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Memory as a Self-Protective Mechanism

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Abstract

The autobiographical memory literature has established that people remember poorly unpleasant, relative to pleasant, life events. We complemented this literature with a theoretical model – the mnemic neglect model – and an experimental paradigm that exerts tight control over the to-be-remembered material. Participants recall poorly self-threatening feedback compared to self-affirming or other-relevant feedback – a phenomenon we labeled *mnemic neglect*. The phenomenon is motivational: it is in the service of self-protection. The phenomenon is also flexible. Participants can switch from self-protection (e.g. avoiding negative feedback) to an alternative goal (e.g. striving for feedback with improvement potential), when circumstances call for it such as when the feedback is provided by a close other rather than a stranger. Finally, self-threatening feedback may be forgotten, but it is not lost: the mnemic neglect effect is not obtained in recognition recall.

Memory as a Self-Protective Mechanism

A Hollywood film, *Eternal Sunshine of the Spotless Mind*, conjures up the notion that problem memories (e.g. a relationship gone sour) can be erased by a painless electrical editing of neurons. In this case, Hollywood may be only slightly ahead of real-world events: a pill, *propranolol*, is currently undergoing testing at Harvard Medical School. A beta-blocker that affects stress hormones in the brain, propranolol, may prevent highly charged emotional memories taking hold, if taken shortly after witnessing a dramatic event (Cromie, 2004). Human memory, however, has been doing its own editing of unpleasant memories long before medical or pharmaceutical procedures were suggested. In this study, we review research on autobiographical memory for unpleasant and pleasant memories. We then describe and evaluate a theoretical model, the mnemic neglect model, which purports to explain how memory copes dynamically with self-threatening information.

Autobiographical Memory for Unpleasant and Pleasant Memories

In a review of the literature, Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) concluded that negative memories are recalled better than positive memories (an example of the 'bad is stronger than good' principle). This conclusion, however, is unwarranted in the domain of autobiographical memory. Indeed, the autobiographical memory literature has established that unpleasant life events are recalled more poorly than pleasant life events (Mather, 2006; Skowronski, Betz, Thompson, & Shannon, 1991; Thompson, Skowronski, Larsen, & Betz, 1996). The fading affect bias (FAB) has been offered as an explanation for this memory discrepancy. According to the FAB, the negative effect linked with autobiographical memories fades faster across time than the positive affect linked with

such memories (Ritchie et al., 2006; Skowronski, Gibbons, Vogl, & Walker, 2004; Walker, Skowronski, & Thompson, 2003).

Nevertheless, there are reasons why an experimental paradigm can complement and extend the autobiographical memory findings. As Walker, Skowronski, and Thompson (2003) concluded that the base rate of positive versus negative events in people's lives is unequal: positive events are about twice as frequent as negative events (50% versus 25%). As such, positive information may be remembered better because it has greater similarity and density in associative memory than negative information does (Unkelbach, Fiedler, Bayer, Stegmueller, & Danner, 2008). Also, environmental cues at encoding (e.g. pleasant surroundings) may account in part for this recall discrepancy. Finally, although some autobiographical memory research has examined the role of memory importance (Ritchie et al., 2006) and compared self versus other memory (Skowronski, Betz, Thompson, & Shannon, 1991), no work in this tradition has investigated these variables simultaneously.

Our research, then, complements autobiographical memory literature in that it is concerned with the on-line processing of a concrete and experimentally provided array of relevant information rather than the reconstruction of pleasant or unpleasant life events. Thus, our research exerts tight control over the to-be-remembered material. The ratio of positive to negative information is equal. Environmental cues at encoding are standardized. The role of self versus other memories is taken into consideration; in fact, the same information becomes self-referent in one condition and other-referent in another. Finally, the importance of memories is manipulated. We proceed with the description of our theoretical model and related empirical findings.

The Mnemic Neglect Model

Applicability domain

The model is applicable to circumstances, quite typical we think, in which people receive mixed feedback. A friend may label you with a positive trait, yet add a negative trait. A journal editor may express approval of an aspect of your manuscript, yet disapprove of another. A romantic partner may compliment you for one habit, yet disparage you for another. How do people process and remember positive and negative feedbacks about the self? How do they protect the self from threatening information? Do memories about oneself differ from memories about another person?

