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Children's Reasoning About Which Episode of a Repeated Event is Best Remembered

MEAGHAN C. DANBY[1], SONJA P. BRUBACHER[1], STEFANIE J. SHARMAN[1]*, MARTINE B. POWELL[1] and KIM P. ROBERTS[2]

[1]*Centre for Investigative Interviewing, Deakin University, Burwood, Victoria, Australia*
[2]*Wilfrid Laurier University, Waterloo, Ontario, Canada*

Summary: Despite much research into children's ability to report information from an individual episode of a repeated event, their capacity to identify well-remembered episodes is unknown. Children (n = 177) from Grades 1 to 3 participated in four episodes of a repeated event and were later asked to recall the time that they remembered 'best' and then 'another time.' Post-recall, children were asked what they believed 'the time you remember best' meant, and how they decided which episode to recall. Older children were better able than younger to understand the prompt and nominate an episode, but children of all ages showed improved ability to produce an episode for discussion when subsequently asked about 'another time.' All children struggled to describe their decision-making processes, suggesting that they had yet to develop sufficient metamemory knowledge for the task. Results suggest that children have difficulty explicitly identifying well-remembered episodes of repeated events.

CHILDREN'S REASONING ABOUT WHICH EPISODE OF A REPEATED EVENT IS BEST REMEMBERED

Numerous studies have explored how children report memories of specific episodes within a repeated event and ways to facilitate that recall (see Brubacher, Powell, & Roberts, 2014, for review). This literature built on foundational work by Nelson, Hudson, and Fivush (e.g., Fivush, 1984; Fivush, Hudson, & Nelson, 1984; Hudson & Nelson, 1983, 1986), who provided detailed descriptions of the encoding, organization, and retrieval of children's scripts; memories for what *usually happens* during a repeated event. Although repeated experience strengthens children's scripts, it also impairs their accurate retrieval of details specific to individual episodes (Brubacher et al., 2014). Recalling specific episodes of a repeated event relies on cognitive skills such as source monitoring (Johnson, Hashtroudi, & Lindsay, 1993), temporal understanding (Roberts et al., 2015), and critically, the metamemory ability to decide which episode(s) have the strongest memory traces.

In forensic interviewing protocols (e.g., the *National Institute of Child Health and Human Development [NICHD] protocol*, Lamb, La Rooy, Malloy, & Katz, 2011; *Ten step investigative interview*, Lyon, 2005), interviewers may ask children with repeated experience to describe specific details of a time they can remember well. Giving children control over which episode to describe is assumed to yield high quality information because it purportedly allows them to report the episodes deemed most memorable. This assumption has no empirical basis and, indeed, it is not known what children understand to be well remembered. Interviewers hope witnesses will provide memories of the events that contain the most detail without compromising the accuracy of that detail. Children's ability to judge which episode of a repeated event is best remembered, however, is challenging from a metacognitive perspective. The set of skills upon which the task rests develops between the ages of 4 to 12 (Beal, 1985; O'Sullivan, 1997; Roberts, 2002; Schneider & Lockl, 2008). The current study examined children's ability to choose one of four episodes of a repeated event that they remembered best.

Cognitive requirements for nominating the episode best remembered

The task of effectively nominating an episode best remembered requires discriminating among episodes during retrieval, and comparing memory for each episode to decide which is strongest. When episodes contain many similarities, memory scripts for what usually occurs are strong (Farrar & Goodman, 1992; Hudson, Fivush, & Kuebli, 1992) and discriminating between episodes is challenging (Lindsay, Johnson, & Kwon, 1991). Children are able to recall details that differentiate episodes (i.e., details that only happened in one episode; Brubacher, Glisic, Roberts, & Powell, 2011), but often misattribute them as occurring during an incorrect episode (Connolly & Lindsay, 2001; Powell & Thomson, 1996). The source-monitoring framework can be used to understand children's ability to accurately discriminate between memories (Johnson et al., 1993).

Source monitoring involves decision-making processes that are carried out during memory retrieval about the origin of the information being recalled (Johnson et al., 1993; Roberts, 2002). The qualitative properties of memories are used to decide the source of the memory content. For example, adults might decide that strong memories must originate from recent episodes because they are aware that memory decays over time (Johnson, Foley, Suengas, & Raye, 1988). Such knowledge about the properties of memory is called declarative metamemory, which tends to improve with

*Correspondence to: Stefanie J. Sharman, Centre for Investigative Interviewing, Deakin University, Burwood, Victoria, Australia.
E-mail: stefanie.sharman@deakin.edu.au

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age as children learn about memory strategies (Cherney, 2003; Schleepen & Jonkman, 2014).

Beyond knowledge of how memory works, metamemory also encompasses the real-time application of skills such as monitoring memories and utilizing effective memory strategies, known as procedural metamemory (Flavell & Wellman, 1977; Schneider & Lockl, 2002). Nominating a well-remembered episode to be discussed during an interview requires the application of these skills to monitor memories of each episode, and to utilize strategies to decide which one is most suitable. Procedural metamemory is highly influenced by the specific memory task at hand (Fritz, Howie, & Kleitman, 2010; Schneider & Lockl, 2008; Schneider, 2015). For example, Roebers and Howie (2003) examined children's ability to monitor their own attempts at retrieving information from memory. When 8- and 10-year-olds were asked specific non-misleading questions about a witnessed video, they were more confident about their correct than incorrect answers. However, when asked specific misleading questions about the video, children no longer demonstrated this metacognitive insight, reporting they were highly confident in their correct and incorrect answers. Early evidence of memory monitoring during recall of repeated events has been found in young children. Roberts and Powell (2005) found that 5- and 6-year-olds who had experienced a repeated event were very confident in their responses to questions about event details that were exactly the same across every episode (script-consistent), but were less confident about details that changed.

Current study

In only three experimental studies on children's memory for individual episodes of repeated events have children been asked to report details of a time of their choosing (i.e., the time remembered best; Brubacher, Glisic, et al., 2011; Brubacher, Roberts, & Powell, 2011, 2012). The 'remember best' experiments generally demonstrated that older children had better memories for a specific episode than younger children. However, we do not know what these children understood by requests to describe the episode they remember best, and how they chose that episode. Establishing children's comprehension of the phrase 'the time you remember best' has implications for theories of the development of repeated event memory and for investigative interviewers tasked with eliciting children's accounts of repeated events.

