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Pairing Visuals with Direct Questions: Can Children's Response Accuracy Be Improved?

by

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Honours Thesis

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Abstract

Are visual aids effective in improving children's response accuracy to direct questions? One hundred and five children ages 4- to 7-years-old (55.24% female) were randomly assigned to one of two experimental conditions: visual aids present or visual aids absent. The visual aids present condition included a "yes" visual aid, a "no" visual aid, and an "I don't know" visual aid. The visual aid absent condition did not contain any visual aids. The children were individually interviewed and asked a series of 9 questions. Of the 9 questions, 3 were answerable and 6 were unanswerable in nature. It was hypothesized that the presence of visual aids would improve the children's accuracy in response to direct questions. The hypothesis was not supported, as there was no significant difference in accuracy between the visual aids present and visual aids absent condition. However, the results showed that young children can be as accurate as older children in response to answerable questions, while the older children were more accurate than younger children in response to unanswerable questions.

Pairing Visuals with Direct Questions: Can Children's Response Accuracy Be Improved?

The information that child witnesses provide in forensic interviews may be important, especially in cases where the child is the sole witness to the alleged crime or there is little physical evidence. Because of the critical reliance on children's testimony, research has been conducted in order to elicit accurate accounts from children (Peterson & Bell, 1996; Poole & White, 1991). Much of this research was in response to high profile cases that have employed inappropriate interviewing techniques. Such inappropriate and suggestive interviewing techniques have rendered children's testimony unreliable in high stakes investigations and can have serious consequences for the involved parties (Ceci & Bruck, 1995). Asking young children direct or specific questions appears to be a problematic interviewing technique that often produces inaccurate responses, while young children seem to provide very accurate accounts in response to open-ended questions (Cassel, Roebbers, & Bjorklund, 1996). In order to improve response accuracy from children, specific interviewing protocol and guidelines have been developed including The National Institute of Child Health and Human Development (NICHD) (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007).

The NICHD interviewing protocol recommends the use of open-ended questions when interviewing children in forensic investigations (Lamb et al., 2007). The use of direct questioning is discouraged, and the NICHD protocol recommends employing specific questions only when essential information is required. Despite the NICHD protocol's acknowledgement that direct questioning may be essential in some cases, research has mainly aimed to compare open-ended and direct questioning. Little research has been conducted toward improving children's accuracy in response to direct questioning techniques specifically. The purpose of the present study was to

test whether children's response accuracy to direct questions can be improved by employing visual aids.

The goal when questioning children in forensic investigations is to elicit the most accurate information possible, while limiting and preventing the disclosure of inaccurate information. Children can provide reports as accurate as adults when asked open-ended questions, while specific or direct questions tend to result in more inaccurate information from children (Poole & White, 1991). For example, Peterson and Bell (1996) examined the impact of stressful emotional events on children's response accuracy and detail of response. The researchers recruited 2- to 13-year-olds from a hospital emergency room. The children attended the emergency room for traumatic injury as defined by emergency room staff. The parents and children were first interviewed approximately 6 days following the emergency room treatment. The children were interviewed using free recall questions such as, "Tell me about what happened." Following the free recall, children were asked specific questions such as, "Did it bleed?" The parental interviews and medical records from the emergency room were used to corroborate the children's statements. After 6-months, the children were re-interviewed using the same format and questions as the 6-day post-event interview. The researchers concluded that the children's level of stress had little impact on the children's response accuracy and type of details disclosed. However, the question format impacted children's response accuracy: the children reported information with 91% accuracy in response to open-ended questions but only with 45% accuracy in response to direct or specific questioning.

Direct questioning is especially problematic for young children. Brady, Poole, Warren, and Jones (1999) studied the appropriateness of specific yes-no questioning in forensic interviews and age differences in response accuracy to these specific questions. The 3- to 7-year-

olds viewed a videotaped event depicting a boy and girl arguing over a baby doll. After a 2-minute delay, the interviewer asked the child 16 yes-no questions such as, “Was the baby’s name Sally?” Following another 2-minute delay the child was asked the same 16 questions in a forced-choice format (e.g., “Was the baby’s name Sally, yes or no?”). The results indicated that the children’s responses to specific questions were highly inaccurate. Furthermore, the younger children (3- to 4-year-olds) had lower response accuracy than the older children (5- to 7-year-olds). Such results indicate that specific questioning is especially problematic for young children.