Tenets

The mnemic neglect model (Sedikides, Green, & Pinter, 2004) portrays the self-concept as a complex, predominantly positive, and motivationally imbued mental representation (Sedikides & Gregg, 2003; Sedikides & Spencer, 2007). People think of themselves as worthwhile, competent, warm, moral, attractive, and loveable (Alicke & Sedikides, 2009; Sedikides & Gregg, 2008). The model postulates that people strive to maintain the positivity of self-knowledge by guarding against unfavorable social feedback (Campbell & Sedikides, 1999; Sedikides & Strube, 1997). How is memorial self-protection achieved?

The model draws three key distinctions. One is between feedback whose implications are positive and negative. Another is between feedback that pertains to traits that are central (relatively certain, descriptive, and important – such as kind and trustworthy) and peripheral (relatively uncertain, undescriptive, and unimportant – such as uncomplaining and modest). The third distinction is between feedback that refers to oneself and someone

else. Based on these three distinctions, the model derives four kinds of feedback. Self-threatening feedback is negative, pertains to central traits, and refers to oneself. Self-affirming feedback is positive, central, and self-referent. Other-relevant feedback is positive or negative, central, but other-referent. Finally, tangential feedback is positive or negative, other-referent or self-referent, but peripheral.

The thrust of the model is that individuals attend to and encode self-threatening feedback (e.g. *An employer would not rely on you to have an important project completed by the deadline*, *You would purposely hurt someone to benefit yourself*), but subsequently process it in a superficial manner (Brown & Craik, 2000). Shallow processing involves the separation or disconnection of feedback from stored self-knowledge (Pinter, Green, & Sedikides, 2009). This type of processing will result in reduced elaboration, fewer retrieval routes, and ultimately poorer recall. The same will generally be true (although the pattern will be attenuated) for other-relevant feedback: despite referring to another person, the feedback nonetheless pertains to important traits, thereby maintaining interest and cognitive processing.

In contrast, individuals not only attend to and encode self-affirming feedback (e.g. *You would follow through on a promise made to friends*, *You would help a handicapped neighbor paint his house*), but they also process it in a thorough manner. Deep processing involves integration or connection of feedback with stored self-knowledge (Pinter, Green, & Sedikides, 2009). This type of processing will result in increased elaboration, more retrieval routes, and ultimately better recall. Tangential feedback, which pertains to unimportant or peripheral traits, will also receive relatively shallow processing, regardless of its referent (self versus other) or its valence (positive versus negative).

On the nature of neglect

The mnemic neglect model posits that people are motivated to believe that they are good and to defend this belief. Mnemic neglect serves a self-protective function. As such, it resembles what Erdelyi (2006) called inhibitory repression. This involves ''cognitive avoidance (non-thinking) of some target material [that] leads to loss of accessible memory'' (p. 499). The concept of inhibitory repression is rooted in Ebbinghaus' (1885/1964) work, showing that the simple exclusion of stimuli from consciousness leads to forgetting. It is also anchored in contemporary findings that forgetting can be induced intentionally (Anderson & Green, 2001; Macrae, Bodenhausen, Milne, & Ford, 1997). Indeed, inhibitory control is more successful for negative than neutral memories (Depue, Banich, & Curran, 2006). We suspect that this suppression is not an active, effortful suppression that could yield rebound effects (Wegner, 1994), although this proposal requires empirical verification. From this perspective, then, the neglect of self-threatening feedback is a type of inhibitory repression (Sedikides & Green, 2006).

Evidence for the Mnemic Neglect Model

Initial evidence

In experimental tests of the mnemic neglect model, participants are presented with behavioral feedback. Some participants are asked to imagine, or are led to believe, that they are likely to perform these behaviors. Other participants are asked to imagine, or are led to believe, that another person (Chris) is likely to perform these behaviors. The behaviors are either positive or negative and exemplify either central (e.g. *kind* versus

unkind) or peripheral (e.g. *modest* versus *immodest*) traits. Subsequently, participants carry out a surprise recall task. The typical finding is that participants recall poorly self-threatening behaviors (self-referent negative central) compared to either self-affirming behaviors (self-referent positive central) or other-relevant behaviors (other-referent positive/negative central). We have labeled the recall disparity between self-affirming and self-threatening behaviors – in the backdrop of other-relevant and tangential behaviors – as *mnemic neglect* (Table 1).

