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Children's Memory for a Special Event: Exploring the Effects of Repeated
Questioning on Recall, Suggestibility, and Photo Lineup Identification.

Daniela Maestri

A Thesis
in
The Department
of
Psychology

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts at
Concordia University
Montreal, Quebec, Canada

January 1996

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ABSTRACT

Children's Memory for a Special Event: Exploring the Effects of Repeated Questioning on Recall, Suggestibility, and Photo Lineup Identification.

Daniela Maestri

The present study is based on a review of the literature on suggestibility and photo lineup identification. Its purpose was to evaluate children's memory for a special, non stressful outing and to assess the degree to which leading questions would make children create and describe a suggested event. Two types of fictional events were suggested: the first one asked if the child him/herself had been hurt, and the second one if a friend had been hurt. Finally, a photo lineup recognition task with familiar and unfamiliar faces was included at the end of the interviews. Recollections of a visit at the Olympic Stadium were elicited on four occasions with free recall, direct questions, and misleading questions from 4.5- and 5.5-year-old children. Reports were analyzed in terms of correct, incorrect, neutral, repeated, omitted, or attributional information. In general, free recall produced the most accurate answers, and direct questioning the most inaccurate ones in both age groups. Children from both groups displayed high degrees of acquiescence to the misleading questions. They also exhibited a clear preference for the suggestion that did not imply their own involvement. In the photo lineup identification task a relatively high percentage of children from both groups mistakenly judged familiar and unfamiliar faces as being present at the event. The older group was more able than the younger one to produce the name of

the place where the event took place. The legal implications of the findings are discussed.

à GIULIA

"ne pas craindre d'être lent, seulement de s'arrêter"

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Children's Memory for a Special Event: Exploring the Effects of Repeated Questioning on Recall, Suggestibility, and Photo Lineup Identification.

In the last decade there has been a growing concern with the accuracy of children's memories. Children can be victims and witnesses of crime; as such, they are questioned about what they have heard, seen, and experienced in general during traumatic events. Quite often, their reports are used in courts of law. Are children accurate in reporting the criminal events they experience either as witnesses or as victims? Are they vulnerable to suggestions or prone to confabulation? Two quite opposite positions have evolved in the scientific/clinical community.

In the early 80's there was a large social movement best summarized by its motto: "Believe the children". This movement affirmed that children were reliable witnesses of what they experience, and that their verbal reports should not be doubted. In support of this movement, court cases where children's testimonies were offered as sole evidence for quite often atrocious abusive actions, were highly publicized. For example, in the Country Walk Baby-sitting case (Goodman, Aman, & Hirschman, 1987) a 17-year-old woman and her husband, who ran a baby-sitting service, were accused of sexually abusing the children they cared for. At this point children, aged between 2 and 5, began to be interviewed repetitively. At the beginning, the children denied that abuse had happened. Gradually, with more interviews and with the additional help of anatomically correct dolls, they began telling about acts of sexual abuse. Some of the accounts were extraordinary as it was alleged, for instance, that the two care-takers ate some of the children for dinner (Goodman et al., 1987). As a result of the children's reports the husband was found guilty and received what amounted to 6 life sentences and 165 years in

prison (Nathan and Snedeker, 1995). His young wife, Iliana, was sentenced to ten years.

When the trial began, the experts who were consulted testified that children's accounts of sexual abuse were not reliable. The testimonies had not been offered spontaneously but only after repeated suggestive questioning and the use of anatomically correct dolls (Goodman et al, 1987). The trial was also criticized on several additional grounds. First of all, children evoked memories about something that had happened allegedly 15 months earlier, and in some cases a few years earlier. In this respect even the wife's reports were suspect given that she changed her testimony and began to corroborate children's accounts 15 months into the investigatory process. In fact, Iliana recanted all of her accusations recently (R. Rosenthal, personal communication to J. R. Laurence, 28 February, 1995). In addition, interviewers created an atmosphere that facilitated corroboration of allegations and encouraged accusation, by making the children feel that it was correct to tell. As a result, interviewers and prosecutors accepted children's reports uncritically on the basis that children do not lie or make mistakes about sexual claims (Ceci & Bruck, 1993; for another highly publicized case which presents the same type of problems, see the Wee Care Nursery case reported by Ceci & Bruck, 1993).

In the United States researchers and clinicians first became interested in the accuracy of children's reports in the second half of the 20th century (Ceci & Bruck, 1993). Up to that point, children were seen as dangerous witnesses because of the belief that, compared to adults, they recall less, give fewer details, forget more, and use their imagination too much (Brown, 1926). This point of view stemmed from the results of research conducted in Europe at the end of the nineteenth century and the early decades of the twentieth

century. Amongst the most well-known researchers interested in children's testimony, were Alfred Binet (1900), William Stern (1910), Varendock (1911), and Lipmann (1911). Most of their work addressed the issue of the suggestibility of children. These researchers emphasized the impact of such factors, as stimulus presentation, rehearsal and retrieval strategies, conformity, and compliance, in influencing suggestibility and, in turn, the reliability of memories. These investigators warned of the detrimental effects of repeated questioning, of how children interpret questions in an imperative way, and of the difficulty they have in distinguishing reality from fantasy. Furthermore, their work demonstrated that free recall results in fewer errors than do leading questions and yes-no answers, and that adults are suggestible also (Binet, 1900). As we will see, these results are similar to what contemporary researchers have reported.

Up until the 1970's, psychological research in the United States on children's suggestibility and witness competence was rejected by the legal community (Ceci & Bruck, 1993). The main reasons for this were that, supposedly, psychology had nothing to offer law, and that psychological studies were based on group averages which are of no use to law because they do not focus on the reliability of a single person. There were, however, a few studies conducted during the 1920s and the 1930s on the relation of age, sex, and intelligence and various suggestibility measures (most of which were adaptations of tests devised by Binet and Stern). Overall, this research showed that younger children are more vulnerable than older children and adults to suggestive questioning. Furthermore, it showed a negative correlation between suggestibility and IQ, people with lower IQ having more difficulties in resisting suggestions. However, these latter studies used paper-and-pencil tests and the resulting negative correlation between suggestibility

and IQ may have been due to the difficulties that the poorer subjects had with written materials or with concentrating over a long period of time (see for example Otis, 1924; Sherman, 1925; Hurlock, 1930; Burt and Gaskill, 1932; and Messerschmidt, 1933).

During this period few theories were advanced to explain the mechanisms underlying suggestibility and to account for its developmental trend. There were two main views on suggestibility. The first view proposed that a trait-like tendency was responsible for people's susceptibility to suggestive questioning (Aveling & Hargreaves, 1921; as cited by Ceci & Bruck, 1993). Children are more suggestible because their cognitive mechanisms are still immature; therefore, they are more prone to be influenced by external factors. The second view looked at suggestibility as dependent upon task-specific factors, such as characteristics of the experimenter, and setting. Following this rather arid period in children's testimony an increase in interest occurred during the late 1970's.

In the last 20 years there has been a great number of studies conducted on this subject. Some researchers argue that children are not suggestible, and are reliable witnesses. Others believe that children are very suggestible, have a difficult time in separating facts from fantasy, are influenced by the presence of and questioning by an authority figure, and, consequently, are less reliable than adults. As Ceci and Bruck (1993) have proposed however, these discrepancies are due more to how the data are interpreted than to actual differences in results. The variation in the interpretation of results in research with children often reflects cultural, legal, and psychological needs of the time. Care is of the utmost importance in interpreting any results stemming from this field of research and clinical work.

Modern studies are methodologically more sophisticated than the older ones. The procedures of these studies also attempt to resemble real life situations more closely. Most of these studies look at the effects of suggestions on the way in which children process and recall events that are for them very important, emotionally loaded, and stressful.

Notwithstanding the improvement of conducting studies in more naturalistic settings, results from such studies are still far from being generalizable to specific single court cases. Ecological validity is associated with the concept of external validity. Both concepts deal with "how far one can generalize from the procedures and subjects of one study to a target population" (Ceci, 1991, p.3). More specifically, external validity, which encompasses the concept of ecological validity, has to do with how much a certain effect is actually caused by the specific contingencies under study, and how generalizable such a causal relation is.

Ecological validity is concerned more directly with the analysis of the settings, people, and treatments. It is a problem that appears when generalizations are made from a research context to a real-world context; hence, the main issue becomes how research results are applied (Yuille & Wells, 1991). To be able to infer from an experimental situation to other nonexperimental situations it is crucial that the experimental situation reflects satisfactorily the process under investigation (Orne & Holland, 1968). To overcome this problem the process under investigation has to be operationally defined. Given that human behavior is tied to the context in which it occurs then, to study a phenomenon properly, it is of major importance to be able to reproduce in the research setting similar psychological, cognitive, and social characteristics (such as the emotions, the motives, the demands, the threats, and so forth) that are found in a given

real-world context. Therefore, as Orne and Holland (1968) maintained: "The validity of findings for legitimate generalizations to nonexperimental contexts where the concept applies depends upon the appropriateness of the experimental situation and the adequacy of the operational definition - questions central to the issue of ecological validity." (p. 284).

One has to be careful however not to reject experimental results on the premise that the experimental context does not match perfectly the correspondent real life situation. In other words, we cannot afford to abandon the scientific method because of the difficulties of research that we encounter in this area. Experimental studies are usually informed by "real-world" situations. In fact, in the field of eyewitness research, designs are constructed on "real-world" knowledge of investigative practices. Although it is difficult to go from a nomothetic to an idiographic approach, experimental results should inform and guide practical issues.

ARE CHILDREN MORE OR LESS SUGGESTIBLE THAN ADULTS ?

Evidence that supports the view that children are more suggestible than adults comes from a variety of studies. For example, Dale, Loftus, and Rathbun (1978) showed 4- and 5-year-olds a film depicting different events. Later, children were asked questions about events that were present in or absent from the film. The questions asked differed in their syntactic form along with whatever they implied. The results showed that answers were influenced by the form of the question only when the questions were about an event that was absent from the story.

Similar findings were obtained in a study by Cohen and Harnick (1980). These investigators showed movies of petty crimes to 9-year-olds, 12-year-olds, and college students and tested their recall immediately afterward and at

one week delay. In the immediate recall half of the questions asked by the experimenters were misleading, and half were non-misleading. They found age differences in suggestibility with the younger group being more influenced by both the misleading and the non-misleading questions than the two older groups. When the same groups were tested one week later with multiple-choice questions, the suggestibility effect was still present but no developmental differences were found. The investigators interpreted the results as evidence that the younger group was more likely to consciously comply with the suggestions than the two older groups but that the suggestions affected recall of the events in a similar manner for all groups.

In another study, Goodman and Reed (1986) tested 3-, and 6-year-olds and adults. The subjects interacted with a stranger for five minutes. Four or five days later the subjects were asked leading and direct questions, asked to give a free recall of the event, and to recognize the person they interacted with from a photo lineup. Results showed that the youngest group recalled less and was more suggestible than the older groups. In a related study, King and Yuille (1987) investigated 6-, 9-, 11-, and 16-year-olds. Subjects watched a staged live event in which a man entered the room to care for some plants; after noticing the time and indicating it was late, he left the scene. During the interviews children were asked to recall what they had seen and were asked some leading questions. Results indicated that the 6-year-olds recalled less and were more suggestible than the 9-, and 16-year-olds.

More evidence supporting the position that children are more suggestible than adults comes from a study by Ceci, Ross, and Toglia (1987, Experiment 1). In this study children aged 3 to 4, 5 to 6, 7 to 9, and 10 to 12 were read a story which was accompanied by eight pictures illustrating the main events of the story. One day after the presentation of the story, some of

the children were presented with biased information about the events described by the story, while the other children were presented with unbiased information. Three days after the presentation of the story, children were asked a description of what they could recall and to select two pictures that accurately depicted the story. The to-be-selected pictures were four in total: two were accurate representation of the story, and two included the biased information about the story.

The unbiased group identified pictures more accurately than the biased one. Age also played a role: older subjects were more accurate than the younger ones in both conditions. However, given that the three older groups were not significantly different from each other in mean accuracy, the results were interpreted as suggesting that the 3- to 4-year-olds' memories were distorted by the introduction of false information between the time of presentation and the time of recollection of the story.

Along the same lines, Oates and Shrimpton (1991) explored the effect of questioning on two groups of 4- to 12-year-old children. One group received a blood test and the other group encountered a friendly stranger at the library who put a loose cotton shirt on the child and then removed it. Recall was assessed 4 to 10 days after the event or 3 to 6 weeks later. The results showed that children from the two different groups performed much in the same way on all measures. Children were more accurate after the short delay session than after the long delay. Still, the 7- to 12-year-olds performed better than the 4- to 6-year-olds on free recall, direct questions, and some misleading questions. Older children were less suggestible about actions; however, no age differences were found on resistance to being misled about the person with whom they interacted. Children were more easily misled about actions when their memory was tested after the long delay than after the short delay.

Ceci, Loftus, Leichtman, and Bruck (1994) conducted a study with children of two age groups: 3-4-year-olds and 5-6-year-olds. The children were interviewed once a week for 12 weeks consecutively. During each session four cards representing actual or real events (information provided by the parents) and four cards representing fictional events were shown to the subjects. Fictional events were of four types: (1) negative participant event (e.g.: falling off the tricycle), (2) positive participant event (e.g.: going on a hot air balloon with friends), (3) neutral participant event (e.g.: waiting for a bus), and (4) neutral non participant event (e.g.: watching somebody waiting for a bus). Upon seeing a card children were asked to picture in their head what the event looked like and think about it before trying to remember if it really happened. The results showed that children rarely forgot an actual event, with little variability in memory for the four authentic events. False assenting was high however from the first session and over time children increasingly assented to the fictional events.

Younger children assented to significantly more fictional events than older children. In general, regardless of the condition, subjects were assigned to (participant vs. non participant event condition), 88% of children were more likely to give false reports that the event had occurred for fictional neutral events and positive events than for negative events. The conclusion was that encouraging a child to imagine a fictional event contribute to their source misattribution and even more so for certain types of events.

In contrast to the experiments described above, several studies either have failed to find any developmental differences in suggestibility or even found younger children to be less suggestible than older persons. For example, Marin, Holmes, Guth, and Kovac (1979) studied 5-, 8-, and 12-year-old children, and college students. Shortly after exposing the subjects to a live

staged argument between two adults, their memory was tested with twenty objective questions and one misleading question. Children were found to perform more poorly than adults on free recall tasks, but no significant age-related differences were found on the objective questions and on the misleading question.

Along the same lines, in their first experiment Duncan, Whitney, and Kunen (1982) presented slide sequences of cartoons to 6-, 8-, and 10-year-olds, and college students. Following this, subjects were asked a series of questions. Along with some direct questions there were some leading and misleading questions. Results showed that the ability to answer direct questions increased steadily with age. However when the interaction between the effects of leading questions, suggestibility and age was investigated, younger subjects appeared to be less vulnerable than the other groups. In their second experiment (Duncan et al., 1982), memory changes generated by questioning were monitored by a slide recognition task. In this task some of the distractor items included the erroneous information given by the questions. Again, accuracy in the questioning phase as well as accuracy in the recognition task increased with age. Further analyses explored only the data of subjects who showed good performance during the questioning phase. Again, all age-group subjects showed equivalent effects for misleading questions in the recognition task; the greater effects of the leading questions were produced by the older children and the college-age subjects.

