Explaining the role of emotional valence in children's memory suggestibility

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An Abstract of

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The present study addressed developmental differences in the effect of emotional valence on children’s suggestibility to an investigative interviewer using a controlled laboratory experiment. Children ages 6- to 11-years-old (N = 157) participated in watching a cartoon with either a positive or negative emotional outcome. Afterward, children were given an interview that included true and false leading questions. One-week later, children experienced a follow-up interview that assessed memory recall, true and false recognition, and source monitoring. Findings showed that children who witnessed the negative cartoon were more suggestible, as evidenced by heightened misinformation effects in the follow-up interview. Regarding developmental patterns, children in the positive condition showed conventional age decreases in suggestibility, whereas in the negative condition age decreases in suggestibility were greatly attenuated. Furthermore, children’s resistance to suggestion in the first interview moderated the developmental relationship between valence and suggestibility in the later interview. No evidence was found to support that source monitoring explained valence differences in suggestibility. Implications for developmental trends in suggestibility and forensic interview procedures are discussed.
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List of Abbreviations

DRM………Deese-Roediger-McDermott  false memory paradigm (Roediger & McDermott, 1995)
FTT…………Fuzzy-trace theory
Chapter One

Introduction

Concerns about child forensic interview procedures have led many developmental researchers to investigate the impact of negative emotional arousal (i.e., stress) on the reliability and suggestibility of children’s event memory (for reviews see Fivush, 1998; Paz-Alonso, Larson, Castelli, Alley, & Goodman, 2009; Pezdek & Taylor, 2002). Yet, findings from these studies have been inconsistent. Some argue this could be due to the restricted focus on the relationship between negative emotional arousal (i.e., stress) and memory (see Davis, Quas, & Levine, 2008; Holland & Kensinger, 2010; Levine & Edelstein, 2009; Levine & Pizzaro, 2004; 2006). Realizing this limitation, many recent developmental investigations have begun examining the effects of the broader construct of emotional valence on children’s memory and false memory (Baker-ward, Eaton, & Banks, 2005; Brainerd, Holliday, Reyna, Yang, & Toglia, 2010; Cordon, Melinder, Goodman, & Edelstein, 2013; Howe, 2007; Howe et al., 2010; Otgaar, Candel, & Merckelbach, 2008; Otgaar, Howe, Peters, Sauerland, & Raymaekers, in press; Rush, Edelstein, & Yim, 2013; Van Bergen, Wall, & Salmon, 2013). Forensically relevant, however, is how emotional valence differentially influences children’s vulnerability to suggestive interviewing practices. Emerging evidence suggests that children may be more suggestible when questioned about a negative relative to a positive experience and the influence of valence on suggestibility may differ across child development (Conradt & London, 2012; Levine, Burgess, & Laney, 2008). The purpose of this research was to further investigate the developmental effects of emotional valence on suggestibility to an interviewer in a controlled laboratory experiment. Additionally, we explored source
monitoring as a potential cognitive mechanism underlying valence differences in children’s suggestibility.

Extant studies examining the impact of negative emotion on children’s autobiographical memory have featured a wide range of negative events, from mild laboratory stressors (e.g., Bugental et al., 1992; Peters, 1991, 1997; Quas, Bauer, & Boyce, 2004; Quas, Carrick, Alkon, Goldstein, & Boyce, 2006; Quas & Lench, 2007; Stein & Boyce, 1995) to stressful naturalistic events including routine medical check-ups (e.g., Baker-ward et al., 1993; Goodman, Hirschman, Hepps, & Rudy, 1991), emergency room visits (e.g., Howe, Courage, & Peterson, 1994; Peterson, 2012; Peterson & Bell, 1996; Peterson & Whalen, 2001), invasive medical procedures that involve genital touching (e.g., Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1996; Merrit, Ornstein, & Spicker, 1994; Quas, Goodman, Bidrose, Pipe, Craw, & Ablin, 1999), natural disasters (e.g., Bahrick, Parker, Fivush, & Levitt, 1998; Fivush, Hazzard, Sales, Sarfati, & Brown, 2003; Fivush, Sales, Goldberg, Bahrick, & Parker, 2004), traumatic events (e.g., Pynoos & Nader, 1989; Terr, 1979;1983), and experiences of childhood sexual abuse with corroborating evidence (e.g., Bidrose & Goodman, 2000; Orbach & Lamb, 1999). Overall, the results of these studies have been instrumental in advising forensic practice, indicating children can indeed provide reliable memory reports for negative events and can do so even after a substantial delay.

However, these studies have revealed widely disparate findings regarding the relationship between negative emotion (i.e., stress) and memory. Common practice in the studies reported above was to examine the influence of negative emotional arousal (i.e, high versus low stress) on children’s memory, either examining the influence of
children’s naturally varying stress reactions on memory for the same event (e.g., medical procedure) or examining children’s memory for a stressful versus non-stressful event. Across the studies, some of the findings support that increased stress enhances children’s event memory (e.g., Goodman, Hirschman, Hepps, & Rudy, 1991; Peterson & Whalen, 2001), whereas others indicate that increased stress hinders children’s event memory recall (e.g., Merrit, Ornstein, & Spicker, 1994; Quas et al., 1999; Peters, 1997; Stein & Boyce, 1995). Moreover, of the studies that examined children’s susceptibility to memory suggestion, the findings remain similarly equivocal. For instance, as part of a larger review examining individual difference factors in children’s suggestibility, Bruck and Melnyk (2004) compared 15 studies that examined the influence of negative emotional arousal on children’s suggestibility. The findings of the studies were equally divided, with seven studies showing no relationship between stress and suggestibility, four studies providing support that increased stress decreases suggestibility, and the other four studies providing support that increased stress increases suggestibility.

Hence, despite numerous studies, the effect of the emotional context on children’s memory and suggestibility remains inconclusive. These investigations mainly construed emotion as negative emotional arousal or stress. As noted by others (Davis, Quas, & Levine, 2008; Holland & Kensinger, 2010; Levine & Edelstein, 2009; Levine & Pizzaro, 2004; 2006), concentrating on such a narrow scope of emotion without considering other aspects will likely result in an incomplete understanding of how the emotional context influences memorial processes. In particular, beyond emotional arousal (i.e., high versus low affective intensity), emotion consists of emotional valence (affective direction: positive versus negative) and discrete emotional states (e.g., happiness, sadness, anger).
Until recently, the role of emotional valence had rarely been considered in studies examining children’s memory, false memory, and suggestibility. Next, we outline recent advancements in developmental research on emotional valence and memory.

**Emotional Valence and Children’s True Memory, False Memory, and Suggestibility**

In the following section, developmental studies investigating the effects of emotional valence on children’s true memory, false memory, and suggestibility are reviewed. For sake of brevity, this section featured theories and lines of research that have included developmental samples. Alternatively, there is a wide body of social cognitive evidence that examines the effect of emotional valence on memory in adults (for reviews see Holland & Kensinger, 2010; Levine & Edelstein, 2009). This literature is briefly reviewed in Appendix A. Developmental findings discussed here are organized into two sub-sections summarized in Table 1. First, research examining the effect of valence on true and false non-event memory development is reviewed, focusing on theory and studies examining false memory development in emotional word lists (Brainerd et al., 2010; Brainerd & Reyna, 2012; Brainerd, Stein, Silveira, Rohenkohl, & Reyna, 2008; Howe, 2007; Howe et al., 2010). In this sub-section, we make a point to review the theory and findings regarding both valence differences and developmental patterns in false memory research. Second, the few studies that have examined memory and suggestibility for positive versus negative events are reviewed in advance of introducing the current study.

**Emotional Valence and False Memory Development.** Recent studies examining false memory (i.e., false alarms) in children and adults for semantically associated emotional word lists have found that negatively valenced emotional word lists
Table 1

*Comparison of Methods, Theories, and Findings in Emotional Valence and Memory Research*

<table>
<thead>
<tr>
<th>Method</th>
<th>Prominent Theory Reviewed</th>
<th>Key Finding</th>
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<tr>
<td>False memory for positive versus negative word lists</td>
<td><strong>Fuzzy-trace theory</strong>&lt;br&gt;Positive materials reduce reliance on memory for gist; negative materials increase reliance on gist and suppress verbatim memory traces.</td>
<td>Older children and adults have higher false alarm rates to negative word lists (Brainerd et al., 2010).</td>
</tr>
<tr>
<td>Memory and suggestibility for positive versus negative events</td>
<td><strong>Goal relevance model</strong>&lt;br&gt;Positive events are result of goal attainment and result in attention and memory broadening; negative events are result of goal failure and result in attention and memory narrowing to goal relevant information</td>
<td><strong>Adults</strong>&lt;br&gt;Increased memory malleability and intrusion errors for positive events (Levine &amp; Bluck, 2004).&lt;br&gt;<strong>Children</strong>&lt;br&gt;Increased memory suggestibility for negative events (Levine et al., 2008; Conradt &amp; London, 2012).</td>
</tr>
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Foment higher rates of recognition errors than neutral or positive word lists (Brainerd et al., 2010; Brainerd, Stein, et al., 2008; Howe, 2007; Howe et al., 2010). In an initial investigation, Howe (2007) examined 8- and 12-year-olds performance on recall and recognition measures for neutral and negatively valenced DRM word lists (Deese, 1959; Roedigger & McDermott, 1995). The DRM procedure consists of presenting participants with word lists, each of which has a semantically related critical lure not presented in the list. After being presented with the list participants are given recall and/or recognition tests for list words, sometimes falsely including the non-presented critical lure. Howe (2007) found that while true and false recall and true recognition rates were higher for
neutral word lists, false recognition rates were higher for negative word lists. Also, false memory increased with age for both neutral and negative word lists.

In a subsequent investigation, Howe and colleagues (2010) replicated these findings in children and adults. As before, age trends were found as false memory increased from 7-year-olds to 11-year-olds for neutral and negative emotional lists. Moreover, additional studies showed that when adult and child participants were given a recognition test after a one-week delay, true recognition rates decreased and false recognition rates increased for negative emotional word lists (but not for neutral word lists) relative to participants given an immediate recognition test. In sum, these findings suggest that negatively valenced word lists increased false recognition (i.e., false alarms) relative to neutral lists, and the endorsement of false recognition items for negative word lists increased with a delay.

However, in the studies above there is a caveat to concluding definitively that word list valence explained the increases in false recognition. As pointed out by Brainerd and colleagues (Brainerd et al., 2010; Brainerd, Stein, et al., 2008), these findings are confounded by the fact the negative word lists not only varied in valence with respect to neutral word lists, but also varied in arousal. Considering this, Brainerd, Stein, et al. (2008) administered negative, neutral, and positive DRM word lists to adult participants, wherein negative and positive emotional word lists were statistically controlled for arousal levels. Findings on recognition measures revealed a linear pattern of false memory, such that negative emotional lists had higher false alarm rates for critical lures than neutral lists and neutral lists had higher rates than positive lists. Negative emotional lists also had higher rates of true memory and lower rates of response bias (i.e.,
recognition of unrelated distractors). This suggests that word valence as opposed to arousal was the important factor that increased false recognition rates.

Brainerd et al. (2010) further examined the effects of emotional arousal and emotional valence on false memory in 7-year-olds, 11-year-olds, and young adults. Emotional DRM word lists (Cornell/Cortland Emotion Lists; CEL) were created that systematically varied the emotional arousal (high and low) and emotional valence (positive and negative) of the words presented in lists and associated critical lures. Across all lists, false memory increased (7-year-olds < 11-year-olds < 20-year-olds) and overall net accuracy decreased with age. For emotion, valence was found to be a more important factor than emotional arousal. Specifically, false recognition rates of critical distractors were higher for negative relative to positive word lists in 11-year-olds and 20-year-olds, but not 7-year-olds. In contrast, compared with negative lists, positive emotional lists had higher true recognition rates and more pronounced age increases in true memory. Emotional arousal of lists had smaller effects on false and true memory, with high arousal word lists showing greater rates of false and true recognition than low arousal word lists. Considered together, research findings regarding valence and arousal effects showed that false recognition rates were greatest for emotional lists with negative valence and high arousal, and this rate increased with age. These findings are particularly alarming because it would suggest that, at least among older school-aged children and adults who have thus far been tested, they are most susceptible to false memories in the emotional context in which they are questioned about in the legal environment, namely, under high negatively emotionally arousing contexts.
The results from the studies above using emotional word lists with children and adults are consistent with predictions derived from fuzzy-trace theory (FFT; for review see Reyna & Brainerd, 1995) regarding developmental reversals in suggestibility (although see Howe, Wimmer, Gagnon, & Plumpton, 2009 for a different account). A common finding in child suggestibility studies is that suggestibility decreases with age (Bruck & Ceci, 1999; Ceci & Bruck, 1993; Ceci, Ross, & Toglia, 1987). Recently, though, FTT was used to predict specific situations that ought to produce developmental reversals in suggestibility (for reviews see Brainerd, Reyna, & Ceci, 2008; Brainerd & Reyna, 2012). The FTT contends that individuals independently encode separate episodic memory traces for both the surface content (verbatim traces) and the meaning content (gist traces) of an experience (Brainerd & Reyna, 2004; Brainerd, Reyna et al., 2008). Subsequent memory performance is dependent upon the mixture of independent verbatim and gist traces available at the time of retrieval (Brainerd & Reyna, 2004). According to FTT, greater reliance on memory for gist (relative to verbatim) increases susceptibility toward committing memory errors (Brainerd & Reyna, 2002). Additionally, both verbatim and gist memory abilities improve with development, with gist relative to verbatim improvements coming online later in development (Brainerd & Reyna, 2004). Therefore, FTT predicts that susceptibility to suggestion and memory errors will decrease with age in experimental paradigms that are sensitive to older children’s superior verbatim memory abilities, but will increase in experimental paradigms that are sensitive to older children’s superior gist memory abilities (Brainerd, Reyna et al., 2008).
According to FTT, since false memory in DRM word list procedures relies heavily on gist memory abilities to form meaning connection across list words it explains why false memory in these procedures increases with age (Brainerd, Reyna et al., 2008). Moreover, FTT proposes that emotional valence further influences the availability of separate memory traces and would predict differential effects of valence on false memory according to children’s development. Specifically, negative valence appears to support gist processing, storage, and retrieval while at the same time interferes with verbatim processing, storage, and retrieval (Brainerd et al., 2010; Brainerd, Stein et al., 2008). Stronger gist representations for negative emotional materials explain the higher rates of false recognition (Brainerd et al., 2010; Brainerd, Stein et al., 2008; Howe, 2007; Howe et al., 2010) and more pronounced valence differences in memory errors with age (Brainerd et al., 2010). Also, stronger gist representations can explain why negative emotional materials increased false memory rates over time (i.e., Howe et al., 2010), as stronger gist representations are more likely to persist over time relative to verbatim representations (Brainerd & Reyna, 2004).

However, a debate persists whether memory for word lists generalizes to false memory and suggestibility for dynamic events (see Brainerd & Reyna, 2012; Otgaar et al., in press; Pezdek & Lam, 2007). As with word lists, there is some evidence that indicates children show increased false memory for negative events. For instance, Otgaar, Candel, and Merckelbach (2008) found that a higher percentage of seven-year-olds falsely recalled a non-experienced negative event (being accused of cheating by a teacher) than a non-experienced neutral event (moving to another classroom). Additionally, Otgaar et al. (in press) found that false memory rates for negative emotional
word lists were moderately correlated with false memory rates to a negatively valenced video in a group of 10- to 12-year-olds. Yet, this same study showed that children had lower rates of false memory to the negative video (a street fight) than the positive (birthday party) or neutral (electrician working) video and that false memory for all videos was greater in children (both 6- to 8-year-olds and 10- to 12-year-olds) than adults. Meanwhile, findings on emotional word lists showed that both age groups of children had higher false memory rates for negative than neutral word lists and older children and adults had higher rates of false memory across list types than younger children.