We demonstrated mnemic neglect in a laboratory context characterized by relatively high mundane realism (Sedikides & Green, 2000, Experiment 1). Participants completed a 45-item computer-administered personality scale (the alleged Michigan Omnibus Personality Inventory or MOPI). The MOPI was ostensibly valid, reliable, and widely used, while it provided feedback in terms of behaviors (rather than traits) that the test-taker was likely to perform. The MOPI items were plausibly phrased and believable to participants. Examples included: ''It's amazing how 'light' life sometimes seems'', ''I sometimes go to people I consider wise for advice'', and ''I don't mind visiting places where I have never been before''. Next, participants waited for the computer to calculate their scores and provide them with their 'personality profile', which consisted of behaviors that they (or Chris) would be likely to enact. After a brief filler task, participants recalled as many behaviors as possible and as accurately as possible. Participants evidenced the mnemic neglect effect: they recalled poorly self-threatening behaviors relative to affirming behaviors.

In a follow-up experiment (Sedikides & Green, 2000; Experiment 2), we set out to test the generality of mnemic neglect. What if the feedback is presented to participants as completely imaginary and fictitious, rather than under the veneer of a valid personality inventory? Would participants be threatened by make-believe (or role-play) feedback about themselves? We instructed participants in the self-referent condition to ''consider the following description of yourself. Think of the description as being based on actual knowledge of people who know you well. Think of the description as real''. We instructed participants in the other-referent condition to ''consider the description of a person named Chris. Think of the description as being based on actual knowledge of people who know Chris well. Think of the description as real''. Otherwise, we followed a procedure and design identical to those of the previous experiment. Participants, once

Table 1 Mean (unweighted) recall accuracy across eight experiments as a function of referent, behavior type, and behavior valence

	Central behaviors		**Peripheral behaviors**	
	Positive	**Negative**	**Positive**	**Negative**
Self-referent	0.42	0.30	0.19	0.18
Chris-referent	0.40	0.41	0.20	0.18

Note 1. Values reflect the mean proportion of correctly recalled behaviors from each set of eight defined by the interaction between behavior valence and behavior type.
Note 2. The following experiments are included: Green, Pinter, and Sedikides (2005), unmodifiable condition; Green and Sedikides (2004), high diagnosticity condition; Green, Sedikides, and Gregg (2008), Experiment 1; Green, Sedikides, Pinter, and Van Tongeren (2009), Experiment 1, control condition; Sedikides and Green (2000), Experiments 1–2; Experiment 3, ample time condition; Sedikides and Green (2004), Experiment 1, self and Chris conditions.

again, evidenced mnemic neglect. The fact this effect occurs under such minimal conditions attests to its spontaneity and robustness. As another testament to its generality, the effect has been replicated with different traits and multiple sets of behaviors, as well as with different behavioral presentation formats (behaviors being blocked by trait and presented on separate booklet pages versus behaviors presented randomly and via a computer; Green, Sedikides, & Gregg, 2008; Green, Sedikides, Pinter, & Van Tongeren, 2009; Sedikides & Green, 2004).

A key postulate of the model is that self-threatening information is processed in a shallow manner: it is not linked to existing self-knowledge, as self-affirming information is. Furthermore, the model assumes that limited processing time is a determinant of poor recall (Story, 1998). In addition, the model posits that participants allocate minimal processing resources (e.g. time) to self-threatening feedback, resulting in poor recall. We (Sedikides & Green, 2000, Experiment 3) carried out a test of this proposition, manipulating the time the feedback was displayed on a computer screen. In the *ample duration* condition, each behavior remained on the screen for 8 s. This condition mimicked the conditions of the above-mentioned experiments. In the *limited duration* condition, however, each behavior remained on the screen for only 2 s. We reasoned that, if self-threatening feedback is minimally elaborated on, then recall for self-threatening feedback should not differ between the *limited duration* and *ample duration* conditions. In contrast, providing ample compared to limited time would increase recall for all types of behaviors *except* for self-threatening ones. The mnemic neglect effect emerged in the ample duration condition, thus replicating our past research. However, the effect was canceled out in the limited duration condition. Put another way, recall of self-threatening feedback was the same in the two conditions, whereas recall of self-affirming feedback in the *ample duration* condition was twice that of the *limited duration* condition. One reason, then, self-threatening feedback is recalled poorly is because it is allotted minimal processing time. Also, mnemic neglect is a matter of protection (attenuated recall of self-threatening feedback) rather than enhancement (exaggerated recall of self-affirming feedback; Table 1).

