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What Children Recall About a Repeated Event When One Instance Is Different From the Others

Deborah A. Connolly
Simon Fraser University

Heidi M. Gordon
University of Toronto

Dayna M. Woiwod
Simon Fraser University

Heather L. Price
University of Regina

This research examined whether a memorable and unexpected change (deviation details) presented during 1 instance of a repeated event facilitated children's memory for that instance and whether a repeated event facilitated children's memory for deviation details. In Experiments 1 and 2, 8-year-olds (N = 167) watched 1 or 4 live magic shows. Children were interviewed about the last or only show, which did or did not contain deviation details. Children reported more accurate information about the instance when deviation details were presented than when they were not, but repeated experience did not improve memory for deviation details. In Experiment 3, children (N = 145; 6- to 11-year-olds) participated in 4 magic shows and answered questions about each one. Deviation details were manipulated such that they caused a change in how the show was experienced (continuous) or had no such effect on the rest of the show (discrete). Younger, but not older, children's recall of all instances improved when a continuous deviation occurred compared to no deviation. Implications for how deviation details are represented in memory, as well as forensic applications of the findings, are discussed.

Keywords: memory for repeated events, memory for deviations, script memory, children's testimony

Children's lives are filled with events they experience repeatedly. Memory for repeated events, perhaps the earliest form of autobiographical memory to develop (e.g., Fivush, 1988; Hudson & Mayhew, 2009; Nelson, 1988), has been observed in children as young as 2 years of age (Bauer & Fivush, 1992; Bauer & Shore, 1987; Nelson & Gruendel, 1986). It may be the foundation for more complex cognitive and social processes such as planning, interactive play (Furman & Walden, 1990), communicative competence (Nelson & Gruendel, 1979), and categorization (e.g., Lucariello & Nelson, 1985). Historically, there are two approaches to explain memory for repeated events: instance-based and schema-based. *Instance-based approaches* (e.g., Alba & Hasher, 1983; Hintzman, 1986) posit that each instance of a repeated event is stored in memory as a separate trace. *Schema-based approaches* (e.g., script theory) focus on an abstract representation of what typically happens. A more recent theory, fuzzy-trace theory (e.g., Brainerd & Reyna, 2012) draws from both instance- and schema-based approaches such that it describes both general event memory (gist memory) and memory for individual instances (verbatim memory).

Both script theory and fuzzy-trace theory posit a general event representation that provides an understanding of the event. According to script theory, a script is a hierarchical and sequentially organized representation of the actors, actions, and objects that are typically present during any given instance of the repeated event (Hudson & Mayhew, 2009). According to fuzzy-trace theory, gist memory contains information about patterns and meaning of the event (Brainerd & Reyna, 2012). Both theories argue the general representation is dominant and decays more slowly than memory for individual instances. Importantly, based on both theories, the general event representation is independent of memory for instances; retrieval of the general event representation does not assure access to memory for an instance.

In the context of the current research, a general event representation stems from repeated experience with instances. As described in more detail below, most experiences include details that remain the same across instances (i.e., fixed details) and details that vary in predictable ways across instances (i.e., variable details). Occasionally, something unexpected may occur during one instance of a repeated event (i.e., deviation). Whether memory for deviation details is linked to instance memory or to memory for the general event representation is one focus of the current research.

Deborah A. Connolly, Department of Psychology, Simon Fraser University; Heidi M. Gordon, Department of Psychology, University of Toronto; Dayna M. Woiwod, Department of Psychology, Simon Fraser University; Heather L. Price, Department of Psychology, University of Regina.

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Correspondence concerning this article should be addressed to Deborah A. Connolly, Department of Psychology, Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, V5A 1S6 Canada. E-mail: debc@sfu.ca

Children recall instances of repeated events as well as single-occurring events if asked about the instance immediately after the experience (Slackman & Nelson, 1984); however, memory for ordinary instances decays rapidly (e.g., Myles-Worsley, Cromer, & Dodd, 1986; Powell & Thomson, 1997). According to script theory, following a short delay, memory for ordinary instances of repeated events is largely reconstructive. When asked about an ordinary instance, children will retrieve the script and use it to "know" the probable actors, actions, objects, and sequence and combine this with some details from specific experiences (Hudson & Mayhew, 2009). According to fuzzy-trace theory, when an event is encountered, parallel verbatim and gist traces of what occurred are formed. The verbatim trace contains the surface structure of the experience that will allow a child to reproduce details of that particular experience. However, the verbatim trace decays quickly, accounting for the difficulty children have in recalling ordinary instances of a repeated event after even a short delay. Here, we refer to *ordinary* instances, which are instances that proceed in a predictable manner on the basis of knowledge of what typically happens. If something extraordinary occurs during an instance of a repeated event decay of the memory trace may be delayed.

For the most part, children are not required to report particular instances of a repeated event. In the course of most social interactions, it will be sufficient for children to know what normally happens. At least one context when memory for particular instances may be required is when legal authorities investigate an allegation of repeated abuse. For a charge to be particular enough for the accused to raise a defense, children may be asked to describe specific instances of the alleged abuse (Guadagno, Powell, & Wright, 2006). Sadly, in the context of allegations of child sexual abuse, about half of all allegations are of repeated abuse (e.g., Finkelhor, 1979; Trocmé et al., 2010). To help a child report an instance of alleged repeated abuse, forensic interviewers may guide the child to a time that was different from the others (e.g., Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007). There are two assumptions implicit in this prompt: (a) Children are able to recall details that make one instance different from the others and (b) those differences help children to recall the entire instance.

Memory for Deviation Details

One objective in the current research is to study children's memory for details that make one instance different from the others. There are two ways that one instance can differ from the others: predictable and unpredictable differences. In most repeated events, some details change across experiences in predictable ways. For instance, during a child's "taking a bath" routine the following details are likely to vary: the time of the bath, the toys played with in the bathtub, the color of the towel used to dry off, and the clothes put on after the bath. These differences are called predictable variation, or variable details with associated variable options, because they are differences the child has come to expect. Each variable detail (e.g., the color of the towel) has a set of associated variable options (e.g., blue, white, green) or different ways it has been experienced and that may make one instance different from some others. Predictable variation does not help children to recall an instance of a repeated event. Children recall variable options that were presented but not the instances in which each variable option was experienced (e.g., Brubacher, Roberts, & Powell, 2012; Connolly & Gordon, 2014; Fivush, 1984; Gomes, Sheahan, Fitzgerald, Connolly, & Price, 2015; Powell & Thomson, 1997). Instances may also differ in unpredictable ways. These are differences that the child does not expect and cannot predict from what they know about the routine (i.e., deviations). For instance, on one occasion of the "getting ready for bed" routine, a glass container fell and shattered on the floor or the child wore a bathing suit into the bathtub. In the current research, we focus on unpredictable variation, or deviation details.

Compared with their memory for variable options, children recall deviation details well immediately (Adams & Worden, 1986; Hudson, 1988) and after a 1-day delay if deviation details are vivid or consequential (Davidson & Hoe, 1993; Davidson & Jergovic, 1996; Hudson, 1988). Further, when the retrieval cue is specific to how one instance deviated from the others, children are able to describe other ways the instance differed (e.g., Farrar & Boyer-Pennington, 1999; Farrar & Goodman, 1990, 1992; Fivush, Hudson, & Nelson, 1984). For example, in Farrar and Goodman (1992), children engaged in multiple identical instances followed by one instance that deviated from the others in several ways. Children were asked to recall the deviation instance and were given the name of a unique item as a retrieval cue. After repeated experience and once a script had formed, children were quite accurate in their descriptions of how the deviation instance was different from the other instances. Similarly, Brubacher, Glisic, Roberts, and Powell (2011) had 4- to 5-year-olds and 7- to 8-year-olds engage in four similar play sessions that contained predictable variation as well as an unpredictable change during one play session. Children were asked to report what happened during the time they remembered best. Responses were coded as a correct attribution (i.e., the detail had occurred during the nominated event) or an incorrect attribution (i.e., the detail had occurred during a different instance). Older children's attributions of unpredictable variation were more likely to be correct than their attributions of predictable variation.

According to the schema-confirmation-deployment hypothesis (Farrar & Goodman, 1990), there are two information-processing phases when an event is encountered: confirmation and deployment. In the schema confirmation phase, one will look for a relevant schema to guide event comprehension. If no schema exists, as would occur when children experience the event once, children will attend to both discrepant and typical details similarly. If a schema exists, as would occur if children experience several similar instances, children enter the deployment phase and allot relatively little attention to predictable details compared to discrepant information. Accordingly, as long as a script exists, it is reasonable to expect that repeat-event children will recall deviation details better than single-event children because deviation details are given more attention. On the basis of this research, we predict that children who experience deviation details in one instance of a repeated event will correctly report more deviation details than children who experience the same deviation details in the context of a single event.

Memory for Variable Options From an Instance of a Repeated Event That Contains Deviation Details

Another objective in the current research is to examine whether a deviation from the routine will help children to recall the variable options that occurred during the instance that contained deviation details. Children's ability to do this depends, in part, on whether memory for deviation details is linked to individual instances or to a general event representation (e.g., a script). If deviation details are part of memory for the instance, as posited by instance-based approaches, it is expected that deviation details will make the entire instance distinct from the others and more memorable. According to Howe (2006), children remember an event better if it is distinct than if it is commonplace. For a child to identify something as distinct, he or she must know that it is different from some context. In the current research, the routine is the context and deviation details distinguish one instance from the others. On the other hand, if deviation details are linked to the general event representation and not to the instance, deviation details should not help children to recall the instance. According to script theory, deviation details are linked to the script, not to memory for individual instances (Fivush, Kuebli, & Clubb, 1992; Graesser, Gordon, & Sawyer, 1979; Graesser, Woll, Kowalski, & Smith, 1980; Hudson, 1988; Kuebli & Fivush, 1994). Accordingly, children's ability to recall deviation details should not help them to recall the instance that contained deviation details. We do not have empirical grounds to prefer one approach over the other and so we simply ask whether deviation details help children to recall variable options from the instance that contained deviation details.

