Forgotten but not Gone:

The Recall and Recognition of Self-Threatening Memories

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Abstract

When people selectively forget feedback that threatens the self (*mnemic neglect*), are those memories permanently lost or potentially recoverable? In two experiments, participants processed feedback pertaining either to themselves or to another person. Feedback consisted of a mixture of positive and negative behaviors exemplifying traits that were both central and peripheral to participants' self-definition. In Experiment 1, participants exhibited poorer recall for, but unimpaired recognition of, *self-threatening* feedback (i.e., negative, central, self-referent), relative to both *self-affirming* feedback (positive, central, self-referent) and *other-relevant* feedback (positive/negative, central, other-referent). In Experiment 2, participants who had experienced ego-deflation, but not ego-inflation, exhibited mnemic neglect for recall, but not for recognition. Both experiments imply that, even after being self-protectively neglected, self-threatening memories can still be retrieved.

Keywords: self-protection, recall, recognition, repression, feedback, neglect, inhibition, retrieval

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Getting mixed feedback is a recurring fact of life. A long-time friend praises one aspect of your personality, yet criticizes another. A journal editor compliments your research hypothesis, yet complains that you tested it poorly. A romantic partner showers you with accolades one moment, yet heaps imprecations on you the next. Just how do people process positive and negative information about the self? In particular, how do people protect the self from negative information?

Under the assumption that perceivers seek to form accurate social impressions, person memory research has proposed various hypotheses to account for how individuals encode, store, and retrieve behavioral information about others. Variables such as prior expectancies, number and type of behaviors, and processing goals have all been examined (Hamilton & Garcia-Marques, 2003; Smith & Queller, 2001; Srull & Wyer, 1989). The question arises, however: Can research of this sort be extended to memories of behavioral information about *oneself*? Moreover, might memories about oneself differ from memories about others? And might any such differences stem from a stronger motive to form favorable impressions of oneself than of others? We submit that the answer to all these questions is yes.

The Mnemic Neglect Model

Tenets

The *mnemic neglect model* (Sedikides, Green, & Pinter, 2004) portrays the self-concept as a rich, well-organized, and predominantly positive mental representation, significantly shaped by emotion and motivation (McConnell & Strain, 2007; Sedikides & Gregg, 2003; Tracy & Robins, 2007). The main aim of the model is to account for the processing of self-threatening feedback. In contrast to person perception theory, which holds that perceivers, guided by

accuracy concerns, strive to *resolve* inconsistencies in how they view others, the model postulates that individuals strive to maintain the *positivity* of their self-conceptions (Baumeister, 1998; Brown & Dutton, 1995; Sedikides & Strube, 1997), principally by protecting the self from unfavorable social feedback (Burris & Rempel, 2004; Campbell & Sedikides, 1999; Newman, Duff, & Baumeister, 1997).

The model draws three key distinctions: between feedback whose implications are *positive* versus *negative*; between feedback pertaining to traits that are *central* (i.e., relatively certain, descriptive, and important, like *trustworthy* and *kind*) versus *peripheral* (i.e., relatively uncertain, undescriptive, and unimportant, like *modest* and *uncomplaining*); and between feedback referring to *oneself* versus *someone else*. Feedback that (a) is negative, (b) pertains to central traits, and (c) refers to oneself, is defined as *self-threatening*. Three other categories of feedback can also be defined: *self-affirming* (positive, central, self-referent); *other-relevant* (positive/negative, central, but other-referent); and *tangential* (positive/negative, other-referent/self-referent, but peripheral).

The thrust of the model is that people fail to process self-threatening feedback thoroughly. Self-threatening feedback (e.g., *You would refuse to lend classnotes to a friend who was ill*) will receive relatively shallow processing (Brown & Craik, 2000; Craik, 2002). Thus, less long-term elaboration will ensue, resulting in fewer retrieval routes, and ultimately poorer recall. In contrast, self-affirming feedback (e.g., *You would help a handicapped neighbor paint his house*) will receive relatively deep processing. Thus, greater long-term elaboration will ensue, resulting in more retrieval routes, and ultimately better recall. The same will also be true for other-relevant feedback: despite referring to another person, it nonetheless pertains to important traits, thereby maintaining interest and cognitive processing. In contrast, tangential feedback, which pertains to

unimportant or peripheral traits, will receive relatively shallow processing, regardless of its referent or valence.

Evidence

In experiments designed to test the mnemic neglect model, participants are presented with feedback in the form of discrete behaviors (see Appendix, *Original Set*). These behaviors vary by being either positive or negative, and by exemplifying either central or peripheral traits (e.g., central: *kind* versus *cruel*; peripheral: *modest* versus *immodest*), resulting in four classes of behaviors (i.e., positive central; negative central; positive peripheral; negative peripheral). Some participants are led to believe, or are asked to imagine, that they might personally perform these behaviors. Other participants are led to believe that the behaviors might be performed by another generic person (Chris). This design feature permits a direct comparison of self-referent and other-referent memory when participants are given a surprise recall task. The typical finding is that participants show poorer recall for self-threatening behaviors (i.e., self-referent negative central) than for either self-affirming (i.e., self-referent positive central) or for other-relevant behaviors (i.e., other-referent positive/negative central). It is this recall disparity between self-affirming and self-threatening behaviors (in the backdrop of other-relevant or tangential behaviors) that we have termed *mnemic neglect*.

Mnemic neglect has been demonstrated in laboratory contexts high in mundane realism. For example, in one study (Sedikides & Green, 2000, Experiment 1), participants received feedback ostensibly from a computer-administered personality test. As a prelude to receiving it, they first answered an array of plausibly-phrased questions from a personality inventory described as valid, reliable, and widely used. Participants then waited for the computer to calculate their results and provide them with their "personality profile," allegedly consisting of behaviors that the participant was "highly likely to perform." In a surprise recall task

administered after a short break, participants showed selective neglect of self-threatening behaviors relative to affirming behaviors. The same pattern is obtained when participants believe that the source of the feedback is an acquaintance, working with them on a dyadic task (Green, Sedikides, Pinter, & Van Tongeren, 2007). In addition, however, mnemic neglect occurs even when participants merely *imagine* receiving feedback (e.g., Sedikides & Green, 2000, Experiment 2). The fact that mnemic neglect occurs under such minimal conditions attests to both the spontaneity and robustness of the effect.

Additional research has revealed mnemic neglect to be strategic: individuals do not indiscriminately neglect all negative self-referent feedback, but only the most threatening feedback. Green and Sedikides (2004) manipulated feedback diagnosticity—the degree to which behaviors define or imply an underlying trait. (Highly diagnostic behaviors alone had been used in all previous experiments.) Behaviors that are both negative and high in diagnosticity are liable to threaten the self, because their unflattering implications would be clear-cut. In contrast, behaviors that are negative but low in diagnosticity are liable *not* to threaten the self, because their unflattering implications are equivocal. The hypothesis was confirmed: mnemic neglect emerged only for negative feedback that was high as opposed to low in diagnosticity. In a similar vein, Green, Pinter, and Sedikides (2005) manipulated the perceived modifiability of personality traits. They hypothesized that negative feedback about fixed traits would be found threatening but that negative feedback about modifiable traits would not (cf. Roese & Olson, 2007). They reasoned that, whereas the latter could be understood as a form of constructive advice that facilitates future self-improvement, no such positive construal could be managed of the former. Accordingly, before participants received the standard behavioral feedback, participants were led to believe that the central traits concerned were either modifiable (i.e., flexible, malleable, and

inconsistent) or fixed (inflexible, unchangeable, and consistent) across the lifespan. As hypothesized, mnemic neglect emerged for fixed traits only, not for modifiable ones.

