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The misinformation effect revisited: Interactions between spontaneous memory processes and misleading suggestions

Ainat Pansky *, Einat Tenenboim, Sarah Kate Bar

University of Haifa, Israel

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ABSTRACT

Recent findings indicate that retained information tends to converge at the basic level (BL). The aim of the present study was to apply these findings to the investigation of misinformation phenomena. In three experiments, we examined the extent to which the contaminating effects of misinformation are influenced by its consistency with the accessible representation of the original information. Following different retention intervals, participants were misled with items that either shared the same BL with the target items (Same-BL condition) or did not (Different-BL condition). Misinformation was found to interfere with subsequent correct recall of event information only in the Same-BL condition. Suggestibility was more pronounced and more affected by the timing of misinformation presentation in the Same-BL condition. Moreover, Same-BL distortions were more often misattributed to the event than Different-BL distortions. These findings are interpreted in terms of the interaction between the misinformation and the accessible (BL) representations of the event information at the time the misinformation is introduced.

Introduction

Recent findings have shown that information reported from memory tends to converge at an intermediate level of abstractness – the basic level (hence, BL), particularly over time (Pansky & Koriat, 2004). In the present study, we applied these findings to the investigation of misinformation phenomena. We examined the extent to which the contaminating effects of misleading post-event information (MPI) are influenced by the consistency between the MPI and the accessible representation of the original information (i.e., its BL) following a normal degrading process (i.e., BL convergence).

The misinformation effect

One of the most researched topics in the eyewitness testimony literature is the contaminating effect of MPI. Following the seminal study of Loftus, Miller, and Burns (1978), numerous studies have shown that exposure to misleading information presented after an event can distort the memory for that event in what is known as *the misinformation effect* (see Ayers & Reder, 1998). In a prototypical experiment, participants who are exposed to an event are later misinformed about some details, and are finally tested for their memory of the original details. Loftus et al. (1978) presented participants with slides depicting a car accident and later asked them a series of questions about these slides. Embedded in one of these questions was the misleading presupposition that the car stopped at a yield sign, although the slides had shown a stop sign. On a subsequent memory test, the participants who received the misleading question were less likely to correctly report having seen the original stop sign than were the participants whose intervening question contained the

* Corresponding author. Address: Department of Psychology, University of Haifa, Haifa 31905, Israel. Fax: +972 4 8249431.
E-mail address: pansky@research.haifa.ac.il (A. Pansky).

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correct target information (STOP SIGN) or neutral information (INTERSECTION). Most experiments investigating the misinformation effect have used some variant of this three-stage paradigm (for reviews, see Ayers & Reder, 1998; Belli & Loftus, 1996; Zaragoza, Belli, & Payment, 2007).

A close examination of the vast misinformation literature reveals that the term *misinformation effect* has been used to refer to the influence of MPI from two different perspectives. The first perspective focuses on the potentially interfering effect of MPI on correct retrieval of the event items (e.g., Belli, Lindsay, Gales, & McCarthy, 1994; Chandler, 1989; Eakin, Schreiber, & Sergent-Marshall, 2003; Lindsay, 1990; Paz-Alonso & Goodman, 2008; Schreiber & Sergent, 1998), which we will refer to as *misinformation interference* (following Belli, 1989; Chandler, Gargano, & Holt, 2001). The second perspective focuses on the potential effect of MPI in inducing false reports of the misleading items (e.g., Ayers & Reder, 1998; Blank, 1998; Cann & Katz, 2005; Higham, 1998; Lindsay, 1990; Pansky & Tenenboim, in press; Paz-Alonso & Goodman, 2008; Tousignant, Hall, & Loftus, 1986; Zaragoza & Koshmider 1989; Zaragoza & Lane, 1994), which we will refer to as *suggestibility* (following Chambers & Zaragoza, 2001). Obviously, the two perspectives are strongly related. In fact, for memory tests that allow a single response per test item, reporting the suggested item necessarily implies a failure to correctly report the event item. However, when such memory tests also allow reporting items other than the original and the misleading items (e.g., a recall test), the two perspectives are not necessarily complementary. Previous studies have demonstrated cases in which suggestibility involved misinformation interference (e.g., Belli, 1989; Paz-Alonso & Goodman, 2008; Tversky & Tuchin, 1989) as well as cases in which it did not (e.g., Chan, Thomas, & Bulevich 2009; Frost, 2000, delayed condition; Underwood & Pezdek, 1998).