The Present Research

We explored children's recall of two types of event details: (a) variable options of a target instance that did or did not contain deviation details and (b) deviation details that were presented in one instance of a repeated event or a single event.

Children between 6 and 11 years of age participated in the current studies. Whether age differences emerge in memory for the deviation instance depends on whether deviation details are linked to the general event representation or the instance. If deviation details are linked to the general event representation, we do not expect age differences; once a script is formed, there are few qualitative differences between older and younger children's scripts (Fivush, 1988; Hudson, Fivush, & Kuebli, 1992). The youngest children in the current research were 6- to 8-years-old and had the capacity to develop script-like knowledge for a similar event (Price & Goodman, 1990). If deviation details are part of memory for the instance, we expect older children to recall the instance that contains deviation details better than younger children. This is based on a substantial literature that demonstrates event memory improves with age (e.g., Goodman, Ogle, McWilliams, Narr, & Paz-Alonso, 2014).

A similar methodology was used across three studies. Some children experienced four magic shows, each of which contained predictable variation and others experienced a single magic show. For some children, deviation details were presented in the fourth (or only) instance and consisted of a confederate magician interrupting the magic show. After the target instance (1 or 2 days), children were asked to recall only the target instance (Experiments 1 and 2) or all four instances (Experiment 3). Children in the deviation conditions were also asked about deviation details. All studies were approved by the university ethics committee. Parents provided written consent and children gave oral assent.

Extant approaches propose that deviation details are linked to the general event representation (e.g., script theory) or that deviation details are linked to the instance (instance-based approaches). Given the lack of empirical and theoretical direction, we did not make specific predictions about memory for the instance that contains a deviation; we asked (a) whether deviation details help children to recall variable options of an instance (Experiments 1, 2, and 3), (b) whether deviation details help children to recall nontarget instances (Experiment 3), and (c) whether the effects of deviation details differ across ages (Experiment 3). We made the following predictions about memory for deviation details: (a) Children who experienced deviation details in the context of an instance of a repeated event will recall deviation details better than children who experienced the same deviation details in the context of a single event (Experiments 1 and 2) and (b) older children will recall more deviation details than younger children (Experiment 3).

Experiment 1

Method

Participants. Seventy-five 8-year-olds recruited from a university science camp participated (51 boys; M_{age} = 8.58 years, SD = 0.62 years; range = 7.33 years to 9.58 years). Science camp was 1 week long and children in each week of camp were randomly assigned to one of three experimental conditions. In the studies reported in this paper, we were interested in investigating the effect of a memorable deviation on memory for variable options. Thus, we excluded the 10 children who recalled fewer than half of the deviation questions from our analyses of memory for variable options (final sample: N = 65; M_{age} = 8.54, SD = 0.61; range = 7.33 years to 9.50 years). Analyses of memory for deviation details included all 75 children.

Design and procedure. This was a three-group between-subjects design such that children experienced four instances with no deviation (repeated event [RE] without deviation; n = 26), four instances with a deviation (RE with deviation, n = 22), or a single event that included deviation details (single event [SE]; n = 17). In all analyses, gender was also included, although we had no hypotheses concerning this variable.

Magic shows. All children enrolled during each week of summer camp (approximately 20 to 25 children each week) watched one or four live magic shows performed by the same magician. Children in the RE conditions experienced the magic shows over 2 days with at least 1 hr between shows. Each magic show lasted approximately 15 min and included 10 critical details. For children in the RE conditions, each critical detail had four associated variable options, one of which was presented during each show. The variable options were partially counterbalanced such that half of the RE children experienced variable options A, B, C, and D in instances 1, 2, 3, and 4 and the others experienced variable options B, D, A, and C in instances 1, 2, 3, and 4. Table 1 depicts one order of variable options presented to children.

The order in which the critical details were presented in the magic shows remained the same across instances and children. Children did a warm-up activity after which the magician showed children her magic tool and told them that she would pretend to be a famous magician with a different name. To begin the show, the

Table 1
Critical Details and Variable Options Presented to Children in Experiments 1, 2, and 3

Critical detail	Variable option A	Variable option B	Variable option C	Variable option D
Magician removes . . .$_c$	Scarf	Sunglasses	Belt	Sweater
Warm-up exercise$_{abc}$	Running in place	Stretching	Jumping jacks	Push-ups
Type of container for props$_{bc}$	Basket	Bin	Bucket	Plastic bag
Magic prop$_{abc}$	Wand	Ring	Handkerchief	Ball
Pretend stage name$_{abc}$	Taylor	Alex	Sam	Jessie
Color of hat magician wore$_a$	Red	Green	Blue	Yellow
Mat shape$_{ab}$	Circle	Octagon	Triangle	Square
Mode of transportation$_a$	Car	Airplane	Truck	Motorcycle
Lucky letter$_a$	V	J	A	P
Weather$_{ab}$	Sunny	Rainy	Windy	Snowy
Type of hat each child wore$_{bc}$	Safari hat	Straw hat	Cowboy hat	Glitter top hat
Color of cape magician wore$_b$	Green	Red	Yellow	Blue
Magic spray$_c$	Vanilla	Chocolate	Honey	Cinnamon
Magician's stuffed assistant$_{bc}$	Rabbit	Dolphin	Monkey	Caterpillar
Snack the magician eats$_{bc}$	Strawberry	Orange	Cherry	Apple
Music children listen to$_{bc}$	Violin	Drums	Trumpet	Guitar
Decorations$_b$	Canada Day	Graduation	Baby shower	Valentine's day
Lucky charm$_{bc}$	Four leaf clover	Shooting star	#7	Horseshoe
Magic word(s) of the day$_{abc}$	Abra cadabra	Presto chango	Alacazam	Hocus pocus
Magic trick^{ab}	Coin slide	Disappearing ball	Penny to a dime	Predicting dice
Sticker on . . . body part$_c$	Hand	Leg	Cheek	Arm
Magician's secret$_c$	"I missed class"	"I did bad on a test"	"I lost Mom's keys"	"I broke a cup"
Goodbye gesture$_{bc}$	Bow	Wave	Curtsey	Thumbs up

Note. The 10 details presented in Experiment 1 are denoted with the subscript a. The 16 details presented in Experiments 2 and 3 are denoted with the subscripts b and c, respectively. In Experiment 3 only, the magic trick served as the retrieval cue for the instance.

magician put on her magic hat, stood on her foam mat, and practiced the magic words. She then told the children to think about a mode of transportation that she used to get to the show, showed children her lucky letter, and asked the children to act out weather. The magician then performed the magic trick. The magician called children's attention to the critical variable details by naming each two to four times. During the only (for SE children) or last (for RE children) magic show the magician wore a large silver bowtie and called it Bowtie Magic Time to tag the last magic show for later testing.

For children in the SE and RE deviation conditions, a deviation from the general event occurred at the end of Bowtie Magic Time. After the magician performed the magic trick and while she was packing up her materials, a confederate entered the room. The confederate was visibly upset and accused the magician of taking her magic things. The magician apologized and explained to the children that she must have mixed up the suitcases and accidentally took the confederate's magic things. The magician then proceeded to look through her suitcase. The magician put a flower necklace around the confederate's neck, gave back her magic tool (a shoe), and gave her a bag to help her carry her magic things. To demonstrate that the altercation had been resolved, the confederate gave the magician an invitation to her birthday party just before she left the room.

Interview. Two days after Bowtie Magic Time, children participated individually in an interview with one of four trained interviewers. All interviewers were blind to the hypotheses and to the child's experimental condition. The interviewer began by establishing rapport (e.g., asking the child what kinds of things they were learning in camp) and then asking the child to describe the bowtie worn during Bowtie Magic Time. Children were not asked about a time that was different from the others. Once the child appeared comfortable and apparently had the target instance in mind, the interviewer proceeded with the two-part interview. First, the child was asked to freely recall everything he or she could remember about Bowtie Magic Time. The interviewer asked three prompts (e.g., "What else happened during Bowtie Magic Time?") to encourage complete recall. When the child appeared to have exhausted his or her free recall for Bowtie Magic Time, the interviewer restated each piece of information provided in the narrative and asked one follow-up prompt (e.g., "Is there anything else you can tell me about that?"). Second, the child was asked one cued recall question for every critical detail in the magic show (e.g., "During Bowtie Magic Time you did a warm-up exercise. What exercise did you do?"). Each child was told that the interviewer was required to ask all of the questions on her sheet, even if the child had provided relevant information earlier. It was emphasized that asking about a detail a second time does not mean that the earlier answer was incorrect. If the child expressed hesitation on a particular question, one prompt was given. Questions were asked in the same order the details were presented in the magic show. After answering questions about the magic show, children in the deviation condition were asked six cued recall questions, one about each deviation detail (e.g., "During Bowtie Magic Time, [magician name] was interrupted by another magician. What was the other magician's name?"). Each interview lasted about 30 min.

Coding. Final memory interviews were transcribed and children's responses to free and cued recall questions were coded into one of the following categories:

Correct: specific information about the detail experienced during the target instance (e.g., "We did push-ups" in response to the question about the warm-up activity).

Superordinate: the category label for the detail (e.g., "We did exercises" after being asked about the type of warm-up activity).

Internal intrusion: a specific variable option that occurred during a nontarget instance (e.g., "We did jumping jacks" when the correct answer was "push-ups").

