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The feeling of choosing: Self-involvement and the cognitive status of things past

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Abstract

Previous research has demonstrated that self-involvement enhances the memorability of information (i.e., self > other) encountered in the past. The emergence of this effect, however, is dependent on guided evaluative processing and the explicit association of items with self. It remains to be seen, therefore, whether self-memory effects would emerge in task contexts characterized by incidental-encoding and minimal self-involvement. Integrating insights from work on source monitoring and action recognition, we hypothesized that the effects of self-involvement on memory function may be moderated by the extent to which encoding experiences entail volitional (i.e., choice-based) processing. The results of three experiments supported this prediction. Despite the adoption of an incidental task context and stimulus materials that were inconsequential to participants, the act of selection enhanced the memorability and accessibility of information. The implications of these findings for contemporary treatments of self are considered.

Keywords: Self; Incidental memory; Choice

1. Introduction

> "If the self causes actions, it must know them."
> Wegner and Sparrow (2004, p. 1201).

Few human qualities are as mysterious as the sense of self that pervades core aspects of social-cognitive functioning. From seemingly intangible origins, self is a psychological construct that guides cognition, shapes behavioral elicitation and provides stability and continuity to the ebb and flow of subjective experience (James, 1890; Neisser, 1988). As Baars has reported, "...some notion of self in psychological theory is not a luxury, not a metaphysical or artificial issue, but a necessity for any complete psychological framework" (1988, p. 336). It comes as little surprise, therefore, to learn that self is a topic that has intrigued scholars

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for centuries and continues to attract interest from diverse sections of the academic community (e.g., Boyer, Robbins, & Jack, 2005; Conway & Pleydell-Pearce, 2000; Gallagher, 2000; Gillihan & Farah, 2005; Heatherton, Macrae, & Kelley, 2004; Klein, Rozendal, & Cosmides, 2002). Although the construct itself has proved difficult to operationalize, scientific interest has tended to focus on a set of well defined empirical problems, such as when self emerges in childhood, where self knowledge is represented in the brain and how self shapes basic aspects of cognitive performance, most notably memory function (Conway & Pleydell-Pearce, 2000; Gillihan & Farah, 2005; Heatherton et al., 2004)? It is towards this final topic that attention is directed in the current inquiry.

1.1. Self-involvement and memory

When it comes to recollecting the past, a reliable behavioral effect has been reported — self-referential thinking affords items an advantage in memory (e.g., Kelley et al., 2002; Macrae, Moran, Heatherton, Banfield, & Kelley, 2004; Maki & McCaul, 1985; Rogers, Kuiper, & Kirker, 1977). Following a task in which participants are required to rate the extent to which personality characteristics are descriptive of both self and a familiar other (e.g., *celebrity*, *best friend*, *parent*), items encoded in a self-referential manner enjoy both a recall and recognition advantage (i.e., self > other)—the so called self-reference effect (SRE) in memory (Symons & Johnson, 1997). Although reliable and intriguing, it is questionable however whether the SRE captures the inherent subtlety and pervasiveness of self-related processing effects in social cognition (Feinberg, 2001; Wegner, 2002)? The problem is that in research to date, self-referential mental activity has been triggered through explicit instruction; specifically, directed evaluative processing ('are *you* (*George W. Bush*) enigmatic?'). If centuries of deliberation and theorizing on self and its cognitive function have suggested anything at all, it is that self is a basic psychological construct that guides cognition in a decidedly implicit, unobtrusive manner (Humphrey, 1992; James, 1890; Neisser, 1988; Tsakiris & Haggard, 2005). This then gives rise to an important functional question. Is it possible to elicit patterns of memorial performance that are indicative of self-involvement, but without the necessity of explicit self-referencing? Put simply, how robust is people's memorial preference for information that has come in contact with self?