As stated above, the mnemic neglect model posits that people are strongly motivated to believe that they are good and to defend this belief. Mnemic neglect, then, serves a self-protective function. In this regard, it resembles repression (Freud, 1915; Greenwald, 1981; Terr, 1994), in particular what Erdelyi (2006) has recently termed 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 not only in Ebbinghaus' (1885) work, showing that the simple exclusion of stimuli from consciousness leads to forgetting, but also in contemporary work, demonstrating that forgetting can be intentionally induced (explanations for which include retrieval inhibition, selective search, and selective rehearsal: Anderson, 2001; Anderson & Green, 2001; Bjork, 1989; Geiselman, Bjork, & Fishman, 1983; Levy & Anderson, 2002; Macrae, Bodenhausen, Milne, & Ford, 1997; Roediger & Crowder, 1972). Indeed, inhibitory control is more successful for negative than neutral memories (Depue, Banich, & Curran, 2006). From this perspective, then, the neglect of self-threatening feedback is one species of inhibitory repression (Sedikides & Green, 2006).

But what exactly does shallow processing, cognitive avoidance, inhibitory repression, or mnemic neglect involve? That is, how do individual allocate processing resources to threatening self-referent information? To address this question, we (Green, Pinter, & Sedikides, 2007) carried out an experiment in which we directly manipulated type of processing for self-referent feedback. Participants were instructed to consider why some behaviors described them (*integration judgments*) and why other behaviors did not (*separation judgments*). Integration judgments led to better recall, whereas separation judgments led to poorer recall. This pattern of results suggests a possible mechanism for mnemic neglect. If information is self-affirming, then

it is integrated with or connected to stored self-knowledge. In contrast, if the information is self-threatening, then it is separated or disconnected from stored self-knowledge.

Also relevant here is a key experiment in which we manipulated the time available for participants to process behavioral feedback (Sedikides & Green, 2000, Experiment 3). Half the participants had ample time (8 seconds) to read each individual behavior (presented one by one, at random, via computer), whereas the other half had only limited processing time (2 seconds). It transpired that mnemic neglect emerged in the ample time condition, but not in the limited time condition. To be specific, when reading time was ample, recall for all classes of behaviors was relatively better, except for behaviors that threatened the self, namely those that provided negative central self-referent feedback. Evidently, participants selectively inhibited thinking about self-threatening feedback relative to self-affirming feedback other-relevant feedback, and tangential feedback. Thus, the pattern is consistent with the possibility that people make separation judgments when confronted with self-threatening information, but integration judgments when confronted with self-affirming (and perhaps other) information (Green et al., 2007).

The Mystery of Neglected Memories

One key and unresolved issue for our model is this: What happens to the neglected memories? Is self-threatening information permanently lost? Or are stored traces of that information still available for subsequent recovery?

One theoretical and empirical perspective suggests that, once forgotten, memories—including self-threatening ones—are well and truly gone: memory decay implies permanent loss (Ganaway, 1989; Holmes, 1990; Loftus, 1993; see Loftus & Davis, 2006, for a recent review). This view, however, can be challenged on two grounds (at least in the case of non-traumatic memories; Erdelyi, 2006). First, many “lost” memories can be recovered simply with retrieval

effort (Erdelyi, 1996; Payne, 1987; Roediger & Thorpe, 1978). Second, memories can be recovered through routes other than recall. Indeed, recovery through such alternative routes is what *defines* implicit, procedural, and recognition memory (Cohen & Eichenbaum, 1993; Nobel & Shiffrin, 2001; Rovee-Collier, Hayne, & Colombo, 2000). Ultimately, the empirical observation that seemingly absent memories can still be subtly present led to postulation of multiple memory systems (Roediger, Marsh, & Lee, 2002; Roediger, Rajaram, & Geraci, in press; Tulving, 1987).

The distinction between recall and recognition is of particular relevance to the present research. Compared to recall measures, recognition measures are generally regarded as more sensitive tools for memory recovery (Anderson & Bower, 1972; Shiffrin & Steyvers, 1997; Srull, 1984). The person memory literature also furnishes some relevant evidence. Two meta-analyses found an overall advantage in recall for behaviors inconsistent (as opposed to consistent) with prior impressions (Rojahn & Pettigrew, 1992; Stangor & McMillan, 1992), though recognition results differed. Note how this effect would tend to inhibit the emergence of mnemic neglect, given that self-threatening feedback is inconsistent with the normative positivity of the self-concept. The fact that mnemic neglect emerges nonetheless underscores the robustness of the phenomenon.

Hypotheses

The autobiographical memory literature has established that negative information is generally remembered more poorly than positive information (*positivity bias*: Kennedy, Mather, & Carstensen, 2004; Skowronski, Betz, Thompson, & Shannon, 1991; Walker, Skowronski, & Thompson, 2003). The mnemic neglect model additionally states that this pattern is exacerbated for negative information about important traits that one possesses. So far, however, research on both autobiographical memory and mnemic neglect has employed measures of recall. However,

given that (a) memories that have been seemingly forgotten can be subsequently retrieved, (b) recognition is more sensitive to such memories than recall, and (c) discrepant findings for measures of recall and recognition have already emerged in the person memory literature, we hypothesized that self-threatening information, even when it becomes inaccessible to recall, will nonetheless remain accessible to recognition. Hence, we predicted that mnemic neglect would emerge on measures of recall but not on measures of recognition.

To be sure, the recognition of self-threatening information, like the recall thereof, relies partly on explicit recollections of previously encountered material. However, unlike recall, recognition also capitalizes upon feelings of familiarity. It is the latter retrieval route—which does not require the detailed traversal of the associative pathways formed during processing (Diana, Reder, Arndt, & Heekyeyong, 2006; McElree, Dolan, & Jacoby, 1999; Yonelinas, 2002)—that we expected to negate the usual mnemic neglect effect, by permitting access to less well-elaborated (i.e., self-protectively inhibited) memory traces.

Overview

We report two experiments. All participants (a) were introductory psychology students at the University of North Carolina at Chapel Hill (UNC-CH), (b) attended in groups of up to seven persons, (c) sat in visually isolated cubicles, and (d) were debriefed upon finishing. In both experiments, participants completed surprise measures of recall and recognition after having received mixed feedback in the form of 32 behaviors that either they or another person would be hypothetically likely to perform. Experiment 2 also featured an additional manipulation of threat sensitivity. Between-subject cell sizes were roughly equivalent.

EXPERIMENT 1

Method

Validation of Stimulus Behaviors

Past research (Sedikides, 1993, 1995; Sedikides & Green, 2000) had established that university (including UNC-CH) students regard the traits *trustworthy* and *kind* as central but the traits *modest* and *uncomplaining* as peripheral. In the present experiment, each of these four traits was exemplified by eight behaviors (four positive, and four negative)—the same 32 behaviors employed by Sedikides and Green (2000; Experiments 1-3). These exemplars had already been pilot-tested (see Sedikides & Green, 2000) to ensure that they were (a) highly positive or negative, (b) highly important to perform or not to perform, and (c) highly diagnostic of intended traits (i.e., the behavior is informative regarding whether or not the individual is described by the underlying trait).

