

Sources of Unreliable Testimony From Children

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ABSTRACT

We distilled research findings on sources of unreliable testimony from children into four principles that capture how the field of forensic developmental psychology conceptualizes this topic. The studies selected to illustrate these principles address three

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major questions: (a) how do young children perform in eyewitness studies, (b) why are some children less accurate than others, and (c) what phenomena generate unreliable testimony? Throughout our research, our focus is on factors other than lying that produce inaccurate or seemingly inconsistent autobiographical reports.

Collectively, this research has shown that (a) children's eyewitness accuracy is highly dependent on context, (b) neurological immaturity makes children vulnerable to errors under some circumstances, and (c) some children are more swayed by external influences than others. Finally, the diversity of factors that can influence the reliability of children's testimony dictates that (d) analyzing children's testimony as if they were adults (i.e., with adult abilities, sensibilities, and motivations) will lead to frequent misunderstandings. It takes considerable knowledge of development—including information about developmental psycholinguistics, memory development, and the gradual emergence of cognitive control—to work with child witnesses and to analyze cases as there are many sources of unreliable testimony.

I. SOURCES OF UNRELIABLE TESTIMONY FROM CHILDREN

Interest in the reliability of children's testimony increased during the 1980s and early 1990s, when exposés of high-profile day care abuse cases chronicled allegations that were unlikely and, sometimes, clearly impossible.¹ Two opinions developed among professionals: that something must have happened in these cases and that allegations could arise in the absence of abuse. To explore these possibilities, researchers reproduced various case features in field and laboratory settings and observed what happened.² Collectively, they studied how numerous factors

1. See Douglas Linder, *The McMartin Preschool Abuse Trial: A Commentary*, FAMOUS TRIALS (2003), <http://law2.umkc.edu/faculty/projects/ftrials/mcmartin/mcmartinaccount.html>; see also Nadja Schreiber et al., *Suggestive Interviewing in the McMartin Preschool and Kelly Michaels Daycare Abuse Cases: A Case Study*, 1 SOC. INFLUENCE 16, 19 (2006) (analyzing interviews from the two cases).

2. See generally Maggie Bruck & Laura Melnyk, *Individual Differences in Children's Suggestibility: A Review and Synthesis*, 18 APPLIED COGNITIVE PSYCHOL. 947 (2004); Debra Ann Poole, Sonja P. Brubacher & Jason J. Dickinson, *Children as Witnesses*, in APA HANDBOOK OF FORENSIC PSYCHOLOGY (Brian L. Cutler & Patricia A. Zapf eds., 2d ed. forthcoming); Gabrielle Principe et al., *Children as Witnesses*, in THE SAGE HANDBOOK OF

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influence children's event reports, including the information encountered in daily life, the characteristics of target events and the interviews that follow, and the individual differences that lead to strikingly diverse testimonies even among children of the same age.³

Today, the biggest impediment to understanding children's testimony is a widespread tendency to reduce the complex findings from these studies into absolutes. For example, the belief that "children do not lie about sexual abuse"⁴ exists alongside the idea that eyewitness research "created a backlash that called into question the general reliability of all child testimony,"⁵ and conference attendees frequently refer to two "sides" or "camps" regarding children's testimonial abilities. This either-or way of thinking is confusing to eyewitness researchers, partly because most investigators are uninterested in lying (they study other mechanisms underlying false reports), but also because children's behavior is too variable to be accurately captured by such firm resolutions.⁶

Our goal is to provide a more productive starting point for case analyses and policy efforts by distilling research findings on sources of unreliable testimony into four principles that capture how the field of forensic developmental psychology conceptualizes this topic.⁷ The studies we selected to illustrate these principles

APPLIED MEMORY (D.S. Lindsay & T. Perfect eds., forthcoming Dec. 2013) [hereinafter Principe et al., 2013].

3. See, e.g., Bruck & Melnyk, *supra* note 2, at 986–87; Poole, Brubacher & Dickinson, *supra* note 2; Principe et al. 2013 *supra* note 2.

4. See, e.g., *Do Children Lie About Sexual Abuse?*, RAPE AND ABUSE CRISIS CENTER (July 2012), <https://www.raccfm.com/files/do%20children%20lie%20about%20sexual%20abuse.pdf>; Child Sexual Abuse, AM. HUMANE ASS'N, <http://www.americanhumane.org/children/stop-child-abuse/fact-sheets/child-sexual-abuse.html> (last visited Nov. 23, 2013).

5. Myrna S. Raeder, *Distrusting Young Children Who Allege Sexual Abuse: Why Stereotypes Don't Die and Ways to Facilitate Child Testimony*, 16 WIDENER L. REV. 239, 242 (2010).

6. Livia L. Gilstrap, Kristina Fritz, Amanda Torres & Annika Melinder, *Child Witnesses: Common Ground and Controversies in the Scientific Community*, 32 WM. MITCHELL L. REV. 59, 79 (2005).

7. See Maggie Bruck & Debra A. Poole, *Introduction to the Special Issue on Forensic Developmental Psychology*, 22 DEVELOPMENTAL REV. 331, 331 (2002) (introducing the term forensic developmental psychology to capture the growing body of developmental studies that are grounded in basic research yet designed to investigate psychological processes that have legal

address three major questions: (a) how do young children perform in eyewitness studies, (b) why are some children less accurate than others, and (c) what phenomena generate unreliable testimony? Throughout, our focus is on factors other than lying that produce inaccurate or seemingly inconsistent autobiographical reports.

II. PATTERNS OF PERFORMANCE IN CHILDREN'S TESTIMONY

Results from three studies illustrate the tremendous variability that is typical of children's eyewitness performance across different situations.⁸ In the first, research assistants, called "Mr. Science," led three- to eight-year-olds through a set of fun science demonstrations, their parents later read them a book that described some things that had happened in the laboratory along with some fictitious events,⁹ and interviewers asked the children to describe the Mr. Science experience before delivering yes-no questions about the experienced and fictitious events (including questions about whether Mr. Science had put something yucky in their mouths or had pushed their tummies).¹⁰ Table 1 reports the percentage of questions about touching that elicited false reports from children who had not been touched by Mr. Science and had not heard anything about touching from the book (left column).¹¹ Notice that these children rarely said "yes" to yes-no questions about nonexperienced touching, which mirrors the low error rates obtained when interviewers ask about

implications).

8. Debra Ann Poole & D. Stephen Lindsay, *Children's Eyewitness Reports after Exposure to Misinformation from Parents*, 7 J. EXPERIMENTAL PSYCHOL.: APPLIED 27, 49 (2001) [hereinafter Poole & Lindsay 2001]; Gabrielle F. Principe et al., *Children's Natural Conversations Following Exposure to a Rumor: Linkages to Later False Reports*, 113 J. OF EXPERIMENTAL CHILD PSYCHOL. 383, 395 (2012) [hereinafter Principe et al. 2012]; Debra Ann Poole et al., *Deficient Cognitive Control Fuels Children's Exuberant False Allegations*, 118 J. EXPERIMENTAL CHILD PSYCHOL. 101,108 (2014) [hereinafter Poole et al. 2014].

9. Poole & Lindsay 2001, *supra* note 8, at 29. There were actually two demonstrations sets and numerous forms of the book so that each science demonstration appeared in each condition across children (experienced, experienced and mentioned in the book, only suggested by the book, or not experienced and not suggested). *Id.* at 30.