Insights into the relationship between self-involvement and memory function can be garnered from several lines of inquiry. For example, work on action recognition has shown that people are better at recognizing their own behavior than the actions of others (Knoblich & Flach, 2003). Whether the outcomes of interest are walking, kinematic aspects of handwriting, the trajectories of darts, excerpts of classical music, or the sound of hands clapping, actors are better at recognizing their own behavioral products than the comparable outputs of other individuals (Beardsworth & Buckner, 1981; Knoblich & Flach, 2001; Knoblich & Prinz, 2001; Repp, 1987; Repp & Knoblich, 2004; Wolff, 1931). Driving these effects are differences in the strength of action-outcome associations when common behaviors are enacted by self or others (Knoblich & Flach, 2003; Prinz, 1997; Repp & Knoblich, 2004). When a person perceives his or her own behavior (compared to observing the behavior of other people), a stronger connection is established between the action and its associated motor code.

Differences in the strength of action-outcome associations, however, is but a single factor that may contribute to the generation of self-memory effects. Moreover, enhanced recognition is likely to extend beyond the memorability of specific actions (e.g., walking, clapping) to information that derives from the execution of these behaviors (i.e., action products). Perhaps the defining feature of self is that, as a psychological construct, it gives rise to people's thoughts and actions (Frith, 1992; Gallagher, 2000; Wegner, 2002; Wegner & Sparrow, 2004). Through mental operations that furnish both a sense of agency and ownership over executed actions (Gallagher, 2000), self-related processing enables people to distinguish reflexive movements from deliberative behavior and self from others. As Boyer et al. have reported, "Among the most basic features of persons is that they make things happen. Not only do people make things happen, they think of themselves as the authors of such happenings. This mode of self-representation underlies the sense of agency" (2005, p. 649). What this suggests is that behavioral products that emerge from volitional action are likely to differ in psychological flavor from those that are performed either by some other person or are performed by self but are constrained in some way (e.g., environmentally triggered). In particular, outcomes associated with volitional activity (i.e., self-as-agent) may be inexorably connected to self, hence display a range of distinctive informa-

tion-processing effects (Boyer et al., 2005; Frith, 2005; Gallagher, 2000; Wegner & Sparrow, 2004), such as enhanced memory performance.

1.2. Choice and memory

Based on an application of the influential source-monitoring framework (Johnson, Hashtroudi, & Lindsay, 1993; Johnson & Raye, 1981; Mitchell & Johnson, 2000), agentic or choice-based processing has been shown to enhance memory performance in a quite specific manner. Compared to participants who have been assigned a particular option (e.g., *house*, *roommate* or *car*) in a decision task, those who can freely choose between competing alternatives demonstrate enhanced memory for choice-supportive features of their selected response (Mather & Johnson, 2000; Mather, Shafir, & Johnson, 2000, 2003). According to the source-monitoring framework, people make use of various types of information to determine the origin of their experiences. Specifically, both the quality of generated memories (i.e., perceptual, contextual and semantic details) and information pertaining to the mental operations that were undertaken on encoded material can be used to determine the source and status of an experience (Johnson et al., 1993; Johnson & Raye, 1981). As selected, but not assigned, options involve generative and evaluative processing prior to the execution of a response, it is likely that these additional task-related cognitive components (together with post-decision motivational influences) serve to facilitate memory performance for selected information (Johnson, Foley, & Leach, 1988; Johnson, Raye, Foley, & Foley, 1981; Mather et al., 2000, Mather, Shafir, & Johnson, 2003).

As is the case with research exploring the SRE in memory (Kelley et al., 2002; Rogers et al., 1977), however, studies adopting the source-monitoring framework also demand the directed appraisal of stimulus items (e.g., how much would you like living in a particular house?), hence promote the explicit association of information with self (Johnson et al., 1988; Mather et al., 2003). It remains to be seen, therefore, whether similar effects would emerge in task contexts in which information is associated with self (and other) is a less obtrusive manner. Consider, for example a situation in which self and another person select or are assigned arbitrary numbers. These numbers, moreover, turn out to be paired with specific stimuli (e.g., objects). If object memory was assessed in a surprised recognition test, would a typical self-memory effect emerge (i.e., objects-associated-with-self > objects-associated-with-other)? That is, although the act of choosing was not directed to the material of interest, is such an operation sufficient to forge a self-object association in mind and enhance subsequent memory. In a paradigm that mirrors this type of scenario, we explored this possibility in the current investigation.

