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Age and Amount of Experience on Children's Representations of Repeated Events

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Age and Amount of Experience on Children's Representations of Repeated Events

By

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Abstract

The current study examined how children's event representations changed with increasing experience with an event. There were 81 children (40 4-to-5-year-olds, and 41 7-to-8-year-olds) who participated in either 2 (n = 41) or 4 (n = 40) repeated event sessions, which consisted of activities such as playing a counting game, and/or doing a puzzle. Event sessions included three different item types; *variable* items (which changed at every occurrence), *fixed* items (which stayed constant throughout the event), and *new* items (which only occurred once throughout the series). Children were interviewed 5-7- days following their last event session using free-recall, as well as specific questioning phases (where they were asked about every item in the series). Increasing experience aided in recalling more *fixed* items, but was detrimental to recall of *variable* and *new* items. Older children had a better ability to recall *fixed* and *variable* items, but not necessarily *new* items than younger children. Results are discussed with reference to script and fuzzy trace theories, as well as the source-monitoring framework.

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Many events that children experience occur more than once, such as swimming lessons or going on vacations, and some children experience less positive events such as repeated abuse. Children's memories for single experiences are qualitatively different from their memories for repeated experiences (see Roberts & Powell, 2001, for a review). Compared to children who experience an event multiple times, children who experience a single event generally have good memories of the details of the event (Farrar & Goodman, 1992), and older children are more accurate in single event recall than younger children (Powell, Roberts, Ceci, & Hembrooke, 1999). Children who experience multiple events do not have problems recalling details which do not change across sessions, but struggle when recalling details that vary in each session, as they tend to get confused between the different occurrences (Powell et. al., 1999).

Such confusions can clearly have implications on the autobiographical memories that children retain of their lives. In other circumstances, such as cases of child abuse when the victims' accounts are of primary importance in order for any prosecution to occur (Lamb et al., 1997), these confusions can be devastating. Problematically, children who have been abused on multiple occasions may be required to particularize; to identify, distinguish and describe one specific incident of repeated abuse in court proceedings (*S v. R,* 1989, as cited in Powell & Thomson, 2003). These specific details may include the time, date, specific actions performed by the perpetrator, or any other unique contextual details. Without such information, specific charges cannot be laid (Powell, Roberts & Guadagno, 2007), and the accused may be unable to refute the allegations (Guadagno, Powell, & Wright, 2006). Identifying, labelling and describing one specific instance of a repeated event with enough detail and accuracy is a difficult task for most children (Connolly & Lindsay, 2001; Hudson, 1990; Lindsay, Johnson & Kwan, 1991; Powell et. al., 1999; Powell & Thomson, 1996). This effect is especially evident with younger children, whose understanding of time, and ability to temporally sequence events is developing (Friedman, 1993). These issues have obvious practical significance, especially in forensic settings. It is important to examine how children mentally represent events they encounter repeatedly, and how these representations change with increasing experience, in order to provide forensic interviewers with practical advice on how to elicit accurate and more detailed accounts of one specific instance of abuse from child witnesses.

Goals of Current Study

In previous research, children's memories for one instance of a repeated event (usually the last instance) have been studied (e.g., Connolly & Price, 2006; Roberts & Powell, 2007). The goal of the current study was to examine how children's event representations *changed* with increasing experience with an event. We examined the narratives of 4-to-5- and 7-to-8-year-old children who experienced an event two or four times. We looked at the raw numbers of information reported (relevant to the event), accuracy, as well as children's abilities to nominate and label a specific occurrence. The event incorporated a number of different variations and deviations in *each* occurrence; thus there were a number of unique features in each occurrence that could later be used by both the child and interviewer in order to distinguish or label the occurrence at the time of the interview. This is different from previous research which has examined children's memories for one deviation episode (nominated by the interviewers) of groups of children who experienced an event on two or four occasions (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999). For example, much of the previous research has asked children to talk about one occurrence, nominated by the interviewer, such as 'the last time', or 'the time you wore a leaf badge'; problematically, the children may not even remember the last time (or know what that term means), or they may not remember the badge detail at all. Due to the variations and deviations in *each* occurrence, the present study allowed each child to nominate and label *any* one of the occurrences that *they* remembered best, rather than having only one deviation episode, later nominated by the interviewer (Farrar & Goodman, Farrar & Boyer-Pennington, 1999), which may not be the most memorable instance for the child. Further, the present study is more ecologically valid than much of previous research in the field, as there are a number of details which change in every occurrence of *any* repeated event, be it learning to play different sports in gym class, to having different team members. Similarly, repeated abuse may occur in different places, or at different times of the day.

First, the repeated events paradigm and the methodology will be reviewed, followed by three main theories which help explain and predict children's memories for repeated events: Script theory (Abelson, 1981; Hudson et al., 1992), The Schema Confirmation-Deployment Model (Farrar & Goodman, 1992) with a focus on recall of typical vs. atypical information (Farrar & Boyer-Pennington, 1999), Fuzzy Trace theory (Brainerd & Reyna, 1998; Brainerd & Reyna, 2004; Reyna & Brainerd, 1995), as well as the Source-Monitoring Framework (Lindsay, Johnson, & Kwon, 1991; Johnson, Hashtroudi, & Lindsay, 1993). In conclusion, the specific hypotheses of the current study will be outlined.

The Repeated Events Paradigm

After multiple experiences with an event, *fixed* items (which stay the same in all occurrences; e.g., the children get introduced to a fox every time) are well recalled by children, compared to single event recall (Hudson, 1990; Connolly & Lindsay, 2001). Alternately, *variable* items (which change in every occurrence; e.g., the leader wears a different coloured cloak every time) are often poorly recalled, as the children get confused between the occurrences, and recall items from the other occurrences *not* in question. These are known as internal intrusion errors, and are the most common type of errors found in children's repeated event recall (Powell et. al., 1999). For full methodological details and item types of the current study, refer to table 1.

In addition to using *fixed* and *variable* items, the current design also incorporated *new* items (see *new* item row of Table 1); these items only happened in one occurrence across the series (e.g., the children played with airport magnets the first time only, and counted frogs only in the second time etc.). These items are unique to only one occurrence of the event, and children may tag these unique details in order to help them identify, distinguish and label one specific occurrence later on. Children have been found to be generally more accurate in their recall of *new* items than *variable* items, suggesting an enhanced ability to recall unique aspects of an occurrence of a repeated event versus constant, albeit varying, aspects of an event (Brubacher, Glisic, Roberts, & Powell, in press).

While much of the previous repeated-events research has examined items that vary in *each* occurrence (Powell et al., 1999), or items which vary in *some* occurrences (Powell & Thomson, 1996), it has not included *deviations*, per se; that is, items which only happen one time. On the contrary, Farrar and Goodman's (1992) work did include a deviation episode, but there was no variation; that is, the children experienced a standard (or constant) event one, two or three times (which was exactly the same *every* time), and then a deviation episode (which was different than the standard event). Importantly, this work will tie all of the previous research together as it incorporated constants (*fixed* items), variations (*variable* items), as well as deviations (*new* items) in *each* occurrence of the event. Next, the discussion will focus on a theory with relevance to the repeated events paradigm and recall of constants, variations and deviations: script theory.

Script Theory

The first theory to be reviewed is script theory, which has its basis in schema theories. Schemas are generic knowledge structures which help us to organise our world; they contain certain components or relationships that normally occur within that schema (Graesser, Gordon, & Sawyer, 1979; Abelson, 1981). A script is a schema for an event that a person has repeatedly experienced. A classic example is the restaurant script; there is a specific sequence that happens every time one goes to a restaurant, which includes first being seated, then ordering your food, eating it and then paying the bill. This script will eventually become stronger the more times that one experiences dining at a restaurant. Further, with increasing experience with an event, the more adaptable the script gets; it could begin to include the different foods you ate at any particular time. Therefore, eating an entree is considered a part of the general event representation (it almost always happens when one goes to a restaurant), with a number of specific slots or lists of the different variations experienced at different times (such as ordering steak, chicken, or a salad). Thus, scripts are spatially-temporally organized representations of an event in memory (Hudson et al., 1992).

When children experience a repeated event, they similarly develop scripts for their experiences; details that are common to all of the occurrences become a part of the general event representation and they use these to help guide their recall of the event (Hudson et al., 1992). With increasing experience with an event, the script begins to allow for variations to be noted. When children try to recall the event, they now face the issue of deciding which variation happened at which time (e.g., there were four different cloaks: a red, blue, green and yellow one, but which one happened the second time?). The next discussion will focus on a developmental script theory known as the schema confirmation-deployment model, which attempts to explain how age and amount of repetition may influence the accuracy of children's recall of one specific occurrence of a repeated event.

The Schema Confirmation-Deployment Model. This model was derived from script theory; it asserts that a schema is established after repetition of an event (Farrar & Goodman, 1992). Once a basic schema is established, information consistent with the schema is noted and the schema gets *confirmed.* During the *schema-confirmation* phase, children allocate attention to predictable information (e.g., we always get a button badge, and then put together a puzzle), as it is necessary to develop the script. When children who are in *schema-confirmation* are faced with variations or deviations (e.g., the cloak is a different colour every time or they play with airport magnets only in the first day), their attention is still focused on building a script, thus these variations and deviations may not be noticed, or they may be incorporated into the general script representation. This would make it more difficult to accurately form an episodic memory for one specific episode (i.e., memories of details particular to that specific occurrence of the event). Once a fully formed script for an event is established, however, there is less of a need to attend to predictable, scripted information. Now, more attention can be allocated to unpredictable deviations or variations in the script (referred to as *schema-deployment*), which should produce more accurate episodic memories.

Farrar and Goodman (1992) had children participate in an event 1, 2, or 4 times. The 2-session group experienced a 'standard' visit first, followed by a 'deviation' visit. The 4-session group experienced the standard visit 3 times (each standard occurrence was identical), followed by the 'deviation' visit (the deviation was different from the standard visit). For example, the 4-session group played at a puppet table (an item) and a frog jumped over a fence (*instantiations* of the puppet table item) in the first 3 occurrences (standard visits), and then with a turtle and a pig crawling under a bridge (different *instantiations* of the puppet table item) in the last occurrence (the deviation episode). The researchers found that younger children (4-year-olds) take longer to build up scripts (*confirm* their schemas) than older children (7-year-olds), and that those with more experience with an event (4 visits), had better episodic recall than those with less experience (2 visits). An issue with these findings is that the standard visit was always the same, and the deviation visit always occurred last. It is not clear whether children were recalling a script *per se*, that is, a general event representation, or whether they simply remembered the fixed details because they were so rehearsed. Also note that one variation of an item that has been fixed for the majority of sessions is quite different to an item that varies constantly. In the latter case, a generic representation would be the overall item (e.g., see a fox each time), whereas a variation would be more specific (e.g., leader wears a different cloak every time). Thus, script theories are useful but not sufficient to explain the patterns found in children's memories of repeated events; theories of memories of repeated events must include some mechanism of which details are most likely to be confused.

Memory for typical vs. atypical details. The script pointer + tag hypothesis suggests one such mechanism, but was developed to explain adult script memory. This hypothesis asserts that conceptual representations of scripted events consist of a 'pointer' to the general script as a whole, as well as 'tags' for actions or items which are not typical of the generic script (Graesser et al., 1979). When an activity is encountered, a memory representation is constructed which has a 'pointer' (a memory link) to the best generic script for the activity, along with 'tags' for episodic details which are inconsistent or atypical to the script (Graesser et al., 1979). The phenomenon that memory for atypical details, or details not consistent with the script is better than memory for typical details, or those consistent with the script is known as the *consistency effect* or the *typicality effect* (Roberts & Powell, 2006).

Some recent research has been conducted on children's memories for typical versus atypical information (Davidson & Hoe, 1993; Farrar & Boyer-Pennington, 1999). Davidson and Hoe (1993) found that schema inconsistent (atypical) details in stories were better recalled than schema consistent (typical) details. Children were read stories of a scripted event, which had highly typical scripted details (e.g., having a shopping cart), as well as two types of atypical details: script consistent and plausible details (e.g., a man put doggie treats in a shopping cart), and script inconsistent, implausible details (e.g., a lion was looking up at the carrots). In recall, children recalled more atypical (plausible and implausible), than typical (highly scripted) details, and were better at recalling implausible over plausible atypical information. An issue to be noted is that the children were asked to recall the story one day later; a one day delay may not be very indicative of long term memory processes; with a one or two week delay, children could actually have mentioned more of the typical scripted information. Also, hearing a story may not have the same amount of impact on memory as participating in an event. Finally, the implausible events were not only atypical, but quite fantastical in nature, which is why they may have been well recalled.

The current research examined how this pattern of results about children's memory development was affected by increasing experience with an event, incorporating a longer delay to interview, as well as having less fantastical atypical elements. The *variable* items in our design (those that changed in every occurrence) may be likened to typical details, as they are consistent with the script (the cloak is there *every* time; it just changes colour), and thus would be stored along with *all* of the other characteristics of the event script as a whole, whereas *new* items (only happen once within the series) may be likened to atypical details, or deviations, as they are not consistent with the script, and thus are 'tagged' as unique and stored as a separate unit in memory. When a child in their fourth event session is faced with a *new* item (a pink hearts bookmark), which *only* appears in the fourth session (refer to Table 1 for item frequency details of the current study), and a *variable* item (a yellow cloak) which has been seen in a different form in the past three sessions (blue, red and green cloaks), the pink hearts bookmark will be 'tagged' as a separate unit in memory, whereas the yellow cloak will be amalgamated into the script representation with all of the other script characteristics (which will include the different variations of the cloak and all the other activities belonging to the script). According to the *consistency effect*, a child is more likely to recall the pink hearts bookmark as correctly belonging to the last occurrence, as it has its own representation or 'tag' in memory, than the yellow cloak, as the cloak detail was stored along with all of the other details characteristic of the script, which include the other *variations* of the cloak (blue, red and green). Thus, the yellow cloak itself may not stand out as much in episodic memory. If we can find that children, much like adults, are capable of recalling deviations or unique aspects of specific episodes of similar events, as well as how increased experience affects this ability, then we can begin to incorporate these ideas into educational and forensic settings.