Within-instance intrusion: a critical detail from the target instance that occurred during an incorrect activity (e.g., "We thought about doing push-ups" when asked about the mode of transportation the child imagined during Bowtie Magic Time).

External intrusion: a detail that was not experienced during any of the instances (e.g., "We did sit-ups" as the warm-up activity—sit-ups never occurred).

Other response: do not know, off-topic, or denial that the critical detail had occurred.

Only critical details were coded because they were the only details that varied across instances and could be used to identify the instance from which the child responded. When coding free recall responses, an agreement was recorded if both coders identified a critical detail and coded it into the same category. For cued recall responses, if a child provided multiple responses (e.g., "We did jumping jacks, sit-ups, and stretching") and was unable to choose the variable option that occurred during Bowtie Magic Time, all responses were coded. Responses to cued recall questions about the deviation were coded as correct, incorrect, or other. Cohen's κ on 25% of the transcripts from two independent coders revealed strong agreement on free recall questions about the instance (κ = .888, $p < .001$, 95% CI [0.83, 0.95]), almost perfect agreement on cued recall questions about the instance (κ = .916, $p < .001$, 95% CI [0.88, 0.95]), and almost perfect agreement on cued recall questions about deviation details (κ = .912, $p < .001$, 95% CI [0.83, 0.98]). Disagreements were discussed and the agreed upon code was recorded.

Results

In all experiments, we tested the effect of counterbalancing conditions (interviewer and instance order in Experiments 1, 2, and 3 as well as magic show leader and recall order in Experiment 3) on all six types of responses. Across the 48 tests, there were five significant effects that did not reveal a pattern. Interested readers can obtain these data from the first author. For each child a proportion score was calculated by dividing the total number of responses in each category by the total number of details reported by the child. This was done because children were permitted to provide more than one response in cued recall and it facilitates comparisons across studies.

Did deviation details help repeat-event children to recall variable options presented in the target instance? We compared RE children who experienced deviation details with RE children who did not experience deviation details on each type of response to questions about the target instance. Gender was included in all analyses. Descriptive data are in Table 2.

Correct responses. In cued recall, the effect of deviation condition was significant, $F(1, 44) = 6.30$, $p = .016$, $\eta^2 = .13$, 95% CI [0.00, 0.31]. RE children in the deviation condition provided a higher proportion of correct responses than RE children in the no deviation condition.

All other responses. In cued recall, the proportion of internal intrusion errors was lower among RE children in the deviation condition compared to RE children in the no deviation condition, $F(1, 44) = 5.11$, $p = .03$, $\eta^2 = .10$, 95% CI [0.00, 0.28]. The interaction between gender and deviation on external intrusions in free recall was significant, $F(1, 44) = 6.51$, $p = .014$, $\eta^2 = .13$, 95% CI [0.00, 0.31]. For boys, there was a higher proportion of

Table 2
Mean Proportion of Responses (Standard Deviations in Parentheses) in Free and Cued Recall About the Target Instance and the Deviation in Experiment 1

	SE with deviation		RE with deviation		RE no deviation
Response type	Target instance	Deviation	Target instance	Deviation	Target instance
Free recall					
Correct	.83 (.24)	.33 (.40)	.33 (.29)	.16 (.32)	.27 (.25)
Superordinate	.04 (.01)	.13 (.24)	.18 (.31)	.05 (.13)	.18 (.25)
Internal intrusion	.03 (.09)		.40 (.34)		.46 (.31)
Within-instance intrusion	.01 (.03)	.00 (.00)	.00 (.00)	.00 (.00)	.01 (.03)
External intrusion	.04 (.16)	.01 (.05)	.04 (.12)	.00 (.00)	.05 (.07)
Other response	.06 (.18)	.00 (.00)	.003 (.01)	.00 (.00)	.00 (.00)
Cued recall					
Correct	.63 (.14)	.56 (.23)	.40 (.21)	.57 (.23)	.27 (.16)
Superordinate	.03 (.06)	.06 (.08)	.01 (.03)	.06 (.08)	.01 (.03)
Internal intrusion	.04 (.05)		.39 (.19)		.52 (.16)
Within-instance intrusion	.07 (.09)	.06 (.12)	.01 (.03)	.03 (.07)	.01 (.04)
External intrusion	.10 (.13)	.04 (.09)	.09 (.09)	.05 (.09)	.07 (.07)
Other response	.13 (.12)	.27 (.21)	.10 (.10)	.28 (.21)	.11 (.14)

Note. The total number of cued recall questions about the target instance was 10. The total number of cued recall questions about the deviation was 6. SE = single event; RE = repeated event.

external intrusions in the no deviation condition (M = 0.07, SD = .09) than in the deviation condition (M = 0.01, SD = 0.09).

Did repeat- and single-event children differ on memory for the target instance? We compared RE with deviation and SE conditions on all types of responses to questions about the target instance. Gender was included in all analyses. Descriptive data are shown in Table 2.

Correct responses. The proportion of correct details reported in free recall, $F(1, 35) = 31.25$, $p < .001$, $\eta^2 = .47$, 95% CI [0.22, 0.63], and in cued recall, $F(1, 35) = 14.22$, $p < .001$, $\eta^2 = .29$, 95% CI [0.06, 0.48], was higher for SE children than RE children who observed deviation details during the target instance.

All other responses. RE children who observed deviation details included a higher proportion of internal intrusions than SE children in free recall, $F(1, 35) = 16.65$, $p < .001$, $\eta^2 = .32$, 95% CI [0.09, 0.51], and in cued recall, $F(1, 35) = 48.48$ $p < .001$, $\eta^2 = .58$, 95% CI [0.34, 0.71]. For SE children, an internal intrusion is a guess that happens to be a detail experienced by RE children during a nontarget instance. In cued recall the proportion of within-instance intrusions was higher for SE than RE children, $F(1, 35) = 8.34$, $p = .007$, $\eta^2 = .19$, 95% CI [0.02, 0.40]. This may reflect greater confusion about the target instance among SE than RE children.

Did prior experience with the magic shows help children to recall deviation details? We compared children who experienced deviation details in the RE and SE conditions and included gender in the model. Contrary to expectations, in free recall, SE children recalled a higher proportion of deviation details in free recall (M = 0.33, SD = 0.40) than RE children (M = 0.16, SD = 0.32), $F(1, 45) = 4.99$, $p = .031$, $\eta^2 = .10$, 95% CI [0.00, 0.28]. There was also a main effect of gender on correct responses to cued recall questions, $F(1, 45) = 4.17$, $p = .047$, $\eta^2 = .08$, 95% CI [0.00, 0.26]. Girls provided a higher proportion of correct responses (M = 0.66, SD = 0.19) than boys (M = 0.52, SD = 0.23).

Discussion

RE children who were presented with deviation details during the target instance answered more cued recall questions correctly, reported fewer internal intrusions, and fewer external intrusions (boys only) than RE children who did not observe deviation details during the target instance. This is consistent with the notion that deviation details experienced during one instance of a repeated event will make the memory trace distinct and delay its decay (see Howe, 2006).

On the basis of schema-confirmation deployment hypothesis and the distinctiveness model, we predicted that RE children would provide more correct responses to questions about deviation details than SE children because deviation details stand out against a routine context for RE children but not for SE children. This hypothesis was not supported; in fact, SE children recalled more deviation details than RE children in free recall. It is possible that because the magic trick changed during each magic show, the instances continued to be engaging and attention was not diverted to deviation details. In Experiment 2, we presented the same magic show four times as a more powerful test of this hypothesis. We also included a fully crossed design in which SE children either were or were not presented with deviation details.

Experiment 2

Method

Participants. Ninety-two 8-year-olds from a summer camp participated (46 boys; M_{age} = 8.06 years, SD = 1.48 years; range = 6.00 years to 10.92 years). Each week of camp was randomly assigned to an experimental condition. Nine children correctly answered fewer than half of the questions about deviation details. For reasons described in Experiment 1, we excluded these children from our analyses of memory for variable options. The final sample for these analyses was 83 (M_{age} = 8.13 years, SD = 1.43 years; range = 6.00 years to 10.25 years) with between 11 and 17 children in each condition. All 92 children were included in our analyses of memory for deviation details.

Design and procedure. This was a 3 (event frequency: SE, RE fixed, or RE variable) × 2 (deviation details: present or absent) × 2 (gender) between-subjects design. Magic shows and interviews were conducted as described in Experiment 1 with four exceptions: Half of the RE children watched the same magic show four times (RE fixed condition), there were 16 critical details (see Table 1), two additional questions about deviation details were asked, and only cued recall questions were asked. To reduce the amount of time spent interviewing children and to eliminate redundant questions (asking a cued recall question about a detail reported in free recall) free recall questions were dropped. Interviews lasted about 15 min.

Coding. Children's responses were coded as described in Experiment 1. Cohen's κ on 25% of the transcripts from two independent coders revealed almost perfect agreement on cued recall questions about the instance (κ = .954, $p < .001$, 95% CI [0.92, 0.98]) and strong agreement on cued recall questions about the deviation (κ = .853, $p < .001$, 95% CI [0.75, 0.94]). Disagreements were discussed and the agreed upon code was recorded.

Results

Did deviation details help children to recall variable options presented in the target instance? We conducted a 2 (event frequency: SE or RE variable) × 2 (deviation details: present or absent) × 2 (gender) between-subjects analysis of variance (ANOVA) on each type of response. Mean proportions are in Table 3. The RE fixed condition was not included in these analyses. As is shown in Table 3, the proportion of correct responses from children who watched the same magic show four times was very high (0.86 after a delay of 1 to 2 days) and there was no effect of deviation details on their correct responses. The RE fixed condition was included to study the effect of event repetition on children's memory for deviation details.