The goals of the present study were to describe children's: (i) ability to choose a well-remembered episode from a repeated event; and (ii) understanding of the phrase 'the time you remember best.' A week after children (aged 5 to 9) experienced a repeated event they were interviewed in an open-ended manner about the time at the event they remembered best. The interviewer subsequently asked about another time, in order to allow for comparisons with recall of the episode deemed best remembered. At the conclusion of their interview, children were asked what they believed the phrase 'the time you remember best' meant and how they decided on an episode to report. It was expected that children 's capacity to nominate an episode of a repeated event would increase with age, correspondent with source-monitoring improvements (Brubacher, Malloy, Lamb, & Roberts, 2013; Roberts, 2002). Further, we expected to observe age-related improvements in their ability to explain the phrase 'the time you remember best' because of metacognitive developments. Older children's recall of the time they remembered best was predicted to be more complete than their recall for the second episode they described.

METHOD

Participants

A sample of 177 children (96 girls, 81 boys) was recruited from primary schools across Melbourne, Australia, and surrounding areas. Children were aged 5 to 9 years old ($M = 7.33$ years, $SD = 1.06$). This age range was selected to encompass younger children who are still developing source monitoring and metamemory abilities, and older children who have more developed cognitive abilities (Farrar & Goodman, 1992; Fritz et al., 2010). Children's parents gave informed consent, and children assented to participate in the study. Three children were excluded from the sample as their interviews were terminated early upon the children's request. For analyses, children were divided into their grade levels: Grade 1 ($n = 68$, $M_{years} = 6.26$, $SD = .40$), Grade 2 ($n = 57$, $M_{years} = 7.42$, $SD = .30$), and Grade 3 ($n = 52$, $M_{years} = 8.64$, $SD = .54$).

Materials

Children experienced a 25-min scripted activity session (the Deakin Activities) on four occasions. Each episode of the activities comprised 16 target memory items created specifically for research so that children would not have a pre-existing script for them. Items were always administered in the same temporal order and centered around six main activities: meeting a puppet, listening to a story, doing a puzzle, relaxing, getting refreshed, and receiving a surprise. For example, three items related to meeting the puppet: the puppet's name, the type of animal that had kept the puppet awake at night, and the musical instrument used to wake up the tired puppet. The items were based on those successfully employed in previous repeated event research (e.g., Roberts et al., 2015; Powell & Thomson, 1996).

In each episode of the Deakin Activities, the 16 memory items varied according to a schedule. Four items were presented identically in each episode (e.g., children met the same puppet each time), nine items changed in each episode (e.g., children heard a different story each time), and every episode contained three items that did not appear any other time (e.g., children did a puzzle in only one episode). Because each new item only appeared in a single episode, the particular number of items pertaining to each main activity (i.e., the puppet, story, puzzle, relaxing, refreshment and surprise) differed in each episode, but the overall total per episode was always 16 items. Four counterbalanced presentation schedules were created, such that the particular items that were fixed, variable, and new systematically changed for each group of children. Children were randomly assigned to a counterbalanced version. There were no

significant differences in any of the dependent variables across counterbalanced versions, $ps \geq .07$.

Procedure

The research was approved by the university's human research ethics board. Trained research assistants conducted the Deakin Activities in schools with groups of 20–40 children, twice a week for two weeks. Teachers were present for the activities, but were requested not to discuss them with their students. Individual interviews were conducted with each child 3 to 8 days after the final episode by one interviewer. Because of practical constraints, some interviews were conducted after a weekend break. The number of interviews held before a weekend break ($n = 108$; $M = 4.33$, $SD = 0.70$; 3 – 5 days) or after a weekend break ($n = 69$; $M = 6.78$, $SD = 0.78$; 6 – 8 days) did not significantly differ across age groups, χ^2 (2, $N = 177$) = 4.66, $p = .10$, nor did interview delay influence any of the dependent variables, $\chi^2 s \leq 7.24$, $ps \geq .20$. Accordingly, interview delay was not considered in analyses.

After brief rapport building, children were invited to talk about the Deakin Activities and instructed to recall 'the time you remember best.' If children could not immediately nominate an episode, the interviewer provided another prompt for the child to recall the episode remembered best (e.g., 'Think really hard about the one time you can remember best at the Deakin Activities'). If the child still could not nominate an episode, the interviewer assisted by asking children to select an episode with notably different phrasing (e.g., 'Think about all the days you went to the Deakin Activities. Now tell me about one of the days you went there') or by choosing from a specific detail the child had already reported (e.g., 'You mentioned a dog story. Tell me about the day you heard the dog story'). Although blind to what each child did in each specific episode, the interviewer had a card listing the four details presented identically in each episode and could otherwise choose the first details reported by the child. The purpose of this procedure was to avoid the interviewer choosing an invariant detail to orient children to individual episodes, as these were present every time and would not allow identification of which episode was discussed. The interviewer then elicited a narrative account about the episode using open-ended prompts (e.g., 'Then what happened?' 'Tell me more about X') until children could recall no more.

Children were subsequently invited to talk about 'another time you went to the Deakin Activities' to allow comparisons with their best remembered (or first discussed) episode. Again, if children could not explicitly choose an episode the interviewer gave them another prompt requesting that they recall 'another time.' For those children who still could not nominate an episode, the interviewer again focused them on one episode by utilizing different phrasing (e.g., 'You just told me about one day at Deakin Activities. Now tell me about a different day you did the Deakin Activities') or choosing a mentioned detail. The interviewer then prompted children about this episode until their recall was exhausted. At the conclusion of children's narratives, their comprehension of 'the time you remember best' was assessed by asking 'When I asked you about "the time you remember best", what do you think I meant?' To measure their ability to metacognitively reflect on and select the time remembered best, children were then asked, 'How did you decide which time you remembered best?' Interviews lasted approximately 20 min. The interviews were audio recorded and transcribed verbatim.