10. *Id.* at 30.

11. *Id.* at 36.

nonexperienced touching to the genitals and anus after pediatric examinations.¹²

Table 1
Percentage of Yes-No Questions About Non Experienced Touching That Elicited False "Yes" Responses in Poole & Lindsay (2001, Session 2)

Ages (years)	Condition	
	Story parents read did not describe touching	Story parents read described touching
3	0%	37%
4	16%	42%
5	0%	38%
6	0%	33%
7	0%	33%
8	0%	36%

But we cannot form an accurate picture of children's testimony from this data alone. The right column of Table 1 reports how children performed when their stories had mentioned nonexperienced touching: now they falsely reported touching roughly a third of the time, and many went on to provide narrative accounts of these events.¹³ Interestingly, some of the older children who made false reports actually knew they had not been touched but failed to clarify this when answering yes-no questions (even though the interviewer had instructed them to talk only about things that really happened).¹⁴ Together with results from other studies, we know that it takes special questions to clarify the source of information when children parrot comments they heard before an interview.¹⁵ Confusing something that was only mentioned by an adult with something that actually

12. See, e.g., Margaret S. Steward & David S. Steward, *Interviewing Young Children about Body Touching and Handling*, 61 MONOGRAPHS OF THE SOC'Y FOR RES. IN CHILD DEV. 1, 105 (1996).

13. Poole & Lindsay 2001, *supra* note 8, at 38.

14. *Id.* at 44.

15. *Id.* at 46. See also Principe et al. 2012, *supra* note 8, at 399; Debra Ann Poole & D. Stephen Lindsay, *Reducing Child Witnesses' False Reports of Misinformation from Parents*, 81 J. EXPERIMENTAL CHILD PSYCHOL. 117, 135–36 (2002) [hereinafter Poole & Lindsay 2002].

happened is a type of “source-monitoring” error, and young children are especially prone to these errors.¹⁶ Because source monitoring is also deficient in some adults with injuries to the frontal lobe of the brain, cognitive psychologists believe that neurological immaturity contributes to the fact that young children are often more influenced by misinformation compared to older children and adults.¹⁷

A second study illustrates that the detrimental effect of misinformation replicates across different procedures.¹⁸ Gabrielle Principe and her research team arranged for children (ages three to six years old) to watch a magic show that was carried out by an assistant called Magic Mumfry.¹⁹ At the end of the show, Mumfry tried, unsuccessfully, to pull a rabbit out of a hat and apologized for the failed trick.²⁰ Children in an Overheard condition then heard two adults conversing about a loose rabbit in the school (which was the target rumor), whereas children in the Classmate condition only mingled afterward with these children (while digital recorders documented their conversations).²¹ Finally, children in the Control condition did not hear the rumor or interact with children who had.²² All children were interviewed one week and four weeks after the magic show (with instructions to tell interviewers “only about things that you remember happening to you—things that you really did or remember seeing with your own eyes.”)²³

Table 2 reports findings from the four-week delay for five- and six-year-olds.²⁴ As in other studies, few children in the Control group, who had not been exposed to the rumor, reported the falsehood, and false reports that did occur were in response to

16. KIM P. ROBERTS & MARK BLADES, CHILDREN’S SOURCE MONITORING 321 (2000). Source monitoring refers to the ability to make decisions about where knowledge or a specific memory originated. See Marcia K. Johnson et al., *Source Monitoring*, 114 PSYCHOL. BULLETIN 3, 3 (1993).

17. Daniel L. Schacter et al., *True and False Memories in Children and Adults: A Cognitive Neuroscience Perspective*, 1 PSYCHOL., PUB. POL’Y, & L. 411, 421 (1995).

18. See Principe et al. 2012, *supra* note 8, at 399.

19. *Id.* at 386.

20. *Id.*

21. *Id.*

22. *Id.*

23. *Id.*

24. *Id.* at 389.

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specific questions about the rumor.²⁵ The picture was quite different, though, for children who had overheard the rumor or had interacted with informed peers: nearly all of these children reported the rumor, some volunteered elaborate narratives about the fictitious event (e.g., “He bit my foot and I went ‘Ouch, you stop that now, bunny,’ and he bit my foot. He bit my finger too. I tried to feed him halfway, and he bit.”), and a substantial percentage of the children’s narratives could be traced directly to conversations among peers.²⁶ Replicating results from the Mr. Science paradigm, fewer children reported actually seeing the activity when interviewers asked about the source of their knowledge, but still many did (10% in the Overheard condition and 35% in the Classmate condition).²⁷ Other studies using the rumor paradigm have confirmed that false information embedded in natural conversations with peers has a particularly detrimental influence on eyewitness accuracy.²⁸ This is summarized in Table 2 below.

25. *Id.* Because other studies also found low error rates during open-ended interviewing (e.g., “Tell me what happened.”), many authors have concluded that the information obtained from these prompts is largely accurate. However, most studies that are the basis for this conclusion did not expose children to misinformation before interviews. Though not found with Principe et al.’s (2012) procedures, it is common for misinformation presented before interviews to infiltrate children’s freely-recalled narratives, leading Ceci and his colleagues to include faith in the accuracy of these narratives as one of several myths about children’s eyewitness testimony. Stephen J. Ceci et al., *Unwarranted Assumptions about Children’s Testimonial Accuracy*, 3 ANN. REV. OF CLINICAL PSYCHOL. 311, 318 (2007).

26. Principe et al. 2012, *supra* note 8, at 390, 393.

27. *Id.* at 390.

28. Gabrielle F. Principe & Erica Schindewolf, *Natural Conversations as a Source of False Memories in Children: Implications for the Testimony of Young Witnesses*, 32 DEVELOPMENTAL REV. 205, 214 (2012).

Table 2
Percentage of 5- and 6-Year-Olds Who Reported a False Rumor 4 Weeks After the Event in Principe et al. (2012)

Condition	Interview Phase (question type)		
	Open-ended	Specific	Total
Overheard	71%	24%	95%
Classmate	95%	5%	100%
Control	0%	11%	11%

Note. Interviewers asked specific questions only to children who did not discuss the target rumor during open-ended questioning.

Following publication of early misinformation studies, many professionals concluded that children accurately recall personal experiences, but can be misled by strong misinformation procedures.²⁹ A related claim was that most cases did not involve misinformation as it has been delivered in these sorts of studies, so suggestibility researchers have exaggerated the risks of errors in actual cases.³⁰ Setting aside the issue of how often cases include suggestive influences, these conclusions are misleading for two reasons: many misinformation procedures are far from strong and, in fact, it does not take any explicit misinformation at all to elicit false reports from some children.³¹

To illustrate how a specific collection of factors can influence testimony, meet a boy we will call Mikey, who, at almost six years old, visited Mr. Science to participate in a paradigm called Germ Detective!³² Before some hands-on activities about germs (the target event), assistants created an atmosphere of concern about touching by telling Mikey that there was a new germ rule: Mr. Science was no longer allowed to touch children's skin because the research team did not want to spread the germs that cause colds and flu.³³ During the subsequent activities, Mr. Science "forgot"

29. Kathleen Coulborn Faller, *False Accusations of Child Maltreatment: A Contested Issue*, 29 CHILD ABUSE AND NEGLECT 1327, 1328 (2005).

30. *Id.*

31. See, e.g., Poole & Lindsay 2001, *supra* note 8, at 30 (using misleading information about touching which was only several seconds of narrative).