Farrar and Boyer-Pennington (1999) were interested in examining typical and atypical changes of a scripted event in order to incorporate this into the *schema confirmation-deployment* model. Older children (7-year-olds) accurately remembered both typical and atypical changes more than younger children did (4-year-olds), and thus, were said to be in *schema-deployment*. Interestingly, the 4-year-olds with more experience with the event were more accurate in recalling atypical, over typical information and were said to still be in *schema-confirmation*. Furthermore, when the event was simplified for the 4-year-old group (in a second experiment), the researchers found that they too were able to form distinct memories for both typical and atypical changes, and enter into *schema-deployment*. The authors asserted that the developmental differences children have shown in past studies are not inevitable, but may be attenuated under certain conditions (in this case, a simplification of the standard event). This latter assertion is questionable, as the researchers only simplified and shortened the event for the younger age group, as well as only shortening and simplifying the 'standard' episode(s), while leaving the 'deviation' episode unchanged. The Farrar and Boyer-Pennington (1999) study focused on a single deviation occurrence but past research has shown that children tend to be highly confused when they experience details that vary *every* time they experience a scripted event (Connolly & Lindsay, 2001; Powell et al., 1999).

The current study is different than previous research as our design incorporated constants (*fixed* items, which occur at every session, in exactly the same form; e.g., the children saw the same fox every time), variations, or typical details (*variable* items, which occurred at every session, but in a slightly different form; e.g., the leader wore a different coloured cloak every time), as well as deviations, or atypical details (*new* items, which only happened in one session;

e.g., the leader had a pink hearts bookmark only in the last time). Table 1 provides definitions of the different item frequency types with examples of each.

This design is more representative of a real life repeated event (such as playing soccer), which includes constants (you always wear your uniform), variations (you play a different team every game), as well as unique features, or deviations (your grandpa came to one of your games, or one of your team mates broke their arm). Importantly, the children in this study were asked to nominate the occurrence *they* remembered best, instead of relying on the assumption that the child would remember a specific occurrence of the interviewer's choosing (as much of previous research has relied on this assumption by having the interviewers simply tell the children "I want you to tell me about the last time" or "tell me about the time you wore the leaf badge"). Each child was given a chance to come up with their own unique label, with prompts from the interviewers. The interviewer provided the label *only* if all of the previous prompts did not work.

In summary, script theory is useful in explaining how children remember details on a general script level (details or activities that happen repeatedly). It fails to account for the specific types of errors in children's recall (internal intrusion errors), as it does not give an explanation of *why* children make these errors. The children in *schema-confirmation* may simply overlook (and not encode) variations and deviations, or may absorb them into the general script (not store, or tag the information separately). Also, the age differences (or lack thereof) need to be replicated using a more controlled experiment, by incorporating variations *and* deviations in *every* occurrence of the event. Additionally, the events must be equal in length for all of the age and repetition groups. Further , research needs to distinguish between generic script information covering the general structure of the event (i.e., we meet an animal, and then she puts on a cloak, and then we play a counting game at the end), and more specific episodic recall which includes: details that remain the same in all occurrences (*fixed* items; we meet a fox in the first day, and every day), details which change at every occurrence (*variable* items; she wore a blue cloak the first time, and a red cloak the second time), as well as unique details, or deviations (*new* items; the first day was the only time we played with airport magnets). We must examine how children recall the structure, variability, deviations as well as constancy of events, in order to come up with a comprehensive theory on how children learn to represent events in their memories, at what point these representations change, and how they change. The next discussion will focus on another relevant theory to the current study: Fuzzy trace theory, which makes better predictions as to why children tend to make the errors they do.

Fuzzy-Trace Theory

The second theory which is relevant to the current research is fuzzy trace theory; a dual processing model which posits that memories are encoded as gist and verbatim traces (Reyna & Brainerd, 1995). Verbatim traces are those of a target's exact form (e.g., it was a red cloak); while gist traces involve semantic relations as well as other elaborative information about the target and the event as a whole (e.g. first she put some sort of cloak on). Gist traces can thus be compared to scripts, where gist representations (leader wearing a cloak), can hold slots of a number of gist-consistent verbatim traces (blue, red, or yellow cloak).

Repetition leads to strong traces, and verbatim traces decay much faster than gist traces. Younger children can recall verbatim details of an item with repeated experience with that item, but have poorer verbatim traces of items only encountered once (Brainerd & Reyna, 2004). It also takes younger children longer to develop gist traces (Brainerd & Reyna, 1998; Brainerd &

Reyna, 2004), which is consistent with Farrar and Goodman's (1992) assertions that it takes younger children longer to develop a script.

When a child is accurate in recalling an item which occurred in a specific occurrence, it is because they have recalled the correct verbatim form of the target (e.g., recalling a red cloak, when it did occur in that session), whereas an internal intrusion error is when the child recalls an incorrect verbatim form because of a reliance on strong gist traces. An example of this would be if the child recalled a blue cloak as happening in that occurrence, when it was actually the red cloak. This is because the blue cloak is a gist-consistent verbatim detail. The child in this case was not able to correctly reject the incorrect verbatim detail (blue cloak) of a different occurrence, due to a strong reliance on the gist representation. Repetition strengthens the verbatim traces of fixed details, and strengthens the gist representations of variable details (Roberts & Powell, 2007). With *fixed* items, the gist representations are said to be weak, because the same detail is presented each time. With *variable* items, the details change every time while being gist-consistent with each other, and thus, a strong gist representation should eventually result in less accurate recall.

While fuzzy-trace is helpful in explaining why younger children are less capable of accurate recall than older children, an issue is raised with the idea that as age increases, so does the ability to form gist representations, and since recall errors are based on a reliance on strong gist representations (Brainerd & Reyna, 2004), older children should be less accurate than younger children, which previous research on repeated events does not support (Farrar & Goodman, 1992; Powell & Thomson, 1996). Next, the discussion will focus on a third framework, which examines the processes which occur at retrieval, rather than encoding: the source-monitoring framework.

The Source-Monitoring Framework

The last theory to be discussed is the Source-Monitoring Framework, which posits that recalling an instance of a repeated event includes two separate components: the content details (e.g., yellow cloak) as well as the source of those details. In repeated events, one example of a source is the temporal source of the content detail within the series (e.g., she wore a yellow cloak on the *last day*) (Powell, Roberts, Thomson & Ceci, 2007). The accuracy of remembering a specific incident, according to this framework, is determined during the process of remembering, or at the retrieval stage, and not at encoding (like fuzzy-trace would predict) (Johnson, Hashtroudi, & Lindsay, 1993). The source decision is based on how much perceptual, contextual, sensory, affective, and semantic information we have about a target, how vivid this information is, and the amount of cognitive operations (such as reflections) associated with the memory (Lindsay, Johnson, & Kwon, 1991). A recollection which is rich in the amount, as well as vividness of perceptual detail (such as recalling how the hand sanitizer *smelled*), with few indications of cognitive operations, is usually identified as a real life event, where recollections that are not perceptually vivid, lack detail, and include heavy cognitive operations, are identified as imagined events (Lindsay et al., 1991). Similarly, it can be noted that atypical deviations (or *new* items) may be more vivid than the routine or typical variations (*variable* items), and thus, these items may actually be more accurately attributed to the correct source.

When children attempt to recall one specific instance of a repeated event, they have to refer back to the source or origin of that memory, and research has shown that highly similar sources are much more difficult to distinguish than less similar sources, especially with younger children (Lindsay et al., 1991; Roberts & Blades, 1999), and repeated events can be said to be perceptually similar, which is why source-monitoring errors arise. For instance, when trying to think about which cloak was worn by the leader on the third day, the child may have an intact memory of all the content details; that is, they saw four different colours of cloaks, but the temporal source of which cloak was worn in which occurrence may not be well recalled as the occurrences or sources are highly similar, and therefore difficult to distinguish. Thus, the observed pattern of internal intrusion errors in repeated-event research is easily explained by the source-monitoring framework.

When children confuse events, there is a systematic pattern to their confusions. For instance, Powell and Thomson (1997) had 4-to 5-and 6-to-8-year-old children participate in a repeated event 6 times; the event had the same underlying structure, but the content details varied each time (e.g., the children sat on something every day, but each day it was something different). The children were interviewed about the final occurrence of the event at a 1- or 6-week delay. The results indicate that at the 1-week delay, there was a relatively high proportion of details mentioned which *were* from the last session, and if the children were incorrect, they were more likely to pull out an incorrect detail from a session *closer* to the last session (such as the fourth or fifth session), rather than a session *further* away from the last session (such as the first or second session). Conversely, at the 6-week delay, the incorrect details were more evenly distributed across the sessions; that is, the children were just as likely to confuse the final session with the second, third, or fifth sessions. Additionally, younger children's errors tended to be farther away than the older children, irrespective of the retention interval. It could be stated that this inability to remember at the 6-week delay could have been simply due to forgetting of the content details, so the authors conducted a second study with the exact same design, but the children were asked to report all of the details they remembered from the event(s) (irrespective of the session they occurred in), and then asked to decide which ones happened in the final session, as a way to separate memory for content vs. temporal sources. It was found that while both content and temporal source information declines with time, the effect seems to be more pronounced with the temporal source information; that is, the children may remember that they sat on a blue mat at some point but fail to have a temporal source of when in the series they actually sat on the blue mat. The current study examined these distance effects; it looked at how children's memories and representations changed during the course of the event, by comparing the recall of those in the 2-session vs. those in the 4-session groups.

Developmental differences in the ability to monitor sources have been evident in past research. Drummey and Newcombe (2002) used a fictitious facts paradigm, in which they taught children a number of facts, and tested their knowledge as well as the source of how they learned these facts (a puppet or experimenter) one week later. They found that 4-year-old children were less capable of monitoring their sources correctly than were 6- and 8-year-old children. In fact, the authors found that the 4-year-olds were not only forgetting the sources, but were showing signs of source amnesia; they had completely forgotten the context of the event, and were attributing source to extra experimental factors (such as their moms or teachers, instead of the experimenters or puppets). The authors posit that there might be more mechanisms involved in source monitoring than just at the retrieval process.

More recently, binding processes have been implicated as the possible mechanisms which underlie source-monitoring decisions. Binding is the joining of particular features to form a more complex memory, and this occurs during encoding (Kovacs & Newcombe, 2006). When someone is introduced to a person for the first time, they may remember the name or the specific features of the face of that person (simpler stimuli); additionally, it is beneficial to note the relation between that person's name and the features of their face, in order to recognize them at a later meeting (Sluzenski, Newcombe, & Kovacs, 2006). Thus, binding is the ability to note the relations between stimuli, during initial encoding of those stimuli. Children's ability to remember isolated parts of pictures, as well as their memory for the combinations of the parts was tested (Sluzenski et al., 2006). The researchers found that improvements in recall of combinations increased between 4- and 6years of age, but found no age-related improvements for the isolated parts. Further, the researchers examined children's performance on the combination task with free recall of an episodic event. Results showed a positive relationship between performance on the combination task and performance on an episodic memory task, suggesting that the ability to bind sources at the encoding stage may be essential in the development of source-monitoring ability. Thus, source monitoring may actually begin at encoding (through binding processes), and continue at retrieval (when the source decision is finally made).

In sum, the source-monitoring framework states that source decisions are made at the retrieval stage, and also makes some predictions about younger children being less capable of monitoring their sources than older children. It also predicts that distinct (unique) information be more accurately recalled than routine information (Johnson et al., 1993). With new research on binding processes as possible mechanisms underlying source decisions, the source-monitoring framework may be the framework with the clearest predictions and explanations as to why children make source errors. With source decisions being made at the retrieval stage, it may also be the most fruitful premise for practical implications, as there might be ways to train children to monitor their sources better.

In general, the three theories outlined previously all have elements which are useful when examining children's memories for repeated events. Script theories explain how information is remembered on a general, or structural level, but fail to make predictions or explanations as to why specific internal intrusion errors arise; children who are confirming their scripts may simply overlook variations or deviations (and not even encode the information) due to a larger amount of resources being allocated to the routine aspects of the episodes, or they may not store the information properly (by not attributing the variation or deviation to a specific episode, but rather as a list of possibilities). Fuzzy trace theory is more effective at predicting why children make the errors that they do; especially younger children, whose verbatim traces decay faster than that of older children, but it still does not give any indication as to how to help reduce errors in recall. Conversely, if source decisions are to be made at retrieval, there is hope that there may be training procedures which might help children at attributing their sources correctly, but research has not established a clear answer to this question. A more complete theory is needed; one which incorporates when and how children learn a general event structure, that makes solid predictions about errors (and why they happen). Finally, it should establish methods on how to elicit more accurate recall from children. In order to accomplish this, children's event representations of a new, scripted event were examined. The current study examined age and repetition effects on the accuracy of children's memories; specifically looking at which types of errors children systematically made when examining details that remained constant, details that varied, and details that were unique, or deviated from the script. How children recalled the general structure of an event was also examined, and whether this changed as a function of age, as well as experience with the event. The next discussion will focus on the hypotheses of the current study as well as the predictions according to each theory.

Hypotheses

Labelling. For labelling analyses, we were interested in examining whether age and repetition condition affected the child's ability to nominate and identify their own unique label, and the number of interviewer prompts it took for them to do so.

The Schema Conformation-Deployment Model would predict older children are more likely to come up with their own unique label, and need fewer interviewer prompts than younger children. They *confirm* and *deploy* their schemas faster, and thus retain variations and deviations more so than younger children, which should make them more likely to come up with their own unique labels (identifiers, memory cues) for each occurrence. If they are better at recalling unique details of a certain session, it should also be easier for them to use that unique detail to distinguish that occurrence from all the rest, and label it uniquely.