In a related study, Murray (1983; as cited by Loftus & Davies, 1984) demonstrated the significant role played by the form of the leading question. Based on her work, she suggested that children are particularly suggestible when the leading questions are simplified. In this study, 7- and 11-year-olds were read a story which at different points was illustrated by pictures. Neutral

and leading post event information were then introduced. One day following the presentation of the story, subjects completed a forced-choice recognition task. The recognition task was designed to measure the extent to which children incorporated the information suggested in the questions. Therefore, subjects had to choose between the original picture and the same picture that contained the misinformation. Results showed that 11-year-olds were more accurate in the recognition task than the 7-year-olds. Leading questions produced lower accuracy than neutral questions for both age-groups.

In another study, Ornstein, Gordon, and Larus (1992) tested 3- and 6-year-olds' ability to remember a salient, personally experienced event at an immediate time, over 1-week and 3-week delays. Children were first visited by the nurse then by a pediatrician. During the visit the nurse took a picture of the child. This manipulation added a unique feature to the event. Children's memory was tested with open-ended questions, yes-no questions, and questions involving the details of a particular procedure that did not take place (misleading questions). Results showed that on initial recall older children were better able to produce information in response to open-ended questions, whereas younger children needed more specific prompting. In the delayed recall older children produced more information in response to open-ended questions than did younger children especially at 3-week delay. Although the younger group showed more forgetting than the older group, the two groups did not differ significantly in their ability to produce "new" items (items not previously mentioned).

Responses to misleading questions were scored as correct denials and intrusions. Children were reasonably good at generating correct denials. The older children produced higher percentages of correct denials than the younger ones; this difference approached significance only after the 1-week

delay, but not after the 3-week delay. Children produced low rates of intrusions with small increases over the delay intervals. As for the unique feature of the event, on initial assessment all children were able to recall having had their picture taken. Finally, although the older group performed a little better than that of the younger one, children at both age levels were resistant to suggestion.

Along the same lines, Flin, Boon, Knox, and Bull (1992) studied 6-, and 9-year-olds, and adults. Subjects witnessed a staged argument during a presentation on foot hygiene by a nurse in the school. Half of the subjects were questioned one day later, and all the subjects were questioned five months later. Three of the questions about the event contained misinformation. There were three measures of suggestibility which were calculated as frequencies of: 1- commission errors (the subject spontaneously produced erroneous information); 2- suggestibility errors (the subject accepted the suggestions given by the interviewer); and 3- the degree to which the subject remembered parts of the event that were emotionally loaded. The results showed that all subjects rarely accepted suggestions from the interviewer. Rates increased by 11% for the 6- and 9-year-olds after the 5-month delay, and of 2% for the adults. Concerning those aspects of the event that were emotionally loaded, irrespective of age or testing sessions all subjects could recall more than two of the three possible points.

From a review of these experiments, it is clear that it is not possible to compare these studies to each other in order to solve the enigma of age differences in suggestibility (Ceci & Bruck, 1993). Differences in methodologies make direct comparisons of studies difficult. Differences can be found in all the areas of interest: the way the event was presented (e.g., staged live event, slides depicting a story, verbal story, physical examination,

or interaction with a person); the timing of introduction of the misleading information (e.g., before the event, after the event but before the memory test, or after the memory test); timing of the interview (e.g., right after the event, shortly after the event, several weeks or months after the event); number of interviews, and data analysis. These methodological and statistical problems influence and contaminate interpretations of results found by studies on both sides of the debate. For example, the use of relatively small sample sizes might conceal reliable age differences on some of the suggestibility measures. Consequently, these studies show no developmental differences.

An additional concern is the number of leading questions included in the interviews. The number of suggestive questions chosen may be a confounding factor in the results of studies that do, as well as studies that do not show developmental difference in suggestibility. For example, Marin et al. (1979) included in their study only one leading question to which a yes-no answer was required. Correct answering after a 2-week delay was essentially the same for the four age groups which may be due to the effects of the misleading question. The possibility that floor effects could have prevented a strong test of any age difference however cannot be excluded. By the same token, giving more suggestive questions to older children and fewer ones to younger children may yield results whereby older subjects show less suggestibility (Ceci & Bruck, 1993). A greater number of suggestive questions creates a larger denominator and a smaller overall suggestibility ratio, as it seems to be the case in Ornstein et al.'s (1992) study.

A further problem that may influence the positive or negative findings of developmental differences in suggestibility comes from the linguistic complexity of the leading question (Ceci & Bruck, 1993). In some studies, such as in that of Rudy and Goodman (1991) which did not reveal any

developmental differences in the suggestibility effect, some of the questions may have been linguistically too complex and not comprehensive enough for young children. Therefore, some children answered "I don't know". "I don't know" was scored as a correct answer, but in fact for the younger children it could have meant that they did not understand the question, whereas for the older children it could have meant resistance to suggestion. If this is the case then possible developmental differences could have been masked. However, questions that were linguistically just as complex have also been used in studies in which developmental differences were found. such as in that of Oates and Shrimpton (1991). It may then be that poor comprehension of a question may produce high degrees of conformity.

Another problem arises from the way the data for recall is scored and statistically analyzed. For example, Hudson and Fivush (1991) do not include errors or intrusions in their data analysis. Answers that are classified as elaboration or descriptions may in fact be answers that are not related to the questions asked, making them intrusions. This way of scoring, in addition to not including errors and intrusions in the statistical analysis may inflate the results. It needs to be pointed out, however, that Hudson and Fivush's (1991) study is not one of suggestibility but a study of recall with repeated testing over a 6-year period, which also explored the effects of cueing.

All of these problems are responsible for the present unclear developmental trend of suggestibility that emerges from laboratory studies (Loftus & Davies, 1984). No single factor is probably responsible in itself for all the discrepancies found among studies. The extent to which children are more suggestible than adults probably depends on the interaction between age and other cognitive and social factors, among which are attention during encoding, rehearsal strategies, reactions to authority figures and other overt

social pressures (Zaragoza, 1987). To understand the concept of suggestibility, all of the variables which contribute to the size of the suggestibility effect as well as the developmental differences for these variables need to be investigated. Along the same lines, Ceci and Bruck (1993) emphasize the inefficiency of a point-by-point examination of studies in order to resolve the enigma of age and suggestibility. They proposed that it would be more fruitful to explore the cognitive mechanisms underlying suggestibility which would also explain why its developmental trends are found on some occasion and not others.

As can be seen from the previous review, few studies have focused on children's recall suggestibility for a special, non stressful event. Hudson and Fivush (1991) compared kindergarten children's recall of a visit to a Museum up to six years following the event. Although children were remarkably accurate when their original recall was compared to their recall six years later, the authors noticed that as time went by, children relied more and more on inferential thinking to produce their responses to the cues presented. As the authors suggested these elaborative inferences based on general knowledge may in fact lead to distortions in the story recalled. Unfortunately these authors did not report errors rates or distortions of memory in the children interviewed. There is thus a need to look at how children remember natural events and how their recall may be altered by the use of questions, and especially leading ones.

Whereas the research on accuracy of verbal recall has certainly progressed in the last twenty years, it is surprising to find that very few studies have paid attention to a second important area in legal testimonies, that is, visual identification. Most of the studies reviewed did not address

children's accuracy in recognizing faces, and accuracy in judging the presence or absence of a familiar and unfamiliar person at an event .

FACE RECOGNITION AND PHOTO LINEUP

Two main facts become apparent when reviewing the literature concerning photo lineup identification by children. First, there is only a small number of studies on suggestibility in children (especially very young ones) that have included face identification from a photo lineup. This is somewhat perplexing given that criminal cases are often based on eyewitness accounts. Second, face processing research seems to yield quite different results from research in eyewitness testimony. Face identification from eyewitness research indicates that children perform well enough on identification tests to consider their eyewitness accounts reliable. On the other end, face processing studies indicate that face processing is a skill on which children, especially the young ones, are "profoundly deficient" (Carey, 1992; pp. 95).

In Marin, Holmes, Guth, and Kovac's (1979) study, subjects (5-, 8-, 12-year-olds, and college students) were presented with a simulated eyewitness situation. Children were exposed to a staged event with a live target. Memory was measured with a questionnaire and a photo lineup. As was mentioned previously in this report, no significant differences in suggestibility were found. In addition, their results did not show any linear age-related differences in identification accuracy. In a related unpublished study, Cane, Finkelstein, and Goetz (1981; as cited by Brigham, Van Verst, & Bothwell, 1986) exposed children to a staged purse snatching and found no age differences in description as well as identification accuracy.

Goodman and Reed (1986) conducted a study to examine age related differences in eyewitness testimony. Their subjects, 3- and 6-year-olds and adults, interacted for five minutes with an unfamiliar man who made them perform an arm exercise which directed the subjects' attention to his face. After four or five days subjects were tested with objective and suggestive questions. Participants were then tested for free recall and photo lineup identification. Half of the subjects in each group were confronted with a five-person lineup with all the pictures presented at the same time (the array condition). Subjects had to look at the pictures and say, as well as point out, whether the confederate's picture was among those five. The other half of the subjects saw the photographs one by one (the individual condition). After having viewed all the pictures they were asked to make a judgment. In their analyses of photo identification the researchers dichotomized responses as either correct or incorrect. Incorrect responses included incorrect identifications (the subject falsely identified one of four distractors), and incorrect non-identifications (the subject failed to pick anyone). Results showed that photo layout procedure produced no effects on identification accuracy, but age did. In fact, the 6-year-old group was the most accurate followed by the adult group and the 3-year-old group. The 6-year-olds and the adults did not significantly differ, but both groups were more accurate than the 3-year-olds.

When researchers analyzed the time subjects spent looking away from the confederate, the 3-year-old group differed from the other two groups but not significantly. Therefore, although the poor performance of the youngest group may be due to attention, or lack of it, it seems unlikely to be caused by their looking at the confederate less. Goodman and Reed concluded that while the 3-year-old group performed poorly on all tasks, the 6-year-old and

the adult groups did not differ in their photo recognition accuracy or in their ability to answer objective questions. However, the 6-year-olds were more suggestible and recalled less about the event than the adults.

The results from the latter study should be looked at with caution because some of the statistical techniques used were not appropriate for the type of data that was gathered; for example, an ANOVA was performed on the dichotomous data obtained in the photo identification task.

Similarly, Brigham, Van Verst, and Bothwell (1986) conducted a field study in which 9-, 13-, and 16-year-olds were exposed to a staged theft. The subjects were then interviewed by the same experimenter who dressed either casually (nonauthority figure) or like a policeman (authority figure). Subjects' memory was measured as their responses to leading and nonleading questions, and as their performance on a six-person target-present photo lineup. Identification accuracy was dichotomized as correct (hits) and incorrect (false alarms or lineup rejections). Results showed that students were quite good at the lineup task: 83% picked the correct picture, 7% picked a distractor, and 10% made a lineup rejection. However, age had a significant effect on photo lineup performance, and accounted for 10% of the variance in lineup performance. The 16-, and 13-year-olds did not differ significantly. Both groups, however, differed significantly from the 9-year-olds whose mean identification accuracy was lower. In general, the younger group performed more poorly on the photo lineup task and on several recall variables (height, weight, age, hair color, dress, and so on) than the 13-, and 16-year-olds. This study found little suggestibility in their subjects, and no effects due to the authority or nonauthority figure conditions. Brigham et al. suggested that perhaps children perceive all adults as authority figures regardless of the way they dress.

Peters (1991) investigated the influence of arousal on the eyewitness performance of children in a series of studies. In the first study (Peters, 1987), a group of 3- to 8-year-old children went for a visit to the dentist. Following the dental appointment children were visited at their homes by a research assistant who administered voice and face recognition tests of the dentist and his assistant. Half of the subjects' recognition memory was assessed with a 5-person target present lineup, and the other half of the subjects with a 5-person target-absent lineup. Children received a second visit at home by another research assistant who evaluated their memories of the first research assistant with voice and face recognition tests. All subjects gave confidence ratings following each memory test, and parents gave an anxiety rating of their children at each visit. Voice recognition proved very difficult; in fact, children always performed at the chance level. Results showed that the target-present lineups generated more accurate identifications than the target-absent lineups. In addition, a stress effect was observed which produced more correct identifications, and fewer false alarms for the research assistant than for the dentist. When the subjects were divided into groups (7- to 8-year-olds, 5- to 6-year-olds, and 3- to 4-year-olds), the older group performed significantly more accurately (with more correct identifications and fewer false positives for the target-present lineup of the research assistant) than the two younger groups who did not differ from each other.

In the second study (Peters & Hagen, 1986) a male stranger spoke to a group of 3- to 6-year-olds for about 2 minutes, and told the children about a bogus health check up. Later all of the children were seen individually for a couple of more minutes by the stranger who held the child's wrist to take the pulse. In addition to having their pulse taken, half of the subjects received a vigorous rub on the head (the Touched group); the other half of the

participants did not receive any additional physical contact (the Not Touched group). This procedure was included to evaluate children's memory of physical contact. A week later children's memory was tested with a 5-person photo lineup recognition task. Half of the children were presented with target-present lineups, and half with target-absent lineups. They were also asked whether the stranger touched or rubbed them anywhere. As in the first study, target-present lineups produced more correct identifications and fewer false alarms.

The results of recall of physical contact showed that the Touched group produced more false negative responses (they failed to say they had been touched or rubbed) than correct recall or false positive (they reported that another part of the body had been touched). The Not Touched group produced significantly more correct than incorrect responses. In addition, the children's anxiety ratings by the two experimenters negatively correlated with recognition accuracy: higher anxiety correlated with lower recognition accuracy. Similarly, pulse rates negatively correlated with recognition accuracy: as pulse rate increased, accuracy decreased.

In a similar study, Hagen (1987) had children from three age groups (3 to 4, 5 to 6, and 7 to 9-year-olds) go through an immunization procedure at a clinic, while the control subjects received a talk. One or 10-14 days later children's memory for the nurse was assessed in their homes with a 5-person photo lineup, with target-present for half of the subjects. Results revealed that with target-present lineups the low anxiety (nonshot) group produced significantly more correct identifications, and fewer false identifications, than the high anxiety (immunization) group. There was however a reversal for the target-absent lineups, on which the high anxiety group was slightly more accurate (although not significantly) than the low anxiety group. In addition,

there was a positive correlation between age and accuracy, with the latter improving with the former.

In another eyewitness study, Peters (1988a) employed a simulated-theft procedure with 5- to 10-year-old children. The study had two levels of Event-Stress (staged theft and no theft), two levels of Type of lineup (live lineup and photo lineup), and two Lineup conditions (target-present and target-absent). Subjects exhibited higher levels of anxiety in the theft condition than in the nontheft condition, and during live lineup identification than during the photo lineup identification. Subjects in the nontheft condition who viewed target-present photo lineups produced the best correct identification performance. Subjects in the theft condition, who viewed live, target-present lineups produced the lowest number of accurate identifications.

Live lineups impaired eyewitness performance only when the condition was anxiety provoking (theft condition). Furthermore, children in the theft condition, who viewed live, target-present lineups yielded high levels of false nonidentification (incorrectly saying that the thief was not in the lineup). These children reported to their parents that they were afraid to identify the thief who was in the lineup because they were afraid something bad might happen, or that someone would get into trouble. Incorrect nonidentification was not due to memory failure (errors of commission) but it was due to social factors impairing eyewitness accuracy (errors of omission). Event-anxiety was negatively correlated with age, with younger children displaying greater amounts of anxiety.