The opposing developmental trends between memory stimuli in the Otgaar et al. study illustrate how developmental reversals in suggestibility or false memory are especially context dependent. When experimental memory stimuli require participants to infer meaning connections (as in DRM word lists) or make causal inferences (Principe, Guiliano, & Root, 2008) then developmental reversals in false memory were observed. However, when memory stimuli scaffold meaning connections (as was the case in the videos with underlying themes), then developmental reversals in false memory may be attenuated or more traditional age declines in suggestibility may be observed (Otgaar et al., in press). For example, when studies have embedded DRM word lists into the context of a story they showed either attenuated developmental reversals (Howe & Wilkinson, 2011) or age declines (Dewhurst, Pursglove, & Lewis, 2007) in false memory. In short, FTT predictions of age increases in false memory and suggestibility found in DRM word list studies may not generalize to most studies examining false memory or suggestibility for event-type stimuli, including the present study.
The opposing valence findings between memory stimuli in the Otgaar et al. study are harder to explain. Against predictions, they found that children made fewer false recognition errors to the negative than the positive or neutral video. Should one expect different valence effects on false memory or suggestibility for emotional event-type stimuli than emotional word lists? As explained by Otgaar et al., a possible explanation for this finding was that the negative video (street fight) was more distinctive than the positive and neutral videos prompting more item-specific processing and reduced false memory rates. In particular, the children in the study may have experienced multiple previous birthday parties (positive video), but were less likely to have previously witnessed a street fight. This confound makes it difficult to draw inferences about how the valence of the video influenced false memory rates. Consequently, valence findings from emotional word list studies may be useful in guiding expectations about how emotional valence may influence children’s false memory or suggestibility for an event, with the expectation that children should show increased suggestibility to a negative event.

One final concern in regards to using the theory and studies summarized in this section to guide predictions in the present study is that these studies were evaluating children’s and adults’ spontaneous false memories as opposed to memory suggestibility. This distinction is important for three reasons. First, studies examining suggestion-based memory errors (i.e., children’s susceptibility to misleading information presented by a later source, such as an interviewer) have consistently found that suggestibility declines with age (Bruck & Ceci, 1999; Ceci & Bruck, 1993; Ceci, Ross, & Toglia, 1987; Otgaar, Candel, Merckelbach, & Wade, 2009). For this reason (along with reasons explained
earlier), we should not expect developmental reversals (i.e., age increases) in children’s suggestibility in this study.

Second, cognitive mechanisms implicated in suggestion-based memory errors are different than cognitive explanations for spontaneous false memories (Otgaar et al., in press). Specifically, suggestion-based errors are presumed to reflect difficulty with source monitoring (Johnson, Hashtroudi, & Lindsay, 1993). In the context of a suggestibility paradigm, source monitoring is a person’s ability to distinguish the origin of a memory as coming from a to-be-remembered stimulus or event versus an external source of misinformation (i.e., interviewer). According to the Source-Monitoring Framework (Johnson et al., 1993), individuals fall victim to memory suggestion because they misattribute information originating from the outside source as coming from the stimulus or event their being asked to remember. Moreover, because source monitoring improves with age (Bright-Paul, Jarrold, & Wright, 2005; Lindsay, Johnson, & Kwon, 1991), the source monitoring account can explain why children are less suggestible as they become older.

Third, suggestion-based memory errors involve both endogenous (i.e., cognitive) and exogenous (i.e., social influence) distortion processes (Brainerd, Reyna et al., 2008), whereas false memory errors to emotional words lists involve strictly cognitive processes. Apart from cognitive concerns of source monitoring, children may be suggestible due to social demands imposed by the interviewer (Ceci & Bruck, 1993). Therefore, in anticipating valence effects on children’s suggestibility across development in this study it was important to consider how valence would influence both cognitive and social processes of suggestibility.
In sum, studies examining false memory using emotional DRM word lists consistently found that negatively valenced lists foment higher rates of false alarms than neutral or positively valenced lists irrespective of arousal level. Additionally, valence differences in false memory were shown to become more pronounced with increases in age (Brainerd et al., 2010). These findings were predicted and explained by FTT principles. Emotional word list studies would appear to be advantageous for guiding predictions in the present study because they included developmental samples and used to-be-remembered materials that contained the emotional valence. However, concerns about the generalizability of memory for emotional word lists to memory for emotional events and differences between processes involved in spontaneous false memories and suggestion-based memory errors limit the application of these findings to the present study.

**Children’s Memory and Suggestibility for Positive versus Negative Events.**

The research reviewed in the previous sub-section had primarily examined emotional valence in non-event memory materials. An important question is whether the theoretical framework and series of findings generalize to children’s memory and suggestibility for positive versus negative emotional events. As mentioned previously, many developmental studies have examined children’s memory and suggestibility for negative emotional events, but few investigations have examined memory and suggestibility differences between positive versus negative events. Moreover, developmental studies that have compared children’s memory for positive and negative events have frequently asked children about separate events (e.g., Fivush, et al., 2003). Consequently, any
Valence differences in memory could have been driven by the differences in event content, distinctiveness of the separate events, or the amount each event was rehearsed.

Realizing this caveat, two studies with adult samples used a clever methodology in which they examined true and false memory for the same real-world event for which participants’ emotional valence reactions naturally varied (Kensinger & Schacter, 2006; Levine & Bluck, 2004). Levine and Bluck (2004) examined participants’ emotional reaction and memory regarding the televised announcement of the verdict in the criminal trial of O.J. Simpson. The critical findings were that participants who were happy about the ‘not guilty’ verdict recognized more true and false details in a delayed recognition test than participants who were unhappy about the verdict. Hence, participants who perceived the event as positive correctly recognized more true details, but also committed more false alarms. In a subsequent study, Kensinger and Schacter (2006) examined memory for the crucial game seven of the 2004 American League Championship Series between the Boston Red Sox and the New York Yankees in individuals for whom the outcome was positive (Red Sox fans), negative (Yankee fans), and neutral (baseball fans, but fans of neither team). Findings on memory recall measures indicated that negative outcome participants reported more central event-related details and were more consistent in recalling their accounts across instances than for those who saw the outcome as positive. Consistent with Levine and Bluck (2004), this suggests that a positive event can lead to more memory malleability and distortion relative to negative events.

Levine and colleagues (Levine & Bluck, 2004; Levine & Edelstein, 2009; Levine & Pizarro, 2004, 2006) proposed a related goal-relevance model to explain the valence and memory findings. Levine et al. argue the emotional outcome of an event depends on
one’s appraisal of the event in reference to their goals. An event elicits positive emotion (e.g., happiness) when the event outcome results in goal attainment. The attainment of a goal fosters relational processing leading to a broader memory account and reliance on established knowledge structures (Levine & Bluck, 2004; Levine & Pizarro, 2004). In contrast, negative emotions are elicited when an event outcome reflects goal failure. Consequently, negative emotion promotes item-specific processing and a narrowing of attention to details relevant to why the goal was not attained. The central information attended to may differ depending on the specific negative emotion evoked, which is predicated on the relationship between the event outcome and goal (Levine & Edelstein, 2009). Specifically, central information attenuated to differs if the event reflects irrevocable goal failure (sadness), a potential threat (fear), or an obstacle to goal achievement (anger). Nevertheless, negative emotional events broadly are theorized to narrow memory focus and encourage conservative memory judgments relative to positive events. Thus, the goal relevance model proposes that it is what the emotional valence conveys about goals that lead to processing and memory differences as opposed to the valence states themselves.

Consistent with the goal relevance model, Levine and colleagues contend that children’s emotional responses to events depend on their appraisal of event outcomes with respect to goal attainment or failure (Davis, et al., 2008; Levine et al., 2008; Stein & Levine, 1989; 1990). Subsequently, emotions are proposed to direct children’s cognitions and memory just as they do adults (for review see Davis et al., 2008). However, only a few studies that have examined children’s memory and suggestibility for positive versus negative events in a controlled manner similar to the adult studies
Baker-ward, Eaton, and Banks (2005) examined 9- to 12-year-old children’s memory for a soccer match in which they either won or lost. As with the adult studies, this study capitalized on examining memory for the same real-world event in which emotional valence reactions naturally varied (i.e., players either won or lost the game). Findings indicated that members of winning teams recalled more central details relevant to the outcome of the game, had more coherent memory narratives, and were more likely to discuss the event with others than members of losing teams. Narratives for members of the losing teams included more subjective interpretations of the game. Children in the study were asked misleading questions about the soccer match, but no differences were found between emotion conditions in the number of correct denials of misleading details. The inability to find suggestibility differences between emotional conditions may have been the result of children performing at ceiling in correctly denying misleading details. Conceivably, valence differences in memory suggestibility may have been detected if a more sensitive measure of suggestibility had been used.

Levine et al. (2008) conducted two experiments examining the effect of positive (happiness) and negative (sadness and anger) emotions on 4- and 6-year-olds’ memory and suggestibility. In Experiment 1, all children were presented three separate interactive cartoon stories each of which attempted to elicit a distinct target emotion (happiness, anger, or sadness) based on the goal outcome of the story. Directly following each story, children were questioned and responses to five misleading questions were used to measure suggestibility. The results showed that children who displayed sadness had higher rates of false assents than children who displayed anger or happiness. In Experiment 2, all children viewed one story with the same outcome. Afterward, emotion
was manipulated using an autobiographical recall task (where children were asked to recall a time they felt the assigned emotion of happiness, sadness, or anger) prior to memory retrieval. Like Experiment 1, children in the sad condition agreed with more misleading statements about the story than did happy children. Also, when interviewed by a second experimenter after a brief distracter task, sad children included more memory intrusions in recall than did happy or angry children. Levine and colleagues implicated a social explanation for their findings. Young children were believed to be more suggestible in a sad emotional state because they were more vulnerable to the social demands of the suggestive interviewer. Contrarily, children in happy or angry emotional states have greater feelings of self-efficacy allowing them to resist complying with false information.

Relative to the younger children included in their studies, Levine et al. (2008) speculated that older children may be less vulnerable to social demands influencing suggestibility for a negative event because they rely less on an adult’s assistance in this context. At the same time, as children age they may be more susceptible to valence effects on cognitive mechanisms of suggestibility (Brainerd et al., 2010; Brainerd & Reyna, 2012). To investigate whether valence effects on suggestibility differed across development, Conradt and London (2012) examined children’s interrogative suggestibility (i.e., willingness to assent to misleading questions) and misinformation effects (i.e., incorporation of false information in to later memory reports) to a positive versus negative event across two developmental age groups (4- to 6-year-olds and 8- to 10-year-olds). Children watched a cartoon and were randomly assigned to receive one of two different endings designed to elicit either a positive or a negative emotional state.
based on goal outcomes. Directly following the cartoon, children were administered a suggestive interview that featured open-ended prompts prior to the presentation of true and false leading details about the cartoon. About one-week later, a new experimenter conducted a follow-up interview that assessed participant’s free recall and recognition of true and false leading (presented in the suggestive interview) and control (not presented in the suggestive interview) items.

Findings showed that children’s resistance to suggestions (i.e., interrogative suggestibility) during the initial suggestive interview was low for all children (17.9% for 4- to 6-year-olds; 29.2% for 8- to 10-year-olds) and did not vary between valence conditions. However, valence effects emerged during a delayed interview among older (but not younger) participants. When interviewed after a week delay, 4- to 6-year-olds were susceptible to misinformation regardless of which emotional cartoon they experienced, and the rates did not differ between the positive and negative valence conditions. In contrast, 8- to 10-year-olds showed greater misinformation effects in the negative versus the positive condition. Presented another way, misinformation rates were found to significantly decrease across age groups in the positive condition, but remained stable across age groups in the negative condition. Because findings were limited to misinformation effects in the follow-up interview for older children, results suggest that emotional goal outcomes play an increasingly important role in guiding cognitive and memory processes with age. Moreover, older children became more resistant to suggestion with age, but only after experiencing the positive event outcome.

The study conducted by Conradt and London was notable for a couple of reasons. First, this study featured two important methodological strengths: (1) children witnessed
and were questioned about the same event (with the exception of the ending) and (2) false control items were included in the follow-up recognition test. Having children witness the same cartoon event ensures that event distinctiveness does not confound emotional valence findings. Additionally, because recognition tests involve guessing and other forms of response bias (Brainerd, Reyna, et al., 2008), the inclusion of false control items allowed for this study to examine if misleading suggestions increased children’s false recognition rate relative to children’s baseline false recognition rate. Including control recognition items in DRM word list procedures (known as unrelated distractors) is common practice, but such control measures are less frequently included in children’s suggestibility studies. These methodological considerations served to control for confounds observed in previously reviewed studies (e.g., Baker-ward et al., 2005; Levine et al., 2008; Otgaar et al., in press). Second, these findings are in direct contrast to findings in emotional event studies with adults (e.g., Kensinger & Schacter, 2006; Levine & Bluck, 2004), but are consistent with developmental studies examining false memory for emotional word lists. As in Brainerd et al. (2010), this study found that older children were more susceptible to valence effects on suggestibility, showing greater misinformation effects to the negative than the positive cartoon outcome. This suggests that emotional word list findings on false memory development may generalize to children’s suggestibility for valenced events and that negative emotional memory stimuli increase children’s susceptibility to memory errors.

As cautioned earlier however, there are limitations to assuming that valence differences across development in false memory for emotional word lists were observed for the same reasons as valence differences across development in suggestibility for
emotional events. In particular, the Conradt and London study found the typical age decline in suggestibility for children witnessing the positive cartoon outcome, but this age decline in suggestibility was attenuated for children witnessing the negative cartoon outcome. Conversely, emotional word list studies have consistently found false memory rates to increase with age. Additionally, valence effects on children’s suggestion-based memory errors could reflect differences in source monitoring and/or vulnerability to social influences of the interviewer in addition to cognitive explanations offered (i.e., FTT) for valence differences in false memory development.

For instance, one potential explanation could be that older children show valence differences in suggestibility because the emotional valence differentially influences source monitoring. Conceivably, negative emotion could impede source memory. Since source memory skills improve with age, this would explain why older children were more susceptible to valence effects on suggestion-based memory errors. Also, this would explain why age decreases in suggestibility were attenuated for children experiencing the negative event outcome. As explained earlier, improvement in source memory with age may partly contribute to age declines in memory suggestibility. If negative emotion interferes with source memory, then age declines in suggestibility may be attenuated. There is some support in studies with adults (Cook, Hicks, & Marsh, 2007) that negatively valenced material reduces the binding of contextual details (such as the source) into memory. Moreover, this explanation would be compatible with the goal relevance model explained previously (i.e., Levine & Bluck, 2004; Levine & Edelstein, 2009; Levine & Pizarro, 2004, 2006). If negative emotion narrows attention to information directly pertinent to goals, then individuals will be less likely to encode and
remember peripheral or contextual information inconsequential to goals, such as the source of information. Conversely, if positive emotion broadens attention to a wider range of information, then individuals should be more likely to encode peripheral or contextual information. Based on this logic, a goal of the present study was to investigate source monitoring as a potential explanation for valence differences in memory suggestibility across development.