The Schema Confirmation-Deployment Model would also predict that the 4-session group will be more likely to come up with a unique label than the 2-session group (due to more experience with the event; by the fourth session, the children should enter into *deployment*, and be retaining deviations and variations of each occurrence). The 2-session group will still be *confirming* their schemas. Older children also have a better knowledge of the language, both its meaning, and structure, and have a better knowledge of time, time sequencing, as well as the use of temporal labels (e.g., Friedman & Lyon, 2005).

Fuzzy Trace Theory would predict a similar pattern of results, due to older children's verbatim traces lasting longer than those of the younger children. Further, The Source-Monitoring Framework would also predict this age difference; as older children are much better at binding their sources (Drummey & Newcombe, 2002; Sluzenski et al., 2006); they are more likely to bind together the different details of each occurrence, be able to note the differences *between* occurrences, and use this information in order to identify and label an occurrence in a unique way which differentiates it from the others.

In the current study, it was predicted that older children would be significantly more likely come up with their own unique label, need fewer interviewer prompts to do so, and be less likely to need an interviewer label than younger children (Hypothesis 1).

Accuracy. The current study examined whether age, repetition condition, and item frequency type had an effect on children's accuracy of recall of one specific occurrence of the repeated event. The Schema Confirmation-Deployment Model, Fuzzy Trace Theory and The Source-Monitoring Framework would all predict that children in all of the age groups and repetition conditions would be very accurate in recall of *fixed* items, as these items were the exact same in every occurrence, and there is not any reason for confusion between them. If the children saw a fox in every occurrence, they are highly likely to remember it and recall it correctly later on; they have nothing to confuse it with, as it was there in the *exact* same form every time. These items were used in order to add a level of constancy to the event, and to assist children in building up a script. Thus, no significant age or repetition condition differences on accuracy are predicted for *fixed* details.

The Schema Confirmation-Deployment Model would predict that the 4-session group would have better recall of both the atypical deviations (*new* items), and typical variations (*variable* items) than the 2-sesion group, as their increased experience would make it more likely that they would be in the *schema-deployment* phase, and thus remember both deviations and variations. The 2-session group will still be *confirming* their schemas, and if anything, they could be more accurate recalling the atypical deviations (*new* details) better than typical variations (*variable* details) as the most atypical, unique details are said to be encoded earlier and more accurately recalled than variable, but typical details. The Schema Confirmation-Deployment Model would also predict the younger children in the 2-session group to be much less accurate than older children in the 2-session group as it takes the former longer to *confirm* their schema, This difference should be smaller for the 4-session group (as the younger children should benefit from repetition, and *confirm* their schemas).

Interestingly, older children develop gist traces more quickly according to Fuzzy Trace Theory, and this can actually cause them problems in recalling *variable* items. Due to the stronger gist trace, they have a large number of gist-consistent verbatim details of each *variable* item type to choose from, and thus might result in less accurate recall. This would be opposite of what the script confirmation-deployment model would suggest (as repetition increases, so does level of script development, and ability to recall variations correctly). Fuzzy Trace Theory would also predict that since new items are experienced only once, they would be poorly recalled as there would be no strong verbatim traces or gist traces that would be encoded, due to lack of repetition.

It has been shown that younger children are worse at binding and monitoring their sources than older children are (Drummey & Newcombe, 2002; Sluzenski et al., 2006). Thus, The Source-Monitoring Framework would predict that older children, due to their more advanced abilities to bind together different features of one specific session, will also recall individual occurrences of an event more accurately (e.g., note that the red cloak was on the second day, and was followed by playing a counting game with frogs etc.). Once one of these details is retrieved at recall, it may cause the other detail to be retrieved along with it. Younger children, not yet having this ability to bind different features of one occurrence into one episodic representation will have less accurate recall.

Further, The Source-Monitoring Framework would posit that the need to come up with a more complex memory of an event is increased as the frequency of occurrences increases, as it keeps changing. As each new occurrence is experienced, it is possible that the previous instantiations of an item will be retrieved, thus strengthening the memory trace of that item (Roberts, Lamb & Sternberg, 1999). For example, a child in their third occurrence of the event may see the green cloak, recall that this was different than the red cloak they saw last time, which was different than the blue cloak the first time, leading to a stronger memory trace of the red or blue cloak, due to it now having been retrieved from their memories. With *variable* items, this retrieval could occur as many as three times (in occurrence 2, 3, and 4). The 2-session group does not get to practice this as many times.

In the current study, it was predicted that older children would report more of, and be more accurate than younger children with *variable* and *new* items (Hypothesis 2 and 3, for each item type, respectively). They *confirm* their schemas more quickly; thus, they enter *schema-*

deployment faster and are subsequently more capable of noticing both atypical deviations and typical variations, and storing them as episodic traces (As the Schema Confirmation-Deployment Model would predict). Older children are also more proficient at source monitoring as well as binding their sources, and their verbatim details last longer than that of younger children.

The current study predicted the 4-session group to recall more of, and have better recall of both the typical variations (*variable* details) (Hypothesis 4), and atypical deviations (*new* details) (Hypothesis 5) than the 2-sesion group, as their increased experience would make it more likely that they would be in the *schema-deployment* phase, and thus remember both deviations and variations.

The current study predicted a much larger difference in accuracy for the *new* and *variable* details between the younger and older children in 2-session group (the older children would be much more accurate), but this age difference in accuracy should be attenuated in the 4-session group, as the younger children should have more experience with *confirming* their scripts by the 4th session, and will be slightly more accurate with episodic recall (because they should be entering *schema-deployment*). This interaction was predicted for *new* (Hypothesis 6) as well as *variable* items (Hypothesis 7).

Method

Design

Children participated in 2 or 4 occurrences of a scripted event, which involved different frequencies of items throughout the series (*fixed*, *variable* and *new*). Participants were interviewed 5-7- days after the last occurrence of the event, and were asked to talk about the time they remembered best. Each child was interviewed using a free-recall method, followed by specific questions about every item in the series. They were then asked to discuss what they think would happen next time at the Laurier Activities. The design employed was a 2(age: 4-5-years vs. 7-8- years) x 2(repeated condition: 2 vs. 4 events) x 3(item frequency type: *fixed* vs. *variable* vs. *new),* with the last factor as a repeated measure.

Participants

Originally, 97 children were recruited to take part in the study. The final sample consisted of 81 children (44 males, 37 females). Of the 16 children who were excluded, 4 missed their interview, 2 would not speak at the interview, 3 did not have unique labels (interviewer error), 2 did not remember the Laurier Activities at all, 1 child could not be interviewed due to a developmental disability, and 4 children remembered very little about the Laurier Activities and gave a large number of external details. There were two counterbalanced item sets, (Group 1 and Group 2) and children were randomly assigned under the condition that age, gender, and repeated condition be equated under the two item sets, as best as possible. Table 2 presents the participant gender information by cell, as well as mean ages, standard deviations and age ranges (all in months) and is organized by age group, repeated condition, and item set (Group 1 or Group 2).

Children were recruited through local elementary schools, daycares, and a database of parents who had expressed interest in participating in developmental research. Only children whose parents signed informed consent participated. The children also gave oral consent before each occurrence of the event. The parents of children recruited through the Wilfrid Laurier family database were compensated $10 for their travel expenses and these children received a small toy after each of the sessions. The children recruited through the elementary school system were compensated by a donation of $50 for each grade, and $5 for each child that participated in the study (up to a maximum of $400).

Materials

In order to control for item effects, two sets of items (Group 1 and Group 2) were created for the study. Please refer to Appendix A for the counterbalancing procedure and Appendix B and C, for item sets (groups) 1 and 2, respectively. Each occurrence of the event consisted of 14 target items with different frequency types: *variable* items, *fixed* items, as well as *new* items. Table 1 refers to item frequency type examples and definitions.

Of the target items used in the series, six were *variable* items; for example, the leader wore a cloak in every occurrence, but the colour of the cloak differed every time. Thus, each different colour of cloak may be labelled as a different instantiation of that item. Another six of the items in the series were *fixed* items, which stayed the same at every occurrence; for example, the children saw the same fox every time. The remaining eight items in the series were the *new* items; each of these items appeared only once throughout the series, and each occurrence included two distinct *new* items. For example, in the first occurrence (see Table 1), children played with airport magnets; the magnets were not repeated again in the series, and were used in the design in order to test children's memories for unique aspects of an occurrence, or atypical deviations. For a more detailed example of all of the items used in each occurrence of the study (for Groups 1 and 2), see Appendix A and B. The children in the 2-occurrence condition participated in the first and second occurrences of each item set only.

Procedure

The Event. The event, referred to as the 'Laurier Activities' (LA) was carried out four times over a two week period by a trained research assistant (RA) to groups of one to five children (or two times in a one week period for the 2-occurrence group). Each event occurrence took approximately 20 minutes to complete. Three RAs were responsible for conducting the events, and an attempt was made so that each RA ran approximately the same number of children in the study. In groups of five or more children, two RAs were present, with one acting as the leader of the event, and the other as an assistant.

The scripted event included a number of different activities. In every occurrence, the leader told the children that they were participating in the 'Laurier Activities', put up an 'L for Laurier poster', and told the children her name. After this beginning phase of the event, the items occurred in the order that they are listed in Appendices B and C for Groups 1 and 2, respectively. For example, in Group 1, occurrence 1, after the leader did the introductory activities, the children were given cardboard to sit on, and then introduced to Boo the fox and the noisy penguin. Parents and teachers were instructed not to discuss the activities with the children, or to inform them that they would eventually be interviewed about their memories for these activities.

The Interview. Following five to seven days after the last occurrence of the LA, children individually participated in an interview, which was approximately 20- to 30- minutes in length. First, the children were asked to talk about themselves for approximately five minutes, in order to build rapport with the interviewer. Following rapport building, the interviewer told the children that 'I wasn't there when you did the Laurier Activities, but I'd really like to know what happened'. The interviewer waited for the child to spontaneously disclose multiple incidents (that the LA happened more than once). Once a child mentioned anything about the LA happening more than one time, they were asked to confirm what they meant. For instance, if a child said: 'she always has a cape', the interviewer would then ask 'you said always, what you mean by always?' The full interview protocol can be found in Appendix D. After the interviewer established that the child did in fact, disclose multiple incidents (by asking 'did the LA happen one time or more than one time?'), the child was asked 'how many times did the LA happen?' Children who did not disclose multiple incidents on their own were asked whether The LA happened one time or more than one time after a maximum of 5 minutes spent in this section of the interview. Subsequently, the children were asked to talk about 'the time they remembered best', and the interviewers used open ended prompts such as 'tell me more', 'what else happened', 'what happened next/after that', or 'what types of things did you do/play/see/hear the time you remember best?'

Labelling. The children were encouraged to come up with their own labels for the time they remembered best. If the child immediately used a clear and unique label to the first "time you remember best" prompt (one that was easily distinguishable from all of the others for coding purposes, such as "I remember the first time the best", or "the time with the winter story is the one I remember best"), that label was used in the remainder of the questioning. For instance, in occurrence 1 (refer to Table 2), some distinctive instantiations would be: the airport magnets (*new*), or the blue cloak (*variable*) as they only take place in the first occurrence. *Fixed* instantiations were not used as labels as they appeared in every occurrence, and did not uniquely identify any single incidence. Using a *fixed* instantiation as a label would make it impossible to code for accuracy, and thus render that participant's narrative inadmissible to the analysis.

If the child struggled with identifying a unique label immediately, they were supported by the interviewer to create a meaningful label. The interviewers had several prompts to use which were organized in a 'funnel' such that the prompts progressed from most to least open-ended. If the child did not immediately come up with a unique label, they were re-asked the prompt 'tell me about the time you remembered best'. If they did not label then (or mention a *new* or *variable* instantiation that could be probed further by the interviewer, they were instructed 'Let's give this time/your favourite time a name. What do you want to call it?' The remainder of the funnel questions can be found in Appendix D, and were asked in the order they appear, until a unique label was reached. There were 7 label funnel questions in total.

If the child did not come up with a unique label immediately, or after being asked all of the funnel questions, the interviewers used either a temporal label (first/last time) or a distinctive instantiation mentioned by the child as the label (such as a *variable* or *new* instantiation).

In order to allow the child to talk about the time they remembered best, and to maximise the number of interviews to be coded for accuracy, the interviewers in this study were not blind; they were aware which instantiations were distinctive to every occurrence. Making sure each child's label was unique maximized the number of narratives used in the analysis. Forensic interviewers do not have such information available to them; they do not know what actually happened when, like the interviewers in this study, but they might have some of this information at their disposal in the form of physical evidence or other witness accounts and testimony. This way, they check the child's account against the other sources available to them, much like the interviewers in this study.

When the child's free narrative was exhausted, the specific questioning was introduced, where the child was asked about every item in the series. The questions were asked in random order and can be found in the Interview Protocol (see Appendix D). If the children gave a 'don't know' response to a specific question, they were prompted once or twice to 'try and think really hard about it'. They were prompted after every three 'don't know responses' Following the specific questioning phase, the children were asked 'what do you think would/will happen next time you do the LA. Tell me everything you can think of that might happen.' As this cannot be measured for accuracy, this part of the interview was used to gauge how far children's scripts for the event have developed, but these data will not be included in the current thesis.

Coding. Interviews were audio taped, videotaped and transcribed verbatim for coding purposes. Each of the items (e.g., "she read us a story") as well as the instantiations of those items (e.g., boat story, or party story) that the child mentioned were noted, along with the frequency type (*fixed, variable, or new*), as well as which occurrence(s) the instantiations occurred in (1, 2, 3, or 4). There were three categories for free-recall coding: (i) an instantiation was coded as accurate if it was present in the target occurrence; (ii) an instantiation was coded as inaccurate or an internal intrusion error if it had been present in one of the other occurrences in the series, not the target occurrence; (iii) any reference to an item/activity/object that was not present in any of the occurrences was coded as an external intrusion error. (There were not many external errors, and so they are not discussed further in the results). Accuracy was computed by dividing the total number of accurate target instantiations of each frequency type (*fixed, variable,* and *new*) by the total number of target instantiations mentioned of that frequency type, to yield three separate proportional accuracy scores. Further, we also calculated proportions of inaccurate responses to each item frequency type, in order to yield 3 separate proportions of inaccurate scores. Table 3 provides examples of some hypothetical answers and utterances children gave in free recall and specific questioning phases, and the codes that correspond with such utterances/answers.