Thus, an extra set of 32 behaviors exemplifying the same traits was required to serve as control or lure behaviors for the recognition task. This new set was derived from two sources: 16 central behaviors used in a previous experiment (Sedikides & Green, 2000, Experiment 4); and 16 newly-constructed peripheral behaviors. Care was taken so that the new behaviors were as similar as possible to the old ones. The Appendix contains the complete list of 64 behaviors.

Participants and Experimental Design

One hundred and seventy-eight participants were randomly assigned to between-subjects conditions. Data were discarded from seven participants who misunderstood the recall instructions and recorded trait words rather than behaviors, and from two participants who wrote more than three intrusions (e.g., writing down a behavior that was not presented). The experimental design was a 2 (Referent: Self vs. Chris) x 2 (Behavior Set: Original vs. New) x 2 (Behavior Type Order: Central-First vs. Peripheral-First) x 2 (Behavior Valence Order: Positive-First vs. Negative-First) x 2 (Behavior Type: Central vs. Peripheral) x 2 (Behavior Valence: Positive vs. Negative) factorial. The first four factors were between-subjects, the last two within-subjects. All are explicated below.

Procedure

The procedure was identical to that of Sedikides and Green (2000, Experiment 2), with some important additions. Participants read 32 behaviors under one of two instructional sets. In the Self condition, participants considered the behaviors with reference to themselves. At the top of each page, they were reminded 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." In the Chris condition, participants considered "a 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." This manipulation constituted the Referent factor (Self vs. Chris).

Eight behaviors exemplified each of four trait dimensions. The two central trait dimensions were *trustworthy-untrustworthy* and *kind-unkind*; the two peripheral trait dimensions were *modest-immodest* and *uncomplaining-complaining*. This constituted the Behavior Type factor (Central vs. Peripheral). Four positive and four negative behaviors represented each trait dimension. This constituted the Behavior Valence factor (Positive vs. Negative). Also, half of the participants read the original 32 behaviors whereas the remaining half read the new ones. This constituted the Behavior Set factor (Original vs. Novel). Finally, two between-subjects order variables (Behavior Valence Order and Behavior Type Order) were retained from previous research (Sedikides & Green, 2000).[1]

Participants read through the packet of behaviors at their own pace for about 5 minutes and then engaged in a distractor task for 2.5 minutes. Next, the packet of behaviors was replaced by a booklet of blank slips of paper. Participants were instructed to generate as many behaviors as they could remember in any order that the behaviors came to mind (recall task). In addition,

they were asked (a) to write only one behavior per page, (b) not to turn back to previous pages, and (c) to attempt to be accurate without worrying about recalling the behaviors verbatim.

Participants then engaged in a recognition accuracy task administered on IBM PCs. The first computer screen contained the following instructions: "Now we are going to present several behaviors to you. Some of these you read before in the booklet, but some are new—you haven't seen them before. We would like you to identify the old sentences and the new sentences. If the sentence is old (i.e., you read it before), then press the 'z' key, but if the sentence is new (i.e., you have not read it before), then press the '/' key." Participants were instructed to rest their fingers on the two keys. The 64 behaviors were presented in the middle of the computer screen in random order.

Results and Discussion

Data Reduction

Recall. Written responses were coded according to a gist criterion (Srull, 1981; Srull & Brand, 1983): behaviors were counted as correctly recalled if the text conveyed the general meaning of the behavior. Intrusions (i.e., writing the same behavior twice, recalling a behavior that was not presented, changing the valence of a recalled behavior) were removed prior to data analysis. Intrusion rates were low (4.1% of recalled items) and comparable to the low intrusion rates reported in other experiments using a similar methodology (Lichtenstein & Srull, 1987; Wyer, Bodenhausen, Srull, 1984; Sedikides & Green, 2000, 2004). The proportion of behaviors correctly recalled served as the dependent index.

Recognition. Recognition responses—having been derived from a yes-no recognition task in which participants indicated whether each behavior was "old" (previously seen) or "new" (never seen before)—were analyzed using signal detection theory (Banaji & Greenwald, 1995; Stanislaw & Todorov, 1999; Swets, 1996). Briefly, the theory assumes that participants seek to

identify a signal (i.e., an "old" item) against a background of noise (i.e., a "new" item). Doing so is an inherently probabilistic and error-prone task. Accordingly, two normal curves of equal variance are used to model respondents' judgments of signal and noise respectively. For yes-no recognition tests, one curve represents participants' judgments about old items (the "signal"), and the other curve their judgments about new items (the "noise"). Participants distinguish between old and new items on the basis of some decision criterion, answering "old" above it and "new" below it. Four types of answer are possible: an old item can be correctly identified as old (a *hit*); a new item can be correctly identified as new (a *correct rejection*); an old item can be mistakenly classified as new (a *miss*); and a new item can be mistakenly identified as old (a *false alarm*). Accuracy of discrimination (or *sensitivity*) is typically quantified by *d'*, the normalized hit rate minus the normalized false alarm rate. This index, which varies from 0 (no discrimination) to ∞ (perfect discrimination), corresponds to the displacement of the two normal curves. It has the virtue of being uninfluenced by response *bias*. Response bias itself can be quantified by *c*, the average of the normalized hit rate and the normalized false alarm rate.[2] This index, which varies from -∞ (always saying "new") to +∞ (always saying "old"), corresponds to the displacement of the criterion from the neutral decision point between the curves. Both *d'* and *c* served as dependent indices. In addition, we also analyzed recognition accuracy using a non-normalized index *δ*—equal to half the proportion of hits plus half the proportion of correct rejections—because of its greater immediate intelligibility and comparability to the recall index (i.e., proportion correct).

Recall and Recognition Accuracy

Although results from recall and recognition measures are typically analyzed separately, our hypotheses required an explicit test for whether they converged or diverged. Consequently, we conducted a preliminary analysis that included Memory Test Type (Recall vs. Recognition) as

an additional within-subjects factor. In particular, we conducted a 2 (Behavior Set) x 2 (Referent: Self vs. Chris) x 2 (Behavior Valence) x 2 (Behavior Type: Central vs. Peripheral) x 2 (Memory Test Type: Recall vs. Recognition) mixed-subjects ANOVA, with repeated measures on the final three factors. The accuracy index for recall was proportion correct, while that for recognition was δ.

We hypothesized that mnemic neglect would compromise the recall, but not the recognition, of self-threatening feedback. Hence, we predicted that the three-way Referent x Behavior Type x Behavior Valence interaction that diagnoses mnemic neglect would be present for recall but absent for recognition. If so, then a critical four-way interaction involving these three factors and Memory Test Type should emerge. It did, $F(1, 146) = 9.65$, $p < .002$. We report subsequent analyses for recall and recognition separately below.

Recall

The data from 169 participants were entered into a 2 (Behavior Set) x 2 (Referent) x 2 (Behavior Valence) x 2 (Behavior Type) mixed-subjects ANOVA, with the last two variables as within-subjects factors. Table 1 contains resulting means broken down in terms of the last three factors, expressing the proportion of total behaviors correctly recalled across participants for that condition (e.g., recall of two of the eight negative central behaviors would yield a proportion of .25 for that behavior category).