1.3. The current research

Based on an application of the source-monitoring framework (Johnson et al., 1993) and related research on action identification (Tsakiris & Haggard, 2005; Wegner, 2002), we anticipate that memorial effects indicative of self-involvement will continue to emerge in task contexts in which self is only minimally engaged (see Gallagher, 2000). In particular, the cognitive operations associated with outcomes that are generated via choice-related processing (i.e., response evaluation/selection) should serve to enhance the memorability of behavioral products (Johnson et al., 1993), even when these products are quite trivial in nature and are paired with self in an incidental manner. In other words, even minimal levels of self-involvement with stimuli may be sufficient to enhance the memorability of the material, if self-involvement entails rudimentary choice-based (i.e., volitional) processing. In this way, self can guide cognitive functioning in the absence of explicit demands to remember the past or requests to evaluate information in a self-referential manner.

To explore the effects of incidental self-involvement on memory function, we designed a task context in which both the origin (i.e., self vs. other) of an outcome and the nature of the selection experience (i.e., selected vs. assigned) that preceded the generation of the outcome were manipulated. To realize these objectives, participants performed a task in pairs (i.e., self and other) in which they were required to select slips of paper (i.e., action = reach for a piece of paper) on which concealed numbers were written. Each number signaled a unique word (i.e., outcome = word) that was uttered by the experimenter. Of theoretical interest was the manner in which words were paired with participants and how this would impact on subsequent memory performance. In one condition, participants selected slips of paper from multiple competing alternatives (i.e., all the numbers were placed in a common area between both participants); in a second condition, the slips of paper were

pre-assigned to participants by the experimenter (i.e., half of the numbers were placed in an area in front of each participant).

The utility of the current paradigm was that it enabled outcomes (selected words vs. assigned words) to be paired with participants in an incidental manner, following the execution of a common action (i.e., reaching for a slip of paper). What differed across conditions was the manner in which the items were paired with participants. Whereas in one condition (i.e., 'selected' condition), participants had control over stimulus selection (i.e., which numbers would ultimately be paired with them), in the other condition (i.e., 'assigned' condition), this action-outcome relationship was absent (i.e., the numbers ultimately paired with them was pre-assigned by the experimenter). We anticipated that classic self/other differences in memory performance (i.e., self > other) would only emerge when participants selected the items (i.e., volitional activity preceded the outcome). When the items were pre-assigned to participants, differences in memory performance were not expected to emerge. In addition, memory for self-selected items was expected to exceed that of self-assigned items (Mather et al., 2003; Takahashi, 1991; Watanabe & Soraci, 2004). We explored these predictions in our first two experiments.

2. Experiments 1a and 1b

2.1. Self-involvement and memory performance

2.1.1. Method

2.1.1.1. Participants and design. Forty-four undergraduates (13 men, 31 women) from Dartmouth College completed Experiment 1a and 60 undergraduates (17 men, 43 women) completed Experiment 1b. Participants completed the experiments in return for course credit and each study had a 2 (item: selected or assigned) × 2 (source: self or other) mixed design with repeated measures on the second factor. All that differed between the experiments was the manner in which memory was assessed (Experiment 1a—free recall, Experiment 1b—recognition).

2.1.1.2. Procedure and stimulus materials. Participants arrived at the laboratory in pairs, were greeted by a female experimenter and randomly assigned to complete either Experiment 1a (i.e., free recall) or Experiment 1b (i.e., recognition). Participants were mostly recruited from an introductory psychology class and registered individually on a web-based scheduling program. When registering, participants did not have access to the names of students who were already signed-up. Consequently, it is unlikely that participants within each pair were highly familiar with each other. Nevertheless, the possibility that some participants knew each other cannot be completely ruled out.

