Testing promotes eyewitness accuracy with a warning: Implications for retrieval enhanced suggestibility

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ABSTRACT

Numerous studies have demonstrated that repeated retrieval boosts later retention. However, recent research has shown that testing can increase eyewitness susceptibility to misleading post-event information (e.g., Chan, Thomas, & Bulevich, 2009). The present study examines the effects of warning on this counterintuitive finding. In two experiments, subjects either took an initial test or performed a filler task after they viewed a video event. They were then given post-event information before they took a final test. Critically, one group of subjects was warned about potential inaccuracies in the post-event narrative and the other group was not. Without a warning, subjects who received an initial test were more likely to endorse misleading post-event information, replicating the retrieval-enhanced suggestibility (RES) effect. However, this RES effect was eliminated when subjects were warned about the veracity of the narrative. These results are consistent with a retrieval fluency account of RES.

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Introduction

In their classic study, Loftus, Miller, and Burns (1978) demonstrated that exposure to misleading information after witnessing an event reduced accuracy on a later memory test. Variants of this general finding have since been demonstrated in dozens of papers. The relevant societal implication of eyewitness fallibility has encouraged an investigation into techniques that could be employed to resist effects of misleading post-event information. Recently, Chan et al. (2009) attempted to reduce eyewitness suggestibility by testing subjects prior to the presentation of a post-event narrative. The logic was that initial testing would reduce people's susceptibility to later misinformation because the initial test would enhance memory for the original event. This hypothesis was based on the well established testing effect (for a review, see Roediger & Kar-

picke, 2006), which is the finding that taking an intervening test between learning and a final delayed test boosts performance on that final test. Contrary to this hypothesis, Chan et al. found that subjects who received an initial test were less accurate on a final test of memory, and more likely to endorse misleading post-event information, than those who received only the final test. In this paper, we refer to this finding as retrieval-enhanced suggestibility (RES).[1]

In the present study, we investigated whether retrieval fluency of the misinformation accounts for the increased suggestibility that occurs under repeated retrieval conditions.

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[1] In the Chan et al. (2009) paper, this finding was referred to as the "reversed testing effect." However, upon further considerations, we feel that this terminology is not representative of the most important aspect of the finding – that initial retrieval can increase eyewitness suggestibility to misinformation. Further, Chan and Langley (in press) have reported that a regular testing effect can co-occur with retrieval-enhanced suggestibility (RES), thus, we feel that RES is a more suitable and descriptive term of this finding.

In the RES procedure, after viewing a complex video event, subjects take a test and then are presented with a post-event narrative, which includes details associated with the initially tested material. We hypothesize that those details in the narrative may capture attention, and are thus better encoded (for a similar finding in verbal learning, see Robbins & Irvin, 1976; Tulving & Watkins, 1974). Further, this enhanced encoding of the misinformation increases its ease of retrieval later, which is manifested as increased susceptibility to misinformation (i.e., RES). In the present paper, we refer to this account as the retrieval fluency hypothesis (Baddeley, 1982a; Jacoby & Dallas, 1981; Jacoby, Kelley, & Dywan, 1989b). The term 'retrieval fluency' refers to the ease with which a piece of information is recalled from memory (Baddeley, 1982b; Jacoby & Dallas, 1981; Jacoby, Kelley, & Dywan, 1989a). This retrieval fluency hypothesis depends on two propositions: (a) initial testing enhances learning of the post-event information, which increases its ease of retrieval, and (b) subjects answer questions on the final test based on retrieval fluency, and that they do not carefully examine the source of the retrieved information. The goal of this paper is to provide support for this retrieval fluency account using a converging evidence approach. To that end, we examined (1) the effects of warning on RES, (2) confidence, and (3) response latencies.