Coding

Coding categories were created based on all of the authors' collective experiences in interviewing children about repeated events. Operational definitions for each category were created, and expected exemplars were listed. The two graduate student coders were blind to children's ages and the hypotheses of the study.

The time you remember best/another time at the Deakin Activities

Children's immediate response to the prompts asking them to describe 'the time you remember best' and 'another time' were recorded. For children who received extra prompting to help them nominate an episode all additional responses were noted, and it was recorded if the child could ultimately nominate an episode or not (i.e., if the interviewer had to direct the child to an episode using an alternative prompt or a mentioned detail).

Children's responses to 'the time you remember best' and the 'another time' prompts fell into one of four categories: *Don't know*, *Nominated*, *Script reference*, and *Other* (see Table 1 for a description and examples of each response category). 'I don't remember' and 'I don't understand' responses were collapsed with the *Don't know* category because these answers were too infrequent to warrant separate categories (12 children responded 'I don't understand' and four said 'I don't remember'). Although knowing and understanding are semantically different, previous research has shown that children often fail to signal misunderstandings. Instead, they provide an answer or respond, 'don't know' (Markman, 1979; Waterman, Blades, & Spencer, 2000).

Comprehension question: 'When I asked you about "the time you remember best", what do you think I meant?'

Coders recorded how children responded when asked what they thought the phrase 'the time you remember best' meant after their narratives. Children's responses fell into one of five categories: *Explanation* (a reasonable explanation such as 'The one I remember the most things from'), *Don't know*, *Script reference* (e.g., 'You meant the puppet part'), *Favorite* (the child chose the episode or activity s/he enjoyed the most), and *Other*.

Metacognitive question: 'How did you decide which time you remembered best?'

Coders recorded how children responded when asked how they decided which time they remembered best. Responses fell into one of seven categories: *Explanation* (a reasonable explanation of the child's decision-making process such as 'I thought of them all and picked the one I know the most for'), *Restate* (restatement of the chosen episode such as 'I

Table 1. Response categories for children's responses to the prompts 'the time you remember best' and 'another time'.

Category	Category description	Example responses
Nominated	Child speaks about one episode listing details from a single episode, or labelling the episode with a clear term (i.e., 'the X time').	'We did a cat story, a clown puzzle and got star stickers.' 'The last time.'
Don't know	Child admits s/he does not know, understand, or remember.	'I don't know/remember/understand'
Script reference	Child refers to his/her script for the activities, reporting how the activities usually occurred or a script component rather than a whole episode.	'We always do the same things.' 'When we got refreshed.'
Other	Response does not fit into any other category.	'10 o'clock.' 'We learned lots.'

thought of the last one'), *Don't know, Script reference, Favorite, Cognition* (the child referred to cognitive processes without mention of deciding upon an episode; e.g., 'I just thought hard'), and *Other*. Only two responses fell into the *Explanation* category, so it was combined with the *Restate* category. Analyses were the same regardless of whether the two responses were omitted or collapsed.

Narratives

When children were discussing the episodes best remembered and another time at the Deakin Activities, coders recorded which of the four episodes (first, second, third, or fourth) were selected. Next, coders tallied the amount of episode-specific information (e.g., hearing a story *about an elephant*) children reported from each of the two episodes they had recalled.

Reliability

For reliability purposes, 20% of transcripts were double-coded; 10% at the outset of coding, and an additional 10% later to ensure that coders maintained reliability. Kappa ranged from 0.80 to 1.00 ($M = 0.90$) across both time points. Disagreements were resolved through discussion.

RESULTS

We first examined children's immediate responses to the 'time you remember best' prompt, as well as how children answered the comprehension and metacognitive questions. Because many children could not produce an episode for discussion without interviewer assistance, we then examined differences between those children who could and could not provide an episode to the 'time you remember best' prompt. Finally, we examined children's responses when prompted to recall 'another time' and compared children's recall of each episode (i.e., the time deemed best remembered, and another time).

How did children interpret the 'time you remember best' prompt?

One child did not receive the prompt to recall the time remembered best (the Grade 2 child immediately narrated a specific episode without prompting; see Figure 1 for a flowchart of interviewer prompting and children's responses). Of the remaining 176 children, 70 nominated an episode, either by labelling the episode with a clear term ($n = 52$; 7 Grade 1 s, 23 Grade 2 s, and 22 Grade 3 s) or listing what happened during one episode ($n = 18$; equal across age groups). A 3 (grade: 1, 2, 3) × 4 (response category: Nominated, Don't know, Script reference, Other) chi-square demonstrated that age was significantly related to children's responses to 'the time you remember best' prompt, χ^2 (6, $N = 176$) = 21.20, $p = .002$ (see upper half of Table 2 for response distributions). Grade 2 s and 3 s were more likely to nominate an episode of the activities than expected, while Grade 1 s were less likely to do so. Instead, Grade 1 s were more likely to refer to their scripts (e.g., choosing a script component such as 'doing the puzzles') than expected.

Comprehension question responses

There were six children who did not answer the comprehension question (one Grade 2 and five Grade 3 s) and one who did not receive the time remember best prompt. For the remaining 170 children, a 3 (grade: 1, 2, 3) × 5 (comprehensive question response: Explanation, Don't know, Script reference, Favorite, Other) chi-square revealed a significant relationship between age and response, χ^2 (8, $N = 170$) = 21.45, $p = .006$ (see Table 3). Grade 1 s were more, and Grade 3 s less, likely than expected to report they did not know what the phrase meant. The reverse was true for reasonably explaining the phrase, with Grade 1 s less likely and Grade 3 s more likely to do so.

We further examined if children's response to the time you remember best prompt was associated with their ability to reasonably explain what the phrase meant. A 4 ('time remember best' response: Nominated, Don't know, Script reference, Other) × 2 (comprehensive question response: provided reasonable explanation or not) chi square demonstrated that performance on the comprehension question was associated with responses to the time remembered best prompt, χ^2 (3, $N = 170$) = 12.35, $p = .006$. Children who successfully nominated an episode of the activities more often provided a reasonable response to the comprehension question than expected, in contrast to children who referred to their scripts, or gave other responses.