Correct responses. There was a main effect of event frequency, $F(1, 43) = 23.00$, $p < .001$, $\eta^2 = .35$, 95% CI [0.13, 0.52], because the proportion of correct responses was higher for SE children than RE variable children. As expected, there was a main effect of deviation details on correct responses, $F(1, 43) = 6.75$, $p = .013$, $\eta^2 = .14$, 95% CI [0.01, 0.32], but there was no interaction between event frequency and deviation details. Children in both the SE and RE variable conditions provided a higher proportion of correct answers about the variable options when the instance contained deviation details (M = 0.54, SD = 0.22) than when no deviation details were present (M = 0.38, SD = 0.23).

Table 3
Mean Proportion of Responses (Standard Deviations in Parentheses) to Cued Recall Questions in Experiment 2

Condition	Correct	Superordinate	Internal intrusion	Within-instance intrusion	External intrusion	Other
			Target instance			
SE						
Deviation	.69 (.19)	.04 (.05)	.02 (.03)	.05 (.07)	.03 (.09)	.16 (.12)
No deviation	.44 (.23)	.06 (.04)	.05 (.05)	.04 (.05)	.13 (.09)	.27 (.24)
Overall mean	.54 (.25)	.05 (.04)	.03 (.05)	.04 (.05)	.09 (.10)	.23 (.20)
RE variable						
Deviation	.35 (.11)	.01 (.04)	.49 (.08)	.01 (.02)	.06 (.09)	.07 (.08)
No deviation	.27 (.22)	.01 (.03)	.51 (.20)	.01 (.02)	.10 (.09)	.09 (.11)
Overall mean	.31 (.18)	.01 (.04)	.50 (.16)	.01 (.02)	.08 (.09)	.08 (.10)
RE fixed						
Deviation	.87 (.10)	.04 (.04)	.00 (.00)	.03 (.05)	.02 (.04)	.04 (.06)
No deviation	.84 (.19)	.04 (.06)	.02 (.05)	.03 (.05)	.02 (.03)	.04 (.08)
Overall mean	.86 (.15)	.04 (.05)	.01 (.03)	.03 (.05)	.02 (.03)	.04 (.07)
			Deviation			
SE	.41 (.19)	.03 (.06)		.09 (.13)	.21 (.19)	.25 (.14)
RE variable	.44 (.20)	.04 (.06)		.07 (.08)	.19 (.20)	.26 (.19)
RE fixed	.54 (.19)	.04 (.08)		.05 (.07)	.13 (.14)	.23 (.18)

Note. There were 16 cued recall questions about the target instance and 8 cued recall questions about the deviation. SE = single event; RE = repeated event.

All other responses. Compared with RE variable children, SE children provided a higher proportion of superordinate responses, $F(1, 43) = 18.15$, $p < .001$, $\eta^2 = .30$, 95% CI [0.09, 0.48], a higher proportion of within-instance intrusions, $F(1, 43) = 9.78$, $p = .003$, $\eta^2 = .19$, 95% CI [0.02, 0.37], a smaller proportion of internal intrusions, $F(1, 43) = 171.42$, $p < .001$, $\eta^2 = .80$, 95% CI [0.68, 0.86], and a higher proportion of other responses, $F(1, 43) = 7.01$, $p = .011$, $\eta^2 = .14$, 95% CI [0.01, 0.33].

There was a main effect of deviation condition on external intrusions, $F(1, 43) = 7.11$, $p = .011$, $\eta^2 = .14$, 95% CI [0.01, 0.33], such that a lower proportion of external intrusions were included in children's responses when a deviation was present ($M = 0.04$, $SD = 0.09$) than when no deviation was present ($M = 0.11$, $SD = 0.09$).

Did prior experience with the magic shows help children to recall deviation details? To test this question, we only included children who experienced deviation details and ran a 3 (event frequency: RE fixed, RE variable, and SE) × 2 (gender) ANOVA on the proportion of each type of responses to questions about deviation details. An examination of the mean proportions in Table 3 illustrates that there were no significant effects.

Discussion

We were surprised that RE children in Experiment 1 did not correctly recall more deviation details than SE children and speculated that RE children continued to allocate attention to the routine because it changed during each show. However, in Experiment 2, when children watched the same magic show each time, RE and SE children recalled the same number of deviation details. This is discussed more fully in the General Discussion.

As in Experiment 1, the presence of deviation details helped children to recall variable options presented during the target instance. To further test and extend this finding the methodology in Experiment 3 was modified in three ways. First, the way deviation details affected children's experience of the variable options was manipulated. In the deviation conditions of Experiments 1 and 2, two kinds of deviation details occurred: the magician wore a large bowtie throughout the show to tag the target instance for later memory testing and an altercation occurred between two magicians at the end of the target instance that had no effect on how the critical details were experienced. These two kinds of deviation details were separated in Experiment 3 to study their independent effects on memory for variable options. Deviation details were presented at the beginning of the target instance and either led to a change in the way the entire instance was experienced (continuous deviation) or had no effect on the context of the instance (discrete deviation). Second, children were asked questions about all instances. If deviation details are linked to memory for the instance that contains the deviation, a benefit of deviation details should not be observed in memory reports of nontarget instances. Third, a wider range of ages was tested. In Experiments 1 and 2, only 8-year-olds participated, whereas 6- to 8-year-olds and 9- to 11-year-olds participated in Experiment 3. In Experiment 3, we also had children participate in the magic show rather than observe it. However, we did not expect this would change the pattern of data (Murachver, Pipe, Gordon, Owens, & Fivush, 1996).

Experiment 3

Method

Participants. Participants were 6- to 8-year-olds ($n = 72$; 32 boys; $M_{age} = 6.98$ years, $SD = 0.95$ years; range = 5.27 years to 8.32 years) and 9- to 11-year-olds ($n = 73$; 45 boys, $M_{age} = 9.75$ years, $SD = 0.92$ years; range = 8.33 years to 11.62 years) from university summer camps. Children participated in the magic shows in groups no larger than five to ensure that all children interacted with the materials in the same way (i.e., we had five full sets of magic show props). Children were randomly assigned to one of three deviation conditions (none, discrete, continuous). Data from one child was omitted as an outlier; for two instances, the number of correct responses was three or four standard deviations above the mean. Twenty-five children answered fewer than half of the questions about deviation details correctly. As explained in Experiment 1, these children were excluded from the analyses of memory for variable options. The sample for the analyses of memory for variable options comprised 6- to 8-year-olds ($n = 60$; 21 boys; $M_{age} = 7.15$ years, $SD = 0.99$ years; range = 5.27 years to 8.42 years) and 9- to 11-year-olds ($n = 60$; 40 boys; $M_{age} = 9.78$ years, $SD = 0.84$ years; range = 8.44 years to 11.58 years). All children were included in the analyses of memory for deviation details.

Design and procedure. This experiment was a 2 (age: 6- to 8-year-olds and 9- to 11-year-olds) × 3 (deviation: none, continuous, discrete) × 2 (gender) × 4 (instance: 1, 2, 3, 4) mixed-model ANOVA with instance as the within-subjects variable. There was no SE condition in Experiment 3.

Magic shows. In groups of between 1 and 5, children participated in four 15-min magic shows facilitated by one of four magicians (each magician ran about the same number of children across the two age groups and deviation conditions). Children participated in two shows on each of two days with at least one hour between shows. As shown in Table 1, there were 15 critical details with categorically associated variable options that varied during each of the four magic shows. As in Experiments 1 and 2, the order in which the variable options were presented was partially counterbalanced such that children received one of two presentation orders (A, B, C, D or D, C, B, A).

Deviation details. Some children experienced a discrete or continuous deviation at the beginning of the final magic show. In both deviation conditions, a confederate magician interrupted the show after the warm-up exercise. The confederate was wearing a bright purple bowtie (this is two critical details: the bowtie and the color) and claimed to need help because he or she had cast a disappearing spell on himself or herself. The magician broke the spell by administering a special antidote, giving the confederate a magical necklace, and spinning the confederate three times. After receiving the antidote, the confederate thanked the magician with a birthday card. In the discrete deviation condition, the show continued as normal. In the continuous deviation condition, the confederate's interruption caused the magician to fumble throughout the show (i.e., have trouble remembering where the props were and how to perform the trick). The magician apologized for being clumsy and forgetful and explained that her behavior was due to the interruption.

Interview. After the last magic show (1 or 2 days), interviews were conducted as in Experiment 2 except that children were asked about each instance and the name of the trick was used to cue children to the instance they should think about when answering each set of questions. Children were not cued to an instance that was different from the others. Children were asked about each instance in one of four possible recall orders (e.g., Instances 2, 4, 1, and 3) that were counterbalanced across participants. At the end of the interview, children in the deviation conditions answered seven cued recall questions about deviation details. All interviews were conducted individually by one of 16 trained interviewers (six interviewers conducted 77% of the interviews). On average, interviews lasted about 45 min.

Coding. Responses to questions about the instances were coded as in Experiments 1 and 2. Cohen's κ on 20% of the interviews from two independent coders revealed almost perfect agreement for cued recall questions about the instance ($\kappa = .948$, $p < .001$, 95% CI [0.94, 0.96]) and cued recall questions about the deviation ($\kappa = .990$, $p < .001$, 95% CI [0.96, 1.00]). Disagreements were discussed and the agreed upon code was recorded.

Results

As in Experiments 1 and 2, proportions were analyzed. For effects that involve the instance variable, each type of response is a proportion of all responses to questions about each instance. For effects that did not involve the instance variable, each type of response is a proportion of the total number of responses provided (i.e., summed across all instances).