On the motivational nature of mnemic neglect

We have argued that mnemic neglect is in the service of self-protection. We put this idea to a test by examining the role of feedback diagnosticity as well as the implications of self-affirmation theory for mnemic neglect.

In all experiments reviewed so far, feedback was high in diagnosticity. All behaviors provided credible testimony as to whether a person who enacted them possessed or did not possess the underlying personality trait. If you 'would often lie to your parents' you are untrustworthy, and if you 'would make fun of others because of their looks' you are unkind. High-diagnosticity feedback is threatening, because its implications are dire and irrefutable. Low-diagnosticity feedback, however, is not particularly threatening, because its implications are ambiguous and refutable. You are not necessarily an untrustworthy person because you 'would take a pen from the bank after signing a check', and you are not necessarily an unkind person because you 'would chuckle when someone slid down an icy hill'.

We (Green & Sedikides, 2004) conducted an experiment in which we manipulated feedback diagnosticity. Half of participants received high-diagnosticity feedback, half low-diagnosticity feedback. We reasoned that evidence for the self-protective function of mnemic neglect would be obtained, if the effect was present in the high-diagnosticity

condition, but absent in the low-diagnosticity condition. This was indeed the case, supporting the notion that mnemic neglect servers a self-protective function.

We relied on the insights of self-affirmation theory (Sherman & Cohen, 2006) to conduct another test of this notion. According to this theory, self-bolstering undercuts the need to self-protect. When, for example, one receives favorable performance feedback, one relaxes her/his defenses against subsequent undesirable information (Kumashiro & Sedikides, 2005; Trope & Neter, 1994). The implications of self-affirmation theory for the mnemic neglect model are clear. Self-bolstering will eliminate memorial self-protection (the mnemic neglect effect).

We put this proposition to an empirical test (Green, Sedikides, & Gregg, 2008, Experiment 2).

Participants completed a creativity test and received information purported either to diminish the self (''you are uncreative – at the 31st percentile of your peers'') or bolster the self (''you are very creative – at the 93rd percentile of your peers''). The usual behavioral feedback followed on how familiar others ostensibly perceived one's important social qualities (e.g. trustworthiness, kindness). This feedback was the basis for testing mnemic neglect. How would initial self-diminishment or self-boosting influence the subsequent processing and recall of self-threatening and self-affirming feedbacks? We hypothesized that mnemic neglect would be more pronounced following self-diminishment than self-boosting. Shaken by a self-diminishing experience, participants would shy away from self-threatening feedback and endorse self-affirming feedback. In contrast, armored with a self-bolstering experience, participants would take self-threatening feedback in stride, and would not feel the need to protect the self by rehearsing and recalling self-affirming feedback. The results were consistent with the hypothesis: self-bolstering feedback eliminated mnemic neglect.

Alternatives to a motivational interpretation of mnemic neglect

Nevertheless, there are at least three alternatives to the idea that the mnemic neglect is a self-protective mechanism. One alternative involves self–other differences in behavioral expectancies. Another involves the possibility that mnemic neglect reflect consistency rather than self-protection processes. A third involves the possibility of emotion regulation playing a role in mnemic neglect.

Expectancies and neglect. Participants may expect for the self, but not an acquaintance (Chris), to perform positive behaviors and to avoid performing negative behaviors (Gilbert & Gill, 2000; Mischel, Ebbesen, & Zeiss, 1976). If so, self-threatening feedback is recalled poorly not because it diminishes the self but because it does not fit with participants' expectancies. We put this alternative to the test (Sedikides & Green, 2004, Experiment 1). All participants received hypothetical behavioral feedback. However, the referent of the feedback varied. A quarter of participants received feedback about themselves, another quarter about Chris. These two conditions were identical to those of the typical 'neglect' experiment. We introduced two additional conditions. The third quarter of participants received feedback referring to a person who had been previously described in glowing terms, such as extraordinarily trustworthy and kind (glowing Chris condition). Here, participants had formed highly positive expectancies about glowing Chris before processing the feedback. For the fourth quarter of participants, the feedback referred to a close friend; naturally, participants' expectancies about their friend were highly positive. Indeed, as pretesting established, participants held the most positive expectancies for glowing Chris, regarding him/her as most likely to enact positive behaviors and least

likely to enact negative behaviors. Expectancies for close friend and self were virtually identical, and they were both more positive than expectancies for Chris.