For the first part of each experiment, participants were seated at a table facing the experimenter and given the cover story that the task was a pilot study to assess the viability of a procedure (e.g., the duration of trials) to be used later in the session in an experiment with children. Each pair of participants was then randomly assigned to one of two item-acquisition conditions (i.e., 'selected' or 'assigned'). These conditions were designed to differ in the extent to which they involved volitional processing in the pairing of stimulus information with participants (Turk et al., 2004). In the 'selected' condition, participants were instructed to alternately select a piece of paper from a bowl that was placed in the center of the table. The bowl contained 40 pieces of paper on each of which a unique number was written. The numbers were not visible to participants. Once a piece of paper was selected, it was passed to the experimenter who checked the number against a list of words (i.e., personality traits) on a clipboard and then uttered the item in question. Importantly, it was never suggested that the trait words could refer to the participants and no explicit consideration of these words was ever required of them.

In total, each participant selected 20 items during this phase of the task. In the 'assigned' condition, the procedure was identical apart from the manner in which the items were paired with participants. For these individuals, half of the items (were pre-selected by the experimenter from the bowl and) were placed on the table in front of each participant before they arrived in the room. Thus, participants would simply alternately pass one of the pre-assigned pieces of paper (20 for each participant) to the experimenter who would then utter the word in question. With this procedure, all aspects of the task (i.e., required actions and accompanying outcomes) were identical across the two conditions (i.e., reach for paper, hand paper to experimenter, experimenter read aloud word), except for the manner in which items were paired with participants (i.e., selected vs. assigned). Participants had no

idea that memory for the material would subsequently be assessed. Instead, they believed the study was a pilot experiment for subsequent research on children. In this respect, they were requested to focus on the timing of the task (i.e., only pick a number after the experimenter has uttered the current word).

The stimulus words associated with the numbered pieces of paper were evaluatively positive personality traits (e.g., *gentle*, *wise*, *polite*) taken from Anderson (1968). For participants in the 'assigned' condition, two lists were created (i.e., self-list and other-list). The items in each list were matched for likeability and length and presentation of the lists was counterbalanced across the experimental conditions. During this phase of the task, the experimenter gave participants the instruction not to start the next round (i.e., reaching for a piece of paper) until she had uttered the current word. When each word was spoken, care was taken by the experimenter not to direct her gaze towards the participant with whom the item was paired (i.e., the experimenter stared at her clipboard). On completion of the selection phase of the experiment, participants performed a 3-min distracter task in which they were requested to write down as many US State Capitals as possible.

For the testing phase of the experiment, participants were brought to separate rooms by a male experimenter. In Experiment 1a, participants were given a free recall task in which they were given 4 min to list as many words as possible from the first part of the study. In Experiment 1b, participants performed a computer-based (IMac) recognition test in which 60 words appeared on the screen (40 targets and 20 foils) and they had to report, by means of a key press, whether each word was 'old' (i.e., had appeared in the previous phase of the task) or 'new' (i.e., had not been presented before). The foils were taken from Anderson (1968) and the items were matched in valence, length and likeability to the target words. On completion of the testing phase, participants were debriefed and dismissed.

2.1.2. Results and discussion

Free Recall (Experiment 1a)—Participants' recall proportions were submitted to a 2 (item: selected or assigned) × 2 (source: self or other) mixed-model analysis of variance (ANOVA) with repeated measures on