Metacognitive question responses

There were nine children who did not provide a response to the metacognitive question (including the six who did not

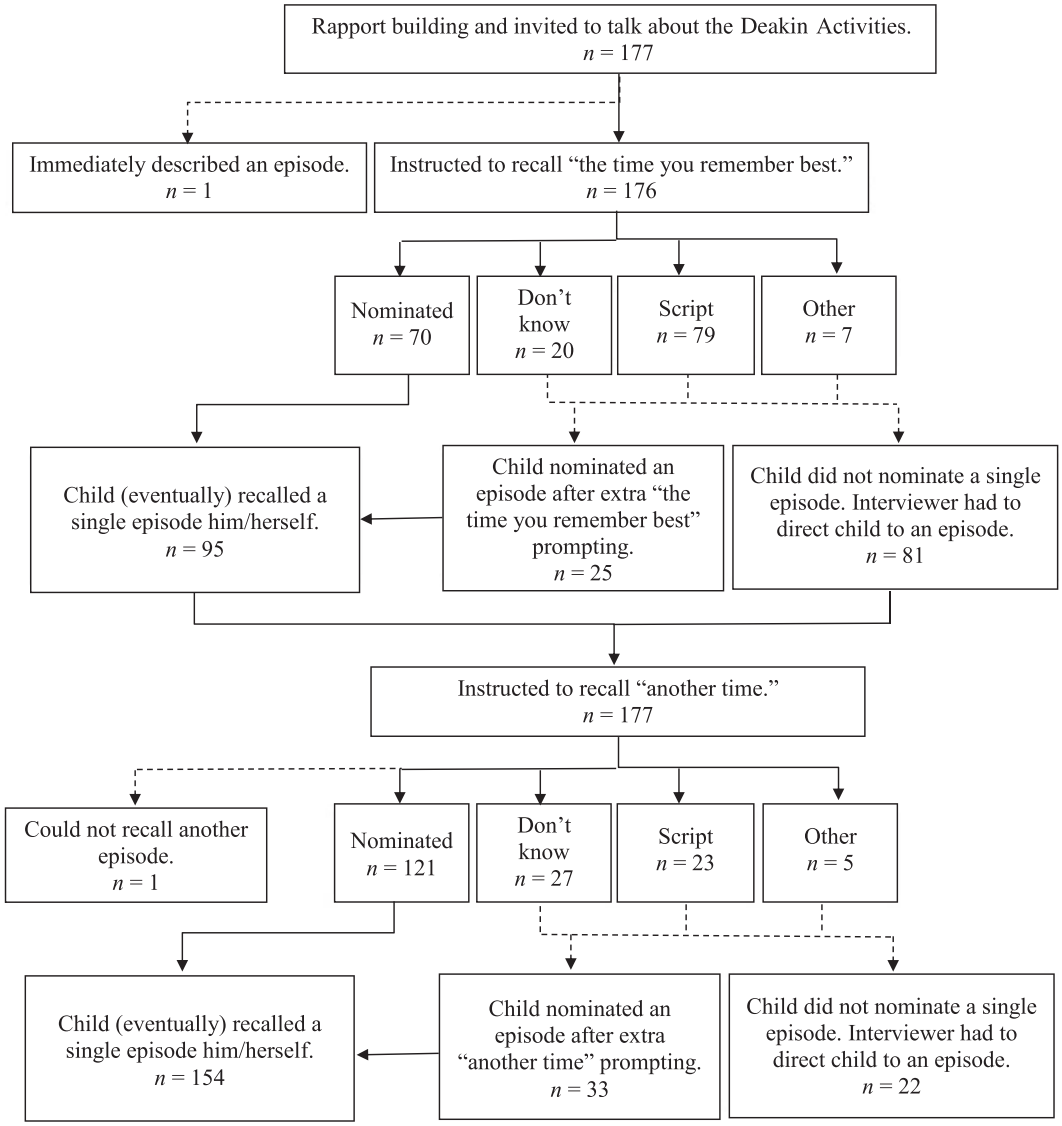

Figure 1. Flowchart of methodology and children's responses

Table 2. Distribution of children's responses to 'the time you remember best' and 'another time' by age group

	Response to 'time you remember best' prompt							
	Nominated		Don't know		Script reference		Other	
Age group	*n*	%	*n*	%	*n*	%	*n*	%
Grade 1	14	20.6	7	10.3	42	61.8	5	7.4
Grade 2	28	50.0	8	14.3	19	33.9	1	1.8
Grade 3	28	53.8	5	9.6	18	34.6	1	1.9
Response to 'another time' prompt								
Grade 1	39	58.2	11	16.4	13	19.4	4	6.0
Grade 2	39	68.4	8	14.0	9	15.8	1	1.8
Grade 3	43	82.7	8	15.4	1	1.9	0	0.0

Note: Percentages are across age group.

answer the comprehension question; two Grade 1 s, two Grade 2 s, and five Grade 3 s), and one Grade 2 child who was not asked the time you remember best prompt during her interview. For the 167 children who tried to answer, a 3 (grade: 1, 2, 3) × 6 (response: Explanation/Restate, Don't know, Script reference, Favorite, Cognition, Other) chi square showed no association between age and metacognitive question response categories, χ^2 (10, $N = 167$) = 13.70, $p = .19$.

Comparing children who could and could not choose an episode themselves

As noted, children were not always able to choose an episode themselves. Of the 106 children who did not immediately choose an episode as the time they remembered best, 25 went on to choose one with an additional 'time remember best' prompt. The remaining 81 children needed the interviewer to coax them through choosing an episode (e.g., 'think really hard and tell me about one day at the Deakin Activities') or to choose an episode for them from a mentioned detail. We investigated age differences between those children who were (eventually) able to nominate an episode ($n = 95$), and those who were not ($n = 81$). A 3 (grade: 1, 2, 3) × 2 (nominator: child, interviewer) chi square demonstrated that age was significantly related to children's ability to nominate an episode, χ^2 (2, $N = 176$) = 13.47, $p = .001$ (see Table 4). Grade 3 s were more likely to nominate an episode

Table 3. Distribution of children's comprehension of 'the time you remember best' by age group

	Response									
	Explanation		Don't know		Script reference		Favourite		Other	
Age group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Grade 1	12	17.6	22	32.4	20	29.4	9	13.2	5	7.4
Grade 2	21	37.5	13	23.2	10	17.9	7	12.5	5	8.9
Grade 3	21	38.9	2	4.3	13	27.7	9	19.1	2	4.3

Note: Percentages are across age group.

