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Brief Report

Mood congruity and episodic memory in young children

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ABSTRACT

Although mood congruity effects on episodic memory have been reported extensively in adults, they have not been reported for children younger than 10 years. The current research investigated mood congruity effects in story recall using an embodied approach to mood induction involving a facial manipulation task with 3- and 4-year-old children. Participants held a chopstick or a popsicle stick in their mouths in a way to either produce or inhibit a smile while they listened to a story featuring happy events for a happy character and sad events for a sad character. Children's mood ratings before and after mood induction indicated that mood became more positive in the smile condition, with no change in the no smile condition. Children in the smile condition, but not in the no smile condition, remembered more about the happy character than the sad character in the story. These results extend mood congruity effects to 3- and 4-year olds, suggesting that at this age representations of emotion interact with basic memory processes. Moreover, the efficacy of reenactment of sensorimotor components of emotion in modifying mood is consistent with embodied representation of emotion during early childhood.

Introduction

Mood congruity effects occur when episodic memory is better for emotional material that matches a person's mood, for example, a person remembering more happy than sad events in a story when

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feeling happy but not when feeling sad. These effects of mood on episodic memory have been demonstrated extensively in adults in both normal and clinical samples (e.g., Bower, 1981; Mayer, McCormick, & Strong, 1995; Ruci, Tomes, & Zelenski, 2009). The few studies with children report no evidence for mood congruity effects on episodic memory in children younger than 10 years (Forgas, Burnham, & Trimboli, 1988; Potts, Morse, Felleman, & Masters, 1986). We test mood congruity effects in young children using a different approach to induce mood than used in previous studies; we adjust facial position to induce mood (e.g., Niedenthal, 2007). This approach seems especially promising for young children given the powerful effect of sensorimotor experiences on their learning and development (e.g., Kontra, Goldin-Meadow, & Beilock, 2012).

Mood is a sustained emotion without a specific focus, whereas emotion is typically acute and centered on a specific encounter (e.g., Lazarus, 1991). Mood congruity effects in young children are of particular interest for understanding the development of fundamental processes that may contribute to the increase in episodic memory during childhood. Explanations of mood congruity effects postulate that mood increases attention to mood-compatible events enhancing their encoding, and at retrieval mood cues episodic representations of events that have been bound to representations of the mood (Bower, 1981, 1987; Lewis & Critchley, 2003). In this framework, mood congruity effects derive from both attentional encoding processes and enhanced retrieval processes. Enhanced retrieval depends on binding processes that have been shown to develop during childhood and contribute to the age-related increase in episodic memory during these years (e.g., Newcombe, Lloyd, & Balcomb, 2012; Riggins, 2014; Sluzenski, Newcombe, & Kovacs, 2006). Using a novel methodology to manipulate mood in 3- and 4-year-olds, the current study investigated the interaction of mood with basic memory processes at encoding and/or retrieval.

Development of emotion effects on memory

There is evidence that young children form representations of emotion states, a process that is essential for mood congruity effects. For example, 3-year-olds talk about emotions in the self and others and can match a basic emotion word (e.g., happy, sad) with the appropriate facial expression (Pons, Harris, & de Rosnay, 2004; Smiley & Huttenlocher, 1989). Most 4- and 5-year-olds can match an emotion word or facial expression with a scenario or story likely to cause the emotion (Camras & Allison, 1985; Pons et al., 2004; Smiley & Huttenlocher, 1989). These findings suggest that by 3 or 4 years of age children have developed emotional knowledge that involves representations of basic emotional states, including their corresponding verbal labels, facial expressions, and the situations that evoke them.

Moreover, emotion in a story enhances children's episodic memory for the story; for example, 5- and 6-year-olds remembered more emotional than neutral stories, with better memory for negative than positive stories (Van Bergen, Wall, & Salmon, 2015), and 6- to 11-year-olds recalled more emotional than nonemotional events in a narrative, with no effect of event valence (e.g., Davidson, Luo, & Burden, 2001; Potts et al., 1986). Leventon, Stevens, and Bauer (2014) reported that although emotional content of images did not affect 5- to 9-year-olds' behavioral episodic recognition, negative images did affect heart rate and, in children 7.5 years and older, an event-related potential (ERP) measure of recognition memory.

However, when using videos or reminiscence of happy or sad events to induce mood, recall of children in this age range was not better for mood congruent than mood incongruent information about a character (Forgas et al., 1988; Potts et al., 1986). Nasby and Yando (1982) tested slightly older children, 10- and 11-year-olds, who after reminiscing about a happy personal experience recalled more positively valenced words than children who reminisced about a sad experience. Sad reminiscing decreased happy word recall but did not increase recall of sad words. In contrast, Bishop, Dalgleish, and Yule (2004) did not experimentally manipulate mood but tested 5- to 11-year-olds identified as either low or high in nonclinical depression. Depressed children recalled more negative than positive or neutral emotion stories, whereas recall of low-depression children did not differ for negative and positive stories and both were higher than for neutral stories. These results suggest that nonclinical depression produced a mood that is sufficiently intense to affect memory processes, whereas previous attempts to manipulate negative mood in nondepressed children did not.

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