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## Resisting imagination and confabulation: Effects of metacognitive training



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### ABSTRACT

False memory rejection is enhanced when individuals rely on memorability-based inferences (e.g., “I should remember this event well; if I don’t, it must not have happened”). The present study investigated whether 8- and 9-year-olds and adults could be trained to engage in memorability-based inferences to reject false, but highly familiar (increased through imagination and confabulation), events. Across two experiments, participants enacted, imagined, or confabulated a series of actions differing in expected memorability. Two weeks later, half of the participants received memorability-based training before being administered an old/new recognition test in which they were asked to endorse only enacted actions. Thus, imagined and confabulated actions were to be rejected in the face of their high familiarity. Results indicated that adults, but not children, exhibited increased rejection of these false events if they were of high memorability following a training procedure that explained the functioning of memorability-based inferences (Experiment 1,  $N = 100$ ). Children’s rejection of familiar events improved only when the training procedure closely mimicked the demands of the retrieval test (Experiment 2,  $N = 125$ ). Theoretical and practical implications are discussed.

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## Introduction

Over the past decades, a large body of research has addressed children's ability to discriminate between accurate and potentially inaccurate (or false) memories (e.g., Brainerd, Reyna, Wright, & Mojardin, 2003; Ghetti, 2003; Koriat & Goldsmith, 1996; Mulder & Vrij, 1996; Thierry & Spence, 2002). This ability is especially valued in forensic settings, where the capacity to produce accurate reports of witnessed or personally experienced events and avoid acquiescing to the occurrence of inaccurate or false events is key to prevent miscarriages of justice (Bruck & Ceci, 1995; Goodman, 2006).

The ability to evaluate the accuracy of retrieved information (as indicated by higher confidence judgments for correct vs. incorrect responses) is robust in middle childhood (i.e., 8-year-olds; Roebbers, 2002; Roebbers & Howie, 2003) and is observed even earlier in development (i.e., 5-year-olds; Ghetti & Castelli, 2006; Ghetti, Qin, & Goodman, 2002). Still, the capacity to monitor certain memory characteristics (e.g., memory strength, evoked feelings of familiarity, distinctiveness) and rely on the output of these monitoring processes to screen out false memories undergoes substantial development (Brainerd & Reyna, 1998; Gee, Gregory, & Pipe, 1999; Koriat, Goldsmith, Schneider, & Nakash-Dura, 2001; Roebbers & Fernandez, 2002), with the ability to monitor some factors (e.g., strong differences in the familiarity of enacted events) emerging earlier in development than the ability to monitor other factors (e.g., subtle familiarity differences) (see Ghetti, Lyons, Lazzarin, & Cornoldi, 2008). Therefore, it is important, for both practical and theoretical reasons, to explore procedures that may improve the effectiveness of monitoring operations that support rejection of inaccurate memories.

### *Diagnostic monitoring and training procedures*

Diagnostic monitoring refers to a class of false-event rejection processes in which the characteristics of true memories are used as a standard against which to compare memories whose veracity has yet to be determined (Gallo, 2004; Johnson, Hashtroudi, & Lindsay, 1993). In other words, when one evaluates the veracity of memory of an event, if the available memorial evidence is not as compelling as that expected for true events, the occurrence of the event is rejected (see Ghetti, 2003; Israel & Schacter, 1997; Strack & Bless, 1994).

In source monitoring tasks, for example, memory expectations help determine whether poorly remembered events derive from a source other than personal experience (i.e., "it-had-to-be-you" bias; Foley, Johnson, & Raye, 1983) and should thus be rejected as personal memories. Similarly, memorability-based inferences (Ghetti, 2003; Strack & Bless, 1994) are based on expectations about how memorable an event should be to determine whether the current memory state is good enough to be endorsed as a true memory.

The ability to correctly monitor the origin of one's memory has been found to develop considerably during the course of childhood (Ackil & Zaragoza, 1995; Johnson et al., 1993; Markham, Howie, & Hlavacek, 1999). Children seem to be at a disadvantage especially when they attempt to discriminate between internally generated sources (e.g., distinguishing memories of enacted actions from memories of imagined actions; Foley & Johnson, 1985; Foley & Ratner, 1998; Johnson et al., 1993; Parker, 1995). This likely occurs because children lack the necessary cognitive flexibility to rely on different cues and expectations to make correct source attributions when the candidate sources produce highly similar memory representations (Foley et al., 1983; Roberts, 2002). Indeed, one of the reasons why imagination (i.e., thinking about a non-experienced event; Thomas & Loftus, 2002) and confabulation (i.e., thinking and describing the occurrence of a non-experienced event; Ackil & Zaragoza, 1998) greatly contribute to false-memory formation in children is that the source attribution process is made particularly difficult by the increased similarity of these memories to memories generated by direct enactment (Day, Howie, & Markham, 1998; Lindsay, Johnson, & Kwon, 1991; Roberts & Blades, 1998, 2000).

A similar developmental trajectory has been documented in the ability to use memorability-based inferences (Ghetti & Alexander, 2004; Ghetti & Castelli, 2006; Ghetti, Castelli, & Lyons, 2010). Specifically, whereas children between 8 and 9 years of age have been found to use these inferences spontaneously (Ghetti, 2003; Ghetti & Alexander, 2004; Ghetti & Castelli, 2006; Ghetti et al., 2010),

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