Beyond different potential explanations for the observed results, there were also limitations to the study conducted by Conradt and London (2012). First, the study did not include a measure of children’s emotional valence appraisal to the cartoon. As a result, one cannot determine if the assigned version of the cartoon caused the intended emotional valence response. Second, the study was unable to replicate the previous findings reported by Levine et al. (2008) that showed younger children (4- and 6-year-olds) were more susceptible to interviewer suggestibility for a negative versus positive emotional cartoon. The study concluded that younger children were less susceptible to valence effects on memory suggestion. However, an alternative explanation for this may be that younger children did not understand the goal outcome of the cartoon, nor experience the intended emotion. Lastly, the designated age groups for younger (4- to 6-year-olds) and older (8- to 10-year-olds) children each included a wide range of ages. Ostensibly, the inclusion of a more sensitive age comparison would allow for a better understanding of the role of emotional valence on children’s memory suggestibility across development. The present study had the goal of addressing these methodological weaknesses to bolster evidence that emotional valence of an event influences children’s suggestibility to an investigative interviewer.
Overall, the findings of developmental studies point to children being more susceptible to memory suggestibility for negative compared to positive events. Due to the important implications for children’s testimony, additional research is needed to substantiate this finding. Moreover, research is needed to clarify developmental trends regarding valence effects on children’s suggestibility. Finally, further research is needed to explain what it is about a negative relative to a positive event that leads children to show increased susceptibility to suggestion.

The Present Study

The purpose of the present investigation was to use a controlled laboratory experiment to examine the developmental effects of emotional valence on children’s suggestibility in an investigative interview context. Specifically, the aim of this research was to replicate and advance findings from our previous research (Conradt & London, 2012) that showed event valence had differential effects on children’s suggestibility across development. The specific aims were to advance upon our previous research in three significant ways: (1) by using a more sensitive age measure to investigate developmental trends; (2) by including measures of children’s emotional valence appraisal of the cartoon; and (3) by examining source monitoring as a potential underlying cognitive mechanism for children’s increased susceptibility to memory suggestion for a negative event across development. Examining age using age in months allowed for better mapping of developmental trends regarding event valence effects on children’s suggestibility. Including measures of children’s emotional valence appraisal toward the event ensured that the assigned version of the cartoon evoked the intended valence.
Children 6- to 11-years-old watched the same interactive cartoon used in our previous study that is designed to bring about a positive or negative emotional state based on goal outcomes. Across the two emotional conditions the story was identical except for the ending sequence designed to bring about the positive or negative emotion. The cartoon featured a protagonist who asked the child participant for help in finding his lost dog. Consistent with the goal relevance model (Davis et al., 2008; Levine et al., 2008; Stein & Levine, 1989; 1990), each cartoon version had a different outcome (success or failure) in relation to the goal of helping the protagonist find his lost dog. Afterward, children experienced a suggestive interview that assessed free recall prior to presenting the child with true and false leading questions. One-week later, a new (previously unseen) experimenter conducted a follow-up interview that evaluated children’s free recall, recognition of true and false suggested details, and source monitoring.

The present study had the following central hypotheses. First, in accordance with our previous findings, we predicted that valence differences in suggestibility (e.g., misinformation effects) will become more pronounced as children become older. In particular, the misinformation effect was hypothesized to decrease more pointedly with age increases in the positive condition, but be less steep (attenuated) or remain relatively constant with age increases in the negative condition. Consequently, as children become older they were predicted to be more suggestible than their same age peers in the negative compared to the positive condition. Second, if valence effects were the result of source monitoring, then we should expect children in the negative condition to show reduced source monitoring, especially for false suggested details.
Chapter Two

Method

Participants

Participants were 165 children between 6- to 11-years-old recruited from Toledo metropolitan area private grade schools. Ethics approval was granted by our Institutional Review Board. Written parental consent was obtained for all participants and each participant gave verbal assent to the procedure on the days of testing. Overall, complete data was available for 157 participants (79 females; 84.7% Caucasian) who fully participated in both testing sessions. For the other eight participants, four participants received incorrect pairings of suggestive and follow-up interviews, three participants were unavailable for the follow-up testing session, and one participant was removed from analyses for failing a manipulation check question about the emotional outcome of the cartoon. A breakdown of the composition for the 157 participants based on the study design is presented in Table 2.

Materials and Procedure

Children participated individually in two separate testing sessions at their school site. A description of the materials and procedures used in each testing session follows below.

Session 1: Cartoon and Suggestive Interview. In testing Session 1, an experimenter (undergraduate research assistant) obtained the child’s assent to participate and ushered them into the testing room (see Appendix B for the experimenter script). To begin Session 1, the experimenter administered a baseline assessment of children’s mood/emotion prior to watching the emotional cartoon. Child participants were asked to
<table>
<thead>
<tr>
<th>Age</th>
<th>Interview Version</th>
<th>Valence Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>6 year-olds (n = 26)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>7 year-olds (n = 34)</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>8 year-olds (n = 31)</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>9 year-olds (n = 27)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>10 year-olds (n = 21)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td>11 year-olds (n = 18)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>8</strong></td>
</tr>
<tr>
<td><strong>Total (N = 157)</strong></td>
<td><strong>79</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>
self-rate their emotional valence state by pointing to a scale featuring five faces ranging from exaggerated frown to exaggerated smile (see Appendix B). This scale was modeled from similar scales used within the developmental literature (e.g., Bradley & Lang, 1994; Quas, Wallin, Horwitz, Davis, & Lyon, 2009). Afterward, the experimenter directed the child to an electronic tablet and administered instructions for watching the cartoon.

Two versions of a computer animated cartoon with corresponding audio were created using Toon Boom Studio 5 animation software (Conradt & London, 2012). The inclusion of the cartoon stimuli was methodologically important because our aim was to have a to-be-remembered event that was identical except for different endings to elicit opposing valenced emotional states. The cartoon versions were scripted, drawn, and animated by the study’s author. Adult voice actors were used for the dialogue between characters.

The cartoon story featured a child protagonist named Owen who asks the child participant for help finding his lost dog. Together Owen, his friend Kayla, and the child participant go on a quest to find the lost dog. The cartoon was meant to be interactive so the child was given clues throughout to help the protagonist and thereby increase the investment of the child in the goal of helping the protagonist find his lost dog (much like the children’s television show “Blue’s Clues”). Collectively, the cartoon was divided into six scenes. Table 3 displays a brief description of each scene and the full script of the cartoon can be found in Appendix C. Based on previous developmental research (Levine et al., 2008; Stein & Levine, 1989; 1990), the emotional valence targeted is related to the goal outcome of the cartoon. In the positive condition, the participant helped the protagonist find his lost dog at the end of the cartoon, thereby achieving the
Table 3

**Summary of Cartoon Scenes and Emotional Outcomes**

<table>
<thead>
<tr>
<th>Scene</th>
<th>Scene Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scene 1</td>
<td>When walking in the park, Owen loses his dog Scooter while talking with his friend Kayla.</td>
</tr>
<tr>
<td>Scene 2</td>
<td>Owen and Kayla search at places in the park getting help from people and clues along the way.</td>
</tr>
<tr>
<td>Scene 3</td>
<td>Owen and Kayla leave the park and search for Scooter at an ice cream shop.</td>
</tr>
<tr>
<td>Scene 4</td>
<td>Owen and Kayla go to Owen’s home to search and they make flyers to help find Scooter.</td>
</tr>
<tr>
<td>Scene 5</td>
<td>While hanging up flyers, Owen and Kayla get help from people and clues in town that lead them back to the park.</td>
</tr>
<tr>
<td>Scene 6</td>
<td>Owen and Kayla think Scooter may be playing hide-and-seek by the pond. They search one side of the pond and then the other side.</td>
</tr>
<tr>
<td>Emotional Outcomes</td>
<td>Child views Scooter hide behind a rock before Owen and Kayla arrive on the other side of the pond. Owen and Kayla ask the child if he/she saw Scooter.</td>
</tr>
<tr>
<td>Positive</td>
<td>Owen and Kayla find Scooter behind the rock.</td>
</tr>
<tr>
<td>Negative</td>
<td>Owen and Kayla do not find Scooter behind the rock.</td>
</tr>
</tbody>
</table>

goal. In the negative condition the participant was unable to help the protagonist find his lost dog prompting goal failure.

Prior to watching the cartoon, the experimenter informed the child that they will be watching a cartoon with a boy named Owen and that Owen may need their help. Furthermore, the experimenter stated, “In order to help Owen it is important that you try real hard and pay close attention to the cartoon.” The experimenter helped the child put on the headphones. When the child was ready, the experimenter started the cartoon and monitored the child as they watched the randomly assigned positive (9 minutes 28 seconds) or negative (9 minutes 38 seconds) cartoon. Promptly following the cartoon,
the experimenter approached the child with a different response depending on the emotional ending experienced in an effort to make the child’s goal outcome salient. Specifically, in the positive condition the experimenter congratulated the child on helping to find the lost dog and thanked them for their help. Alternatively, in the negative condition the experimenter acknowledged that the child was unable to help find the lost dog and thanked them for trying. Afterward, children’s emotional valence response to the cartoon outcome was measured. As before the cartoon, children again used the five-point face scale ranging from exaggerated frown to exaggerated smile and pointed to the face that indicated how they were feeling after the ending of the cartoon. The first experimenter left the room making way for the second experimenter, the suggestive interviewer.

Suggestive interviews were conducted by a new undergraduate research assistant that was blind to study hypotheses and the child’s valence condition. All interview sessions were audio recorded. An example suggestive interview protocol is presented in Appendix D. The suggestive interviewer entered the room wearing a tall colorful novelty hat and introduced themselves. Next, the interviewer instructed the child that their job is to talk to children to see how much they can remember and that they would like to ask them about the cartoon they had just witnessed. Also, the interviewer stated that because they had not watched the cartoon they do not know what happened and really need the child’s help to understand the cartoon.

Each suggestive interview consisted of two phases that are consistent with previous research examining children’s suggestibility (e.g., Kulkofsky & Klemfuss, 2008; Poole & Lindsey, 1995; Quas, Bauer, & Boyce, 2004). In the first phase, children
were asked an open-ended prompt instructing them to tell the interviewer everything that happened in the cartoon from beginning to end. Additional neutral open-ended prompts (e.g., “What else happened?” “Can you tell me more?”) were asked until the child’s free recall was exhausted.

In the second phase of the interview, children were presented true and false leading questions following a method commonly employed in child suggestibility research (e.g., Bruck, London, Landa, & Goodman, 2007; London, Bruck, & Melnyk, 2009; Melnyk & Bruck, 2004). The cartoon contained 24 target details across six scenes. Each (true) target detail in the cartoon was paired with a generated misleading (false) detail. For example, the true detail “Scooter chased a bunny rabbit” was paired with the false detail “Scooter chased a cat.” A complete list of true details with paired false details is shown in Appendix E. In sum, children were presented 6 true targets (referred to as true reminders) and 6 false targets (referred to as false reminders). Directly following the presentation of each true or false reminder, the child was asked a forced-choice question about that reminder. For example, the interviewer would present a false (or true) detail (e.g., “I heard that while walking in the park Scooter chased a cat.”). Then the interviewer would follow-up the detail with a forced-choice question about the reminder (e.g., “Was the cat black or orange?”). During the suggestive portion of the interview each child was presented 12 forced choice questions, six regarding true reminders and six regarding false reminders. Children were presented one true and one false reminder for each of the six scenes in the cartoon. True reminders never appeared with its paired false reminder and within each interview version true and false reminders were presented in a counterbalanced order. A total of four different suggestive interview
versions were created with each true and false reminder appearing equally across interview versions. Children were randomly assigned to an interview version with each version being used equally across emotion condition and age.

The interviewer started the suggestive portion of the interview by explaining that they were told some of the things that happened in the cartoon by the first experimenter and wanted to make sure they understood these things really well. Next, the interviewer proceeded to ask the 12 forced-choice questions containing true and false reminders. If a child resisted or challenged a reminder, the interviewer informed the child “I just need to write something down. So was the cat Scooter (the dog) chased black or orange?” In the event the child continued to resist or challenge, the interviewer would randomly choose an option for the child (e.g., “So Scooter chased a black cat while taking a walk in the park”). After all the reminders were presented, the interviewer slowly repeated each reminder back to the child (e.g., “You told me that Scooter chased a black cat while taking a walk in the park”). Overall, Session 1 lasted about 30 minutes.

**Session 2: Follow-up Interview.** Approximately one week after the suggestive interview ($M = 7.32$ days; range: 7-12 days) a new interviewer blind to study hypotheses and children’s valence condition conducted a follow-up interview with the child. Appendix F shows an example of the experimenter’s script for the follow-up session. The researcher established rapport and attained the child’s assent to participate. As in the previous session, the child was brought to a quiet room at their school to conduct the session. The session started with a follow-up interview about the cartoon the child witnessed one week prior. Again, each follow-up interview was audio recorded. The interviewer initiated the session by stating that they had not watched the cartoon and
would like to know what happened. Similar to the first interview, children’s free recall of the cartoon was assessed using open-ended prompts.

Afterward, children’s recognition of true and false target details was tested following the method used in previous research (Bruck et al., 2007; London et al., 2009; Melnyk & Bruck, 2004). The interviewer asked 24 yes/no questions about the target details of the story. Specifically, children were asked six questions about the true reminded items presented in the suggestive interview. Likewise, children were asked six questions about the false reminded items presented in the suggestive interview. The remaining 12 questions consisted of true and false control (non-presented) target items. The interviewer asked children six questions that contained accurate information about the cartoon, but were not presented in the suggestive interview (referred to as true non-reminders). Similarly, the interviewer asked children six questions that included false information about the cartoon, but were not presented in the suggestive interview (referred to as false non-reminders).

The inclusion of true details not presented in the suggestive interview (i.e., the true non-reminders) allow for evaluation of the facilitative effect of true reminded items. If presenting true target items in the suggestive interview facilitate item recognition in the follow-up interview, then children should be more accurate responding to true reminded items than non-reminded items. Similarly, the inclusion of false details not presented in the suggestive interview (i.e., the false non-reminders) allow for the evaluation of the misinformation effect of the false reminded items. If presenting false items in the suggestive interview increased children’s level of false assents to these items in the follow-up interview, then children should show higher levels of false assents to the false
reminded items than non-reminded items. Across participants, two different follow-up interview versions were used. The two follow-up interview versions corresponded to the four suggestive interviews to ensure each true and false question was equally represented as a reminder and non-reminder across participants for each age in years and valence condition. Children were asked four questions per scene for each of the six designated scenes of the cartoon. Question sets for each scene contained one recognition question about a true reminder, a false reminder, a true non-reminder, and a false non-reminder. True and false paired questions were never contained within the same follow-up interview version. Children’s responses were marked on the interview protocol as well as audio recorded.

**Session 2: Source Monitoring Task.** The yes/no questions were followed by a child friendly source monitoring task previously used in developmental studies (Bright-Paul et al., 2005; Conradt, London, & Bruck, 2011). The experimenter introduced the source monitoring task by informing the child they would like to know how the child learned about the things that happened in the cartoon. Four containers were placed in front of the child. Each container included a picture identifying one of four potential sources from which children may have learned about the events of the cartoon. From the child’s left to right, the containers identified the following four sources: (1) cartoon + interviewer, (2) cartoon only, (3) interviewer only, and (4) nobody. After placing the source containers in front of the child, the interviewer explained the rules of the source monitoring task. Children were instructed to place a token (i.e, poker chip) in container 1 if they learned the answer because they saw it in the cartoon and because the person in the colorful hat (the suggestive interviewer) told them. Likewise children were instructed
to place a token in container 2 if they saw it in the cartoon only, container 3 if they only knew this because the person in the colorful hat told them, or container 4 if the event was not the cartoon nor did the person in the colorful hat tell them. An example of the source monitoring task is shown in Figure 1. After giving instructions, the experimenter administered practice trials to make sure the source monitoring task was well understood before asking any source monitoring questions. Training persisted until the child participant was able to distinguish all four source options without hesitancy.

After the child demonstrated mastery of the task, source monitoring questions were asked for all recognition items the child confirmed as taking place in the cartoon (said “yes” too). In response to the source monitoring questions children were instructed to put a token into the corresponding container identifying the source of information. The experimenter recorded the child’s response to each source monitoring question.