Table 4. Distribution of children's ability to nominate an episode by age group

	Nominator of episode			
	Child		Interviewer assisted	
Age group	*n*	%	*n*	%
Grade 1	25	36.8	43	63.2
Grade 2	35	62.5	21	37.5
Grade 3	35	67.3	17	32.7

Note: Percentages are across age group.

themselves while Grade 1 s most often required interviewer assistance to select an episode.

Interactions with comprehension question responses

A 2 (nominator: child, interviewer) × 5 (comprehension question response: Explanation, Don't know, Script reference, Favorite, Other) chi square revealed a significant relationship between children's ability to nominate an episode and their understanding of the phrase 'the time you remember best', χ^2 (4, $N = 170$) = 26.27, $p < .001$. Children who did not nominate an episode themselves were most likely to admit that they did not know what the phrase meant, while children who did nominate an episode were most likely to either satisfactorily explain the phrase or to explain that the phrase meant their 'favorite time'.

Interactions with metacognitive question responses

A 2 (nominator: child, interviewer) × 5 (metacognitive question response: Explanation/Restate, Don't know, Script reference, Favorite, Cognition, Other) chi square demonstrated no significant relationship between children's ability to nominate an episode and their explanation of their cognitive processes when nominating an episode, χ^2 (5, $N = 167$) = 9.25, $p = .09$.

Which episodes were chosen?

We identified the episode ultimately discussed as the time remembered best. Data from five children (two Grade 1 s, and three Grade 2 s) had to be removed from the analysis because their chosen episode was ambiguous (e.g., 'one of the middle days,' 'the time with the story' [when a story was present every time]). Of the remaining 172 children, 53 discussed the first episode, 15 discussed the second, 23 discussed the third, and 81 discussed the last. Which episode was nominated did not differ across age groups, χ^2 (6, $N = 172$) = 4.14, $p = .66$, and importantly did not differ according to whether it had been chosen by the child or the interviewer, χ^2 (3, $N = 172$) = 4.71, $p = .19$. Further, the chosen episode had no relationship with the primary dependent variables, χ^2s ≤ 11.61, ps ≥ .48.

Response when prompted to describe another time

When children were requested to describe what happened 'another time at the Deakin Activities,' one child could not report a second episode (the Grade 1 child only spoke generically about what usually happened at the activities). Of the 176 children who discussed another episode, 121 explicitly nominated the episode themselves, labelling the episode with a clear term ($n = 58$; 14 Grade 1 s, 21 Grade 2 s, and 23 Grade 3 s) or listing specific details about what happened ($n = 63$; 25 Grade 1 s, 18 Grade 2 s, and 20 Grade 3 s). Because of small expected cell counts in the contingency table, the Fisher–Freeman–Halton exact test was used to examine age differences across response groups. This test generalizes Fisher's exact test to contingency tables greater than 2 × 2 (Conover, 1980). The 3 (grade: 1, 2, 3) × 4 (response category: Nominated, Don't know, Script reference, Other) contingency table demonstrated that children's age was significantly related to their response when prompted to recall 'another time,' $p = .015$ (see lower half of Table 2 for response distributions). The most frequent response of each age group was to nominate an episode; however, Grade 1 s made this response less often than expected, while Grade 3 s made this response more often than expected. Further, Grade 1 s were more likely to refer to their scripts than expected, and Grade 3 s were less likely to do so.

Of the 55 children who did not immediately nominate an episode themselves, 33 soon went on to nominate an episode with additional prompting (see Figure 1). We investigated age differences between those children who selected another episode themselves ($n = 154$) and those for whom the interviewer ultimately had to choose the episode to be discussed by referring to a mentioned detail ($n = 22$). There was no association between age and who selected the episode, χ^2 (2, $N = 176$) = 3.09, $p = .21$.

Eight children only referred to ambiguous details about their second reported episode, so we could not determine which of the four activity sessions they chose. Of the remaining 168 children, the episode selected as 'another episode' was evenly spread: 48 chose the first, 40 chose the second, 39 chose the third, and 41 chose the last episode. Episode choice did not differ across age groups, χ^2 (6, $N = 168$)

= 8.46, $p = .21$. There was no association between episode choice and whether it was nominated by the child or the interviewer, χ^2 (3, $N = 168$) = 4.06, $p = .26$. Further, chosen episode had no relationship to the primary dependent variables, χ^2s ≤ 19.18, ps ≥ .21.

Comparing children's reports of each episode

A significantly higher proportion of children immediately nominated an episode when prompted to recall another time ($n = 121$, of 177 children) than the proportion who did so when prompted to recall the time remembered best ($n = 70$, of 176 children), $z = 5.39$, $p < .01$. We compared children's memories for the episode ultimately discussed as 'the time remembered best' and for 'another time' (as indexed by mention of episode-specific details). A repeated measures ANOVA was conducted to compare the number of episode-specific details children reported when recalling each episode. Age group was included as a between-subjects factor (see Table 5 for means and standard deviations). Children reported significantly more details about the episode nominated as 'remembered best' ($M = 4.74$, $SD = 2.35$) than about 'another time' ($M = 3.95$, $SD = 2.08$), $F(1, 174) = 20.99$, $p < .001$, $\eta_p^2 = .11$. There was also a main effect of age group, $F(1, 174) = 12.74$, $p < .001$, $\eta_p^2 = .13$. Grade 1 s reported significantly fewer details than Grade 2 s, $p = .005$, and Grade 3 s, $p < .001$, who did not differ from each other, $p = .25$. The episode nominated did not interact with age group on the number of details reported, $F(2, 174) = 0.45$, $p = .64$.