Pretesting allowed us to formulate precise hypotheses. Our reasoning was as follows. If expectancies constituted a sufficient explanation for mnemic neglect, then the effect would be more strongly evident in the glowing Chris than the self condition, and it would be equally strong in the close friend and self conditions. However, this is not what we (Sedikides & Green, 2004, Experiment 1) found. Participants evidenced the highest level of neglect in the self-referent condition, followed by the friend-referent condition, and then by the Chris/glowing and Chris conditions (which did not differ significantly). Expectancies cannot account for the phenomenon of mnemic neglect.

Consistency and neglect. We considered another, related alternative: mnemic neglect simply reflects processing of information that is inconsistent with the self-concept. Self-threatening feedback is recalled poorly, because it is inconsistent with one's positive self-view. By the same logic, self-affirming feedback would also be recalled poorly, for those with a negative self-view.

We (Sedikides & Green, 2004) conducted an experiment to find out whether feedback inconsistency (behaviors that are inconsistent with the self-view) or feedback negativity (behaviors that are negative regardless of whether they are consistent or inconsistent with the self-view) drives mnemic neglect. In a pretest, we identified individuals who thought of themselves as relatively untrustworthy or unkind. For these participants, untrustworthy and unkind were central traits. As such, untrustworthy and unkind behaviors would be consistent with their self-conceptions. The consistency alternative (Swann, Rentfrow, & Guinn, 2003) would be supported if participants manifested high recall for untrustworthy and unkind behavior, and manifested low recall for trustworthy and kind behaviors. On the other hand, the self-protection perspective would be supported if participants manifested low recall for untrustworthy and unkind behaviors (mnemic neglect), and manifested high recall for trustworthy and kind behaviors. All participants evidenced mnemic neglect. Even individuals who regarded themselves as relatively untrustworthy or unkind neglected the recall of untrustworthy or unkind behaviors. Even individuals with unfavorable self-views were threatened by negative feedback about themselves. Mnemic neglect is in the service of protecting the self-concept.

Newman, Nibert, and Winer (2009) presented converging evidence that mnemic neglect is not driven by expectancies. In a separate session after the usual exposure to and recall of behaviors, participants provided expectancies for each behavior (the extent to which they could imagine performing the behavior) for either the self or Chris. Expectancies and recall were only correlated for a subset of participants – defensive pessimists – but they, as hypothesized, did not show the typical mnemic neglect pattern regarding threatening (negative central) self-referent versus Chris-referent behaviors.

Emotion regulation and neglect. A third alternative explanation is that mnemic neglect is driven by emotion regulation. Mather (2006) reported that older adults exhibit a more robust positivity bias than younger adults in autobiographical memory, and they proposed that this difference is the result of older adults having stronger chronically activated emotion regulation goals. Implementing these goals requires cognitive resources. In one study (Mather & Knight, 2005), older adults given a concurrent task (listening to changing sounds) recalled more negative than positive pictures, whereas those not given a concurrent task recalled more positive than negative pictures. (The concurrent task had no effect on younger adults.) In another study, repeated retrieval of positive and negative pictures

(20 min and then 48 h after exposure) exacerbated the positivity bias in recall for older, but not younger, adults. The authors interpreted these findings as older adults engaging in ''more elaborative processing when retrieving positive information than when retrieving negative information'' (p. 559).

The term emotion regulation notwithstanding, we see these results, though restricted to older adults, as consistent with our mnemic neglect work and providing an additional link between mnemic neglect and autobiographical memory research. Positive information, particularly self-relevant information, is spontaneously elaborated upon, whereas negative information is allocated limited processing resources. If self-referent information had been used, we suspect that Mather and Knight (2005) would have found greater elaboration of positive relative to negative information. If a cognitive load manipulation were introduced to our traditional mnemic neglect paradigm, we predict that recall of self-threatening feedback would not change, but recall of self-affirming feedback would be reduced. This manipulation also would distinguish between hypotheses that individuals actively and effortfully repress threatening information, or, alternatively, counterargue with it.