32. Jason J. Dickinson & Debra A. Poole, Mr. Science—Germ Detective!: A Novel Paradigm for Manipulating Disclosure Histories for Research on Children's Eyewitness Testimony, Presented at the Annual Meeting of the APLS Conference (Mar. 14, 2012).

33. See *id.*

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the germ rule two times. Mikey returned for an interview the following week, and later we invited him back for another session³⁴ to learn more about why he was prone to errors in the face of a technique that sometimes produces thoughtless responding.³⁵

During Mikey's session, a researcher pointed to places on a human body diagram to determine Mikey's names for certain body parts ("What's this?").³⁶ The researcher then asked if Mr. Science had touched him in any of the places on the diagram when he played Germ Detective!, marked the spot Mikey pointed to, and said, "Did Mr. Science touch you somewhere else?" until Mikey replied "no."³⁷ With this procedure, Mikey falsely accused Mr. Science of twenty-nine distinct touches before the interviewer terminated questioning.³⁸ He then accused the researcher of ten touches when she asked if she had touched him, and he added three more false reports when she asked about touching to specific parts on the diagram.³⁹ As in other studies, the children who made false reports often described realistic context when asked to explain what happened.⁴⁰ For example, one child told the researcher that she "touched me here so you could feel me am I burning up or not."⁴¹ Of course, the researcher had just met Mikey, after which they walked into a room and sat on opposite sides of the table.⁴² Mikey was one of the "exuberant false reporters" in this study—children who made more than three false accusations of touching against Mr. Science.⁴³ These children ranged in age from four to seven years old, with the majority being five years or older.⁴⁴

34. Poole et al. 2014, *supra* note 8, at 103.

35. Debra Ann Poole & Maggie Bruck, *Divining testimony? The Impact of Interviewing Props on Children's Reports of Touching*, 32 *DEVELOPMENTAL REV.* 165, 174 (2012); Debra Ann Poole & Jason J. Dickinson, *Evidence Supporting Restrictions on Uses of Body Diagrams in Forensic Interviews*, 35 *CHILD ABUSE & NEGLECT* 659, 660 (2011).

36. Poole et al. 2014, *supra* note 8, at 103.

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.*

44. *Id.*

The studies reviewed thus far illustrate the wide range of performance that is typical of eyewitness studies, from largely accurate (when children have not been exposed to misleading information or an atmosphere of concern about touching) to highly inaccurate. Furthermore, results cannot be captured by a simple conclusion that only the youngest children are suggestible. While it is true that false “yes” responses among children who were not exposed to misinformation were limited to younger children in the first study, this was not the case when children were exposed to misinformation: now older children reported nearly as many false reports as the younger children did (until the interviewer delivered instructions asking them to distinguish between experienced and suggested events, in which case the older children were more, though not completely, accurate).⁴⁵ It is also possible to construct situations in which younger children report more accurately than older children (which psychologists call reverse age trends or developmental reversals).⁴⁶ This tends to happen when older children have knowledge about certain types of events that conflicts with what happened or that leads them to think about related information (whereas younger children do not have such knowledge) so that highly associated but nonexperienced details infiltrate older children’s reports. These findings bring us to the first principle of children’s testimony:

Principle #1. Eyewitness errors result from the architecture of children’s brains interacting with specific contexts and tasks. Young children are often less reliable witnesses than older children and adults, but age trends are flat or even reversed in some circumstances.

Child witness experts always think in terms of Brain + Context. On the Brain side, we have children’s ages and information about abilities and conditions associated with performance during memory interviews. On the Context side, we have evidence of adult influence, the types of questions interviewers ask, and other environmental factors that influence accuracy. Cases with no evidence of adult influence are analyzed

45. Poole & Lindsay 2001, *supra* note 8, at 36.

46. C.J. Brainerd & V.F. Reyna, *Reliability of Children’s Testimony in The Era of Developmental Reversals*, 32 *DEVELOPMENTAL REV.*, 224, 237 (2012).

differently than cases with significant adult influence or cases with investigative techniques that are incompatible with children's brains.

III. INDIVIDUAL DIFFERENCES IN CHILDREN'S EYEWITNESS PERFORMANCE

Although all children in the Classmate condition in Table 2 came to report an event that never happened, it is more typical for some children to cave to suggestive influences while others do not. What are the characteristics of inaccurate children?

To investigate this question, we gave a battery of developmental tasks to Mikey and some other children who had participated in the Germ Detective! paradigm.⁴⁷ Highly inaccurate children were different from accurate children in the following ways.

- Inaccurate children were very hands-on: they continued to reach out and use objects even after they had just repeated a "no touching" rule delivered by the interviewer. (We used instructions from Bresnard⁴⁸ but substituted child-appropriate objects). Unlike more accurate children, these children could not use a rule to guide their behavior even for short periods of time.⁴⁹

- Inaccurate children found it hard to inhibit a prepotent response: they performed poorly when asked to tap once when the researcher tapped twice but twice when the researcher tapped once.⁵⁰ Yet, on an alternate response conflict task in which working memory demands were lessened because the stimuli (pictures) remained in view,⁵¹ accurate and inaccurate children

47. Poole et al. 2014, *supra* note 8, at 101.

48. See *generally* J. Bresnard, P. Allain, G. Aubin, V. Chauviré, F. Etcharry-Bouyx & D. Le Gall, *A Contribution to the Study of Environmental Dependency Phenomena: The Social Hypothesis*, 49 *NEUROPSYCHOLOGIA* 3279–3294 (2011); Poole et al. 2014, *supra* note 8, at 104.

49. Poole et al. et al 2014, *supra* note 8, at 105–07.

50. See *generally* Adele Diamond & Colleen Taylor, *Development of an Aspect of Executive Control: Development of the Abilities to Remember What I Said and to "Do As I Say, Not as I Do,"* 29 *DEVELOPMENTAL PSYCHOBIOLOGY* 315 (1996).

51. See *generally* Cherie L. Gerstadt, Yoon Joo Hong & Adele Diamond, *The Relationship Between Cognition and Action: Performance of Children 3 1/2–7 Years Old on a Stroop-Like Day-Night Test*, 53 *COGNITION* 129 (1994).

performed similarly.⁵²

● Inaccurate children could not report what someone else was thinking when that information differed from what they knew.⁵³ For example, they watched assistants enact a story with dolls in which a girl saw a ball go into a beach bag, after which her playmate moved it to a box without her knowledge.⁵⁴ When the doll returned and the assistant asked “Where will she look?”, many of the children who were inaccurate about the Germ Detective! event said, “The box” (i.e., where *they* knew it was).⁵⁵

These results demonstrate that children like Mikey have difficulty using thoughts to guide their behavior.⁵⁶ Broadly speaking, they do poorly on tests of executive function/cognitive control, which are the “processes associated with the control of thought and action.”⁵⁷ During development, cognitive control improves as individual brain regions mature and become organized into increasingly specialized circuits.⁵⁸ Children who have good cognitive control can attend to information in the environment that is relevant to the current situation and filter out what is not, attend to memories that are related to the topic of conversation and filter out memories from other experiences (reality filtering), store information in working memory and work with it (such as the questions interviewers ask), maintain contextual information that distinguishes relevant thoughts/actions from irrelevant thoughts/actions (task-set

52. See Poole et al. 2014, *supra* note 8, at 105.

53. See *id.* at 105–07.

54. See Alison Gopnik & Janet W. Astington, *Children's Understanding of Representational Change and its Relation to The Understanding of False Belief and The Appearance-Reality Distinction*, 59 CHILD DEV. 26, 27 (1988); Heinz Wimmer & Josef Perner, *Beliefs about Beliefs: Representation and Constraining Function of Wrong Beliefs in Young Children's Understanding of Deception*, 13 COGNITION 103, 108 (1983).

