



Original Article

The good, the bad, and the neutral: The influence of emotional valence on young children's recall

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ABSTRACT

Despite the important theoretical and applied implications, there is limited experimental research investigating the influence of emotional valence on young children's verbal recall of everyday emotional experiences. This issue was addressed in the current study. Specifically, we investigated young children's (5–6 years) recall of emotional experiences presented in six brief stories. To address methodological limitations of the small body of existing literature, we adopted a within participants design in which story content was matched and valence (positive, negative, neutral) was counterbalanced across stories. Fifty-four children were presented the six stories via narrated slideshow, and recall was assessed after delay. Results showed that emotional stories were better recalled than neutral stories and negatively valenced stories were better recalled than positively valenced stories. The recall advantage of negatively valenced information was found for all aspects of each story, suggesting that negative valence renders events particularly memorable.

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1. Introduction

The influence of emotional valence on young children's recall of everyday experiences remains poorly understood, particularly relative to findings with adults (Carver, 2014). Yet for theoretical and applied reasons, it is important to understand whether certain kinds of experiences – positively or negatively valenced or nonemotional – have primacy in children's memory. Children's recall of everyday emotional experiences plays a key role in development, providing a conceptual foundation for their knowledge and understanding of their own and others' emotions, for emotion regulation, and, more generally, for psychological wellbeing (Denham, Bassett, & Zinsser, 2012; Salmon & O'Kearney, 2014). Research investigating how children remember these experiences can therefore contribute to developmental theory. Moreover, children's recall of their experiences can influence clinical and forensic assessment. In each context, children may be required to report their own and other peoples' emotional reactions and consequences and non-emotional event details (Cederborg, Lamb, & Laurell, 2007; Marche & Salmon, 2013; Pipe & Salmon, 2008; Salmon, 2006). In the current study, we investigated children's recall of emotional (positive,

negative) and non-emotional (neutral) information embedded in stories that were developed to reflect everyday concerns that might be experienced by young children (5–6 years).

There is general consensus that emotion facilitates memory (Adelman & Estes, 2013). Replicating a much larger body of research with adults, findings suggest that children manifest better recall of emotional than non-emotional information (Hamman & Stephens, 2014; see Davidson, Luo, & Burden, 2001; Van Bergen & Salmon, 2010). Emotion captures attention and provides an interpretational framework, likely facilitating integrated processing of all aspects of an experience (Kensinger, 2009; Laney, Campbell, Heuer, & Reisberg, 2004). With respect to valence, there are theoretical arguments for a negativity bias, described in the context of research with adults as “one of the most basic and far-reaching psychological principles” (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001, p. 362). Emerging findings also raise the possibility of a negativity bias for young children's socio-emotional development (Vaish, Grossmann, & Woodward, 2008). But research relating to the influence of valence on children's memory has several limitations.

First, studies demonstrating a memory advantage for negatively valenced experiences typically adopt an observational paradigm. Although the findings of this strong body of work are suggestive, showing that across childhood and into adulthood, narratives about negative (relative to positive) everyday experiences become longer and more linguistically complex (Habermas,

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Meier, & Mukhtar, 2009; Lagattuta, 2014; Sales, Fivush, & Peterson, 2003), this research design cannot eliminate the possibility that adults and children talk differently about such events because the events themselves potentially differ over and above differences in valence (e.g., their structure and complexity and the levels of arousal induced). These factors, in turn, likely play an important role in determining recall (Kuppens, Tuerlinckx, Russell, & Barrett, 2013). An experimental paradigm can therefore potentially supplement the findings from this observational research.

Second, the scant experimental research directly comparing children's memory for emotionally valenced information has tended to adopt wordlist stimuli (the Deese–Roediger–McDermott [DRM] wordlist paradigm, Deese, 1959; Roediger & McDermott, 1995) to investigate developmental reversals in children's incorrect recognition. Together, findings suggest that recognition is influenced by age, arousal, valence, and mode of presentation. For example, increasing with age (7 years to adulthood), participants manifest greater true recognition for neutral or positive words but greater false recognition of negative relative to neutral or positive words, with arousal controlled (Brainerd, Holliday, Reyna, Yang, & Toglia, 2010). Further, embedding the DRM words in a story context, rather than a list, renders young children (age 5 years) particularly vulnerable to false recognition, relative to their older peers (Dewhurst, Pursglove, & Lewis, 2007; see also Howe, Candel, Otgaar, Malone, & Wimmer, 2010; Otgaar, Howe, Peters, Sauerland, & Raymaekers, 2013).