Reliability was assessed by the author training one undergraduate student to code the narrative recall of the interviews for accuracy; reliability was performed on approximately 12 percent of the transcripts separately for items and instantiations. Cohen's Kappa for reporting items was .91, and was .97 for instantiations.

Responses to the specific questions were coded as accurate, inaccurate or internal intrusions, external intrusions, "don't know" responses, and 'other' errors. Other errors included when a child said that the instantiation did not take place in the occurrence (and it did), or when the child confused other instantiations that were included in the same occurrence. For instance, if a child was asked what activity they did to warm up and their response was: 'lie down and listen to birds' (which is actually an instantiation of the relaxing item in that occurrence), this would be coded as an 'other' error. Proportionate accuracy scores were created as in free recall, as well as proportions of inaccurate responses by each item frequency type (these were often the inverse of proportions of accurate responses unless there were a large number of "don't know", "other", and "external intrusion errors"). There were not many "other" or "external intrusion" errors to warrant any further analysis, so they are not discussed further. As the codes are so simple, and do not take much subjective reasoning, there was no reliability computed for the specific questions.

Disclosure of multiple incidents was coded by counting the number of prompts the interviewer provided before the child mentioned that the LA happened more than one time, as well as whether it was the child who disclosed multiple incidents or whether the interviewer had to ask.

Each label was categorized as child provided or interviewer provided. The portion of the interview in which labelling occurred was noted as immediate (after the first interviewer prompt of "tell me about the time you remember best", these children did not get label funnel), few prompts needed (the child answered first prompt with something from the LA but needed a few more prompts until they labelled, these children did not have label funnel), or label funnel (child did not label spontaneously but needed to be asked label funnel questions).

Ten interviews were used for reliability; reliability for whether it was child or interviewer that disclosed multiple incidents, and whether it was the child or interviewer that labelled was perfect. There were no disagreements, thus, Cohen's Kappa was 1. There were also no disagreements as to which portion of the interview labelling occurred in, and the label funnel question number. Number of prompts until disclosure of multiple incidents was calculated as a spearman correlation between two raters, and was found to be .97.

Total amount of information (relevant to the event) was calculated by tallying up number of raw details (items and instantiations) mentioned. Proportions of the total number of items and instantiations were calculated by dividing the total number of items/instantiations mentioned by the child by 14 (the total number of items and instantiations in each occurrence). An item level statement would be 'we wore a badge' whereas 'we wore a leaf badge' would be an instantiation level statement.

Results

Disclosure of Multiple Incidents

Disclosure of multiple incidents was examined by noting whether the child or interviewer disclosed that the LA happened more than one time. A 2(Age) x 2(Repeated condition) x 2(Who disclosed: child or interviewer) Chi-square analysis revealed an association between age and who disclosed multiple incidents. Fewer 4-to-5-year-olds disclosed multiple incidents by themselves than was expected by chance and had the interviewer disclose for them more than expected, while the 7-to-8-year-olds were the opposite; they disclosed by themselves more and had the interviewer disclose for them less than expected, $\chi^2(1, N = 81) = 15.237, p < .001$. The children did not differ in disclosure depending on repeated condition, $\chi^2(1, N = 81) = .001, p =$ ns. The number of interviewer prompts until disclosure was examined in a 2(Age) x 2(Repeated Condition) ANOVA, which revealed a main effect of age, $F(1,77) = 37.33, p < .001, \eta_p^2 = .326$. Younger children ($M = 7.13, SD = 3.63$) needed more interviewer prompts than older children ($M = 2.95, SD = 1.56$). The effect of repeated condition was not significant, $F(1,77) = .273, p = ns, \eta_p^2 = .004$, nor was the interaction , $F(1,77) = .580, p =$ ns, $\eta_p^2 = .007$.

Summary. Whether children disclosed multiple incidents was largely associated with age. The 4-to-5-year-olds were more likely to not disclose spontaneously and needed the interviewer to ask them whether the LA occurred more than once, whereas the 7-to-8-year-olds were more likely to disclose multiple incidents spontaneously without the help of an interviewer.

Labelling

To test the first part of Hypothesis 1 (that older children would be more likely to identify their own label than younger children), a 2(Age) x 2(Repeated Condition) x 2(Who labelled: child or interviewer) Chi-square analysis was examined. Contrary to predictions, who labelled was not dependent on age, $\chi^2(1, N = 81) = .998, p =$ ns, or repeated condition, $\chi^2(1, N = 81) = .998, p =$ ns. Refer to Table 4 for a list of hypotheses, and whether they were supported.

To test the second part of Hypothesis 1(older children would need less help and fewer prompts from the interviewer in order to decide on a label), a 2(Age) x 2(Repeated Condition) x 3(Labelling: immediately, with few prompts, or in labelling funnel) Chi-square analysis on the labelling section revealed that contrary to the prediction, there was no dependence with age, $\chi^2(2, N = 81) = 2.308, p =$ ns, or repeated condition, $\chi^2(2, N = 81) = .217, p =$ ns.

To further test Hypothesis 1, using the children that needed the label funnel, a 2(Age) by 2(Repeated Condition) x 3(Who Labelled: child or interviewer) Chi-square analysis revealed that who labelled was not dependent on age, $\chi^2(1, N = 38) = 2.056, p =$ ns, or repeated condition, $\chi^2(1, N = 38) = .452, p =$ ns. A 2(Age) x 2(Repeated Condition) ANOVA on the number of questions asked in the label funnel until labelling occurred (the maximum was 7) revealed that neither age, $F(1,34) = .280, p = ns, \eta_p^2 = .008$, repeated condition, $F(1,34) = .211, p = ns, \eta_p^2 = .006$, or the interaction were significant , $[F(1,34) = .211, p = ns, \eta_p^2 = .006]$.

Overall, 56.8% of the labels used in the study were temporal, and 43.2% were instantiation level labels (30.9% were of *variable*, and only 12.3% were of *new* instantiations). In order to examine whether repeated experience and age had an effect on the types of labels children had for their narratives, a 2(Age) x 2(Repeated Condition) x 3(Type of Label: temporal or instantiation) Chi-square analysis revealed that type of label was not dependent on age, $\chi^2(1, N = 81) = 1.050, p =$ ns, or repeated condition, $\chi^2(1, N = 81) = .593, p =$ ns. Further, a 2(Age) x 2(Repeated Condition) x 2(Instantiation label type: *variable* or *new*) Chi-square analysis for only those children that had chosen their own instantiation level labels was examined; whether the instantiation label was *new* or *variable* did not depend on repeated condition, $\chi^2(1, N = 16) = .780$, $p = .377$; or age, $\chi^2(1, N = 16) = .2.618$, $p = .106$.

While primacy and recency effects in labelling were not initially predicted, the data were analyzed in order to examine these effects. A 2(Age) by 2(Repeated Condition) x 3(target label: first, last, or second and third). Chi-square analysis (on only the children who picked their own label), revealed that which occurrence was the target label did not depend on repeated condition, $\chi^2(2, N = 45) = 2.984$, $p = .225$, or age, $\chi^2(2, N = 45) = .385$, $p = .825$.

Summary. There did not seem to be any relation of age or repeated condition with when during the interview labelling occurred or who labelled (Thus, no support for Hypothesis 1). Also, there were no primacy or recency effects found.

Total Amount of Information Reported in Narrative

Children could report details at the item level (e.g., 'we wore a badge') or at the instantiation level (e.g., 'we wore a *feather* badge'). *N*s vary because not all children mentioned each type of item or instantiation in their narrative (i.e., a child who mentioned a *fixed* instantiation and did not include a *new* instantiation in their narrative would be included in the *fixed* instantiation analysis, but not in the *new* instantiation analysis).

The total proportion of items in the narrative portion of the interview was calculated as the total number of items mentioned by the child divided by14 (the total amount of items in every occurrence). Similarly, total proportion of instantiations was computed as the total number of instantiations mentioned divided by 14 (the total number of instantiations in the occurrence). Total proportion of items and total proportion of instantiations served as the dependent variables

(DVs) in a 2(Age) x 2(Repeated Condition) Multivariate Analysis of Variance (MANOVA). Age was found to be significant, Wilks' λ = .817, F(2,76) = 8.505, $p < .001$, η_p^2 = .183, while repeated condition was not, Wilks' λ = .985, F(2,76) = .569, p = ..568, η_p^2 = .015. The interaction was also not significant, Wilks' λ = .964, F(2,76) = .1.399, p = ..253, η_p^2 = .036. Given the significance of the overall MANOVA test for age, a univariate main effect of age was examined and was obtained for total proportion of instantiations, F(1,77) = 17, $p < .001$, η_p^2 = .181; older children (M = .47, SD = .19) mentioned more instantiations than did younger children (M = .32, SD = .14). Older and younger children did not differ significantly on total proportion of items, F(1, 77) = .252, p =*ns*, η_p^2 = .003.

Instantiations. For the narrative portion of the interview, proportions of each instantiation type were computed. The number of *fixed* and *variable* instantiations the child mentioned were divided by the total number of *fixed* and *variable* instantiations in each occurrence (there were 6) to yield the two proportion scores. Proportions of *new* instantiations were similarly computed except that the number of *new* instantiations mentioned was divided by 2 (as there were 2 *new* instantiations in each occurrence). The proportions of *fixed*, *variable*, and *new* instantiations served as DVs in a 2(Age) x 2(Repeated Condition) MANOVA. The analysis revealed significant effects of age, Wilks' λ = .800, F(3,75) = 6.251, p = .001, η_p^2 = .200, and repeated condition, Wilks' λ = .870, F(3,75) = 3.743, p = .015, η_p^2 = .130. While it approached it, the interaction did not reach statistically acceptable levels of significance, Wilks' λ = .083, F(3,75) = 2.277, p = .087, η_p^2 = .083.

Univariate tests on the age main effect revealed that older children (M = .51, SD = .21) mentioned more *fixed* instantiations than younger children (M = .33, SD = .22), F(1,77) = 13.31,

$p < .001$, $\eta_p^2 = .147$. Further, as was predicted by Hypothesis 2, older children ($M = .50$, $SD = .28$) also mentioned more *variable* instantiations than younger children ($M = .32$, $SD = .19$), $F(1,77) = 11.62$, $p = .001$, $\eta_p^2 = .131$. Surprisingly, there were no age effects with proportions of *new* instantiations, $F(1,77) = .135$, $p =$ ns, $\eta_p^2 = .002$. This does not lend support to Hypothesis 3: that older children would mention more *new* instantiations than younger children.

Univariate tests on repeated condition demonstrated that the children in the 4-session group ($M = .49$, $SD = .25$) mentioned a greater number of *fixed* instantiations than those in the 2-session group ($M = .33$, $SD = .22$), $F(1,77) = 6.94$, $p = .010$, $\eta_p^2 = .083$. Contrary to Hypothesis 5, the children in the 2-session group ($M = .35$, $SD = .32$) actually mentioned more *new* instantiations than those in the 4-session group ($M = .21$, $SD = .39$), $F(1,77) = 4.381$, $p = .040$, $\eta_p^2 = .054$. Hypothesis 4 predicted that those in the 4 session condition would mention more *variable* instantiations; there were no repeated condition differences in proportions of *variable* instantiations, $F(1,77) = .189$, $p = ns$, $\eta_p^2 = .002$

While the interaction component of the MANOVA did not quite reach significance, Wilks' $\lambda = .083$, $F(3,75) = 2.277$, $p = .087$, $\eta_p^2 = .083$, the means of the proportions of *new* instantiations mentioned by age and repeated condition (refer to Table 5 for the means) suggest that while the older children remained fairly consistent with the rate of reporting *new* instantiations between 2 and 4 sessions, the younger children's means for reporting these decreased from 2 sessions to 4.

Summary. In sum, there were robust age differences in the kinds of instantiations children reported in their narratives. Overall, older children reported more instantiations total than younger children. More specifically, older children also reported greater proportions of *fixed* and *variable* instantiations than did the younger children, thus lending support for Hypothesis 2. Further, the 2-session group reported more *new* instantiations than the 4-session group.

Accuracy

Narrative. For the narrative (free-recall) portion of the interview, proportional accuracy scores were computed by dividing the number of accurate reported instantiations of each frequency type by the total number of target instantiations mentioned of that frequency type, yielding proportional accuracy scores for *fixed*, *variable* and *new* instantiations for the narrative section. Accuracy referred to whether the mentioned details were present in the occurrence that the children identified.

Fixed instantiations. All of the children that mentioned *fixed* instantiations in their narrative were accurate in their attributions. Note that this is not an empirical finding but rather a reflection on how the data were coded. *Fixed* instantiations were present in every occurrence, and thus, if a child mentioned a detail of this type, they were automatically accurate. Table 6 presents the means of proportions of accurate responses for each item frequency type by age and repeated condition.

Variable instantiations. A 2(Age) x 2(Repeated Condition) univariate ANOVA on the proportion of accurate attributions for *variable* instantiations revealed a significant main effect of age. As predicted by Hypothesis 2, older children (M = .61, SD = .35) were more accurate than younger children (M = .43, SD = .41), $F(1,74) = 5.84$, $p = .018$, $\eta_p^2 = .073$. Repeated condition was also significant, albeit in the opposite direction than was predicted in Hypothesis 4; the 2-session children (M = .68, SD = .38) were more accurate than 4-session children (M = .35, SD =

.33), $F(1,74) = 17.15, p < .001, \eta_p^2 = .188$. The interaction component was not significant, $F(1,74) = .495, p = ns, \eta_p^2 = .007$.