55. See Poole et al. 2014, *supra* note 8, at 104.

56. See generally Poole et al. 2014, *supra* note 8.

57. Silvia A. Bunge & Eveline A. Crone, *Neural correlates of the development of cognitive control*, in NEUROIMAGING IN DEVELOPMENTAL CLINICAL NEUROSCIENCE 22 (Judith M. Rumsey & Monique Ernst eds., 2009).

58. Beatriz Luna, Aarthi Padmanabhan & Kristen O'Hearn, *What has fMRI Told us About the Development of Cognitive Control through Adolescence?*, 72 BRAIN AND COGNITION 101, 112 (2010); Beatriz Luna & John A. Sweeney, *The Emergence of Collaborative Brain Function: fMRI Studies of The Development of Response Inhibition*, 1021 ANNALS OF THE N.Y. ACAD. OF SCI. 296, 300 (2004).

representation), switch goals as tasks switch (task-switching; e.g., when the topic changes, shift to talk about that topic), and inhibit inappropriate responses.⁵⁹

Although all children struggle with these things some of the time, a subset of children have more difficulty: compared to their peers, these children have poor cognitive control.⁶⁰ In our study, performance on three of the developmental tasks correctly categorized 90% of the children as either exuberant false reporters or typical children, and the common variance among tasks predicted the number of false reports.⁶¹ This leads to the next two principles of children's testimony:

Principle #2. The architecture of children's brains is different from the architecture of adults' brains, and these differences produce differences in executive processing/cognitive control that can influence eyewitness performance.

Principle #3. Even within a specific age, children vary widely in the extent to which they stay on topic, keep rules in mind, and gate out irrelevant thoughts and actions. Although many children are reluctant to disclose experienced touching, a subset of children readily disclose nonexperienced touching. Understanding the dynamics of the first situation does not help us understand the dynamics of the second situation.

Maggie Bruck recently said that people "should be able to keep two thoughts in mind at once."⁶² Keeping two thoughts in mind means realizing that children can be very accurate and very inaccurate, and you need to understand both sides of this issue to analyze children's testimony. But keeping two thoughts in mind is more than just knowing that a specific child can be accurate in

59. Bunge & Crone, *supra* note 57.

60. See generally Inge-Marie Eigsti et al., *Predicting Cognitive Control From Preschool to Late Adolescence and Young Adulthood*, 17 PSYCHOL. SCI. 478 (2006).

61. Poole et al. 2014, *supra* note 8.

62. Personal Communication with Maggie Bruck (Mar. 10, 2013). In *The Crack-Up*, F. Scott Fitzgerald voiced the same sentiment when he said that "the test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time, and still retain the ability to function." F. Scott Fitzgerald, *The Crack-Up*, ESQUIRE (1936).

one situation and inaccurate in another: it also means recognizing the important individual differences among children. Therefore, there is variability in the architecture of the brains that come to eyewitness tasks as well as variability in children's contexts (their experiences before and during eyewitness interviews). The numerous ways that children's developmental levels and experiences combine to produce unreliable testimony, which we turn to next, provide the background for our last principle of children's testimony.

IV. MECHANISMS UNDERLYING UNRELIABLE TESTIMONY

In a study we described earlier, Mr. Science started each session by setting a red tomato-shaped kitchen timer while explaining that this was how much time they had to play.⁶³ Remarkably, a dozen children later told interviewers about the "potato," including one child who said, "[t]here was a big clock like a potato."⁶⁴ Months after a short event, this 3.5-year-old demonstrated impressive memory for the object even though it was not big, it was not a clock, and it was not a potato.⁶⁵

The proliferation of potatoes has a simple explanation: children acquire bilabial sounds (such as /m/ and /p/) sooner than lingua-alveolar sounds (such as /t/) and avoid words they cannot pronounce.⁶⁶ This example illustrates that testimony—whether from an adult or from a child—is rarely entirely accurate or entirely inaccurate.⁶⁷ Instead, numerous factors are associated with the reliability of small details and the critical events embedded in those details, including memory errors that plague all humans and phenomena that are more common among young witnesses and those with cognitive impairments.⁶⁸

A. *Linguistic Confusions*

There is an ever-present threat of misunderstanding children

63. See Poole & Lindsay 2001, *supra* note 8, at 29.

64. See generally *id.*

65. See generally *id.*

66. See, e.g., PETER A. REICH, LANGUAGE DEVELOPMENT 54–57 (1986); Graham Williamson, *Speech Sound Development Chart*, SLT INFO (June 24, 2012), <http://www.sltinfo.com/speech-sound-development-chart.html>.

67. See generally Poole & Lindsay 2001, *supra* note 8.

68. See generally Poole, Brubacher & Dickinson, *supra* note 2

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due to linguistic phenomena involving individual speech sounds, words, sentences, and even rules that govern the social uses of language. Errors can appear in case documentation and even change children's testimony (through a process we will describe later in which children come to accept adults' interpretations of their testimony).⁶⁹

Disarticulations are errors in the production of speech sounds that make it difficult to understand children. In an interviewer training one of us attended, for example, an attendee heard a child say "He put some paint on my arm" when, actually, the child had said, "He put some ting on my arm" (i.e., "He put something on my arm"), illustrating a common mistake in which children delete one of two consonants that occur together (consonant cluster reduction).⁷⁰ Children also substitute sounds, as a child in one of our laboratories did when she repeatedly referred to being given "dope." The interviewer knew this child was likely referring to the hand sanitizer used to clean children's hands (referred to by many of the children as "soap"), but in actual investigative interviews pronunciation problems and mumbling can lead to serious errors that send investigations off in wrong directions. For example, we have heard interviewers ignore responses they could not understand and continue to pursue faulty hypotheses even after children had attempted to set conversations on track.⁷¹ Younger children are also more likely than older children to use ambiguous words, which can lead to confusion about the identity of a suspect or the number of suspects.⁷² For example, Battin, Ceci, and Lust showed younger (three to five years) and older (six to nine years) children a short video of two men and two women who were engaged in a task that ended in a misdeed by one of the women.⁷³ In response to free recall prompts to describe what happened, the majority of younger children used incorrect pronouns (e.g., "they")

69. See discussion *infra* notes 140–45 and accompanying text.

70. What Kids Can Tell Us: A Critical Assessment of Interview Strategies, Training Institute sponsored by Cornell University and The Just "For Kids!" Foundation, Inc. (June 4–6, 1996).

71. For a discussion of common pronunciation problems, see ERIKA HOFF, LANGUAGE DEVELOPMENT (5th ed. forthcoming 2013).

72. David B. Battin et al., *Do Children Really Mean What They Say? The Forensic Implications of Preschoolers' Linguistic Referencing*, 33 J. APPLIED DEVELOPMENTAL PSYCHOL. 167, 173 (2012).