Again in another study, Peters (1988b) investigated the effects of misleading information on eyewitness performance. Children, 6- to 9-year-olds, were exposed to two levels of Event-Stress (fire-alarm vs. no-fire-alarm) and two levels of Type of Question (misleading vs. neutral). Half of the

subjects at each level of Event-Stress were asked questions that contained misleading information, and the other half were asked the same questions which contained neutral information. Recognition memory was assessed with 6-person photo lineups, target-present for half of the subjects, and target-absent for the other half. Analyses of free recall accounts revealed a nonsignificant difference between the fire-alarm and the no-fire-alarm subjects, with the no-fire-alarm group producing more correct statements and fewer incorrect ones. On the objective questions the no-fire-alarm group was superior in recall to the fire-alarm group. An interaction was found between Event-Stress and Type of question.

When the wording of the questions was neutral, children in the no-fire-alarm condition produced the most accurate performances. The subjects who experienced the fire-alarm condition and were confronted with misleading questions provided the worst performances. Thus, it appears that high stress conditions in combination with the misleading questions impaired eyewitness accuracy. In addition, the low anxiety (no-fire-alarm) condition coupled with target-present lineups yielded the most accurate identifications, whereas the high stress (fire-alarm) condition coupled with target-absent lineups produced the least accurate identifications.

Overall in Peters' studies heightened arousal did not increase the recognition or recall accuracy of the subjects. Nonetheless, these studies are not free from problems. Goodman (1991) pointed out that in the dental visit study Peters' (1987) conclusion that stress had a detrimental effect on identification accuracy is unwarranted. The problem is that age and stress were negatively correlated. Given that younger children were more stressed and that younger children are typically less accurate on identification tests, then age could account for Peters' findings. Furthermore, although exposure

time to the dentist and his assistant was kept equal, the amount of time spent looking at the dentist was probably very little. Because children probably looked away from the dentist's face while he had his hands in their mouth, actual exposure time to the dentist may have been less than the exposure time to the research assistant during the home visit. These problems make it unclear whether it was really stress that had detrimental effects on memory.

In a similar manner, in their second study, Peters and Hagen (1986) reported that the more anxious children were, the smaller the number of correct identifications they made. Children were divided into high and low stress groups without controlling for age. Hence, it is very possible that age could account for Peters' findings.

Warren-Leubecker (1991) pointed out another problem that plagues Peters' studies and all the studies that look at arousal and eyewitness reports: it concerned the subjects' level of arousal. The lack of a clear definition of stress and the inability to manipulate and measure it with confidence makes it unclear whether stress had a strong impact on memory. In addition, Warren-Leubecker does not share Peters' view that only high stress is forensically relevant. She believes that in order to comprehend the situation children's affective reaction to various types of events should be studied. Altogether, what needs to be studied is what the person finds stressful, which probably differs from person to person.

Goodman, Hirschman, Hepps, and Rudy (1991) also conducted four studies to investigate children's memory for stressful events. The subjects were 3- to 7-year-old children who received venipuncture or inoculations as part of their health care. Memory was assessed with free recall, direct questions, misleading questions, and face recognition tests. For the face recognition test the target was the laboratory technician. Performance on this

latter test was assessed through target-present photo lineups. In this first study, results showed that regardless of whether children looked nervous, stress did not have any effect upon children's memory. Results from the face recognition task were equivocal: subjects in the control group, who did not receive any inoculations, made a few more accurate identifications than the subjects in the experimental group, who received inoculations. The difference was however not statistically significant.

In their second study, Goodman et al. (1991) used the same procedure as in the first one, with children from two age groups: 3- to 4-year-olds, and 5- to 6-year-olds. Testing occurred 3 to 4 days later (short delay), or 5 to 6 days later (long delay). Face recognition was tested with 6-person target-present photo lineups. The results of analyses showed that stress was associated with better memory. The most highly stressed children were more resistant to suggestions and remembered more correct information than the less stressed children. Furthermore, they were also more likely to recognize the nurse. There were no differences between the younger and the older children in free recall. Older children were more accurate than younger ones in answering direct questions, and they were more resistant to suggestions. On the face recognition task differences between the two groups appeared only in the long delay condition. The identification accuracy of both groups was quite poor. Children's parents, however, performed just as poorly. Findings revealed age differences in false identifications: older children gave fewer false identifications than younger ones. This result may be interpreted as indicating that older children are more willing to admit that they could not remember, and younger children preferring to guess on any picture that they did not recognize. Therefore, it could be a willingness to guess as much as a matter of memory.

In Goodman et al.'s (1991) third study the procedure was similar to the two previous studies. They divided children into two age groups: 3- to 4-year-olds, and 5- to 6-year-olds. Testing session took place after 3 to 4 days (short delay), or 7 to 9 days (long delay). This third study was designed to examine further the effects of stress on memory by including a less stressed control group. Children in the control group provided more incorrect information than children in the experimental group. These findings seem to support the idea that stress may have beneficial effects on memory. Younger children were less accurate than older ones in answering specific and misleading questions. The two groups did not differ, however, in the amount of correct and incorrect information recalled. In addition, in the face recognition task older children were better at identifying the nurse than were the younger ones. Age influenced the number of correct identifications only. Older children and their parents, however, did not differ in face recognition ability.

Goodman et al.'s (1991) fourth study was designed to study the effects of stress and repeated questioning on memory after a long delay. Children from their second study were retested after 1-year delay, and their performances were compared. Findings revealed a decrease in memory for the stressful event. One year later children recalled less correct information, answered fewer specific questions (questions about actions), accepted more misleading questions, and made fewer correct identification. Children did not produce, however, more incorrect information or false identification. In their discussion Goodman et al. (1991) argued that studies in general have not paid enough attention to emotions that tasks, goals, and information created by the testing situation can arouse in subjects. In addition, they pointed out that the quality and quantity of emotion influence event recollections.

Research on the development of face perception shows that face recognition is a skill that develops over time (Carey, 1992). Children, compared to adults are very deficient at face encoding. Carey reports that such deficiency is so extensive that on some clinical cases, children under 10-years perform at the same level of someone who has suffered right hemisphere brain damage. Ten-year-olds, however, although still worse than adults, perform in the normal adult range. Carey addressed the issue of what it is about face recognition that makes younger children worse than older ones and adults. She explained that face recognition has two components. First, there is the initial encoding, during which the representation of a previously unseen face is formed. Then there is recognition, which is the process of matching a current stimulus with a stored representation. As Carey (1992) suggests, the problem with children occurs during the encoding phase, and less so at the recognition phase. Studies have shown that young children, having to decide whether two pictures are depicting the same face, perform very badly if different lighting, hairstyle, colors and so on have been used for the two pictures (see Saltz & Sigel, 1967; Diamond & Carey, 1977). Young children fail to encode features that remain constant over possible changes across photos.

Carey (1981) reported on the developmental course of face processing. In short, face processing skills improve until 10- or 11-years of age. This is followed by a developmental dip at prepuberty, which appears to be marked by a shift from "perceiving faces in a piecemeal fashion to one where the full configural information contained within faces is appreciated" (Ellis, 1992, p. 106). After such a dip they begin improving at about the age of 13 and soon after they reach ceiling. Findings that support the idea that children are dominated by a feature information way of processing faces come from a

study (see Diamond & Carey, 1977) in which children were shown a face with a particular expression or wearing some kind of very obvious paraphernalia. In the subsequent two-alternative forced choice face recognition task children showed an inclination to choose the face on which the paraphernalia was transposed. This does not seem to occur when the faces are familiar. This study and others indicate that "The ability to discern invariance despite a variety of 'normal' changes to a face is presumably learned with experience" (Ellis, 1992, p. 106). This ability improves constantly throughout childhood.

Furthermore, Carey maintained that both limitations in information processing, and the subjects being novices at the task, are responsible for children's poor performances on face recognition tests. Children do not encode faces in terms of features that distinguish one face from another mainly because of their limited knowledge of faces per se. Ellis (1992) proposed that perhaps younger children do not encode faces as thoroughly as older children do. Older children may make more sophisticated elaborations of the internal representation of faces which allow them to be more accurate at recognizing these faces. In two experiments (see Ellis & Flin, 1990) which addressed recognition memory for faces, 7- and 10-year-olds were compared. The subjects' exposure duration to the stimulus was manipulated to obtain different exposure times. Recognition testing also occurred after varying intervals. Results showed that the younger children performed more poorly than the older ones. Furthermore, findings indicated that whereas older children's performance improved when they were given more time to scan the stimulus, younger children did not take advantage of the longer duration. It was reported that when they were allowed more time they only took advantage of the first 2 seconds of the duration.

Studies of face recognition with adults always demonstrated that faces that are physiognomically distinctive are more easily recognized and learned. Ellis (1992) reported about a study (Ellis, Wallace, & Ellis, 1992, in preparation) that looked at this phenomenon in children. A series of distinctive and typical faces were shown to three groups of subjects 6-8, 9-11, 12-14-year-olds. The youngest group performed equally well on distinctive and typical faces. The two older groups showed a sharp advantage in recognition of distinctive faces. However, all three groups were just as much inclined to erroneously identify distinctive distractor faces. These findings were interpreted as indicating that children below the age of 8 either do not encode the distinctiveness of faces, or encode distinctive and typical faces in the same way. Furthermore, Ellis et al.'s (1992) study seems to lend support to the idea that up to the age of 13 children cannot say whether a distinctive distractor face has been seen before with more accuracy than if it were a typical face (which is very different from what adults do).

Some studies have investigated face memory in the 'non-person context', that is recognition accuracy when the background context changes between study and test. Ellis (1992) reported about a study by Markham, Ellis, and Ellis (1991) in which 6-, 8-, 10-, and 24-year-olds looked at faces on a screen each against a different background. In the testing session some of the faces were shown against a new background, whereas some of the distractor faces were shown against backgrounds used for some of the faces in the series. The results were clear. hit rates increased evenly with age (51% for the 6-year-olds, 60% for the 8-year-olds, 64% for the 10-year-olds, and 80% for the 24-year-olds). The researchers concluded that younger children were more affected by changes in the background, and they were more inclined to make false identifications of new faces when they were shown on an old background.

In conclusion, the face processing literature provides evidence that young children see faces as looking very similar to each other, and because of their still limited experience with them (Ellis, 1992) in combination with immature cognitive processes (Carey, 1981) they perform very poorly on face recognition tasks. Furthermore, the findings reported indicate that in the context of the reliability of children's eyewitness testimony special care and caution should be exercised before identifications made by young children are accepted.

THE PRESENT STUDY

In the present study the term suggestibility is defined by the broadest definition supplied by Ceci and Bruck (1993): "Suggestibility concerns the degree to which children's encoding, storage, retrieval, and reporting of events can be influenced by a range of social and psychological factors" (p. 404). This definition implies that the person may, or may not, be aware that the accepted information differs from the original one, such as in confabulation and in acquiescence. If the person is aware of this difference then there is no alteration of memory. It further implies that suggestibility can occur as a result of having introduced information either before or after the occurrence of an event. Finally, it implies that cognitive factors as well as social factors can produce suggestibility (such as suggestions, misleading questions, bribes, threats)

The present study sought to assess children's memory for a special, nonstressful event. As indicated earlier, there have been only a few studies that investigated children's recall for this type of event. Whereas these studies focused mostly on correct recall, the present study paid attention to

correct, incorrect and neutral information, that is, information not directly related to the event but which nonetheless forms a part of children's narratives. These types of elaborations or inferences may in fact lead to distortions of memories (Hudson, 1990).

Children's ability to give free recall accounts to answer direct and misleading questions and to identify visually the adults accompanying the children was examined also. Following Ceci et al. (1994), an attempt was made to determine whether encouraging children to think hard about an event would make them produce fictional events. Whereas Ceci et al. used twelve testing sessions one week apart, the present study sought to determine whether only a few sessions interspersed over many months would replicate their findings. The four testing sessions in the present study extended over 5 months, with each session 6- to 7-weeks apart. One further difference was introduced regarding misleading questions. With the exception of Ceci et al.'s study where a condition of neutral non participant event (eg.: imagining watching someone waiting for the bus) was included, in all the studies reviewed, children are asked about what happened to them, not if they witnessed something happening to someone else. In the present study, children were asked if they had witnessed a friend being hurt, and were asked also if they had been hurt themselves. It was hypothesised that children may be more prone to report that someone else were hurt rather than themselves.

The possible effects produced over time by repeated questioning was evaluated. Stern (Ceci & Bruck, 1993) alerted researchers to the dangers of repeated questioning, and that he maintained that people seem to remember more what they say than what they see. The present study was also designed to examine children's ability to recognize and report the presence or absence of familiar and unfamiliar faces from a 6-person photo lineup under

nonstressful conditions. Most eyewitness studies look at the effects that some type of stress has on identification accuracy. Finally, the study sought to determine whether differences could be found between two groups with a mean age difference of about 10 months. The variable of interest here was the fact that the oldest group had begun academic training in reading, writing and elementary thinking strategies whereas the younger group was still mainly involved in free play or manual activities most of the time. No previous studies were found that investigated this specific hypothesis. In addition, the two groups of children, although close in age, were kept separate because they were separated on the basis of age by the daycare. Given that the intention of the present study was to look at children in their natural context, it seemed to be important to maintain such a division in order to preserve the ecological validity of the study.

It was predicted that: 1. - Both age groups would show an increase in errors and neutral information over time whereas correct information would remain stable during free recall. 2. - The younger group (4.5-year-olds) would perform more poorly than the oldest group (5.3-year-olds) in free recall. 3. - Both age groups would show an increase in correct and incorrect information during direct questioning. 4. - Productivity (all the information, correct, incorrect, and neutral taken together volunteered by the children) would be greater for the older group in free recall, direct questioning, and misleading questioning. 5. - Both age groups would show increased acquiescence over time to misleading questions; that is, sparse questioning (4 times in 6 months) would be sufficient to replicate Ceci et al.'s (1994) findings that children will incorporate the misleading information provided. 6 - Children would tend to report more a young friend being hurt during the outing than themselves. 7. - Both age groups would report the presence of a

person who was in fact not present, whether the face was a familiar or a nonfamiliar one in the face recognition test, and 8. - The younger group (4.5-year-olds) would perform more poorly than the oldest group (5.3-year-olds) in the photo identification task by exhibiting lower levels of accuracy for each of the target pictures.

The present study broke new ground in several respects. First of all, children's memory for a special event, that still falls in the realms of everyday life experiences, was monitored in a natural context. In addition, the use of two different types of misleading questions, one that refers to the child him/herself and the other one that refers to somebody else, might indicate a preference or a tendency to accept suggestions that are formulated in specific ways. This variation is particularly relevant legally where, in most cases, children are questioned repetitively about what may have happened to their friends. Finally, the inclusion in the photo lineup identification task of familiar and unfamiliar faces, for which a judgment about the presence or absence of a person at the event was also required, could shed some light on the risks of using such methods with children. The results could be very useful in helping to approach children during legal cases and serve to set at least preliminary guidelines for interviewing children.

Being a naturalistic study it is impossible to recreate the same type of control that is possible in a laboratory study. In real life situations, when children are interviewed in legal cases about what they have experienced or witnessed, there is no way to assess veridicality of recall. Therefore, this study is of particular usefulness because it looks at children's behavior in its natural context, while permitting comparison of their recall to a known series of events.

Method

Subjects

The subjects of the present study were twenty-four children enrolled in a day-care center in Montréal and the four monitors who worked with them. Consent to participate in the present study was obtained from the coordinator of the daycare, from the monitors, and from the parents of the children concerned. The children were divided by the daycare into two age groups: group 1 and group 2. In group one there were 10 children: 4 females and 6 males, and their ages ranged from fifty to fifty-eight months (mean age = 54.8 mos. or 4.5 years, S.D. = 2.57 months). In group 2 there were 14 children: 7 males and 7 females, and their age ranged from sixty to seventy-three months (mean age = 63.5 mos. or 5.3 years, S.D. = 4.66 months). There were no age differences between males and females within each group. The age difference between the two children groups was significant, $t(21) = 5.31$, $p < .001$. There were four monitors: two females and two males of adult age. Their age ranged from twenty-five to fifty-six. The limited number of monitors in the present study allowed for no reliable statistical analyses. However, the monitors' data were included in the study for the purpose of comparison with the children's data at the exploratory level only.