One explanation of why children struggle to provide accurate responses to direct questions is their perception of the adult interviewer (Ceci, Ross, & Toglia, 1987). Children view adults as cooperative, truthful, credible, and competent source of information (Nelson & Gruendel, 1979). Because of this perception, children may assume that questions posed by adults must be answerable. As a result, young children often provide answers to unanswerable questions (Waterman & Blades, 2011). For example, Poole and White (1991) examined the impact of repeated questioning on the use of open-ended and direct questions. Four age groups including 4-year-olds, 6-year-olds, 8-year-olds, and adults witnessed an altercation in which a male confederate took a pen away from a female confederate. In one condition, participants were interviewed one week following the event. Participants in the second condition were interviewed immediately following the event and again one week following the event. In each interviewing session, participants were asked seven open ended and specific questions, each repeated three times. The questions also included the unanswerable question: “Do you know what the man does for a living-what is his job?” The results showed that despite the repeated questioning, responses to open-ended questions remained accurate and consistent amongst the age groups. However, the 4-year-olds were substantially more inconsistent than older children

and adults in response to specific questions. Furthermore, the 4-year-olds often provided answers regarding the man's occupation despite the unanswerable nature of the question.

The first study to specifically examine children's responses to unanswerable questions was conducted by Hughes and Grieve (1980). The researchers asked 5- and 7-year-olds four unanswerable questions (e.g., "Is milk bigger than water?"). If the child did not provide a response to the question or responded, "I don't know," the question was repeated. If a child provided a response without justifying their answer, the researcher replied, "Why?" prompting the child to elaborate on their answer. The results indicated that the 5-year-olds answered the unanswerable questions 87% of the time without ever qualifying a response. Furthermore, the 7-year-olds provided answers to the unanswerable questions 100% of the time but qualified approximately 28% these responses, indicating greater uncertainty than the 5-year-olds in their answering. Overall, the researchers noted that despite the unanswerable nature of the questions, the children provided answers in most instances.

In order to improve children's response accuracy in forensic interviews, the NICHD protocol has suggested providing children with ground rules. Specifically, ground rules include informing the child that it is appropriate to answer, "I don't know," when responding to questions that are unanswerable or the answer is unknown (Lamb et al., 2007). However, research testing the effectiveness of the ground rule has produced mixed results (Earhart, LaRooy, Brubacher, & Lamb, 2014). For example, Cassel et al. (1996) examined children's responses to questioning after being provided with the guideline that it is acceptable to answer "I don't know." Children in kindergarten, grade-2, and grade-4 viewed a video in which a boy argued with a girl over a bicycle and subsequently took the bicycle away from the girl. Approximately one week later, participants were interviewed and provided with the ground rule

that the children can answer, “I don’t know,” if the question is unanswerable. The participants were then asked free recall questions followed by increasingly misleading questions about the video. Despite being informed about the “I don’t know” ground rule and the unanswerable nature of questions, children provided specific answers 81% of the time. Furthermore, Earhart et al. (2014) investigated patterns of “I don’t know” responding in investigative interviews. The researchers examined 76 transcripts of investigative interviews with abused children. The results indicated that the “I don’t know” ground rule did not alter children’s, “I don’t know,” responding. Furthermore, children who received the ground rule were no more likely to answer, “I don’t know.”

Perhaps a better alternative to the “I don’t know” ground rule is to employ techniques from lineup studies that have improved children’s response accuracy. Direct questioning techniques may benefit from applying lineup techniques, as both forensic processes are similar (Davies, 1996). In children’s lineup literature, the pattern for children’s response accuracy parallels research conducted on eyewitness accuracy for reporting events when later asked direct questions. That is, when the target is included in a lineup, preschool children’s identification accuracy is comparable to older children’s and even adult’s accuracy. The challenge for responses however, occurs when the suspect or target is not included in the lineup. In a target absent lineup, where the suspect is not present, younger children are far more likely to make a false identification compared to older children and adults. For example, Beal, Schmitt, and Dekle (1995) examined children’s identification accuracy in target-absent lineups. Five-year-old children viewed a slide show depicting an outdoor picnic. During the picnic, a woman stole a camera off of a table from another individual at the picnic. Following the slide show, the children were shown a target-present or target-absent simultaneous lineup, in which all of the pictures

were shown to the child at once. The results indicated that the children made more false identifications when presented with the target-absent lineup compared to the target-present lineup. Not only do target-absent lineups and direct questioning elicit poor response-accuracy, but children also struggle to respond appropriately to both processes. Similar to direct questioning, children may not understand that they cannot always provide an answer in target-absent lineups. In both target-absent lineups and direct questioning, the child may be required to answer, "I don't know." Additionally, similar social explanations may account for children's response accuracy to unanswerable direct questions and selection accuracy in target-absent lineups (Davies, 1996).

Lineup researchers have developed modified lineup procedures that may reduce the rate of children's false identifications in target-absent lineups. One promising technique is the wildcard lineup procedure. In the wildcard lineup, one of the pictures shown is the silhouette of a face with a question mark superimposed. When asked to identify the suspect, children are instructed to point at the wildcard if the suspect is not present in the lineup. Zajac and Karageorge (2009) examined the effectiveness of the wildcard as a visual aid in lineups. The 8- to 11-year-olds were briefly exposed to a confederate during a staged event. The first groups of participants were exposed to either a target-present or target-absent photographic lineup task that did not include the wildcard. The second groups of participants were exposed to either a target-present or target-absent photographic lineup with the wildcard. The children in the target-absent lineup without a wildcard correctly rejected the lineup 46% of the time. In contrast, the children in the target-absent lineup with a wildcard correctly rejected the lineup by selecting the wildcard 71% of the time. These results indicated that the inclusion of the wildcard improved the accuracy of children in the target-absent lineups, as the children in the target-absent wildcard lineup

rejected the lineup significantly more often than the children in the target-absent lineup with the wildcard.

Children's response accuracy has been improved in lineup studies through the use of such visual aids as the wildcard. The visual aid in the wildcard lineup alleviates the social pressure children feel to be compliant, by presenting "I don't know" as a legitimate answer (Harvard & Memon, 2013). Thus, due to the similarities that underlie answering direct questioning and target-absent lineups, the visual aid question mark may also improve response accuracy to direct questioning. Additionally, by providing children with a visual option for the answer, "I don't know," in direct questioning may improve accuracy by allowing them to choose, "I don't know," when the question is unanswerable.

Using experimental methods to determine whether visual aids improve the children's response accuracy to direct questions provides a unique research contribution. Such research may indicate whether visuals should be further studied in the context of forensic interviewing. In the present study, the accuracy of response to direct answerable and unanswerable questions with or without visual aid selections was examined. Children aged 4- to 7-years old were asked 9 questions with or without 3 visual aid cards representing "yes," "no," and "I don't know." Of the 9 questions, 3 were answerable and 6 were unanswerable. It was hypothesized that the children provided with visual aids would demonstrate higher response accuracy than the children who were not provided with the visuals (Harvard & Memon, 2013; Zajac & Karageorge, 2009).

Method

Participants

Participants were 105 children (55.24% female) ranging from age 50- to 85-months-old ($M=67.45\text{mos}$, $SD=5.52\text{mos}$) from 2 elementary schools located in Stratford, Ontario. The

children's demographic information was collected from their parents on the parental consent form. The data including demographic information for the age groups are presented in Table 1. For the study, the children were randomly assigned to either the visual aids absent condition ($M=67.42\text{mos}$, $SD=3.78\text{mos}$, 58.32% female), or the visual aids present condition ($M=68.63\text{mos}$, $SD=3.46\text{mos}$, 51.67% female). The younger children included those 50- to 67-months-old and the older children included those 68- to 85-months-old. For data analysis, participants were divided into four groups including: younger children with visual aids present ($n=28$, $M_{age}=58.23$, $SD_{age}=3.57$, 50.00% female), younger children with visual aids absent ($n=25$, $M_{age}=59.13$, $SD_{age}=3.78$, 50.00% female), older children with visual aids present ($n=26$, $M_{age}=75.50$, $SD_{age}=4.13$, 46.15% female), and older children with visual aids absent ($n=26$, $M_{age}=77.21$, $SD_{age}=3.91$, 53.85% female). Recruitment involved providing the participating teachers with a letter of information to be sent home with the children in order to obtain parental consent. The children were verbally thanked for their participation, and provided with a sticker and a participation certificate.

Materials

Visual Aids. The visual aids consisted of three separate cards. The first card illustrated the answer “no,” and consisted of a large red circle with a white x shape in the center. The second card illustrated the answer “yes,” and consisted of a large green circle with a white check mark in the center. The third card illustrated the answer “I don't know,” and consisted of a large black circle with a white question mark in the center. In the visual aids present condition, the children were shown the three visual aids simultaneously while the questions were asked. In the visual aids absent condition, the children were not provided with the visual aids. The visual aid cards were each 150x150mm in dimension.

Questions. Children were asked a series of nine yes/no answerable and yes/no unanswerable questions. Two of the questions were developed by Hughes and Grieve (1980) and seven of the questions were developed by Pratt (1990) to test children's response accuracy. Three of the questions were answerable in nature (e.g., "Is a bus longer than a car?") and seven of the questions were unanswerable in nature (e.g., "Is a box louder than a knee?"). One hundred random sequences of the questions 1-9 were generated and each participant was asked a different order of the 9 questions. For the answerable questions, a summary score of the each child's accuracy in response to answerable questions was created by calculating the percentage of answerable questions correctly answered. Additionally, for the unanswerable questions, a summary score of each child's response accuracy to the unanswerable questions was created by calculating the percentage of unanswerable questions answered correctly.

Procedure

Ethics approval from King's University College was obtained. The researcher contacted the director of the Huron-Perth Catholic District School Board for ethics approval. Once the school board director approved ethics, the researcher contacted two schools in Stratford, Ontario. A letter of information with consent form was sent home with the children in junior kindergarten, senior kindergarten, and grade-1. Those that received parental consent participated in the study. The children were randomly assigned to one of two experimental conditions: visual aids present and visual aids absent.

In the classroom, children individually met with a researcher during class time. In both conditions, children were asked to answer nine direct answerable and direct unanswerable questions. The duration of the questioning was approximately 5 minutes per child. In the visual aids absent condition, the researcher told the child:

I am going to ask you some questions. For some of these questions, you may know the answer and for some of these questions you may not know the answer. If you do not know the answer it is acceptable to say, "I don't know." If you do know the answer, you can answer the question, "yes," or, "no," depending on what you think the answer is.

In the visual aids present condition the researcher placed the three visual aid cards in front of the child and told the child:

I am going to ask you some questions. For some of these questions, you may know the answer and for some of these questions you may not know the answer. If you do not know the answer you can point to the black card with the question mark to answer, "I don't know." If you do know the answer you can point to the red card with the x to answer, "no," or the green card with the check mark to answer, "yes," depending on what you think the answer is.

Once the children in each condition were provided with this information, the researcher conducted a practice trial with the students. For the practice trial, the researcher asked, "If I asked you what I ate for breakfast today what would you say?" If the child correctly responded, "I don't know," the researcher began asking the 9 study questions. If the child was unable to correctly respond, "I don't know," the researcher corrected the child by saying, "Do you think because you don't know what I ate for breakfast, you would answer 'I don't know'?" The researcher then asked the follow up question, "If I asked you what is my favourite colour, what would you say?" Following the second practice question the researcher began asking the children the 9 study questions regardless of their response on the second practice question. The children's responses to the practice questions were recorded. The responses to the 9 study questions were

recorded on a question recording sheet. After the interview, the children were verbally debriefed, thanked for their participation, provided with a sticker and a participation certificate.

Results

A mixed model ANOVA with two between subjects independent variables and one within subjects independent variable was carried out. The two between subjects independent variables were age (younger vs. older) and condition (visual aids absent vs. visual aids present). The within subjects independent variable was question type (answerable vs. unanswerable). The continuous dependent variable was the children's response accuracy measured as the percentage of correct responses. There was a significant main effect of age on accuracy $F(1, 101) = 6.79, p = .011$. There was also a significant main effect of question type $F(1, 101) = 400.96, p < .001$. The data are presented in Table 1. The hypothesis of the study predicted that children in the visual aids present condition would have a significantly higher percentage of correct responses. Importantly, the analysis revealed that there was no significant main effect of condition on accuracy. The analysis also revealed a significant interaction of Age x Question Type $F(1, 101) = 11.58, p = .001$. To interpret the interaction, an analysis of simple main effects was conducted. The older children demonstrated a higher percentage of correct responses to the unanswerable questions ($M = 0.32, SD = 0.32$), than the younger children ($M = 0.11, SD = 0.20$). There was no significant difference in accuracy between older children ($M = 0.86, SD = 0.26$) and younger children ($M = 0.86, SD = 0.27$) in response to answerable questions. The results indicate that younger children may be as accurate as older children in response to answerable questions. However, the older children are more accurate than the younger children in response to the unanswerable questions, indicating that older children correctly provide an, "I don't know," response more often than the younger children.

Table 1

Mean Percentage of Correct Responses (with Standard Deviations)

Question Type	Older		Younger	
	Control	Visual Aids	Control	Visual Aids
Answerable	.86 (.27)	.86 (.25)	.89 (.25)	.83 (.28)
Unanswerable	.29 (.31)	.35 (.34)	.06 (.14)	.15 (.24)

Note. A correct response for the answerable questions was, “yes,” and a correct response for the unanswerable questions was, “I don’t know.”

Discussion

This study investigated whether visual aids can effectively improve children's responses to direct questions. The statistical analysis revealed that the children's percentage of correct responses to direct questions were not significantly improved when presented with visual aids. Additionally, the results demonstrated a significant interaction of Question Type and Age of the child. According to this interaction, older and younger children did not significantly differ in response to the answerable questions, but older children were significantly more accurate than younger children in response to the unanswerable questions.

It was hypothesized that the children presented with visual aids while answering the direct questions would demonstrate a significantly greater percentage of correct responses than the children that did not receive the visual aids. However, the finding that the visual aids did not significantly improve response accuracy does not support the hypothesis. This result is inconsistent with previous research by Zajac and Karageorge (2009) where the visual aid question mark improved children's response accuracy in target-absent lineups. In the present study, the presence of a visual aid question mark did not improve children's responses. It is possible that these results are inconsistent because the lineup study tested children 8- to 11-years-old, while the present study tested children 4- to 7-years old. Given the difference in age, the children presently tested were at a lower cognitive and developmental stage. However, a more recent study by Zajac and Karageorge (2011) demonstrated that children as young as 5-years-old benefit from the use of the wildcard. Children aged 5- to 7-years-old and 8- to 11-years-old took part in a memory event at a fire station. The children witnessed a painter sliding down the fire pole and being reprimanded by firefighters for inappropriate use of the pole. The children were individually interviewed two days or two weeks following the fire station visit and asked to

identify the painter in a photographic lineup. The children either received a target present or target absent lineup without a wildcard or a target-present or target-absent lineup with a wildcard. The results indicated that while the 5- to-7-year olds were less accurate than the 8- to 11-year-olds, the presence of the wildcard improved children's accuracy in correct rejections by selecting the wildcard. This result illustrates the idea that visual aids can be effective for children as young as 5-years-old. Perhaps one of the major differences between the visual aids employed in the present study and the wildcard in lineup studies was the use of abstract or unanswerable questions in the present study.

Children in the lineup studies were asked questions relating to their own experiences of a witnessed event. In contrast, the present study asked children unanswerable questions that were abstract. It is possible that while children may benefit from the visual aid when questioned about lived experience, the visual aid may not provide the same benefits when it is used to respond to abstract unanswerable questions. The findings of the present study are consistent with the notion that young children tend to provide answers to unanswerable questions (Hughes & Grieve, 1980; Pratt 1990). In order to improve the ecological validity of the present study, it may be beneficial for future research to use these visual aids to interview children using direct questions that pertain to a witnessed event.

Furthermore, the significant interaction of Age and Question Type in the present study is consistent with the previous research that children struggle to accurately respond to direct questions (Cassel et al., 1996; Peterson & Bell, 1996; Poole & White, 1991). Additionally, the results are consistent with the well-established finding that younger children are more inaccurate than older children in response to direct questions (Brady et al., 1999). However, it is interesting to note that the young children in the present study were as accurate as the older children in

response to the answerable questions. This finding illustrates the idea that young children can be very accurate, and as accurate as older children, in response to direct questions when the child knows the answer. Additionally, in order to respond to the answerable questions, the children do not need to rely on applying interviewing ground rules. The children must only need to apply the, “I don’t know,” ground rule when the question is unanswerable. The finding that younger children were less accurate in response to the unanswerable questions, which require use of the ground rule, demonstrates that there may be important underlying cognitive and developmental factors preventing the children from applying the ground rule. This possibility is further supported through the exploratory analysis of the practice questions employed in the present study.

During an exploratory analysis of the responses to the 2 practice questions, it was determined that of the 67 students at the second school tested, 59% of the students failed to respond, “I don’t know,” to the first practice question. This was despite the students receiving instructions that it is acceptable to answer, “I don’t know,” immediately before the first practice question. Furthermore, of the 59% that failed the first practice question, an additional 33% failed to respond, “I don’t know,” on the second practice question, despite being told the appropriate response to the first practice question was, “I don’t know.” The children’s high percentage of failure, despite the researcher clearly stating that “I don’t know” was an acceptable response, indicates the possibility that the lack of “I don’t know” responses may be due to children’s cognitive development rather than social factors related to compliance and pressure.

In the future, it may be beneficial to focus on improving techniques for practice questions. In the present study, the practice questions were not immediately focused on. The children were asked

practice questions created by the researcher rather than practice questions developed by interviewing protocols such as the NICHD.

Although the NICHD protocol recommends the use of the ground rules such as appropriately responding, “I don’t know,” another leading protocol, The Step-Wise Interview, does not suggest providing children with ground rules at the outset of an interview (Cooper, Herve, & Yuille, 2009). According to The Step-Wise Interview, preschool aged children do not have the required attention span and cognitive capacity to understand rules applied at the onset of an interview. Therefore, the younger children may be very accurate in response to the answerable questions because understanding the “I don’t know” ground rule is not necessary for these responses. However, the younger children may be more inaccurate than the older children in response to the unanswerable questions, because they do not have the same attention span and cognitive capacity required to apply the ground rule throughout the interview.

The present study provided a unique research contribution, as no previous experiments have employed visual aids to improve children’s response accuracy to direct questions. Due to this novelty, the study was limited by a lack of age-appropriate visual aid research. The present study applied the visual aid question mark that was successfully used by Zajac and Karageorge (2009). However, studies using the wildcard lineup have not tested children 4-years-old and younger. As a result, it is unknown whether the visual aid question mark used was appropriate for the 4-year-old students tested in the present study. Furthermore, the findings may be limited due to the absence of an experienced event for the children. In most forensic investigations, children are interviewed based on a witnessed event, and therefore the forensic interview process also requires the children to employ memory processes. In the present study, the children were not required to also incorporate memory of an experienced event into their responses. As a result,

the present experiment may lack ecological validity. In the future, incorporating an experienced event and asking direct questions based on the event may improve the generalizability of the results.

In order for visual aids to effectively improve children's response accuracy, children must first understand and have the ability to apply the "I don't know" ground rule. Current interviewing protocol has not developed age specific ground rules geared toward the developmental stage of the child. For example, the NICHD interviewing protocol has been used on children 3-to 13-years-old (Cyr & Lamb, 2009). Future research should aim to determine appropriate ground rules specific to the age of the child and their cognitive abilities. Furthermore, in order for visual aids to improve children's response accuracy in the future, additional research must be conducted to determine developmentally appropriate visuals. Zajac and Karageorge (2009) demonstrated that the question mark may be an appropriate visual aid for children 5-years-old and older, however future research should focus on developing appropriate visual aids for children 4-years-old and younger.

The findings of the present study highlight the importance for parents, educators, and law enforcement to understand how to properly question children. The low level of accuracy in response to direct questions by both older and younger children indicates that it is important for adults to avoid asking children direct questions. Furthermore, any responses elicited through direct questioning should be accepted cautiously, as the present study has demonstrated that a large proportion of children will provide answers to unanswerable questions. Most notably, children 4- to 5-years-old demonstrate the greatest inaccurate response rate to unanswerable questions. Additionally, this study has demonstrated the difficulty young children have with answering, "I don't know," even in the presence of visual aids. Parents, educators, and law

enforcement should remain skeptical that young children will indicate that they cannot answer a question when the question is posed in a direct format. As a result, readily accepting young children's responses to direct questions may have serious consequences, especially in the context of forensic investigations.

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