortality salience manipulation, self-worth scores remained a significant predictor of positive memory affect ($\beta = .33$, $t = 2.67$, $p = .01$). Finally, a Sobel test indicated that self-worth was a marginal mediator of the influence of mortality salience on PA for childhood memories ($Z = 1.80$, $p = .071$). This results pattern suggests partial mediation.

Application of Preacher and Hayes' (2008) bootstrapping procedures (1000 bootstraps) yielded a 95% confidence interval (bias-corrected and accelerated) not containing 0 (.017, .368). Thus, the two sets of analyses converge in indicating that the influence of mortality salience on perceived PA for childhood memories may have partially occurred through its mediating relation with self-worth.

GENERAL DISCUSSION

Past research findings suggest that the stronger or more positive the self, the greater the intensity of affect provoked by positive event recollections and the lower the intensity of affect provoked by negative event recollections (Walker et al., 2003). However, although such findings suggest that the working self is associated with recall-prompted emotion, their observational nature does not allow the claim that elements of the working self *caused* the shifts in emotion.

The present research provides such evidence. We manipulated participants' current working self in divergent ways and assessed affect reported following event recall. The results converged, demonstrating that: (1) memories central to the self provoked more positivity in emotional reactions prompted by recall than memories peripheral to the self (Experiment 1); (2) memories recalled from the third-person perspective provoked more muted emotional reactions than memories recalled from the original first-person perspective (Experiment 1); (3) memories of an event in the life of each participant's mother (Experiment 2) provoked weaker positive emotional reactions when participants were induced to experience a self that felt less close to their mothers; and (4) participant memories of an event from their own childhood provoked particularly positive emotional reactions following exposure to a mortality salience manipulation that raised self-worth. Two experiments additionally assessed crucial mediational constructs (extent to which mother was included in the self: Experiment 2 and self-worth: Experiment 3) showing that these were plausible mediators of the effects of the manipulations on emotional reactions to recalled events.

Importantly, in our studies manipulations influencing the working self were introduced "after" a memory was recalled. Thus, the observed effects cannot be attributed to participants in different self-states recalling different types of memories.

Instead, manipulations inducing different self-states caused participants to experience their memories differently.

Establishment of this causal order is crucial. It is commonly assumed that the usual causal sequence involves emotional reactions to recalled events affecting the self, and not vice versa. For example, it has been argued that people prefer a positive mood and take actions to maintain or promote such a mood (Forgas & Bower, 1988; Sedikides, 1992). One such action is to recall positive memories and avoid recalling negative memories. One such case is illustrated in a study reported by Kennedy, Mather, and Carstensen (2004). In this study, nuns recalled personal information originally reported 14 years earlier. They did so under experimental conditions that repeatedly prompted them to focus on current emotional states, on memory accuracy or that provided no instructional focus. Both older control condition participants and those who focused on current emotional states remembered the past more positively than originally reported. The authors concluded that recall was involved in emotion regulation, which buttressed and enhanced the current self.

Our findings suggest that this causal sequence is not the only one that can account for a relation between the self and affect prompted by event recall. Instead, the state of the self (as reflected in the working self) can also influence emotions experienced at event recall. In this regard, the reader might note that Experiments 2 and 3 were designed such that participants reported the mediating measure (mother closeness: Experiment 2; self-worth: Experiment 3) after they reported the affect prompted by the recalled memory. Some may hold that this methodology may open the possibility that emotional intensity experienced at recall influenced felt closeness with one's mother and self-worth. Our retort is that the order in which constructs are assessed does not necessarily correspond to proper placement of the constructs in the model. To be clear, though, we do not consider our results to repudiate the recall-to-self causal order. Rather, we contend that the relation between the self and event-prompted emotion is bidirectional (echoing Ritchie et al., 2013b), a contention that ought to be checked by future research.