Correct source responses were dependent on the type of reminder (true versus false; reminded versus non-reminded) the original yes/no question addressed. For example, true reminded items asked about details that occurred in the cartoon and were asked about by the suggestive interviewer. Hence, the correct source response for true reminded items would be placing a token in source container 1 depicting a picture of the cartoon and the person in the colorful hat (suggestive interviewer). Similarly, true non-reminded items (container 2), false reminded items (container 3), and false non-reminded items (container 4) each had their own correct source container. Following the source monitoring task, the experimenter asked the child if they had any questions about their participation in the study. To close Session 2, the child was praised for their performance and given a certificate for their participation. Session 2 lasted approximately 30 minutes.
Data Coding

Suggestive Interview Recall. Recorded audio files of the open-ended segments of the suggestive interview were transcribed verbatim by undergraduate research assistants. Two independent coders, blind to study hypotheses, coded the open-ended segment for correct and incorrect new utterances. An utterance was operationally defined as a statement bound by pauses containing one verb (as used by Bruck et al., 2007). Transcripts were coded following a series of steps. First, coders crossed out any off-topic utterances, requests for clarification, false starts, or any value statement that could not be coded for accuracy. Second, the remaining information was divided into utterances. Third, coders crossed out any information that was redundant or repeated. Fourth, each remaining utterance was coded as correct or incorrect. An utterance was deemed correct if all information conveyed had taken place in the cartoon. Lastly, the numbers of correct
and incorrect utterances were summed. A representative sample of 51 (32.5%) transcripts was coded by both coders to assess interrater reliability. An interrater reliability analysis between correct and incorrect utterances showed high agreement between coders ($\kappa = .91$). Each transcript coded by both coders was reviewed and any discrepancies were resolved through discussion. The remaining transcripts were coded by one of the two coders.

**Follow-up Interview Recall.** As with suggestive interviews, follow-up interview sessions were transcribed verbatim by undergraduate research assistants. Two different independent coders, blind to study hypotheses, coded the open-ended segment of the follow-up interview. Coding of children’s recall in the follow-up interview was identical to coding of suggestive interview recall with one addition to the fourth step. Specifically, utterances were categorized as correct or incorrect, but also as suggested or non-suggested depending on if the utterance contained information derived from true or false reminders in the suggestive interview. Thus, utterances were coded as either correct suggested, correct non-suggested, incorrect suggested, or incorrect non-suggested. A representative sample of 51 (32.9%) transcripts was coded by both coders to assess interrater reliability\(^1\). Agreement between coders on correct/incorrect and suggested/non-suggested utterance classification was high ($\kappa = .95$). Each transcript coded by both coders was reviewed and any discrepancies were resolved through discussion. The remaining transcripts were coded by one of the two coders.

**Recognition Item Scoring.** The numbers of accurate “yes” responses to true reminded and true non-reminded items out of six were counted separately. Likewise, the

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\(^1\) Two of the follow-up interviews were not audio recorded. As a result, follow-up interview free recall data was available for 155 children.
numbers of false assents (i.e., “yes” responses) to false reminded and false non-reminded items out of six were counted separately.

**Source Monitoring Scoring.** Correct source responses for each reminder type were counted and a proportion correct was calculated by taking the number of correct source responses out of the number of source questions asked for each reminder type. Also, an overall proportion correct of source monitoring responses was calculated. A more sensitive measure of source monitoring responses was created to assess specific source attributions. For each reminder type, correct source identifications were counted separately for the cartoon and the suggestive interviewer. Proportions were created by taking the number of correct source identifications out of the number of questions asked for each reminder type.
Chapter Three

Results

Preliminary Analyses

Child participants were strategically randomly assigned to a valence condition and suggestive interview version by age in years to maintain comparable representation across groups (see Table 2 above). As a measure of precaution, children’s age in months between valence conditions was examined to ensure comparable age representation. No differences in age make-up were observed between positive ($M = 105.45$ months; $SD = 20.03$) and negative ($M = 103.67$ months; $SD = 18.73$) conditions. Also, no differences were found in length of delay between positive ($M = 7.29$ days) and negative ($M = 7.36$ days) conditions.

As a manipulation check of emotional valence, measures of children’s valence appraisals were taken before and after watching the cartoon. Ratings were on a scale of one (exaggerated frown; very negative) to five (exaggerated smile; very positive). Prior to watching the cartoon, children’s emotional valence ratings did not differ between positive ($M = 4.47, SD = 0.68$) and negative ($M = 4.44, SD = 0.68$) valence conditions. After watching the cartoon, children’s emotional valence ratings were found to differ in the expected directions ($p < .001$). Children who experienced the positive cartoon outcome maintained positive valence ratings ($M = 4.59, SD = 0.71$), whereas those who experienced the negative cartoon outcome had negative valence ratings ($M = 1.79, SD = 1.02$). This supports that the emotional cartoon versions constructed around emotional goal outcomes evoked the intended emotional valence.
Suggestive Interview

Open-Ended Recall. Aspects of children’s open-ended questioning session in the initial (suggestive) interview were examined. On average, interviewers asked 2.74 (SD = 0.97) open-ended prompts during the open-ended section of the interview. The number of prompts administered did not differ between valence conditions or child’s age. Characteristics of children’s open-ended free recall are summarized in Table 4. Overall, children were very accurate in retelling the events of the cartoon and there were no differences observed between valence conditions. As would be expected, the number of correct utterances increased with age ($r = .41, p < .001$). A mixed linear analysis found children’s age to be a significant predictor of number of correct utterances, $F (1, 157) = 30.93, p < .001$. The slope of the regression line indicated that for every 12 month increase in age children recalled 3.19 additional correct utterances. Additional mixed linear models showed the inclusion of valence and the valence by age (covariate) interaction did not significantly improve the fit of the model. Hence, the number of correct utterances did not differ between valence conditions and increased at similar rates with age between valence conditions. A curious finding emerged when examining children’s overall accuracy in their initial open-ended recall. After the removal of two extreme outliers (< 70% net accuracy), a significant positive association was found to persist between age and accuracy in the negative valence condition ($r = .24, p = .040$). Conversely, a marginally significant inverse association was found between age and accuracy in the positive valence condition ($r = -.22, p = .053$). Nevertheless, when these relationships are put into proper context they really have little practical significance. Across the full age range in this study (72 months) the slope of the regression line for
children’s accuracy decreased by a total of 4.24% in the positive condition and increased by a total of 6.33% in the negative condition with neither line falling below 92% accuracy. In sum, prior to the presentation of any misinformation children in both valence conditions were very accurate in their free recall of the cartoon, with children providing more overall correct information in their memory reports as they became older.

**Resistance to Misleading Forced Choice Questions.** The number of forced choice questions challenged out of the six misleading (i.e., false reminded) questions during the initial suggestive interview was counted. A challenge was defined as any disagreement and/or correction of false information included in a forced choice question. This measure provides an index of children’s interrogative suggestibility or willingness to assent to misleading questions in an interview (Bruck & Melyn, 2004). Overall, children’s resistance to misleading information presented by the suggestive interviewer was low, with children challenging 22% ($M = 1.30$ challenges, $SD = 1.62$) of false reminded details. A strong minority of children ($n = 72; 46\%$) challenged none of the false reminded details. Table 5 provides a breakdown of the number of challenges.
children offered between valence conditions. No significant differences were found between the number of challenges in the positive ($M = 1.42, SD = 1.81$) and negative ($M = 1.15, SD = 1.40$) conditions. Surprisingly, there was not a significant positive linear relationship between number of challenges and age ($r = .14, p = .08$). Instead the relationship between challenges and age was better explained as a U-shaped curvilinear relationship ($r$ quadratic = .21) with children in the middle age range challenging the fewest false reminded details (see Figure 2). A regression model including a quadratic trend showed a significant predictive curvilinear relationship between age and number of challenges ($t = 2.04, p = .043$). Additionally, both valence conditions showed similar quadratic trends in challenges across age. This represents a novel finding implying that children’s susceptibility to interrogative suggestibility may not change uniformly (i.e., linearly) with age. On the other hand, the quadratic relationship was relatively weak ($r^2$ quadratic = .044). Also, children overall challenged few false reminded details and this may have contributed to why these developmental patterns were observed.

**Follow-up Interview**

**Open-Ended Recall.** As with the suggestive interview, aspects of children’s open-ended questioning session in the follow-up interview were examined. On average, interviewers asked 2.90 ($SD = 0.95$) open-ended prompts during this session of the interview. The number of prompts administered was found to reduce with age ($r = -.24, p = .003$), but prompts did not differ between valence conditions. Characteristics of children’s open-ended free recall are summarized in Table 6. Overall, children’s recall was very consistent across interviews, as the number of correct utterances provided in

footnote: A total of three children were not included in follow-up interview. Two children were excluded because of failure to audio record their interviews. One additional child was excluded because they provided no open-ended recall.
Table 5  
*Frequency of Challenges to Misleading Questions Between Valence Conditions*  

<table>
<thead>
<tr>
<th>Number of Challenges</th>
<th>Valence Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive ((n = 79))</td>
<td>Negative ((n = 78))</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>34</td>
<td>38</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>11</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>16</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>8</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 2.* Quadratic relationship between age in months and challenges to misleading questions.
both open-ended sessions were strongly correlated ($r = .80$). Again, children had high accuracy in their recall and no differences were found in recall measures between valence conditions. As expected, the number of correct utterances provided increased with age ($r = .35, p < .001$). A mixed linear analysis found children’s age to be a significant predictor of number of correct utterances, $F(1, 155) = 21.50, p < .001$. The slope of the regression line indicated that for every 12 month increase in age children recalled 3.11 additional correct utterances in the follow-up interview. Additional specified models that included valence and the valence by age interaction did not improve the predictive fit of the model. No additional age differences were found in the other measures of open-ended recall. Notably, children included very few incorrect utterances that contained false suggested details from the prior interview and these utterances did not vary between valence conditions.

**Recognition Items.** Accurate responses (out of six each) to reminded (suggested) and non-reminded (control) true recognition questions were examined. For ease of interpretation, we started by conducting a 2 (valence condition) x 2 (reminder type: reminded or non-reminded) mixed factorial ANOVA with reminder type being a within-subjects factor. The analysis showed a main effect of reminder type, $F(1, 155) = 45.85, p < .001, \eta^2_p = .23$, confirming the memory facilitation effect of true reminded items. In particular, children had more correct responses to true reminded ($M = 5.72, SD = 0.55$) than non-reminded items ($M = 5.15, SD = 0.92$). The main effect of valence and the valence by reminder type interaction were not significant, indicating that there were no differences in number of correct true recognition items between valence conditions. Additional specified mixed linear models that built off of the original two-factor model
were used to examine effects of age and possible interactions with age. The inclusion of these factors did not improve the predictive fit of the model. In other words, there were no differences observed across age in the number of correct true recognition items and there were no interactions with age. The absence of age improvements in true recognition rates likely reflects the fact that overall children performed near ceiling on true recognition items.

Children’s responses to false recognition questions were of central interest in this study. The number of false assents (out of six each) to reminded (suggested) and non-reminded (control) false recognition questions were examined. As with true items, for ease of interpretation we started by conducting a 2 (valence condition) x 2 (reminder type: reminded or non-reminded) mixed factorial ANOVA with reminder type being a within-subjects factor. The analysis showed a main effect of reminder type, \( F(1, 155) = 197.30, p < .001, \eta_p^2 = .56 \), strongly confirming the misinformation effect of false reminded items. As shown in Table 7, children had higher rates of false assent when the detail had been reminded (suggested) than non-reminded (control). This validates that

<table>
<thead>
<tr>
<th>Valence Condition</th>
<th>n</th>
<th>Overall Correct Utterances M (SD)</th>
<th>Incorrect Suggested Utterances M (SD)</th>
<th>Overall Incorrect Utterances M (SD)</th>
<th>Net Accuracy of Utterances M %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>78</td>
<td>19.74 (14.42)</td>
<td>0.40 (0.78)</td>
<td>2.01 (2.39)</td>
<td>92.06%</td>
</tr>
<tr>
<td>Negative</td>
<td>76</td>
<td>21.97 (14.13)</td>
<td>0.34 (0.56)</td>
<td>2.05 (1.82)</td>
<td>91.87%</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>20.71 (14.33)</td>
<td>0.37 (0.67)</td>
<td>2.02 (2.12)</td>
<td>91.97%</td>
</tr>
</tbody>
</table>
our procedure for memory suggestion was effective. Additionally, there was a significant reminder type by valence condition interaction, $F (1, 155) = 4.72, p = .031, \eta^2_p = .03$. A simple effects analysis showed that children in the negative valence condition had higher rates of false assent to false reminded recognition items (see Table 7) than the positive condition, $F (1, 155) = 4.54, p = .035, \eta^2_p = .03$. However, rates of false assent to non-reminded items were very similar between valence conditions. Stated another way, children in the negative condition showed greater misinformation effects ($\eta^2_p = .46$) than children in the positive condition ($\eta^2_p = .31$) indicating that children overall were more susceptible to memory suggestion after experiencing the negative cartoon outcome. Notably, children showed misinformation effects (were suggestible) in both valence conditions, but this effect was heightened in the negative condition.

Additional specified mixed linear models that built off of the original two-factor model were used to test our primary hypothesis that valence has differential effects on children’s suggestibility rates across development. Specifically, we were interested in the three-way reminder type (within subjects) x valence condition (between subjects) x age

<table>
<thead>
<tr>
<th>Valence Condition</th>
<th>n</th>
<th>False Reminders M (SD)</th>
<th>False Non-Reminders M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>79</td>
<td>2.75 (1.61)</td>
<td>1.37 (0.99)</td>
</tr>
<tr>
<td>Negative</td>
<td>78</td>
<td>3.31 (1.69)</td>
<td>1.42 (1.19)</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>3.03 (1.67)</td>
<td>1.39 (1.09)</td>
</tr>
</tbody>
</table>
(linear covariate) interaction. A mixed linear model was specified that included main
effects of reminder type and valence condition along with the reminder type x valence
condition x age interaction. A likelihood ratio test comparing the -2 log likelihood from
this new model with our previous model (i.e., the two-factor model specified in the
ANOVA) showed that the inclusion of the three-way interaction term significantly
improved the predictive fit of the model, $\chi^2(3) = 25.28, p < .001$. The reminder type x
valence condition x age interaction was found to be a significant predictor of children’s
false assents to false recognition items, $F(4, 161.121) = 8.05, p < .001$. As shown in
Figure 3, in the positive condition the slope of the regression line for number of false
assents to reminded items significantly decreased with age, $b = -.022, t(202.45) = -2.89,$
$p = .004$, but the slope of the regression line for non-reminded items did not significantly
decrease with age, $b = -.010, t(161.60) = -1.70, p = .091$. Hence, as children became
older the regression lines for reminded and non-reminded false items in the positive
condition converged. Since the misinformation effect is the rate of children’s false assent
to reminded items relative to their baseline false assent rate to non-reminded items (i.e.,
the gap between the two regression lines), this indicates that the misinformation effect
decreased as children became older in the positive valence condition. In contrast, in the
negative condition the slopes of the regression lines for both reminded, $b = -.033, t$
$(208.64) = -4.22, p < .001$, and non-reminded items, $b = -.026, t(161.67) = -4.22, p < .001$, significantly decreased with age. Moreover, the slopes of these regression lines
decreased at similar rates indicating that the misinformation effect was relatively
persistent (slight decrease) across age for the negative valence condition.
Figure 3. Scatterplots with regression lines for number of false assents to reminded (suggested) and non-reminded (control) false recognition items across age for each valence condition.
The presence of the significant three-way interaction and resulting interpretation supports our hypothesis. As expected, children in the positive valence condition showed the conventional age decrease in suggestibility, whereas this effect was greatly attenuated for children in the negative condition. Children overall showed a greater misinformation effect in the negative relative to the positive condition, but the difference in misinformation effects between valence conditions increased as children became older. Thus, as predicted, children became more suggestible than their same age peers in the negative relative to the positive condition as age increased.