In the present study, we examined the effects of MPI from both perspectives because we were particularly interested in: (1) cases of suggestibility that involve misinformation interference, a focus that is guided by the first perspective, and (2) cases of suggestibility in which the rememberer believes that the falsely reported item was part of the original event, a focus that is guided by the second perspective.

Much of the theoretical debate on misinformation interference has focused on the type of impairment that underlies it, if any (see, Ayers & Reder, 1998; Belli & Loftus, 1996). Initially, misinformation interference was attributed to a storage-based impairment by which the MPI replaces or alters the stored memory traces for the original information, rendering the original traces unavailable for consequent retrieval (e.g., Loftus, 1979; Loftus & Loftus, 1980). This approach was challenged by McCloskey and Zaragoza (1985), who attributed misinformation interference to response biases rather than to memory impairment of the event information. They suggested that inferior performance for misleading than for control items derives from cases in which the event items are not remembered even in the absence of misinformation (either due to forgetting or because they were not encoded in the first place) but the more recently presented MPI is remembered. Thus, with certain memory tests (such as the standard recognition test used by Loftus et al., 1978), apparent misinformation interference could result from an increased tendency to report the MPI in the misleading condition, without any effect on the accessibility of the memory representation of the event information. Subsequent studies have convincingly shown that misinformation interference can be temporary (e.g., Chandler, 1989, 1991) or reduced using retrieval manipulations (e.g., Bekerian & Bowers, 1983; Bowers & Bekerian, 1984; Kroll, Ogawa, & Nieters, 1988), suggesting that the MPI does not impair the stored representation of the original information but rather impairs its accessibility relative to that of the misleading information (see also Eakin et al., 2003). According to fuzzy-trace theory (FTT), misinformation interference depends on the relative accessibility of verbatim and gist representations of the original information and the verbatim representation of the misleading information. Accessing either the gist representation of the original information or the verbatim representation of the misleading information (instead of the verbatim representation of the original information) can result in suggestibility, whereas accessing the verbatim representation of the misleading information can also result in misinformation interference, but this does not imply a storage-based impairment of the original trace (see Brainerd & Reyna, 1998; Reyna & Brainerd, 1995; Reyna & Titcomb, 1997; Titcomb & Reyna, 1995). Finally, an influential account of suggestibility views it as a result of an error in source monitoring by which the misleading item is misattributed to the original event (e.g., Johnson, Hashtroudi, & Lindsay, 1993; Lindsay & Johnson, 1989; see Lindsay, 2008, for a recent review).

An additional approach to misinformation interference that is consistent with ideas suggested within the source-monitoring framework (SMF; e.g., Lindsay, 1994; Lindsay & Johnson, 2000) and FTT (e.g., Reyna & Brainerd, 1995; Titcomb & Reyna, 1995), views a memory representation as consisting of features that are bound together to a certain degree (see also Cowan, 1998). Memory traces differ in the number of encoded features and in the strength of the bonds between them, both determining their memorability. Over time, the bonds that connect the features together are assumed to weaken or disintegrate, causing some of the features to become "lost", and resulting in a partial degradation of the original trace (see Belli, Windschitl, McCarthy, & Winfrey, 1992; Brainerd, Reyna, Howe, & Kingma, 1990). Another factor that may cause the disintegration of the original memory traces is the introduction of MPI. If the MPI weakens the bonds below a certain threshold, the original features may be lost, resulting in misinformation interference. Belli et al. (1992) have proposed such a storage-based, partial-degradation account of misinformation interference (see also Belli & Loftus, 1996). According to this account, with short retention intervals, the bonds between the features are assumed to be quite strong, and although the MPI weakens them, they are likely to remain strong enough to resist any loss of features. However, with long retention intervals, the additional weakening caused by the MPI can result in lost features and may thus yield misinformation interference.