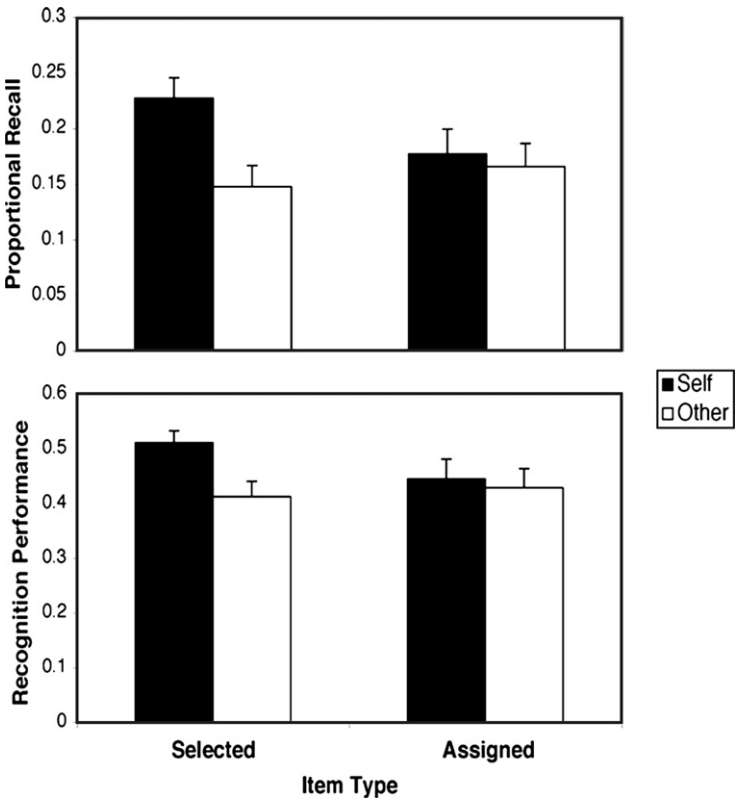

Fig. 1. Memory performances as a function of source and item type (Experiment 1a (top panel)—free recall; Experiment 1b (bottom panel)—recognition).

the second factor. Mean recall performance is depicted in Fig. 1 (top panel). The analysis yielded a significant effect of source on memory performance [$F(1,42) = 8.07$, $p < .007$; partial $\eta^2 = .161$], such that participants remembered more words when the items were paired with self than when they were paired with their interaction partner (respective *M*s: .202 vs. .156). This effect was qualified, however, by an source × item interaction [$F(1,42) = 4.54$, $p < .04$; partial $\eta^2 = .098$] which revealed that only in the 'selected' condition did a recall advantage emerge for words paired with self, $t(21) = 3.89$, $p < .001$. In addition, when words were paired with self, memory was better when the items were selected rather than assigned, although this effect was only marginally significant, $t(42) = 1.77$, $p < .09$.

Item Recognition (Experiment 1b)—Participants' corrected recognition performance was submitted to a 2 (item: selected or assigned) × 2 (source: self or other) mixed-model ANOVA with repeated measures on the second factor.[1] Mean recognition performance is depicted in Fig. 1 (bottom panel). The analysis yielded a significant effect of source on recognition performance [$F(1,58) = 7.56$, $p < 008$; partial $\eta^2 = .115$], such that participants recognized more words when the items were paired with self than when they were paired with an interaction partner (respective *M*s: .475 vs. .423). As in Experiment 1a, this effect was qualified by a source × item interaction [$F(1,58) = 4.88$, $p < .04$; partial $\eta^2 = .077$] which revealed that only in the 'selected' condition did a recognition advantage emerge for words paired with self, $t(29) = 3.75$, $p < .001$. When words were paired with self, recognition memory was better when the items were selected rather than assigned, although as in Experiment 1a this effect was only marginally significant, $t(58) = 1.70$, $p < .10$.

These results corroborate the prediction that incidental self-involvement can facilitate subsequent memory performance, if that involvement is elicited by minimal levels of choice-related processing. On both measures of recall and recognition, memory for self-related items exceeded that of other-related items, but only when the words were selected by participants. What is interesting about this effect is that it mimics the SRE in memory (self > other), but in the absence of explicit self referencing (Symons & Johnson, 1997). This suggests that self-involvement may exert pervasive effects on memory function, even when people are not explicitly engaged in tasks that demand self-referential mental activity (e.g., introspection, preference-based decision making, stimulus generation). It would seem that when personal involvement (i.e., the feeling of choosing) shapes the course of future outcomes (even trivial outcomes), these outcomes are referenced to self (Gallagher, 2000; Tsakiris & Haggard, 2005; Wegner, 2002). As a result of this process, memory for self-selected items exceeds that of other-selected items (Kelley et al., 2002; Rogers et al., 1977). In addition, items selected by self are more memorable than items that were assigned to self by the experimenter (Mather et al., 2000, 2003; Takahashi, 1991; Watanabe & Soraci, 2004). Of course, if self-involvement operates in this manner one would expect comparable effects to emerge on other measures of cognitive functioning. For example, one might expect self-involvement to enhance the cognitive accessibility of information. To expand the scope of the current inquiry, we explored this possibility in our next experiment.