In an attempt to further explain the valence differences in children’s suggestibility across development one additional mixed linear model was specified. Specifically, children who challenged false details in the suggestive interview should have had fewer false assents to false reminded items in the follow-up interview and reduced misinformation effects. Correlational analyses supported this prediction, showing that challenges were related to reduced false assents to reminded items ($r = -.35, p < .001$), while only being modestly related to reduced false assents to non-reminded items ($r = -.19, p = .015$). The aim of this additional analysis was to investigate whether challenging false information presented by the suggestive interviewer (i.e., resistance to interrogative suggestibility) differentially predicted developmental changes in later misinformation effects between valence conditions.

A mixed linear model was specified that included the previous model and added a four-way reminder type (within subjects) x valence condition (between subjects) x challenges (linear covariate) x age (linear covariate) interaction term. Despite the added complexity of this model, a likelihood ratio test comparing the -2 log likelihood from this
new model with our previous model showed that the inclusion of the four-way interaction term significantly improved the predictive fit of the model, $\chi^2(4) = 14.69, p = .005$. The reminder type x valence condition x challenges x age interaction was found to be a significant predictor of children’s false assents to false recognition items, $F(4, 158.45) = 3.84, p = .005$. As displayed in the regression equations in Table 8, amount of challenges had the greatest impact on reducing children’s false assent rate to reminded items in the positive condition, $b = -.0028, t (157.18) = -3.28, p = .001$, but were not significantly predictive of children’s false assent rate to non-reminded items in the positive condition, $b = -.0008, t (157.05) = -1.38, p = .17$. This indicates that challenging false details in the suggestive interview was largely predictive of decreasing the misinformation effect in the

Table 8

Regression Equations for Linear Model Including Reminder Type x Valence Condition x Challenges x Age Interaction

<table>
<thead>
<tr>
<th></th>
<th>Positive False Reminded</th>
<th>Positive False Non-Reminded</th>
<th>Negative False Reminded</th>
<th>Negative False Non-Reminded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted False Assents</td>
<td>$-0.015(\text{age in months}) - 0.0028(# \text{of challenges}) + 4.76$</td>
<td>$-0.0081(\text{age in months}) - 0.0008(# \text{of challenges}) + 2.34$</td>
<td>$-0.026(\text{age in months}) - 0.0023(# \text{of challenges}) + 6.27$</td>
<td>$-0.022(\text{age in months}) - 0.0010(# \text{of challenges}) + 3.85$</td>
</tr>
</tbody>
</table>
positive condition. In contrast, amount of challenges had less of an impact on children’s false assent rate to reminded items in the negative (than positive) condition, \( b = -.0023, t (160.10) = -2.11, p = .036 \). Challenges were not significantly predictive of false assents to non-reminded items in the negative condition, \( b = -.0010, t (157.87) = -1.34, p = .18 \). Therefore, challenging false details in the suggestive interview was not as impactful at reducing the misinformation effect for children in the negative condition.

As a means of further breaking down the interaction and evaluating the differences across development, the number of challenges issued in the suggestive interview was trichotomized into representative groups. Groups specified were: (1) children who challenged zero false details (no challenges); (2) children who challenged one or two false details (low challenges); and (3) children who challenged 3 or more false details (high challenges). Table 9 presents descriptives for false assents to reminded and non-reminded false recognition items organized by challenge groups and valence conditions. Examining children in the high challenge group, we find a large discrepancy in the misinformation effect (i.e., false assents to reminded relative to non-reminded items) between valence conditions. Specifically, when children in the positive condition challenged three or more false details in the suggestive interview this greatly reduced their susceptibility to misinformation effects in the follow-up interview. However, when children in the negative condition challenged three or more false details in the suggestive interview they were still highly susceptible to the misinformation effect. This is consistent with our conclusion drawn from evaluating the regression coefficients and implicates that initial resistance to false information after witnessing a negative event does not protect children from endorsing the same false information in a later
### False Assents to False Recognition Items for Valence Condition and Challenge Group

<table>
<thead>
<tr>
<th>Challenge Group</th>
<th>Valence Condition</th>
<th>n</th>
<th>False Reminders $M (SD)$</th>
<th>False Non-Reminders $M (SD)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Challenges</td>
<td>Positive</td>
<td>34</td>
<td>3.12 (1.68)</td>
<td>1.47 (0.86)</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>38</td>
<td>3.66 (1.73)</td>
<td>1.66 (1.24)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72</td>
<td>3.40 (1.72)</td>
<td>1.57 (1.07)</td>
</tr>
<tr>
<td>Low (1 to 2) Challenges</td>
<td>Positive</td>
<td>26</td>
<td>3.15 (1.35)</td>
<td>1.50 (1.18)</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>27</td>
<td>3.07 (1.54)</td>
<td>1.26 (1.16)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>53</td>
<td>3.11 (1.44)</td>
<td>1.38 (1.16)</td>
</tr>
<tr>
<td>High (3+) Challenges</td>
<td>Positive</td>
<td>19</td>
<td>1.53 (1.22)</td>
<td>1.00 (0.88)</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>13</td>
<td>2.77 (1.74)</td>
<td>1.08 (1.04)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>32</td>
<td>2.03 (1.56)</td>
<td>1.03 (0.93)</td>
</tr>
</tbody>
</table>

investigative interview. Yet, this table should be interpreted with caution as the low and high challenge groups have some differences in group composition between valence conditions (see Table 5 above).

Lastly, the contribution of age in the significant four-way interaction is shown in Figure 4. This figure contains six scatterplots comparing valence conditions on predicted false assent values for reminded and non-reminded false recognition items across age for each challenge group. When examining across challenge groups for the positive condition, the figure shows two important trends: (1) the misinformation effect was reduced as number of challenges increased; and (2) as challenges increased the misinformation effect decreased at more rapid rates with increases in age. In particular,
Figure 4. Scatterplots with regression lines for predicted number of false assents to reminded (suggested) and non-reminded (control) false recognition items across age separated by valence condition and challenge groups.
when children challenged three or more false details the misinformation effect dissipated with age. This implies that for children who experienced the positive cartoon outcome, reduced interrogative suggestibility (higher number of challenges) in the suggestive interview was incrementally more predictive in reducing subsequent misinformation effects as children became older. Next, when examining across challenge groups for the negative condition, the figure shows two important trends: (1) the misinformation effect was persistent even as the number of challenges increased; and (2) age declines in the misinformation effect were greatly attenuated even among children who had three or more challenges. Thus, for children who experienced the negative cartoon outcome, increased resistance to interrogative suggestibility in the suggestive interview did not greatly aid in children’s resistance to misinformation effects in the follow-up interview even amongst older children included in the sample.

In summary, we found overall that children in the negative valence condition had heightened misinformation rates. This was further explained by developmental differences between valence conditions. As hypothesized, children’s suggestibility was found to decrease with age for children in the positive condition, but this age decline in suggestibility was attenuated for children in the negative condition. Additionally, taking into consideration children’s resistance (number of challenges) to false reminded details introduced by the suggestive interviewer further explained why valence and developmental differences between valence conditions in children’s suggestibility were found. Initial resistance to suggestion in the first interview was a great indicator of reduced misinformation effects for children who experienced the positive cartoon, especially as they became older. Conversely, resistance to suggestion in the first
interview did not weaken misinformation effects to the same degree for children who experienced the negative cartoon.

**Source Monitoring.** An additional aim of this study was to examine whether emotional valence differences in children’s suggestibility found above were the result of valence effects on source monitoring. Overall, children showed low accuracy rates to source monitoring questions, correctly responding to (i.e., placing a token in the correct source container out of the four) 39.33% of a source monitoring questions asked. Children were best at correctly identifying the source of true non-reminded recognition items (\(M = 0.69, SD = 0.29\); given as mean proportions), but had low accuracy rates to both reminded (\(M = 0.13, SD = 0.23\)) and non-reminded (\(M = .04, SD = .13\)) false recognition items. Remember, children were only asked source monitoring questions to details they had confirmed as taking place in the cartoon (i.e., said “yes” to). Consequently, these very low accuracy proportions for false recognition items are not surprising given they had mistakenly confirmed witnessing these events in the cartoon during the recognition questions. As shown in Figure 5, no significant differences in accuracy to source monitoring questions were found between valence conditions. Notably, no differences in accuracy were found between valence conditions for false reminded items. Children in the negative condition did correctly answer slightly more false reminded source monitoring questions overall (\(M = 0.49, SD = 0.75\)) compared to the positive condition (\(M = 0.27, SD = 0.53\)), \(t(143.2) = -1.99, p = .049\). However, the comparable accuracies between valence conditions reflect the fact that children in the negative condition were asked more source monitoring questions about false reminded items than those in the positive condition. Source monitoring accuracy overall was
modestly associated with increases in age ($r = .20$, $p = .014$). A regression analysis showed that age was a significant predictor of source monitoring accuracy, $F (1, 155) = 6.24$, $p = .014$, with source monitoring accuracy increasing by 2.4% for every 12 month increase in age. No differences in source monitoring accuracy were observed between valence conditions across age.

Children’s source monitoring responses were further dissected by examining accuracy to source identifications for each reminder type. As shown in Figure 6, there were no significant differences found between valence conditions in correct identifications for either source (cartoon or interviewer) across reminder types. Collapsing across valence conditions, findings showed that low accuracy of source monitoring responses to true reminded items appeared to be due to children’s failure to
Figure 6. Mean proportion correct source identifications of cartoon and interviewer between valence conditions and across each reminder type. Error bars show standard error of the mean.

identify the interviewer in addition to the cartoon as a source of true reminded items (i.e., many children incorrectly responded to true reminded items with the “cartoon only” response). Additionally, many children mistakenly identified having witnessed false reminded and non-reminded details in the cartoon. Age was found to be related to higher accuracy in correctly identifying the cartoon as the source of information for both true reminded ($r = .29, p < .001$) and true non-reminded ($r = .29, p < .001$) items.

Collectively, these findings provide no support for our hypothesis that negative valence decreased source memory functioning and was the mechanism behind valence differences in children’s suggestibility.
Chapter Four

Discussion

The purpose of this study was to: (1) establish that emotional valence influences children’s suggestibility to an investigative interviewer; (2) further investigate developmental trends in valence effects on children’s suggestibility; and (3) explore underlying reasons for children’s increased susceptibility to memory suggestion for a negative relative to a positive event. Building on our previous research (Conradt & London, 2012), children 6- to 11-years-old were suggestively questioned about a cartoon event with either a positive or negative outcome. Results revealed that children did not differ on initial resistance to misleading questions between valence conditions. At the one-week follow-up interview, children who watched the negative cartoon showed greater misinformation effects than children who watched the positive cartoon. Consistent with our previous study (Conradt & London, 2012), we found that misinformation effects decreased with age in the positive condition, but were relatively persistent with age in the negative condition. Furthermore, children’s resistance to misleading questions in the suggestive interview was found to be an important factor in developmental valence differences observed in children’s misinformation effects. Increased resistance to false suggested items in the suggestive interview was found to be predictive of decreased misinformation effects in the follow-up interview for children in the positive condition, especially as they became older. Alternatively, initial resistance to false suggested items did not have the same impact for children in the negative condition. Performance on a source monitoring task showed no differences between valence
conditions, suggesting that source monitoring was unlikely the cause of valence differences in misinformation effects.

An intention of this study was to maintain methodological strengths of our previous study (Conradt & London, 2012), but also to address some methodological weaknesses. One limitation from our previous study was that no measure of children’s emotional appraisal of the cartoon was taken. Consequently, we could not be certain that the emotional cartoon versions elicited the desired valence response. Children’s valence reactions to the cartoon administered in this study confirmed that the cartoon versions elicited the intended valence responses, providing evidence that emotional valence was manipulated by the cartoon event.

In addition to addressing weaknesses, the present study maintained unique methodological strengths over other prior investigations examining valence and memory. First, other than experiencing different endings, children in both valence conditions witnessed the same cartoon event and were questioned about the same event details. Compared to other investigations that questioned children about different positive and negative events (Fivush et al., 2003; Otgaar et al., in press), this ensures that event distinctiveness does not confound valence findings. Second, this study examined both initial resistance to false suggestions (i.e., interrogative suggestibility) and delayed misinformation effects. Conversely, past studies examining event valence and children’s suggestibility had only examined interrogative suggestibility (e.g., Baker-ward et al., 2005; Levine et al., 2008). Moreover, the present study included false control questions allowing for misinformation rates to be judged relative to baseline false assent rates within participants. Adding to the methodological rigor, the false questions were
counterbalanced by using different interview versions so the same false details appeared equally as suggested (i.e., reminded) and control (i.e., non-reminded) items across valence conditions and age. Collectively, the inclusion of these experimental controls attest that: (1) differences in false assents to suggested versus control recognition items occurred because the detail was suggested in the first interview; and (2) observed differences between valence conditions were due to the emotional valence of the cartoon. This high internal validity and fact that findings were replicated across experiments provides compelling evidence that children are more susceptible to suggestive interviewing practices for a negative event.

**Developmental Trends in Valence Effects on Children’s Suggestibility.** As presented in the introduction, many recent developmental studies have been interested in the developmental patterns of false memory for positive versus negative emotional DRM word lists (Brainerd et al., 2010; Brainerd & Reyna, 2012; Howe, 2007; Howe et al., 2010; Otgaar et al., in press; Rush, Edelstein, & Yim, 2013). Results from these studies indicated that false memory increases with age for all list types and that negative word lists (relative to neutral or positive) engender higher rates of false memory (i.e., false alarms) in older children and adults. An interest in this study was to examine how developmental trends for suggestion-based memory errors between a positive and negative event compare to false memory for emotional word lists. As predicted, our results showed that children’s suggestibility (i.e., misinformation effects) decreased with age in the positive condition, but the age declines in suggestibility were greatly attenuated for children in the negative condition. These developmental differences in valence findings are consistent with our previous study (Conradt & London, 2012) as well as
emotional word list studies (Brainerd et al., 2010). Generally, both lines of research show that emotional valence is a more important factor in memory errors as children become older, with children becoming more vulnerable to negatively valenced memory materials (e.g., word lists, event) relative to their same age peers.

However, the two lines of research differ in the direction of observed developmental trends. Specifically, emotional DRM studies find that false alarm rates for negatively valenced word lists increase more markedly with age than positive word lists. In contrast, our studies examining the effect of event valence on children’s suggestibility have found that misinformation effects for the negative condition decrease at an attenuated rate as children become older relative to the positive condition. Studies examining suggestion-based memory errors (like the present study) have consistently found developmental decreases in children’s memory suggestibility (Bruck & Ceci, 1999; Bruck, Ceci, & Principe, 2006; Ceci & Bruck, 1993; Ceci, Ross, & Toglia, 1987; Otgaar et al., 2009). Consequently, the results of the present study are notable because they implicate that this conventional age decline in suggestion-based memory errors is not similarly observed for a negative event.

The presence of opposing developmental trends does not preclude that emotional valence effects on children’s false memory for word lists and suggestion-based errors for events reflect similar processes. For instance, Otgaar et al. (in press) found that false memory for emotional word lists was related to memory errors for an event despite reporting opposing developmental trends for the separate memory stimuli. To the extent that emotional valence affects children’s suggestibility for events in the same manner as false memory for word lists, our findings could be interpreted in light of fuzzy-trace
theory (FTT) (or alternatively Associative-Activation Theory; Howe et al., 2009). For example, if negative emotion promotes gist memory processing and interferes with verbatim memory processing, then these conditions would make older children more vulnerable to suggestion for the negative cartoon in the present study (Brainerd et al., 2010; Brainerd & Reyna, 2012; Brainerd, Reyna et al., 2008). However, as explained previously, suggestion-based memory errors can be driven by both cognitive and social mechanisms. For this reason, an additional goal of this study was to explore alternative underlying explanations for children’s increased susceptibility to memory suggestion for a negative event.