Another issue of note concerns a methodological detail. Participants in our studies retrospectively reported a memory accompanied by cue words, and then later were asked to recall the memory after being prompted by the cue words. Devotees of methods might note that we never actually recorded the memory that was prompted by the cue words, leading those devotees to wonder whether participants actually rated the same memory that they recorded. Such a circumstance might lead to the claim that our results may be invalid because participants rated different events than they reported. This might be a troubling criticism if we did not have an extensive corpus of FAB research on which to draw. Instead, we do have that extensive corpus of results (Skowronski et al., 2014). The methodological variations used in such past research have included: (1) diary studies in which events are rated both on entry into the diaries as well as when the full diary entries are represented, (2) studies in which events are entered into diaries accompanied by cue words and are rated at recall only when prompted by the cue words, (3) retrospective recall studies in which events are rated at the time of recall and (4) retrospective recall studies (such as those reported in this manuscript) in which participants retrospectively recall events accompanied by cue words and then later rate the events prompted by the cue words. The results from all of these studies converge, which renders unlikely that the criticism that our results might be invalid, because participants rated different events that they reported.

Another issue that requires discussion is that the valence of the recalled events was not included in our analyses. We did not do so because we relied on results from past research indicating that, when the PA and the NA prompted by an event were simultaneously measured for a single event, the FAB would emerge from the affect ratings (Ritchie et al., 2006) when those ratings were examined collapsing across event valence. That is exactly what we found. However, one useful extension of our research would be to ask participants to report both positive and negative memories from their personal pasts and to test how the two kinds of memories react to the manipulations. A perspective that considers memories of the personal past in the context of emotion regulation (Skowronski, 2011) would predict that increasing the involvement of the self would lead to minimisation of negativity in reactions to memories of negative events. This prediction is supported by results from prior observational work (Ritchie et al., 2013b): High self-concept clarity is associated with weak negative reactions at negative event recall. Yet, it would be desirable to use the

current manipulations to confirm that the self causes such effects in affective responses to negative events.

Although our research documents the link between the self and affect experienced at event recall, it does not address the specific *processes* by which such effects emerge. For example, in Experiment 3 participants reported more positive emotions in the mortality salience condition than in the control condition. Mortality salience manipulations may produce negative moods, and, as suggested by Skowronski (2011) and Ritchie et al. (2013b), in attempts at mood repair people may spend much time and effort thinking about their positive life events or explaining away their negative life events. Thus, although participants in Experiment 3 chose their memory prior to the manipulation, in the service of mood repair they may have reflected in their memories for different amounts of time. The same idea might drive reported affect in Experiment 1. Participants who operated from a self-POV may have lingered on their memories longer out of a desire to experience positive emotions. This savouring may have caused those thinking from the self-POV to rate their recalled positive events as especially likely to produce strong PA. Future research, then, should focus on mental processes and mental mechanisms linking the self to emotions experienced at event recall.

One additional feature of our results is that they are consistent with the view that the tendency to engage in self-protective or self-enhancing thinking is found not only in Western culture (Alicke & Sedikides, 2011; D'Argembeau & Van der Linden, 2008; Sedikides & Green, 2009; Skowronski, 2011) but also in East-Asian culture (Chiu, Wan, Cheng, Kim, & Yang, 2011; Sedikides, 2012; Sedikides & Alicke, 2012). Moreover, the data that we report significantly add to the FAB literature in that, to our knowledge, they are the first to indicate that a FAB emerges in non-Western cultures.

CODA

People experience emotions when they recall memories from their past. Recalled positive events tend to produce stronger affect at event recall than negative events. However, the self is not a fixed entity, it varies across time and circumstance. We proposed that changes to the working self induced by our manipulations could *cause* changes in affective responses to recalled events. Results from three studies supported this proposition, and this is the first time such causal evidence has been reported. Such results suggest that affective responses to recalled events are not fixed, but instead can vary across time and circumstance. One task of additional research is to further identify the causes of variability in how an individual is made to feel when they recall a given event from the past.

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