

APA Handbooks in Psychology

APA Handbook of
**Forensic
Psychology**

VOLUME 2

Criminal Investigation, Adjudication,
and Sentencing Outcomes

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Published by
American Psychological Association
750 First Street, NE
Washington, DC 20002-4242
www.apa.org

To order
APA Order Department
P.O. Box 92984
Washington, DC 20090-2984
Tel: (800) 374-2721; Direct: (202) 336-5510
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In the U.K., Europe, Africa, and the Middle East, copies may be ordered from
American Psychological Association
3 Henrietta Street
Covent Garden, London
WC2E 8LU England

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Typeset in Berkeley by Cenveo Publisher Services, Columbia, MD

Printer: Maple Press, York, PA
Cover Designer: Naylor Design, Washington, DC

Library of Congress Cataloging-in-Publication Data

APA handbook of forensic psychology / Brian L. Cutler and Patricia A. Zapf,
Editors-in-Chief.

pages cm. — (APA handbooks in psychology)

Includes bibliographical references and index.

ISBN 978-1-4338-1793-9 — ISBN 1-4338-1793-4

1. Forensic psychology—Handbooks, manuals, etc. I. Cutler, Brian L.,
editor of compilation. II. Zapf, Patricia A., 1971— editor of compilation.

RA1148.A63 2014

614'.1—dc23

2014014393

British Library Cataloguing-in-Publication Data
A CIP record is available from the British Library.

Printed in the United States of America
First Edition

<http://dx.doi.org/10.1037/14462-000>

CHILDREN AS WITNESSES

Debra Ann Poole, Sonja P. Brubacher, and Jason J. Dickinson

This chapter reviews three knowledge sets that professionals rely on to navigate cases involving child witnesses. The first set includes psychological principles that explain why children's testimony can be amazingly rich and accurate in some instances and disturbingly inaccurate at other times. Children recall events from the time they start talking, but episodic memory (memory for details of personally experienced events) has a protracted developmental course. In early development, neurological immaturity contributes to poor source monitoring (the confusion of information from various sources), a propensity for false recognition (saying, "Yes, that is familiar" to novel stimuli), confabulations (wild tales that are interjected into event narratives), a tendency to drift off the topic of conversation, and impulsive responding. Broad knowledge of development is necessary for working with child witnesses because many facets of development influence testimony, and basic processes are affected by individual children's life experiences, temperaments, and developmental trajectories.

The second knowledge set consists of findings about autobiographical recall and suggestibility that describe how developmental principles translate into children's capabilities and limitations as witnesses. Even at young ages, children's reports of personally significant events are logically structured and include basic information about who was involved and what happened. Episodic memories are fragile when children are just learning to talk, however, and event reports contain some inaccuracies at all ages and delays. Accuracy declines when

interviewers ask specific and yes-no questions, and the passage of time both hurts testimony (because accuracy declines) and helps testimony (because children's accounts become more detailed as they mature). Children develop scripts when they experience multiple instances of similar events (i.e., general representations that describe what usually happens), but young children are less likely than older children to retrieve details that vary across repeated events and are more likely to make errors when matching these details to the correct occurrence.

Compared to adults, children are at a disadvantage when it comes to resisting suggestions. Influences that compromise testimonial accuracy include asking specific and misleading questions, pairing props with specific questions, using social incentives during conversations (e.g., verbally reinforcing desired responses), voicing negative stereotypes about an individual prior to interviews, and exposing children to narratives about events they did not experience (either through adults or by mere contact with peers who spontaneously talk about those events). Preschoolers and school-aged children sometimes come to believe fictitious events, and false information acquired before interviews often appears in responses to open-ended questions. Contrary to myth, it does not take heavy-handed techniques to distort children's testimony, and no features have been found that reliably distinguish narratives about suggested versus experienced events. Children's vulnerability to suggestion is also evident when they are asked to identify

a perpetrator in a lineup: Even into adolescence, children frequently make errors by selecting a photo from target-absent lineups.

The third knowledge set involves four principles of skilled practice: Expert practice is informed by knowledge of human development, embeds testimony in the context of children's lives, considers the strength of case evidence when making practice decisions, and is guided by standards and evidence-based protocols. Examples for each of these four principles of skilled practice explain how forensic thinking and practice differ from the habits adults acquire in their everyday lives. Experts need a comprehensive, detailed approach to cases involving child witnesses because autobiographical reports are dynamic products of a developing cognitive architecture interacting with a social world.

IMPORTANCE OF THE PROBLEM

It has been said that the legal system "has not known quite what to make of child witnesses" (McGough, 1994, p. 4). Depending on the time and place, young children have been excluded as witnesses, treated in the same manner as other witnesses, or viewed as "testimonial cripples" (McGough, 1994, p. 5) who could serve fact-finding efforts reliably only when special procedures addressed their emotional and developmental needs. The inability to construct a stable view of child witnesses stems partly from the range of decisions that hinge on their testimony and partly from the complex pattern of their capacities and limitations.