New instantiations. A univariate ANOVA on the proportion of accurate *new* instantiations mentioned was not possible due to the small number of 4-to-5-year-old children in the 4-session group that mentioned a *new* instantiation in their narrative. Of the four children in this group that mentioned a *new* instantiation, three of them were accurate in their attribution. Conversely, there were 15 4-to-5-year-olds in the 2-session condition that mentioned *new* instantiations in their narrative, and 12 of them were accurate in their attributions. A Chi-square analysis on the number of 4-to-5-year-olds who mentioned a *new* instantiation in their narrative revealed no difference in accuracy depending on whether children participated 2 or 4 times, $\chi^2(1, N = 19) = .048, p = .827$. The Chi-square for the 7-to-8-year-olds that mentioned *new* instantiations in their narrative also revealed no difference in accuracy, depending on whether children participated in 2 or 4 sessions, $\chi^2(2, N = 21) = 1.175, p =$ ns.

Summary. On the whole, the children who did mention instantiations in their free narratives were accurate regardless of whether they mentioned *fixed* or *new* instantiations. *Variable* instantiations were fairly often recalled by children and older children recalled them more accurately than younger children. Further, the 2-session children were more accurate with *variable* details than the children in the 4-session condition.

Specific questions. The proportions of accurate, inaccurate, and DK responses to the specific questions were computed separately for each item frequency type. Proportions of *fixed* accurate, *fixed* inaccurate, *fixed* DK, *variable* accurate, *variable* inaccurate, *variable* DK, *new* accurate, *new* inaccurate, *new* DK were used as DVs in a 2(Age) x 2(Repeated Condition)

MANOVA. Analysis revealed significant main effects of age, Wilks' $\lambda = .683$, $F(9,69) = 3.558$, $p = .001$, $\eta_p^2 = .317$, and repeated condition, Wilks' $\lambda = .515$, $F(9,69) = 7.210$, $p < .001$, $\eta_p^2 = .485$. The interaction component was not significant, Wilks' $\lambda = .861$, $F(9,69) = 1.236$, $p = .288$, $\eta_p^2 = .139$. This non significant finding term dismisses Hypotheses 7 and 8, as there are no significant interactions.

Univariate tests on the effect of age revealed that older children ($M = .88$, $SD = .13$) were more accurate in attributing *fixed* instantiations to the correct occurrence than younger children ($M = .72$, $SD = .24$), $F(1,77) = 14.51$, $p < .001$, $\eta_p^2 = .159$. The 7-to-8-year-old children ($M = .44$, $SD = .26$) were also more accurate at attributing *variable* instantiations to the correct occurrence than were the 4-to-5-year-olds ($M = .26$, $SD = .23$), $F(1,77) = 14.21$, $p < .001$, $\eta_p^2 = .156$, as was originally predicted by Hypothesis 2. Further, the younger children ($M = .46$, $SD = .25$) were also significantly more inaccurate than older children with *variable* instantiations ($M = .35$, $SD = .23$), $F(1,77) = 5.496$, $p = .022$, $\eta_p^2 = .067$. While no predictions were made about DK responses, it was found that younger children ($M = .15$, $SD = .21$) were more likely to give a DK response to a specific question about a *fixed* instantiation than older children ($M = .05$, $SD = .10$), $F(1,77) = 6.72$, $p = .011$, $\eta_p^2 = .080$. Younger children ($M = .18$, $SD = .19$) were also significantly more likely to give DK responses to questions about *variable* instantiations than older children ($M = .10$, $SD = .12$), $F(1,77) = 4.99$, $p = .028$, $\eta_p^2 = .061$. Surprisingly, there were no age differences in children's proportions of accurate, $F(1,77) = .025$, $p = \text{ns}$, $\eta_p^2 < .001$, inaccurate, $F(1,77) = .175$, $p = \text{ns}$, $\eta_p^2 = .002$, or DK, $F(1,77) = .331$, $p = \text{ns}$, $\eta_p^2 = .004$, responses to *new* instantiations (contrary to Hypothesis 3; refer to table 4 for a list of hypotheses and whether they were supported).

The univariate tests on repeated condition revealed, in contrast to the predictions of Hypothesis 5, the 2-session children ($M = .29$, $SD = .20$) were more accurate regarding *new* instantiations than the 4-session children ($M = .11$, $SD = .11$), $F(1,77) = 22.18$, $p < .001$, $\eta_p^2 = .224$. Surprisingly, the children in the 2-session group ($M = .44$, $SD = .25$) were also more accurate with *variable* instantiations than those in the 4-session group ($M = .25$, $SD = .23$), $F(1,77) = 14.45$, $p < .001$, $\eta_p^2 = .158$. Further, The 4-session group ($M = .49$, $SD = .21$) were more inaccurate with *variable* instantiations than the 2-session group ($M = .33$, $SD = .25$), $F(1,77) = 10.03$, $p = .002$, $\eta_p^2 = .115$. Repetition did not have an effect on proportions of accurate, $F(1,77) = 1.653$, $p =$ ns, $\eta_p^2 = .021$, inaccurate, $F(1,77) = 2.892$, $p =$ ns, $\eta_p^2 = .036$, or DK, $F(1,77) = .033$, $p =$ ns, $\eta_p^2 < .001$, responses to questions about *fixed* instantiations. Repeated condition also did not have an effect on proportions of DK responses to *variable*, $F(1,77) = 1.01$, $p = ns$, $\eta_p^2 = .013$, or *new*, $F(1,77) = .025$, $p =$ ns, $\eta_p^2 < .001$ instantiations. Proportions of inaccurate responses to *new* instantiations did not differ by repeated condition, $F(1,77) = .001$, $p =$ ns, $\eta_p^2 < .001$.

Summary. Strong age effects emerged again in response to the specific questions favouring accurate responses from the older children. The older children responded accurately to a greater proportion of questions about *fixed* and *variable* (though not *new*) instantiations than did younger children. Younger children also responded with more DKs to questions about *fixed* and *variable* instantiations.

The amount of experience with the event mattered when answering questions about *variable* and *new* instantiations; children were more accurate after 2-sessions than 4-sessions. Four experiences of the event led to no greater accuracy regarding *fixed* details.

Discussion

The current study examined how age and repeated experience affected children's mental representations of a repeated event. Children participated in a repeated event 2 or 4 times, and the event was designed such that it included constants, variations as well as deviations in *each* occurrence, just as many real life repeated events do. The study investigated a number of different facets that may be underlying a mental representation: ability of children to encode and recall different types of variations of a repeated event, their levels of script development, ability to monitor sources, ability to disclose that the event occurred more than once (multiple incidents disclosure), as well as their ability to take unique aspects and use that to help identify and label one instance of this repeated event in their own words (with or without the help of an interviewer). This is the first study of its kind to include a varying repeated condition, as well as including constants, variations, and deviations in *every* occurrence.

One of the issues with forensic interviews of children who may have been abused repeatedly is for the interviewer and child to come up with a name or label for the occurrence in question. It is important that the label identifies a single occurrence, and is not ambiguous to the child or the interviewer (Guadagno et al., 2006). It would be very useful to determine ways to interview children better, to ensure that the child and the interviewer are speaking of the same occurrence, and maximize the correct amount of information the child recalls. This study used both free recall and specific questioning techniques, which are both common practices when interviewing children in forensic settings.

Across analyses, it was evident that both age and repeated condition had an effect on children's representations of repeated events, and the accuracy of their memories for different item frequency types. Next, the discussion will examine the main findings of the study, pertaining to children's ability to disclose multiple incidents, their ability to label one specific instance, and how accurately they reported constants (*fixed* items), variations (*variable* items), and deviations (*new* items). The findings will all be discussed in reference to three main theories: script theory (and more specifically the schema confirmation-deployment model), the source-monitoring framework, as well as fuzzy trace theory.

Multiple Incident Disclosure

The first findings to be discussed are those on whether children spontaneously disclosed multiple incidents. Fewer 4-to-5-year-old children disclosed multiple incidents spontaneously (and without the help of an interviewer) than was expected; they also needed more interviewer prompts in order to do so. On the contrary, more 7-to-8-year-old children disclosed multiple incidents spontaneously and needed a smaller number of interviewer prompts in order to do so. This finding is not surprising, given older children are said to be more advanced at script development. They *confirm* (notice similarities between the incidents), as well as *deploy* (notice variations and deviations) their schemas faster than younger children (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999). With their advanced level of script development, as well as their more advanced abilities at understanding time, temporal sequencing, and temporal language (Friedman, 1993; Friedman & Lyon, 2005), the older children would be able to use more generic language (e.g., 'we usually see a fox'), episodic language (e.g., 'the first day, we did __'), as well as discriminatory language (e.g., 'one time the cloak was blue, the next time it was red') than the younger children, and indicate to the interviewer that the activities occurred more than once.

There were no effects of repeated condition on children's ability to disclose multiple incidents, which is slightly surprising; the schema confirmation-deployment model would predict that at least the children in the 4-session condition would be further along in script development than the 2-session condition and would be more likely to use terms such as: 'usually/always/the first time', and therefore disclose multiple incidents spontaneously on their own. Increased experience with the event did not seem to help children in identifying that the LA occurred more than once, while an increase in age did have an effect on this ability. Perhaps with increased experience with the event, the tendency to lean towards a scripted representation made it so that they were speaking in present tense terms such as 'we do puzzles, she wears a red, and green cloak, and we see a fox.' This type of language is not indicative of having an episodic representation; perhaps the 2 session children were the opposite; since they had only experienced the events twice, and their scripted representations would not be as strong, they could be representing these events as two separate and non-related, independent incidents. They would then use less present tense and general language (as they would not be falling into a script mentality), but they also would not be using episodic language (e.g., 'we did this the first time') as the events were still fairly unrelated to these children. Thus, no difference would be found between the groups. Next, the discussion will focus on the data regarding children's ability to nominate their own label for one occurrence of the repeated event.

Labelling

While there were many children in both age groups and repeated conditions that did label on their own, contrary to initial predictions, there were no significant effects on who was more likely to label (child or interviewer), the section of narrative the labelling occurred, or the number of interviewer prompts needed to label that were dependent on age or increased experience. At least, it could be predicted (especially with the findings of multiple disclosure of incidents in the current study) that older children (and those in the 4 session condition) would be more likely to label the target instance on their own, without the interviewer's help. The schema confirmation-deployment model would pit these children to be further into (or have passed through) *deployment* (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999); they should be capable of encoding and later recalling variations and deviations in each different session, and later using these unique features in order to label the occurrence, without the help of the interviewer.

Older children are also more proficient with use of temporal language, as well as language and its structure in general (Friedman & Lyon, 2005), which would make them more likely to use temporal labels than younger children. They also have longer lasting verbatim traces (Brainerd & Reyna, 1998; 2004), better source monitoring abilities (Lindsay et al., 1991), as well as an increased ability at binding their sources into a more cohesive representation (Drummey & Newcombe, 2002; Sluzenski et al., 2006) than younger children. Since the older children's traces of the different details in the event are said to be longer lasting, their ability to distinguish between the occurrences and bind the different features of each occurrence into a more substantial representation of each occurrence are also thought to be more advanced than those of younger children; it is somewhat surprising that the older children were not better than younger children at identifying a unique label on their own. For excerpts from interviews with an 8-year-old at the labelling phase and a 4-year-old in the same phase, refer to Appendices E and F, respectively.

It is not as though the older children did not have better knowledge of constants as well as variations than younger children; they did, as evidenced by their ability to mention more *fixed* details in their narrative, as well as being more accurate with *variable* details. Older children showed better performance on these facets, and yet could not use them in order to identify their own unique label more so than younger children. Perhaps a difference could have been noted if a slightly older age group was used (ages 9 and 10), as these children would be more advanced with using language. It could also be argued that this study's label funnel was helping the younger children so much that they were actually on par with the older children at identifying a unique label.

Often, children's labels would be: 'the funnest time at the LA'; while this label could work and be very unique to the child (one of the times was much more fun than the others), it is entirely ambiguous to the interviewer. Some label funnel questions were slightly repetitive (Refer to Appendix D for the interview protocol), and perhaps after children were told that their label was 'good, but let's try and give it another name' a couple of times, they may have gotten discouraged. Implicitly telling the children what an example of a good label would be (e.g., 'a good name would be something that only happened one time'), may have also increased the children's ability to identify their own label. Perhaps children need to be trained on how to better pay attention to unique details in order to later use them as a discriminatory feature.

Attempts were made to analyze the types of labels used by the children and whether any of these were related to age or repeated experience. For children who labelled, no significant differences were found for type of label (temporal or instantiation level). There were also no significant primacy and recency preferences across the groups. While it is a positive aspect to have interviewers that are not blind, and thus have the ability to label for the child if the child is incapable (in order to not lose any data), it may also take something away from the data; since every child eventually identified their own or was given a unique label, all of the labels ended up unique (to the researcher perhaps, not the child in all cases). It would be interesting to conduct a labelling training study where in one condition the interviewers were completely blind as to what the child experienced, and used the child's first label (whatever that may be) without using any of the label funnel questions, and to compare it with a label funnelling condition, in order to test whether this funnel aided children. Next, the discussion will focus on the children's ability to recall constant, unvarying details of the event.

Recall of constants

Older children mentioned more and were more accurate with *fixed* instantiations than younger children. Younger children, on the other hand, were more likely to give a DK response to *fixed* instantiations than older children were. Interestingly, increasing experience did not have an effect on accuracy for *fixed* instantiations, but it did have an effect on the number of *fixed* details mentioned in the narrative; 4 session children mentioned more *fixed* details in their narrative. Initially we had predicted no age or repeated condition differences, as it was assumed that all children would be performing at ceiling for these details; they were present in every occurrence in the exact same form, and the children did not have any other exemplars to confuse them (as would be the case with *variable* details). This prediction was only true when examining the focused questions data. With only 2 experiences with an event, a child may not have a solid scripted representation, at least not enough to mention these generic constants spontaneously, whereas a child with multiple experience with the same object, and a more advanced script representation of the event, would probably be able recall it on their own (it did happen 4 times) than a 2 session child. However, when the 2 session child is asked specifically "which animal did she introduce you to at the LA?" it is highly likely that a child with less experience would be able to recall it, simply with the question as a prompt; 'I only saw one animal, and it was the same both times. It was a fox'. Thus, why 2 and 4 session children differ on reporting of *fixed* instantiations spontaneously in narrative, but do not differ when specifically asked.