Source Monitoring. Beyond valence differences in memory processes, children could be more vulnerable to a suggestive interviewer after experiencing a negative event because of diminished source monitoring. However, we found no support for our hypothesis that negative valence adversely affects source monitoring. Overall, measures of source monitoring were quite similar across valence conditions, including the critical false reminded (suggested) items. Consistent with previous research (Bright-Paul et al., 2005; Lindsay et al., 1991), we did find that source monitoring performance improved with age. Children’s overall low accuracy and overt tendency to choose one source response (“cartoon only”) could reflect response bias and/or poor task understanding. If this was the case, then the ability to detect valence differences in source monitoring would have been limited in this study. Furthermore, our source monitoring task could have been improved by having children answer source questions to all recognition items as opposed to only recognition items they confirmed to have witnessed in the cartoon (i.e., said “yes” to). This would have provided a more sensitive measure of source
monitoring to false reminded and non-reminded recognition items and could have increased the possibility of finding valence differences. Given these limitations, one cannot rule out source monitoring as a potential contributor to valence differences in children’s suggestibility.

**Social Mechanisms.** Another alternative is that negative emotion could have increased sensitivity to social demands of the suggestive interviewer. Children in a negative emotional state may be particularly vulnerable to social influence of an adult interviewer and more receptive to accepting erroneous details without resistance (Levine et al., 2008). Our findings showed no initial differences in the number of times children challenged misleading statements in the suggestive interview between valence conditions. However, the results showed more subtle socio-emotional developmental influences on children’s suggestibility. When children in the positive condition challenged more false details in the suggestive interview they showed greatly reduced misinformation effects in the follow-up interview. This was particularly the case as children became older. In contrast, increased resistance or challenges to false details in the suggestive interview was not as effective at minimizing later misinformation effects for children in the negative condition.

These findings imply that children in the positive condition were more likely to maintain their resistance to false suggested information across interviews. This could be because children who experienced goal achievement (i.e., finding the lost dog) in the positive condition may have had greater feelings of self-efficacy (Levine et al., 2008). In turn, this could have instilled confidence in their true memory, allowing them to dismiss the false alternatives presented by the interviewer, and promote maintenance of the true
memory over time. Alternatively, children experienced irrevocable goal failure in the negative condition which is theorized to elicit the negative emotion of sadness (Levine et al., 2008; Stein & Levine, 1989; 1990). Sadness is associated with a feeling of uncertainty and can lead to less certainty in subsequent judgments (Tiedens & Linton, 2001). Consequently, even though children in the negative condition showed no differences in initial resistance to false details, they may have been more open to alternative information and cognitive restructuring of the event. In particular, children in the negative condition may have been sensitive to counter-challenges issued by the suggestive interviewer.

However, this finding is unlikely the result of strictly social processes on children’s suggestibility. In some instances children may acquiesce to an interviewer’s misleading statements even though they know the content to be inaccurate (Bruck, Ceci, & Principe, 2006). At other times, initial social susceptibility to an interviewer’s misinformation or misleading questions can lead to cognitive changes in memory over time (Bruck, Ceci, & Principe, 2006; Ceci & Bruck, 1995). Our results implicate the latter explanation for children in the negative condition in this study. Specifically, children in the negative condition showed heightened misinformation effects in a one-week follow-up interview administered by a new interviewer. Hence, children did not have the social pressure to conform to the original suggestive interviewer and they were no longer experiencing the emotional effects of the cartoon. This implies that children in the negative condition showed increased misinformation effects because initial vulnerability to suggested information changed their memory representation for the event. Moreover, even children who openly refuted (i.e., challenged) more false
statements in the first interview, knowing them to be false, showed tendencies of incorporating this false information into their later memory for the event.

**Limitations and Directions for Future Research.** The methodological goal of this study was to conduct a laboratory-based investigation with strong experimental control. An inherent trade-off of this goal is that it limits the ecological validity of the present study. Relative to an event a child may be asked about in a forensic setting, the emotional cartoon versions used in this study evoked mild emotional responses. Child participants showed little outward signs of negative emotion and careful consideration was taken to make sure their experience was enjoyable otherwise. However, in some ways this may make our findings even more robust; if memory effects can be detected even with a mild valence manipulation, then highly evocative emotional events would be expected to produce even more pronounced effects. Additionally, memory for an emotional cartoon may be different than memory for an emotional event a child personally experiences. Personally experienced events may involve increased investment in goal outcomes, be more self-relevant, and be more distinctive. Future research should examine the effects of emotional valence of an event on children’s memory and suggestibility in more naturalistic contexts. For instance, previous studies in adults (Kensinger & Schacter, 2006; Levine & Bluck, 2004) and children (Baker-ward et al., 2005) examined memory for shared personal events in which participants’ emotional valence reactions naturally varied. A similar developmental study could be conducted examining children’s suggestibility in addition to memory.

As previously mentioned, a second limitation was the methodological shortcomings of the source monitoring task. Consequently, future research should further
investigate whether emotional valence influences children’s source monitoring. In particular, the developmental trends found this study may be consistent with a Source-Monitoring Framework (Johnson et al., 1993) interpretation. However, we found no support for this.

The findings from this study invite more questions for future research regarding the effects of emotional valence on children’s memory suggestibility. First, research should be conducted to evaluate whether similar memory processes explain developmental trends in false memory for emotional word lists and children’s suggestibility for valenced events. Such research would improve our understanding of why children show differential patterns to valence effects on suggestibility across development. Also, this research would provide further evidence regarding the ecological validity and generalizability of word list memory procedures to memory for events. Second, this research found some evidence that negative emotion may influence social mechanisms of suggestibility. In light of this finding, an important area for future child development eyewitness research would be to investigate how the forensic interview context influences the effect of emotional valence on suggestibility across development. For example, research could examine if a non-supportive interviewer intensifies valence differences in suggestibility, whereas a supportive interviewer perhaps assuages differences (Quas & Lench, 2007).

**Conclusions and Forensic Implications.** In conclusion, this research found that emotional valence has specific implications for the suggestibility of children’s memory across development. Advancing on previous research (Conradt & London, 2012), this study showed: (1) children are more suggestible to a negative than positive event; (2)
children’s suggestibility decreased with age for the positive event, but this age decrease in suggestibility was greatly attenuated for a negative event; and (3) children who experienced the negative event were less likely to maintain resistance to misleading suggestions into a second interview.

The findings of this research have important implications for forensic interviewing procedures with children. In the criminal justice system children are routinely asked to testify about negative emotional events. This research implicates that children are more vulnerable to suggestive interviewing practices for a negative experience. Additionally, a common misassumption is that only young children (i.e., preschoolers) are suggestible (Ceci, Kulkofsky, Klemfuss, Sweeney, & Bruck, 2007). Evidence from this study indicates that for a negative experience susceptibility to a suggestive interrogative interview persists across grade-school aged children. Furthermore, children may be increasingly vulnerable to multiple suggestive interviews about a negative event. This research shows the hazards of suggestively interviewing children and encourages investigative interviewers to use less harmful, empirically established questioning methods (e.g., Lamb, Hershkowitz, Orbach, & Esplin, 2008) within forensic practice.


Appendix A

Review of Emotional Valence and Memory in Adults

Recent evidence indicates that positive versus negative emotion has differential effects on cognition and memory (Holland & Kensinger, 2010; Levine & Bluck, 2004; Levine & Edelstein, 2009). Moreover, many studies have found differences in false memory when individuals are in positive versus negative emotional states. In this section, a prominent theory and findings from adult studies on emotional valence and memory are reviewed.

Many theoretical frameworks on emotion and cognition propose that an individual’s affective valence state (i.e., positive versus negative mood) influences their mode of information-processing, which in turn has downstream effects on higher-order cognitions, such as memory, problem solving, and judgment and decision making (Isen, 1999; Levine & Bluck, 2004; Schwartz & Clore, 1983; 1988; 2007; Storbeck & Clore, 2005). For example, according to the affect-as-information hypothesis (Schwartz & Clore, 1983; 1988; 2007; Storbeck & Clore, 2005), a person’s affective valence state shapes their response to their environment. A positive mood state tends to prompt broaden-and-build cognitive tendencies (Fredrickson, 2001) and the use of relational or heuristic information-processing strategies. On the other hand, negative mood states alarm a person that something is amiss in their environment, leading to the tendency to adopt a more effortful systematic or item-specific style of information-processing. Hence, the tendency to adopt different information-processing strategies in opposing valence states has an ensuing impact on a person’s memory. By encouraging a relational processing tendency, a positive mood state engenders a broader memory account with
greater access to existing general knowledge structures (i.e., scripts, schemas, stereotypes) to fill in gaps in information (Bless et al., 1996; Levine & Bluck, 2004). Such a processing tendency results in richer memory accounts, but makes an individual vulnerable to reconstructive memory errors and memory intrusions. Conversely, by encouraging an item-specific processing tendency, a negative mood state engenders more restrictive memory foci with conservative memory judgments and a decreased likelihood of endorsing inaccurate information (Storbeck & Clore, 2005).

Empirical studies conducted with adults have provided support for the affect-as-information framework’s proposed valence effects on information-processing and memory (Bless et al., 1996; Corson & Verrier, 2007; Forgas, Laham, & Vargas, 2005; Storbeck & Clore, 2005; 2011). These studies have consistently found that individuals are more susceptible to memory intrusions and false alarms in a positive relative to a negative mood state. Specifically, findings showed that individuals in a positive mood have an increased reliance on general knowledge structures, making them more vulnerable to schema consistent inferences and intrusion errors than individuals in a negative mood (Bless et al., 1996). Conversely, the induction of a negative mood state prior to learning material was found to reduce memory errors through the adoption of item-specific processing (Storbeck & Clore, 2005; 2011). Additionally, Forgas, Laham, and Vargas (2005) found that a positive mood increased susceptibility to misinformation effects, whereas a negative mood suppressed such effects. This further suggests that mood induced after experiencing the event, but prior to being presented misinformation, can influence memory reconstruction and the incorporation of the misinformation into later memory.
These studies provide strong support for the affect-as-information hypothesis. However, the studies above are limited to findings of incidental affect or transient moods on neutral to-be-remembered materials. The distinction between mood and emotion as affective states has been a point of debate, but there tends to be consensus that a mood state is different than an emotion and they have separate influences on cognition (Bower & Forgas, 2000; Gilet & Jallais, 2012). Emotion that is elicited from an experienced event may influence memory processes for that event differently than one’s transient mood state. However, some adult studies examining memory for positive versus negative events (e.g., Kensinger & Schacter, 2006; Levine & Bluck, 2004) have netted findings consistent with the affect-as-information hypothesis and mood studies described above. In particular, these studies found that positive relative to negative events increase vulnerability to memory errors. A second limitation is that this research is limited to adult samples. Future research should address whether children employ similar processing tendencies in opposing valenced mood states and at what age children may use mood valence as a cue for information processing.
Appendix B

Child Assent and Experimenter Script for Administering Cartoon (Session 1)

Prior to asking the child’s assent to participate, engage with the child to build rapport. Offer to play with the child or ask the child a few questions about himself/herself. Once the child is comfortable around you, ask the child’s assent

Verbal assent: Hi, my name is __________. I work with kids like you. I would like to learn more about what kids think about different things. Your mom said it was okay if you come play on the computer with us. Would you like to play on the computer? If you decide you don’t want to do this, you can quit any time.

Once the child has assented to participate, you can bring him/her into the adjoining room where you have the computer set-up. Have the child sit in the chair in front of the computer.

First you will record how the child is feeling before s/he watches the cartoon.

Before we get started, I would like to know how you are feeling today. Can you point to the face that shows how you are feeling right now?

Record the child’s emotional rating on the picture below by circling their choice.

Next explain to them what they will be doing on the computer...

Okay (child’s name), do you want to know what we will be playing on the computer today? I have a cartoon that I would like you to watch. In the cartoon you will meet my friend, Owen, who I think will need your help. In order to help Owen it is important that you try real hard and pay close attention to the cartoon. Do you think you will be able to help my friend Owen? All right! I am going to give you these headphones in which to listen to the cartoon. Help child put on the headphones making sure they fit comfortably. Are you ready to watch the cartoon? Push play on the story.

While the child is watching the cartoon, fill out the remaining blank items at the top of the first page of the suggestive interview protocol packet.
After the story is completed your initial response will differ depending on which condition the child is in.

Be sure to over-exaggerate your response, making it clear that the child either helped Owen find his lost or failed to help Owen find his lost dog.

**POSITIVE CONDITION**
Super job!!! Thanks to you, Owen found his dog Scooter!!! You are such a great helper! Owen could not have found Scooter without you!

**NEGATIVE CONDITION**
Oh no!!! You did not help Owen find his dog Scooter!! Scooter is still lost! I know you tried real hard. Thanks for trying.

Afterward record the child’s emotional response to the cartoon ending.

I would like to know how you are feeling right now. By pointing, tell me how [not helping / helping] Owen find his dog makes you feel.

Record the child’s emotional rating on the picture below by circling their choice.

![Smiley Faces](image)

1  2  3  4  5

Now I am going to go get a friend of mine who would like to ask you some questions about the cartoon, okay? Wait right here and I will go get him/her and he/she will be right back to talk to you about the cartoon.

Go get second experimenter. Hand him/her the suggestive interview protocol and exit the room.

Notes:
Appendix C

Story Script

Scene 1: Setting: Owen is taking his dog Scooter for a walk in the park on a sunny summer day. In the park, Owen crosses paths with his friend Kayla. While talking with Kayla, Owen loses track of Scooter and cannot find him anywhere. He then asks the audience if they would help him find his lost dog.

(Owen and Scooter are walking into the park entrance) (Intro music)

Owen: Hi there friends. My name is Owen… and this is my dog Scooter. (Scooter barks) Scooter and I were just about to take a walk in the park, would you like to join us? (A brief pause to allow children to answer)

Owen: Come along! (Start walking into the park) Scooter really likes the park in the summer, when he can meet other dogs and people and the sun is shining. (Scooter smells a flower). (During the walk a rabbit runs out from behind a bush, Scooter starts chasing it and Owen is trying to keep up.)

Owen: Scooter, slow down! Whoa! (Owen is running to keep up with Scooter) (After a brief episode of running around, the rabbit gets away and Scooter slows down by a park bench. Owen is huffing and puffing)

Owen: Scooter, let me catch my breath. (Owen sits down on the park bench with Scooter sitting below him)

(While sitting on the bench, Owen’s friend Kayla starts walking into the scene).

Owen: Hey everybody, here comes my friend Kayla. Hi Kayla!

Kayla: Hi Owen. What are you doing at the park today?

Owen: My friends and I are taking Scooter for a walk.

Kayla: Oh yes, Scooter. How are you Scooter? (Kayla pets Scooter; Scooter barks)… and your friends?

Owen: Oh yes. Let me introduce you. Friends this is Kayla. (Scooter starts to walk off)

Kayla: Why hello. It’s a pleasure to meet you. Owen, why are you sweating?

Owen: (Stating in a macho tone) Well, I was just taking Scooter for a run. He was having trouble keeping up.
Kayla: (Looking at the audience) Is that really what happened? (A brief pause to allow the child to answer; meanwhile Scooter has started to chase a butterfly)

Owen: No, Scooter was actually chasing a rabbit. (Scooter disappears off the screen)

Weren’t you Scooter? Scooter? Where did Scooter go? On no, I lost him. Kayla, do you know where he is?

Kayla: No, I wasn’t paying attention to him. Perhaps our friends know.