Apparatus

The four testing sessions took place in the same room made available by the day-care center. The physical setting included a small table and two chairs facing each other. Each session was tape-recorded on a Panasonic tape-recorder, model No. RQ-2765, which was placed in the middle of the table. In addition, a set of six color pictures (which measured 10.5x10cm in size) was

used for post-interview identification of the adult participants. The pictures portrayed the head, shoulders and chest of the person on a white background. The six pictures were glued on a 43x27.5cm. beige card-board forming two rows. The upper row included pictures No. 1, 2, 3; the lower row included pictures No. 4, 5, 6. Pictures No. 1, 4 and 6 portrayed monitors from the day-care who were present during the event; picture No. 2 portrayed a monitor who was not present during the event; picture No. 3 was the picture of a stranger (a person who was not a monitor, who was unknown to the children and who was not present during the event); picture No. 5 represented a male individual who was not a monitor, but who was introduced to the children as: "This is Normand and he will be coming with us to take pictures" and who was present during the event. The set did not include the picture of one monitor who was present as well as the picture of the first experimenter.

Procedure

Description of the special event

Children's memory for a special event was the focus of the present research. The event chosen was an outing to the Olympic Stadium for a session of gymnastics. This type of event was chosen because it was special, or different from the children's typical everyday activities, and it did not have any particular emotional or stressful connotations. On the morning of the outing, children congregated at the day-care center. A male individual who was not a monitor and who was never to be seen again after this outing was introduced by the experimenter to the children as "This is Normand and he will be coming with us to take pictures." The experimenter, being the mother of one of the subjects, was well known to children therefore she did not need to introduce herself in any way before going along with them. At

this point the children went to the Olympic Stadium accompanied by four monitors. Upon arrival at the Stadium the children were welcomed by a woman monitor. Subsequently, boys and girls went to the men and women locker rooms respectively and changed into exercise clothing. From this point on they went through a series of exercises and games (see Appendix A for a complete list of activities). After completion of the activities Normand, the male person who was not a monitor, left the scene. The children had lunch in the dining room, and then went back to the locker rooms and changed. Finally, they were assembled outside the Stadium before taking the metro and the bus that headed back to the day-care center.

Description of testing or interviewing sessions

There were four testing sessions that extended over six months. Session one took place the day immediately following the excursion, session two eight weeks after session one, session three six weeks after session two, and session four seven weeks after session three. The delays were chosen on the basis of the availability of the daycare for testing. In terms of questions and order of questions the four interview sessions were the same. They differed with the exception that the first question in session three and four was to recall the number of times they had been previously interviewed. Moreover, at the beginning of each session children were asked to produce the name of the place they went. Subsequently, the interviews evolved in the same way along three lines of questioning making it possible to investigate differences among these three type of answers. The three conditions were: free recall, direct questions, and misleading question. In the free recall condition children were asked to recount everything they did during the outing, whenever they stopped producing information they were prompted to

produce more by asking them "What else". After "What else" was repeated three times the experimenter went on to the next group of questions. In the direct questions condition a list of direct questions was asked (see Appendix B for the list of direct questions). Some of the questions concerned the type of activities they had performed, others concern details of the activities, and some others concerned descriptions of people and what their role was in the activities. The misleading question condition included the suggestion that somebody else and the child him/herself got hurt while playing. If the child denied the occurrence of such event it was suggested to him/her that somebody else had reported about it and that the experimenter wanted to know if it was true or not (see Appendix C for examples of questions and answers during interviews). After each interview the children were rewarded for their participation with a candy-bar.

In sessions two, three, and four a picture/face recognition task was added at the end of the interview. The decision to avoid the face recognition task in the first session was taken in order to make this situation more naturalistic. In real life, pictures are introduced only a few weeks into the investigation. The subjects were asked to name the persons in the pictures (with the exception of the two strangers, children were very familiar with the monitors and their names). The child also had to judge whether the person was present at the Olympic Stadium or not; if a positive answer was produced for a person who was not present at the Stadium then the child was asked to report on what that person was doing at the Stadium.

Description of the scoring system

The first question to be scored had to do with the ability of the subject to produce, on the first try the name of the place where the outing occurred, as

such it was scored as either as yes (capable) or no (incapable).

In the free recall, question, and misleading question conditions elements of information provided by the child were classified as either correct, incorrect, or neutral. The 'correct' category included pieces of correct information that were also pertinent to the event children were asked about. The 'incorrect' category grouped pieces of information that were incorrect but relevant to the event in question. The 'neutral' category classified elements of information that were not relevant to the situation, such as information about what they had for breakfast.

In the free recall condition a 'repeat' category was found, also, relevant to this condition only, which included bits of information that were already mentioned. In this case the first time an information was mentioned it was classified as either correct, incorrect, or neutral, and the second time that the same element was provided it was classified as repeat.

In the question condition, the additional 'omission' category, which was pertinent to this condition only, included elements of information that the child omitted: for example, when the child named three monitors rather than four, or when the child said s/he could not remember.

In the misleading question condition there is the 'attributional' category which is only found in this condition. This category grouped the number of bits of information that were explanatory or justificatory of an either correct or incorrect answer

For the 'picture recognition' task the subject had to say whether the person in the photo was at the Stadium or not. Therefore, the answer was either a yes or a no. The pictures that were of most interest were picture No. 2 (a monitor known by the children but not present at the Stadium), No. 3 (a male person not known by the children who was also not at the Stadium),

and picture No. 5 (the male person not known by the children until he was introduced to them as Normand who was accompanying the children to take photographs).

The two investigators independently coded 21% (6 out of 29) of the protocols representing a cross section from each recall session. Inter-rater correlations were high, ranging from over Pearson $r = .90$ to $.94$ for correct and incorrect information, and ranging from over $r = .80$ to $.88$ for neutral, forgotten, and attributional categories in free recall, direct questioning, and misleading question. With such reliabilities the rest of the protocols were scored by the main investigator only (D. Maestri).

Results

Unless otherwise stated, all of the analyses reported are comparisons of children from the two age groups. Although the group of monitors have not been included in the analyses, their data will be reported for comparison purposes. The limited number of monitors ($n = 4$) did not allow for more sophisticated statistical analyses. Results have been analyzed for the 5 main set of data of the study. First was the 'Olympic Stadium' question. In this case we wanted to assess children's recall for the name of the place they had visited. Recall was scored positive if, upon questioning, the child was able to reproduce the name of the place on first attempt. If further solicitation to recall the name of the place was called for, recall on first attempt was treated as having failed. Second, 'free recall' was analyzed in terms of correct, incorrect, neutral, or repeated responses. Third, 'direct questions' were evaluated in terms of correct, incorrect, neutral, or omitted responses. Fourth, suggestibility was assessed in terms of responses to the 'misleading questions'. In this case, accuracy (correct) was an indication of resistance to the misleading questions, and inaccuracy (incorrect) was a sign of acceptance, or suggestibility. Neutral and attributional responses were included in the analyses as well. In addition, productivity or overall production of information generated by the subjects was analysed for free recall, direct questions, and misleading questions. Fifth, photo lineup identifications were analyzed in terms of incorrect answers.

Olympic Stadium Question

In the 'Olympic Stadium' question monitors always answered correctly.

The result of a Cochran Q test for k related samples performed on the

responses to the Olympic Stadium question (dichotomous data) was not significant, $Q(3) = 6.619$, $p < 0.10$, indicating that there were no significant changes in the ability to reproduce the name of the place they had been under sessions 1, 2, 3, and 4. A separate t-test analysis (between groups), $t(22) = -3.34$, $p < 0.003$, indicated that the older children (Group 2, $M = 2.357$) remembered the target item more often than the younger ones (Group 1, $M = 1.00$).

In general, the younger group forgot the name of the place where they had been significantly more often than the older group.

Free recall

Means and standard deviations for 'free recall' correct, incorrect, neutral, and repeated information are reported for the 3 groups in Tables 1, 2, 3, and 4.

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Insert Tables 1, 2, 3, and 4 about here

.....

Productivity or overall production of "ideas" generated by the subjects in groups 1, 2, and 3, respectively, was calculated by summing up the responses in the correct, incorrect, and neutral categories. Means and standard deviations are reported in Table 5.

.....

Insert Tables 5 about here

A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for productivity in free recall revealed no main effect of group, no main effect of session, and no significant interaction (see appendix D, Table D-1 for ANOVA source table)

Table 1

Means and standard deviations for 'Correct' information produced in Free Recall for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	4.50	3.06	4.54	3.13	8.00	2.00
session 2	3.00	2.54	4.00	3.37	5.75	3.59
session 3	3.30	1.70	2.64	1.22	10.75	4.99
session 4	1.80	1.55	2.79	1.53	8.25	5.06

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 2

Means and standard deviations for 'Incorrect' information produced in Free Recall for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	0.30	0.67	0.23	0.44	0.50	0.58
session 2	1.70	1.57	1.14	1.35	0.00	0.00
session 3	0.70	0.95	1.29	1.64	0.75	0.50
session 4	1.20	1.55	1.36	1.74	0.50	0.58

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 3

Means and standard deviations for 'Neutral' information produced in Free Recall for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	2.10	4.36	1.69	2.63	0.50	0.58
session 2	1.30	1.42	0.64	1.28	0.00	0.00
session 3	1.70	1.64	0.93	0.92	0.25	0.50
session 4	1.00	0.67	1.14	1.35	0.25	0.50

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 4

Means and standard deviations for 'Repeated' information produced in Free Recall for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	0.90	1.37	0.85	1.07	1.00	1.41
session 2	0.30	0.67	0.57	0.76	0.75	0.50
session 3	0.60	1.07	0.21	0.43	0.25	0.50
session 4	0.00	0.00	0.29	0.61	0.00	0.00

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 5

Means and standard deviations for Productivity in Free Recall for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	6.90	6.10	6.46	5.46	9.00	2.00
session 2	6.00	4.03	5.79	3.49	5.75	3.59
session 3	5.70	2.83	4.86	1.83	11.75	5.31
session 4	4.00	1.76	5.28	3.02	9.00	5.35

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

It should be noted that the adults' productivity means were not very different from the children's means. Although in sessions 1, 3, and 4 adults were somewhat more productive than the children, in session 2 the opposite situation occurs.

A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for 'correct' responses yielded no main effect of groups. There was a significant main effect of session $F(3, 63) = 4.216$, $p < 0.009$. A significant linear trend was found [$F(1, 2) = 11.88$, $p < 0.002$], indicating that children from both groups recalled less across sessions. The analyses revealed no significant interaction. For the purpose of comparison to children, it should be noted that the adults reported a definite greater number of correct information. Analyses of 'incorrect' responses revealed a significant main effect of recall session $F(3, 63) = 3.653$, $p < 0.017$. A post-hoc test (Tukey's HSD = 0.947) indicated that session 1 was significantly different from session 2 and 4. Hence, children produced less incorrect information across sessions. The analysis revealed no main effect of group and no significant interaction. Interestingly, a comparison of adults' number of incorrect responses to the children's performance indicated that adults do not seem to differ much from the children. Analysis of 'neutral' responses revealed no main effect of session, no main effect of group, and no significant interaction. Adults in comparison to children give fewer neutral details information. Analysis of 'repeated' responses revealed a significant main effect of recall session $F(3, 63) = 3.430$, $p < 0.022$, the number of repeated responses decreased over time. A post-hoc test (Tukey's HSD = 0.551) indicated the source of significance was attributable to the difference between session 1 and 4. However, no main effect of group and no significant interaction were found (see Appendix L for ANOVA source tables). Again, a

comparison of adults to children in terms of number of repeated responses indicated to see that adults perform much in the same way as children do.

In sum, upon free recall questioning children from the two age groups did not significantly differ, and both groups produced a decreasing number of correct, incorrect, and repeated information over time. Only neutral information did not change significantly.

Direct Questions

Means and standard deviations for correct, incorrect, neutral, and omitted information produced upon "direct questioning" for the 3 groups are reported in Tables 6, 7, 8, and 9.

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Insert Tables 6, 7, 8, and 9 about here

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Productivity of "ideas" generated by the subjects in groups 1, 2, and 3, respectively, was calculated by summing up the responses in the correct, incorrect, and neutral categories. Means and standard deviations are reported in Table 10

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Insert Tables 10 about here

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A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for productivity in response to direct questioning revealed no main effect of groups, no main effect of sessions, and no significant interaction (see appendix D, Table D-2 for ANOVA source table)

Table 6

Means and standard deviations for 'Correct' information produced upon Direct Questioning for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	14.90	3.28	16.77	3.65	17.25	8.10
session 2	15.80	4.31	17.29	3.60	16.00	2.16
session 3	15.20	3.99	15.71	3.73	16.75	0.96
session 4	12.70	4.06	15.00	3.53	15.75	2.50

Note. The maximum score for correct answers to direct questions is 23.

SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 7

Means and standard deviations for 'Incorrect' information produced upon Direct Questioning for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	5.10	4.12	2.77	1.64	1.75	2.22
session 2	4.90	3.07	3.50	1.83	1.50	1.29
session 3	4.10	3.35	3.43	2.59	2.00	2.83
session 4	4.70	3.89	3.43	1.74	1.50	1.29

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 8

Means and standard deviations for 'Neutral' information produced upon Direct Questioning for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	1.50	2.01	1.85	4.90	1.75	3.50
session 2	3.20	4.39	0.79	0.89	0.25	0.50
session 3	1.00	1.76	0.43	0.85	0.00	0.00
session 4	2.20	4.94	0.36	1.08	0.00	0.00

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 9

Means and standard deviations for 'Omitted' information produced upon Direct Questioning for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	2.80	1.81	2.23	1.83	0.50	1.00
session 2	4.10	2.77	2.36	1.28	0.25	0.50
session 3	2.70	1.95	1.71	0.91	0.00	0.00
session 4	2.70	1.95	1.79	1.42	0.25	0.50

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 10

Means and standard deviations for Productivity in Direct Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	21.50	4.76	21.38	7.08	20.75	13.60
session 2	23.90	5.88	21.57	3.30	17.75	1.50
session 3	20.30	5.70	19.57	4.36	18.75	3.59
session 4	19.60	8.42	18.79	5.06	17.25	1.26

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Again, a comparison of productivity means reveals that, although the children seem to have a slightly higher productivity level, the adults do not seem to produce much less.

A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for 'correct' responses showed a significant main effect of recall session $F(3, 63) = 2.881, p < 0.043$, children from both groups recalled less information over time. A post-hoc test (Tukey's HSD = 2.22) indicated that the source of significance was attributable to the difference between session 2 and 4. Furthermore, there was no main effect of group and no significant interaction. In the comparison of adults to children, the adults in this study recalled slightly more correct information than the children, and their recall decreased a little over time. Analyses of 'incorrect' responses showed no main effect of group, no main effect of recall session, and no significant interaction. Again, one finds that the adults produced fewer incorrect information upon direct questioning than the children. Analyses of 'neutral' responses showed a non significant main effect of group, $F(1,21) = 3.721, p < 0.067$: the younger children produced more neutral information than the older ones but not significantly so. The analysis produced no main effect of recall session and no significant interaction. The adults produced fewer neutral information than the children. Analyses of 'omitted' responses revealed a significant main effect of group, with the younger group showing more forgetting than the older one, $F(1, 21) = 4.33, p < 0.05$. There were no main effect of recall session, and no significant interaction (see Appendix F for ANOVA source tables). In addition, the adults omitted fewer information in comparison to the children in the study.