Did deviation details help children to recall variable options presented in each instance? We ran a 2 (age) × 3 (deviation) × 2 (gender) × 4 (instance) mixed-model ANOVA with instance manipulated within-participants. When Mauchly's test of sphericity was significant we report the Greenhouse-Geisser correction for effects including the instance variable.

Correct responses. There were significant main effects of Instance, $F(2.58, 278.17) = 11.63$, $p < .001$, $\eta^2 = .10$, 95% CI [0.04, 0.16]; age: $F(1, 108) = 15.92$, $p < .001$, $\eta^2 = .13$, 95% CI [0.03, 0.25]; and deviation: $F(2, 108) = 3.07$, $p = .05$, $\eta^2 = .05$, 95% CI [0.00, 0.14]. Across instances, older children provided a higher proportion of correct responses ($M = 0.24$, $SD = 0.10$) than younger children ($M = 0.17$, $SD = 0.10$). The Instance × Deviation × Age interaction was not significant, $F(5.15, 278.17) = 1.52$, $p = .18$, $\eta^2 = .03$, 95% CI [0.00,0.06]; however, on the basis of the results from Experiments 1 and 2, we expected younger children to benefit from exposure to deviation details and so we interpreted the three-way interaction. The mean proportions of correct responses to questions about each instance are illustrated in Figures 1 and 2 for younger and older children, respectively. Among younger children the main effect of instance was significant, $F(2.34, 133.28) = 3.01$, $p = .045$, $\eta^2 = .05$, 95% CI [0.00, 0.13], and the main effect of deviation approached significance, $F(2, 57) = 2.95$, $p = .06$, $\eta^2 = .09$, 95% CI [0.00, 0.23]. Pairwise comparisons revealed that younger children provided a higher

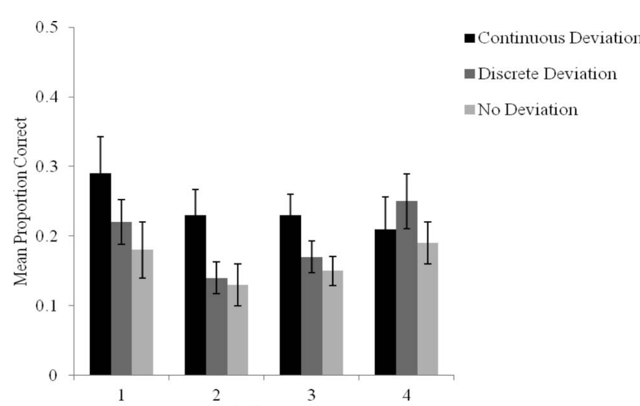

Figure 1. Mean proportion of correct responses from 6- to 8-year-olds to questions about the variable options in Experiment 3. Error bars are SEMs.

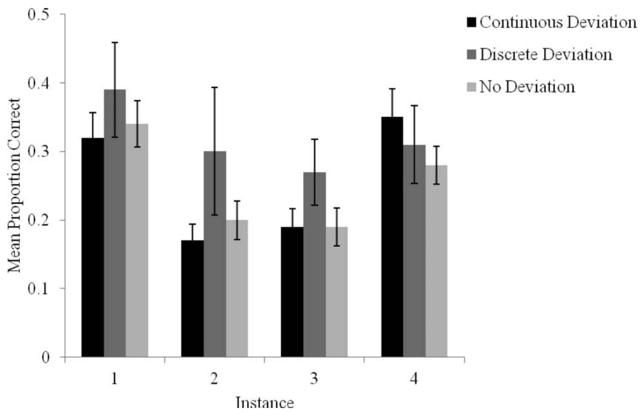

Figure 2. Mean proportion of correct responses from 9- to 11-year-olds to questions about the variable options in Experiment 3. Error bars are SEMs.

proportion of correct responses to questions about Instances 1 ($M = 0.23$, $SD = 0.19$) and 4 ($M = 0.22$, $SD = 0.17$) than those about Instance 2 ($M = 0.16$, $SD = 0.14$); the proportion of correct responses to questions about Instance 3 ($M = 0.18$, $SD = 0.11$) was intermediate and did not differ from the others. Tukey's post hoc tests revealed that across instances, younger children provided a higher proportion of correct responses in the continuous deviation condition ($M = 0.24$, $SD = 0.12$) than in the no deviation condition ($M = 0.16$, $SD = 0.10$). The proportion of correct responses from children in the discrete deviation condition was intermediate ($M = 0.19$, $SD = 0.07$) and did not differ from the other two groups. In the analyses of older children's correct responses, there was a main effect of instance, $F(3, 171) = 9.41$, $p < .001$, $\eta^2 = .14$, 95% CI [0.05, 0.23]. Older children provided a higher proportion of correct responses to questions about Instances 1 ($M = 0.34$, $SD = 0.19$) and 4 ($M = 0.31$, $SD = 0.18$) than to those about Instances 2 ($M = 0.21$, $SD = 0.15$) and 3 ($M = 0.20$, $SD = 0.14$). No other effects were significant.

All other responses. In the analysis of superordinate responses, there was a main effect of gender, $F(1, 108) = 5.48$, $p = .02$, $\eta^2 = .05$, 95% CI [0.00, 0.15], because boys provided a higher proportion of superordinate responses ($M = 0.01$, $SD = 0.02$) than did girls ($M = 0.003$, $SD = 0.01$).

For internal intrusions, there was a main effect of instance, $F(3, 324) = 8.03$, $p < .001$, $\eta^2 = .07$, 95% CI [0.02, 0.12], and a three-way interaction between instance, deviation, and gender, $F(6, 324) = 2.51$, $p = .02$, $\eta^2 = .04$, 95% CI [0.00, 0.08]. We analyzed the effects of instance and deviation for boys and girls separately. For boys, the Instance × Deviation interaction was significant, $F(6, 174) = 2.69$, $p = .02$, $\eta^2 = .08$, 95% CI [0.00, 0.14]. In the no deviation condition, a higher proportion of responses to questions about Instance 2 contained internal intrusions ($M = 0.49$, $SD = 0.17$) than did responses about any other instance (*M*s = 0.38, 0.38, 0.30 and *SD*s = 0.15, 0.12, 0.14, for Instances 1, 3, and 4, respectively), $F(3, 69) = 6.80$, $p < .001$, $\eta^2 = .23$, 95% CI [0.05, 0.36]. In the continuous deviation condition, boys reported a higher proportion of internal intrusions to questions about Instances 2 ($M = 0.41$, $SD = 0.19$) and 3 ($M = 0.44$, $SD = 0.18$) than about Instance 4 ($M = 0.28$, $SD = 0.16$). The proportion of internal intrusions to questions about Instance 1 was intermediate ($M = 0.36$, $SD = 0.23$) and did not differ from any of the other instances, $F(3, 69) = 4.14$, $p = .01$, $\eta^2 = .15$, 95% CI [0.01, 0.28]. In the discrete deviation condition, there was no effect of instance for boys. For girls, only the main effect of instance was significant, $F(3, 168) = 4.18$, $p = .01$, $\eta^2 = .07$, 95% CI [0.01, 0.14]. Girls provided a higher proportion of internal intrusions to questions about Instances 2 ($M = 0.39$, $SD = 0.17$) and 3 ($M = 0.43$, $SD = 0.19$) than about Instance 4 ($M = 0.32$, $SD = 0.16$). The proportion of internal intrusions to questions about Instance 1 was intermediate ($M = 0.37$, $SD = 0.21$) and did not differ from Instances 2 or 4.

For other responses, there was a main effect of age, $F(1, 108) = 16.24$, $p < .001$, $\eta^2 = .13$, 95% CI [0.03, 0.25]. Across instances, younger children provided a higher proportion of other responses ($M = 0.38$, $SD = 0.15$) than did older children ($M = 0.27$, $SD = 0.12$).

Did the type of deviation affect how children recalled deviation details? We conducted a 2 (age) × 2 (deviation: continuous or discrete) × 2 (gender) ANOVA on the proportion of correct, incorrect, and do not know responses to cued recall questions about deviation details. There were only 14 denials across children and so these were not analyzed.

The proportion of correct responses provided by children who saw the magician carry on as expected after the deviation ($M = 0.52$, $SD = 0.16$) and those who saw the magician fumble throughout the magic show ($M = 0.55$, $SD = 0.17$) did not differ. Only the main effect of age was reliable, $F(1, 90) = 7.08$, $p = .01$, $\eta^2 = .07$, 95% CI [0.00, 0.19]. Older children provided a higher proportion of correct responses to questions about deviation details ($M = 0.58$, $SD = 0.16$) than younger children ($M = 0.50$, $SD = 0.16$).

In the analysis of incorrect responses, the main effect of deviation approached significance, $F(1, 90) = 3.93$, $p = .05$, $\eta^2 = .04$, 95% CI [0.00, 0.15]. There was a marginally higher proportion of incorrect responses from children in the discrete deviation condition ($M = 0.26$, $SD = 0.14$) than from children in the continuous deviation condition ($M = 0.19$, $SD = 0.17$). In the analysis of do not know responses, there were no significant effects.

Discussion

Across instances, 6- to 8-year-olds correctly recalled more variable options if a continuous deviation was present during the fourth instance than if there was no deviation. However, in contrast to Experiments 1 and 2, children in the discrete deviation condition of Experiment 3 did not benefit compared with children in the no deviation condition. We speculate that the bowtie worn by the magician during the target instance in Experiments 1 and 2 operated as a continuous deviation. However, the bowtie alone cannot explain the effect because children in Experiments 1 and 2 who saw the bowtie but not the deviation answered fewer questions about the target instance correctly. In Experiment 3, the interruption alone (i.e., discrete deviation condition) did not help children to correctly recall variable options; only the interruption that caused a contextual change led to improved memory compared with the no deviation condition. For RE children in Experiments 1 and 2, the bowtie worn by the magician during the target instance was a deviation. When the confederate interrupted at the end of the show and accused the magician of taking her things, the children may have inferred a connection between the two deviations by attributing the presence of the bowtie to the magician's acquisition of the confederate's things. We did not intend the two deviations to be related and so we did not investigate this possibility in Experiments 1 and 2. However, in light of the results of Experiment 3, this is a plausible explanation that requires further study.