Owen: (Looking at the audience) Did you see which way Scooter went? (Brief pause to allow child to respond) This way you said? (Walking towards the direction Scooter went). Kayla, will you help me look for Scooter?

Kayla: Of course

Owen: (Looking at the audience) Will you help me find my lost dog? I need your help. (Brief pause to let child respond) Thank you. Scooter went this way you said? (pointing and starting to walk in the direction) Let’s go!

Scene 2: Search at the park.

(Owen and Kayla are walking down the path.)

Kayla: Where do you think Scooter is?

Owen: Maybe we should look at some of his favorite places in the park.

Kayla: That’s a great idea.

Owen: Scooter really likes playing with kids. Maybe he went by the playground. Let’s go see!

(Kayla and Owen approach the playground.)

Owen: I do not see Scooter anywhere.

Kayla: I don’t see him either. Do you? (Looking at the audience) Maybe we should ask the man sitting at the park bench.

Owen: Good idea. (Walks up to the person) Excuse me sir, did you see a dog go by here?

Man: Why actually I did. He was playing with children on the playground. He followed them when they left. I thought it was their dog.

Kayla: Did you see which way they went?

Man: Why they ran off that way (pointing in direction)
Owen: Thank you sir for your help.

Kayla: Yes, thank you.

Man: Your welcome.

Owen: Let’s hurry!

(Owen and Kayla run off in the direction the man pointed)

(Owen and Kayla come to a fork in the road; from the side paw prints enter the picture and follow one of the paths)

Owen: Which way should we go?

Kayla: Look here! (pointing to the paw prints) Maybe we should follow them. Which way do you think we should go? (Looking at the audience; give them time to respond)

Owen: Great advice. Thank you for your help. (Looking at audience) Let’s follow these paw prints.

(Paw prints lead to behind a tree)

Kayla: Maybe Scooter is just behind that tree.

(Kayla and Owen run to look behind the tree; they see a big dog with its owner; In a low tone the dog woofs)

Dog Owner: Hi there. This is Sydney and I’m Amanda.

Owen: Pleased to meet you both. I am looking for my dog. Did you see another dog around?

Dog Owner: Why yes I did. The dog went that way out of the park (pointing to the exit of the park).

Kayla: Thanks for your help. Come on everyone let’s continue our search! (Start to walk towards the exit of the park)

**Scene 3: Visit to the ice cream shop.**

(Owen and Kayla exit the park into the sidewalk of downtown)

Kayla: Where do we look now?
Owen: I have got an idea. It’s a hot summer day, what do you like to do in town on a hot summer day?

Kayla: I dunno. What?
Owen: Eat ice cream at The Ice Cream Shoppe.

Kayla: Owen, Scooter is a dog. He doesn’t eat ice cream.

Owen: Not true. Scooter comes with me all the time to get ice cream and sometimes I give him some.

Kayla: Well, I guess it’s worth a try.

Owen: All right, let’s go see.

(On the way to the Ice Cream Shoppe Kayla and Owen hear a distant bark; and a distant voice shouting)

Ice cream proprietor: Get out! No dogs allowed.

Kayla: Hurry! That could be Scooter.

(Kayla and Owen approach the Ice Cream Shoppe huffing and puffing; Scooter is not in sight; They enter store to talk to proprietor)

Owen: Good day sir. Did you see a dog come by here?

Ice cream proprietor: (In disgruntled tone) Yes, he was trying to come into my store. Is that dog yours?

Owen: (Answering reluctantly) Yes. Did you…

Ice cream proprietor: (Cutting Owen off, still angry) You need to be more responsible. Clearly no dogs are allowed.

Owen: I am sorry sir. I lost him earlier and have been searching for him and could use your help. Do you know which way he went?

Ice cream proprietor: (In an apologetic tone) Sorry I did not know. I think he went that way (pointing in direction). Good luck finding him.

Owen: Thank you sir. Let’s go

(Owen and Kayla exit the store)
Kayla: Now which way did the man say he went?

Owen: I don’t remember. Do you remember which way to go? (Pause to give child chance to respond) … That’s right. Great job paying attention!

Kayla: Where do we look now?

Owen: Well my house is this way. Maybe Scooter found his way home.

Kayla: Lets go see. (Kayla and Owen start walking)

Scene 4: Search at Owen’s home

(Kayla and Owen approach the home; Scooter is not in the yard)

Kayla: Owen, I don’t see him.

Owen: Let’s check the backyard. (Walk to backyard) He’s not here either. (In a sad tone; sad musical tones) I lost my dog. What do we do? We’ve looked all over and cannot find him.

Kayla: Let’s go inside and think of a plan. Cheer up we will find Scooter.
(Kayla and Owen enter the house)

Owen: I do not know where else to look.

Kayla: I’ve got a plan.

Owen: What’s that?

Kayla: Why don’t we make a flyer and hang it up all over town? We can put a picture of Scooter on it and include your phone number and address.

Owen: That is a great idea. Maybe we will find Scooter after all. Let’s start making the flyer.
(A quick sequence of the two working with frantic music playing)

Kayla: There, it’s done.
(Show close up of the flyer)

Owen: (Looking at the audience) What do you think? (Pause) Let’s make copies and post them all over town.
Scene 5: Putting up flyers around town... a lead.

(Owen and Kayla are putting up flyers around town... music playing)

(Owen is putting a flyer on a light post while a stranger is looking on; Owen starts to walk away)
Woman: Young man I think I can help you.

Owen: Really?

Woman: Yes, I saw a dog like that one peering into the window at the pet store a little while ago.
Owen: Thanks. (Shouting) Kayla, to the pet store!

(Arrive at the pet store, Scooter is not there. There is a construction worker nearby working on repairing the sidewalk. There is an area of wet cement with paw prints leading from it)

Owen: (In a sad tone) He’s not here.

Kayla: (Seeing the construction worker) Maybe he saw Scooter.

Owen: Excuse me sir, have you seen this dog (showing a flyer).

Construction Worker: Oh yes. Because of him I have to fix this area of sidewalk. He stepped in the wet cement.

Owen: Sorry. Did you see which way he went?

Construction Worker: I did not.

Kayla: Which way should we look? Do you know? (looking at the audience, pause to let them answer) That’s right, we can follow the paw prints. Thanks for your help again.

Owen: Quick, they go this way.

(Owen and Kayla follow the paw prints, they start getting fainter as they lead back to the park; The paw prints stop at the park entrance)

Owen: The prints stop at the park. The cement must have dried. Now what?

Kayla: I guess we go back into the park.

Scene 6: Emotional Manipulation... Alternate Endings

(Owen and Kayla enter the park)
Kayla: Now where do we look? We are running out of time.

Owen: I know, let me think. Mhmmm… I’ve got it! Scooter and I sometimes play hide and seek by the pond. Maybe he thought I was hiding on him and he went to find me.

Kayla: Quickly, let’s go to the pond.

(Owen and Kayla approach the pond on one side; there are a few trees scattered about and other possible hiding places)

Owen: I don’t see him here. (As he is looking behind a tree)
Kayla: Just ducks here. (Kayla says as she sees a mother duck and a few chicks walking in a straight file line).

Owen: It doesn’t look like he is anywhere on this side of the pond.

Kayla: Should we check the other side of the pond?

Owen: Yes, but we better run we are almost out of time.

(Owen and Kayla start running towards the other end of the pond. The screen cuts-away to the area Owen and Kayla are running towards; here the audience sees Scooter. Scooter sees them coming and hides behind a rock.)

(Owen and Kayla arrive at the other side of the pond)

Owen: I don’t see him here either. Do you Kayla?

Kayla: No (in a sad tone). (Looking at audience) Friends did you see Scooter? (Brief pause to allow child to answer) You did. Where? (Brief pause to allow the child to answer) Behind that rock (pointing to the rock the children saw Scooter hide behind).

Owen: You are such a great help! (says while looking at the audience) We are going to find Scooter!

(Kayla and Owen start to approach the rock and start to peer behind when…)

*Positive Ending:*

(Owen and Kayla peer around the rock to find Scooter there hiding; Scooter barks as he sees Owen; happy musical tones are playing)

Owen: Scooter! (Owen says as he embraces Scooter)
Kayla: We found him! Thank you so much for your help we never could have found him without you. (Looking and smiling at the audience)

Owen: Yes, thank you. You were so helpful (Owen says with a large grin) Scooter, how ‘bout we go home? Thanks again friends Owen says waving good-bye. Thanks for your help Kayla, too. Good bye.

Kayla: Good bye Owen. Thanks again for your help friends. (Kayla says looking at the audience as Owen starts walking away, starts waving) Good bye. (Kayla walks off, happy music is playing; screen fades out)

*Negative Ending:*

(Owen and Kayla peer around the rock to find nothing there; sad musical tones play)

Owen: He’s not there. Scooter…Scooter! (Owen cries to see if he is around)

Kayla: I thought he would be here. Where is he?

Owen: I lost my dog! (Owen says with a somber expression and looks as if he is about to cry) The search is over, we’ve looked everywhere.

Kayla: (Also has sad expression, looks at audience). I really thought we could have found him with your help. I better go try to cheer up Owen.

Owen: Why couldn’t we find him? Why?

Kayla: Bye friends. (Kayla says with sad expression and goes to catch up with Owen; sad music is playing; the screen fades out)
Appendix D

Example Suggestive Interview Protocol

[To be given directly after the cartoon story by a second researcher; wearing colorful tall hat]

Hi (child’s name). My name is (your name), but some people call me the [man/lady] in the colorful hat. Do you like my big colorful hat? It is pretty silly isn’t it?

I go around to different places and talk to children about different things because I like to see how much they remember.

I was just talking with (other researcher’s name) and he/she told me that you watched a cartoon story with my friend Owen. Is that right? Now (child’s name) I want to hear what you can remember about the cartoon with our friend Owen. I am going to use this (referring to the audio recorder) to record everything you say about the story. [Begin audio recording.]

I wasn’t in the room and I have not watched the cartoon, so I do not know what happened. [Proceed to first open-ended question].

Interview Format:

1) Open Ended Questions:

Can you tell me everything that happened in the cartoon story? Start with the first thing that happened and tell me everything you can, even things you don’t think are very important. But don’t guess or make anything up – just tell me what you saw or heard or did during the cartoon.

If the child says he or she does not know or does not remember encourage them by saying...

-Think real hard, can you tell me everything that happened in the story?

Allow the child to tell as much as he or she can to this one prompt.
If the child stops responding, follow-up with these types of questions:

(Examples: What else happened? Can you tell me more? Anything else?)

Also, if the child is giving some vague details about a general part of the story and you think they can tell you a little more, you can ask questions such as these:

(Examples: Can you tell me more about that part of the story? What else happened in the beginning?)

The free narrative will be considered complete when the child stops talking and remains silent for a minimum of fifteen seconds and/or states that he or she cannot remember anything else.
2) **Direct Questions:**

When asking the child the following questions, if the child says that an event did not happen, tell them, “Just say something,” “just take a guess,” or “I need to write something down. Just pick one,” and repeat the question. If child corrects you say, “I need you to answer my question” and repeat question and choices. If the child still doesn’t agree, say, “I just need to write it down – Owen had Scooter on a red leash while walking in the park.” Don’t let the child ramble!

Now I just have a few more questions about things that (the other researcher’s name) said happened in the story. I just want to make sure I understand everything that happened.

**Scene 1: Walk in the Park**

First, I want to ask you some questions about the beginning of the story, when Owen was taking Scooter for a walk in the park.

1) While walking in the park, I heard that Scooter was walking ahead of Owen. Was Scooter close to or far away from Owen?

2) I heard that while taking a walk in the park Scooter chased a cat. Was the cat black or orange?

**Scene 2: Search at the Park**

Next, I want to ask you some questions about Kayla and Owen searching for Scooter at the park right after they lost him.

1) While searching at the park, I heard that Owen and Kayla followed paw prints. Were the paw prints big or small?

2) While searching at the park, I heard that Owen and Kayla met a small black dog? Was the dog’s owner a man or a woman?

**Scene 3: Visit to the Ice Cream Shop**

Next, I want to ask you some questions about when Kayla and Owen left the park to search for Scooter.

1) After leaving the park, I heard that Owen and Kayla first looked for Scooter at a lemonade stand. Was the lemonade stand far away from or close to the park?
2) I heard that the ice cream store worker told Owen that “no dogs were allowed” in the ice cream store.
   Was the ice cream store worker tall or short?

Scene 4: Search at Owen’s Home

And now I want to ask you some questions about when Owen and Kayla went to Owen’s house to search for Scooter.

1) I heard that Owen and Kayla called neighbors on the phone to help find Scooter
   Did Kayla or Owen suggest calling the neighbors?

2) I heard that the flyer that Owen and Kayla made had a picture of Scooter on it.
   Was the picture of Scooter in color or was it in black and white?

Scene 5: Putting up Flyers Around Town…A Lead

And next I would like to ask you some questions about when Owen and Kayla were putting up the lost dog posters and finding clues about where Scooter was.

1) I heard that a woman told Owen that she saw Scooter outside a pet store.
   Was the woman old or young?

2) I heard that Owen and Kayla met a construction worker that was wearing a yellow hardhat.
   Was the construction worker tall or short?

Scene 6: Alternate Endings

Now I am going to ask you some questions about the end of the cartoon, when Owen and Kayla went back into the park to try and find Scooter.

1) I heard that in the park Owen and Kayla last looked for Scooter on the other side of the pond.
   Did Owen and Kayla search in the pond or only next to the pond?

2) I heard that near the end of the cartoon you saw Scooter hide behind a park bench.
   Was the park bench close to or far away from the pond?
First administer the following specific prompt and allow the child to tell you what happened at the end of the cartoon.

I have one more question I would like to ask you about the cartoon.

Can you tell me what happened at the end of the cartoon?

Follow-up the child’s response with this question...