In sum, both groups were less able to recall correct information upon direct questioning across sessions. Furthermore, the younger group forgot (or

omitted) more information than the older one. Regarding the number of incorrect and neutral information produced, both groups' performances were comparable and did not significantly change over time.

Misleading questions

Scores were analysed for outliers; only one child scored in the outlier range (more than three standard deviations away from the group's mean). The outlier's score was reduced to one unit higher than the highest score.

Means and standard deviations for correct, incorrect, neutral, and attributional information produced in response to the 'misleading questions' for the 3 groups are reported in Tables 11, 12, 13, and 14.

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Insert Tables 11, 12, 13, and 14 about here

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Productivity of "ideas" generated by the subjects in groups 1, 2, and 3, respectively, was calculated by summing up the responses in the correct, incorrect, neutral, and attributional categories. Means and standard deviations are reported in Table 15.

Insert Tables 15 about here

A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for productivity in response to the misleading questions revealed a main effect of session, $F(3, 63) = 2.767$, $p = 0.0049$: children in both groups volunteered less information over time. Furthermore, there was no main effect of groups and no significant interaction (see Appendix D, Table D-3 for ANOVA source table).

Table 11

Means and standard deviations for 'Correct' information produced in response to the Misleading Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	2.10	11.17	2.23	1.36	1.25	0.50
session 2	4.10	2.77	2.36	1.28	0.25	0.50
session 3	2.70	1.95	1.71	0.91	0.00	0.00
session 4	2.70	1.95	1.79	1.42	0.25	0.50

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 12

Means and standard deviations for 'Incorrect' information produced in response to the Misleading Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	1.20	1.99	1.15	1.07	1.00	1.41
session 2	1.50	2.01	1.07	1.07	0.50	0.58
session 3	1.60	1.65	0.71	0.73	0.50	0.58
session 4	0.80	0.92	0.79	0.97	0.50	0.58

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 13

Means and standard deviations for 'Neutral' information produced in response to the Misleading Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	M	SD	M	SD	M	SD
session 1	0.80	1.03	1.38	1.80	1.00	1.15
session 2	1.60	1.35	1.21	1.19	0.25	0.50
session 3	0.50	0.71	1.07	1.14	0.25	0.50
session 4	0.60	1.07	0.64	0.84	0.00	0.00

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 14

Means and standard deviations for 'Attributional' information produced in response to the Misleading Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	6.10	11.17	3.61	4.15	4.25	5.31
session 2	3.70	4.30	2.50	2.47	1.75	2.36
session 3	3.90	4.61	0.79	1.48	0.75	0.95
session 4	3.20	4.16	1.21	2.58	1.25	1.50

Note. SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Table 15

Means and standard deviations for Productivity in Misleading Questions for groups 1, 2, and 3.

SESSIONS	Group 1		Group 2		Group 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
session 1	10.20	12.16	8.38	5.44	7.50	7.19
session 2	8.10	4.65	7.00	3.57	3.75	2.87
session 3	7.80	4.71	4.64	1.39	3.25	1.50
session 4	7.00	3.71	5.14	3.53	3.50	1.29

Note SESSIONS = recall sessions. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. Group 3= monitors.

Comparisons of the adults' productivity means to the children's show that although children were somewhat more productive than the adults, they were not very diverse.

A 2 X 4 repeated measure ANOVA with one between variable (groups) and one within variable (4 sessions) for 'correct' responses ('no' responses indicating resistance to suggestion) showed no main effect of group, no main effect of session, and no significant interaction. In addition, it was found that the adults in this study gave a smaller number of correct information than the children. Analyses of 'incorrect' responses ('yes' responses indicating suggestibility) revealed no main effect of group, no main effect of session, and no significant interaction. The adults produced less incorrect information than the children, which could be taken as an indication of adults being less suggestible than children. The analyses of 'neutral' responses revealed no main effect of group, no main effect of session, and no significant interaction. Again, the adults produced slightly fewer neutral answers than the children. The analyses of 'attributional' responses showed no main effect of group, no main effect of session, and no significant interaction (see Appendix G for ANOVA source tables). The adults produced less attributional information than the children. Nevertheless, their performances was more similar to the older than the younger group. Overall the two groups did not differ in their ability to resist, or succumb, to the suggestions implied by the misleading questions.

The misleading questions were further analyzed. There were two misleading questions. the first one asked the subject about some other child getting hurt, and the second one asked the subject about him/herself getting hurt. The questions were designed to assess if children had a tendency to accept more easily suggestions about a negative event happening to them

versus happening to others. The data obtained from the two questions taken together show that more than 50% of the children at each testing session accepted and went along with at least one of the suggestions implied by the misleading questions (see Table 16). Only 2 of the 24 children who

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 Insert Table 16 about here

participated in the study did not ever agree with the suggestions and always correctly rejected them. In contrast, 2 of the children always accepted the suggestions at each testing session. The remaining 20 children did not show any special trend over the sessions. In addition, it is interesting to notice that 54% of the children accepted one misleading question on at least three of the four possible occasions. As for the adults, two of them answered yes to the misleading question, and the other two answered no. The two adults who answered yes, however, said that they were not sure and were reporting on what they had heard but had not seen.

The data obtained from the two questions separately show that the majority of children accepted the suggestion when the question implied that another child got hurt. In comparison, few children accepted the suggestion when the question implied that the child him/herself got hurt (see Table 17 for percentages).

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 Insert Table 17 about here

Children accepted the suggestion significantly more often when the suggestion implied somebody else getting hurt, $t(23) = -4.071$, $p < 0.001$. Furthermore, a one-way repeated measure ANOVA was performed on the

Table 16

Percentages of children that said 'yes' to at least one of the two misleading questions across sessions in group 1 and in group 2.

	SESSIONS			
	1	2	3	4
GROUP 1	30%	60%	80%	60%
	(10)	(10)	(10)	(10)
GROUP 2	64%	71%	57%	50%
	(13)	(14)	(14)	(14)
GROUP 1 & 2	50%	67%	67%	54%
	(23)	(24)	(24)	(24)

Note. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. GROUP 1 & 2= the two groups together. The numbers in () correspond to the number of subjects in the sample on which the percentage was calculated.

Table 17

Percentages of children that said 'yes' to the misleading question that referred to 'myself' vs 'others', across sessions in groups 1 and 2.

MISLEADING QUESTION	SESSIONS			
	1	2	3	4
<u>MYSELF</u>				
GROUP 1	30%	30%	40%	20%
	(10)	(10)	(10)	(10)
GROUP 2	29%	21%	14%	14%
	(13)	(14)	(14)	(14)
GROUP 1 & 2	29%	25%	25%	17%
	(23)	(24)	(24)	(24)
<u>OTHERS</u>				
GROUP 1	20%	60%	80%	60%
	(10)	(10)	(10)	(10)
GROUP 2	57%	64%	57%	50%
	(13)	(14)	(14)	(14)
GROUP 1 & 2	41%	62%	66%	54%
	(23)	(24)	(24)	(24)

Note Group 1= 4 5-year-olds Group 2= 5.3-year-olds. GROUP 1 & 2= the two groups taken together The numbers in () correspond to the number of subjects in the sample on which the percentage was calculated MYSELF= refers to the misleading question that involved the child getting hurt OTHERS= refers to some other child getting hurt

sum of children's responses to the misleading questions (ME and OTHERS) over four sessions. The results of this analysis indicated that there was no main effect of sessions; that is, children's responses to the misleading questions did not significantly differ from session to session (see Appendix H for ANOVA source table).

Photo Lineup Identification

For the photo lineup identifications all children gave accurate answers for pictures No. 1, 4, and 6, that is correctly identified adults who were present on the visit. The pictures of interest were picture No. 2 (familiar person but not present at the Stadium), No. 3 (face never seen and not present at the Olympic stadium), and No. 5 (unfamiliar person, introduced to the children before going to the event, and present at the Stadium).

Percentages of incorrect identifications or false positives for picture No. 2 (children said he was there when he was not) are reported in Table 18.

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Insert Table 18 about here

.....

Percentages of incorrect identifications or false positives for picture No. 3 (children said he was there when he was not) are reported in Table 19.

.....

Insert Table 19 about here

Percentages of incorrect identifications or false negatives for picture No. 5 (children said the person in the picture was not there, when he actually was) are reported in Table 20.

Insert Table 20 about here

.....

The results of three separate Cochran Q tests for k related samples were performed on the identifications of pictures No. 2, 3, and 5, respectively. Results indicated that these tests were not significant (picture No. 2, $Q(2) = 2.0$, $p > .05$; picture No. 3, $Q(2) = 1.33$, $p > .05$; picture No. 5, $Q(2) = 3.0$, $p > .05$), meaning that there were no significant changes over sessions; that is, the probabilities of "yes" responses were not different under interviews 2, 3, or 4.

In order to assess a possible difference between groups (group 1 and 2) on the face recognition task for picture No. 2, 3, and 5, the results for each picture were collapsed over sessions (sessions 2, 3, and 4). Three separate t-tests were performed on the latter data and the results revealed no significant differences between the younger and the older children.

The adults in the study always provided correct answers to all of the pictures and never made false identifications or false nonidentifications.

Table 18

Percentages of incorrect answers or false positives for picture n. 2 (familiar person, not present at the event).

	SESSIONS		
	2	3	4
GROUP 1	20% (10)	20% (10)	30% (10)
GROUP 2	21% (14)	28% (14)	43% (14)
GROUP 1 & 2	21% (24)	25% (24)	37% (24)

Note. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. GROUP 1 & 2= all the children from the groups taken. The numbers in () correspond to the number of subjects in the sample on which the percentage was calculated. Incorrect answer or false positive= the child reported that the person in the picture was present at the event, but he was not.

Table 19

Percentages of incorrect answers or false positives for picture n. 3 (stranger, not present at the event).

	SESSIONS		
	2	3	4
GROUP 1	20%	30%	30%
	(10)	(10)	(10)
GROUP 2	14%	21%	7%
	(14)	(14)	(14)
GROUP 1 & 2	17%	25%	17%
	(24)	(24)	(24)

Note. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. GROUP 1 & 2= all the children from the two groups taken. The numbers in () correspond to the number of subjects in the sample on which the percentage was calculated. Incorrect answer or false positive= the child reported that the person in the picture was present at the event, but he was not.

Table 20

Percentages of incorrect answers or false negatives for picture n. 5 (unfamiliar person, introduced to the children before going to the event, and present at the Stadium).

	SESSIONS		
	2	3	4
GROUP 1	50%	60%	60%
	(10)	(10)	(10)
GROUP 2	21%	28%	36%
	(14)	(14)	(14)
GROUP 1 & 2	33%	42%	46%
	(24)	(24)	(24)

Note. Group 1= 4.5-year-olds. Group 2= 5.3-year-olds. GROUP 1 & 2= all the children from the two groups taken. The numbers in () correspond to the number of subjects in the sample on which the percentage was calculated. Incorrect answer or false positive= the child reported that the person in the picture was not present at the event, but he was.

Discussion

There was a number of interesting findings in the present study. They are discussed in light of the importance given to children's testimony in legal courts. The results will be discussed for each of the 8 hypotheses predicted.

FREE RECALL AND DIRECT QUESTIONING

It was hypothesized that both age groups (4.5- and 5.3-year-olds) would produce more incorrect and neutral information over time, whereas correct information would remain constant during free recall.

When children were asked to identify where the outing had taken place and to free recall the specific events linked to this trip, they showed a gradual decrease of correct information over time as was predicted in the literature review in the Introduction. However, contrary to the prediction that incorrect and neutral information would increase over time, both decreased.

The prediction that younger children would perform more poorly than older ones during free recall was not supported. Both groups' performances were equivalent.

Children in the free recall context were unwilling to fill the gaps in their report and preferred to remain silent or say that they could not remember. Furthermore, the suggestions implied by the misleading questions were never incorporated in the free recall of a session, even the subject accepted the suggestions. It is well-known among researchers in this area that asking very young children to recall is extremely difficult.

Furthermore, it was hypothesized that both groups would show an increase in correct and incorrect information during direct questioning. When direct questioning was employed, children remembered much more

than their free recall performance could lead one to believe. Hence, it is not surprising that when children are interviewed in a legal or clinical context, structured or semi-structured interviews are commonly used. Provided with cues, their recall performance increases dramatically (see also Fivush and Hudson, 1991). In the present study, the correct information provided by the direct questioning nearly quadrupled for all children across sessions. Unfortunately so did the incorrect information produced, supporting the hypothesis stated earlier. It must be emphasized here that this rather large increase in incorrect information was produced even though the direct questions never introduced false information before the end of the structured interview. In fact, the largest number of incorrect responses can be found during session one, that is, before the misleading questions were ever asked. They proceeded to remain constant across sessions.

There were no major differences found among the two groups of children. The younger group showed an increase in forgotten information both for recalling where they had gone that day, and across sessions during direct questioning. However, groups did not differ in terms of correct or incorrect information produced.

It was hypothesized also that older children would obtain higher levels of productivity, when in fact they did not generate more "ideas" than the younger group during free recall and direct questioning.

MISLEADING QUESTIONS

It was hypothesized that both age groups would show an increase in acquiescence over time to the misleading questions, and that sparse questioning would be sufficient to replicate Ceci et al.'s (1994) findings that children would incorporate the misleading information provided. It was

predicted also that children would show a preference in reporting that another child was hurt rather than themselves.

The different hypotheses of the present study were supported by the results. Children did endorse the misleading questions significantly and in a constant fashion. There were no group differences in acceptance of the misleading question. As well, the construction of a fictional event remained constant throughout the sessions. Whereas Ceci et al. (1994) had found that the fictional event was slowly accepted over time, children in the present study went along with the suggestion from the beginning. Comparably to Ceci et al.' results, which found that the higher number of false assents occurred for the neutral nonparticipant events, and the fewest assents occurred for the negative participant event, the children in the present study showed a definite preference for the suggestion that some other child had been hurt. The percentages are quite astounding in light of the consequences that may follow such constructions in a legal or clinical contexts. Overall, more than 50% of the children reported an incident across sessions. As we had hypothesized, children were more willing to say that a friend had been hurt than themselves. The difference in procedures of the present study from Ceci and Bruck's one may account for the earlier intrusions of the fictional event. Across sessions approximately 20% of children acknowledged that something had happened to them (already quite a high percentage) compared to the 50% found for others. This finding is important in light of the fact that during most of the legal cases reported in the literature (especially cases involving nurseries or day-care centers) children are routinely asked if they saw what happened to their friends. Furthermore, they are often told what other children have said about themselves and asked to corroborate the events. One can easily see from the results of the present study how

dangerous this type of interviewing may be in misleading to the production of convincing albeit fictional events. A few examples are worth describing because they illustrate well the type of constructions that children can make in response to misleading questions. First of all, all children seemed very eager to participate in the experiment which was evidenced by the fact that they kept asking about when their turn was going to come up. But, more importantly, when the experimenter asked the misleading question, "is it true that a kid got hurt?", and the child said no, and the experimenter went on saying "you know it's because I was told that a child got hurt while playing", children who had initially said no, changed their version and made remarks like: "oh yes, it was..." or "oh yes, now I remember...". Sometimes the children held on to their no, but almost always added some kind of an explanation, justification, or went on talking about another event that happened some other time. It was fairly obvious that it was very difficult for most children to limit themselves to a plain no. They seemed to feel compelled to add something in order to please the experimenter.