This literature has not addressed the influence of valence (positive, negative, neutral) on young children's recall, however, and has not always controlled the influence of arousal. Moreover, it remains unclear whether the patterns from the DRM paradigm are generalizable to children's recall of more contextualized and temporally connected stimuli, reflecting everyday experiences. One possibility is that, relative to wordlists, stories about everyday events with potentially meaningful themes enable children to more readily access their knowledge about emotions, and this, in turn, differentially facilitates their recall of negative information. Pointing to this possibility are at least three findings from research investigating the development of children's emotion competence. These findings show that young children's emotion understanding is embedded in increasingly complex, linguistically based emotion scripts, which mirror the structure of stories and comprise labels, facial and vocal expressions, typical causes and consequences (Widen, 2013); that children's knowledge (scripts) of negative emotions is more complex and sophisticated than positive emotions (Lagattuta, 2014); and that emotion knowledge predicts children's recall of contrived and naturally occurring emotional events (Van Bergen & Salmon, 2010; Wang, Hutt, Kulkofsky, McDermott, & Wei, 2006). There is, therefore, a need to test whether findings relating to the influence of valence on memory are replicated given diverse stimulus materials and paradigms.

A third limitation of existing research is that, where experimental studies have adopted more complex stimuli, it is nonetheless difficult to draw definitive conclusions given potential confounds in the experimental stimuli. For example, Bishop, Dalgleish, and Yule (2004) found a recall advantage of negative relative to positive or neutral stories for community children (5–11 years) reporting higher levels of depression, whereas children lower on depression showed superior recall of positive relative to neutral stories (see also Potts, Morse, Felleman, & Masters, 1986). Although many details of the stories were matched across valence, they differed with respect to their potential level of arousal and uniqueness (e.g., being threatened with a knife vs. given a baby squirrel). Similarly, Baltazar, Shutts and Kinzler (2012) found that children better recalled the actions of a story character described as mean (e.g., "she stole everyone's cookies") than one described as nice (e.g., "she brought in cookies"). Yet the children may have recalled more

of the mean character because stealing is a less common and/or more salient occurrence (Adelman & Estes, 2013; Baltazar et al., 2012). These findings highlight the need for research that tightly controls the content of the stories so that the effect of valence can be identified.

In light of these inconsistencies in the current research and to advance the limited understanding of the influence of valence on young children's verbal recall, we directly compared positive, negative, and neutral information while experimentally controlling for other relevant variables. We adopted a within-participants design with contextualized stimuli (causally, temporally connected stories with themes relevant to children's everyday concerns) and we matched the stimuli for length, content, and emotional intensity. Participants were ages 5 and 6 years, given that children of this age range manifest relatively good recall of emotional content (Habermas et al., 2009), and may, at times, be asked to recall their everyday experiences in clinical or legal settings (e.g., Salmon, 2006). Additionally, relatively few studies have focused on this young age range. Consistent with past research, we expected that children would recall more information about emotional than neutral stories. We also expected that children would recall more information about negative than positive stories, although current findings regarding the influence of valence on children's recall are mixed. Finally, we expected this memory advantage would occur across the emotional and more general event-related story elements.

2. Method

2.1. Participants

Fifty-four children five- and six-years-old ($M = 71.12$, $SD = 6.92$ months) were recruited from two higher socio-economic schools in Wellington, New Zealand and Sydney, Australia (39 from New Zealand [20 female, 19 male], and 15 from Australia [6 female, 9 male]). Children were randomly assigned to one of six conditions (see below). Condition assignment did not vary by country, and nor did age and gender (all p 's > .05).

2.2. Materials

For each of six stories, a Powerpoint™ slide displayed a cartoon picture of an animal with the relevant emotion expression (Ekman, 1973), coupled with a recorded narration of the story. The stories had simple themes (e.g., Monkey playing in the jungle with her friend; Hippo baking a birthday card for her Dad). For each animal, positive, negative, and neutral versions of the story were created (36 versions in total). Thus, all six animals displayed all six emotion/non-emotional states: two positive (happy, excited); two negative (sad, scared); and two neutral (wet, sticky). Other than valence, essential elements of the storylines were matched (see Table 1 for three of the six stories relating to Monkey; see Appendix 1 for the 36 stories by within participants condition). Stories were presented in the same order for all participants – monkey, giraffe, lion, hippopotamus, sheep, and tiger – but with valence counter-balanced. Thus, in counterbalanced order, each child was presented with six stories, one relating to each of the six animals and two relating to each of the three emotional valences.

Key emotion words were matched for intensity according to Strauss and Allen's (2008) wordlists, which provide ratings for over 400 emotional and nonemotional words with respect to emotional intensity and discrete emotion categorization with the caution that these were developed from intensity ratings developed in research with adults rather than children. We conceptualized emotional intensity as reflecting extent of emotional experiencing and as

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