DISCUSSION

This study was the first to describe how children interpret requests to select and narrate a memorable episode from a repeated event. Although the first and last episodes of a repeated event should be well recalled (Gomes, Sandhu, Qi, Lee, & Connolly, 2014; Roberts et al., 2015), interviewers cannot assume that these are the most memorable episodes for every child. For example, the first episode may have happened when the child was very young and unable to create and store a detailed memory for the incident, or an intermediate episode may involve salient or unique factors making it more memorable. Further, prompting children to recall the first or last episodes may prove impractical with young children, because an understanding of temporal language develops gradually (Orbach & Lamb, 2007; Powell & Thomson, 1997). The current research began to address these concerns.

Table 5. Mean number of episode-specific details reported about 'the time you remember best' and 'another time' by age group

	Time remembered best		Another time	
Age group	*M*	*SD*	*M*	*SD*
Grade 1	3.91	2.36	2.91	1.98
Grade 2	4.81	2.25	4.19	1.87
Grade 3	5.52	2.43	4.75	2.40

Developmental findings

Results demonstrated emerging developmental improvements in children's responding to the 'time you remember best' prompt. Only the two older age groups were more likely than expected to nominate an episode when prompted. The younger children instead required the interviewer to assist them in choosing an episode. Further, when questioned about their understanding of the prompt 'the time you remember best,' the youngest children tended to admit they did not know what it meant, while the oldest children gave appropriate explanations for the phrase. Finally, the older children reported more episode-specific details about both nominated episodes (i.e., the time remembered best and another time) than the younger children. These developmental improvements are likely because of older children's superior source-monitoring (Roberts, 2002), and metacognitive abilities (Fritz et al., 2010).

Efficiently nominating the time remembered best requires children to discriminate between each episode (source) and compare the content remembered from each. Older children reliably outperform their younger counterparts at discriminating sources of information (Drummey & Newcombe, 2002; Powell & Thomson, 1996), and recall more details from a specific episode of a repeated event (Brubacher et al., 2014). Episodes of repeated events can be discriminated from one another by identifying script-inconsistent details, which older children do more successfully than do younger (Brubacher, Glisic, et al., 2011; Farrar & Boyer-Pennington, 1999; Farrar & Goodman, 1992). Indeed, in the current study, the Grade 1 s appeared disinclined to distinguish between episodes, referring to their scripts more often than expected in response to prompting about 'the time you remember best' and 'another time.' Further, they frequently required the interviewer to assist them in choosing an individual episode for discussion.

All children struggled to describe their decision-making processes when responding to the metacognitive question, suggesting that the ability to reflect on the decision lags behind comprehension of the phrase, as would be expected. To successfully nominate the time remembered best, children required declarative metamemory knowledge of the cognitive demands of the task (e.g., understanding memories for each episode must be distinguished internally for comparison), and procedural metamemory application of this knowledge during the interview (e.g., nominating the episode they have reasoned they should be able to recall the most). Declarative knowledge of memory processes continues to develop and refine well beyond the age-range of the current sample (Fritz et al., 2010; Schneider, 2015). For example, Friedman (2007) found that children under 10–12 years had many limitations to their understanding of memory processes, and asserted that much metamemory development occurs beyond this age. Conversely, procedural metamemory abilities appear impartial to developmental improvements (hinging instead on the specific memory task at hand), where even older children and adults will fail to engage in appropriate metamemory applications during particular memory tasks (Markman, 1979; Shing, Werkle-Bergner, Li, & Lindenberger, 2009). The metamemory skills

required to nominate and then narrate a well-remembered episode from a repeated event appear too sophisticated for the younger children in the current sample. Even the older children, who nominated an episode more often than would be expected by chance, lacked the ability to report their developing metamemory abilities when questioned about their decision-making processes.

Older children reported more details than younger children about both the episode remembered best and another time. Older children's more developed memory systems likely allowed them to report more details about the episodes than the younger children (Roberts, 2002). The lack of interaction between age group and episode (i.e., the time remembered best and another time) demonstrates that children's capacity to nominate an episode deemed 'well-remembered' is not necessarily related to their capacity to recall the episode. Despite the younger children's decreased ability to understand the 'time you remember best' prompt and nominate an episode, they were still able to report on the episode appropriately once the interviewer assisted them in choosing it.

The time best remembered versus another time

There was tenuous evidence that children in the current sample made more informed decisions when nominating the time remembered best than another time. While children reported significantly more episode-specific details about the time they remembered best compared to another time, the difference was practically small (less than one detail). The first and last episodes (for which memory is typically stronger than intermediate episodes; Gomes et al., 2014; Roberts et al., 2015) were most commonly nominated as best remembered, whereas all four episodes were more equally nominated as 'another time.' These results suggest that children may have been making informed decisions when nominating the time remembered best.

Despite evidence that children had some insight into the quality of their memories for episodes, some caveats must be recognized. Because all children first recalled the time remembered best, their attention may have dwindled by the time that they recalled 'another time' (Russell, 2006; Yates, 1987), accounting for fewer reported details for the second episode. This limitation may not be overcome by additional experimental research because reversing the order of recall (i.e., requesting children recall 'a time' before 'the time you remember best') would likely still see children selecting a well-remembered episode first. Alternatively, retrieving the memory for the time remembered best may have interfered with children's subsequent retrieval of another episode, causing children to recall fewer details about 'another time' (see Anderson, Bjork, & Bjork, 1994; Phenix & Price, 2012 for further explanations of retrieval-based forgetting). Further experimental research may address this concern by having children recall each episode on a different day, rather than recalling one immediately after the other. It must also be considered that if children truly had an established understanding of the phrase 'the time you remember best,' those with superior comprehension and metacognitive reasoning might be expected to nominate the first or last episodes most frequently. This was not the case; children's choice of episode was not related to their performance on comprehension and metacognitive questions.

Children appeared to have an easier time selecting one episode for discussion in response to prompting about 'another time' than they did in response to the 'time you remember best' prompt, because a significantly higher proportion of children nominated an episode to in response to the former prompt than the latter. Through the course of the interview, children may have learned that the task was to recall an individual episode when requested to recall another time, as shown by the large increase in children listing the happenings of a single episode in response to this prompt. This finding is reflective of Brubacher, Roberts and colleagues' (2011) research on practice narratives, wherein children who practiced describing two episodes of an autobiographical repeated event subsequently demonstrated increased sensitivity to the repeated nature of a target laboratory event, compared to children who received other kinds of practice.