The mnemic neglect model predicts a three-way interaction among Referent, Behavior Valence, and Behavior Type, such that the Referent x Behavior Valence interaction obtains for central behaviors but not for peripheral ones. This critical three-way interaction indeed proved significant, $F(1, 153) = 11.40$, $p < .001$.[3] We proceeded to examine the Referent x Behavior Valence interaction separately for central and peripheral behaviors.

Central behaviors. The Referent x Behavior Valence interaction was significant for central behaviors, $F(1, 153) = 15.90$, $p < .0005$. The mnemic neglect model further predicts that the interaction should be driven specifically by the selective neglect of self-threatening behaviors relative to self-affirming behaviors and the corresponding other-relevant behaviors. If so, then self-threatening behaviors should be neglected relative to both self-affirming and other-relevant behaviors. Follow-up pairwise comparisons confirmed this to be the case. Participants recalled self-threatening behaviors less accurately than either self-affirming behaviors, $F(1, 75) = 11.90$, $p < .0001$, or Chris-relevant negative behaviors, $F(1, 153) = 16.51$, $p < .0005$. In addition, participants recalled Chris-relevant negative behaviors *more* accurately than Chris-relevant positive behaviors, $F(1, 78) = 4.28$, $p < .05$, and their recall of Chris-relevant positive behaviors did not differ significantly from their recall of self-affirming behaviors, $F(1, 153) < 1$.

Peripheral behaviors. The Referent x Behavior Valence interaction did not emerge for peripheral behaviors, $F(1, 153) < 1$. This finding accorded with prediction: tangential behaviors, which do not matter much, should not be recalled differentially on the basis of referent and valence.

Behavior set effects. No overall effect emerged for Behavior Set, $F(1, 153) < 1$. However, the factor did interact with Behavior Type, such that a predicted main effect for the latter—that central behaviors would generally be recalled better than peripheral ones, $F(1, 153) = 109.83$, $p < .0001$—was stronger for original than for novel behaviors, $F(1, 153) = 15.00$, $p < .0001$. In addition, Behavior Set interacted with Behavior Valence, $F(1, 153) = 10.86$, $p < .0005$, such that, for the original set, more positive than negative behaviors were recalled, whereas for the novel set, more negative than positive behaviors were. Crucially, however, Behavior Set did not qualify the critical Referent x Behavior Type x Behavior Valence interaction, $F(1, 153) < 1$, or any other

term in the model. Hence, the two sets can be considered equivalent for the purposes of demonstrating mnemic neglect.

Recognition

Accuracy. We predicted that the three-way interaction indicative of mnemic neglect (i.e., Referent x Behavior Valence x Behavior Type) would *not* emerge for recognition. We tested this using two indices of recognition accuracy, the intuitive δ (displayed in Table 2) and the formal d'. In neither case did the three-way interaction approach significance, both Fs(1, 146) < 1. Nor did any of the two-way Referent x Behavior Valence interactions, for Central and Peripheral behaviors separately, approach significance, all Fs(1, 146) < 1. Thus, no evidence emerged that memories of self-threatening feedback, despite becoming selectively less accessible to recall, are permanently lost. In the presence of the appropriate retrieval cues, they can be as readily recovered (i.e., recognized) as memories of self-affirming or other-relevant feedback.

Only two significant effects emerged for δ and d'. First, central behaviors were better recognized than peripheral ones, both Fs(1, 146) > 40.00, both ps < .0005. Second, negative behaviors were better recognized than positive ones, both Fs(1, 146) > 10.00, both ps < .001. This suggests a general encoding advantage for consequential unflattering material. However, no self-related motivation is implicated, and the Referent factor is uninvolved.

Bias. We used the index c to quantify participants' propensity to judge behaviors as previously seen or previously unseen. Participants were more cautious about claiming to recognize central behaviors than peripheral ones, $F(1, 146) = 4.51$, $p < .05$. They were also more cautious about claiming to recognize negative behaviors than positive ones, $F(1, 146) = 11.32$, $p < .0001$, an effect that was stronger for peripheral than for central behaviors, $F(1, 146) = 6.55$, $p < .02$. However, no simple or interactive effects involving the Referent factor emerged.

Nonetheless, if one compares Self and Chris participants directly within each cell defined by the Behavior Type by Behavior Valence interaction, one finds that the former were significantly less ready than the latter to claim to recognize central negative behaviors, $F(1, 160) = 5.48$, $p < .02$, but not to claim to recognize central positive ones ($F < 1$), peripheral positive ones ($F < 1$), or peripheral negative ones, ($F = 1.76$, $p = .18$). Greater reluctance to recognize negative central behaviors, when ascribed to oneself as opposed to another, suggests yet another attempt to self-protect.

Summary

As hypothesized, mnemic neglect emerged on a measure of recall: participants forgot feedback more when it was self-threatening than when it was self-affirming or other-relevant. This oft-obtained pattern, however, did not emerge on a measure of recognition: accurate discrimination of old and new items was unaffected by self-threat. These discrepant results for different memory measures are consistent with self-threatening information being encoded into memory but being thereafter less accessible to recall than to recognition. Unflattering material, though clearly forgotten, is not entirely gone.

EXPERIMENT 2

Our prior research has established that self-threat drives the mnemic neglect effect (Green & Sedikides, 2004; Green et al., 2005; Sedikides & Green, 2000; Sedikides & Green, 2004). In that research, however—as in the current Experiment 1—the self-threat has been presented in isolation, devoid of context. In contrast, threatening feedback in everyday life is typically provided against a backdrop of *additional* feedback. Moreover, the earlier feedback will, in many cases, already have exerted a psychological effect, either by diminishing people's self-esteem (*ego-deflation*) or by augmenting it (*ego-inflation*). For example, after first learning that the manuscript you submitted to *Journal of Experimental Social Psychology* has been

unconditionally accepted (ego-inflation) or definitively rejected (ego-deflation), you might subsequently arrive home to find your partner either commending you for always considering the children (positive feedback) or denouncing you for never doing the dishes (negative feedback). Hence, we wondered how initial ego inflation or deflation influences the processing and retrieval of self-threatening and self-affirming feedback (in comparison to other-relevant and tangential feedback). Would the motivational nature of mnemic neglect (e.g., Green and Sedikides, 2004; Green et al., 2005) again be illustrated? And, crucially, would measures of recall and recognition once again yield different patterns of results (Experiment 1, above)? These are the questions we addressed in Experiment 2.

In Experiment 2, we simulated the ongoing nature of feedback in daily life. In particular, we had participants initially receive either critical or flattering feedback from one type of source, followed by the usual mixed behavioral information from a different source. The feedback from the first source, designed to induce initial ego deflation or inflation, stemmed from an assessment of cognitive abilities (i.e., a creativity test). The feedback from the second source, designed to induce subsequent mnemic neglect, stemmed from the way familiar others ostensibly perceived one's important social qualities (e.g., trustworthiness, kindness), as in Experiment 1. The idea that one round of feedback can influence how another round is received finds fertile ground in Tesser's (2000) substitution principle. According to this principle, psychological resources are interchangeable in the self-system. This implies that the impact of sequential emotional experiences should be transferable.