It should be added that one child was by mistake, not tested in session one, but was tested in session 2, 3, and 4. When the experimenter realized that there was no record of the first session, she asked the child whether she was tested. The child reported being tested despite evidence to the contrary.

Finally, the hypothesis that older children would produce a greater number of ideas was not supported because both groups' performances were equivalent.

FACE RECOGNITION AND PHOTO LINEUP

The results of the present study support the hypothesis that, despite the familiarity or nonfamiliarity with the person, children reported the presence

of a person who was in fact not present or failed to report a true presence. In fact, over the sessions between 33% to 46% failed to report the presence at the event of the stranger who was introduced to the children that day and who remained with them for the entire duration of the event. Furthermore, across sessions between 17% to 25% of children falsely reported the presence of a person whom they had never seen. Again, between 21% to 37% of the children falsely reported that a familiar person was present at the event. Overall, it seems that regardless of familiarity, just asking children to identify a face is sufficient to elicit false identifications. The results did not support the hypothesis that the younger group would perform more poorly than the oldest one on the photo lineup identification task. Although in terms of percentages the two groups appear to be quite different, the statistical analyses were not significant. Therefore, it appears that for children between the age of four and six, photo lineups identification yields performances that are too risky, especially if they are used in a court of law.

From a review of the literature it is clear that findings from the development of face perception are somewhat in contradiction with the findings from eyewitness testimony. The former takes the position that children are not good at face recognition, while the latter takes the opposite position. Although the reasons for such discrepancy may be numerous (different theories, methodologies, measurements, expectations, and so forth), they may not be as discrepant as they appear. In fact, in all of the studies on eyewitness testimony younger children always performed more poorly than older ones, which is what the developmental data on face perception would predict. It is possible that a lack of contributing efforts from both domain is responsible for the present lack of clarity of the situation. We may need to look more at eyewitness ability at critical ages as

predicted by the face perception literature (such as: 3- to 4-, 6- to 7-, 8- to 10-, 11- to 14-, 15- to 18-years of age).

Overall, the present study indicates that no matter how we look at it, children are not good at photo lineup identifications.

CONCLUSIONS

As mentioned in the Introduction, it is difficult to compare studies to each other because they all use different methodologies. The same type of problem arises if we try to compare the present study to previous similar ones. Different methodologies effect all areas. For example, if we consider the target event of studies, some researchers used data obtained from subjects watching a film (Dale, Loftus, & Rathbun, 1978; Cohen & Harnick, 1980); some others a staged live event (King & Yuille, 1987; Marin, Holmes, Guth, & Kovac, 1979; Flin, Boon, Knox, & Bull, 1992); again others hearing a story (Ceci, Ross, & Toglia, 1987; Murray, 1983); and in the present study the researcher used data obtained from children participating to an outing.

The same type of diversities affects other areas of interest, such as the number of misleading questions asked, the time of introduction of the misleading questions, the scoring systems used, the statistical techniques performed, the number of sessions, the intervals between sessions, to mention a few. Future research, while bringing their own innovations, should attempt to keep some methodologies constant with the methodologies of other studies. By doing this, the tasks of comparison of studies, and conclusion drawing from these same ones, would be made easier and clearer.

The results of the present study and the evidence provided by previous research strongly suggest that witness reports from children should be taken with a much caution and skepticism. Future research should aim at

providing more studies on the malleability of children's memory and on their ability to recognize. Identifying the circumstances under which children are more suggestible should also be a priority. This latter point includes looking at characteristics of the situation (such as bribes, threats, possible consequences of the child's report) as well as characteristics of the interviewer. For example, it would be interesting to study the effects of gender of the interviewer on children's reports, or interviewers' postures, tone of voice, as well as certain characteristics of the setting itself (such as the physical characteristics of the room where the interview takes place. such as in a typical lawyer's office vs an environment that appears friendly to a child).

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APPENDIX A

List of the main events that could be mentioned by subjects.

List of the main events:

1. Children went to the locker room and changed.
2. They passed by a blue tunnel, looked at it but did not play with it.
3. They played the game of "Madame le loup et les cochons": What time is it madame le loup? Three o'clock, they take three steps, twelve o'clock they run back into a circle to avoid being eaten; if they get eaten by madame le loup, they become like her.
4. They played three games with a big pink ball: first they played with their hands, second the children were lying down and the ball rolled over them, third they played with their feet.
5. The children ran after madame le loup.
6. They drank from the water fountain.
7. They looked at the scuba diving pool.
8. They went to the elastic carpet: They took off their shoes, then jumped on it, then they lied down on their back while the monitor made them jump, then put their shoes back on.
9. They ate lunch in the dining-room.
10. They went to the locker room and got dressed.
11. They congregated outside the Olympic Stadium.
12. They took the metro, the bus, and walked back to the day-care center.

APPENDIX B
List of Direct Questions

Direct Questions:

- 1 What games did you play?
- 2 Did you jump on an elastic carpet?
- 3 Did you play with a ball?
- 4 Was the ball big or small?
- 5 What was the color of the ball?
- 6 Did you play at Madamr Wolf?
- 7 What was the game?
- 8 Who was there?
- 9 What monitors from daycare were there?
- 10 Was Pollux there?
- 11 Was Philippe there?
- 12 Was Elena there?
- 13 Was Michel there?
- 14 Was I there?
- 15 Was somebody taking pictures?
- 16 Was that person small or tall?
- 17 Was that person thin or fat?
- 18 Did that person play with the ball?
- 19 How was Madame Wolf dressed?
- 20 Did she have a make up?
- 21 Did she have a costume?

APPENDIX C

Representative sample of subject's interviews for Sessions 1, 2, 3, and 4.

SESSION 1KORY

I: Où on est allé hier?

E: Au Stade Olympique. aha.

Free recall:

I: Qu'est-ce-que tu as fait?

E: On a joué sur la trampoline, puis on a joué aux trois petits cochons, puis on s'est pitché sur le dos sur la trampoline, après au début mais quand on rentrait on marchait on a pu aller à la trampoline.

I: Quoi d'autre?

E: Puis aussi on n'avait pas le temps d'y aller avec eux.

I: D'aller où?

E: Sur le truc bleu où les autres amis jouaient.

I: Ok.

E: Là tous les amis disaient je veux aller je veux aller puis après on est parti.

I: Quoi d'autre vous avez fait?

E: Puis on a joué aux trois petits cochons, puis on a fait de la trampoline.

I: Rien d'autre?

E: Non.

Questions:

I: Est-ce que tu as joué avec une balle?

E: Non.

I: Non? Une balle rose?

E: Non.

I: Qui était là?

E: Il y avait moi, il y avait Christine, il y avait Giulia.

I: Mais dans les moniteurs ou monitrices?

E: Dans les monitrices il y avait Chantal, Elena, Philippe, c'est tout.

I: C'est qui.

E: Chantal Elena Philippe et c'est tout.

I: C'est tout?

E: Oui.

I: Est-ce que moi j'étais là?

E: Oui.

I: Est-ce que Michel était là?

E: Oui.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Quoi? Te le rappelles-tu? Pourrais-tu le décrire?

E: Je ne me rappelles pas du nom.

I: Pas du nom mais tu te rappelles de la personne qui prenait des photos?

E: Oui.

- I: De quoi il avait l'air? Il était grand ou petit?
 E: Grand.
 I: Grand. Est-ce qu'il avait les cheveux blonds, bruns?
 E: Bruns.
 I: Gros? Est-ce qu'il était gros?
 E: À peu près comme nous.
 I: Comme toi?
 E: Bruns, un petit peu brun.
 I: Ok. Est-ce qu'il était gros ou mince?
 E: Mince.
 I: Est-ce qu'il a joué avec le ballon?
 E: Quel ballon?
 I: Le grand ballon. La madame loup comment elle était habillée?
 E: Manche courts et des shorts.
 I: Est-ce qu'elle avait un maquillage?
 E: Non.
 I: Un déguisement?
 E: Non.

Misleading question (OTHER):

- I: Est-ce que c'est vrai que un enfant s'est fait mal?
 E: Non.
 I: Non? Tu vois il y a quelqu'un qui m'a dit qu'il y avait un enfant qui s'est fait mal?
 E: Je n'ai pas entendu pleurer.

Misleading question (ME):

- I: Est-ce que tu t'es fait mal?
 E: Moi non.
 I: Parce que quelqu'un m'a dit que tu t'étais fait mal.
 E: Je ne me suis pas fait mal.
 I: Ok.

MAXIME

- I: Où tu as été hier avec la garderie?
 E: Au Stade Olympique.

Free recall:

- I: Uhu. Qu'est-ce que tu as fait au Stade?
 E: J'avais couru après quelqu'un, j'ai couru après une personne, puis j'ai fait de la trampoline.
 I: Quoi d'autre?
 E: J'ai fait de la trampoline, mais après ça on s'en va mais avant qu'on m'attrappe j'ai allé joué dans le tunnel.

Questions:

- I: As tu joué avec un ballon?

E: Mais oui on s'est couchés, si on le touchait on retournait à sa place après ça il tournait sur nous.

I: Uhu. De quelle couleur était le ballon?

E: Rose.

I: Rose. Il était gros ou petit?

E: Très gros.

I: Très gros. La madame loup qu'est-ce qu'elle faisait?

E: Mais on était un par un quand nous courait après, il fallait retourner dans le rond pour pas que on se fait attrapper.

I: Uhu. Ok. Qui était là?

E: Tout le monde.

I: Mais quels moniteurs ou monitrices étaient là?

E: Elena, Chantal, Michel, Philippe.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce que moi j'étais là?

E: Non.

I: Non?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Qui?

E: Je ne me souviens pas de son nom mais c'était un monsieur.

I: Uhu Est-ce qu'il était gros ou mince?

E: Entre les deux.

I: Entre les deux. Est-ce qu'il était grand ou petit?

E: Grand.

I: Es-ce qu'il a joué avec le ballon?

E: Beh non il fallait se faire toucher.

I: Mais le monsieur?

E: Lui aussi il s'est fait toucher.

I: Ah oui? La madame le loup comment elle était habillée?

E: Ordinaire, comme tout le monde.

I: Ordinaire. Est-ce qu'elle avait un maquillage?

E: Non, elle avait rien, était ordinaire.

Misleading question (OTHER):

I: Est-ce que c'est vrai que un enfant s'est fait mal?

E: Charlotte oui.

I: Oui, qu'est-ce qui est arrivé?

E: Mais elle courait sur le bord des cailloux et bang elle est tombée sur les cailloux.

I: Est-ce que s'est fait très mal?

E: Beh oui.

I: Ah oui?

E: Elle est tombée vers les escaliers.

I: Oh, et puis?

E: Et ça fait mal, très fort.

Misleading question (ME)

I: Très fort. Est-ce que c'est vrai que tu t'es fait mal?

E: Non, moi je ne me suis pas fait mal.

I: Non? Parce que tu sais quelqu'un m'a dit que toi t'es fait mal.

E: Je me suis fait mal mais je n'ai pas pleuré.

I: Mais tu t'es fait mal? Comment?

E: Je courais avec mes shorts et je me suis graffigné.

EVE

I: Ou tu as été hier?

E: Au Stade Olympique.

Free recall:

I: Ohh. Et qu'est-ce que tu as fait?

E: J'ai sauté sur la trampoline.

I: Uhu.

E: On a joué.

I: À quoi?

E: Petits cochons et la madame loup.

I: Quoi d'autre?

E: Avant on s'est déshabillé, on s'est mis en shorts, puis on est allé on est allé au Stade Olympique, puis aussi là avant oui les petits cochons oui et la madame loup puis après après.

Questions:

I: Est-ce que tu as joué avec un ballon?

E: Oui on a joué quand on était collé puis on poussait le ballon.

I: De quelle couleur était le ballon?

E: Rose.

I: Rose. Est-ce qu'il était gros ou petit le ballon?

E: Gros.

I: Gros? Qu'est-ce qu'elle faisait la madame loup?

E: Quand c'était midi il fallait qu'on est dans notre maison.

I: Uhu. Qui était là?

E: Il y avait Maxime, je le sais qu'il y avait Giulia, il y avait Clothilde il y avait Myrrha puis j'ai oublié.

I: Quels moniteurs ou monitrices de la garderie étaient là?

E: Chantal, Elena, Michel.

I: Et qui d'autres?

E: Des autres moniteurs?

I: Oui des autres moniteurs.

E: Des autres moniteurs je pense qu'il y en avait quatre avec toi.

I: Avec moi ok. Est-ce Philippe était là?

E: Oui.

I: Est-ce que Pollux était là?

E: Non.

I: Non, ok. Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Oui? De quoi il avait l'air?

E: Un gentil monsieur.

I: Un gentil monsieur? Est-ce qu'il était petit ou grand?

E: Grand.

I: Est-ce qu'il était gros ou mince?

E: Mince.

I: Est-ce qu'il a les cheveux bruns ou blonds? Tu ne le sais pas? D'accord.
Est-ce que ce monsieur a joué avec le ballon rose?

E: Non.

I: Non? La madame loup comment elle était habillée?

E: Elle était habillée en shorts et des chaussures de cours.

I: Est-ce qu'elle avait un maquillage?

E: Non.

I: Non?

Misleading question (OTHER):

I: Est-ce que c'est vrai qu' un enfant s'est blessé, s'est fait mal?

E: Oui.

I: Oui?

E: Ça peut parce que si on s'accrochait à quelque chose ça peut.

I: Mais est-ce que quelqu'un s'est fait mal?

E: Non.

I: Non? Parce que tu sais quelqu'un m'a dit qu'un enfant s'est fait mal.

E: Maxime?

I: Qui s'est fait mal je ne le sais pas. Est-ce qu'il y a quelqu'un qui s'est fait mal?

E: Non.

Misleading question (ME):

I: Est-ce que toi tu t'es faite mal?

E: Non.

I: Là aussi quelqu'un m'a dit que tu t'es faite mal.

E: Ça peut parce qu'il y a des petits ----- des fois que on ramasse puis on a coupé quand on est arrivé au Stade Olympique on en ramasse et quand on a plus le goût de l'avoir on le jète a terre.

I: Uhu. Mais tu t'es faite mal avec ça?

E: Non.

SESSION 2

KORY

I: Tu te souviens que je suis venue une fois te poser des questions sur une sortie que tu as fait avec la garderie? À quel endroit tu as été cette fois là? Tu

as fait une sortie et après la sortie moi je suis venue te poser des questions. La sortie de quoi?

E: C'était le matin quand tu es venue me poser des questions.

I: Est-ce que tu as fait une sortie au Stade Olympique?

E: Oui.

Free recall:

I: Oui. Te rappelles qu'est-ce que tu as fait au Stade?

E: Oui, on a sauté sur la trampoline. Uhu et on a joué au petit chaperon rouge, au petits cochons.

I: Qu'est-ce que c'était le jeu?

E: Il y avait un gros rond puis nous autres étaient là, puis il y avait quelqu'un d'autre et c'était le loup puis s'il nous attrapait on était un loup.

I: Uhu, as-tu joué avec quelque chose d'autre?

E: Non.

Questions:

I: As tu joué avec un ballon?

E: Nous, non.

I: Non? Ok. Quels moniteurs ou monitrices de la garderie étaient là?

E: Il y avait Chantal, Philippe et c'est tout.

I: Est-ce que Elena était là?

E: Cui.

I: Est-ce que Michel était là?

E: Oui.

I: Est-ce que Paul était là?

E: Non.

I: Est-ce que moi j'étais là?

E: Oui.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Qui?

E: Je ne m'en souviens plus de son nom.

I: Mais est-ce que c'était une madame ou un monsieur?

E: Un monsieur.

I: Est-ce qu'il était grand ou petit?