The benefit of a continuous deviation was not limited to the instance that contained deviation details. Compared with the no deviation condition, younger children in the continuous deviation condition recalled more details from all instances. This effect is inconsistent with our previous inference that a deviation helps children to keep the instance that contained deviation details intact in memory. We discuss the effects of deviation details on memory for all instances, and the finding that children recalled more about the first and last instances than the middle instances in the General Discussion.

The type of deviation did not help children to correctly recall deviation details. However, incorrect responses to questions about deviation details were more common in the discrete than continuous deviation condition. This pattern suggests better memory for the continuous deviation compared to the discrete deviation.

As predicted, older children recalled more deviation details than younger children. To the extent that a deviation helps children to recall variable options, we further predicted that older children would benefit more from deviation details than younger children. We found no support for this. In fact, among children who recalled the deviation (i.e., correctly answered half or more of the questions about deviation details) only younger children recalled more variable options if there was a continuous deviation than if there was no deviation. We return to this in the General Discussion.

General Discussion

This research tested the assumption that children are better able to recall an instance of a repeated event if the instance differed in unpredictable ways from the others. Previous research has shown that children remember deviations well (e.g., Davidson & Hoe, 1993). However, whether differences in an instance help children to recall the variable options associated with the entire instance is unknown. In the introductory paragraphs of this article, we reasoned that if the deviation is linked to memory for the instance, it will help children to remember the instance that contained the deviation. Conversely, if the deviation is linked to a general event representation, the memory advantage will not be targeted to the deviation instance.

The Effect of a Deviation on Memory for Variable Options of an Instance of a Repeated Event

In three experiments with over 200 children around the age of 8 years, a benefit of a deviation was observed. In Experiment 1, RE children who experienced a deviation provided more correct responses about the target instance than children who did not experience a deviation. In Experiment 2, SE and RE children who received a deviation provided more correct responses about the target instance than children who did not experience a deviation. In Experiment 3 when younger children were asked about all instances, a continuous deviation facilitated recall of all instances compared to a no deviation condition, but the benefits of a deviation were not evidenced with children 9 to 11 years of age.

If a deviation is part of memory for the instance it would have made the deviation instance distinct from the others and helped children to recall the experienced variable options contained therein (e.g., Howe, 2006). In Experiment 3, when RE children were asked about all instances, the benefit of a deviation was not restricted to the deviation instance; it helped children to recall variable options from all instances. The same benefit may have occurred in Experiments 1 and 2; however, because we only asked about the target instance we could not observe an effect of the deviation on memory for nontarget instances.

We are confident that deviation details were distinct enough to improve memory for the deviation instance, if it was accessible. In Experiment 2, SE children who observed deviation details recalled more target details (variable options for RE children) than SE children who did not observe deviation details. Although it is possible that a more unusual deviation is needed to support independent memory for the deviation instance, Hudson (1988) notes that deviation details should not be so extraordinary that the instance becomes about the deviation and loses its association with other similar instances. In the current research, the deviation details were designed to be unusual but not so extraordinary that the entire instance became about the deviation rather than being another instance of the magic show routine. If the deviation details were so extraordinary that they distracted children from the magic show, we would have observed poorer memory for the target instance when deviation details were presented than when they were not presented; we did not. If memory for deviation details was unconnected to the magic shows (i.e., encoded as an entirely distinct event) it would not have facilitated memory for variable options of the magic show(s); it did. We are confident that the interruption was seen by the children as a deviation from the magic show routine and not a separate event that was distinct and distracting.

We also considered the possibility that a unique memory trace for the deviation instance existed but the memory task in Experiment 3 was too difficult. If this explained the pattern of data, we would have observed a benefit of the deviation instance when it was the first one children were asked to recall. There was no effect of recall order on children's correct reports, although the sample sizes were very small and there was little power in this test. If fatigue explains the effect, children should have provided more correct responses in Experiments 1 and 2, when they were asked about one instance, than Experiment 3 when children where asked about all four instances. The proportions of correct responses to questions about the deviation instance from younger children who were in the RE deviation conditions were .40, 35, and .23 in Experiments 1, 2, and 3, respectively, $F(2, 70) = 6.93$, $p = .002$. Children provided more correct responses in Experiment 1 than in Experiment 3 but the difference between Experiments 2 and 3 was not significant. Interestingly, in Experiment 1 we began with free recall and then asked cued recall questions while in Experiments 2 and 3 we began the interview with cued recall. This suggests that fatigue alone cannot explain the effect found in Experiment 3.

The data from Experiment 3 can be explained by script theory, wherein variable options of a repeated event are represented in memory at a general level (e.g., magic words) with an associated list of experienced variable options (e.g., *abra cadabra, alacazam, hocus pocus*) that are not tightly associated with particular instances (Fivush, 1984; Lucariello & Nelson, 1985; Nelson &

Gruendel, 1986; Slackman & Nelson, 1984). The data from Experiments 1 and 2 are not inconsistent with this explanation. However, because we asked about the target instance only, we do not know if the deviation helped children to recall nontarget instances too.

To support our hypothesis, we first describe memory for variable options when no deviation is present and then explain how a deviation may modify the process. Perhaps, each time an instance is experienced, rehearsal of all variable options occurs. This rehearsal may help children to consolidate memory for the general event that organizes variable options across instances rather than within instances. This is consistent with two findings from a recent meta-analysis: (a) RE children's memory for variable options is very good (e.g., they remember what was experienced across instances), but memory for when each variable option was experienced is quite poor; (b) RE children are less likely than SE children to report information that had not occurred at any time during the experiment (Gomes et al., 2015).

When a deviation occurs during one instance, rehearsal may be more elaborate because there is information about how the experience with variable options differs from the other similar experiences. Elaborate rehearsal enhances consolidation with adults (Racsmány, Conway, & Demeter, 2010) and may do so with children too. This may also explain why a continuous deviation is necessary to observe the benefit; it provides a context change against which previously experienced variable options can be compared and elaborately rehearsed. A consolidation explanation is particularly compelling given that a benefit of a deviation was observed when it was presented at the end of the instance, when it could not have benefitted encoding (Experiments 1 and 2).

If a deviation, and especially a continuous deviation, elicits rehearsal of all relevant previous variable options, it leads to a further hypothesis that source cues provided by a continuous deviation are linked to memory for variable options rather than to memory for instances. If this is the case, we might help children to reconstruct the deviation instance by reminding them to select variable options that were presented by a fumbling and forgetful magician.

The advantage of a continuous deviation was observed with 8-year-olds (Experiments 1 and 2) and 6- to 8-year-olds (Experiment 3). Surprisingly, the advantage was not present for 9- to 11-year-olds (Experiment 3). Notably, younger children did not provide as many correct responses as older children in any of the conditions. This was not the result of a ceiling effect among older children; they responded correctly to less than one third of the questions. A second possibility concerns our exclusion criterion. To ensure that all children attended to the deviation, we excluded those who correctly answered fewer than half of the questions about deviation details. We may have excluded older children who would have benefitted from a deviation; those with poorer memory for the magic shows. To investigate this, we reran the analyses with all 9- to 11-year-old children. There were still no effects of the deviation on memory for variable options. It does not appear that our exclusion criteria accounts for the null effect of a deviation on responses from older children.

Why did older children not benefit from a continuous deviation presented in the final instance? Earlier, we speculated that the deviation alerted children to how variable options presented during the deviation instance were different from variable options presented during other instances. This, we suggested, improved memory because it prompted elaborate rehearsal of all related variable options and enhanced consolidation of the general event. For two reasons, we speculate that older children may not need a deviation instance to engage in this kind of rehearsal. First, according to the schema-confirmation-deployment hypothesis (Farrar & Goodman, 1990, 1992), children attend to differences when a script exists (schema confirmation) and the script can be used to identify details experienced in one instance as different from previous instances (schema deployment). Older children develop scripts after fewer experiences than younger children (e.g., Farrar & Boyer-Pennington, 1999; Kuebli & Fivush, 1994) and so enter the deployment phase earlier. If, in the current study, older children developed a script for the event earlier than younger children they would have focused on variable options earlier than younger children and the deviation presented at the end of the sequence would not have been as beneficial. Second, older children may not need a deviation to consolidate efficiently. Bauer (2012) argued that consolidation skills develop throughout the childhood years and may reach adult-like levels by approximately 11 years of age. Older children in the current study may have developed sufficiently sophisticated consolidation skills to engage in the process without a deviation. This is consistent with our finding that although older children did not benefit from a continuous deviation, they recalled more variable options than younger children.

The deviation helped SE children to recall details experienced during the deviation instance. We suspect this occurred because the single event was more interesting and engaging when the deviation was present than when it was not. In neither Experiment 1 nor Experiment 2 did RE children recall as many variable options as SE children. This is consistent with a very large literature that RE children recall less about a target instance than SE children (e.g., Brubacher, Glisic, et al., 2011, 2012; Connolly & Lindsay, 2001; Connolly & Price, 2006; Powell, Roberts, Ceci, & Hembrooke, 1999). We extend this research by finding that even when a deviation is present in one instance, RE children recall fewer target event details than SE children.

Did Event Frequency Help Children to Recall the Deviation?