Consistent with script theory (Hudson, 1990; Hudson et al., 1992); older children and those with more experience with an event are able to recall details that are common to all of the occurrences as they become a part of the general event representation. According to the schema confirmation-deployment model (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999), the first types of details to be remembered would be constant details, as this occurs during the first phase of the model: script *confirmation*. The older children go through this phase faster than younger children do, and those in the 4-session condition would have at least passed through this *confirmation* phase and would move into *deploying* their schema, thus they also would be better at spontaneously disclosing details which remained constant.

Further, fuzzy trace theory would support this pattern of results; repetition leads to strong traces (Brainerd & Reyna, 2004), and verbatim traces of a *fixed* detail grow strong with repetition (Roberts & Powell, 2007). Verbatim traces for a *fixed* detail that is present in the same form, every time, would be stronger after 4 sessions, than after 2 sessions, and older children, whose verbatim traces last longer than those of younger children, would be more proficient at recall of these details than younger children.

Source confusion would not be an issue with *fixed* details as they are always the same; seeing the exact same detail on four different occasions is bound to make this detail well encoded. It would be easy to retrieve as there is no need for source confusions. The more times one sees the same detail, the more likely it is to be recalled spontaneously at a later date. Again, with the nature of the specific question prompt, seeing the same thing two or four times did not matter when it came to accuracy, but did when it came to the number of *fixed* details that the child spontaneously disclosed. As older children are better at monitoring sources, and are less likely to have source amnesia than younger children (Drummey & Newcombe, 2003), this pattern of results is also supported by the source-monitoring framework. Next, the discussion will shift to how the current sample of children recalled details that varied in the scripted event.

Recall of variations

As was predicted, older children mentioned more *variable* instantiations, and were more accurate (in free recall and specific questions) when recalling these details than younger children were (Hypothesis 2 was supported). The younger children were also more likely to give a DK response to *variable* instantiations than the older children were. As the schema confirmation-deployment model would predict, older children moved into schema *deployment* faster than younger children, and were thus more likely to encode variations in an occurrence, because they no longer had to attend to the constant/unvarying details, as they had already *confirmed* their schema for the general event representation (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999). Further evidence of this is that younger children were saying DK more to these varying details; it could be stated that they may have not encoded them at all, or if they had encoded them (e.g., they know they saw a red, green, blue and yellow cloak), they did not yet have the ability to ascertain which occurrence each colour of cloak was from. The schema confirmation-deployment model does not make predictions or explanations as to why children make these errors (failure at encoding, or an issue with monitoring the sources at retrieval).

Additionally, older children have longer lasting verbatim traces (Brainerd & Reyna, 1998; 2004) than younger children, according to fuzzy trace theory. They also do not have as strong of a reliance on gist traces as younger children do; errors in recalling details that vary, according to fuzzy trace theory, arise due to a strong reliance on gist representations. A gist *trace* may be likened to a script of the event as a whole (e.g., 'we go into that room, she tells us her name, and then she puts on a cloak, and then we do some magnets and puzzles'); a gist *representation* could be likened to an item level representation (e.g., for the cloak *variable* item, it would be that the leader wears a different coloured cloak); this item level representation holds slots for a number of gist consistent *verbatim* details (target's exact form: the red, green, yellow, and blue cloaks). Since repetition strengthens the gist *representations* of variable details (Roberts & Powell, 2007), errors occur because children recall incorrect *verbatim* traces due to a strong gist *representation* (which holds a number of inconsistent verbatim details of the cloak). Thus children may be quite likely to falsely recall that it was the blue/red/green cloak when it was really yellow. With their verbatim traces fading more quickly than those of older children, their propensity to rely on their gist representations, their decreased ability to monitor (Johnson et al., 1993; Lindsay et al., 1991) and bind their sources (Drummey & Newcombe, 2002; Sluzenski et al., 2006), it is no surprise that younger children fared worse with the *variable* details.

Very surprisingly, the 2-session condition was more accurate with *variable* details (in free recall, as well as specific questioning) than the 4-session condition (the opposite of the prediction of Hypothesis 4; for a list of hypotheses, refer to Table 4). This finding is in contention with the schema confirmation-deployment model; those with increased experience should be more accurate than children with less experience because they should have *confirmed* their schemas, and have moved into *deployment*, where their attention would be focused on noticing details that vary within the script (Farrar & Boyer-Pennington, 1999). Instead, the added experience made the children more confused about varying details.

Further, the model suggests that an interaction would exist between age and repeated condition for accuracy of variable instantiations such that, older children are better/faster at getting through schema-*confirmation*, and should be performing much better than younger children at 2 sessions, but this difference should become attenuated by the fourth session (as the younger children start to move further into script development). Contrary to this hypothesis (#7), younger children were not improving, but progressively getting worse with increasing experience with a *variable* instantiation; the older children were not faring that much better at the fourth session. While older children may have longer lasting verbatim traces, and a better ability to monitor sources, this still does not overshadow the confusion that is brought on by more experience with such similar, albeit varying sources which are gist-consistent verbatim traces (such as a cloak that changes colour). Both fuzzy trace and the source monitoring framework make better predictions as to why that interaction did not occur.

On the contrary, the source monitoring framework would predict that the 2-session children would be better at recalling *variable* details than those in the 4-session condition; with more sources, especially sources that are similar, the more confusion that would arise (Roberts & Blades, 1999). In this case, the fewer options children have available to them, the better it is for their recall, and this was supported by the current study's findings (but contrary to initial predictions).

Fuzzy-Trace would also predict this pattern of findings about the *variable* details; with more experience (4 sessions) with a highly similar object (a cloak that always changes colour), gist representations would be stronger, and thus, a gist-consistent, incorrect verbatim detail is likely to be recalled. Whereas with only 2 sessions, gist representations of the cloak item may not be as strong, and thus, the children would not get as confused between the two different *variable* details. Next to be discussed are the findings relevant to how children recalled unique features, or atypical deviations from the scripted event.

Recall of novel features

The 2-session children mentioned more *new* instantiations, and were more accurate when asked specific questions about the *new* instantiations than 4-session children. This finding was not as originally predicted (and is the opposite of Hypothesis 6). According to the schema confirmation-deployment model, those with more experience should be entering (or passing through) schema-*deployment*; noticing and recalling deviations correctly compared to those with less experience (Farrar & Goodman, 1992; Farrar & Boyer-Pennington, 1999). Instead, the children in this sample were recalling more *new* instantiations after 2-sessions, and were more accurate when specifically asked about them, just as they were with the *variable* instantiations. It seems as though the increased experience led children to lose these unique features into their general event representation. They chose to recall more constant details instead (as can be evidenced by the finding that 4-session children mentioned more *fixed* instantiations in their narratives than 2-session children).

Interestingly, 4-to-5-year old children in the 2 session condition had fairly comparative means to the 7-to-8-year olds (refer to Table 5 for means of the proportions of total *new* instantiations mentioned). The younger children were probably guessing that these unique details were part of the occurrence they chose to mention (they only had a possible four different unique features to mention; 2 being from the target occurrence), and not due to a more advanced ability of encoding or retrieval. By the fourth session, they had eight different exemplars of unique details to choose from, and their mean for mentioning these decreased. As with the *variable* instantiations, the children became more confused between all of the different exemplars of the *new* instantiations in the 4-session condition (e.g., 'we did 8 different *new* things, I can't remember which one was on the third day'). They were not as likely to mention these details in the 4-session condition, and this was especially evident in the younger age group. The 7-to-8-year olds' means of proportions of total *new* instantiations remained fairly constant (and even increased slightly between 2 and 4 sessions). While the 7-to-8-year-olds were not helped by repetition per se (their mean remained fairly constant), the 4-to-5-year-olds actually seemed to do worse with increasing experience.

Additionally, while the free- recall data for the *new* instantiations could not be analyzed for accuracy due to children not mentioning very many *new* instantiations in their narrative, the author points to the numbers of children that did mention *new* instantiations and how they vary with age and increasing experience with the event; while very few 4-to-5-year-olds in the 4-session group even mentioned a *new* instantiation in their narrative (there were only four; three were accurate), there were 15 4-to-5-year-olds in the 2-session group that mentioned a *new* instantiation (12 were accurate). The number of 7-to-8-year olds who mentioned a *new* instantiation in their free recall stayed fairly consistent across repeated condition (10 in the 2-session condition and 11 in the 4-session condition).

The source monitoring framework would predict that unique, more salient information may be better recalled than something familiar or varying; source decisions are based on the amount and vividness of perceptual detail recalled during remembering (Lindsay et al., 1991), and something unique or atypical (such as a *new* instantiation) may be more vivid than routine, albeit varying aspects (*variable* instantiations) and thus, be more often and more accurately recalled. After 2 sessions, the children have experienced 4 unique features (*new* instantiations) and these may be vivid or different enough to be recalled fairly correctly, but by 4 sessions, they now have 8 different unique features (*new* instantiations) to choose from, and are confused by all of the options. It is evident that this is not an encoding issue; *new* details are being encoded by children (as evidenced by the 2 session children's ability to recall them accurately), but by the 4th session, it seems that they have too many exemplars to choose from and cannot be sure which one happened when; they fail to disclose these details in their narrative and attribute them to the wrong occurrence when specifically asked.

Fuzzy-trace theory would predict that children would not remember these unique features very well at all, due to a lack of repetition of them. The theory states children have poorer verbatim traces of details only encountered once (Brainerd & Reyna, 2004). Therefore, since these unique features are only encountered once, repetition would not be a factor which aided the children in recalling these *new* details later. Fuzzy trace would predict though that at least, the older children would be significantly more accurate with unique details, as their verbatim traces last longer. This notion was also not supported by the present sample.

Further, unlike would be predicted by the schema-confirmation deployment model, and this study (Hypothesis 6), the interaction that there would be a much larger difference between the age groups at 2 sessions than at 4, due to the older children *confirming* their schemas faster, entering *deployment*, and encoding *atypical* deviations (*new* instantiations), they would be much more accurate than younger children at 2 sessions; this difference would decrease by 4 sessions, as the younger children should at least be entering *deployment* by the fourth session. This interaction was not supported, and this refutes findings of Boyer-Bennington (1999), where they posited that increasing experience (and simplifying the event) was enough to get even 4-year old children to recall atypical deviations. This study found no such effects. Perhaps more than 4 sessions are needed in order to fully *confirm* and *deploy* a schema for a scripted event.

In sum, younger (and older children somewhat) were not aided by repetition; they were not getting better at noticing deviations (atypical-*new* and typical-*variable*), they were actually getting worse with increased experience as these unique new features were absorbed into their general event representation, and were not being recalled by the fourth session.

Summary

Overall, older children were more skilled at spontaneously disclosing multiple incidents, mentioning more *fixed* and *variable* details in their narrative than younger children. Older children were also more accurate with *variable* details than their younger counterparts; younger children were more likely to give a DK response to *fixed* and *variable* instantiations. No age or repeated condition effects emerged for children's ability to label a specific instance. Repeated condition effects were evident in recall of *variable* and *new* instantiations with the 2-session children faring much better than those with more experience.

Evaluation of Theories

In general, script/schema theories are effective in their predictions of how children recall general, scripted details and constants (*fixed* instantiations), and how increasing experience and age helps accuracy for these details. However, most of the predictions according to the schema confirmation-deployment model and Farrar and Boyer-Pennington's (1999) study about varying and new features were not supported by the current sample. While an age effect was supported by the data for *variable* instantiations, the predictions about increasing experience were not supported. Children were not helped by increasing experience (as the model would predict); while more experience helped with more reporting of *fixed* details, it was actually a detriment to children's recall of *variable* and *new* details.

Further, the schema confirmation-deployment model does not make clear or accurate predictions as to why children make the errors that they do. The model would argue that children completely overlooked *variable* and deviating details in the 2-session condition because they were still *confirming* their script, and needed to pay attention to predictable (*fixed* details). This was not supported, as the children were clearly encoding these details as evidenced by their increased accuracy for the *new* and *variable* details at 2-sessions (vs. 4-sessions). Thus, it can be argued that the model's notions of *deployment* of the schema are not quite accurate (at least not in the current sample); rather, children *do* allocate their attention and encode varying or unique details as well as constant details even after only 2 sessions; by 4 sessions they have too many options to choose from, and are incapable of tying them to the correct occurrence, which is why we evidenced the amount and accuracy differences between the repeated conditions. Further, it could be that children need longer than 4 sessions to fully develop a script. In sum, schema/script theories make accurate predictions when examining general, scripted, and constant details, but falter with predictions about varying and unique features. Next, the discussion will advance to the theories that made better predictions pertaining to the current study's findings: fuzzy trace theory and the source monitoring framework.

Fuzzy trace theory posits that as repetition with *fixed* details increases, so do verbatim traces of those details, and since older children have longer lasting verbatim traces than younger children (Brainerd & Reyna, 1998; 2004), it is not surprising that older were better at recalling these details. Additionally, fuzzy trace's predictions about why children make the errors they do, specifically about *variable* details were supported; with more experience with a varying detail, gist representations grew stronger and since errors are said to occur due to a strong reliance on gist representations (and younger children rely on gist traces more so than older children), older children and those with less experience were better with recall of *variable* details than younger and 4-session children (as was supported by the current study).

Whereas fuzzy trace has well defined and supported concepts about *fixed* and *variable* details, the predictions of unique or *new* details were not supported; the prediction about these items would be that they would not be well recalled by children at all due to a lack of repetition. With less repetition, verbatim traces and gist representations would not be strong, and thus recall would be poor; but children did recall these unique details and quite accurately when they did so, (as can be noted by their free recall data). Further, if anything, older children should be better at recalling these *new* details simply because their verbatim traces last longer and this was not supported. In sum, most of the concepts that fuzzy trace theory would predict were supported, besides those about unique features and their recall. Subsequently, the source monitoring framework predictions about all of the different item types were supported, including those about unique, *new* details, and will be summarized next.