A mood manipulation prior to the standard mnemic neglect paradigm may address the emotion regulation notion more directly. Given past work showing that individuals are more open to negative feedback following self-affirmation or even a boost in positive mood (Sherman & Cohen, 2006; Trope & Neter, 1994), and consistent with the broaden-and-build theory of positive emotions (Fredrickson, 2001), we predict that individuals placed in a happy mood would recall more threatening feedback relative to individuals in a neutral or sad mood. Analogously, providing an alternative source of good feelings (e.g. promising a positive mood induction as a second part of the experiment) may help ascertain the potential role of emotion regulation in mnemic neglect.

These findings speak to the more general notion of whether processing self-referent information is different from processing other types of information. That is, is the self special in some respect, or is it another instantiation of processing that is consistent versus inconsistent with an expectancy, schema, or stereotype? Given the aforementioned evidence arguing against expectancies, it seems that mnemic neglect is a motivational phenomenon special to the self. We have also identified several variables that attest to the flexibility of mnemic neglect; we turn toward discussing these issues.

On the malleability of mnemic neglect: when protection gives way to improvement

Mnemic neglect is a manifestation of the self-protection motive. The pursuit of self-protection is associated with health benefits, such as higher psychological adjustment (e.g. subjective well-being, optimism, planning, active coping) or lower psychological maladjustment (e.g. depression, anxiety, neuroticism, hostility) (Alicke & Sedikides, 2009; Sedikides, Gregg, & Hart, 2007). At the same time, though, the pursuit of self-protection can be associated with psychological costs, such as failure to learn from one's mistakes and unpopularity (Colvin & Griffo, 2007; Sedikides, Horton, & Gregg, 2007).

It would be adaptive, then, for people to be able to regulate self-protection (Sedikides & Luke, 2007; Sedikides & Strube, 1997). It would be particularly useful for them to be able to switch from self-protection (e.g. avoiding negative feedback) to an alternative goal (e.g. striving for feedback with improvement potential). Evidence indicates that people are indeed capable of this self-regulatory switch.

In the first relevant experiment, we (Green, Pinter, & Sedikides, 2005) manipulated the perceived modifiability of personality traits. Participants were led to believe that their central traits were either fixed (inflexible, unchangeable, and consistent) or modifiable

(flexible, malleable, and inconsistent) across the lifespan. We then provided participants with the standard behavioral feedback. We reasoned that negative feedback about fixed traits would be threatening, because it implies that the traits cannot be altered or improved; such feedback cuts at the core of one's self-system, as it exposes fundamental weaknesses in one's personality. On the other hand, negative feedback about modifiable traits would not be particularly threatening. Such feedback would be seen as having fleeting consequences and would be construed as a form of constructive advice that facilitates future self-improvement (Roese & Olson, 2007; Taylor, Neter, & Wayment, 1995; Trope, Gervey, & Bolger, 2003). This construal might confer long-term benefits for the individual. It would then be to the individual's advantage to process the feedback thoroughly and deeply, resulting in high recall. The results confirmed our hypotheses. Mnemic neglect emerged for fixed, but not modifiable, traits. This finding strengthens the notion that mnemic neglect is a self-protective mechanism.

A similar logic underpinned another experiment (Green, Sedikides, Pinter, & Van Tongeren, 2009, Experiment 2), concerned with relational pragmatics. One condition was a conceptual replication of the standard mnemic neglect experiment. The behavioral feedback here was provided by a stranger. Thus, we expected that self-protection would guide feedback processing and recall. Participants would manifest mnemic neglect. In the other condition, however, the feedback was provided by a close other (e.g. friend, romantic partner). In this case, participants would have strong incentives to process the feedback thoroughly, as it had implications for relationship maintenance (Harvey & Omarzu, 1997; Rusbult, Olson, Davis, & Hannon, 2001). Thus, we expected that self-improvement would guide feedback processing and recall. The mnemic neglect effect would be eliminated. The results were supportive of the hypotheses. Mnemic neglect was present when the source of the behavioral feedback was a stranger but was absent when the source of the behavioral feedback was a close other.