Because discussions about children and the law are discussions about their involvement in particular types of cases, deep knowledge of a specialty area is crucial for understanding young witnesses. Consider the following example, in which seasoned detectives relied on their experiences to protect a child and her community:¹

Jon took his 5-year-old daughter to a medical clinic after noticing stains on

her underwear. Although the doctor diagnosed an infection, Jon was uncomfortable and researched his ex-wife's boyfriend on the Internet. He quickly discovered that the man was a registered sex offender and contacted the local police department.

The girl was reluctant to talk when a detective first visited. Nonetheless, an investigative team went to the mother's home to interview the adults and to inquire about computers, which the boyfriend was prohibited from using as part of his probation conditions. After seizing a computer, a forensic examination revealed videos of abuse, which were then registered with the National Center for Missing and Exploited Children. During a subsequent interview, the girl described events consistent with the video-recorded evidence.

This investigative team knew a great deal about sexual offenders, realized that victims are not always forthcoming about abuse, and operated under the assumption that statements from child witnesses are only one part of an investigation (see Volume 1, Chapter 11, this handbook for a review of sexual offending). They carefully researched the child's caregivers, interviewed these caregivers separately, looked quickly and thoroughly for corroborating evidence, and were guided by a protocol that encourages children to express themselves in their own words. In a similar fashion, experts in other fields of criminal investigation—along with child protective services workers and professionals involved in family law and civil cases—close files each day that illustrate best-practice standards for cases involving child witnesses.

When case features overwhelm professionals' knowledge, however, the result can be what one judge called a "runaway train" (Brasier & Wisely, 2011, para. 5). Consider the cascade of events that impacted this Midwestern family:

¹We created this composite case by combining features from multiple cases; this example and the others that follow do not describe any single case that we know of and are not intended to reference a particular case.

Julian and Thal Wendrow wanted the best life possible for their mute, autistic daughter. When a retired education professor introduced them to facilitated communication, the couple thought the technique would open up a world of opportunities for their child. They pressured the school district to hire a full-time aide, and soon the girl who had tested at the cognitive level of a 2-year-old was mastering middle-school coursework with an adult supporting her hands over a keyboard.

School officials and the Wendrows had reached a truce—until one fall day, when the girl's hands typed that her father had been sexually abusing her. In the words of two journalists who followed the trial, "Within hours, police, prosecutors and social workers were on the move. Within two days, the children were wards of the state. Within a week, the Wendrows were in jail . . . The ordeal didn't end when it was clear that the girl wasn't communicating, after all. It didn't end when a sexual assault exam found no proof of abuse. And it didn't end when a prosecution witness insisted the abuse never happened" (Brasier & Wisely, 2011, "The allegations," para. 7–9, and "Introduction to the series," para. 8). By the time the prosecutor filed for dismissal, the case had slowly unraveled in the face of evidence that the girl's responses originated solely from the facilitator.

The majority of cases lie between the textbook cases, in which children were quickly understood, and those like the Wendrow's, where misunderstanding prevailed.² Most of the time, professionals

live with varying degrees of uncertainty as they work to make sense of children's behaviors and reports. Making sense often involves three types of information. First is education about basic psychological theory and principles, which we address by answering a series of questions about memory, development, and individual differences. Next is knowledge of how these principles translate into children's capabilities and limitations as witnesses. Finally, four practice recommendations provide guidance for navigating a world in which no two children and sets of circumstances are exactly alike.

RELEVANT PSYCHOLOGICAL THEORY AND PRINCIPLES

Principles of cognition and development give experts the vocabulary to explain why children's testimony can be amazingly rich and accurate in some instances and disturbingly inaccurate at other times. Memory research is the foundation for analyzing testimony because the research tell us how testimony is altered by the passage of time, the way memory is assessed, and other influences. However, event reports reflect more than just the ability to encode (lay down), store, and retrieve memories. Neurological immaturity in early childhood interjects some interesting phenomena into the process of talking about life, and developmental milestones in language and other facets of cognition also affect the accuracy and cohesiveness of children's reports. Finally, children are social creatures as well as individuals from birth, so their environments and unique characteristics produce large variability in performance, even among children of the same age. These foundational issues lay the groundwork for understanding the expanding literature on children as witnesses (see Chapter 7, this volume for a review of research on adult eyewitnesses).