3. Experiment 2

3.1. Self-involvement and item accessibility

3.1.1. Method

3.1.1.1. Participants and design. Fifty-seven undergraduates (19 men, 38 women) from Dartmouth College completed the experiment for additional course credit. The experiment had a single factor (source: self or other or new) repeated measures design.

3.1.1.2. Procedure and stimulus materials. The experimental procedure was identical to Experiments 1a and 1b, with the exception that participants always selected pieces of paper (pertaining to evaluatively positive traits) from a bowl placed in the center of the table. The 'assigned' condition was dropped in this experiment as between-condition (i.e., self vs. other) differences only emerged in the previous studies when participants

[1] As the foils have no a priori status (i.e., selected or assigned), false alarm rates were divided by two and distributed equally across the two sources in each condition (i.e., selected = .175, assigned = .205).

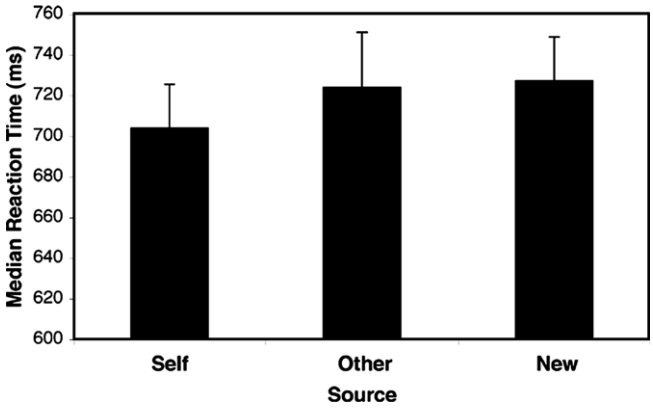

Fig. 2. Item accessibility as a function of source (Experiment 2).

selected the items. For the testing phase of the experiment, participants were brought into separate rooms and seated facing the screen of an Apple Macintosh computer (IMac). The experimenter then explained that their task was to report, by means of a key press, whether items appearing in the center of the computer screen were favorable or unfavorable in evaluative implication (van Leeuwen & Macrae, 2004). In total, participants were presented with 120 traits (60 favorable, 60 unfavorable). Of interest were participants' classification times when responding to the favorable traits. Of the 60 items, 20 were traits previously selected by self (i.e., self), 20 were traits previously selected by the other participant (i.e., other) and 20 were entirely new traits (i.e., new). Evaluatively negative traits were included in the task to prevent participants from always making the same button response. Trials consisted of the appearance of a fixation cross for 500 ms followed by a word that remained on the screen until participants made a response. The computer recorded the latency and accuracy of each response. On completion of the task, participants were debriefed and dismissed.

3.1.2. Results and discussion

Trials on which errors were made were omitted from the statistical analysis (2.3% of trials), as were responses to unfavorable traits. Median reaction times were then calculated for the three types of item (self, other, new) for each participant and the resulting data were submitted to a contrast analysis testing the prediction that reaction times for 'self' items would differ from those observed for both 'other' and 'new' items. The analysis confirmed this prediction [$F(1, 56) = 7.17$, $p < .01$; partial $\eta^2 = .114$], such that participants were quicker to classify traits when these items were previously selected by self than when they were either selected by another person or were entirely new (see Fig. 2). Extending the results of Experiments 1a and 1b, these findings demonstrate that not only does incidental self-involvement enhance memory performance, but it also increases the accessibility of selected information.

4. General discussion

The current findings reveal the effects of self-involvement on cognitive functioning when information is selected rather than assigned to self (see also Mather et al., 2000, 2003). Despite the adoption of an incidental task context and stimulus information that was inconsequential to participants, the act of selecting items, albeit indirectly, enhanced the memorability of information on both tests of recall and recognition. That is, compared to information that was selected by a partner or material that was pre-assigned to self by the experimenter, participants were more likely to remember items from the past if they had played an active role in the selection of the information (Experiments 1a and 1b), even if this role was minimal and inconsequential (i.e., participants had no control over which words were paired with the selected numbers). Extending this finding, information selected by self was also more accessible than material chosen by another person (Experiment 2), a further demonstration of the influence that self-involvement exerts on cognitive functioning. Taken together, these findings demonstrate that minimal self-involvement enhances memory function in the absence of explicit choice or guided self-referential processing. But what do these findings reveal about the psychological status of

self-involvement in social cognition? Why does self-involvement increase the memorability and accessibility of one's prior experiences, even when these experiences are quite trivial in nature?