The source monitoring framework made the most successful predictions about all of the item types; with *fixed* details, there was less of a need to monitor sources, as the source was always the same; with more experience with exact same details, the memory for the content of these details would become even stronger, and they would be recalled more often by children (though not necessarily more accurately). With similar items that vary in some form every time (*variable* instantiations), the fewer options or sources that one has available in memory, the more accurate recall would be, as was supported by 2-session children being better at *variable* instantiation recall than 4-session children. Older children are more capable of monitoring their sources than younger children are, and this was also supported by the data; older children were better at *variable* instantiation recall than younger children.

Where the schema confirmation-model and fuzzy trace's predictions about *new* details were not supported, the source monitoring framework can explain the results better; *new* items may be better recalled than varying details because they were unique and thus, more salient in memory. They were also less well recalled after increasing experience with an event, as the children had more different *new* features/sources to recall, and thus were less accurate after 4 sessions than after 2. Thus, the source monitoring framework made the most accurate predictions and explanations about how age and repeated experience affected children's ability to recall different types of details of one occurrence of a repeated event. The discussion will now consider the limitations of the present study.

Limitations

An issue to be noted with the study's design is the small number of *new* items in each occurrence (there were only two), whereas there were six each of *fixed* and *variable*. While all of the analyses were conducted in proportions, it would be more beneficial to include the same number of *new* instantiations as there are *fixed* and *variable* in each occurrence. Unfortunately, this was not possible in this study, as the events would have had to be much too long, and nutrition breaks in schools only allow for 20 minute sessions with the children.

Further, a larger sample of children in each condition may have been more beneficial, and would have added more power to the sample, and perhaps made some of the results more robust (especially in the case with some interactions as well as main effects which may have been significant in the overall MANOVA given more participants). While, originally we had expected to have 12 children per cell, this was not possible due to the number of interviews that had to be excluded, as well as a low participation rate from the school board due to timing constraints (the study was quite a long time commitment for schools, and required participation for three consecutive weeks).

Furthermore, some of the label funnel questions were repetitive in nature, as this was a completely exploratory route. The repeated questions in the funnel may not have been completely useful; children may have not wanted to give another response to a question they had already answered, or they may have been discouraged and not willing to try again. An explanation of why their answer was not the correct one, or an explicit explanation of what a good label would be may have aided this aspect of the interview, as well as including a non label funnel condition for comparison purposes.

Another issue to be noted is that the children in this study were not maltreated or abused and thus, their memories and recall may be much different than children who have been abused or maltreated; traumatic events are likely remembered differently than a fun interactive event. Also, within this forensic realm, it is not likely that the interview delay would be 5-to-7- days after the last time the events took place. Memory may change over longer periods of time. Thus, caution should be used when generalizing to this population.

Implications and Future Directions

One of the strengths of this study is that we were able to ask children about the time *they* remembered best. Due to the number of unique variations and deviations that were present in each occurrence of the series, there was no need to rely on the assumption that children would remember one specific deviation episode provided by the interviewer, as previous research has done (Farrar & Boyer-Pennington, 1999; Farrar & Goodman, 1993; Powel et al., 1999; Powell & Thomson, 1996). Further, we incorporated a labelling funnel of sorts in order to help children identify their own label; while age or repetition condition differences were not obtained in the findings, at least there were both older and younger children in each condition that were capable of identifying their own label. Further, this design more closely resembled the reality of many abuse situations; that is, abuse is often repeated, and includes many variations or deviations, as well as constants. This study was the first of its kind to include a varying age group, varying experience with similar (albeit varying) event, and which included constants, variations, as well as deviations in *each* occurrence of the event.

The study also furthers knowledge in the field of repeated event memory, as the findings indicated robust age and repetition condition differences in how children recall one instance of a repeated event. This study examined three different theories of memory development in children: script theory, the source-monitoring framework, as well as fuzzy-trace theory. There has been a number of conflicting studies on the developmental nature of children's source monitoring ability as well as script development. Some research has supported a developmental pattern; that is, younger children's general script representation may be underdeveloped as compared to older children (Farrar & Goodman, 1990, 1992). Other research has found no age differences in children's ability to rely on general event representations (Hudson, 1990; Hudson & Nelson, 1986). This study found that age and repetition differences in how children represent a scripted event, and that increasing experience helps with constant details, but is detrimental to recall of variations and deviations. Older children have a better ability to spontaneously disclose multiple incidents, as well as a better ability to recall constants and variations, but not necessarily deviations.

Further, fuzzy trace theory has been very difficult to implicate in repeated event studies in the past, as most of the methods (such as word lists) used in fuzzy trace-theory design have proven too complex to recreate into a repeated activity format. Nonetheless, the present research addressed how the research findings fit within a fuzzy-trace perspective.

While this study found some support for the predictions of script theories, the schema confirmation-deployment model as well as fuzzy trace, the study confirmed that those of the source monitoring framework were the most accurate, useful, and fruitful; since the errors children made were not due to children not encoding *variable* or *new* details, and were due to their ability to retrieve them correctly, perhaps children could be trained to monitor their sources better. Further research should examine whether specifically training children to monitor their sources in a repeated event would aid in their recall of different types of details.

Another future direction to consider would be having children go through a label training process before being asked to come up with a label for the activity; one that includes showing children a non related video, story, or photograph, and training them how to label correctly, using unique features or temporal information. Further, it would be interesting to recreate the same event (with the same fixed items, more variable item exemplars, and more unique new items), and have children participate in 1-session, 3-session, and 6-session conditions, in order to examine further how much event representations differ, and how increasing (or decreasing) experience interacts with memory for different types of details, and ability to label, and whether children need more experience than 4 sessions to develop a solid script.

Many children who give courtroom evidence are required to remember one specific occurrence of a repeated event, and to be able to describe it with a large amount of detail. Children may be asked to remember temporal details of an incidence of abuse, such as the date, time, or when the incidence occurred in relation to other events, as well as many contextual details of the abuse such as where the incident occurred, what the perpetrator was wearing, or the specific activities performed by the perpetrator (Brennan & Brennan, as cited in Roberts & Powell, 2001). This is done to provide the defendant with an opportunity to come up with an alibi, make it a chargeable offense, and determine the appropriate punishment if found guilty (Powell et al., 2007). If the child can recall many details about the alleged abuse but confuses the time and place, the defendant may be able to come up with an alibi, and thus be acquitted of the charges (Roberts & Powell, 2001). Of importance then, is further study of effective and viable methods, which may assist children in identifying one specific incidence of repeated experience, with a sufficient amount of relevant detail.

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Table 1

Item Frequency Type Examples

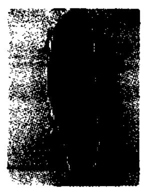
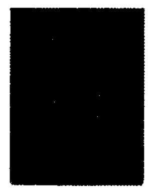
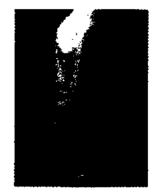
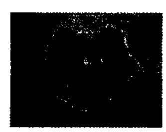
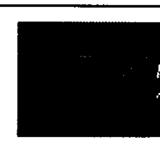
Item Frequency Type	Definition	Item	Session 1	Session 2	Session 3	Session 4
Fixed	Constant; part of script	Animal				
Variable	Variation or typical detail; part of script but changes at every occurrence	Cloak				
New	Atypical deviation; not part of script; only occurs once throughout series; unique	Magnets				
		Count Objects				
		Badge				
		Bookmark				

Table 2

Participant Gender and Mean Age Information (in months) by Age Group, Repeated Condition, and Item Set (Group 1 and Group 2).

	Repeated Condition																
	2-session								4-session								
	Group 1		Group 2		Total				Group 1		Group 2		Total			
	M	F	M	F	*n*	*Mage*	*SD*	Age Range	M	F	M	F	*n*	*Mage*	*SD*	Age Range
4-5	6	5	3	7	21	61.46	6.26	52.53-71.97	6	3	5	5	19	59.01	6.36	50.23-71.37
7-8	4	5	5	6	20	98.69	8.11	84.70-108	6	4	6	5	21	98.79	7.87	84.63-108

Note: Age is reported in months

Table 3

Examples of Hypothetical Child Utterances, and Corresponding Codes Used in Free Recall, and Specific Question Phases

Item Types	True First Occurrence Items	Child- Free Recall Phase	Free Recall Code	Child- Specific Question Phase	Specific Question Code
Fixed	Fox	"We saw a fox"	Accurate (*fixed*); they did see the fox	"I don't remember the stuffed animal or what it was"	Don't know; the child does not remember what the stuffed animal was, or they won't say
Variable	Blue cloak	"We had a green cloak that day"	Internal intrusion error; inaccurate (*variable*); the green cloak was on the 3d day	"The cloak was blue the first time"	Accurate; the cloak was blue in the first occurrence
New	Airport Magnets	"We played with Barbie magnets"	External intrusion error; children never played with Barbie magnets in any occurrence of the event	"We made a clown picture with the magnets"	Other error; the child is confusing this item with something else they did in the event, which was a clown *puzzle*

Table 4

List of Hypotheses, Whether They Were Supported, and the Theory for Basis

Hypothesis	Prediction	Supported	Theory Behind Hypothesis
1	Older > younger: identifying own label	No, *ns*	Schema confirmation-deployment model
	Older < younger: number of interviewer prompts to reach label	No, *ns*	Fuzzy trace theory
			The source monitoring framework
2	Older > younger: number of *variable* details	Yes	Schema confirmation-deployment model
	Older > younger: accuracy for *variable* details	Yes (x 2)	Fuzzy trace theory
			The source monitoring framework
3	Older > younger: number of *new* details	No, *ns*	Schema confirmation-deployment model
	Older > younger: accuracy for *new* details	No, *ns*	The source monitoring framework
4	4 sess > 2 sess: number of *variable* details	No, *ns*	Schema confirmation-deployment model
	4 sess > 2 sess: accuracy for *variable* details	No, 2 > 4	
5	4 sess > 2 sess: number of *new* details	No, 2 > 4	Schema confirmation-deployment model
	4 sess > 2 sess: accuracy for *new* details	No, 2 > 4	
6	*New* details: much bigger difference in accuracy at 2 session between age groups (older > younger), than at 4 sessions	No, *ns*	Schema confirmation-deployment mode
7	*Variable* details: much bigger difference in accuracy at 2 session between age groups (older > younger), than at 4 sessions	No, *ns*	Schema confirmation-deployment model

Table 5

Means of Proportions of New Instantiations Reported by Age and Repeated Condition

	2-session			4-session		
	M	*SD*	*n*	*M*	*SD*	*n*
4-5 years	.43	.33	21	.11	.21	19
7-8 years	.28	.30	20	.31	.37	21

Table 6

Means of Proportions of Accurate Responses in Free Recall, by Age, Repeated Condition and Item Frequency Type

	4- to 5- year olds						7- to 8- year olds					
	2-session			4-session			2-session			4-session		
Item frequency type	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Fixed	1.0	0	18	1.0	0	17	1.0	0	20	1.0	0	20
Variable	.55	.43	20	.28	.34	18	.80	.29	20	.42	.31	20
New	.80	.41	15	.75	.50	4	.70	.48	10	.61	.49	11

Appendix A

Counterbalancing and Target Details

Target Details

No.	Item	G1	G2	A	B	C	D
1	Children sit on X	N	V	Cardboard	Blue mat	Garbage bag	Number Square
2	Cloak of leader	N	N	Red	Yellow	Blue	Green
3	Fox's name	F	V	Boo	Kip	Pop	Jo
4	Noisy animal	F	N	Polar Bear	Penguin	Walrus	Seal
5	Warm-up activity	N	V	Wiggle fingers	Touch toes	jump	Dance
6	Source of story	N	F	Leader wrote	Cupboard	Internet	Library
7	Content of story	V	F	Dog in City	Winter	Party	Boat
8	Bookmark	N	V	Pink heart	Black triangles	Orange circles	Purple squares
9	Utensil to note what the title of the story is	V	F	Pencil	Crayon	Chalk	Texta (Felt pen)
10	Puzzle	V	N	Clown on Tightrope	Clown on Bike	Clown Juggling	Clown in Car
11	Music/scene for relaxing	N	V	Beach	Rain	Birds	Kite
12	Part of body relaxed	F	N	Legs	Nose	Stomach	Arms
13	Method of getting refreshed	F	N	Fan (paper plate)	Baby wipes	Cool drink (water)	Hand sanitizer
14	Theme of magnetic scene	V	N	Airport	Dinosaur	Farm	Construction
15	Container with stickers	N	F	Box	Purse	Envelope	Jar
16	Next stop	V	F	To movie	Walking a dog	Birthday party	Visit friend
17	Badge	N	N	Jelly bean	Pink feather	Leaves	Buttons
18	Type of Object	V	F	Flowers	Frogs	Cars	Tambourines
19	Put Objects Under	F	V	A blanket	Umbrella	Pillow Case	T-shirt
20	Put Objects Away	F	N	In a Hat	In a cookie tin	In a Lunchbox	In an Egg Carton

Counterbalancing Procedure

Item Set:

In all Age x Practice conditions, half of the children are in Group 1 and the remainder in Group 2.

Order of Administration:

Group 1 children receive the Occurrences ABCD in that order. Group 2 children receive the Occurrences CDBA in that order.

Status of Target Items:

There are 20 target items as shown above.

6 of these 20 are *fixed* across the occurrences.

6 of these 20 are *variable* across the occurrences.

8 of these 20 are *new* across the occurrences, such that a *new* item only appears once throughout the series, and each occurrence consists of two distinct *new* items.

The actual items that are assigned to *fixed*, *variable*, and *new* status differ for each group and are shown below.