We will now state our hypotheses formally. For *recall*, we hypothesized that mnemic neglect would once again be observed. Moreover, we hypothesized that it would be more pronounced following ego-deflation than following ego-inflation. Shaken by a self-diminishing experience, ego-deflated participants would shy away from self-threatening feedback and be

more attuned to self-affirming feedback (Baumeister, Heatherton, & Tice, 1993; Campbell, Baumeister, Dhavale, & Tice, 2003; Stapel & Schwinghammer, 2004). In contrast, buoyed and shielded by a self-augmenting experience (Kumashiro & Sedikides, 2005; Sherman & Cohen, 2006; Trope, Gervey, & Bolger, 2003), ego-inflated participants would be able to take self-threatening feedback in their stride, and have a reduced need to bolster their self-views by rehearsing and recalling self-affirming feedback. Hence, we hypothesized that recall of self-affirming feedback would exceed recall of self-threatening information in the ego-deflation condition but not in the ego-inflation condition. We also hypothesized that recall of other-referent and tangential feedback would be unaffected by the prior feedback manipulation.

In contrast, we hypothesized no corresponding pattern of results for *recognition*. Informed by past literature (Erdelyi, 2006), and by the findings of Experiment 1, we hypothesized that memories of self-threatening behaviors would be recovered as successfully as memories of other types of behaviors (self-affirming, other-relevant, or tangential), whether they were preceded by ego-deflation or by ego-inflation. In short, we hypothesized that mnemic neglect would simply not emerge on measures of recognition.

Method

Participants and Experimental Design

Two hundred and thirty-two participants were randomly assigned to between-subjects conditions. Data from 11 participants were excluded: three exhibited more than three intrusions, and eight misunderstood recall instructions. The design was identical to that of Experiment 1, with the addition of the extra between-subjects factor Manipulation Type (Ego-Deflation vs. Ego-Inflation).

Procedure

The procedure was identical to that of Experiment 1, with the crucial addition of a between-subject manipulation involving ego-deflation or ego-inflation prior to presenting the set of self-referent or other-referent behaviors. Participants began by engaging in an ostensible creativity task, dubbed the "Lange-Elliot Creativity Test." This bogus test has been used successfully elsewhere to provide participants with false feedback (Gaertner, Sedikides, & Graetz, 1999; Sedikides, Campbell, Reeder, & Elliot, 1998). After rating the personal importance of the trait "creativity" on an 11-point scale (1 = *not at all important*; 11 = *extremely important*), participants spent 5 minutes generating various functional uses for a brick and a candle. Their answers were collected and ostensibly graded, while they performed an unrelated distractor task (i.e., drawing a map of the campus) for approximately 6 minutes. The feedback indicated participants' relative position on a histogram describing a large sample of UNC-CH students who had already taken the test. Participants learned either that they had performed poorly, ranking in the 31st percentile (*Ego-Deflation*), or that they had performed well, ranking in the 93rd percentile (*Ego-Inflation*). To reinforce the point, arrows pointed to relevant percentiles. Participants then confirmed that they understood the feedback by initialing a line below.

Participants then answered three manipulation-check questions about how they perceived the manipulation, and three further questions about their mood. First, they indicated, on 11-point scales, (a) the extent to which they believed that they had succeeded or failed at the creativity task, (b) how pleased they were with their performance, and (c) how positive or negative they regarded the feedback as being. Next, they rated, also on 11-point scales, how they felt at that moment (*good-bad*; *happy-sad*; *pleasant-unpleasant*).

Following the manipulation, participants proceeded to the "impression" task. As in Experiment 1, they read a description of a person (either themselves or Chris) consisting of 32

single-sentence behaviors in a booklet. Having done so, they engaged in the distractor task for 2.5 min, followed by the surprise recall task. Finally, the 32 previously seen behaviors, and a control set of 32 behaviors, were presented on the computer screen, one by one in a random order.

Results and Discussion

Manipulation Check

We computed composite scores for both the manipulation-perception questions ($\alpha = .79$) and the mood questions ($\alpha = .93$). Participants reported more positive perceptions following ego-inflation ($M = 8.56$) than ego-deflation ($M = 6.89$), $t(221) = 6.44$, $p < .001$. In addition, participants were in a better mood following ego-inflation ($M = 8.56$) than ego-deflation ($M = 6.89$), $t(221) = 6.44$, $p < .0001$. We therefore deemed our manipulation successful.

Data Reduction

Recall and recognition data were coded and quantified as in Experiment 1. For recall, intrusion rates were again low (4.1% of recalled items).

Analytic Strategy

We predicted a significant five-way interaction involving Referent, Behavior Type, Behavior Valence, Manipulation Type, and Memory Test Type. More specifically, we expected this interaction to split significantly into a pair of four-way interactions (Referent x Behavior Type x Behavior Valence x Manipulation Type) for each level of Memory Test Type, with that for Recall significant, but that for Recognition not. In turn, we expected the four-way interaction for Recall to split significantly into a pair of three-way interactions (Referent x Behavior Type x Behavior Valence) for each level of Manipulation Type, with that for Ego-Deflation significant, but that for Ego-Inflation not. Next, we expected the three-way interaction for Ego-Deflation to split significantly into a pair of two-way interactions (Referent x Behavior Valence) for each

level of Behavior Type, with that for Central behaviors significant but that for Peripheral ones not. Finally, we expected follow-up pairwise comparisons to confirm that the two-way interaction for Central behaviors was driven by the selective neglect of Self-referent Negative (threatening) behaviors relative to self-referent Positive (affirming) behaviors, consistent with our hypotheses.

Accordingly, we began by running a 2 (Behavior Set) x 2 (Referent) x 2 (Manipulation Type) x 2 (Behavior Valence) x 2 (Behavior Type) x 2 (Memory Test Type) ANOVA, with repeated measures on the final three factors. [4] Again, accuracy of recall was indexed by proportion correct, and accuracy of recognition by δ. As predicted, a critical five-way interaction (Referent x Behavior Valence x Behavior Type x Manipulation Type x Memory Test Type) emerged, $F(1, 185) = 4.65$, $p < .05$. We duly decomposed it into a pair of four-way interactions (Referent x Behavior Valence x Behavior Type x Feedback Type), one for recall and one for recognition, reported separately below.

Recall

Means (proportions correct) for 221 participants, broken down by Referent, Behavior Valence, Behavior Type, and Manipulation Type, are displayed in Table 3. The predicted four-way interaction emerged between Referent, Behavior Valence, Behavior Type, and Manipulation Type, $F(1, 189) = 6.68$, $p = .011$. We decomposed this into a pair of Referent x Behavior Valence x Behavior Type interactions for each level of Manipulation Type. The three-way interaction was significant for Ego-Deflation, $F(1, 92) = 10.93$, $p < .001$, but not for Ego-Inflation, $F(1, 96) < 1$.

We proceeded by decomposing the three-way interaction for Ego-Deflation into a pair of two-way interactions (Referent x Behavior Valence), for central and peripheral behaviors separately. The two-way interaction was significant for central behaviors, $F(1, 93) = 14.64$, $p < .0005$, but not for peripheral ones, $F(1, 93) < 1$.

Follow-up pairwise comparisons confirmed that, for central behaviors, the selective neglect of self-threatening behaviors relative to self-affirming behaviors drove the interaction. Participants recalled threatening behaviors less accurately than either self-affirming behaviors, $F(1, 48) = 19.45$, $p < .0005$, or Chris-relevant negative behaviors, $F(1, 107) = 11.97$, $p < .001$. In addition, participants did not differ in how accurately they recalled Chris- relevant positive behaviors and either Chris- relevant negative behaviors, $F(1, 45) < 1$, or self-affirming behaviors, $F(1, 107) < 1$.[5]

Thus, our sequence of a priori predictions for recall was perfectly borne out. Mnemic neglect emerged reliably following ego-deflation but not following ego-inflation. However, inspection of the means in Table 3 reveals that recall of self-threatening (central negative) behaviors did not differ significantly between the ego-inflation and ego-deflation conditions, $t(108) = 0.65$, $p < .52$, though recall of self-affirming (positive central) behaviors was significantly higher in the ego-deflation condition, $t(108) = -3.49$, $p < .001$. Is this problematic for the mnemic neglect model? Comparison to positive central recall as well as comparison to the equivalent Chris conditions provides the necessary context for the manifestation of mnemic neglect. Informed by the results of a previous experiment that manipulated reading time (Sedikides & Green, 2000, Experiment 3), in which self-threatening recall was the same for limited and ample reading time conditions, we suggest that there is a limit to the degree of inhibition of threatening information but that individuals can bolster self-views by focusing more on affirming behaviors.

This interpretation is consistent with the non-significant Referent x Behavior Valence interaction in the Ego-inflation condition. This was not because the four relevant means were statistically equivalent (as was the case for peripheral behaviors). Rather, self-referent recall proved inferior to Chris-referent recall for both negative central behaviors, $F(1, 110) = 30.59$, $p <$

.0001, and positive central behaviors, $F(1, 93) = 11.31$, $p < .001$. Following an ego-inflation experience, individuals may have been less motivated in general to recall self-referent behaviors, particularly threatening behaviors. In fact, on the basis of recent insights (Roese & Olson, 2007; see also Sherman & Cohen, 2006), we suggest that there is a dynamic relationship between self-affirming and self-threatening information, such that elaborative processes for the former behaviors will be stronger after a previous ego-deflation, but weaker after a previous ego-inflation. That is, when an individual feels affirmed, the motive to protect the self by selectively recalling more self-affirming than self-threatening information should be muted, whereas, when an individual feels threatened, the motive to protect the self should come to the fore, leading to increased recall for self-affirming versus self-threatening information.

In order to further explore this interpretation, we examined the internal correlations between reactions to the creativity test feedback and recall. We analyzed the ego-deflation and ego-inflation conditions separately for participants who processed the information self-referentially. In the ego-inflation condition, the correlation between reaction to the feedback and recall for self-threatening behaviors was significant: the more positively they responded to the ego-inflation feedback, the more they recalled negative central behaviors, $r(53) = .33$, $p < .02$. This finding is consistent with theory and results of self-affirmation theory (Sherman & Cohen, 2006; Steele, Spencer, & Lynch, 1993). In the ego-deflation condition, the correlation between response to feedback and recall for self-affirming (positive central) behaviors was marginal, $r(55) = -.26$, $p < .06$. That is, the more negatively they reacted to the ego-deflation feedback, the more they recalled positive central behaviors. This correlation appears to support our contention that individuals may respond to threat by bolstering their self-views via selective recall of affirming information. No other correlations between reactions to feedback and any recall or recognition indices attained significance.

Recognition

Accuracy. As in Experiment 1, two indices of recognition accuracy were used, δ and d'. Means for 225 participants[6], expressed as δ, are displayed in Table 4.

As predicted, no four-way interaction emerged between Referent, Behavior Valence, Behavior Type, and Manipulation Type for either δ or d', both Fs(1, 193) < 1. Nor, collapsing across Manipulation Type, did the three-way interaction between Referent, Behavior Valence, and Behavior Type approach significance, either for δ, $F(1, 193) < 1$, or for d', $F(1, 193) = 1.53$, $p = .23$. Thus, like in Experiment 1, no evidence of mnemic neglect emerged on measures of recognition.

Bias. As in Experiment 1, c served as the index of recognition bias. None of the previous effects observed replicated.[7]

Ruling Out Mood as an Explanation for the Recall Results

As previously mentioned, participants in the ego-inflation condition reported a more positive mood than those in the ego-deflation condition. However, when mood was entered as a covariate, none of the recall effects changed significantly. Thus, we can rule out mood as an explanation for the divergent recall findings between the ego-inflation and ego-deflation conditions. These findings echo the results of related research, in which mood fails to moderate the effects of negative feedback (e.g., social exclusion; Baumeister, DeWall, Ciarocco, & Twenge, 2005).

Summary

Results were again consistent with the hypotheses. For recall, mnemic neglect was significantly moderated by the recent experience of ego-deflation or ego-inflation, emerging reliably after the former but vanishing after the latter. For recognition, mnemic neglect failed to emerge in either case. Thus, Experiment 2 again found both that self-protection prompts the

neglect of central negative feedback, but that such neglect is not the result of offending memories being eliminated. Rather, their latent traces can be unearthed through recognition.

General Discussion

In a previous part of this program of research (Green & Sedikides, 2004; Green et al., 2005; Sedikides & Green, 2000, 2004), we simulated, in the experimental laboratory, social situations in which people receive mixed social feedback. In particular, participants received real or imagined feedback from familiar others (e.g., friends, employers, partners), consisting of both positive and negative elements, and referring both to central and peripheral aspects of personality. We repeatedly found that people showed selectively poorer recall for self-threatening feedback (i.e., negative in implication, and pertaining to central aspects of personality) compared to self-affirming (i.e., positive central) or other-relevant feedback. We labeled this phenomenon mnemic neglect, and characterized it as a species of self-protection (Sedikides et al., 2004). In this article, we addressed an important unresolved question arising out of this research: Are the forgotten memories of self-threatening feedback permanently lost or potentially recoverable?

Evidence exists that many memories which cannot be initially recalled can nonetheless be subsequently recovered, either with retrieval effort (Payne, 1987; Roediger & Thorpe, 1978) or through recognition (Shiffrin & Steyvers, 1997; Wyer et al., 1984). Given that forgotten memories can nonetheless persist, and that recognition measures can be sensitive to their presence, we hypothesized that mnemic neglect would be present on measures of recall (replicating past research) but absent from measures of recognition. The results of Experiment 1 duly confirmed these hypotheses.

In Experiment 2, we proceeded to investigate a potential moderator of mnemic neglect, again using parallel measures of recall and recognition. In Experiment 1, and our own past research (e.g., Sedikides et al., 2004), the mixed feedback was a once-off affair. However, in the

real world, different waves of feedback often follow in swift succession, with one wave being psychologically processed in the context of another. Consequently, we wondered, how would the prior receipt of favorable or unfavorable feedback, leading to either ego-inflating or ego-deflation, affect the magnitude of the mnemic neglect effect? We hypothesized that, whereas ego-inflation would undermine mnemic neglect by affirming and shielding the self-system (Sherman & Cohen, 2006; Trope & Neter, 1994), ego-deflation would promote it by fostering additional self-protective motivation (Campbell et al., 2003; Stapel & Schwinghammer, 2004). In addition, we hypothesized that these dynamics—which would again underscore the motivational nature of mnemic neglect—would only be apparent on measures of recall, not on measures of recognition. The results of Experiment 2 confirmed these hypotheses.

The mnemic neglect model may help to explain the cognitive underpinnings of other established effects, such as the positivity bias in autobiographical memory (Walker et al., 2003), positive illusions about the self (Taylor & Brown, 1988), and the self-serving attributional bias (Mezulis, Abramson, Hyde, & Hankin, 2004). If one is especially prone to forget negative details about oneself on topics of consequences, then it is easy to see why one's life might appear rosy in retrospect, why one might remember only the positive points of one's personality, or why one might remember only one's own contributions to one's success. At the same time, the recall versus recognition findings we report may also help resolve the paradox of why such robust self-enhancing biases exist despite the fact that negative information generally garners greater attention (Fiske, 1980; Pratto & John, 1991) and is generally accorded greater weight (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). We suggest a resolution along the lines of Taylor's (1991) *mobilization-minimization hypothesis*, according to which a negative event (e.g., self-threatening feedback) initially elicits a vigorous, rapid, and direct response (e.g., reacting strongly against criticism), followed by a more measured, prolonged, and indirect response (e.g.,

not thinking about it). The former, mobilization, seeks to undo or contain the negative event, whereas the latter, minimization, seeks to dampen or erase its impact. When it comes to negative feedback, we suspect that people firstly mobilize by challenging and counterarguing its implications (Ditto & Lopez, 1992; Edwards & Smith, 1996) but secondarily minimize by distancing themselves from it (Simon, Greenberg, & Brehm, 1995) or not thinking about it (Erdelyi, 2006). We submit that mnemic neglect, and many other biases in favor of self, occur at the minimization stage, whereas negativity biases occur at the mobilization stage.

This resolution also suggests that using different memory strategies (e.g., recognition), or inducing individuals to actively reflect on negative information, may reduce self-related biases to which mnemic neglect contributes. In keeping with this suggestion, Sedikides, Horton, and Gregg (2007) reported that participants who reflected on why they might or might not possess negative central traits (e.g., untrustworthy, unkind, unfriendly) rated themselves more unfavorably on those traits than control participants did.

Stereotyping research (von Hippel, Jonides, Hilton, & Narayan, 1993; Sherman, Lee, Bessenoff, & Frost, 1998) suggests that stereotypes facilitate quick and efficient coding of consistent items (i.e., good conceptual processing) relative to inconsistent items, but that less attention is paid to the details of the stimulus (i.e., poor perceptual processing). This system is flexible and efficient, and one implication of this model is that under cognitive load, more processing resources are allocated to inconsistent items (i.e., longer attention and better perceptual encoding), although conceptual processing of consistent items is still superior (Sherman et al., 1998). Might these processing styles have some bearing on the processing of self-threatening and self-affirming information? We are skeptical for two reasons. First we have found that reading time for self-threatening and self-affirming information does not significantly differ (Green & Sedikides, 2007). Second, recognition of self-threatening (inconsistent)

information in the present experiments was not higher than recognition of self-affirming (consistent) information. However, future research could more directly test this proposition by manipulating cognitive load, assessing reading time, and measuring both conceptual and perceptual processing (e.g., by providing a richer stimulus set and assessing how well perceptual details are recalled), or by directly pitting processing of threatening and affirming information against each other (Sherman et al., 1998). In addition, a "think aloud" protocol might shed light on the type of encoding as well as further empirically examine the integration and separation judgments that we have proposed.

Our current findings open up several additional interesting possibilities for future research. In Experiment 2, ego-inflation apparently muted the generally pervasive motivation for maintaining a glowing self-concept. Could other social situations activate different motivations and override the often preoccupying self-protection motive? For example, would mnemic neglect be absent under conditions in which the self-improvement motive is activated (Kurman, 2006)? Another question concerns the cross-cultural generalizability of our findings: Is the mnemic neglect effect universal (Sedikides, Gaertner, & Toguchi, 2003; Sedikides, Gaertner, & Vevea, 2005) or restricted to individualistic cultures (Heine, 2005; Heine, Lehman, Markus, & Kitayama, 1999)? In addition, what role might idiosyncratic self-views play in mnemic neglect? Although in past research we have not found differences across some demographic variables or individuals high versus low on the traits (trustworthiness and kindness) exemplified by the stimulus behaviors (Sedikides & Green, 2004, Experiment 2), future research should examine whether mnemic neglect is moderated by such individual differences as self-esteem (Vohs & Heatherton, 2004), narcissism (Campbell & Green, 2007), or repression (Newman & McKinney, 2002). Finally, to what extent might affective states such as happiness, sadness, anger, or shame

influence mnemic neglect, either directly or indirectly via effects on processing style (Wegener & Petty, 1994)?

In conclusion, our research showed that self-threatening memories are accessible and recoverable in normal adults. Our findings complement relevant literature in clinical psychology (Erdelyi, 2006), and take a step toward bridging the theoretical and methodological gap between the self-perceptions and person-perception literatures. Empirical inquiry into the cognitive mechanisms underlying the processing of self-threatening information evidently has a promising feature.

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Table 1

Experiment 1: Mean Recall Accuracy (with Standard Deviations) as a Function of Referent, Behavior Type, and Behavior Valence

	Central Behaviors		Peripheral Behaviors	
	Positive	Negative	Positive	Negative
Self-referent	.39 (.17)	.30 (.17)	.19 (.17)	.23 (.17)
Chris-referent	.36 (.17)	.40 (.18)	.21 (.15)	.23 (.16)

Note. Values reflect the mean proportion of correctly recalled behaviors from each set of eight defined by the interaction of Behavior Valence and Behavior Type.

Table 2

Experiment 1: Mean Recognition Accuracy (with Standard Deviations) as a Function of Referent, Behavior Type, Behavior Valence, and Response Type

	Central Behaviors		Peripheral Behaviors	
	Positive	Negative	Positive	Negative
Self-referent	.86 (.11)	.88 (.09)	.82 (.14)	.84 (.13)
Chris-referent	.88 (.10)	.88 (.09)	.81 (.12)	.85 (.13)

Note. Values (δ) were derived by converting mean hits (previously seen behaviors, judged as such) and mean correct rejections (previously unseen behaviors, judged as such) into proportions, and then by averaging the result, for each set of eight behaviors defined by the interaction of Behavior Valence and Behavior Type.

Table 3

Experiment 2: Mean Recall Accuracy (with Standard Deviations) as a Function of Manipulation Type, Referent, Behavior Type, and Behavior Valence

	Central Behaviors		Peripheral Behaviors	
	Positive	Negative	Positive	Negative
Ego-Inflation				
Self-Referent	.30 (.15)	.33 (.21)	.18 (.17)	.22 (.18)
Chris-Referent	.47 (.17)	.46 (.19)	.21 (.15)	.23 (.16)
Ego-Deflation				
Self-Referent	.44 (.23)	.30 (.19)	.18 (.15)	.23 (.16)
Chris-Referent	.40 (.17)	.43 (.21)	.20 (.17)	.23 (.18)

Note. Values reflect the mean proportion of correctly recalled behaviors from each set of eight defined by the interaction of Behavior Valence and Behavior Type.

Table 4

Experiment 2: Mean Recognition Accuracy (with Standard Deviations) as a Function of Manipulation Type, Referent, Behavior Type, and Behavior Valence

	Central Behaviors		Peripheral Behaviors	
	Positive	Negative	Positive	Negative
Ego-Inflation				
Self-Referent	.89 (.09)	.86 (.09)	.85 (.11)	.85 (.13)
Chris-Referent	.90 (.09)	.91 (.11)	.83 (.12)	.88 (.10)
Ego-Deflation				
Self-Referent	.90 (.10)	.92 (.08)	.82 (.11)	.85 (.10)
Chris-Referent	.88 (.10)	.91 (.09)	.79 (.10)	.83 (.12)

Note. Values (δ) were derived by converting mean hits (previously seen behaviors, judged as such) and mean correct rejections (previously unseen behaviors, judged as such) into proportions, and then by averaging the result, for each set of eight behaviors defined by the interaction of Behavior Valence and Behavior Type.

Footnotes

[1] For each trait dimension, we randomized the order of behaviors presented (to control for recency and primacy effects), under the constraint that no more than two behaviors of the same valence appeared sequentially (Behavior Valence Order). We also used two randomization patterns: the first, presented to half the participants, started with a negative and ended with a positive behavior; the second, presented to the remaining half, started with a positive and ended with a negative behavior (being the mirror image of the first). Also counterbalanced was the order in which central and peripheral behaviors appeared (Behavior Type Order). Half the participants read the central behaviors first, and half read the peripheral behaviors first. In the data analysis of both experiments, these two between-subjects order variables were included in the model, but are not included in the model description for the sake of presentation clarity. No substantive effects involving either order variable emerged, rendering our decision to omit them from the model description easier.

[2] Traditionally, response bias in signal detection paradigms has been quantified by (the natural logarithm of) β, which represents the ratio of the heights of the signal and noise distributions at the decision criterion (McNicol, 1972, pp. 62-63). However, it may be less plausible to assume that respondents base their decisions on a likelihood ratio than on the actual position of decision criterion (Richardson, 1994). In addition, c has two advantages over log β: it is unaffected by changes in d' (McNicol, 1972, pp. 63-64) and it is computationally simpler. We express c such that positive values indicate a bias towards detecting a signal (i.e., an "old" item; Snodgrass & Corwin, 1988). In cases where the proportions on which c is based equal unity or zero, a value of .5 ÷ k, where k is number of signal or noise trials, can be subtracted or added to facilitate computation (similarly for d' ; McMillan & Kaplan, 1985).

[3] The Referent x Behavior Valence interaction, which has been consistently obtained in prior research (e.g., Sedikides & Green, 2000, 2004), was also significant in both Experiment 1 and Experiment 2. The pattern was identical, with participants recalling fewer negative than positive behaviors for self, but more negative than positive behaviors for Chris.

[4] As in Experiment 1, the two order variables are included in the model, but omitted from the description. No substantive effects involving the order variables were significant.

[5] Effects for the Behavior Set factor generally resembled those in Experiment 1. Crucially, this factor did not qualify any key interactions (e.g., Referent x Behavior Type x Behavior Valence). Full details are available from the authors.

[6]Several participants responded to only 63 behaviors during the recognition task due to a programming error. One behavior for each participant was randomly omitted. The accuracy proportions were corrected accordingly.

[7]A significant Behavior Valence x Behavior Type x Manipulation Type did emerge, $F(1, 193) = 8.56$, $p < .005$, but resists obvious explanation and is in any case irrelevant to our hypotheses.

Appendix

All participants considered the 32 behaviors below that reflect the traits trustworthy, kind, uncomplaining, and modest. All eight behaviors reflecting the same trait were presented on the same page. When Chris allegedly performed the behaviors, Chris replaced the self as the author of the behavior, and the sentences were altered slightly to remove all pronouns, allowing participants to infer that Chris was either male or female.

Original Set

Trustworthy and Untrustworthy Behaviors

I would borrow other people's belongings without their knowledge.
I would keep secrets when asked to.
I would be unfaithful when in an intimate relationship.
I would follow through on a promise made to friends.
I would often lie to **my** parents.
An employer would not rely on **me** to have an important project completed by the deadline.
A teacher would leave **me** alone in a room while taking a test and not be afraid that **I** would cheat.
People would be willing to tell **me** embarrassing things about themselves in confidence.

Kind and Unkind Behaviors

I would make fun of others because of their looks.
I would offer to care for a neighbor's child when the baby-sitter couldn't come.
I would purposely hurt someone to benefit **myself**.
I would help people by opening a door if their hands were full.
I would refuse to lend classnotes to a friend who was ill.
I would make an obscene gesture to an old lady.
I would help a handicapped neighbor paint his house.
I would volunteer time to work as a big brother/big sister to a child in need.

Uncomplaining and Complaining Behaviors

I would look for faults even if **my** life was going well.
I would rarely inform others about physical ailments.
When **I** would not like to do something, **I** would constantly mention it.
I would overlook the bad points about a roommate.

I would constantly talk about how much stuff there is to be done.
I would pick only the bad points to describe the classes **I** attend.
I would minimize bad experiences when telling about them.
I would tolerate situations even when not having a good time.

Modest and Immodest Behaviors
I would act in a condescending manner to other people.
I would take the focus off **myself** and redirect it to others.
I would point out others' weaknesses to make **myself** look better.
I would let some of **my** achievements go by unaccredited.
I would talk more about **myself** than about others.
I would like to show off in front of others.
I would give others the credit for a group success.
I would never openly brag about **my** accomplishments.

New Set

Trustworthy and Untrustworthy Behaviors
I would completely forget about an important meeting at work.
I would not report a large source of income on **my** income taxes.
I would not pay back money that **I** owed to a friend.
I would gossip about a good friend to other people.
I would remember to pick things up for a friend.
I would handle confidential tasks at work successfully.
When **I** found a wallet containing a lot of money, **I** would track down the owner and return it.
Even though **I** had a lot of work, **I** would not cheat on a homework assignment.

Kind and Unkind Behaviors
I would ignore someone at a party that I didn't know very well.
I would criticize a friend's boyfriend or girlfriend in front of **my** friend.
I would refuse to lend money to a brother or sister.
I would get in a heated argument with someone over a minor issue.
I would take care of a sick friend for several days.
I would drive a friend around while his/her car was being repaired.
I would help **my** roommate study for a difficult exam even though **I** had a great deal of work to do.
I would take care of a friend's pet for the entire summer.

Uncomplaining and Complaining Behaviors

I wouldn't say anything if food was overcooked at a restaurant.
I wouldn't get mad if a friend promised to call but forgot.
I would simply smile if someone was rude to me.
I wouldn't really comment negatively about politicians that **I** disliked.
I would complain about my boss to co-workers.
I would gripe when a roommate didn't keep the place neat and clean.
I would criticize a friend if she or he was late meeting **me**.
I would get irritated and comment loudly if the weather was bad.

Modest and Immodest Behaviors

I would change the subject if someone praised **me**.
I wouldn't publicize it to many people if **I** got an award or honor.
I would talk about a friend's successes more than **my** own.
I would downplay **my** good performance at work.
I would openly brag to friends about a good grade.
I would look down on some people because of their background or dress.
I would boast about winning a game or sporting contest.
I would ignore certain types of people at a party.

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