In the experiment discussed above (Green, Sedikides, Pinter, & Van Tongeren, 2009, Experiment 2), we assumed the activation of the self-improvement motive. In another experiment (Green, Sedikides, Pinter, & Van Tongeren, 2009, Experiment 1), we induced this motive directly through a sentence-completion priming task (after Brown & Zagefka, 2006). Participants received a sheet containing 20 sets of four to six words and were instructed to remove one word to write a correct sentence using all remaining words. Four of the word sets were fillers, whereas the other 16 sets consisted of words associated with self-improvement (e.g. optimizes, improved, aspirations). In the control condition, we replaced 15 of the 16 improvement words with filler words (e.g. heels, tours, announced). The standard behavioral feedback followed. We reasoned that, in the control (no prime) condition, self-protection would guide feedback processing and recall. Participants would process self-threatening feedback in a relatively shallow manner and recall it poorly. In the experimental (prime) condition, however, self-improvement would guide feedback processing and recall. Participants would process self-threatening feedback in a relatively deep manner and would recall it well. We hypothesized, then, that the mnemic neglect effect would emerge in the control condition, but would be canceled out in the experimental condition. This is indeed what we found. When self-improvement was primed, participants recalled self-threatening feedback equally well with self-affirming feedback.

Are neglected memories lost?

Is self-threatening information permanently lost or recoverable? According to one theoretical perspective, memory decay implies permanent loss. Once forgotten,

memories – including self-threatening ones – are gone forever (Holmes, 1990; Loftus & Davis, 2006). This perspective has received empirical backing in the case of traumatic memories. In the case of non-traumatic memories, however, things may be different. Many memories considered lost can be recovered with retrieval effort (Erdelyi, 1996; Payne, 1987). Also, memories can be recovered through routes other than recall. Recovery through such alternative routes is what defines implicit, procedural, and recognition memory (Nobel & Shiffrin, 2001; Rovee-Collier, Hayne, & Colombo, 2000).

The distinction between recall and recognition is relevant to the mnemic neglect model. Compared to recall measures, recognition measures are regarded as more sensitive tools for memory recovery (Shiffrin & Steyvers, 1997; Srull, 1984). The person memory literature is also informative. Two meta-analyses found an overall advantage in recall for behaviors inconsistent (rather than consistent) with prior impressions (Rojahn & Pettigrew, 1992; Stangor & McMillan, 1992). (Recognition results differed, though only for studies that did not control for guessing.) This effect would inhibit the emergence of mnemic neglect, given that self-threatening feedback is inconsistent with the normative positivity of the self-concept. The emergence of mnemic neglect nonetheless underscores the robustness of the phenomenon.

So far, mnemic neglect (and autobiographical memory) research has employed recall measures. As mentioned above, however, memories seemingly forgotten can be subsequently retrieved, recognition is more sensitive to such memories than recall, and discrepant findings for recall and recognition measures have emerged in the person memory literature. We therefore reasoned that self-threatening information, even when it becomes inaccessible to recall, will nonetheless remain accessible to recognition. In particular, we hypothesized that mnemic neglect would emerge on measures of recall (in replication of past research) but not on measures of recognition (controlling for guessing by also presenting a set of lure behaviors). The results of two experiments (Green, Sedikides, & Gregg, 2008) provided support to this hypothesis: individuals recognized threatening self-referent information as accurately (90% of items) and quickly as affirming self-referent information and Chris-referent information. Self-threatening memories are encoded and recoverable in normal adults.

Implications

The autobiographical memory literature has established that people remember poorly unpleasant relative to pleasant life events. We complemented this literature by developing a theoretical model, the mnemic neglect model, and by implementing an experimental paradigm to test it. The paradigm exerted tight control over the to-be-remembered material, equating the proportion of positive feedback with that of negative feedback. In addition, the paradigm incorporated two crucial variables in our model: whether memories were self-referent or other-referent and whether memories were central or peripheral.

We found that participants recalled poorly self-threatening feedback compared to either self-affirming feedback or other-relevant behaviors, and we termed this phenomenon *mnemic neglect*. In subsequent research, we showed that mnemic neglect is motivational; that is, it is in the service of self-protection. We also demonstrated that mnemic neglect is flexible. Participants switched from a self-protection to a self-improvement goal, as a response to the informational value of the feedback (the feedback-relevant trait being malleable rather than rigid), to the accessibility of the improvement goal (improvement rather than control prime being used), and to the source of the feedback (feedback given by a close other rather than a stranger). Finally, we showed that mnemic neglect is not

obtained with recognition measures. Our findings offer a compelling explanation for the well-established pattern of poor autobiographical memory for unpleasant (versus pleasant) events: Such events are remembered poorly because they are processed in a shallow manner (encoded but not elaborated on, as pleasant event are) at the time of their occurrence.

