Survival processing versus self-reference: A memory advantage following descriptive self-referential encoding

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A R T I C L E   I N F O

Article history:
Received 15 June 2016
revision received 17 January 2017

Keywords:
Survival processing
Self-reference effect
Recall
Recognition

A B S T R A C T

Previous research has shown that rating words for their relevance to a survival scenario leads to better retention of the words than rating them for self-reference. Past studies have, however, relied exclusively on an autobiographical self-reference task in which participants rate how easily a common noun brings to mind a personal experience. We report five experiments comparing survival processing to a descriptive self-reference task in which participants rated how well trait words described them. Rating trait adjectives for survival value led to higher levels of recall and recognition than rating them for their relevance to a moving home scenario. Rating the adjectives for self-reference, however, led to higher levels of recall (Experiments 1 and 3) and recollection (Experiment 2) than survival rating. Experiment 4 replaced trait adjectives with trait nouns and found that self-reference led to greater recognition accuracy than survival processing. Experiment 5 used trait nouns followed by tests of free recall and found a memory advantage following self-reference that was not influenced by the imageability of the stimuli. The findings are discussed in terms of theories of the survival processing and self-reference effects and the relationship between them.

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Introduction

The survival processing effect, first reported by Nairne and colleagues (e.g., Nairne & Pandeirada, 2010; Nairne, Pandeirada, & Thompson, 2008; Nairne, Thompson, & Pandeirada, 2007), refers to the finding that rating information for its relevance to a survival scenario enhances recall of the information, relative to other rating tasks. In the initial study by Nairne et al. (2007), participants were instructed to imagine a survival scenario in which they were stranded in the grasslands of a foreign country. They then rated a series of common nouns for their relevance to the scenario. In a surprise recall test, participants in the survival condition recalled more of the nouns than participants who rated them for pleasantness, self-reference, or relevance to a ‘moving home’ scenario. The survival processing effect has been replicated in many subsequent studies (see Nairne, 2014, for a review) and has been extended to other stimuli, including pictures (Otgaar, Smeets, & van Bergen, 2010) and object locations (Nairne, VanArsdall, Pandeirada, & Blunt, 2012).

Researchers have also been concerned with identifying the mechanisms that underlie the survival processing effect. Nairne et al. (2007) proposed an evolutionary account whereby memory systems are tuned to remember information that is relevant to survival. This view was supported by Klein (2012) who made the point that a memory system will be maximally efficient when current demands match those for which it evolved. Other proposals have drawn on traditional memory theories. For example, Kroneisen and Erdfelder (2011) presented evidence that the survival processing effect is the product of rich or
distinctive encoding (Craik & Tulving, 1975), while Burns, Burns, and Hwang (2011) attributed the survival memory advantage to the combined effects of item-specific and relational processing (Einstein & Hunt, 1980; Hunt & Einstein, 1981). The survival processing advantage is also eliminated under conditions of cognitive load, suggesting that the effect is due to increased elaboration of encoding (Kroneisen, Rummel, & Erdfelder, 2014; Nouchi, 2013). The congruity of the stimuli, whereby a word is more likely to be recalled if the response to a rating task is ‘yes’ rather than ‘no’ (Schulman, 1974), has also been shown to be an important factor (Butler, Kang, & Roediger, 2009, but see Nairne & Pandeirada, 2011).

The point of departure for the current study is the proposal by Burns et al. (2011) that self-reference may be one of the mechanisms underlying the survival processing effect. As noted above, Burns et al. suggested that the survival processing effect occurs because survival rating activates both item-specific and relational processing. In support of this, they found that survival rating led to higher levels of recall and recognition relative to an orienting task that only recruited relational processing (a category sorting task) or a task that recruits only item-specific processing (sorting items into ad hoc categories). Burns et al. noted that the only other orienting task that recruits both relational and item-specific processing, rather than a trade-off between the two, is self-reference (see Klein & Loftus, 1988). This led Burns et al. to speculate that the survival processing and self-reference effects may have similar underlying mechanisms. As the authors observed, “After all, what is more self-relevant than considering one’s own survival?” (2011, p. 216).