4.1. Memorial benefits of self-involvement

Previous explorations into the effects of self-involvement on memory function have been guided by the source-monitoring framework (Johnson et al., 1993; Johnson & Raye, 1981; Mitchell & Johnson, 2000). Mather and colleagues, for example, have shown that compared to participants who are assigned specific outcomes, those who can freely choose among options display enhanced memory for choice-supportive features of their selected response (Mather et al., 2000, 2003). Underlying choice-based decisions are processing operations (e.g., option evaluation, response selection) that are not implemented when outcomes are assigned to perceivers (Johnson et al., 1993). Together with post-decision motivational forces, these differences in the mental operations that accompany stimulus encoding serve to enhance the memorability of choice-supportive material (Mather et al., 2000, 2003; Mitchell & Johnson, 2000).

The present findings are noteworthy as they extend the source-monitoring account of self-memory effects in a number of important ways. First, the generation of self-involvement effects (e.g., selected > assigned) does not require the explicit appraisal of competing outcomes. Even incidental contact with outcomes (i.e., selecting numbers that pertain to outcomes) is sufficient to trigger a recall and recognition advantage for selected items. Second, this self-memory effect is not restricted to meaningful stimuli (e.g., *roommates*, *apartments*), memory for inconsequential material also benefits from prior self-involvement, if that involvement is triggered by choice-based processing. Third, choice-based processing mimics the effects of self referencing, such that memory for self-selected items exceeds that of other-selected items (Kelley et al., 2002). Thus, the SRE in memory extends to incidental-encoding environments (Symons & Johnson, 1997). What the current findings reveal, therefore, are the minimal conditions under which self-involvement guides basic aspects of cognitive functioning. It is well established that explicit self-involvement modulates the efficiency of item memory (Kelley et al., 2002; Mather & Johnson, 2000; Mather et al., 2000, 2003; Slamecka & Graf, 1978; Takahashi, 1991), here however we have shown that equivalent effects can be generated following the unobtrusive involvement of self in an inconsequential task context.

Driving effects of the sort reported in the current inquiry may be differences in the attentional resources that are allocated to action products as a function of how they are experienced by perceivers. In particular, products that emerge from volitional behavior may be associated with distinct patterns of neural activity (Turk et al., 2004). Neuroimaging investigations have revealed common regions of the dorsal premotor cortex and posterior parietal cortex that show higher levels of activity during choice than no-choice decision tasks, particularly when the associated judgmental products are inconsequential to perceivers (Jenkins, Passingham, Nixon, Frackowiak, & Brooks, 1992; Mushiake, Inase, & Tanji, 1991; Turk et al., 2004). It is possible that increased activity in this parietal-premotor network may contribute to the enhanced memorability of information that derives from prior choice-related behavior, most notably when incidental memory is assessed (Macrae et al., 2004). One task for future research will be to investigate this possibility and to further chart the neural underpinnings of agency and ownership (Frith, 2005).

4.2. Self as agent and owner

In a recent paper, Gallagher (2000) has drawn a fundamental distinction between the *minimal* and *narrative* components of self. Of relevance to the current inquiry, the minimal self provides perceivers with a sense of bodily ownership and agency over self-generated behaviors. In other words, ownership refers to feelings that derive from the authorship of intentional action (e.g., "I did that"). It is possible, however, that this concept may also extend to the products of actions, rather than the process of action generation per se. In a provocative article, Belk (1988) has suggested that a diverse range of stimuli (e.g., possessions, acquaintances, places) are routinely incorporated into people's representations of self (Burris & Rempel, 2004; Wicklund & Gollwitzer, 1982), even when contact with the stimuli is quite incidental. The behavioral consequences of this process of self-object/other assimilation are intriguing. Objects that come in contact with self typically elicit feelings of ownership (Beggan, 1992) and exaggerated perceptions of desirability