73. *Id.* at 169.

or ambiguous articles (e.g., “a . . . ” or “the . . . ”) to describe the person who had performed the misdeed, whereas older children were more likely to describe events clearly.⁷⁴ By the end of the interview, older children were more likely than younger children to have clarified ambiguous descriptions.⁷⁵

It also takes time for children to learn the meaning of words that seem simple to adults.⁷⁶ For example, children may deny having had clothes on if they were wearing a bathing suit (because their definition of clothes does not include a bathing suit) or use the word “yesterday” to mean some other time in the past. The need to avoid late-acquired words is one of the biggest challenges of interviewing young children, along with the need to word questions in simple, direct ways that children understand.⁷⁷

Children appreciate the need to take turns and cooperate in conversations, but their desire to follow social conventions can also mislead adults. One well-known tendency is their penchant for answering questions even when they do not know the answers.⁷⁸ Another strategy they use to keep the conversational ball rolling is illustrated by this example from Karen Saywitz:

Attorney: When you were at your grandma’s house with your daddy, whose mamma is your grandma?

Jenny: Grandma Ann. (gives grandma’s name)

Attorney: Is she your daddy’s mamma?

Jenny: Huh? (doesn’t understand the question)

Attorney: Is she your daddy’s mamma? (leading question requiring only a nod)

74. *Id.* at 170.

75. *Id.* at 171.

76. ANNE GRAFFAM WALKER, HANDBOOK ON QUESTIONING CHILDREN: A LINGUISTIC PERSPECTIVE 27–37, 39–44 (2d ed. 1999).

77. *See id.*

78. *See, e.g.,* Amanda H. Waterman & Mark Blades, *The Effect of Delay and Individual Differences on Children’s Tendency to Guess*, 49 DEVELOPMENTAL PSYCHOL. 215, 215–16 (2013).

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Jenny: Daddy's mamma. (repeats the end of the sentence;
common response when communicating with children fails)

Attorney: Is grandma daddy's mother? (requires only a nod
to force the adult to stop this line of questioning)

Jenny: She has a boyfriend, two boyfriends. (irrelevant
response)⁷⁹

Here, Jenny is confused about kinship terms but is adept at turning conversation back to the attorney by repeating his last words (i.e., "Daddy's mamma" was not necessarily an answer) and, finally, by bringing up information only loosely related to the topic.⁸⁰ As Saywitz, Nathanson, and Snyder explained, "[c]hildren's apparent lack of credibility has as much to do with the competence of adults to relate to and communicate with children as it does with children's abilities to remember and relate their experiences accurately."⁸¹

These are just a few of the numerous language phenomena that cause confusions during investigations. Because language is still developing throughout the elementary school years and well into adolescence, psychologists recommend that professionals who work with child witnesses follow a set of developmentally-appropriate guidelines for speaking and consider language issues whenever children make remarks that seem inconsistent or thoughtless.⁸²

B. *Memory Phenomena*

Memory, which has been described as "open to editing anytime it's pulled up," is an ever-shifting approximation of reality that is prone to errors and inconsistencies.⁸³ In eyewitness

79. Karen J. Saywitz, *The Credibility of Child Witnesses*, FAM. ADVOC., Winter 1988, at 38, 38–39.

80. *See id.*

81. Karen J. Saywitz, Rebecca Nathanson & Lynn S. Snyder, *Credibility of Child Witnesses: The Role of Communicative Competence*, 13 TOPICS IN LANGUAGE DISORDERS 59, 59 (1993).

82. *See* DEBRA A. POOLE & MICHAEL E. LAMB, INVESTIGATIVE INTERVIEWS OF CHILDREN: A GUIDE FOR HELPING PROFESSIONALS 178–80 (1998); *see also* WALKER, *supra* note 76, at 77–84.

83. Greg Miller, *How Are Memories Retrieved?*, 338 SCI. 30, 31 (2012).

cases, the issue is whether these problems exceed what is typically found when people report past events under similar conditions. Decisions about whether testimonial content is typical of narratives that describe experienced events are based on extensive knowledge of how memory works and the nature of children's autobiographical reports,⁸⁴ including the following phenomena.⁸⁵

Schema and script-based errors. Schema (our internal representations of the world) and scripts (general representations of how things usually happen) give meaning to our experiences but can interfere with accurate recollection. In one study, for instance, children watched a slide show about a visit to McDonald's that omitted some central and noncentral details of a typical trip.⁸⁶ When interviewed about the show, they often inserted the expected details into responses to specific questions, and they did so more often for central details (e.g., paying for the food) and after a longer delay.⁸⁷ In our studies, these errors have shown up as a description of a laboratory room that actually matched another room in the child's life, reports that Mr. Science demonstrated a well-known science activity (e.g., a volcano) that was not part of the demonstration set, and erroneous claims that he shook hands at the beginning of the session or patted the child on the back. As memories fade, children increasingly fill in the blanks with information from general knowledge about how things usually are and how people usually act.⁸⁸

Detail errors. When researchers expose children to events without tampering with their memories, and then interview them

84. See generally Carole Peterson, *Children's Long-Term Memory for Autobiographical Events*, 22 *Developmental Rev.* 370 (2002); Carole Peterson, *Children's Memory Reports Over Time: Getting Both Better and Worse*, 109 *J. of Experimental Child Psychol.* 275 (2011); Carole Peterson, *Children's Autobiographical Memories Across the Years: Forensic Implications of Childhood Amnesia and Eyewitness Memory for Stressful Events*, 32 *Developmental Rev.* 287 (2012).

85. See Poole, Brubacher & Dickinson, *supra* note 2.

86. Alicia Erskine, Roslyn Markham & Pauline Howie, *Children's Script-Based Inferences: Implications for Eyewitness Testimony*, 16 *COGNITIVE DEV.* 871, 876 (2001).

87. *Id.* at 882.

88. See Marina Myles-Worsley, Cindy C. Cromer & David H. Dodd, *Children's Preschool Script Reconstruction: Reliance of General Knowledge as Memory Fades*, 22 *DEVELOPMENTAL PSYCHOL.* 22, 27-28 (1986).

days or month later, only a small percentage of the information reported in response to open-ended requests to tell what happened are detail errors, such as misreporting the color of an item or the order of several events.⁸⁹ Nonetheless, these types of errors do occur as children's minds automatically fill in memory gaps.⁹⁰ Although a few detail errors should not cause adults to question the gist of the story, numerous details that do not mesh with reality (after considering the ways children describe things) should be cause for concern.

Reminiscence. Children rarely report everything they know about an event in a single long narrative; instead, they add new information when asked additional questions or when interviewed on another occasion.⁹¹ Error rates for these new details, though typically not as high as for early-reported information, range from largely accurate to problematic. One year after an event, for example, the information a group of six-year-olds repeated from their earlier testimony was accurate 98% of the time, whereas new information was accurate only 76% of the time.⁹² Among children interviewed with toy props, which can prompt discussion about details that were not part of the target event, only 51% of the new information was accurate.⁹³

Misattributions. All age groups are prone to memory misattributions: we remember an event but place it in the wrong time or location, have a sense of familiarity about a face at the grocery store but falsely recall how we know the person, and believe we have novel insights we actually read on the Internet. In *The Seven Sins of Memory*, Daniel Schacter described the "lethal recipe for misattribution": a strong sense of familiarity along with an absence of memories for the details that define specific episodes of our lives.⁹⁴

89. Poole & Lindsay 2001, *supra* note 8, at 32–33.

90. See Myles-Worsley, Cromer & Dodd, *supra* note 88.

91. David La Rooy, Carmit Katz, Lindsay C. Malloy & Michael E. Lamb, *Do We Need to Rethink Guidance on Repeated Interviews?*, 16 PSYCHOL. PUB. POL'Y & L. 373, 386 (2010).