The current study raises concerns over asking young children to recall a well-remembered time in forensic interviews. Ultimately, fewer than half the children (14 Grade 1 s, 28 Grade 2 s, and 28 Grade 3 s) understood the initial request to nominate a specific episode of the Deakin Activities, and there was much variability in children's misinterpretations of the prompt. One common misinterpretation was for children to interpret the time *remembered* best to mean the time they *liked* best. While the current study included innocuous events, children discussing ongoing abuse in forensic interviews will likely experience the abuse negatively (Putnam, 2003), and to suggest an episode is their favorite could be confusing (or unethical). Future research should compare the specific phrasing of 'the time you remember best' to alternatives such as 'a time you remember well,' or 'the time you remember most.' Despite potential differences in comprehensibility of alternate phrasings, current results nevertheless shed light on children's ability to nominate a well-remembered episode and explain their reasoning processes, not just their understanding of the exact phrase 'the time you remember best.' Elicitation of narrative details which can subsequently be used to direct children to recall individual episodes (e.g., 'You mentioned X. Tell me more about the time that X happened') may prove a viable alternative to assist children to discuss an episode.

LIMITATIONS AND FUTURE RESEARCH

Some limitations of the current design are worth considering. The delay between the final episode of the Deakin Activities and children's interviews was short (maximum of 8 days). Delay influences children's recall of correct episode-specific information (see Powell, Thomson, & Dietze, 1997, for a review), and long delays can be expected in forensic interviews. However, after long delays we would expect to see amplification of the current discrepancy between memories for the best remembered episode and another time (at least for those children who effectively chose a time remembered best). The best remembered episode would be expected to remain strong in memory, whereas other episodes are expected

to fade with time. Further, it was beyond the scope of the current study to test the metamemory strategies that children adopted to identify the time they remembered best. Future research determining the metamemory strategies children use to recognize well-remembered episodes of repeated events may be useful to further understand children's metamemory development.

CONCLUSIONS AND FORENSIC IMPLICATIONS

The present research characterizes children's capacity to nominate a well-remembered episode of a repeated event and provides a first look at their metamemory insights into this nature of source decision. The ability to nominate 'the time remembered best' appears to improve between the ages of 5 and 9 years, which corresponds with children's ability to comprehend the prompt. Although their reasoning about why it was the most memorable episode lagged behind their comprehension of the phrase, children did indeed recall more details about their 'best remembered' episode than another time, demonstrating emerging but fragile abilities to complete the task.

Given children's tendency to interpret the time remembered best as the time they liked best, and younger children 's common miscomprehension of the prompt, investigative interviewers should be cautious both about using the specific phrase 'time you remember best' and asking children to report a highly memorable episode of repeated abuse. Current results elucidate children's difficulty in nominating a well-remembered episode themselves. Until future research can ascertain more effective techniques to assist children to choose an appropriate episode themselves, it may instead be preferable to select pre-disclosed details from children's narratives to direct them to individual episodes.

REFERENCES

Anderson, M. C., Bjork, R. A., & Bjork, E. L. (1994). Remembering can cause forgetting: Retrieval dynamics in long-term memory. *Journal of Experimental Psychology Learning Memory and Cognition*, *20*, 1063–1087. DOI:10.1037/0278-7393.20.5.1063.

Beal, C. R. (1985). Development of knowledge about use of cue to aid prospective retrieval. *Child Development*, *56*, 631–642. DOI:10.2307/1129753.

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. DOI:10.1002/acp.1696.

Brubacher, S. P., Malloy, L. C., Lamb, M. E., & Roberts, K. P. (2013). How do interviewers and children discuss individual occurrences of alleged repeated abuse in forensic interviews? *Applied Cognitive Psychology*, *27*, 443–450. DOI:10.1002/acp.2920.

Brubacher, S. P., Powell, M. B., & Roberts, K. P. (2014). Recommendations for interviewing children about repeated experiences. *Psychology, Public Policy, and Law*, *20*, 325–335. DOI:10.1037/law0000011.

Brubacher, S. P., Roberts, K. P., & Powell, M. B. (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. DOI:10.1037/a0022793.

Brubacher, S. P., Roberts, K. P., & Powell, M. B. (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. DOI:10.1037/a0025864.

Cherney, I. D. (2003). Young children's spontaneous utterances of mental terms and the accuracy of their memory behaviors: A different methodological approach. *Infant and Child Development*, *12*, 89–105. DOI:10.1002/icd.267.

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. DOI:10.1002/1099-0720(200103/04)15:2<205::AID-ACP698>3.0.CO;2-F.

Conover, W. J. (1980). *Practical nonparametric statistics* (2nd edn). New York, NY: John Willey & Sons.

Drummey, A. B., & Newcombe, N. S. (2002). Developmental changes in source memory. *Developmental Science*, *15*, 205–223. DOI:10.1111/1467-7687.00243.

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

Farrar, M. J., & Goodman, G. S. (1992). Developmental changes in event memory. *Developmental Review*, *63*, 173–187. DOI:10.2307/1130911.

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

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.

Flavell, J. H., & Wellman, H. M. (1977). Metamemory. In R. V. Kail, & J. W. Hagen (Eds.), *Perspectives on the development of memory and cognitions*. Hillsdale: Erlbaum.

Friedman, W. J. (2007). The development of temporal metamemory. *Child Development*, *78*, 1472–1491. DOI:10.1111/j.1467-8624.2007.01078.x.

Fritz, K., Howie, P., & Kleitman, S. (2010). "How do I remember when I got my dog?" The structure and development of children's metamemory. *Metacognition Learning*, *5*, 207–228. DOI:10.1007/s11409-010-9058-0.

Gomes, D., Sandhu, K. K., Qi, H., Lee, C. M., & Connolly, D. A. (2014). Primacy and recency effects in children's memory for instances of an active, repeated event. Poster presented at the annual meeting of the Psychonomic Society, Long beach, California.

Hudson, J., Fivush, R., & Kuebli, J. (1992). Scripts and episodes: The development of event memory. *Applied Cognitive Psychology*, *6*, 483–505. DOI:10.1002/acp.2350060604.

