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ScienceDirect
Journal of Experimental Child Psychology 99 (2008) 157–181
Journal of Experimental Child Psychology
www.elsevier.com/locate/jecp

The development of metamemory monitoring during retrieval: The case of memory strength and memory absence ☆

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Received 7 April 2007; revised 26 November 2007
Available online 11 January 2008

Abstract

This research examined the development of the ability to monitor memory strength and memory absence at retrieval. In two experiments, 7-year-olds, 10-year-olds, and adults enacted and imagined enacting a series of bizarre and common actions. Two weeks later, they completed a memory test in which they were asked to determine whether each action had been enacted, had been imagined, or was novel and to provide a confidence judgment for each response. Results showed that participants across age groups successfully monitored differences in strength between memories for enacted actions and memories for imagined actions. However, compared with 10-year-olds and adults, 7-year-olds exhibited deficits in monitoring of differences in memory strength among imagined actions as well as deficits in monitoring memory absence. Results underscore metamemory developments that have important implications for memory accuracy.

Keywords: Metamemory; Memory; Confidence; Imagery; Distinctiveness

☆ Authors' Note. We are indebted to the children, parents, teachers, and principals who participated in or supported the present research. The present research is in part supported by the National Science Foundation under Grant No. 0241125. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation. The Italian National Research Council also partially supported this research.
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doi:10.1016/j.jecp.2007.11.001

Introduction

It is well documented that memory accuracy increases over the course of childhood. Relative to older children, younger children have been found to have a particularly difficult time discriminating between memories derived from different sources (e.g., Lindsay, Johnson, & Kwon, 1991) and to be more susceptible to the effects of misinformation (e.g., Bruck & Ceci, 1999). Children's propensity to experience memory distortions has been so celebrated in the literature that some authors have even metaphorically compared children's memory accuracy to that of confabulating patients (Schacter, Kagan, & Leichtman, 1995).

The increase in memory accuracy observed over the course of childhood may be attributed to age-related improvements in several cognitive processes. Some of these pertain to basic memory functioning such as binding (Sluzenski, Newcombe, & Kovacs, 2006) and recollection processes (e.g., Billingsley, Smith, & McAndrews, 2002; Brainerd, Holliday, & Reyna, 2004; Ghetti & Angelini, in press) that allow children to retrieve item–context associations and qualitative details about a target event. Age-related improvements in metamemory (i.e., knowledge about, monitoring of, and control of memory functioning) also contribute to this trend (Plude, Nelson, & Scholnick, 1998; Roebers, 2002; Roebers, von der Linden, & Howie, 2007; Schneider & Lockl, 2002).

Several models posit that metamemory plays an important role in memory accuracy (e.g., Koriat & Goldsmith, 1996; Mazzoni & Kirsch, 2002; Nelson & Narens, 1990). Nelson and Narens's (1990) model has been highly influential in this literature; although this model does not entirely capture the complex processes underlying the relation between monitoring and control operations (e.g., Roebers & Schneider, 2005), it is helpful heuristically to identify key components of metamemory operations occurring from encoding to retrieval. The operations, of most relevance to the current research are those occurring during retrieval, when it is proposed that memories initially recovered during a search are monitored for their likely accuracy. The results of this monitoring process are used to guide subsequent memory decisions (e.g., to report or withhold the retrieved information; Nelson & Narens, 1990). From this perspective, to the extent that children are capable of using the output of monitoring operations to regulate their performance, age-related improvements in monitoring should promote age-related improvements in accuracy (Koriat, Goldsmith, Schneider, & Nakash-Dura, 2001; Plude et al., 1998). The aim of the current research was to investigate age differences in the ability to monitor two dimensions that play a key role in evaluations of the likely accuracy of potential responses: memory strength and memory absence.

Development of metamemory monitoring of retrieval

A sizable body of research has documented that substantial changes in declarative metamemory (i.e., overt knowledge about memory functioning) occur during middle childhood. Kreutzer, Leonard, and Flavell (1975) and Caponi and Cornoldi (1989) observed important differences between 6- to 7-year-olds' and 9- to 10-year-olds' declarative metamemory in a number of domains (e.g., effects of time on memory loss, effects of the nature of the stimuli on retention). Results from several other studies parallel these findings, indicating that declarative metamemory undergoes critical improvement during middle childhood (e.g., Schneider, 1999).