92. Karen Salmon & Margaret-Ellen Pipe, *Props and Children's Event Reports: The Impact of a 1-Year Delay*, 65 J. EXPERIMENTAL CHILD PSYCHOL. 261, 281 (1997).

93. *Id.*

94. DANIEL L. SCHACTER, *THE SEVEN SINS OF MEMORY: HOW THE MIND FORGETS AND REMEMBERS* 97 (2001).

Accurate memories for individual episodes rely on mental processes that bind together the various features that define those memories and, later, strategically access them.⁹⁵ Because these processes are not fully developed during childhood, it is easy to nudge some children into falsely saying they experienced certain events by exposing them to general information about those events.⁹⁶ This can be accomplished by reading children stories that describe fictitious events,⁹⁷ arranging for them to overhear adults or other children talking about the events,⁹⁸ or asking misleading questions that convey the desired information.⁹⁹ Misinformation does not have to originate from an individual who is motivated to propagate it, however. Giving interviewers false ideas about the nature of the event is enough to increase errors (by increasing their use of suggestive techniques),¹⁰⁰ and rumors rapidly spread beyond the children who initially encountered them.¹⁰¹

Sometimes just asking children to provide information they do not have can lead them to confuse what really happened with self-generated information. This can occur when well-meaning interviewers encourage children to provide responses because they believe that a lack of response signals reluctance rather than

95. Vinaya Raj & Martha Ann Bell, *Cognitive Processes Supporting Episodic Memory Formation in Childhood: The Role of Source Memory, Binding, and Executive Functioning*, 30 DEVELOPMENTAL REV. 384, 385 (2010).

96. *Id.* at 397.

97. See Poole & Lindsay 2001, *supra* note 8, at 44; Poole & Lindsay 2002, *supra* note 15, at 129.

98. See Principe et al. 2012, *supra* note 8.

99. See, e.g., William S. Cassel, Claudia E. M. Roebbers & David F. Bjorklund, *Developmental Patterns of Eyewitness Responses to Repeated and Increasingly Suggestive Questions*, 61 J. EXPERIMENTAL CHILD PSYCHOL. 116, 130 (1996); Thomas Hünefeldt, Annalisa Lucidi, Augusta Furia & Clelia Rossi-Arnaud, *Age Differences in the Interrogative Suggestibility of Children's memory: Do Shift Scores Peak Around 5–6 Years of Age?*, 45 PERSONALITY AND INDIVIDUAL DIFFERENCES 521, 524–25 (2008).

100. See Gail S. Goodman, Anupama Sharma, Sherry F. Thomas & Mary Golden Considine, *Mother Knows Best: Effects of Relationship Status and Interviewer Bias on Children's Memory*, 60 J. EXPERIMENTAL CHILD PSYCHOL. 195, 225 (1995); Gabrielle F. Principe, Julio DiPuppo & Jessie Gammel, *Effects of Mothers' Conversation Style and Receipt of Misinformation on Children's Event Reports*, 28 COGNITIVE DEV. 260, 268–70 (2013).

101. Principe & Schindewolf, *supra* note 28, at 220.

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ignorance or forgetting. To investigate the consequences of this interviewing behavior, researchers pressed a group of six- and nine-year old children to provide information they did not know at a first interview.¹⁰² Demonstrating that consistent testimony is not always accurate, some of them repeated the inaccurate information at a second interview, and this effect was more pronounced for the older children.¹⁰³

Similarly, more explicit instructions to visualize or imagine events can etch erroneous information into memory, and this process can occur in daily life, during therapy sessions, or through inexpert interviewing. This technique was used in the McMartin Preschool case, as illustrated by the following excerpt:

Interviewer: Can you remember the naked pictures?

Child: (Shakes head “no”)

Interviewer: Can’t remember that part?

Child: (Shakes head “no”)

Interviewer: Why don’t you think about that for a while, okay? Your memory might come back to you.¹⁰⁴

Stephen Ceci and his colleagues mimicked this influence by repeatedly asking children (three to six years of age) to “make a picture . . . in your head” of true and false events they were told their parents had reported.¹⁰⁵ During the last session, a new interviewer said that the other interviewer had made mistakes and had “told many children that things happened to them that never happened” before asking about the target events.¹⁰⁶ Although the children were highly accurate when reporting true

102. Stacia Stolzenberg & Kathy Pezdek, *Interviewing Child Witnesses: The Effect of Forced Confabulation on Event Memory*, 114 *J. EXPERIMENTAL CHILD PSYCHOL.* 77, 80 (2013).

103. *Id.* at 85.

104. Schreiber et al., *supra* note 1, at 28.

105. Stephen J. Ceci, Elizabeth F. Loftus, Michelle D. Leichtman & Maggie Bruck, *The Possible Role of Source Misattributions in the Creation of False Beliefs Among Preschoolers*, 42 *INT’L J. CLINICAL & EXPERIMENTAL HYPNOSIS* 304, 309 (1994).

106. *Id.* at 310.

events, they acquiesced to more than a quarter of the fictitious events in the first interview session and to more than 40% in the last.¹⁰⁷

Confabulation. Adults with certain types of brain damage invent answers to questions and tell fantastic but false stories about their lives.¹⁰⁸ Because the information in these confabulations is often based on fragments of true memories that are pieced together and displaced in time and place, researchers believe that damage to certain regions of the brain interferes with the ability to suppress memories that become activated but are not relevant to the current situation.¹⁰⁹ The idea that a filter usually blocks task-irrelevant memories from intruding into conversations is consistent with the finding that confabulating patients produce fewer memory errors when they divide their attention between two tasks, presumably because the second task reduces the cognitive resources that would otherwise engage irrelevant memories.¹¹⁰

Neurological immaturity is likely responsible for the fact that some young children also produce fantastic narratives during interviews.¹¹¹ During the years when potty talk is funny,¹¹² this behavior can appear as silly scatological talk or as bizarre stories with other themes.¹¹³ In one of our laboratories, for example, a boy described how an owl flew into the room, and knocked over a machine that blew the boy into the wall. Adults who do not realize that children are “mental surfing,”¹¹⁴ may ask inappropriate follow-up questions that children sometimes acquiesce to, starting a process that expands and entrenches the story.

False recognition and acquiescence. People commit false

107. See *id.* at 315–17 (describing results of false reports under milder instructions).

108. See Armin Schnider, *Spontaneous Confabulation and the Adaptation of Thought to Ongoing Reality*, 44 *NATURE REVIEWS NEUROSCIENCE*, 662, 663 (2003).

109. See *id.* at 667–68 (describing reality monitoring).

110. Elisa Ciaramelli et al., *Divided attention during retrieval suppresses false recognition in confabulation*, 45 *CORTEX*, 141, 141 (2009).

111. See Schacter et al., *supra* note 17.

112. LOUIS B. AMES & FRANCES L. ILG, *YOUR SIX YEAR OLD: LOVING AND DEFIANT* 71–72 (1979).

113. See *generally* STEPHEN J. CECI & MAGGIE BRUCK, *JEOPARDY IN THE COURTROOM: A SCIENTIFIC ANALYSIS OF CHILDREN'S TESTIMONY* (1995).