E: Grand.

I: Est-ce qu'il avait les cheveux bruns, blonds, ou noirs?

E: Je pense qu'ils étaient bruns.

I: Est-ce que ce monsieur là a joué à quelque chose?

E: Non.

I: La madame le loup comment elle était habillée?

E: Je ne le sais pas, elle avait des souliers en tout cas blancs, des souliers blancs mais je ne sais pas des autres affaires.

I: Uhu. Est-ce qu'elle avait un maquillage?

E: Non.

I: Un déguisement?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'un enfant s'est fait mal?

E: Oui.

I: Qui?

E: Je ne sais pas.

I: Mais qu'est-ce qu'il est arrivé?

E: Il est tombé.

I: Mais c'était qui l'enfant t te rappelles-tu?

E: Non.

Misleading question (ME):

I: Est-ce que toi tu t'es fait mal?

E: Non.

I: Quelqu'un m'a dit que toi tu t'es fait mal.

E: Pas vrai.

Photo identification:

1. oui 2. Non 3. Non 4. Non 5. oui 6. oui

I: Le N. 5 qu'est-ce qu'il faisait?

E: Je ne le sais pas il faisait rien il nous regardait sauter sur la trampoline.

MAXIME

I: Te souviens-tu que je suis venue une fois te poser des questions sur une sortie que tu as fait avec la garderie? A quel endroit as-tu été avec la garderie?

E: On a été au parc.

I: Non, attends, tu es sortie avec la garderie, tu as été dans une place particulier, qu'est-ce que tu as fait dans cette place?

E: Je ne sais pas, je ne m'en souviens presque plus.

I: C'est une place où tu as fait de l'exercice.

E: Au Stade Olympique.

Free recall:

I: Oui bravo. À quoi tu as joué au Stade Olympique.

E: On a fait de la trampoline, on s'est baigné, on a joué à madame loup.

I: Qu'est-ce qu'elle faisait la madame loup?

E: La madame loup était dans un rond, nous on était dans un autre rond et nous on demandait il est quel heure madame loup, et là elle disait une heure et on faisait un pas et quand elle disait midi il fallait qu'elle nous attrappe.

I: Uhu. À quoi d'autre tu as joué?

E: Je ne m'en rappelle plus.

Questions:

I: Est-ce que tu as joué avec un ballon?

E: Oui.

I: De quelle couleur était le ballon?

E: Plein de couleurs.

I: Est-ce qu'il était grand ou petit?

E: Grand.

I: Te rappelles-tu quels moniteurs ou monitrices de la garderie étaient là?

E: Chantal et Philippe.

I: Qui d'autres?

E: Je ne m'en souviens plus.

I: Est-ce que Elena était là?

E: Oui.

I: Est-ce que Michel était là?

E: Non.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce que moi j'étais là?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Non.

I: Est-ce qu'il y avait un monsieur qui prenait des photos?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'un enfant s'est fait mal?

E: Oui.

I: C'est qui?

E: Francis.

I: Qu'est-ce qui est arrivé à Francis?

E: Francis s'est cogné sur la trampoline, Eve quand elle jouait à madame le loup elle s'est cogné le cou sur le plancher.

Misleading question (ME):

I: Uhu. Est-ce que toi tu t'es fait mal?

E: Oui.

I: Qu'est-ce qu'il est arrivé à toi?

E: Je suis tombé sur la colonne vertébrale.

I: Ça faisait mal?

E: Oui.

I: L'autre fois tu m'a dit que Charlotte s'est faite mal?

E: Je crois que oui.

I: Qu'est-ce qu'il est arrivé avec elle?

E: Je ne me rappelle plus à cause que je n'ai pas vu, je ne le sais pas parce que je ne l'ai pas vu.

Photo identification:

1. oui 2. Non 3. Non 4. Non 5. oui 6. oui

I: Qu'est-ce qu'il faisait le N. 5?

E: Je ne le sais pas, il nous regardait, il regardait tout le monde.

I: Est-ce qu'il a joué avec le ballon?

E: Non, il n'a même pas joué un seul coup.

EVE

I: Je voulais encore te demander des questions comme l'autre fois, est-ce que tu t'en souviens la fois que tu es sortie avec la garderie; te souviens-tu à quel endroit tu as été?

E: Au planétarium.

I: Oui ça c'est vrai ça; c'était l'autre jour, mais il y a longtemps où tu as été avec la garderie?

E: Au cours de gymnastique.

I: Oui, tu te rappelles le nom de la place? Est-ce qu'il s'appellait Stade.....

E: Le Stade Olympique.

Free recall:

I: Oui, et qu'est-ce que tu as faite au Stade Olympique?

E: On a sauté sur la trampoline puis on a couru.

I: Oui, qu'est-ce que tu faisais quand tu courais. Qu'est-ce que c'était le jeu?

E: C'est quelle heure madame le loup.

I: Uhu et elle qu'est-ce qu'elle faisait madame le loup?

E: Elle disait une heure, deux heures, trois heures, quatre heures, cinq heures, dix heures, onze heures, midi.

I: Qu'est-ce qui arrivait quand elle disait midi?

E: Elle voulait nous attrapper pour nous manger.

I: Uhu, as tu joué à quelque chose d'autre?

E: On a couru après la madame.

I: Uhu.

E: Puis avant de faire le cours de gymnastique on, a surveillé la piscine.

Questions:

I: As tu joué avec un ballon?

E: Oui.

I: De quelle couleur était le ballon?

E: Bleu.

I: Bleu? Est-ce qu'il était petit ou grand?

E: Petit.

I: Pourrais tu me dire quels moniteurs ou monitrices de la garderie étaient au Stade?

E: Philippe, Chantal.

I: Puis?

E: Je pense Flavia et Michel.

I: Est-ce que Elena était là?

E: Oui.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce que moi j'étais là?

E: Oui.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Qui?

E: Un monsieur.

I: Tu te rappelles s'il était grand ou petit?

E: Grand.

I: Gros ou mince?

E: Comme nous.

I: Ok. Est-ce qu'il avait les cheveux blonds bruns ou noirs? Tu t'en souviens?

E: Je pense blonds.

I: Blonds? Est-ce que le monsieur a joué avec le ballon?

E: Non.

I: La madame le loup comment elle était habillée?

E: Comme nous.

I: Ça veut dire?

E: Ça veut dire elle avait des shorts puis des souliers.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'un enfant s'est fait mal?

E: Non.

I: Parce que quelqu'un m'a dit qu'un enfant s'est fait mal. Est-ce que c'est vrai?

E: J'en n'ai vu aucun qui s'est fait mal.

Misleading question (ME):

I: Est-ce que toi tu t'es faite mal.

E: Non.

I: Parce que un enfant m'a dit que toi tu t'es faite mal.

E: Mais je peux tomber parce que je ne courres pas si vite, j'ai réussi à attrapper la madame le loup.

I: Est-ce que tu t'es faite mal?

E: Non.

Photo identification:

1. oui 2. Non 3. Non 4. oui 5. oui 6. oui

E: N.5, celui qui prenait des photos.

SESSION 3

KORY

I: Tu te rappelles que je suis venue te parler d'une sortie que tu as fait avec la garderie, combien des fois je suis venue te parler?

E: C'est la quatrième fois.

I: Est-ce que tu te rappelles à quel endroit tu as été avec la garderie?

E: Aujourd'hui on est allé nulle part.

I: Pas aujourd'hui, tu as fait une sortie avec la garderie, puis après ça je suis venue te parler de cette sortie. Tu te rappelles de quel endroit on parlait?

E: Oui, où qu'on est allé sur la trampoline.

I: Comment s'appelle la place?

E: Je ne le sais pas. Stade Olympique.

Free recall:

I: Dis-moi tout ce que tu as fait au Stade Olympique.

E: Au Stade Olympique on a sauté sur la trampoline, on a joué au loup, puis les cochons, puis on a couru c'est tout.

I: C'est tout. Rien d'autre?

E: Non.

Questions:

I: As tu joué avec un ballon?

E: Non.

I: Quels moniteurs et monitrices de la garderie il y avait là?

E: Il y avait Michel, Philippe, Chantal, et toi.

I: Quelqu'un d'autre?

E: Non, juste le gardienne qui nous surveillait.

I: Est-ce que Elena était là?

E: Non.

I: Est-ce que Pollux était là?

E: Oui.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Je ne sais pas.

I: Tu te rappelles de quelqu'un qui est venu prendre des photos?

E: Oui, toi.

I: Quelqu'un d'autre?

E: Non.

I: La madame le loup comment elle était habillée?

E: Elle avait des shorts, puis elle avait un chandail à manches courtes.

I: Est-ce qu'elle avait un maquillage?

E: Non.

I: Un déguisement?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'il y a un enfant qui s'est fait mal en jouant?

E: Oui.

I: Qui?

E: Je ne sais pas.

I: Mais qu'est-ce qui est arrivé?

E: Mais il est tombé par terre.

Misleading question (ME):

I: Est-ce que toi tu t'es fait mal?

E: Non.

I: Parce que quelqu'un m'a dit que toi tu t'es fait mal en jouant.

E: Tu me l'avait dit l'autre jour.

I: Et c'est pas vrai?

E: Non.

Photo identification:

1. oui 2. non 3. oui 4. oui 5. oui 6. oui

E: N. 5 nous regardait, N. 3 nous regardait.

MAXIME

I: Tu te rappelles que je suis venue te parler d'une sortie que tu as fait avec la garderie; combien des fois je suis venue te parler?

E: Trois fois.

I: Tu te rappelles à quel endroit tu as été avec la garderie?

E: Au Stade Olympique.

Free recall:

I: Oui. Dis-moi tout, tout, tout, ce que tu as fait au Stade Olympique.

E: On a joué au loup qui essayait de nous attrapper; quand c'est midi, il essayait de nous attrapper; quand c'est une heure, on avance un pas; quand c'est quatre heures, on avance quatre pas.

I: Uhu, quoi d'autre?

E: On s'est baignés.

I: Quoi d'autre? Tu t'en souviens?

E: Non.

Questions:

I: As-tu joué avec un ballon?

E: Oui.

I: De quelle couleur était le ballon?

E: De toutes les couleurs.

I: Est-ce que c'était petit ou gros?

E: D'abord c'était le petit puis c'était le moyen.

I: Quels moniteurs ou monitrices de la garderie étaient là?

E: Michel, Elena, Philippe, Chantal et c'est tout.

I: Est-ce que moi j'étais là?

E: Oui.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Qui?

E: Je ne sais pas son nom.

I: Monsieur ou madame?

E: Madame.

I: Une madame qui prenait des photos?

E: Oui.

I: Grande ou petite?

E: Grande.

I: Grosse ou mince?

E: Moyen.

I: Est-ce qu'elle avait les cheveux bruns blonds ou noirs?

E: Blonds.

I: Est-ce que cette madame a joué avec le ballon?

E: Non, elle prenait toutes les photos.

I: Ok. La madame le loup comment elle était habillée?

E: Beh comme toi et moi, comme des vrais personnes.

I: Est-ce qu'elle avait un maquillage?

E: Non, elle était juste habillée.

I: Mais est-ce qu'elle avait un déguisement?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'il y a un enfant qui s'est fait mal?

E: Oui.

I: C'est qui?

E: Francis.

I: Qu'est-ce qu'il est arrivé?

E: Il était dans la piscine moyen et il s'est cogné la tête sur le bord.

I: Quelqu'un d'autre s'est fait mal?

E: Non.

Misleading question (ME):

I: Est-ce que toi tu t'es fait mal?

E: Oui.

I: Comment?

E: Beh, je nageais; il y avait quelque chose de très dure pour faire tenir la trampoline et je me frappé dessus.

Photo identification:

1. oui 2. non 3. oui 4. oui 5. oui 6. oui

E: N. 5 quand on joué à madame le loup il était assis sur le ban.

EVE

I: Tu te rappelles je suis venue te parler d'une sortie que tu as fait avec la garderie, combien de fois je suis venue te parler?

E: Quatre fois.

I: Tu te rappelles à quel endroit tu as été avec la garderie?

E: Oui, au Stade Olympique.

Free recall:

I: Oui, dis-moi tout, tout, tout ce que tu as fait au Stade Olympique.

E: Des exercices, on a fait les petits cochons, on a sauté sur la trampoline.

I: Uhu. Quoi d'autre?

E: Je ne le sais plus, ce qu'on a fait.

Questions:

I: Est-ce que tu as joué avec un ballon?

- E: Oui.
 I: De quelle couleur était le ballon?
 E: Je crois qu'il était un petit, je crois qu'il était rose.
 I: Est-ce qu'il était grand ou petit?
 E: Petit.
 I: Quels moniteurs ou monitrices de la garderie étaient là?
 E: Pollux.
 I: Qui d'autre?
 E: Elena, Michel, Chantal.
 I: Est-ce que Philippe était là?
 E: Oui.
 I: Est-ce que moi j'étais là?
 E: Oui.
 I: Est-ce qu'il y avait quelqu'un qui prenait des photos?
 E: Oui.
 I: Qui?
 E: Je ne sais pas son nom.
 I: Monsieur ou madame?
 E: Monsieur avec les cheveux courts.
 I: Grand ou petit?
 E: Grand.
 I: Gros ou mince?
 E: Mince.
 I: Est-ce qu'il avait les cheveux bruns, blonds, ou noirs?
 E: Blonds.
 I: Est-ce que ce monsieur a joué avec le ballon?
 E: Non.
 I: La madame le loup comment elle était habillée?
 E: Des shorts et un chandail.
 I: Est-ce qu'elle avait un maquillage?
 E: Non.
 I: Un déguisement?
 E: Non.
- Misleading Question (OTHER):
 I: Est-ce que c'est vrai qu'un enfant s'est fait mal en jouant?
 E: Non, personne m'a dit ça.
 I: Parce que quelqu'un m'a dit qu'il y a un enfant qui s'est fait mal.
 E: Il y a personne qui s'est fait mal.
- Misleading question (ME):
 I: Est-ce que toi tu t'es faite mal?
 E: Non.
 I: Parce que la personne m'a dit que c'est toi qui s'est faite mal.
 E: Non, je ne me suis pas faite mal parce que je courai vite.

Photo identification:

1. oui 2. oui 3. non 4. oui 5. oui 6. oui

E: N. 5 prenait des photos.

SESSION 4

KORY

I: Tu te rappelles que je suis venue te parler d'une sortie que tu as fait avec la garderie, combien des fois je suis venue te parler?

E: Trois.

I: À quel endroit tu as été avec la garderie?

E: À la piscine.

I: Est-ce que tu t'en souviens du nom de la place?

E: Non.

I: Stade Olympique, pour la gymnastique.

Free recall:

I: Dis-moi tout tout tout ce que tu as fait au Stade Olympique pour la gymnastique.

E: On a joué au petit cochon, puis on a sauté sur la trampoline, c'est tout.

I: C'est tout?

E: C'est tout.

I: As-tu joué avec un ballon?

E: Non.

I: Ok. Quels moniteurs et monitrices de la garderie étaient au Stade?

E: Elena, Michaud, Chantal, Philippe.

I: Est-ce que moi j'étais là?

E: Oui.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui.

I: Qui?

E: Je ne sais pas.

I: Madame ou monsieur?

E: Monsieur.

I: Grand ou petit?

E: Grand.

I: Gros ou mince?

E: Mince.

I: Est-ce qu'il avait les cheveux bruns, blonds, ou noirs?

E: Je ne sais pas.

I: Est-ce que ce monsieur a joué avec un ballon?

E: Non.

I: Et toi as-tu joué avec un ballon?

E: Non.

I: La madame le loup comment elle était habillée?