In fact, the mnemic neglect model may help explain the cognitive underpinnings of the FAB (Walker, Skowronski, & Thompson, 2003) as well as other established effects, such as positive illusions about the self (Taylor & Brown, 1988) and the self-serving attributional bias (Campbell & Sedikides, 1999). If a person is prone to forget negative details about the self on topics of consequence, then it is easy to see why this person's life would appear rosy in retrospect, why this person would remember mostly positive points about their personality, or why this person would remember mostly their own contribution to a successful task outcome. At the same time, the recall versus recognition findings may help resolve the paradox of why such robust self-enhancing biases exist despite negative information generally garnering greater attention (Skowronski & Carlston, 1989) and being accorded greater weight (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Severely unpleasant events or feedback (high self-threat) elicit mobilization, that is, challenging and counterarguing the implications of the feedback (Ditto & Lopez, 1992; Taylor, 1991). However, slightly to mildly unpleasant events or feedback (moderate self-threat) elicit minimization, that is, not thinking about the event (Erdelyi, 2006) or distancing the self from it (Simon, Greenberg, & Brehm, 1995). Negativity biases, then, involve mobilization, whereas mnemic neglect involves minimization.

This resolution has an interesting implication. It suggests that using different memory strategies (e.g. recognition), or inducing individuals to reflect actively on negative feedback, may decrease self-biases to which mnemic neglect contributes. In line with the latter suggestion, Sedikides, Horton, and Gregg (2007) found that participants who reflected on why they might or might not have negative central traits (e.g. untrustworthy, unkind) rated themselves more unfavorably on those traits compared to control participants.

Mnemic neglect likely does not extend to all types of autobiographical memories. Traumatic memories typically are recalled quite well and attempts to suppress them may ironically heighten recall (Dalgleish, Hauer, & Kuyken, 2008). Mnemic neglect may be described as a ''first line of defense'' (Newman, Nibert, & Winer, 2009, 485). More severe memories such as traumatic memories may overwhelm attempts to neglect them. Alternatively, traumatic memories may activate different and competing goals, such as the desire to make sense of the experience in order to move forward. As mentioned previously, mnemic neglect is attenuated when individuals are focused on self-improvement, receive threatening feedback from a close other, or believe the feedback exemplifies modifiable trait dimensions (Green, Pinter, & Sedikides, 2005; Green, Sedikides, Pinter, & Van Tongeren, 2009; Sedikides, 2009). Thus, memory severity may moderate the mnemic neglect.

Another issue refers to cross-cultural generalizability. Is the mnemic neglect effect universal or restricted to Western culture? We would argue for the universality of mnemic neglect, given that members or collectivistic (or interdependent) cultures are more likely than members of individualistic (or independent) cultures to adopt avoidance personal goals (Elliot, Chirkov, Kim, & Sheldon, 2001). Also, is mnemic neglect moderated by self-esteem, narcissism, or depression (cf. Walker, Skowronski, Gibbons, Vogl, & Thompson, 2003)? What are the neuroanatomical bases of mnemic neglect? To what extent affective states such as anger, shame, or guilt influence mnemic neglect? These and other issues paint a promising future for research on self-protective memory.

Short Biographies

Constantine Sedikides' research is on self and identity and their interplay with emotion and motivation, close relationships, and group processes. He has authored or co-authored articles on these topics for *Advances in Experimental Social Psychology*, *Journal of Experimental Social Psychology*, *Journal of Personality*, *Journal of Personality and Social Psychology*, *Personality and Social Psychology Bulletin*, and *Social Cognition*. Before coming to the University of Southampton, where he presently teaches, Sedikides taught at the University of Wisconsin-Madison and the University of North Carolina at Chapel Hill. He holds a BA from the Aristotle University of Thessaloniki, Greece, and a PhD from the Ohio State University.

Jeffrey D. Green received his PhD from the University of North Carolina at Chapel Hill and his BA from Dartmouth College, and currently is a member of the psychology department at Virginia Commonwealth University. Green studies the interplay of affect and the self, self-protection and self-enhancement, close relationships and the self (e.g. forgiveness, attachment). Green's work has been published in journals including the *Journal of Personality and Social Psychology, Personality and Social Psychology Bulletin, Self and Identity, Social Cognition, Journal of Experimental Social Psychology,* and *Psychological Inquiry*.

Endnote

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