So at the end of the cartoon, did you help Owen find his dog Scooter?    Y    N
## Appendix E

### True and false event items given during the suggestive interview involving the cartoon story

<table>
<thead>
<tr>
<th>True Items</th>
<th>False Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scene 1: Walk in the Park</strong></td>
<td></td>
</tr>
<tr>
<td>Scooter was walking ahead of Owen</td>
<td>Owen had Scooter on a leash</td>
</tr>
<tr>
<td>Scooter chased a bunny rabbit</td>
<td>Scooter chased a cat</td>
</tr>
<tr>
<td>Scooter got lost following a butterfly</td>
<td>Scooter got lost playing with a beach ball</td>
</tr>
<tr>
<td>Owen was talking with his friend Kayla when Scooter got lost.</td>
<td>Owen was playing catch with his friend Kayla when Scooter got lost.</td>
</tr>
<tr>
<td><strong>Scene 2: Search at the Park</strong></td>
<td></td>
</tr>
<tr>
<td>Owen and Kayla look for Scooter at the playground</td>
<td>Owen and Kayla look for Scooter at the sandbox</td>
</tr>
<tr>
<td>Owen and Kayla asked a man if he saw Scooter</td>
<td>Owen and Kayla asked a woman with a stroller if she saw Scooter</td>
</tr>
<tr>
<td>Owen and Kayla followed paw prints</td>
<td>Owen and Kayla followed children playing.</td>
</tr>
<tr>
<td>Owen and Kayla met a big gray dog.</td>
<td>Owen and Kayla met a small black dog.</td>
</tr>
<tr>
<td><strong>Scene 3: Visit to the Ice Cream Shop</strong></td>
<td></td>
</tr>
<tr>
<td>The ice cream store worker told Owen that “No Dogs were allowed” in the ice cream store.</td>
<td>Dogs were allowed in the ice cream shop.</td>
</tr>
<tr>
<td>The ice cream store worker was wearing a hat.</td>
<td>The ice cream store worker was wearing a colorful apron.</td>
</tr>
<tr>
<td>The ice cream store worker pointed which way Scooter went.</td>
<td>Owen got an ice cream cone.</td>
</tr>
<tr>
<td><strong>Scene 4: Search at Owen’s Home</strong></td>
<td></td>
</tr>
<tr>
<td>Owen’s house was blue.</td>
<td>Owen’s house was white.</td>
</tr>
<tr>
<td>Owen searched the backyard at his house.</td>
<td>Owen searched at his neighbor’s house for Scooter.</td>
</tr>
<tr>
<td>Owen and Kayla made a flyer to help find Scooter.</td>
<td>Owen and Kayla called neighbors on the phone to help find Scooter.</td>
</tr>
<tr>
<td>The flyer had a picture of Scooter on it.</td>
<td>The flyer was printed on bright yellow paper.</td>
</tr>
<tr>
<td><strong>Scene 5: Putting up Flyers Around Town…A Lead</strong></td>
<td></td>
</tr>
<tr>
<td>A woman says she saw Scooter outside the pet store.</td>
<td>A woman says she saw Scooter outside a restaurant.</td>
</tr>
<tr>
<td>The construction worker was wearing a bright orange vest.</td>
<td>The construction worker was wearing a yellow hard hat.</td>
</tr>
<tr>
<td>Scooter stepped in wet cement creating a trail of paw prints.</td>
<td>Scooter stepped in a mud puddle creating a trail of paw prints.</td>
</tr>
<tr>
<td>The paw prints led Owen and Kayla back to the park entrance.</td>
<td>The paw prints led Owen and Kayla back to Owen’s house.</td>
</tr>
<tr>
<td><strong>Scene 6: Alternate Endings</strong></td>
<td></td>
</tr>
<tr>
<td>Owen and Kayla search by the pond, where Owen and Scooter sometimes play hide and seek.</td>
<td>Owen and Kayla search by the jungle gym, where Owen and Scooter sometimes play tag.</td>
</tr>
<tr>
<td>While searching for Scooter, Kayla spots some ducks.</td>
<td>While searching for Scooter, Kayla spots a squirrel.</td>
</tr>
<tr>
<td>When they don’t find Scooter on one side of the pond, Owen and Kayla search on the other side of the pond</td>
<td>When they don’t find Scooter on one side of the pond, Owen and Kayla search in the forest</td>
</tr>
<tr>
<td>At the end of the cartoon Scooter hides behind a rock</td>
<td>At the end of the cartoon Scooter hides behind a park bench</td>
</tr>
</tbody>
</table>
Appendix F

Example Follow-up Interview Protocol

To start, engage with the child to build rapport.

**Warm-up**

Hi my name is _____. I would like to talk to you about a few things today.

Examples:

Let’s start with talking about what you are your current class and teacher.

What grade are you in this year?

Who is your current teacher?

What is your favorite part of school?

Do you have any pets at home? Tell me about one.

OR

What kind of pet would you like to have? Why?

After you have become comfortable with interacting with the child, ask the child’s assent to questioning him/her about the story they watched one week ago.

Now, (Child’s name) do you remember a little while ago when you watched a cartoon with a boy named Owen? *Wait for child to respond.*

Good. I was wondering if I could talk to you about the cartoon with Owen.

If the child says yes, bring him/her into a quiet room to conduct the interview. If the child says no, you can try to encourage them to participate. Tell them how much of a help it would be if he/she could tell you about the cartoon. Once in the room with the child and yourself seated you can start with the testing session.

Now (child’s name) I want to hear what you can remember about the cartoon with Owen. I am going to use this (referring to the audio recorder) to record everything you say about the story.

*[Begin audio recording.]*

All right, (child's name) I wasn’t here when you watched the cartoon story with Owen, so I don’t know what happened.
Interview Format:

1) Open Ended Questions:

Can you tell me everything that happened in the cartoon story? Start with the first thing that happened and tell me everything you can, even things you don’t think are very important. But don’t guess or make anything up – just tell me what you saw or heard or did during the cartoon.

If the child says he or she does not know or does not remember encourage them by saying...

-Think real hard, can you tell me everything that happened in the story?

Allow the child to tell as much as he or she can to this one prompt.
If the child stops responding, follow-up with these types of questions:

-What else happened?

-Can you tell me more?

-Anything else?

Also, if the child is giving some vague details about a general part of the story and you think they can tell you a little more, you can ask questions such as these:

-Can you tell me more about that part of the story?

-What else happened in the beginning?

Overall, give a maximum of 4 open-ended prompts once the child begins recalling the cartoon.

The free narrative will be considered complete when the child stops talking and remains silent for a minimum of fifteen seconds and/or states that he or she cannot remember anything else.
2) **Direct Questions:**

Now I just have a few more questions about things that I was told happened in the story with Owen. I just want to make sure I understand everything that happened. If I ask you about something that didn’t happen in the story with Owen, I want you to say “no.” But if you remember something that I ask about, then I want you to tell about it. *(If he/she says “I don’t know” mark this and then say take a guess and mark the answer with a second circle.)*

When asking the direct questions, first ask each question in bold marking the child’s response with a circle. Afterward, follow the instructions at the end of this questioning section about asking the “SM” questions.

**Scene 1: Walk in the Park**

First, I want to ask you some questions about the beginning of the story, when Owen was taking Scooter for a walk in the park.

1.) While walking in the park, was Scooter walking ahead of Owen?

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
<th>DK</th>
</tr>
</thead>
</table>

**SM**: You told me that while walking in the park, Scooter was walking ahead of Owen. Do you know this because …

- [ ] You saw it in the cartoon and the person with the colorful hat told you about it.
- [ ] You saw it in the cartoon only
- [ ] The person with the colorful hat told you only
- [ ] You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

2.) While walking in the park, did Scooter chase a cat?

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
<th>DK</th>
</tr>
</thead>
</table>

**SM**: You told me that while walking in the park, Scooter chased a cat. Do you know this because …

- [ ] You saw it in the cartoon and the person with the colorful hat told you about it.
- [ ] You saw it in the cartoon only
- [ ] The person with the colorful hat told you only
- [ ] You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
3.) Did Scooter get lost chasing a beach ball?

   Y       N       DK

   SM: You told me Scooter got lost chasing a beach ball.
   Do you know this because …

   □ You saw it in the cartoon and the person with the colorful hat told you about it.
   □ You saw it in the cartoon only
   □ The person with the colorful hat told you only
   □ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

4.) Was Owen talking with his friend Kayla when Scooter got lost?

   Y       N       DK

   SM: You told me Owen was talking with his friend Kayla when Scooter got lost.
   Do you know this because …

   □ You saw it in the cartoon and the person with the colorful hat told you about it.
   □ You saw it in the cartoon only
   □ The person with the colorful hat told you only
   □ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

Scene 2: Search at the Park

Next, I want to ask you some questions about Kayla and Owen searching for Scooter at the park right after they lost him.

5.) In the park, did Owen and Kayla look for Scooter at the sandbox?

   Y       N       DK

   SM: You told me that while in the park, Owen and Kayla looked for Scooter at the sandbox.
   Do you know this because …

   □ You saw it in the cartoon and the person with the colorful hat told you about it.
   □ You saw it in the cartoon only
   □ The person with the colorful hat told you only
   □ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
6.) In the park, did Owen and Kayla ask an old man if he saw Scooter?  
   Y   N   DK  

   SM: You told me in the park, Owen and Kayla asked an old man if he saw Scooter?  
   Do you know this because …  
   ☐ You saw it in the cartoon and the person with the colorful hat told you about it.  
   ☐ You saw it in the cartoon only  
   ☐ The person with the colorful hat told you only  
   ☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.  

7.) In the park, did Owen and Kayla follow paw prints?  
   Y   N   DK  

   SM: You told me in the park, Owen and Kayla followed paw prints.  
   Do you know this because …  
   ☐ You saw it in the cartoon and the person with the colorful hat told you about it.  
   ☐ You saw it in the cartoon only  
   ☐ The person with the colorful hat told you only  
   ☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.  

8.) In the park, did Owen and Kayla meet a small black dog?  
   Y   N   DK  

   SM: You told me in the park, Owen and Kayla met a small black dog.  
   Do you know this because …  
   ☐ You saw it in the cartoon and the person with the colorful hat told you about it.  
   ☐ You saw it in the cartoon only  
   ☐ The person with the colorful hat told you only  
   ☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
Scene 3: Visit to the Ice Cream Shop

Next, I want to ask you some questions about when Kayla and Owen left the park to search for Scooter.

9.) After leaving the park, did Owen and Kayla first look for Scooter at a lemonade stand? Y N DK

SM: You told me after leaving the park, Owen and Kayla first looked for Scooter at a lemonade stand.

Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

10.) Did the ice cream store worker tell Owen that “no dogs were allowed” in the ice cream store? Y N DK

SM: You told me the ice cream store worker told Owen that “no dogs were allowed” in the ice cream store.

Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

11.) Was the ice cream store worker wearing a hat? Y N DK

SM: You told me that the ice cream store worker was wearing a hat.

Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
12.) Did Owen get an ice cream cone at the ice cream store?
   Y  N  DK

SM: You told me Owen got an ice cream cone at the ice cream store.  
Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

Scene 4: Search at Owen’s Home
And now I want to ask you some questions about when Owen and Kayla went to Owen’s house to search for Scooter.

13.) Did Owen have a blue house?
   Y  N  DK

SM: You told me Owen had a blue house.  
Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

14.) Did Owen search for Scooter at his neighbor’s house?
   Y  N  DK

SM: You told me Owen searched for Scooter at his neighbor’s house. 
Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
15.) Did Owen and Kayla call neighbors on the phone to help find Scooter?
   Y   N   DK

SM: You told me Owen and Kayla called neighbors on the phone to help find Scooter. Do you know this because …
   - You saw it in the cartoon and the person with the colorful hat told you about it.
   - You saw it in the cartoon only
   - The person with the colorful hat told you only
   - You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

16.) Did the flyer Owen and Kayla make have a picture of Scooter on it?
   Y   N   DK

SM: You told me that the flyer Owen and Kayla made had a picture of Scooter on it. Do you know this because …
   - You saw it in the cartoon and the person with the colorful hat told you about it.
   - You saw it in the cartoon only
   - The person with the colorful hat told you only
   - You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

Scene 5: Putting up Flyers Around Town…A Lead
And next I would like to ask you some questions about when Owen and Kayla were putting up the lost dog posters and finding clues about where Scooter was.

17.) When hanging up the flyers, did a woman tell Owen that she saw Scooter outside a pet store?
   Y   N   DK

SM: You told me when hanging up flyers, a woman told Owen that she saw Scooter outside a pet store. Do you know this because …
   - You saw it in the cartoon and the person with the colorful hat told you about it.
   - You saw it in the cartoon only
   - The person with the colorful hat told you only
   - You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
18.) Was the construction worker Owen and Kayla met wearing a yellow hardhat?  

   Y  N  DK

SM: You told me the construction worker Owen and Kayla met was wearing a yellow hardhat.  
Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

19.) Did Scooter step in a mud puddle making a trail of paw prints?  

   Y  N  DK

SM: You told me Scooter stepped in a mud puddle making a trail of paw prints.  
☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

20.) Did the paw prints lead Owen and Kayla back to the park entrance?  

   Y  N  DK

SM: You told me the paw prints lead Owen and Kayla back to the park entrance.  
Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
Scene 6: Alternate Endings

Now I am going to ask you some questions about the end of the cartoon, when Owen and Kayla went back into the park to try and find Scooter.

21.) Did Owen and Kayla search by the jungle gym, where Owen and Scooter sometimes play tag?
   Y    N    DK

SM: You told me Owen and Kayla searched by the jungle gym, where Owen and Scooter sometimes play tag.
   Do you know this because …
   □ You saw it in the cartoon and the person with the colorful hat told you about it.
   □ You saw it in the cartoon only
   □ The person with the colorful hat told you only
   □ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

22) While searching for Scooter, did Kayla see some ducks?
   Y    N    DK

SM: You told me that while searching for Scooter, Kayla saw some ducks.
   Do you know this because …
   □ You saw it in the cartoon and the person with the colorful hat told you about it.
   □ You saw it in the cartoon only
   □ The person with the colorful hat told you only
   □ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.
23) In the park, did Owen and Kayla last look for Scooter on the other side of the pond?

Y     N    DK

SM: You told me that in the park, Owen and Kayla last looked for Scooter on the other side of the pond.

Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

24) At the end of the cartoon, did you see Scooter hide behind a park bench?

SM: You told me that at the end of the cartoon, you saw Scooter hide behind a park bench.

Do you know this because …

☐ You saw it in the cartoon and the person with the colorful hat told you about it.
☐ You saw it in the cartoon only
☐ The person with the colorful hat told you only
☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

I have one more question I would like to ask you about the cartoon.

Can you tell me what happened at the end of the cartoon?

Follow-up the child’s response with this question...

25) So at the end of the cartoon, did you help Owen find his dog Scooter?    Y     N

Source Monitoring (SM)

When you are finished asking the direct questions labeled in bold and marking the child’s responses, the next task is to go back through the “SM” questions.

SM QUESTIONS WILL ONLY BE ASKED ABOUT DETAILS CHILD RESPONDS “YES” TO (i.e., indicates that they occurred in the cartoon).
Place the four SM posting containers in front of the child in the following order from the child’s left to right: 1) cartoon & interviewer 2) cartoon only 3) interviewer only 4) did not see it in the cartoon & was not told it by suggestive interviewer.

Instructions:
For this next thing, I want to play this fun game where you show me how you know the things you told me about.

I want to know how you learned about things that happened in the cartoon with Owen.

SM Training:
Did you see it in the cartoon and the person with the colorful hat also told you about it?
If I ask you a question, and you know the answer because you saw it in the cartoon and the person with the colorful hat told you, then put your chip in here (show the container with the picture of both the cartoon and interviewer to the child’s far left).

Did you see it in the cartoon only?
If I ask you a question, and you know the answer because you saw it in the cartoon, then put your chip in here (show the container with the picture of the cartoon only, second to the child’s left).

Did the person with the colorful hat tell you only?
If I ask you a question, and you know the answer because the colorful hat person told you, then put your chip in here (show the container with the picture of the interviewer).

If you didn’t see it in the cartoon and the colorful hat person didn’t tell you either, then you put your chip right here at nobody! (show the container without a source).

Review:
Okay, so if you know something because you saw it in the cartoon and the person with the colorful hat told you, then where would you put your chip?

If you know something because you saw it in the cartoon only, then where would you put your chip?

If you know something because the colorful hat person told you, then where would you put your chip?

But maybe I ask you a silly question about something that never happened. If I ask you something, and you did not see it in the cartoon and the colorful hat person didn’t tell you about it either, where would you put your chip?

Provide feedback to each response the child gives to the review questions. If the child points to the incorrect container, have the child try again. Training should continue until the child can answer all four source questions without trouble. If the child is still
confused about the task keep going through the review questions until the child fully understands. Once the child shows understanding of the task (quickly identifies all four correctly) then move onto the task.

I see you understand how to play the game. Now I want to ask you how you knew some of the things you told me about.

Go back through the direct questions (using the SM question below) and ask each source question the child responded “yes” to during the direct question sequence. Do not provide any feedback to the child’s responses (i.e., whether you think they are right or wrong).

Example:
You told me that Owen was talking to his friend Kayla when Scooter got lost.

Do you know this because ...

☐ You saw it in the cartoon and the person with the colorful hat told you about it.

☐ You saw it in the cartoon only

☐ The person with the colorful hat told you only

☐ You didn’t see it in the cartoon and the person with the colorful hat did not tell you.

Go through the question and while asking each option point to the container matching the answer. Be sure to mark the box corresponding to the child’s response. Write down any opened statement the child gives as well.

Ask the child if they have any questions about their participation in the study.

Thank the child and tell them what a big help they were!!

Please provide a brief description of the testing room:

Please list any unusual responses or events: