The Use of Ground Rules in Investigative Interviews with Children: A Synthesis and Call for Research

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Abstract

Guidelines for conducting investigative interviews with children often include instructions that explain the conversational rules of the interview. Despite the widespread and international use of such instructions (also referred to as "ground rules"), the body of research characterizing children's understanding of these rules and documenting the impact of instruction on memory reports is relatively small. We review the use of ground rules in investigative interviews, the developmental differences that likely underlie children's ability to make sense of these rules, and research pertaining to the effects of the ground rules commonly included in interview guidelines on the reports of 3- to 13-year-old children. We then present a study space analysis concerning the five ground rules reviewed: (a) a statement about interviewer naïveté regarding the target events, (b) instructions to tell the interviewer when a mistake has been made, (c) cautions that some questions may be repeated, and instructions to say (d) "I don't understand" and (e) "I don't know." The results demonstrate obvious gaps in this body of literature, with only the "I don't know" ground rule having received significant attention. In addition to exploring how individual rules impact interview performance, we encourage more process-oriented studies that relate developmental differences in ground rules benefits to the cognitive processes that underlie rule understanding and implementation. Optimally, this research should identify the most suitable format and placement of instruction in interviews and broaden to more often include field studies of child witnesses.

Keywords: investigative interviewing, children, ground rules, interview instructions, metacognition

The Use of Ground Rules in Investigative Interviews with Children: A Synthesis and Call for Research

Guidelines for conducting investigative interviews with children often include instructions (i.e., ground rules) that convey the communicative expectations of the interview. These can include directives to say "I don't know" when prompted information cannot be recalled, to ask for clarification when misunderstandings arise, and to tell the interviewer when a mistake has been made. The purpose of discussing ground rules is to make children aware that they are the experts on the events in question and to set the stage for a unique style of conversation that is likely to be unfamiliar to young witnesses (Lamb & Brown, 2006; Poole & Lamb, 1998).

In daily life, children's conversations often involve informed and familiar adults who are testing children's memories of shared experiences or emerging knowledge (e.g. "Where did we go this morning?" or "What kind of animal is this?" Nelson & Fivush, 2000). Even when adults lack knowledge of target events ("What did you do at school today?"), they nonetheless tend to direct conversations with prompts that provide much of the structure and content for children's stories (Kelly & Bailey, 2013; Principe, DiPuppo, & Gammel, 2013). Children therefore know that adults usually expect answers to questions and want them to learn the new information embedded in conversations. It is not surprising, then, that children often answer questions regardless of their level of certainty or understanding (Hughes & Grieve, 1987; Pratt, 1990; see Warren & McGough, 1996 for a review) and comply with adults' suggestions (Ceci, Kulkofsky, Klemfuss, Sweeney, & Bruck, 2007; Principe et el., 2013).

Supporters of ground rules fear that the power dynamic in investigative interviews, wherein children likely view interviewers as authority figures, will amplify unwanted speculation and acquiescence to suggestion. Indeed, research has shown that children are more likely to accept suggestions from interviewers they believe to be knowledgeable rather than naïve

(Waterman, Blades, & Spencer, 2004; Welch-Ross, 1999) and from adults rather than peers (Toglia, Ross, Ceci, & Hembrooke, 1992). Consequently, it seems prudent for interviewers to explain that "I don't know" is an acceptable answer, that children can correct interviewers' mistakes, and that children should report only memories of experienced events when potentially-confusing situations arise during the course of an interview (e.g., that a repeated question does not mean the child's previous answer was inadequate).

The prediction that children would benefit from ground rules emerged from analyses of the question forms investigative interviewers delivered most frequently, along with the accuracy of children's responses to these forms in analog studies, rather than in-depth understanding of the cognitive skills needed to comprehend and implement the rules. Our primary position in this paper is that this very understanding is needed to advance the use of ground rules so interviewers explain instructions to children in the most optimal ways. Although we acknowledge that motivational and emotional factors (e.g., being fatigued, under stress, or reluctant) may prevent children from benefitting from interview instructions (see Saywitz, 1995, for a discussion), in this review we focus on the cognitive factors that underlie the ability to understand and benefit from the rules. After reviewing how ground rules are currently integrated into investigative interviews, we describe basic research on the emergence of cognitive skills that likely underlie ground rules benefits and analog studies that documented the impact of ground rules on testimonial quality. Following discussion of these research traditions, we present a two-part study space analysis that identifies gaps in the literature and directions for future research.

The Use of Ground Rules in Investigative Interviews

Although guidelines unanimously advise interviewers to avoid complex vocabulary and to rely on open (i.e., free-recall) questions, even well-executed interviews contain numerous

specific (i.e., wh-) and option posing (multiple choice and yes-no) questions (e.g., Orbach, Hershkowitz, Lamb, Esplin, & Horowitz, 2000; see Lamb, Orbach, Hershkowitz, Esplin & Horowitz, 2007, for a review). The high frequency of these question forms in front-line interviews is partly due to limited interviewing skills (e.g., Powell, Hughes-Scholes, & Sharman, 2012) and partly because case exploration usually necessitates asking such questions (especially of very young children; Hershkowitz, Lamb, Orbach, Katz, & Horowitz, 2012).

Although it is well known that the risk of inaccurate reports increases coincident with the specificity of questions (Waterman, Blades, & Spencer, 2000; 2004), commentators less frequently mention that open questions are not a magical elixir for truth (for a discussion, see Ceci et al., 2007). In fact, open questions can be misleading with respect to content (Sharman & Powell, 2012) and temporal details (Powell, Roberts, Thomson, 2000), and children may not be able to recall prompted information or may retrieve related information in its place (due to mechanisms underlying confabulation or source-monitoring confusions; e.g., Poole & Lindsay, 2001). Therefore, supporters of ground rules argue that instructions are warranted even when interviewers use a nondirective questioning style.

To address these problems, many interviewing guidelines had adopted ground rules by the 1990s (e.g., *Memorandum of Good Practice*, Home Office, 1992 [later *Achieving Best Evidence in Criminal Proceedings,* Ministry of Justice, 2011]; the NICHD Protocol, Orbach et al., 2000 [with ongoing revisions, see Hershkowitz, Lamb, Katz, & Malloy, 2013]; *Forensic Interviewing Protocol*, State of Michigan Governor's Task Force on Children's Justice and Department of Human Services, 1998 [third edition from the State of Michigan Governor's Task Force on Child Abuse and Neglect and Department of Human Services, 2011]; *Oregon Interviewing Guidelines*, Bourg et al., 1998 [third edition DeClue et al., 2012]; the Step-Wise

Interview, Yuille, Hunter, Joffe, & Zaparniuk, 1993 [later the Step-Wise Guidelines, Yuille, Cooper, & Hervé, 2009]). Over the years, these guidelines were revised based on research findings and feedback from investigative interviewers. For example, later versions of the NICHD Protocol (Lamb et al., 2007) included additional rules and delayed the delivery of the rules (in the Revised protocol) until children had completed a narrative practice phase (recall of a nontarget event) to give interviewers more time to establish themselves as friendly and naïve (see Lamb, Hershkowitz, & Lyon, 2013). Today, *Achieving Best Evidence* guidelines support the early introduction of ground rules, but it is at interviewers' discretion when to do so. Furthermore, interviewers have the option of restating rules after the free narrative account is complete but before specific questioning commences (Ministry of Justice, 2011). Similarly, in the Developmental Narrative Elaboration Interview, Saywitz and Camparo (2014) present interview instructions as a set of tools and encourage interviewers to choose the most appropriate tools for each child and interview situation (rather than recommending a fixed set of rules for all interviews).

Though ground rules are widely discussed in interview protocols, guidelines have not unanimously favored the practice of front-loading interviews with ground rules instruction. For example, the RATAC protocol (developed by CornerHouse, an abuse evaluation center) advocated instruction only as problems arose during interviews, citing the time it takes to deliver ground rules (during which children could become inattentive), young children's lack of understanding of the instructions, and weak evidence for the effectiveness of instruction, as limitations of a discrete interview phase (Anderson et al., 2010; see also Russell, 2006). (CornerHouse recently began to include "orienting messages" at the beginning of interviews with reinforcing comments as issues arise; Anderson, 2013; 2014). The StepWise Guidelines (Yuille

et al., 2009) also encouraged interviewers to reinforce use of the rules when children show desired behaviors during the course of an interview (e.g., "… that's good, Mary. I am only interested in things you can remember") rather than delivering them at the outset.

Overall, there is agreement that ground rules should be mentioned in investigative protocols but no uniformity across guidelines regarding the recommended format, placement, or extent of instruction. For the field to progress beyond the simple realization that children need clarification of their role as expert informants, it is necessary to determine how effective interview instructions actually are for children at different levels of cognitive development. A satisfying answer to this question will entail a two-pronged approach: first, understanding which cognitive structures must be in place before children can understand and implement each ground rule (which sets boundary conditions on the appropriateness of various ground rules for children in different age brackets) and, second, determining the efficacy of instruction on the quality of children's testimony. As we will show, the existing database provides only spotty answers to these questions.

How Developing Cognitions Help Children Make Sense of Ground Rules

Although direct evidence is lacking, numerous cognitive skills that develop during early and middle childhood should theoretically influence the degree to which children can benefit from various ground rules. An obvious candidate process is theory of mind (ToM), which is a broad set of skills supporting understanding of the mental states of the self and others (Premack & Woodruff, 1978). Two measures of ToM are arguably relevant for ground-rules understanding: knowledge access and false belief (see Wellman & Liu, 2004, for task descriptions and developmental trajectories). The former refers to an understanding of how knowledge and event memories are acquired (e.g., through direct experience) and who has access to that information. Without a developed understanding of knowledge access, children are

unlikely to benefit from being told that the interviewer is naïve to the child's experience (e.g., see Koenig & Harris, 2005; Waterman et al., 2004; Welch-Ross, 1999). Relatedly, the understanding that others can hold false beliefs may be relevant to ground rules that instruct children to correct the interviewer when a mistake has been made. These skills tend to develop between the ages of 4 and 6 years, with most children passing knowledge access tasks at an earlier age than false belief tasks (Peterson, Wellman & Slaughter, 2012; Wellman & Liu, 2004).

Metacognitive skills should also be important for understanding of ground rules. Metacognition refers to the ability to reflect on one's own thoughts and mental processes (Flavell, 1979; Sodian, Thoermer, Kristen, & Perst, 2012). The awareness that a question was difficult because the vocabulary was not understood is an example of this skill, as is recognizing whether one has or does not have access to information (rather than reflexively taking a guess or replying "I don't know" when information does not come quickly to mind). Reasoning about *memories*, called metamemory, involves knowledge and understanding about one's own memory, including its capabilities and how it can be influenced (Flavell & Wellman, 1977).

Two components of metacognition have been distinguished: declarative and procedural (although other terms have been used; see Schneider & Lockl, 2002, for a review). Declarative metacognition refers to knowing what factors influence cognition and why (e.g., with respect to meta*memory*, knowing that if you cannot remember feeling a particular bodily touch then you may not have directly experienced it), whereas procedural metacognition refers to the online application of that knowledge (e.g., rejecting the notion that you actually experienced the touch and reasoning that someone told you about it). Procedural metacognition is relatively age independent because many factors influence implementation, such that young children may be capable of metacognitive insights on some tasks but not others (Schneider & Lockl, 2008). For

example, Waterman and colleagues (2000) demonstrated that children as young as 5- to 6-years-old could distinguish between sensible and nonsensical questions when asked if questions were silly. When asked to answer the questions, however, the children provided responses to nonsensical yes-no questions (e.g., "Is a box louder than a knee?") but said "don't know" in reply to questions that were not option-posing (e.g., "Where do circles live?").

Reflecting on knowledge access when asked option-posing questions may require stronger procedural metacognitive skills than what is required in the face of recall-based questions (e.g., wh- and open-ended). The former question-type affords responses (that is, a choice of options can be made without further processing), whereas the latter are typically answered only when knowledge is present (Waterman, Blades, & Spencer, 2001; Waterman et al., 2004). Further support for this suggestion comes from a recent study by Rohwer, Kloo, and Perner (2012) in which children (2 to 7 years) had to guess the identity of a toy hidden in a box. When they were completely ignorant about the contents, they were highly accurate at admitting that they did not know (although only the 6- and 7-year-olds were able to provide reasonable justifications for *why* they did not know; e.g., "You did not show me."). When children saw two possible objects before one was hidden in the box, however, the younger children often made a guess (70%), whereas the 6- and 7-year-old children did not (6%). The provision of a response option afforded an answer, just as forced-choice questions do.

Evidence that procedural metacognition develops most rapidly in the early elementary-school years comes from Fritz, Howie, and Kleitman (2010), who found a large increase in performance between 6- to 8-years-old with continued but slower improvement towards the end of elementary school. An oft-cited set of experiments by Markman (1979), aimed at characterizing children's comprehension monitoring, found stronger evidence for later

development. Eight- to 11-year-olds listened to short stories that were missing critical information required for comprehension (e.g., a story about making baked Alaska did not explain that there is meringue around the ice cream to prevent it melting in the hot oven). Despite demonstrating excellent memory for the content of the stories, many children failed to realize that their comprehension was incomplete. In a follow-up experiment (Study 3), half of the 8- and 12-year-old children were warned that there was "something tricky" about each of the stories and were asked to "spot the problem." The explicit warning conferred more benefit to the 12- than 8-year-olds but improved the performance of both age groups over non-warned children. Similarly, London, Bruck, Poole, and Melnyk (2011) found that it was not until 12 to 13 years that children could consistently understand and explain why a protagonist was led to make a false report through suggestive interviewing. Without this awareness, even children given a rule (e.g., "correct me if I make a mistake") may not recognize situations in which the interviewer is wrong.

Once relevant concept knowledge and online monitoring are in place, the potential for ground rule instruction to impact testimonial quality rests on other developmental advances—most notably, the ability to hold a rule in mind during the course of an interview and to inhibit prepotent responses in order to apply a rule as needed. Because working memory and inhibitory control continue to develop well into adolescence, and performance is task-dependent, it is likely that some children who can demonstrate rule understanding will nonetheless derive no benefit from instruction due to insufficient executive skills. (See Shing, Lindenberger, Diamond, Li, & Davidson, 2010, for a discussion of memory maintenance and inhibitory control from early childhood to adolescence.)

In sum, basic research findings do not lead us to expect a simple situation whereby children above a particular age are most likely to benefit from ground rules instruction. At best, developmental theory explains why instruction has proven more challenging for children less than 6 (see Yuille et al., 2009), but the fact that even older children do not consistently monitor comprehensibility or reflect on social influence suggests the possibility of a protracted developmental period during which the usefulness of interview instructions may be highly task-dependent. Thus basic research findings are currently insufficient for crafting ground rules policy, which ultimately must rest on the efficacy or nonefficacy of interview instructions in analog and field research. After describing our rationale for selecting ground rules and studies in the next section, we review the extant research underlying the most widely-studied and/or frequently recommended ground rules (see Table 1 for an alphabetical list of experiments) and the circumstances under which children of various ages (from 3- to 13-years-old) benefit from the instructions.

Selection of Ground Rules and Studies for Review

We first examined interview protocols and guidelines to determine which instructions were most often recommended. These were identified as (a) information about interviewer naiveté (Lyon, 2010; Powell & Lancaster, 2003; Saywitz & Camparo, 2014); (b) instructions to correct the interviewer when a mistake had been made (Anderson, 2014; Lamb et al., 2007; Lyon, 2010; Saywitz & Camparo, 2014); (c) a caution that sometimes questions may be repeated (Powell & Lancaster, 2003; Saywitz, Geiselman, & Bronstein, 1992); and instructions to tell the interviewer when the child (d) does not understand (Anderson, 2014; Lamb et al., 2007; Lyon, 2010; Powell & Lancaster, 2003; Saywitz & Camparo, 2014) and (e) does not know the answer (Anderson, 2014; Lamb et al., 2007; Lyon, 2010; Powell & Lancaster, 2003; Saywitz et al., 1992; Saywtiz &

Camparo, 2014). We then sought research associated with these rules by searching PsychInfo and Google Scholar for "ground rules," "interview instructions" and words used during delivery of the rules ("naïve," "I wasn't there," "make a mistake," "correct me," "questions [may be] repeated," "don't know," "don't understand"). Next, we reviewed the reference lists of the studies obtained to identify whether any research had been missed. We included only those studies in which some children but not others were delivered a rule and its efficacy was tested. We omitted less-frequently employed rules (e.g., that the child may use any words s/he chooses; see Powell and Lancaster, 2003, for this and other examples) and a variety of other "preparatory" tasks that are beyond the scope of this review, including source-monitoring instructions (e.g., Poole & Lindsay, 2001) and narrative practice (Roberts, Brubacher, Powell, & Price, 2011).

Although truth/lie discussions are sometimes included in a ground rules phase, we omitted this topic from our review because there is relatively good consensus on children's responses to truth/lie questions (Lyon, 2011) and a comprehensive review is available (Talwar & Crossman, 2012). Children's competency to understand the difference between truth and lies is rarely assessed in English-speaking countries (except in the U.S.), but such "tests" do sometimes appear in investigative interviews (Evans & Lyon, 2012). Most children can distinguish true statements from lies by 4- to 5-years old (Bussey, 1992; Lyon & Saywitz, 1999), and although the relationship between *understanding* the truth and *truth-telling* tends to be weak or non-existent (Talwar, Lee, Bala, & Lindsay, 2002), truth-telling is increased by asking children to swear or promise to tell the truth (Talwar et al., 2002; see Talwar & Crossman, 2012, for a review).

Research on Individual Ground Rules

Interviewer naiveté: "I wasn't there…" Many interview guidelines include a statement about the interviewer's naiveté along with the importance of reporting every detail that can be

recalled. Such statements are meant to increase the amount of information children report while reducing the power dynamic that promotes acquiesce to interviewers' suggestions (Lamb & Brown, 2006; Mulder & Vrij, 1996). It seems likely that children would benefit most from the naiveté rule after they have developed a rudimentary understanding of ToM sufficient to grasp the concept that the interviewer does not have the same access to information as they do. Consistent with this idea, some evidence suggests that children who have recently developed ToM profit more from this rule than do older children. When they provided a statement about interviewer naiveté, Waterman and Blades (2011) found that only their 6-year-old participants benefitted in comparison to a control group, whereas the 8-year-olds were unaffected. Because all children in their experiment were given permission to say "don't know," the authors suggested that the extra reminder about interviewer naiveté was unnecessary for the older children.

Some studies that employed this ground rule as a direct statement (e.g., "I wasn't there, I don't know what happened") also simultaneously included other rules (e.g., Beuscher & Roebers, 2005; Cordón, Saetermoe, & Goodman, 2005; Geddie, Beer, Bartosik, & Wuensch, 2001; Krackow & Lynn, 2010; Saywitz & Moan-Hardie, 1994). For example, in addition to modeling complete recall and correcting an interviewer's mistakes, Krackow and Lynn (2010) gave 4- to 5- and 7- to 8-year-old children in their training group an explanatory statement about naiveté ("Sometimes adults ask questions in a way that makes it sound like they know the answers. However, unless an adult was there with you, they do not know the answers." p. 874). Training increased open-ended recall without increasing errors among older children and reduced suggestibility to misleading questions in the preschool group. Mulder and Vrij (1996) crossed the naiveté rule with the "don't know" rule in their study of 4- to 5- and 8- to 10-year-old

children, resulting in a 2 x 2 x 2 design. They found that the naiveté rule reduced incorrect answers to misleading questions for children of both age groups and across both "don't know" conditions, thereby providing the only evidence of the effects of this rule in isolation.

Interviewing guidelines that include a narrative practice phase (see Roberts et al., 2011, for a review) may bolster the effectiveness of this ground rule. Among the primary goals of a practice phase are (a) to give the child an opportunity to be the expert about a neutral event that is unfamiliar to the interviewer and (b) to practice responding to open-ended questions with sufficient detail. It has been suggested that inclusion of this phase can model interviewer naiveté for children while discussing a neutral topic (e.g., La Rooy, Brown & Lamb, 2013). Indeed, because the practice phase trains children to report everything they can remember about an event, even very young children lacking a well-developed theory-of-mind may nevertheless learn to adopt the role of the expert through practice.

General warnings and specific instructions to correct interviewers' mistakes. Motivated by evidence that adults' suggestibility can be reduced by warnings about "tricky" questions (e.g., Chambers & Zaragosa, 2001; Greene, Flynn, & Loftus, 1982), a few experiments focused on the benefits of similar warnings for children, without explicitly instructing them to correct the interviewer when a mistake had been made (Beuscher & Roebers, 2005; Cordón et al., 2005; Endres, Poggenpohl, & Erben, 1999; Warren, Hulse-Trotter, & Tubbs, 1991). All but Beucher and Roebers (2005) reported benefits, but only Warren and colleagues focused exclusively on the warning instruction. These investigators told one group of 1st graders, 6th graders, and adults that some of the questions about a story would be "tricky." The warning reduced acquiescence to leading questions in all age groups but also hampered the performance of the 1st graders, who were more likely to change their answers to non-leading questions after

feedback that they had not performed well on the first round of questions. Thus a warning heightened resistance to suggestibility but also made the youngest children more doubtful of their memories, at least in a context where negative feedback was provided. (In actual forensic interviews, such feedback is strongly discouraged; Lamb et al., 2007; Saywitz & Camparo, 2014). In contrast, Endres and colleagues (Study 1, 1999) found that a warning benefitted both 4- and 7-year-olds. The discrepancy in findings may be due to the fact that while Warren and colleagues (1991, p. 278) told children to "be sure that their answers reflected only what they really remembered about the story," Endres and colleagues told their participants *what to do* when a question was tricky (say "I don't know").

Warnings about questions (i.e., that they may be "tricky" or may contain wrong details) may help children gate out some inaccurate post-event misinformation. A warning can make people more aware of sources of influence on their reports (e.g., that their memory trace is for something the interviewer said after the event rather than from the original event itself). The effects of misinformation may not be completely eliminated by a warning, however, due to "unaware" sources of influence (i.e., true source-monitoring errors; Lindsay, Gonzales, & Eso, 1995; see Holliday, Reyna, & Hayes, 2002, for a review).

To our knowledge, only one study found no effect of warning children that questions might include incorrect information. Beuscher and Roebers (2005) showed a short video to 6-, 8-, and 10-year olds and then interviewed them 1 week later with free-recall followed by specific questions. There were clear developmental differences in children's ability to answer both misleading and non-misleading questions but no effect of a warning. The most striking difference between this study and the previous ones is the delay between event and interview: The other experiments involving a general warning had interviewed children within just 1 day of

the to-be-remembered event (Cordón et al., 2005, interviewed children three times but the first interview was immediate). Because memory traces fade with the passage of time, making them more prone to error (e.g., Jones & Pipe, 2002; Powell, Roberts, Ceci, & Hembrooke, 1999), it is possible that children in Beuscher and Roebers' study were less able to identify misleading questions compared to children who were interviewed soon after the event.

General warnings about questions are absent from most interview guidelines, likely due to the emphasis placed on training interviewers to avoid leading or suggestive questions (Lamb, 1995). Nevertheless, blunders can and do occur in interviewers' questions. For example, interviewers' paraphrases of children's statements frequently contain errors that children fail to correct (Roberts & Lamb, 1999). To reduce this unwanted compliance, some guidelines instead include a rule to correct the interviewer's mistakes. We identified five articles (seven experiments) that included such instruction, of which three reported benefits and two did not. Both Ellis and colleagues (Ellis, Powell, Thomson, & Jones, 2003) and Geddie et al. (2001) failed to demonstrate benefits of any of their ground rules, which included instruction to correct the interviewer. In the former, children were simply given the rule without practice, and in the latter rules and practice were delivered by a different assistant than the interviewer, which has been shown to reduce accuracy (Saywitz, Snyder, & Nathanson, 1999).

Similar to Geddie et al. (2001), Gee, Gregory, and Pipe (1999), Krackow and Lynn (2010), and Saywitz and Moan-Hardie (1994) provided practice in correcting the interviewer but using different procedures. Gee et al. (1999) trained half of their 9- to 13-year-old participants to tell the interviewer when they did not know an answer or thought there was no answer. These children were also given practice questions in which the appropriate response was either "I don't know" (e.g., "Is my middle name Barbara or Jane?") or a statement correcting the interviewer's

wrong assumption (e.g., "What color is your pet dinosaur?"). Children were praised for "don't know" responses and also told that it was okay to correct the interviewer. In Study 1, training reduced both errors and correct responses. By encouraging and reinforcing correct responses to non-misleading questions in training, Study 2 evinced decreases in error rates without a corresponding decrease in accuracy. Yet, because the focus was on instructing children to say "don't know" *when* the interviewer made a mistake, it is difficult to disentangle the two instructions in these experiments.

Krackow and Lynn (2010) and Saywitz and Moan-Hardie (1994) gave children very explicit instructions about correcting interviewers (e.g., in the latter, the training group was taught to use self-statements such as "I won't go along. I'll tell her she's wrong." p. 415). Two weeks after a live event involving bodily touch, 4- to 5- and 7- to 8-year-old children in Krackow and Lynn's training condition were given modeling and practice in correcting the interviewer. These children first watched a video of a boy playing with a remote control dog and then watched another video of a child ("Johnny") answering misleading and non-misleading questions about that event. Sometimes Johnny failed to correct the interviewer's mistakes, and trained children were told that "Johnny did not really break the dog, so he should have told the grown up no. It is okay for children to say no when a grown up asks about something that did not happen" (p. 875). Children then practiced correcting the interviewer's questions about an unrelated video. The children in a control condition engaged in non-training activities for an equal amount of time. The chief finding was that training reduced suggestibility to misleading questions among the 4- to 5-year-old children, raising their accuracy to the level of the 7- to 8-year-old children (which was near ceiling and not affected by training). With similar intensive training procedures

(i.e., discussion, modeling, and feedback), Saywitz and Moan-Hardie (1994) also found benefits from their training package.

Some questions may be repeated. Children sometimes change answers when interviewers repeat questions (see Fivush & Schwarzmueller, 1995, for a review), although this effect is largely limited to closed/specific rather than open questions (see Poole & White, 1991, 1995) and is less common in the field than in the lab (La Rooy & Lamb, 2011). But despite the fact that repeated questions occur in investigative interviews (La Rooy & Lamb, 2011; Lamb & Fauchier, 2001), only a few interview guidelines have included instructions designed to reduce unwanted response changes. We identified only two studies that specifically gave children instructions about repeated questions, with neither reporting pronounced benefits (Geddie et al., 2001; Memon & Vartoukian, 1996).

In Memon and Vartoukian's (1996) study, 5- to 8-year olds witnessed a brief staged event and were interviewed about it 5 minutes later. Children were told that they should not make up answers when they could not remember, and half were also warned that some questions may be repeated. The warning did not affect the 5-year-olds, somewhat impeded the accuracy of the 7-year-olds in response to open questions, and had no other effects. The main finding of interest, however, was that correct information increased across repeated open questions but decreased across repeated closed questions. Geddie and colleagues (2001) told 3- to 6-year-olds that a repeated question did not mean the first answer was incorrect, and the children then practiced responding to repeated questions. Children were given several rules, and after all rules had been delivered and practiced the children restated the rules. Any omitted rules were provided again, and the interview did not begin until children could spontaneously and correctly answer questions that tested each rule. Despite these efforts, the researchers noted that children

struggled with this task, which echoes Memon and Vartoukian's suggestion that the younger children in their sample may not have understood the instruction. Geddie and colleagues found no effects of the warning on children's reports.

Evidence suggests that repeated questions are not problematic for children if they understand that the purpose of repetition is something other than a challenge to their previous response (La Rooy & Lamb, 2011; but see Howie, Nash, Kurukulasuriya & Bowman, 2012). Howie, Sheehan, Mojarrad and Wrzesinska (2004) did not give 4- to 5- and 7- to 8-year-olds a warning about repeated questions but instead provided a rationale to half of the children (i.e., the experimenter's hand was sore and so she could not take notes). Providing a rationale did not affect the overall frequency of shifting responses but did reduce undesirable shifts (i.e., from correct to incorrect) among younger children and increased desirable shifts (i.e., from incorrect to correct) in all children who heard the rationale.

The "don't understand" rule. There is surprisingly little research in the eyewitness memory area on instructing children to tell interviewers when they do not understand something (such as an entire question or a word in a question). This is an important omission given that many legal situations involve terminology that children have not yet acquired (Cooper, Wallin, Quas, & Lyon, 2010; Saywitz, Jaenicke, & Camparo, 1990) and questions that are semantically complex (Korkman, Santilla, Drzewiecki, & Sandnabba, 2008; Zajac, O'Neill, & Hayne, 2012). Children can say "don't know" to such questions, but this response may not accurately reflect their knowledge.

There are many examples of children failing to indicate explicitly when they have not understood. For example, Hughes and Grieve (1980) and Pratt (1990) documented that children (and in some cases adults) attempt to answer bizarre questions that are semantically

incomprehensible. Flavell, Speer, Green and August (1981) found that 8-year-olds implicitly demonstrated some degree of confusion (both verbally [e.g., "huh?"] and with facial and motor behaviors) when listening to ambiguous task-completion instructions, and 6-year-olds did so to a lesser extent, whereas Markman (1979) found that much older children often failed to identify comprehension monitoring errors. Children are even less likely to indicate comprehension failures in unfamiliar situations such as an investigative interview or courtroom (Saywitz, 1995). The cross-examination literature is rife with evidence of children responding to questions they did not comprehend (see Zajac et al., 2012, for a review). Thus, it is clear that this ground rule is important but, as we have noted, the concept underlying it may be challenging from a cognitive-developmental perspective. Furthermore, it may be particularly difficult for children to monitor their uncertainty during tasks involving abstract concepts like memories as opposed to tasks involving concrete stimuli (e.g., perceptual identification tasks, such as guessing the identity of a degraded picture; Ghetti, Hembacher, & Coughlin, 2013).

We identified just two studies in which children were explicitly instructed to tell the interviewer when a misunderstanding had occurred. Peters and Nunez (1999) and Saywitz et al. (1999) trained some of their participating children in "comprehension monitoring" (CM). In both studies, the children were made aware of negative consequences associated with answering questions they did not understand; taught to recognize when an interviewers' question contained difficult vocabulary, structure, or was otherwise incomprehensible (e.g., due to mumbling); given practice saying they did not understand; and instructed to ask for clarification or rephrasing. In addition, they were given feedback and discouraged from guessing.

In Peters and Nunez's (1999) research, CM strategies were taught to preschoolers, kindergartners, and second-graders over a period of three training sessions and then, on testing

day, they watched a video and were interviewed about it immediately afterwards. In contrast, Saywitz and colleagues engaged 6- and 8-year-olds in a live event and 2 weeks later those in the CM condition were trained; testing took place two days later following a 15-min booster session. Despite differences in age groups, event presentation (video/live), and delay from event to test, both studies revealed that children of all age groups who received CM training were more likely to ask that difficult questions be rephrased, and CM-trained children provided more accurate information than did the children in other types of training and control conditions. In the Peters and Nunez study, 91% of children in the CM group requested at least one complex question be rephrased in contrast to only 52% of children who did not receive CM training. Saywitz and colleagues demonstrated that children who had participated in CM training were significantly more accurate and less inaccurate than children who received "rephrasing instructions" (i.e., told to notify the interviewer when they did not understand without practice feedback or reinforcement), who were more accurate and less inaccurate than those in the control condition. (Due to the coding of "don't know" as a separate response category, accuracy and inaccuracy were not inverse proportions.) Finally, children in the CM group were most likely to ask that confusing questions be reworded.

The "I don't know" rule. By far, the "don't know" rule has been the subject of most ground rules research. It could be argued that this is the most important interview instruction because even when children are unable to identify *why* a question is tricky (e.g., the interviewer has used a word the child does not understand or the interviewer has made a mistake/delivered misinformation), saying "don't know" will reduce potential commission errors. Nevertheless, we argue, as have others (e.g., Scoboria & Fisico, 2013), that saying "I don't know" can have different purposes. For example, "I don't know because…:" "I can't remember," "I don't

understand (a word, or the question)," and "You made a mistake (and so I don't know how to respond)" reflect different cognitive states *and* serve different practical purposes in an investigative interview. Thus, for both theoretical and applied reasons, developmental differences in children's propensity and ability to provide these responses should be explored.

We identified 12 articles (15 experiments) in which only some of the children were given the "don't know" ground rule, permitting assessment of its effect. (There are numerous studies in which *all* participants were provided instructions to say "don't know" because the focus was on other aspects of "don't know" responding, such as the effect of question-type or instruction placement; e.g., Beuscher & Roebers, 2005; Memon & Vartoukian, 1996; Roebers & Schneider, 2005; Waterman & Blades, 2012; Waterman et al., 2000; 2004.)

A meta-analysis on these 15 experiments was not desirable for several reasons. First, once important variables were considered (i.e., age, delay, whether or not the event was live, and whether or not the rule was practiced), there were too few studies per cell to permit meaningful analysis. To our surprise, we also uncovered two more important reasons: To date, practice of the rule has been confounded with the delay between events and interviews, and with the live presentation of events. Of the 12 articles, five did not include practice of the "don't know" rule (Ellis et al., 2003; Endres et al., 1999; Moston, 1987; Nesbitt & Markham, 1999; Peterson & Grant, 2001) and five did (Cordón et al., 2005; Geddie et al., 2001; Gee et al., 1999; Mulder & Vrij, 1996; Saywitz & Moan-Hardie, 1994). (Two cannot be classified according to practice, Roebers, Moga, & Schneider, 2001, and Roebers & Fernandez, 2002. We elaborate on this latter point later in this article.) Of the five articles that did not include practice, three used a delay of less than 1 day (all but Ellis et al. and Peterson & Grant). Of the five that did include practice, most included delays of at least 1 week (all but Mulder & Vrij; Cordón et al. employed repeated

interviews from immediate to as long as 5 weeks). In addition, these latter studies all involved live events, whereas those without practice included live and non-live events in roughly equal proportion. We divide our review of the "don't know" ground rule first by whether or not practice was involved and then by the extent to which the rule yielded effects.

The experiments in which children were instructed to say "don't know" without practice have yielded mixed results, although inspection of the procedures sheds light on why these discrepancies exist. In two experiments, the rule was simply stated and participants were very young (maximum age 5 years old); these yielded no effect of the "don't know" ground rule (Ellis et al., 2003, Peterson & Grant, 2001). Moston (1987) found partial benefits after a simple statement: The instruction increased "don't know" responses among 6-, 8-, and 10-year-olds but did not improve accuracy.

Three experiments found strong benefits of the "don't know" rule without practice (Endres et al., 1999 [Study 1 and 2], Nesbitt & Markham, 1999). In these experiments, however, children were given very explicit and/or thorough explanations. In Nesbitt and Markham (1999), 3- to 5-year-old children in the instruction group watched a fox-puppet model in situations in which he should say "I don't know." This instruction phase lasted 20 minutes. All children then watched a videotaped event and heard a story containing misinformation. They were tested after a brief delay, during which the instruction group was reminded to say "don't know." Instruction significantly increased the number of "don't know" responses and the overall proportion correct. The training provided by Endres et al. (1999) for two studies was much briefer, but children in the experimental condition received an example that was not only explicit but also directly connected to the target task (e.g., Study 1: "If I asked you how old the grandmother was in the story, you should say 'I don't know' because the story did not really say anything about her age."

p. 134). Thus, in these three experiments, children did not practice saying "don't know" but received very clear instructions about how and why they should do so.

We now turn to research in which children practiced saying "I don't know" prior to an interview (Cordón et al., 2005, Geddie et al., 2001, Gee et al., 1999; Mulder & Vrij, 1996; Saywitz & Moan-Hardie, 1994). With the exception of Geddie et al. (2001), all found benefits of instruction. Although the children who participated in Geddie et al. were roughly the same age as those in Cordón and colleagues' research, and Geddie et al.'s design did not involve the longest delay, as mentioned earlier the instructions and interviews were delivered by different assistants. Additionally, children's accuracy for the event was very high in Geddie et al. (e.g., even 69% of misleading questions were answered correctly).

The studies of Gee et al. (2001) and Saywitz and Moan-Hardie (1994) both involved two experiments because in the first, instructing children to say "don't know" increased such responses but also led to fewer correct responses (i.e., children were overusing the instruction). The researchers improved these instructions by also encouraging children to respond to questions they did understand or for which they were able to retrieve the information. Relatedly, Mulder and Vrij (1996) found more strategic use of "don't know" responding among children who had received both the "don't know" rule *and* the statement about interviewer naiveté than among children who received either rule alone.

Taken together, these findings suggest that it is important to have children practice the "don't know" ground rule but that practice responding to unanswerable questions in isolation may increase "don't know" responding in a non-strategic way. In practice, most interview guidelines advocate for inclusion (and practice) of several ground rules, and there is evidence to support this recommendation: The children in Cordón and colleagues' (2005) study who received

three ground rules (i.e., interviewer naiveté, tricky questions, and "don't know") performed better than those who received only two or one (along with placebo rules that held constant the number of rules delivered; e.g., "We take turns"). We propose that the narrative practice phase may be particularly helpful in combination with the "don't know" ground rule, and we encourage systematic testing of this hypothesis. Because the practice phase gives children experience being the expert and reporting about a recent event they should remember well, there may be opportunities for interviewers to ask unanswerable questions during this phase (e.g., "What happened at the soccer park after you left?").

We alluded earlier to a set of studies by Roebers and her colleagues (Roebers & Fernandez, 2002; Roebers et al., 2001) that could not be categorized with regard to the inclusion of practice. In these studies, 6- to 8-year olds (and adults) watched a target video and were interviewed 3 weeks later. There were three interview conditions: forced report ("don't know" responses forbidden), free report ("don't know" responses permitted), and free report plus incentives. Children in the latter condition received rewards for correct responses and penalties for incorrect responses; "don't know" responses yielded neither reward nor penalty (see also Koriat, Goldsmith, Schneider, & Nakash-Dura, 2001). Children could use tokens at the end of the study to get a prize, and bigger prizes were purportedly worth more tokens. Overall, both studies found that the incentives condition produced the highest quality responses, and the forced report the lowest quality, across age groups. The incentives condition also yielded the greatest proportion of "don't know" responses.

In both of the earlier studies conducted by Roebers and her colleagues (Roebers & Fernandez, 2002; Roebers et al., 2001), as well as in Roebers and Schneider (2005; Experiment 1), the free report plus incentives condition confounded incentives with immediate feedback.

That is, participants were given feedback on their performance, and thus reinforced for "don't know" responding, after every question. There were four conditions in Roebers and Schneider (Experiment 2): incentives plus feedback, feedback only (no incentives), incentives only (the experimenter recorded the responses and tallied the score at the end), and free report (neither incentives nor feedback). Again, the incentives plus feedback condition yielded the highest quality reports for all age groups. It should be noted that, unlike the previous two studies, *all* children in Roebers and Schneider's study received instructions to say "don't know." Taken together, these studies suggest that even young children are capable of effectively monitoring their memories but may require a combination of both motivation and continuous feedback.

Interim summary. Available evidence dispels any concern that interview instructions will be uniformly unhelpful to young children, as benefits have been found among children as young as 4 years (e.g., a collection of instructions that included interviewer naiveté in Krackow & Lynn, 2010, and warning instruction by Endres & colleagues, Study 1, 1999). Moreover, in some contexts instruction effects are greater among younger than older children (who sometimes perform well without instructions; e.g., naiveté instruction in Waterman & Blades, 2011). Nevertheless, the research reveals neither a clear lower nor upper bound on the ages at which individual ground rules improve performance.

As predicted by our discussion of the cognitive underpinnings of ground rule understanding, some ground rules appear to be conceptually difficult for children (or at least difficult to implement as intended), and for these rules practice or more thorough explanation is necessary to produce the desired effects ("correct me when I'm wrong" instructions in Krackow & Lynn, 2010, and Saywitz & Moan-Hardie, 1994; selective use of the "I don't know" rule). It is unclear whether "some questions may be repeated" results have been disappointing because

the concept is difficult or the instruction does not remedy the mechanism underlying response changes to repeated questions (see Howie, Kulasuriya, Nash, & Marsh, 2009). The paucity of information on most ground rules (including "tell me when you don't understand"), along with procedural variations that prevent confident conclusions about which sets of rules are most appropriate for children in various age groups, motivated the following study space analysis.

Study Space Analysis

The purpose of a study space analysis is to highlight combinations of variables that have received concentrated attention and those that have not, thereby "alerting investigators to territories that have been well worked over and to others where new contributions can be made" (Malpass et al., 2008, p. 794). We included only published research with child participants and studies that included a comparison group of participants who did not receive the rule. As most of the research concerning children's ground rules understanding has used the same or similar dependent variables (i.e., number or proportion accurate, inaccurate, and sometimes "don't know"), we focused our study-space analysis on independent variables, that is, what has been *studied* rather than what has been *found*. It has been suggested that this approach is particularly relevant for situations in which the research question may have an influence on policy development because it makes clear which attributes or combinations thereof have and have not been systematically studied (Malpass et al., 2008).

For our study space (see Table 2), we included the 21 experiments listed in Table 1 and the five ground rules we reviewed earlier: Naïve (a statement that the interviewer was not there and does not know what happened); Correct (a specific instruction to correct the interviewer when a mistake has been made); Repeated (a warning that some question may be repeated); Don't Understand (an instruction to tell the interviewer when the child has not understood something);

and Don't Know (an instruction to say "I don't know"). We also included important independent variables: age, delay, whether or not the target event was live, and whether or not the ground rule was practiced by the child. Because there are dramatic improvements in the development of cognitive skills across the preschool and elementary school ages, we broke age group down into five levels (3-4, 5-6, 7-8, 9-10, and 11-13). Delay was also split into five levels (less than 1 day; 1–7 days, 8–27 days; 28–35 days, and more than 35 days). There were no studies that included delays of more than 35 days (i.e., five weeks), but we included it to provide an upper limit for this variable and to highlight the lack of research assessing ground rules at forensically relevant delays. Because the bulk of studies we reviewed (n = 15) included the "don't know" rule, we conducted a more detailed study space analysis for this rule only (see Table 3).

Unlike other examples of study space analyses (e.g., Memon, Meissner, & Fraser, 2010), we were not able to split all variables of interest into mutually-exclusive categories because individual studies comprise multiple ground rules and age categories, and some include more than one delay (i.e., multiple interviews). Thus, the total percentages in Tables 2 and 3 do not sum to 100%. Consequently, it is neither possible nor meaningful to compare percentages to an expected count per cell. Nonetheless, we bolded combinations representing less than 15% of the study space in Table 2 and less than 25% of the study space in Table 3. These values were chosen arbitrarily but with the intent to highlight understudied combinations. In Tables 2 and 3, the Roebers studies (Roebers et al., 2001; Roebers & Fernandez, 2002) were not categorized according to whether or not they included practice, so percentages for the Practice cells were calculated out of 19 and 13, respectively.

Caveats and Limitations

Despite our efforts to include all published studies concerning the use of five common ground rules, this review is not exhaustive: Some ground rules were not included (e.g., "it's ok to use any words you want"), we could have missed studies (though hopefully our careful search and reviewers' knowledge minimized this problem), and we did not include unpublished work and work that did not appear in peer-reviewed journals. As such, the review may be biased toward research that found effects of ground rules (although certainly some studies with null effects were published, e.g., Ellis et al, 2003; Peterson & Grant, 2001). Nevertheless, the study space, discussed in the subsequent section, identifies important gaps in this literature that can provide starting points for future work in this area.

Call for Research

Based on the current review and the study space analysis, it is evident that despite their inclusion in investigative interview protocols, ground rules other than the "don't know" instruction have received little attention. Some omissions are less surprising than others. For example, given that older children are unlikely to require information that the interviewer is naïve (e.g., Waterman & Blades, 2011), it is perhaps less urgent to conduct research on this rule with 11- to 13-year-old children (see Table 2). Still, such studies would be informative for establishing boundary conditions, which would allow front-line interviewers to bypass preparatory techniques for some of their cases. No published research has attempted to explain to 3- and 4-year-olds that they should express when they have not understood something, and a clearer understanding of the cognitive skills necessary for grasping this rule may point to ways in which preschoolers can be aided in expressing comprehension failures. Older children (9- to 13-year-olds) should be especially likely to benefit from this rule, but no research has been

conducted on the "don't understand" rule with this age group either. The overall study space analysis primarily points to the conclusion that more work is needed with respect to ground rules beyond just the "don't know" instruction.

The follow-up analysis (Table 3) concerning this relatively well-studied rule shows that more research is needed at longer delays. Also, while there are roughly equal numbers of older children who were or were not given practice in using the "don't know" rule, most studies involving 3- to 6-year-olds have not included practice. A pending report by Dickinson, Brubacher, and Poole (2014) suggests that the youngest children benefit most from additional attempts to ensure that this rule has been understood (i.e., by giving them a chance to practice saying "don't know" along with performance-related feedback).

The study space was conducted not only to identify gaps in the combinations of variables that have been studied but also as a springboard for facilitating increased links between developmental researchers (who provide the foundation for predicting developmental differences in ground rules understanding) and those working in the field of psychology-law (who frame their questions in terms of standards for best-practice interviewing and the needs of front-line practitioners). The study space, therefore, is meant as a launching point for researchers who want to explore relationships among children's ability to benefit from certain rules and developments in metacognition.

As we have suggested, developmental theory points to strong links between the capacity to make sense of and employ ground rules, and aspects of ToM and metacognition. Importantly, certain skills should be related to some ground rules but not others. For example, we proposed that children who can pass knowledge access tasks should be more likely to understand and benefit from information about interviewer naiveté than same-aged peers who do not pass. It

may be the case, however, that additional executive skills, such as rule maintenance, must also be in place. We also implied that procedural metacognition should be more strongly associated with strategic responding to option-posing than *wh-* "don't know" questions and hope this assumption will be tested. Research that measures theory-of-mind and cognitive control/executive function along with direct assessments of children's understanding of ground rules, ability to profit from the rules, and memory for the rules at the conclusion of the interview would be equally informative.

Developmentally-oriented research questions that link cognitive abilities to both comprehension and the ability to use each ground rule could inform how interview instructions (and practice) should be delivered and to what ages. Some of the research we reviewed included lengthy training packages that would be impractical in forensic interviews (although may be excellent courtroom preparation for a child who is expected to be cross-examined), and others would be impossible in the real world (e.g., giving tokens for correct responses). We suggest, however, that with advanced knowledge of the foundational cognitive skills for ground-rules understanding it may be possible to make practice developmentally appropriate without the need for extensive or impractical procedures.

One avenue for research into revising ground rules practice relates to the format of the questions (e.g., "Is my dog's name Fido?" versus "What's my dog's name?"). That is, does practice responding to yes-no practice questions confer benefits on both yes-no and wh-questions during the target interview or only on the former (and vice versa for wh- questions)? Given the difference in depth of processing needed to answer recognition versus recall questions, it could be predicted that ground rules presented in the wh- format would result in a more effective practice of the rule than when presented in a forced-choice manner, especially for

younger children. Similarly unclear is the optimal *placement* of ground rules; specifically, before or after the narrative practice phase. Lamb and colleagues (2013) have moved the ground rules discussion to follow the narrative practice phase so that interviewers have already established themselves as naïve before delivering the rules (although this is an empirical question that has yet to be answered). There could be opportunities within the practice phase, however, for children to encounter situations in which they could make use of ground rules. For example, an unanswerable question could be asked ("What happened after you left…?"), and occasions to correct the interviewer and to say "I don't understand" could also be created. Future research should also assess whether additional benefits are observed when rules are reinforced later on during the interview. Thus, there is ample fodder for analog research to investigate the optimal format, placement, and frequency, of ground rules instructions, and resolving these questions is of great relevance to the interviewing community.

Notably absent from our review were field studies that explored the use of ground rules because few exist. An exception is a recent study by Teoh and Lamb (2010), who assessed interviews conducted in Malaysia according to the NICHD protocol with 5-15 year old alleged victims of sexual abuse. Interviewers used significantly more instructive prompts (i.e., ground rules) with the 13- to 15-year-olds than with the 5- to 7-year-olds. Yet, the number of instructive prompts with the youngest age group was strongly positively correlated with the proportion of informative responses in the substantive phase, suggesting that this younger group stood to benefit most (similar to the findings of Dickinson et al., 2014). In the only other field study we are aware of, Earhart, La Rooy, Willemsen, Brubacher and Lamb (in press) assessed the use of the "don't know" ground rule in interviews with alleged sexual abuse victims (4 –14) conducted according to the *Memorandum of Good Practice*. Half of the interviews contained the "don't

know" ground rule instruction and half did not, but interviewers treated children similarly regardless of whether or not they had delivered the rule. That is, across all interviews and regardless of the presence or absence of the rule, 30% of children's don't know statements were rejected either explicitly (7%; e.g., "I think you do really know") or implicitly (e.g., by repeating the question). This field study merits experimental replication. Specifically, if interviewers deliver a ground rule (e.g., "tell me when you don't understand") and then *reject* children's attempts to use the rule, what happens to children's reports in terms of their willingness to use the rule on subsequent opportunities, their accuracy, and their motivation?

Conclusion

The use of ground rules to improve children's reports of experienced events is an area of study rich with possibilities for further exploration. Such research is urgently needed given that ground rules are already included in many forensic interview protocols despite inadequate information (for most rules) about where in an interview they should be delivered, the optimal format of instruction, the extent of training and practice necessary to achieve benefits, and how these factors vary as a function of children's ages and levels of cognitive ability. Such research has implications for broadening our understanding of cognitive development and for front-line forensic interviewers tasked with eliciting the highest quality information that is possible from alleged child witnesses and victims.

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Table 1

Experiments Testing the Efficacy of Ground Rules

Study	Age	Delay (days)	Live [a]	Practice [b]	Naïve	Correct	Repeat [c]	DU [d]	DK [e]
Beuscher & Roebers (2005)	6, 8, 10	7	N	N	X				
Cordón et al. (2005)	3-6	<1, 16, 34	Y	Y	X				X
Ellis et al. (2003)	4-5	8, 15, & 22	Y	N		X			X
Endres et al. (1999) Study 1	4-7	<1	N	N					X
Endres et al. (1999) Study 2	5-6	<1	N	N					X
Geddie et al. (2001)	3 – 6	8-12	Y	Y	X	X	X		X
Gee et al. (1999) Study 1	9-10, 11-13	5-8	Y	Y		X			X
Gee et al. (1999) Study 2	9-11	4-7	Y	Y		X			X
Krackow & Lynn (2010)	4-5, 7-8	12-21	Y	Y	X	X			
Memon & Vartoukian (1996)	5, 7	<1	Y	N			X		
Moston (1987)	6, 8, 10	<1	Y	N					X
Mulder & Vrij (1996)	4-5, 8-10	<1	Y	Y	X				X
Nesbitt & Markham (1999)	3-5	<1	N	N					X

Peters & Nunez (1999)	4, 5-6, 7-8	<1	N	Y				X	
Peterson & Grant (2001)	3-5	7	Y	N					X
Roebers et al. (2001)	6, 7, 8, adult	21	N	[f]					X
Roebers & Fernandez (2002)	6, 7, 8, adult	21	N	[f]					X
Saywitz & Moan-Hardie (1994)									
Study 1	7	14	Y	Y	X	X			X
Saywitz & Moan-Hardie (1994)									
Study 2	7	14	Y	Y	X	X			X
Saywitz et al., 1999	6, 8	16	Y	Y				X	
Waterman & Blades (2011)									
Study 1	5-6, 7-8	1	Y	N	X				

Note: X indicates the presence of the rule in the study instructions. [a] Live refers to whether or not the to-be-remembered event was experienced live. [b] Practice refers to whether or not children explicitly practiced the rule. [c] Repeat = a warning that some questions may be repeated. [d] DU = the "don't understand" rule. [e] DK = the "don't know" rule. [f] The Roebers studies include feedback (and thus reinforcement) after each response and thus were not categorized according to practice.

Table 2

Study Space Analysis Including All Ground Rules Across 21 Experiments

			Naïve	**Correct**	**Repeat** [a]	**DU**[b]	**DK**[c]
		Total	(8)	(7)	(2)	(2)	(15)
Age	3-4	(9)	4 (19%)	**3 (14%)**	**1 (5%)**	**1 (5%)**	7 (33%)
	5-6	(17)	6 (29%)	**3 (14%)**	**2 (10%)**	**2 (10%)**	11 (52%)
	7-8	(13)	6 (29%)	**3 (14%)**	**1 (5%)**	**2 (10%)**	7 (33%)
	9-10	(5)	**2 (10%)**	**2 (10%)**	**0 (0%)**	**0 (0%)**	4 (19%)
	11-13	(2)	**0 (0%)**	**2 (10%)**	**0 (0%)**	**0 (0%)**	**2 (10%)**
Delay (days)	<1	(8)	**2 (10%)**	**0 (0%)**	**1 (5%)**	**1 (5%)**	6 (29%)
	1-7	(5)	**2 (10%)**	**2 (10%)**	**0 (0%)**	**0 (0%)**	**3 (14%)**
	8-27	(9)	5 (24%)	6 (29%)	**1 (5%)**	**1 (5%)**	7 (33%)
	28-35	(1)	**1 (5%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**1 (5%)**

	> 35	(0)	**0**	**0**	**0**	**0**	**0**
			(0%)	**(0%)**	**(0%)**	**(0%)**	**(0%)**
Live [d]	Yes	(14)	7	7	**2**	**1**	10
			(33%)	(33%)	**(10%)**	**(5%)**	(48%)
	No	(7)	**1**	**0**	**0**	**1**	5
			(5%)	**(0%)**	**(0%)**	**(5%)**	(24%)
Practice	Yes	(10)	6	6	**1**	**2**	7
(19) [e]			(32%)	(32%)	**(5%)**	**(11%)**	(37%)
	No	(9)	2	**1**	**1**	**0**	6
			(11%)	**(5%)**	**(5%)**	**(0%)**	(32%)

Note: The percentages of experiments representing each cell in the panel appear in parentheses; values less than 15% are bolded. [a] Repeat = a warning that some questions may be repeated. [b] DU = the "don't understand" rule. [c] DK = the "don't know" rule. [d] Live refers to whether or not the to-be-remembered event was experienced live. [e] Practice refers to whether or not children explicitly practiced the rule. The denominator for this section of the table was 19 because the two Roebers studies include feedback (and thus reinforcement) after each response and thus were not categorized according to practice.

Table 3

Study Space Analysis of the "Don't Know" Ground Rule Across 15 Experiments

		Age					Delay (days)				Live	
		3-4	**5-6**	**7-8**	**9-10**	**11-13**	**<1**	**1-7**	**8-27**	**28-35**	**Yes**	**No**
Delay (days)	**<1**	4 (27%)	6 (40%)	**3 (20%)**	**2 (13%)**	**0 (0%)**						
	1-7	**1 (7%)**	**1 (7%)**	**0 (0%)**	**2 (13%)**	**2 (13%)**						
	8-27	**3 (20%)**	5 (33%)	4 (27%)	**0 (0%)**	**0 (0%)**						
	28-35	**1 (7%)**	**1 (7%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**						
	> 35	**0 (0%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**						
Live[a]	**Yes**	5 (33%)	6 (40%)	4 (27%)	4 (27%)	**2 (13%)**	**3 (20%)**	**3 (20%)**	5 (33%)	**1 (7%)**		
	No	**2 (13%)**	5 (33%)	**3 (20%)**	0 (0%)	**0 (0%)**	**3 (20%)**	**0 (0%)**	**2 (13%)**	**0 (0%)**		
Practice[b]	**Yes**	**3 (23%)**	**3 (23%)**	**3 (23%)**	**3 (23%)**	**2 (15%)**	**2 (15%)**	**2 (15%)**	5 (39%)	**1 (8%)**	7 (54%)	**0 (0%)**
	No	4 (31%)	6 (46%)	**2 (15%)**	**1 (8%)**	**0 (0%)**	4 (31%)	**1 (8%)**	**1 (8%)**	**0 (0%)**	3 (23%)	3 **(23%)**

Note: The percentages of experiments representing each cell in the panel appear in parentheses; values less than 25% are bolded.
[a] Live refers to whether or not the to-be-remembered event was experienced live. [b] Practice refers to whether or not children explicitly practiced the rule. The denominator for this section of the table was 13 because the two Roebers studies include feedback (and thus reinforcement) after each response and thus were not categorized according to practice.