Confidence and retrieval latency

Research suggests that metamemorial assessments may be influenced by the ease with which information comes to mind (Koriat, 1993; Koriat, Ma'ayan, & Nussinson, 2006). For example Nelson and Narens (1990) proposed that confidence in answers is in part determined by retrieval latency. Supporting this conclusion, they found a negative correlation between confidence judgment and response latency. That is, the faster the response, the higher the confidence in that response. Further, this relation held for both accurate and incorrect recall. In a task that involved answering general knowledge questions, Kelley and Lindsay (1993) manipulated retrieval fluency by priming subjects with correct or semantically related, but incorrect, answers prior to questioning. Similar to Nelson and Narens, they found that confidence was negatively correlated with latency. Kelley and Lindsay argued that pre-exposure to correct and to related but incorrect answers caused those answers to come to mind easily and quickly, and the ease with which those answers came to mind led to high confidence.

Research has also demonstrated that like prior exposure, post-event questioning and post-event reflection (i.e., mentally reviewing and evaluating one's previous responses) affected confidence in final answers. Specifically, Shaw (1996) demonstrated that repeated testing paired with reflection on those initial responses led to higher confidence ratings on a later, final test, and suggested that the question-reflection pairing increased retrieval fluency of those answers. Additionally, presentation of a narrative with information consistent or inconsistent with an originally witnessed event resulted in higher confidence on a final test than when a general narrative was presented (Bonham & González-Vallejo, 2009).

In the context of RES, because initial testing enhances encoding of details in the post-event narrative, it should also increase the retrieval fluency of these details. Therefore, we expected that initial testing would increase **confidence** for responses associated with information presented in the post-event narrative in Experiment 1, regardless of whether that information is correct or misleading. To provide additional, and perhaps more direct, support for the retrieval fluency hypothesis, we examined the latency of responses in a recognition test in Experiment 2. Response latency is considered a relatively direct measure of retrieval fluency (Benjamin, Bjork, & Schwartz, 1998). As such, we hypothesized that initial testing would lead to faster response times on the final test when subjects responded with details they learned from the post-event narrative (e.g., the misinformation).

Manipulating retrieval strategy via warning

The retrieval fluency hypothesis specifies that initial testing causes the misinformation to come to mind easily during the final test, which in turn leads subjects to prematurely terminate further recollection that is needed to recall the original target information (e.g., Jacoby, Bishara, Hessels, & Toth, 2005; Jacoby & Rhodes, 2006). To test this hypothesis, the present study examined whether subjects could be encouraged to engage in more effortful recollection and reduce inaccuracies by warning them about the veracity of the narrative. The effects of warning on eyewitness suggestibility have been investigated extensively. For example, Echterhoff, Hirst, and Hussy (2005b) (see also Chambers & Zaragoza, 2001b; Christiaansen & Ochalek, 1983; Eakin, Schreiber, & Sergent-Marshall, 2003; Greene, Flynn, & Loftus, 1982) found that warning subjects after misinformation exposure reduced the misinformation effect. In the context of RES, warning should encourage subjects to engage in more effortful recollection during retrieval (Starns, Lane, Alonzo, & Roussel, 2007), thereby reducing fluency-based responding. Thus, warning should reduce the influence of misinformation and its effect should be particularly pronounced after initial testing. This prediction is based on findings that testing can reduce interference (Szpunar, McDermott, & Roediger, 2008b) and enhance source memory (Chan & McDermott, 2007); therefore, providing subjects with a warning might allow the benefits of testing on source monitoring to surface. That is, when warned, initial testing might help, rather than hurt, subsequent eyewitness memory performance. With regard to response time measurements, providing a warning should reduce fluency-based responding for all subjects, which should result in an overall increase in response latencies. However, those who have taken an initial test would need to engage in more effortful recollection to override to prepotent, fluency-driven responses (i.e., the well-learned misinformation). As a result, when warned, the repeated testing subjects should produce longer response times than the single testing subjects.

Experiment 1

The goal of Experiment 1 was to examine whether the hypothesized increased retrieval fluency under RES