Hudson, J., & Nelson, K. (1983). Effects of script structure on children's story recall. *Developmental Psychology*, *19*, 625–635. DOI:10.1037/0012-1649.19.4.625.

Hudson, J., & Nelson, K. (1986). Repeated encounters of a similar kind: Effects of familiarity on children's autobiographic memory. *Cognitive Development*, *1*, 253–271. DOI:10.1016/s0885-2014(86)80004-1.

Johnson, M. K., Foley, M. A., Suengas, A. G., & Raye, C. L. (1988). Phenomenal characteristics of memories for perceived and imagined autobiographical events. *Journal of Experimental Psychology: General*, *117*, 371–376. DOI:10.1037//0096-3445.117.4.371.

Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, *114*, 3–28. DOI:10.1037//0033-2909.114.1.3.

Lamb, M. E., La Rooy, D. J., Malloy, L. C., & Katz, C. (2011). *Appendix of children's testimony: A handbook of psychological research and forensic practice*. Chichester, UK: Wiley-Blackwell doi: 10.1002/9781119998495.app1.

Lindsay, D. S., Johnson, M. K., & Kwon, P. (1991). Developmental changes in memory source monitoring. *Journal of Experimental Child Psychology*, *52*, 297–318. DOI:10.1016/0022-0965(91)90065-z.

Lyon, T. D. (2005). Ten step investigative interview. Retrieved 3rd March, 2016, from http://works.bepress.com/thomaslyon/5

Markman, E. M. (1979). Realizing that you don't understand: Elementary school children's awareness of inconsistencies. *Child Development*, *50*, 643–655. DOI:10.2307/1128929.

Orbach, Y., & Lamb, M. E. (2007). Young children's references to temporal attributes of allegedly experienced events in the course of forensic interviews. *Child Development*, *78*, 1100–1120. DOI:10.1111/j.1467-8624.2007.01055.x.

O'Sullivan, J. T. (1997). Effort, interest, and recall: Beliefs and behaviors of preschoolers. *Journal of Experimental Child Psychology*, *65*, 43–67. DOI:10.1006/jecp.1996.2355.

Phenix, T. L., & Price, H. L. (2012). Applying retrieval-induced forgetting to children's testimony. *Applied Cognitive Psychology*, *26*, 796–801. DOI:10.1002/acp.2861.

Powell, M. B., & Thomson, D. M. (1996). Children's memory of an occurrence of a repeated event: Effects of age, repetition, and retention interval across three question types. *Child Development*, *67*, 1988–2004. DOI:10.2307/1131605.

Powell, M. B., & Thomson, D. M. (1997). Contrasting memory for temporal-source and memory for content in children's discrimination of repeated events. *Applied Cognitive Psychology*, *11*, 339–360. DOI:10.1002/(sici)1099-0720(199708)11:4<339::aid-acp460>3.0.co;2-o.

Powell, M. B., Thomson, D. M., & Dietze, P. M. (1997). Memories of separate occurrences of an event: Implications for interviewing children. *Families in society: The journal of contemporary social services*, *78*, 600–608. DOI:10.1606/1044-3894.3390.

Putnam, F. W. (2003). Ten-year research update review: Child sexual abuse. *Journal of the American Academy of Child & Adolescent Psychiatry*, *42*, 269–278. DOI:10.1097/00004583-200303000-00006.

Roberts, K. P. (2002). Children's ability to distinguish between memories from multiple sources: Implications for the quality and accuracy of eyewitness statements. *Developmental Review*, *22*, 403–435. DOI:10.1016/s0273-2297(02)00005-9.

Roberts, K. P., Brubacher, S. B., Drohan-Jennings, D., Glisic, U., Powell, M. B., & Friedman, W. J. (2015). Developmental differences in the ability to provide temporal information about repeated events. *Applied Cognitive Psychology*, *29*, 407–417. DOI:10.1002/acp.3118.

Roberts, K. P., & Powell, M. B. (2005). Evidence of metacognitive awareness in young children who have experienced a repeated event. *Applied Cognitive Psychology*, *19*, 1019–1031. DOI:10.1002/acp.1145.

Roebers, C. M., & Howie, P. (2003). Confidence judgments in event recall: Developmental progression in the impact of question format. *Journal of Experimental Child Psychology*, *85*, 352–371. DOI:10.1016/S0022-0965(03)00076-6.

Russell, A. (2006). Best practices in child forensic interviews: Interview instructions and truth-lie discussions. *Hamline Journal of Public Law & Policy*, *28*, 99–130.

Schleepen, T. M., & Jonkman, L. M. (2014). A longitudinal study of semantic grouping strategy use in 6–11-year-old children: Investigating developmental phases, the role of working memory, and strategy transfer. *The Journal of Genetic Psychology*, *175*, 451–471. DOI:10.1080/00221325.2014.958126.

Schneider, W. (2015). *Memory development from early childhood through emerging adulthood*. Switzerland: Springer International Publishing.

Schneider, W., & Lockl, K. (2002). The development of metacognitive knowledge in children and adolescents. In T. J. Perfect, & B. L. Schwartz (Eds.), *Applied metacognition* (edn, pp. 224 – 257). Cambridge, UK: Cambridge University Press.

Schneider, W., & Lockl, K. (2008). Procedural metacognition in children: Evidence for developmental trends. In J. Dunlosky, & R. A. Bjork (Eds.), *Handbook of metamemory and memory* (edn, pp. 391 – 409). New York, NY: Psychology Press.

Shing, Y. L., Werkle-Bergner, M., Li, S., & Lindenberger, U. (2009). Committing memory errors with high confidence: Older adults do but children don't. *Memory*, *17*, 169–179. DOI:10.1080/09658210802190596.

Waterman, A. H., Blades, M., & Spencer, C. (2000). Do children try to answer nonsensical questions? *British Journal of Developmental Psychology*, *18*, 211–225. DOI:10.1348/026151000165652.

Yates, A. (1987). Should young children testify in cases of sexual abuse? *American Journal of Psychiatry*, *144*, 476–480. DOI:10.1176/ajp.144.4.476.