E: Avec des jeans et un chandail à manches courtes.

I: Est-ce qu'elle avait un maquillage?

E: Non.

I: Un déguisement?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'il y a un enfant qui s'est fait mal en jouant?

E: Oui.

I: Qui?

E: Je ne m'en souviens plus.

I: Mais qu'est-ce qui est arrivé?

E: Il s'est cogné sur le plancher.

I: Est-ce qu'il y a quelqu'un d'autre qui s'est fait mal?

E: Non.

Misleading question (ME):

I: Est-ce que toi tu t'es fait mal?

E: Non.

I: Parce que quelqu'un m'a dit que tu t'es fait mal.

E: Ils ont conté des menteries.

Photo identification:

1. oui 2. non 3. non 4. oui 5. oui 6. oui

E: N. 5 nous regardait.

MAXIME

I: Tu te rappelles que je suis venue te parler d'une sortie que tu as fait avec la garderie, combien des fois je suis venue te parler?

E: Deux fois.

I: Tu te rappelles à quel endroit tu as été dans cette sortie?

E: Non.

I: Non? C'était le Stade Olympique pour la gymnastique.

Free recall:

I: Dis-moi tout, tout, tout ce que tu as fait au Stade Olympique pour la gymnastique.

E: Tout tout tout?

I: Oui.

E: La piscine.

I: Non, quand tu as été au Stade Olympique pour la Gymnastique, cette fois là.

E: Je n'ai jamais fait de la gymnastique au Stade Olympique, ah oui je me rappelle avant il y avait une piscine que c'était à peu près creux comme ça, après on a été se baigner après, on est allé à mettre nos vêtements on s'est habillé, il y avait une grande cour, on jouait, après ça on a sauté sur la trampoline, moi je n'ai pas voulu parce qu'il fallait toujours être avant tout le monde.

I: Quoi d'autre?

E: Après ça on est allé mettre nos chaussures et après ça je ne me rappelle plus.

I: As-tu joué avec un ballon?

E: Ah oui, c'est que la monitrice du Stade il fallait admettons ça c'est le rond des petits cochons et ça c'est le rond du loup, et nous on sortait tous et quand elle disait midi, il fallait courir juste jusque dans le rond, si on est pas dans le rond et on se fait toucher, on devient un loup.

I: Ok, as-tu joué à quelque chose d'autre?

E: La trampoline j'ai sauté.

I: Quoi d'autre? On a mis nos chaussures après ça je ne m'en souviens plus tellement, je crois qu'on est parti.

Questions:

I: As tu joué avec un ballon?

E: Non.

I: Non?

E: Non.

I: Quels moniteurs ou monitrices de la garderie étaient là?

E: Philippe, Michaud, Elena, Chantal, c'est tout.

I: Est-ce que moi j'étais là?

E: Je ne t'avais pas vu.

I: Est-ce que Pollux était là?

E: Non.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui mais c'était quelqu'un du Stade.

I: Madame ou monsieur?

E: Monsieur.

I: Grand ou petit?

E: Comme toi.

I: Gros ou mince?

E: Mince.

I: Est-ce qu'il avait les cheveux bruns, blonds, ou noirs?

E: Bruns.

I: Est-ce que ce monsieur a joué.....

E: Lui il prenait un petit pot avec de la crème je ne sais pas qu'est-ce qu'il y avait dedans.

I: Un pot avec de la crème?

E: Oui il l'ouvrait, la mettait dans le visage; je ne sais pas qu'est-ce qu'il faisait.

I: Est-ce qu'il prenait des photos?

E: Oui un petit peu.

I: La madame le loup comment elle était habillée?

E: Comme nous.

I: Est-ce qu'elle avait un maquillage?

E: Non comme ça, elle était comme nous, elle faisait comme le loup, elle venait nous attrapper nous, on était les petits cochons.

I: Est-ce qu'elle avait un déguisement?

E: Non elle était comme nous.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'il y a un enfant qui s'est fait mal?

E: Oui.

I: Qui?

E: Charlotte.

I: Qu'est-ce qui est arrivé?

E: Je ne me rappelle plus du tout. On courait comme ça pour s'en aller dans le rond, elle était sur le côté, elle s'est enfargée et est tombée, c'était un peu dur comme ça mais c'était du plastic très dur et il y avait du ciment, elle est tombée.

I: Est-ce qu'il y a quelqu'un d'autre qui s'est fait mal?

E: Oui sauf que je ne me rappelle plus, je crois que s'était Francis.

I: Qu'est-ce qui est arrivé avec Francis?

E: Je ne me rappelle plus.

I: Quelqu'un d'autre?

E: Non.

Misleading question (ME):

I: Est-ce que toi tu t'es fait mal?

E: Non, un peu.

I: Qu'est-ce qui est arrivé avec toi?

E: Tombée sur le genou.

Photo identification:

1. oui 2. non 3. oui 4. oui 5. oui 6. oui

E: N. 3 était à la piscine. N. 5 mettait de la crème.

EVE

I: Tu te rappelles que je suis venue te parler d'une sortie que tu as fait avec la garderie, combien des fois je suis venue te parler?

E: Trois fois.

I: Tu te rappelles à quel endroit tu as été avec la garderie dans cette sortie?

E: On est allé au Planétarium.

I: Je parle de quand tu es allée au Stade Olympique.

E: Oui on est allé à la piscine. Pour la gymnastique.

Free recall:

I: Dis-moi tout tout tout ce que tu as fait au Stade Olympique.

E: C'était le fun sur la trampoline.

I: Oui c'est vrai, quoi d'autre?

E: Aussi on a fait des culbutess dans la piscine puis on a fait da la plongée en dessous de l'eau.

I: Quoi d'autre? Les jeux qu'on faisait pour la gymnastique c'était un petit peu difficile, ce qu'on jouait au petits cochons et au loup, c'était le fun.

I: Quoi d'autre?

E: Aussi j'ai aimé ça quand on a joué dans la profonde piscine avec des spaghettis là.

I: Quoi d'autre?

E: Aussi on a entouré on a comme fait la laveuse avec du savon.

Questions:

I: Est-ce que as tu joué avec un ballon?

E: Oui.

I: De quelle couleur était le ballon?

E: Dans la petite petite petite il était rose il était petit.

I: Petit? Ok. Dis-moi quels moniteurs ou monitrices de la garderie étaient là?

E: Chantal, Philippe, toi tu étais là, il y avait quelqu'un qui prenait des photos.

I: Michel il était là?

E: Oui.

I: Elena était là?

E: Oui.

I: Est-ce que Pollux était là?

E: Oui.

I: Est-ce qu'il y avait quelqu'un qui prenait des photos?

E: Oui. Le monsieur qui prenait des photos il était grand, il était mince, et il avait les cheveux bruns.

I: Merci. Est-ce qu'il a joué avec le ballon ce monsieur?

E: Non.

I: La madame le loup comment elle était habillée?

E: Avec des shorts, une petite camisole.

I: Est-ce qu'elle avait un maquillage?

E: Non.

I: Un déguisement?

E: Non.

Misleading question (OTHER):

I: Est-ce que c'est vrai qu'il y a un enfant qui s'est fait mal en jouant?

E: Non.

I: Quelqu'un m'a dit qu'il y a quelqu'un qui s'est fait mal en jouant.

E: Personne.

Misleading question (ME):

I: Est-ce que toi tu t'es faite mal?

E: Non.

I: Parce que cette personne m'a dit que c'est toi qui t'es faite mal en jouant.

E: Non.

I: C'est qui?

E: Je ne me rappelle plus.

Photo identification:

1. oui 2. oui 3. non 4. oui 5. oui 6. oui

E: N. 5 prenait des photos.

APPENDIX D

Repeated measure ANOVA source tables for Productivity in Free Recall, Direct Questions, and Misleading Questions with one between variable, Groups (group 1 and group 2) and one within variable, Sessions (4 recall sessions).

Table D-1

Repeated measure ANOVA source table for Productivity in Free Recall with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Subjects					
GROUP	0.19	1	0.193	0.008	0.93
ERROR	515.18	21	24.53		
Within Subjects					
SESSION	48.45	3	16.15	1.411	0.248
SESSION X GROUP	14.97	3	4.99	0.436	0.728
ERROR	721.05	63	11.44		

Note. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds).

SESSION= 4 recall sessions.

* $p < .05$.

Table D-2

Repeated measure ANOVA source table for Productivity in Direct Questions with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	30.00	1	30.00	0.510	0.483
ERROR	1234.22	21	58.77		
Within Subjects					
SESSION	145.80	3	48.60	2.119	0.107
SESSION X GROUP	27.24	3	9.08	0.396	0.756
ERROR	1445.07	63	22.94		

Note. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds).

SESSION= 4 recall sessions.

*p < .05.

Table D-3

Repeated measure ANOVA source table for Productivity in Misleading Questions with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	77.54	1	77.54	1.153	0.295
ERROR	1411.92	21	67.23		
Within Subjects					
SESSION	148.02	3	49.34	2.767	0.049*
SESSION X GROUP	15.41	3	5.14	0.288	0.834
ERROR	1123.57	63	17.83		

Note. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds).

SESSION= 4 recall sessions.

*p < .05.

APPENDIX E

Repeated measure ANOVA source tables for Free Recall with one between variable, Groups (group 1 and group 2) and one within variable, Sessions (4 recall sessions) for correct, incorrect, neutral, and repeated responses, respectively.

Table E-1

Repeated measure ANOVA source table for Free Recall 'Correct' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	1.457	1	1.457	0.163	0.690
ERROR	187.369	21	8.922		
Within Subjects					
SESSION	61.480	3	20.493	4.216	0.009*
SESSION X GROUP	9.045	3	3.015	0.620	0.604
ERROR	306.215	63	4.861		

Note. 'Correct'= correct information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table E-2

Repeated measure ANOVA source table for Free Recall 'Incorrect' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	0.235	1	0.235	0.128	0.724
ERROR	38.417	21	1.829		
Within Subjects					
SESSION	19.551	3	6.517	3.653	0.017*
SESSION X GROUP	4.072	3	1.357	0.761	0.520
ERROR	112.406	63	1.784		

Note. 'Incorrect'= incorrect information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

* $p < .05$.

Table E-3

Repeated measure ANOVA source table for Free Recall 'Neutral' with one between variable (groups) and within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	4.539	1	4.539	0.672	0.422
ERROR	141.917	21	6.758		
Within Subjects					
SESSION	13.190	3	4.397	1.339	0.270
SESSION X GROUP	3.277	3	1.092	0.333	0.802
ERROR	206.875	63	3.284		

Note. 'Neutral'= neutral information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table E-4

Repeated measure ANOVA source table for Free Recall 'Repeated' with one between variable (groups) and within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	0.001	1	0.001	0.002	0.969
ERROR	18.477	21	0.880		
Within Subjects					
SESSION	6.258	3	2.086	3.430	0.022*
SESSION X GROUP	1.823	3	0.608	0.999	0.399
ERROR	38.308	63	0.608		

Note. 'Repeated'= repeated information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

* $p < .05$.

APPENDIX F

Repeated measure ANOVA source tables for Direct Questions with one between variable Groups (group 1 and group 2) and one within variable, Sessions (4 recall sessions) for correct, incorrect, neutral, and omitted responses, respectively.

able F-1

Repeated measure ANOVA source table for Direct Questions 'Correct' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	37.758	1	37.758	1.511	0.233
ERROR	524.677	21	24.985		
Within Subjects					
SESSION	85.119	3	28.373	2.881	0.043*
SESSION X GROUP	9.902	3	3.301	0.335	0.800
ERROR	620.446	63	9.848		

Note. 'Correct'= correct information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table F-2

Repeated measure ANOVA source table for Direct Questions 'Incorrect' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	39.118	1	39.11	2.050	0.167
ERROR	400.708	21	19.081		
Within Subjects					
SESSION	61.480	3	0.529	0.127	0.944
SESSION X GROUP	10.630	3	3.543	0.853	0.470
ERROR	261.631	63	4.153		

Note. 'Incorrect'= incorrect information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table F-3

Repeated measure ANOVA source table for Direct Questions 'Neutral' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	45.415	1	45.41	3.721	0.067
ERROR	256.302	21	12.205		
Within Subjects					
SESSION	17.604	3	5.868	1.507	0.221
SESSION X GROUP	14.082	3	4.694	1.206	0.315
ERROR	245.244	63	3.893		

Note. 'Neutral'= neutral information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

* $p < .05$.

able F-4

Repeated measure ANOVA source table for Direct Questions 'Omitted' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	28.030	1	28.03	4.330	0.050*
ERROR	135.948	21	6.474		
Within Subjects					
SESSION	14.226	3	4.742	2.395	0.077
SESSION X GROUP	5.096	3	1.699	0.858	0.468
ERROR	124.752	63	1.980		

Note. 'Omitted'= omitted or forgotten information. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

APPENDIX G

Repeated measure ANOVA source tables for Misleading Question with one between variable, Groups (group 1 and group 2) and one within variable, Sessions (4 recall sessions) for correct, incorrect, neutral, and attributional responses, respectively.

Table G-1

Repeated measure ANOVA source table for Misleading Question 'Correct' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	<u>SS</u>	<u>df</u>	<u>MS</u>	F	p
Between Subjects					
GROUP	2.474	1	2.474	0.914	0.350
ERROR	56.831	21	2.706		
Within Subjects					
SESSION	5.898	3	1.966	2.064	0.114
SESSION X GROUP	2.767	3	0.922	0.968	0.413
ERROR	60.015	63	0.953		

Note. 'Correct'= correct information recalled, which means not accepting the suggestion implied by the misleading question. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table G-2

Repeated measure ANOVA source table for Misleading Question 'Incorrect' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	1.957	1	1.957	0.514	0.481
ERROR	79.956	21	3.807		
Within Subjects					
SESSION	3.123	3	1.041	0.943	0.425
SESSION X GROUP	2.645	3	0.882	0.799	0.499
ERROR	69.529	63	1.104		

Note. 'Incorrect'= incorrect information recalled, which means accepting the suggestion implied by the misleading question. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

* $p < .05$.

Table G-3

Repeated measure ANOVA source table for Misleading Question 'Neutral' with one between variable (groups) and one within variable (4 recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	1.106	1	1.106	0.439	0.515
ERROR	52.894	21	2.519		
Within Subjects					
SESSION	7.917	3	2.639	2.339	0.082
SESSION X GROUP	3.526	3	1.175	1.042	0.380
ERROR	71.083	63	1.128		

Note. 'Neutral'= neutral information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

*p < .05.

Table G-4

Repeated measure ANOVA source table for Misleading Question
'Attributional' with one between variable (groups) and one within variable (4
recall sessions).

SOURCE	SS	df	MS	F	p
Between Subjects					
GROUP	58.576	1	58.576	1.657	0.212
ERROR	742.533	21	35.359		
Within Subjects					
SESSION	38.399	3	12.800	1.648	0.187
SESSION X GROUP	21.442	3	7.147	0.920	0.436
ERROR	489.275	63	7.766		

Note. 'Attributional'= attributional information recalled. GROUP= group 1 (4.5-year-olds) and group 2 (5.3-year-olds). SESSION= 4 recall sessions.

* $p < .05$.

APPENDIX H

One-way repeated measure ANOVA source table for Misleading Questions
over four sessions.

Table H-1

One-way repeated measure ANOVA source table calculated on the sum of children's responses to the misleading questions (ME and OTHERS) over four sessions.

SOURCE	SS	df	MS	F	p
Within Subjects					
SESSION	0.708	3	0.236	0.608	0.612
ERROR	26.792	69	0.388		

*p < .05.