114. We picked up this wonderful descriptor from Stephen Ceci.

recognitions when they believe that novel stimuli were previously encountered. Confabulating adults have higher rates of false recognition, and both errors involve misattributing events to previous experience, but false recognition and confabulation are different phenomena because these types of errors do not always occur together.¹¹⁵ In eyewitness tasks, inaccurately saying “yes” to a specific question (e.g., “Did he touch you?”) is typically called a false recognition even though these responses can be memory based (when some aspect of the stimulus triggers an unrelated memory) or the product of acquiescence (i.e., going along with the interviewer without a belief that the event actually occurred).¹¹⁶

Compared to adults, children are not universally more likely to falsely say “yes,” but there are circumstances that elevate error rates.¹¹⁷ Line-up tasks are especially problematic, and even teenagers frequently select photos from target-absent lineups. In a meta-analysis comparing adult and adolescent performance, adults selected a photo only about a quarter of the time when the perpetrator was not present, whereas children who were twelve and thirteen years of age did so over half of the time.¹¹⁸

C. *Deficient Cognitive Control*

Because the brain circuitry underlying cognitive control is incomplete during childhood, young children often drift off topic during conversations and respond thoughtlessly due to deficiencies that persist into later ages among individuals with cognitive impairments.¹¹⁹

Drifting off topic. Young children have difficulty acting on rules and task sets, so they often share information that is unrelated to the topic of conversation.¹²⁰ Consider a study

115. See generally Ciaramelli, *supra* note 110.

116. See Henry Otgaar et al., *The Origin of Children's Implanted False Memories: Memory Traces or Compliance?* 139 ACTA PSYCHOLOGICA, 397, 397 (2012) (discussing of the role of memory vs. compliance in suggestibility).

117. See generally Schacter et al., *supra* note 17, at 411.

118. Joanna D. Pozzulo & R.C.L. Lindsay, *Identification Accuracy of Children Versus Adults: A Meta-Analysis*, 22 L. & HUM. BEHAV. 549, 557 (1998).

119. See, e.g., Denise Valenti-Hein, *Use of Visual Tools to Report Sexual Abuse for Adults with Mental Retardation*, 40 MENTAL RETARDATION 297, 301 (2002).

120. Poole & Lindsay 2001, *supra* note 8, at 27.

described earlier in which interviewers elicited free narrative accounts of visits to Mr. Science by first asking children to tell everything that happened and then following with three additional prompts that mentioned the science room.¹²¹ For the fifth prompt, interviewers simply asked if there was something the children had not told that they could tell now.¹²² Despite the fact that interviewers and children had been talking only about the Mr. Science experience, many children did not assume that the final prompt referred to that topic, as in these examples:

four-year-old girl: Ghost, pumpkins, and a spider. Didn't crawl on me. . . watch, that's when you drop drop and roll. (Child moved to the floor and did a fire protection demonstration.)¹²³

eight-year-old male: We have two dogs and two cats in our family. We used to have a fish, but it died.¹²⁴

Notice that the first child did not make it clear she was talking about something other than the topic of conversation. In investigations, this behavior can lead interviewers to link new people and actions to their beliefs about target events, with subsequent questioning causing children to gradually weave this new information into their reports.

Reacting inappropriately to immediate stimuli. Partly due to working memory limitations, cognitively immature children tend to respond to the pull of external stimuli more than other children do.¹²⁵ Behaviors such as off-topic exploring of anatomical dolls, repeatedly and inaccurately pointing to body diagrams, and answering “yes” or “no” without thought are examples of how children sometimes respond inappropriately to what is in front of them or what is said. Among a subset of children, behaviors associated with greater dependence on environmental stimuli

121. *See id.* at 29–31.

122. *Id.* at 30.

123. *See id.* at 32.

124. *See id.* at 46.

125. *See generally* Joseph S. Raiker et al., *Objectively-Measured Impulsivity and Attention-Deficit/Hyperactivity Disorder (ADHD): Testing Competing Predictions from the Working Memory and Behavioral Inhibition Models of ADHD*, 40 J. ABNORMAL CHILD PSYCHOL., 699, 699 (2012).

persist longer in development than is typical.¹²⁶

D. *Contributing Factors and the Subsequent Cascade*

Eyewitness researchers are interested in how a confluence of factors, each of which may not be strongly associated with false reports in isolation, can create a snowball of erroneous information that grows larger and larger as it races down the investigative hill. For instance, a mother may become concerned about abuse after a child makes an ambiguous comment. Wanting to get to the bottom of the matter, she then creates an atmosphere of concern by repeated questioning, sometimes distorting what the child said and resorting to leading questions. Most typically-developing older children would not create false memories of a significant event that presumably just occurred, but even older children and adults are vulnerable in the face of suggestions about long-ago events.¹²⁷ Because the emergence of credible false reports is often a process, experts who create case time-lines (summaries of all people, events, and allegations over time) look for evidence of the following contributing factors.¹²⁸

Honest misunderstandings. Many abuse investigations are triggered by suspicions of abuse rather than children's reports, and children's behavior provides numerous reasons why adults might develop unwarranted suspicions.¹²⁹ For example, a lack of vocabulary and knowledge leads them to report events in misleading ways (e.g., saying "Aiden saw his mom and dad have sex" when the pair was merely kissing), and their drawings often contain innocent yet phallic-looking shapes.

A situation in one of our laboratories illustrates this process. An upset mother called the scheduling manager after her child

126. See, e.g., Megan F. Nicpon, et al., *Utilization Behavior in Boys with ADHD: A Test of Barkley's Theory*, 26 *DEVELOPMENTAL NEUROPSYCHOLOGY* 735, 747 (2004).

127. See, e.g., Henry Otgaar et al., *Abducted by a UFO: Prevalence Information Affects Young Children's False Memories for an Implausible Event*, 23 *APPLIED COGNITIVE PSYCHOL.* 115, 115 (2009) (describing a study that elicited reports of alien abduction from 11- and 12-year-olds).

128. See generally MARGARET-ELLEN PIPE ET AL., *CHILD SEXUAL ABUSE: DISCLOSURE, DELAY, AND DENIAL* 77 (2007).

129. See generally STEPHEN J. CECI & MAGGIE BRUCK, *JEOPARDY IN THE COURTROOM: A SCIENTIFIC ANALYSIS OF CHILDREN'S TESTIMONY* (1995).

told her we had played “dirty doctor games.” She had not consented to such things, she explained, apparently not realizing that this is how a child might explain our germ-related activities. She arrived to watch the session recording with notes she had made of the conversation and, after much laughter about what had happened, gave permission for us to use this story in reports of our findings. Investigators often clarify misunderstandings by asking children to describe events more fully in their own words (“from the very beginning to the end”) but, unfortunately, the following influences can complicate efforts to discover the truth.

Negative stereotypes and an atmosphere of accusation.