	Group 1	Group 2
Variable	7, 9, 10, 14, 16, 18	1, 3, 5, 8, 11, 19
Fixed*	3 (A), 4 (B) 12 (C), 13 (D), 19(A), 20 (B)	6 (D), 7(C), 9 (B), 15 (A), 16 (D), 18 (C)
New*	1(A), 2 (D) 5(B) , 6 (C), 8 (D), 11 (B) , 15(C) , 17(A),	2 (B), 4 (D), 10 (C), 12 (B), 13(A), 14 (D), 17 (C), 20(A)

*Note: The letters in the brackets correspond to the column A, B, C, or D (from the original target item set found in Appendix A) which indicated the instantiation to be chosen to be the fixed (happened 4 times) or new instantiation (happened once). For instance, for item 3 (Fox's name), the instantiation under the A column (Boo) was chosen to be the name of the fox in

Group 1. For Item 2 (cloak of leader), the instantiation under column D (green cloak) was chosen to be the new item for group 2.

Items 2 (cloak) and 17 (badge) are not counterbalanced for status of item. They are administered as a *new* item for both groups. This is because there is are 8 *new* items to the 6 *variable/fixed,* and thus two of the items have to have the same *new* status in both groups

Appendix B
Group 1

No.	Item	Type	A	B	C	D
1	Children sit on X	N	Cardboard			
2	Cloak of leader	N				Green
3	Fox's name	F	Boo	Boo	Boo	Boo
4	Noisy animal	F	Penguin	Penguin	Penguin	Penguin
5	Warm-up activity	N		Touch toes		
6	Source of story	N			Internet	
7	Content of story	V	Dog in City	Winter	Party	Boat
8	Bookmark	N				Purple squares
9	Utensil to note what the title of the story is	V	Pencil	Crayon	Chalk	Texta (Felt pen)
10	Puzzle	V	Clown on Tightrope	Clown on Bike	Clown Juggling	Clown in Car
11	Music/scene for relaxing	N		Rain		
12	Part of body relaxed	F	Stomach	Stomach	Stomach	Stomach
13	Method of getting refreshed	F	Hand sanitizer	Hand sanitizer	Hand sanitizer	Hand sanitizer
14	Theme of magnetic scene	V	Airport	Dinosaur	Farm	Construction
15	Container with magnets	N			Envelope	
16	Next stop	V	To movie	Walking a dog	Birthday party	Visit friend
17	Badge	N	Jelly bean			
18	Type of Object	V	Flowers	Frogs	Cars	Tambourines
19	Put Objects Under	F	A blanket	A blanket	A blanket	A blanket
20	Put Objects Away	F	In a cookie tin	In a cookie tin	In a cookie tin	In a cookie tin

Appendix C

Group 2

No.	Item	G2	C	D	B	A
1	Children sit on X	V	Garbage bag	Number Square	Blue mat	Cardboard
2	Cloak of leader	N			Yellow	
3	Fox's name	V	Pop	Jo	Kip	Boo
4	Noisy animal	N		Seal		
5	Warm-up activity	V	jump	Dance	Touch toes	Wiggle fingers
6	Source of story	F	Library	Library	Library	Library
7	Content of story	F	Party	Party	Party	Party
8	Bookmark	V	Orange circles	Purple squares	Black triangles	Pink heart
9	Utensil to note what the title of the story is	F	Crayon	Crayon	Crayon	Crayon
10	Puzzle	N	Clown Juggling			
11	Music/scene for relaxing	V	Birds	Kite	Rain	Beach
12	Part of body relaxed	N			Nose	
13	Method of getting refreshed	N				Fan (paper plate)
14	Theme of magnetic scene	N		Construction		
15	Container with stickers	F	Box	Box	Box	Box
16	Next stop	F	Visit friend	Visit friend	Visit friend	Visit friend
17	Badge	N	Leaves (artificial)			
18	Type of Object	F	Cars	Cars	Cars	Cars
19	Put Objects Under	V	A Pillow Case	T-shirt	Umbrella	A blanket
20	Put Objects Away	N				In a Hat

Appendix D

Interview Protocol

Interview Sections

PT1: Rapport Building (5 minutes maximum)
PT2: General Recall about the LA (5 minutes max)
PT3: Occurrence Narrative (10 minutes approx. 15 minutes max)
PT4: Focus questions (5 minutes approx.)
PT5: What will happen next time? (5 minutes Max)
PT6: Closure

The interview should be 30 minutes maximum...these times are guidelines, but the maximum times should not be exceeded.

Interview Opening: (5 minutes Maximum)

"Hi! My name is __________, and it's my job is to find out what children remember about things. I heard that you did the Laurier Activities. I wasn't there when you did the Laurier Activities and so I don't know what happened and I'd really like to hear what happened when you did the Laurier Activities. But first I'd like to get to know you a little better. Tell me some things about yourself.

Sample Rapport Building prompts:

Tell me about your family
    Tell me more about (X)
Tell me about your friends
    Tell me more about (X)
Tell me about your school
Tell me what you like to do
Tell me about the things you like to play with
Tell me about your teachers

PT 2 (General LA Recall): (5 minutes maximum)

"Now it's time to talk about the Laurier Activities. Remember, I wasn't there when you did the Laurier Activities and it's really important that I know what happened. I need to know every little detail, so tell me everything you remember about the Laurier Activities from the very beginning to the very end."

If child discloses multiple incidents right away, go to Page 3

C: Well, the first time, we had a feather badge

I: You said the first day; did the LA happen more than once?

OR

C: She always/sometimes makes a puzzle with us

I: Oh, always/sometimes? What do you mean by always/sometimes?

Child might say something like

C: Well sometimes the puzzle is different/ the puzzle is always the same

I: Oh, you said that it's sometimes different/always the same; did the LA happen more than once?

<u>The child has not yet disclosed MI</u>

Give the child general prompts about the LA, using both breadth and depth prompts as appropriate. Breadth and depth prompts do not occur in any particular order, but rather are responsive to the child's utterances.

Sample breadth prompts:

- tell me more about the LA
- tell me what else happened at the LA
- What else happened?
- Tell me about the things you see at the LA?
- Tell me about the things you hear at the LA?
- What happened after that?
- Etc.

Sample depth prompts:

- Tell me more about ___________ (something mentioned by child)
- What happened after she read the story
- Tell me more about the part when _______ [something that child has mentioned].
- Tell me everything about the part when_________________
- Tell me every detail about the part when _______ from the very beginning to the very end.
- What else can you tell me about____
- Etc.

If the child mentions the words "sometimes" or "always," ask them what they mean, and if they disclose MI, go immediately to <u>Page 3</u>

If the child says "first time," "last time," "once", "one time", "every time" etc, go immediately to Part 3

If the child tells you a lot in 5 minutes maximum, but never discloses MI

Ask

"Ok, now did the LA happen one time or more than one time?"

IF MORE THAN ONE TIME:

"How many times did you do the LA?"

"Ok, the LA happened more than once, now what I'd like you to do is tell me all about one time, tell me about the time you remember BEST when you did the LA. Tell me everything that happened that time from the very beginning to the very end."

Give the child prompts about the time they remember best at the LA, using both breadth and depth prompts as appropriate. Breadth and depth prompts do not occur in any particular order, but rather are responsive to the child's utterances.

Move on to Page 4

Typical Encouragement Prompts

You've told me a lot about the Laurier Activities and I understand it much better now

You're being very helpful

I can see that you've been thinking hard

Thank you so much, you are helping me out a lot

Wow, you're doing a great job

The child has just **spontaneously** told you the LA happened more than once

PT3: Narrative about one of the occurrences

Always confirm

"Ok, you said one time/the first time/every time, did the LA happen one time or more than one time?"

"How many times did you do the LA?"

If the child says only one time, say "think carefully, did the LA happen one time or more than one time" If the child still says one time, ask them to tell you about the one time.

"Ok, the LA happened more than once, now what I'd like you to do is tell me all about **one time,** tell me about the time you remember **BEST when you did the LA**. Tell me everything that happened that time from the very beginning to the very end. I don't want you to leave anything out"

If the child is confused, say:

"You told me the LA happened X times, I'd like you to choose just one of those times to tell me about. Tell me all about one time, from the very beginning to the very end"

LABELLING

1.) Child immediately uses label

C: My favourite time was the first/last/button badge etc. time

C: I wanna talk about the /last/button badge etc. time

I: Great, so we're gonna call this time the first/last/button badge etc. time. Now I want you to tell me everything about the first/last/button badge etc. time from the very beginning to the very end.

2.) Child does not mention label right away but mentions items/details from the LA

Once child tells you some items/details from the LA but does not give a label...Say:

1.) I: "Let's give this time, the time you remember the best a name. What do you wanna call it?

C: My favourite Laurier Time (or something as equally non unique)

2.) I: "That's a good idea but maybe we should call it something that will tell it apart from all of the other times"

If child gives you nothing unique, say:

3.) I: "Let's pick out another name.

If child gives you nothing unique, say

4.) I: "Let's call it something that happened *only* in the time you remember best"

If child gives you nothing unique or is confused, say

5.) Think of something that *only* happened in the time you remember best

C: We got a feather badge

I: Was that different in the time you remember best than *all* the other times?

C: Yes…*then use this as the label*

C: No

If child gives you nothing unique or is confused, say:

6.) I: Was there something that was different in the time you remember best?

If child has not answered any of these questions with some sort of unique label, then:

A) Use a **variable** or **new** instantiation the child has mentioned in the general recall

"Ok, you told me that you had a button badge, lets call this the button badge time, and tell me everything that happened that time, from the very beginning to the very end."

OR

B.) Use a temporal label

"Ok, I want you to tell me all about the first/last time you did the LA.

After label is picked, use the standard Breadth/Depth prompts

Sample breadth prompts:

- tell me more about the (child's label) time
- tell me what else happened in the (child's label) time
- What else happened?
- Tell me about the things you saw in the (child's label) time
- Tell me about the things you heard in the (child's label) time
- What happened after that?

Sample depth prompts:

- Tell me more about ___________ (something mentioned by child)
- What happened after she read the story
- Tell me more about the part when _______ [something that child has mentioned].
- Tell me everything about the part when_________________
- Tell me every detail about the part when _______ from the very beginning to the very end.
- What else can you tell me about____
- Etc.

Remember, you don't need to use the child's label with every prompt, but use often, as it lets you and the child know you're speaking about the same occurrence.

After the narrative has been exhausted, move on to focus questions.

PT 4 (Focused Questions)

Begin this stage by saying:

"Wow, you sure told me a lot about the LA. Thank you very much, you were so helpful. Now I just have a few more questions to ask you. You might have already told me some of these things, but I just have to make sure I understand everything, okay?"

- Skip the focused Q that corresponds to the label, if applicable.

Focused questions should be asked using the label for the time the child remembered best.

Focused Questions corresponding to the 20 target details

1. What did you sit on the time [insert child's label, e.g., you got the sticker]?

2. What colour was the leader's cloak the time [child's label]?

3. What was the fox's name the time [child's label]?

4. What noisy animal woke the fox up the time [child's label]?

5. What activity did you do to warm-up the time [child's label]?

6. I heard that the leader talked about where she got the story from. Where did she get the story from the time [child's label]?

7. What was the story about the time [child's label]?

8. What did the bookmark look like the time [child's label]?

9. What did the leader use to write the name of the story in the time [child's label]?

10. What was the puzzle about the time [child's label]?

11. What did you listen to when you relaxed in the time [child's label]?

12. What part of your body did the teacher tell you to relax in the time [child's label]?

13. What did you use to get refreshed with in the time [child's label]?

14. What picture did you make with the magnets in the time [child's label]?

15. What did you pick the magnets in the time [child's label]?

16. Where was the leader going after the LA in the time [child's label]?

17. What badge did you wear the time [child's label]?

18. What toys did you count in the time [child's label]?

19. What did the leader hide the toys under the time [child's label]?

20. What did the leader put the toys in the time [child's label]?

<u>PT5: What will happen next time?</u>

"Wow, you've told me a lot about what you remember about the LA, now I just have a couple more things to ask you."

What do you think would/will happen next time you do the LA. Tell me everything you can think of that might happen.

The children will more than likely list off a number of things immediately. Use prompts such as

Tell me about what else might happen

Tell me more about the types of things you'd do/ games you'd play the next time

Tell me about what you might see/hear the next time you do the LA

What else do you think you'd do at the LA next time?

PT6: Closure

"You've really told me a lot about what happened when you did the Laurier Activities! Thank you for talking to me. You were very helpful.

Appendix E

Interview with 8-year-old

So tell me all about the time that you remember best at the Laurier Activities. Tell me everything that happened that time from the very beginning to the very end.

The last time, we, um the person handed out um cardboard

Okay, so I was just asking you about the time that you remember best at the Laurier Activities and you had mentioned the last time.

Last time we um, went into the room that we were just in, and she gave us um cardboard little square cardboard squares to sit on

Okay, great.

So I got a cardboard squares to sit on so we sat on those and then she said that the little um fox um pet fox, was tired and that he just wanted to go to sleep in his bed and he wanted to say hello so he said hello to them. After, we read this book called Party Times For Two. We also got to make a construction site with magnetics. Construction vehicles like um, dumping trucks and stuff like that.

Oh, awesome. What did you get to do after you did the magnets at the last time?

Then we um she said that Laurier Activities were all done and that after she was going to show us a little dog leash

Appendix F

Interview with 4-year-old

So tell me all about the time you remember the best. Tell me everything from the very beginning to the very end.

Ummm ... I don't remember anymore of this stuff.

So you talked about some stories.

Umm-hmm(positive).

Oh okay. Tell me about the story from that time.

A boat.

Tell me what else happened in the time you remember best.

Um ... I liked the one about the snowman.

Oh did you? Was that from – was that from the time you remember best?

No.

No? Okay. I just want to know all about the time you remember best okay?

Ummmm – boat one, he took some stuff from the ocean.

Okay. So what we're going to have to do now ... Is we're going to have to give this time that you remember the very best a name. Okay? So what would you like to call it?

R.

Oh R. that does sound like a very good name. But, I think we should call it something that will help us tell it apart from all the other times. ... So what sounds like a good name to tell it apart from all the other times?

Ummm ... Um ... Rich?