We hypothesized that deviation details would be recalled better by RE than SE children. The more different events are from some context, the better they will be recalled (Howe, Courage, Vernescu, & Hunt, 2000). In the current experiments, the deviation should have been more distinct for RE than SE children; for RE children there was an established context (the routine magic shows) that should have made the deviation very distinct. There was no benefit of event frequency in Experiment 1. We speculated that RE children did not attend to the deviation as expected in Experiment 1 because each magic show presented novel details that retained children's attention to the magic shows. In Experiment 2, some children saw the same magic show four times. We expected the magic show to be quite dull by the fourth presentation, making the deviation more distinct than if it changed across presentations. Anecdotally, children often groaned when we began the same magic show on the third and fourth presentation, asking if they could "please see a different trick." Although we are confident that children found the magic show tedious, this did not lead to improved memory for the deviation. Across experiments, the proportion of deviations details children recalled was between 0.43 and 0.63 and this did not vary as a function of event frequency. The rather tedious routine presented in the RE fixed condition of Experiment 2 did not lead to improved memory for the deviation.

In the repeat-event literature on children's memory for deviations it has been suggested that deviations elicit a kind of von Restorff effect such that they pop out and are remembered very well (Davidson, 2006). In the current research, we demonstrated superior memory for deviation details relative to variable options. Across three experiments, RE children recalled between 20% and 40% of the variable options experienced during the deviation instance and between 55% and 70% of the deviation details. We would not depict RE children's memory for deviation details as particularly outstanding, however. In Experiments 1 and 2 we compared RE children's memory for the deviation with SE children's memory for the same details. There were no differences. We found no evidence that event frequency facilitated memory for deviation details. Although RE children did not recall more than SE children about the deviation, they did not recall less either. This is in stark contrast to the impoverished memory for instance details that RE children usually have relative to SE children (Brubacher, Roberts, & Powell, 2011; Connolly & Lindsay, 2001). This is a very rare example of comparable memory for RE and SE children.

Are Some Instances Recalled Better Than Others?

In Experiment 3, there were primacy and recency effects. Children provided more correct responses to questions about Instances 1 and 4 than Instance 2 (and Instance 3 for older children). In addition, all children provided fewer internal intrusions in response to questions about Instances 1 and 4 than Instances 2 and 3. Hudson (1990) found that, compared with 4- to 5-year-olds who experienced a single event, children who experienced a repeated event recalled more about the first instance but not the last instance after a 4-week delay. Powell, Thomson, and Ceci (2003) found that after a 3-day delay, older (6- to 8-year-olds) but not younger (4- to 5-year-olds) children recognized and sequenced variable options from the first and last instances better than from the middle instances. After a 3-week delay, the recency effect disappeared, but 6- to 8-year-olds still sequenced variable options from the first instance better than from the middle instances. Powell and Thomson (1997) reported primacy and recency effects for older, but not younger, children when asked to generate all experienced variable options. Overall, there is some evidence for a primacy effect, less evidence for a recency effect, and both may be limited to older children at short delays. In none of the published studies were children asked to recall and attribute details to multiple instances; they were asked about one instance or to report experienced details without assigning them to instances. This is the first demonstration of primacy and recency effects at a short delay when children are asked to attribute details to instances.

Limitations and Future Directions

Several limitations and future directions are relevant to the current study. First, children in the RE conditions participated in four events in two days. In Price, Connolly, and Gordon (2006), the spacing of instances was directly compared (four in 1 day, four in 4 days) with a 1-day delay to test. Children in the four-in-1-day condition reported more internal intrusions than did children in the 4-in-four-days condition. In other words, the four-in-1-day children had more difficulty keeping the instances separate, evidence that has been used to support script formation (Farrar & Goodman, 1990, 1992). The spacing in the current study was intermediate; it did not maximize the possibility of children forming independent memory for each instance. Future research should consider longer delays between instances of a repeated event to study presentation schedules that promote independent memory for instances. Second, the delay to interview in the present study was one to two days. Over time, memory becomes more general and less specific. This could dilute the effect of a deviation on memory for instances. Future research should investigate the effect of a deviation on memory for instances when the delay to test is longer. Third, the deviation was presented last in the series. Given that we found a recency effect in Experiment 3, the last one may be an instance that is naturally recalled well. Perhaps a deviation that occurs in the middle of the series would have a larger effect. Future research could explore this potential effect by placing the deviation in the middle of the series and examining memory for all instances among younger and older children. Fourth, in the current research, children experienced four instances of an engaging event, each instance contained novel and interesting props (e.g., a different magic trick). It is possible that a less engaging event or an event experienced more often would lead to a stronger or more targeted effect of deviation details.

Fifth, in our analyses of memory for variable options of the magic shows we excluded children who correctly answered fewer than half of the cued recall questions about deviation details. This was done to ensure that all children included in the analyses had reasonably good memory for the deviation details and thus, the current data apply to those circumstances only. It is possible that a less memorable deviation will affect children's memory for the deviation instance differently, although we can think of no theory that would support the notion that poorer memory for the deviation would lead to better memory for the instance that contained the deviation. Our decision to exclude based on a memory test held one or two days after the deviation may have had the undesirable effect of excluding not just children who did not attend to the deviation, but also children who attended to and forgot the deviation. In future studies, children's attention to the deviation should be assessed closer to the time the deviation is presented. One application of the current research is to forensic interviews and asking about "a time that was different" to help children to report details of one instance of a repeated offense. For its application to this setting, the deviation must be recallable.

We did not ask children if there was a time that was different from the others. This is an important direction for future research, particularly as it applies to forensic interviews. If children describe a deviation in response to a general question about a time that was different, forensic interviewers can use this information to label the instance and focus the child's report on the deviation instance. The deviation instance may not be remembered better than the others; however, there does not appear to be a disadvantage to asking about the deviation instance.

Conclusions

Many forensic interviewing protocols recommend that the interviewer elicit information about particular instances (e.g., Lamb et al., 2007) to ensure that a subsequent criminal charge is specific enough for the accused to raise a defense (Guadagno et al., 2006). One way to do this is to ask about a time that was different from the others. The expectation is that children are better able to recall an instance that was different from the others. Across three experiments, we found that unpredictable variation helped RE children recall more instance-specific details. In Experiment 3, we found that the benefit of a deviation is not limited to memory for the deviation instance; it helped younger children to recall all instances. This is consistent with script theory that a deviation is linked to the general event representation rather than to an instance. We speculate that cuing children to a time that was different may not help them to recall that instance better than others, but asking about the first or last time may lead to more complete reports.

References

Adams, L. T., & Worden, P. E. (1986). Script development and memory organization in preschool and elementary school children. *Discourse Processes, 9,* 149–166. http://dx.doi.org/10.1080/01638538609544637

Alba, J. W., & Hasher, L. (1983). Is memory schematic? *Psychological Bulletin, 93,* 203–231. http://dx.doi.org/10.1037/0033-2909.93.2.203

Bauer, P. J. (2012). The life I once remembered: The waxing and waning of early memories. In D. Bernsten & D. C. Rubin (Eds.), *Understanding autobiographical memory: Theories and approaches* (pp. 205–225). Cambridge, MA: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139021937.016

Bauer, P. J., & Fivush, R. (1992). Constructing event representations: Building on a foundation of variation and enabling relations. *Cognitive Development, 7,* 381–401. http://dx.doi.org/10.1016/0885-2014(92)90023-K

Bauer, P. J., & Shore, C. M. (1987). Making a memorable event: Effects of familiarity and organization on young children's recall of action sequences. *Cognitive Development, 2,* 327–338. http://dx.doi.org/10.1016/S0885-2014(87)80011-4

Brainerd, C. J., & Reyna, V. F. (2012). Reliability of children's testimony in the era of developmental reversals. *Developmental Review, 32,* 224–267. http://dx.doi.org/10.1016/j.dr.2012.06.008

Brubacher, S. P., Glisic, U., Roberts, K. P., & Powell, M. (2011). Children's ability to recall unique aspects of one occurrence of a repeated event. *Applied Cognitive Psychology, 25,* 351–358. http://dx.doi.org/10.1002/acp.1696

Brubacher, S. P., Roberts, K. P., & Powell, M. (2011). Effects of practicing episodic versus scripted recall on children's subsequent narratives of a repeated event. *Psychology, Public Policy, and Law, 17,* 286–314. http://dx.doi.org/10.1037/a0022793

Brubacher, S. P., Roberts, K. P., & Powell, M. (2012). Retrieval of episodic versus generic information: Does the order of recall affect the amount and accuracy of details reported by children about repeated events? *Developmental Psychology, 48,* 111–122. http://dx.doi.org/10.1037/a0025864

Connolly, D. A., & Gordon, H. M. (2014). Can order of general and specific memory prompts help children to recall an instance of a repeated event that was different from the others? *Psychology, Crime & Law, 20,* 852–864. http://dx.doi.org/10.1080/1068316X.2014.885969

Connolly, D. A., & Lindsay, D. S. (2001). The influence of suggestions on children's reports of a unique experience versus an instance of a repeated experience. *Applied Cognitive Psychology, 15,* 205–223. http://dx.doi.org/10.1002/1099-0720(200103/04)15:2<205::AID-ACP698>3.0.CO;2-F

Connolly, D. A., & Price, H. L. (2006). Children's suggestibility for an instance of a repeated event versus a unique event: The effect of degree of association between variable details. *Journal of Experimental Child Psychology, 93,* 207–223. http://dx.doi.org/10.1016/j.jecp.2005.06.004

Davidson, D. (2006). Memory for bizarre and other unusual events: Evidence from script research. In R. Hunt & J. B. Worthen (Eds.), *Distinctiveness and memory* (pp. 157–179). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780195169669.003.0008

Davidson, D., & Hoe, S. (1993). Children's recall and recognition memory for typical and atypical actions in script-based stories. *Journal of Experimental Child Psychology, 55,* 104–126. http://dx.doi.org/10.1006/jecp.1993.1005

Davidson, D., & Jergovic, D. (1996). Children's memory for atypical actions in script-based stories: An examination of the disruption effect. *Journal of Experimental Child Psychology, 61,* 134–152. http://dx.doi.org/10.1006/jecp.1996.0009

Farrar, M. J., & Boyer-Pennington, M. E. (1999). Remembering specific episodes of a scripted event. *Journal of Experimental Child Psychology, 73,* 266–288. http://dx.doi.org/10.1006/jecp.1999.2507

Farrar, M. J., & Goodman, G. S. (1990). Developmental differences in the relation between scripts and episodic memory: Do they exist? In R. Fivush & J. A. Hudson (Eds.), *Knowing and remembering in young children* (pp. 30–64). New York, NY: Cambridge University Press.