and worth (Kahneman, Knetsch, & Thaler, 1991; Knetsch & Sinden, 1984; Thaler, 1980). Put simply, that which is self-relevant is also special, valuable and attractive (Gallagher, 2000; Humphrey, 1992). That people overvalue their personal possessions is perhaps not terribly surprising, what is noteworthy however is that this phenomenon also extends to the appraisal of artificial stimuli. Feys (1991), for example, has demonstrated that experimentally induced belongingness to self increases the desirability of abstract geometrical drawings, thereby revealing that the effects of self-involvement generalize to the appraisal of inconsequential stimuli.

As demonstrated in the current inquiry, effects reminiscent of ownership also extend to the memorability and accessibility of information that has been selected by self in an earlier processing episode. However, in contrast with studies of mere ownership effects, where participants are positively biased to assess the value of items presented as gifts (Beggan, 1992), the effect obtained here was restricted to words remotely selected by self (e.g., it did not extend to the assigned items). That is, instead of involving self with explicit assessment of items belonging to the participants (Belk, 1988), the current study indirectly prompted self-involvement by giving participants the impression of choosing the experimental stimuli. Therefore, in the current study an illusory feeling of choosing rather than true ownership was sufficient to influence the processing of the items.

Just as people's possessions and actions enjoy a special psychological status, so too it would appear do the products of their unconstrained behaviors, even when the products in question are quite trivial (see Wegner & Sparrow, 2004). That this type of self-involvement has demonstrable cognitive effects may be expected given recent treatments of agency and behavioral generation (Boyer et al., 2005; Humphrey, 1992; Knoblich & Flach, 2003; Wegner, 2002; Wohlschläger, Engbert, & Haggard, 2003). The ability to recognize oneself as the origin of action (or thought) serves as the foundation through which self is seen as an autonomous agent, distinct from the external stimulus world. With the freedom to seemingly initiate, monitor and regulate behavior, self occupies a pivotal position in social-cognitive functioning (James, 1890; Neisser, 1988). Just as one owns one's thoughts and behaviors, so too it would appear one has a proprietary relationship with the products of one's unconstrained behavioral endeavors. By functioning is this way, self-involvement ensures that perceivers are cognizant of the ways in which their behavior gives rise to states of affairs in the external world, even when they are not intentionally trying to remember the outcomes associated with these actions and explicit self-referencing is not a requirement of the current task context.

In order to facilitate comparison with past studies investigating the processing of information relevant to self or other, the words used in the current study were positively valenced traits similar to those commonly employed in explicit self-referencing tasks (Kelley et al., 2002; Symons & Johnson, 1997). However, it is noteworthy that past studies have found the SRE in memory to be more robust for evaluatively positively traits (D'Argembeau, Comblain, & Van der Linden, 2005; Sedikides & Green, 2000). It is therefore possible that the current effects would have been reduced if evaluatively neutral or negatively valenced traits had been used. One task for future research will be to explore this possibility. Similarly, future research should assess the extent to which the current effects generalize to other types of stimuli (e.g., pictures of objects, faces). In so doing, this work will further elucidate how self guides cognitive functioning.

5. Conclusion

Through the possession of a unitary sense of self, people are able to provide order, stability and coherence to their lives. Indeed, without such a construct, it is difficult to imagine how everyday social interaction could proceed. As authors of their thoughts and deeds, perceivers can seemingly direct behavior in whichever direction they so choose (see Wegner, 2002). As observed in the current inquiry, this activity can have some interesting consequences. When behavior is freely chosen (i.e., self-as-agent), memory for the products of one's previous actions exceeds the memorability of both other people's outputs and items that were assigned to self, even when the behavioral outcomes in question are inconsequential. Thus, not only are we skilled at recollecting our actions, but so too the consequences of these actions appear to enjoy an advantage in memory, even when we are not charged with the task of remembering them. In this way, the act of choosing serves as a basis for psychological authorship and exerts a pronounced effect on the cognitive status of things past.

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