Adults who believe that other individuals have certain characteristics sometimes make repeated remarks that lead children to falsely report behavior consistent with those characteristics. The classic study on this process is the Sam Stone study by Leichtman and Ceci.¹³⁰ For the target event, a stranger called Sam Stone briefly visited day care centers, during which nothing remarkable happened.¹³¹ Children assigned to the stereotype condition were visited by a research assistant beforehand who described Sam as a clumsy person.¹³² After Sam’s visit, children who had and had not been exposed to the negative stereotype were interviewed four times, either neutrally or suggestively, followed by a final neutral interview for all children.¹³³

Children who experienced neither the stereotype nor suggestive interviews were highly accurate: on the fifth interview, no child in this control group made a false allegation in response to open-ended requests to describe what happened,¹³⁴ few falsely acquiesced to more specific prompts about events that had not occurred,¹³⁵ and the children who falsely acquiesced often retracted false reports when challenged.¹³⁶ Exposure to the

130. See Michelle D. Leichtman & Stephen J. Ceci, *The Effects of Stereotypes and Suggestions on Preschoolers’ Reports*, 31 *DEVELOPMENTAL PSYCHOL.* 568, 570–76 (1995).

131. *Id.* at 570.

132. *Id.*

133. *Id.* at 570–71.

134. *Id.* at 571.

135. *Id.* at 571, 578 (“I heard something about a book [a teddy bear]. Do you know anything about that?”).

136. *Id.* (“You didn’t really see him do anything to the book [the teddy

negative stereotype elevated the number of false reports in response to specific prompts, and results were dramatically different among children exposed to both forms of influence: 46% of the three- and four-year-olds and 30% of the five- and six-year-olds spontaneously reported suggested misdeeds in their free narrative accounts of the visit.¹³⁷ Videotapes of the children captured creative confabulation as they embellished the suggestions to build a good story.¹³⁸ The Sam Stone study showed that results from study designs that do not include an atmosphere of concern or negative stereotypes cannot be generalized to cases in which this is a prominent feature.¹³⁹

Interviewer modifications. Expectations about what children will say and difficulties understanding them often lead interviewers to repeat back statements that do not match the original testimonies. For example, Kim Roberts and Michael Lamb found 140 instances in which interviewers misinterpreted or distorted children's remarks in only sixty-eight sexual abuse interviews.¹⁴⁰ Many distortions involved actions and the identity of people.¹⁴¹ Most important, children corrected or disagreed with these errors only one-third of the time.¹⁴² When interviewers were not corrected, they continued to refer to the erroneous information for the rest of the interview.¹⁴³

Jennifer Hunt and Eugene Borgida reproduced this process in the laboratory with interviewers who intentionally distorted five answers.¹⁴⁴ Their participants (three- to five-year-olds, nine- to eleven-year-olds, and adults) disagreed only 27% of the time, with younger children more often incorporating the distorted information into answers to questions delivered later in the

bear], did you?").

137. *Id.* at 572–73.

138. *Id.* at 573.

139. *Id.* at 576.

140. Kim P. Roberts & Michael E. Lamb, *Children's responses when interviewers distort details during investigative interviews*, 4 *LEGAL & CRIM. PSYCHOL.* 23, 25, 27–30 (1999).

141. *Id.* at 28–30.

142. *Id.* at 29.

143. *Id.*

144. Jennifer S. Hunt & Eugene Borgida, *Is That What I Said?: Witnesses' Responses to Interviewer Modifications*, 25 *L. & HUM. BEHAV.* 583, 586–90 (2001).

interview.¹⁴⁵ Of course, this process can occur during informal conversations before investigations as well as during investigative interviews.

V. INTERIM SUMMARY

Research has shown that children's eyewitness accuracy is highly dependent on context, that neurological immaturity makes children vulnerable to certain errors, and that some children are more affected by external influences than others due to individual differences. The long list of factors that can influence the reliability of children's testimony brings us to the final principle:

Principle #4. Analyzing children's testimony as if they were adults, with adult abilities, sensibilities, and motivations, leads to frequent misunderstandings. It takes considerable knowledge of development (developmental psycholinguistics, memory development, cognitive control, etc.) to work with child witnesses and to analyze cases because there are many sources of unreliable testimony.

VI. CONCLUDING REMARKS

In medicine, law, and child protection, the knowledge domains that support decision-making are "ill-structured" in the sense that "individual cases of knowledge application are typically multidimensional and there is considerable variability in the structure and content across cases of the same nominal type."¹⁴⁶ A pervasive problem in such fields is the reductive bias, which is a "tendency for people to treat and interpret complex circumstances and topics as simpler than they really are."¹⁴⁷ In the child witness field, limiting interpretation of evidence to one of two camps of thought about children's testimonial reliability is an example of reductive thinking that does little to improve our understanding of

145. *Id.* at 590–91.

146. Rand J. Spiro, Paul J. Feltovich & Richard L. Coulson, *Two Epistemic World-Views: Prefigurative Schemas and Learning in Complex Domains*, 10 *APPLIED COGNITIVE PSYCHOL.* S51 (1996).

147. *See id.* at S52; Paul J. Feltovich, Rand J. Spiro & Richard L. Coulson, *Issues of Expert Flexibility in Contexts Characterized by Complexity and Change*, in *EXPERTISE IN CONTEXT: HUMAN AND MACHINE* 125, 128 (Paul J. Feltovich, Kenneth M. Ford, & Robert R. Hoffman, eds., 1997).

children's testimonial abilities.

Individuals with a reductive worldview hold beliefs about knowledge and learning (i.e., epistemic beliefs) that lead them to view situations as having just one or a few possibilities. They also view situations as being fixed in time and comprised of features, acting separately, that are understood in terms of universally applicable principles.¹⁴⁸ Applied to child witness cases, the reductive view asks whether testimony is true or false, rather than asking which aspects of testimony are true and false; focuses on static time-points in a case, rather than analyzing how testimony developed over time; analyzes important case features individually, rather than recognizing interactions among case features; and applies information about factors that influence testimony similarly across cases, rather than appreciating the context specificity of that information. Counterintuitively, time on the job does not always remedy the tendency to simplify because some jobs provide inadequate feedback about the accuracy of one's decisions¹⁴⁹ and, in some circumstances, decision-making through the lens of the reductive bias solidifies this pattern of thought.¹⁵⁰

The four principles of children's testimony in this review can counteract reductive thinking by reminding us that testimonial accuracy is dependent on context at all ages, that neurological immaturity creates vulnerabilities that impact testimony differently for children of different ages and developmental trajectories, and that many developmental phenomena influence testimonial quality. These complexities dictate the need for evidence-based protocols for interviewing children,¹⁵¹ thorough investigative approaches, and case analyses based on time-lines that track children's reports across time and contexts.¹⁵²

148. Feltovich et al., *supra* note 147, at 134.

149. *See generally* DANIEL KAHNEMAN, THINKING, FAST AND SLOW (Farrar, Straus and Giroux 2013).

150. *See* Feltovich et al., *supra* note 147, at 136.

151. *See generally* MICHAEL E. LAMB, IRIT HERSHKOWITZ, YAEL ORBACH, PHILIP W. ESPLIN, TELL ME WHAT HAPPENED: STRUCTURED INVESTIGATIVE INTERVIEWS OF CHILD VICTIMS AND WITNESSES (2008); *see also, e.g.*, STATE OF MICHIGAN GOVERNOR'S TASK FORCE ON CHILD ABUSE AND NEGLECT & DEP'T OF HUMAN SERVICES, FORENSIC INTERVIEWING PROTOCOL 1–21 (3d ed. 2011).

152. *See generally* Maggie Bruck & Steven J. Ceci, *Forensic Developmental Psychology in the Courtroom*, in COPING WITH PSYCHIATRIC AND PSYCHOLOGICAL TESTIMONY 723–36 (David Faust ed., Press 6th ed. 2012).