Farrar, M. J., & Goodman, G. S. (1992). Developmental changes in event memory. *Child Development, 63,* 173–187. http://dx.doi.org/10.2307/1130911

Finkelhor, D. (1979). *Sexually victimized children*. New York, NY: Simon & Schuster.

Fivush, R. (1984). Learning about school: The development of kindergartners' school scripts. *Child Development, 55,* 1697–1709. http://dx.doi.org/10.2307/1129917

Fivush, R. (1988). The functions of event memory: Some comments on Nelson and Barsalou. In U. Neisser & E. Winograd (Eds.), *Remembering reconsidered: Ecological and traditional approaches to the study of memory* (pp. 277–282). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511664014.011

Fivush, R. (2002). Scripts, schemas, and memory of trauma. In N. L. Stein, P. J. Bauer, & M. Rabinowitz (Eds.), *Representation, memory, and development: Essays in honor of Jean Mandler* (pp. 53–74). Mahwah, NJ: Lawrence Erlbaum.

Fivush, R., Hudson, J., & Nelson, K. (1984). Children's long-term memory for a novel event: An exploratory study. *Merrill-Palmer Quarterly, 30,* 303–316.

Fivush, R., Kuebli, J., & Clubb, P. A. (1992). The structure of events and event representation: A developmental analysis. *Child Development, 63,* 188–201. http://dx.doi.org/10.2307/1130912

Furman, L. N., & Walden, T. A. (1990). Effect of script knowledge on preschool children's communicative competence. *Developmental Psychology, 26,* 227–233. http://dx.doi.org/10.1037/0012-1649.26.2.227

Gomes, D. M., Sheahan, C., Fitzgerald, R., Connolly, D. A., & Price, H. L. (2015, March 12−19). *A meta-analysis examining differences in children's memory for single and repeated events*. Paper presented at the Annual American Psychology-Law Society Conference, San Diego, CA.

Goodman, G. S., Ogle, C. M., McWilliams, K., Narr, R. K., & Paz-Alonso, K. (2014). Memory development in the forensic context. In P. J. Bauer & R. Fivush (Eds.), *Handbook on the development of children's memory* (pp. 920–942). New York, NY: Wiley-Blackwell.

Graesser, A. C., Gordon, S. E., & Sawyer, J. D. (1979). Recognition memory for typical and atypical actions in scripted activities: Tests of a script-pointer + tag hypothesis. *Journal of Verbal Learning and Verbal Behavior, 18,* 319–332. http://dx.doi.org/10.1016/S0022-5371(79)90182-8

Graesser, A. C., Woll, S. B., Kowalski, D. J., & Smith, D. A. (1980). Memory for typical and atypical actions in scripted activities. *Journal of Experimental Psychology: Human Learning and Memory, 6,* 503–515. http://dx.doi.org/10.1037/0278-7393.6.5.503

Guadagno, B. L., Powell, M., & Wright, R. (2006). Police officers' and legal professionals' perceptions regarding how children are, and should be, questioned about repeated abuse. *Psychiatry, Psychology and Law, 13,* 251–260. http://dx.doi.org/10.1375/pplt.13.2.251

Hintzman, D. L. (1986). "Schema abstraction" in a multiple-trace memory model. *Psychological Review, 93,* 411–428. http://dx.doi.org/10.1037/0033-295X.93.4.411

Howe, M. L. (2006). Distinctiveness effects in children's memory. In R. Hunt & J. B. Worthen (Eds.), *Distinctiveness and memory* (pp. 237–257). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780195169669.003.0011

Howe, M. L., Courage, M. L., Vernescu, R., & Hunt, M. (2000). Distinctiveness effects in children's long-term retention. *Developmental Psychology, 36,* 778–792. http://dx.doi.org/10.1037/0012-1649.36.6.778

Hudson, J. A. (1988). Children's memory for atypical actions in script-based stories: Evidence for a disruption effect. *Journal of Experimental Child Psychology, 46,* 159–173. http://dx.doi.org/10.1016/0022-0965(88)90055-0

Hudson, J. A. (1990). Constructive processes in children's event memory. *Developmental Psychology, 26,* 180–187. http://dx.doi.org/10.1037/0012-1649.26.2.180

Hudson, J. A., Fivush, R., & Kuebli, J. (1992). Scripts and episodes: The development of event memory. *Applied Cognitive Development, 6,* 483–505. http://dx.doi.org/10.1002/acp.2350060604

Hudson, J. A., & Mayhew, E. M. Y. (2009). The development of memory for recurring events. In M. Courage & N. Cowan (Eds.), *The development of memory in infancy and childhood* (pp. 69–92). New York, NY: Psychology Press.

Kuebli, J., & Fivush, R. (1994). Children's representation and recall of event alternatives. *Journal of Experimental Child Psychology, 58,* 25–45. http://dx.doi.org/10.1006/jecp.1994.1024

Lamb, M. E., Orbach, Y., Hershkowitz, I., Esplin, P. W., & Horowitz, D. (2007). A structured forensic interview protocol improves the quality and informativeness of investigative interviews with children: A review of research using the NICHD Investigative Interview Protocol. *Child Abuse & Neglect: The International Journal, 31,* 1201–1231. http://dx.doi.org/10.1016/j.chiabu.2007.03.021

Lucariello, J., & Nelson, K. (1985). Slot-filler categories as memory organizers for young children. *Developmental Psychology, 21,* 272–282. http://dx.doi.org/10.1037/0012-1649.21.2.272

Murachver, T., Pipe, M.-E., Gordon, R., Owens, J. L., & Fivush, R. (1996). Do, show, and tell: Children's event memories acquired through direct experience, observation, and stories. *Child Development, 67,* 3029–3044. http://dx.doi.org/10.2307/1131765

Myles-Worsley, M., Cromer, C. C., & Dodd, D. H. (1986). Children's preschool script reconstruction: Reliance on general knowledge as memory fades. *Developmental Psychology, 22,* 22–30. http://dx.doi.org/10.1037/0012-1649.22.1.22

Nelson, K. (1988). The ontogeny of memory for real events. In U. Neisser & E. Winograd (Eds.), *Remembering reconsidered: Ecological and traditional approaches to the study of memory* (pp. 244–279). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511664014.010

Nelson, K., & Gruendel, J. M. (1979). At morning its lunchtime: A scriptal view of children's dialogues. *Discourse Processes, 2,* 73–94. http://dx.doi.org/10.1080/01638537909544456

Nelson, K., & Gruendel, J. M. (1986). Children's scripts. In K. Nelson (Ed.), *Event knowledge: Structure and function in development* (pp. 21–46). Hillside, NJ: Lawrence Erlbaum.

Powell, M. B., Roberts, K. P., Ceci, S. J., & Hembrooke, H. (1999). The effects of repeated experience on children's suggestibility. *Developmental Psychology, 35,* 1462–1477. http://dx.doi.org/10.1037/0012-1649.35.6.1462

Powell, M. B., & Thomson, D. M. (1997). Contrasting memory for temporal-source and memory for context in children's discrimination of repeated events. *Applied Cognitive Psychology, 11,* 339–360. http://dx.doi.org/10.1002/(SICI)1099-0720(199708)11:4<339::AID-ACP460>3.0.CO;2-O

Powell, M. B., & Thomson, D. M. (2003). Improving children's recall of an occurrence of a repeated event: Is it a matter of helping them to generate options? *Law and Human Behavior, 27,* 365–384. http://dx.doi.org/10.1023/A:1024032932556

Powell, M. B., Thomson, D. M., & Ceci, S. J. (2003). Children's memory of recurring events: Is the first event always the best remembered? *Applied Cognitive Psychology, 17,* 127–146. http://dx.doi.org/10.1002/acp.864

Price, D. W., & Goodman, G. S. (1990). Visiting the wizard: Children's memory for a recurring event. *Child Development, 61,* 664–680. http://dx.doi.org/10.2307/1130952

Price, H. L., Connolly, D. A., & Gordon, H. M. (2006). Children's memory for complex autobiographical events: Does spacing of repeated instances matter? *Memory (Hove, England), 14,* 977–989. http://dx.doi.org/10.1080/09658210601009005

Racsmány, M., Conway, M. A., & Demeter, G. (2010). Consolidation of episodic memories during sleep: Long-term effects of retrieval practice. *Psychological Science, 21,* 80–85. http://dx.doi.org/10.1177/0956797609354074

Slackman, E., & Nelson, K. (1984). Acquisition of an unfamiliar script in story form by young children. *Child Development, 55,* 329–340. http://dx.doi.org/10.2307/1129946

Trocmé, N., Fallon, B., MacLaurin, B., Sinha, V., Black, T., Fast, E., . . . Holroyd, J. (2010). *Canadian Incidence Study of Reported Child Abuse and Neglect–2008*. Ottawa, Ontario, Canada: Public Health Agency of Canada.

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