As Burns et al. (2011) acknowledged, the proposal that self-reference may underlie the survival processing effect is at odds with the findings of Nairne et al. (2007) that survival processing led to higher retention levels than self-reference (see also Kostic, McFarlan, & Cleary, 2012; Nairne et al., 2008; Nouchi & Kawashima, 2012). This view is also inconsistent with the findings of Weinstein, Bugg, and Roediger (2008) who compared first person (“Imagine that you are stranded in the grasslands of a foreign land...”) and third person (“Imagine that a friend is stranded in the grasslands of a foreign land...”) versions of the survival processing task. Although the first person perspective led to higher levels of recall when the survival instructions were set in a city scenario, Weinstein et al. found no advantage for the first person perspective in the grasslands scenario. They concluded that the survival processing effect cannot be solely attributable to self-reference. This conclusion is supported by the findings of Kang, McDermott, and Cohen (2008) who showed that the survival processing advantage still occurs when the rating task refers to the survival of a third person.

In contrast, the findings of Klein (2012) provide support for the role of self-reference in producing the survival processing effect. Klein compared survival processing with two self-reference conditions; one that required participants to retrieve autobiographical events and one that did not. Earlier work by Klein, Loftus, & Burton (1989) showed that the self-reference task is effective only when participants are instructed to retrieve an autobiographical event. Asking participants simply to rate how easy it would be to recall an autobiographical event did not produce the same memory advantage. Klein (2012) found that recall levels following survival processing were significantly higher than those produced by self-referential processing, but only when participants were not instructed to retrieve autobiographical events. Self-referential instructions that required participants to retrieve autobiographical events produced equivalent levels of recall to those produced by survival processing.

The importance of self-reference in the survival processing effect was further illustrated by Cunningham, van den Bos, Gill, and Turk (2013) who compared self- versus other-referent versions of the survival paradigm. The self-referent version consisted of the original survival processing procedure developed by Nairne et al. (2007) in which participants were instructed to imagine being stranded in the grasslands of a foreign land and then rate the relevance of a series of common objects. Cunningham et al. compared this to an other-referent condition in which participants imagined David Cameron (British Prime Minister at the time) stranded in the grasslands. They found that recognition accuracy for the object nouns was significantly higher in the self-reference condition than in the other-reference condition, which was not significantly higher than a semantic rating condition. Cunningham attributed the inconsistency between their findings and those of Weinstein et al. (2008) to differences in experimental design. Specifically, their within-subjects manipulation of rating task may have rendered the difference between self and other conditions more salient than the between-subjects manipulation used by Weinstein et al.

Given the powerful effects on memory of both survival processing and self-reference, it is important to establish the relationship between them and to determine the degree to which self-referential encoding underlies the survival processing effect. It is notable, however, that previous comparisons of survival and self-referential encoding have used only one type of self-reference task. As described above, participants in survival rating conditions are presented with lists of common nouns and asked to rate their relevance to a survival scenario. Performance in this condition has typically been compared to a self-reference condition in which participants are asked to rate how readily each noun brings to mind an autobiographical memory. Klein et al. (1989) referred to this as an autobiographical self-reference task. There is, however, an alternative form of self-reference task, developed by Rogers, Kuiper, and Kirker (1977), in which participants are presented with lists of trait adjectives (e.g., friendly, optimistic) and asked to indicate how well the traits describe them. Compared to valence ratings or rating the words for how well they describe another person, self-reference significantly enhances memory for the traits. Klein et al. referred to this as a descriptive self-reference task. As Klein et al. discussed, distinguishing between the two types of self-reference task clarifies some inconsistent findings within the self-reference literature. The studies reviewed by Klein et al. also indicate that, in terms of enhancing memory, the descriptive self-reference task is more effective than the autobiographical self-reference task.
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