²There are no figures on the number of children who serve as witnesses each year, but it is clear that children frequently provide testimony for a variety of reasons. In the United States alone, nearly 3 million children are involved in child protective services investigations each year (U.S. Department of Health and Human Services, 2011), and children are frequently present during intimate partner violence (e.g., more than one third of the cases in one sample; U.S. Department of Justice, 2012). Children are also interviewed for arson and other criminal investigations, for civil cases (e.g., wrongful death and product liability), and for child custody evaluations.

What Is the Architecture of Human Memory?

While you are reading this chapter, you are holding words and sentences in mind while you work with this information to understand what you are reading. The memory system that processes online information while you are reading, conducting a conversation, planning a future task, or solving a problem is called *working memory*.

The human brain records experiences for longer periods of time through two long-term memory systems that recruit different parts of the brain, lay down memories in different ways, and develop at different rates. *Implicit memory* involves learning that occurs without conscious awareness but is observed by changes in behavior. (*Implicit* means implied but not expressed directly.) This system includes procedural memories (memories for skills that usually develop with repeated practice, such as riding a bike or reading), priming (in which exposure to something shifts your later perceptions or judgments), associative learning (such as classical conditioning, in which certain stimuli, through associations with other stimuli, come to elicit certain responses), and nonassociative learning (such as when children gradually pay less attention to repeated stimuli). The circuitry that subserves implicit memory is functional at birth, so this primitive memory system allows even young infants to begin learning about their environments (Richmond & Nelson, 2007).

Adults who infer that abuse occurred because children show fear of particular individuals are claiming that this behavior reflects implicit learning. The problem with inferences like this is not that children are incapable of such learning but that direct experience is not the only possible source of the behavior. For example, young children engage in social referencing, in which they attend to others' emotional reactions to decide how they should react to a situation (Klinnert, Emde, Butterfield, & Campos, 1986), and they rapidly pick up information through conversations. As a result, a child's fear of a person or place could be instilled by an adult's behavior.

The second long-term memory system, and the focus of research on children's testimony, is explicit

(also called declarative) memory. *Explicit memory* includes episodic memory, which stores details of events experienced at particular times and places, and semantic memory, which is the repository for facts and general knowledge of the world. Autobiographical memory is often described as episodic memories that are especially personal (Newcombe, Lloyd, & Ratliff, 2007). For example, you could remember the items on a short to-do list without remembering your involvement in producing the list (i.e., an impersonal episodic memory), or you could remember writing the list (i.e., a personal episodic, or autobiographical, memory). Alternatively, autobiographical memory may involve semantic information along with the contextual information that specifies personalized episodes (see Burianova, McIntosh, & Grady, 2010, for evidence of a unified view of declarative memory).

Most accounts of autobiographical memory agree that event memories hinge on the brain's ability to link different aspects of an experience together through binding processes (see Raj & Bell, 2010). Remarkably, brain-imaging studies have found that the process of retrieving an event activates some of the neural circuitry that was activated when the event was originally experienced. Together with other findings, this suggests that the hippocampus, a critical brain area for recording new episodic memories and retrieving episodic memories of the past, acts as a directory that specifies which subsets of neocortical neurons compose a given memory. This process, however, is far from static. Instead, each act of memory retrieval is an opportunity for memories to become stronger, weaker, or to change in ways that better align the memory with newly learned information. As Miller (2012) summarized, "Our repository of memories may be less like a library and more like Wikipedia, where each entry is open to editing anytime it's pulled up" (p. 31). This highly constructive, malleable nature of event memories is what draws memory researchers to study eyewitness testimony, and it is the plastic nature of memory that raises interesting questions about the fate of memories laid down early in life, when learning is especially rapid.

Although there is no consensus on the exact age when explicit memory becomes functional, this

system is clearly in place by the end of the first 2 years (Jack, Simcock, & Hayne, 2012). Thus, children talk about personally experienced events from the time they can talk, and 2- and 3-year-olds sometimes describe events from as long as a year prior (Peterson, 2002). The brain areas that support explicit memory undergo rapid changes, however, so there are striking differences in children's abilities at 2 years, 4 years, 6 years, and beyond—and in the fate of memories that date from these ages. Cases in which older children or adolescents report events from early childhood raise one of the most basic questions about testimony: Is it possible for older individuals to remember events from their early years?

Skepticism about memories of early childhood stems from knowledge of infantile amnesia, a phenomenon in which few memories acquired before 3 1/2 years of age survive into adulthood. The term is often used broadly to describe the loss of early memories, but behavioral and neuroscience data support two related phenomena: the near total loss of memories for the first 2 years by the time adulthood arrives, and the fate of memories from the next 3 to 5 years, which are fewer and sketchier than would be predicted based on typical rates of forgetting over time (i.e., childhood amnesia, Newcombe et al., 2007).

Even though adults recall few early experiences, the fact that even young, verbal children can recall events suggests that some event memories are encoded but are then gradually lost over time. In one study, for example, the average age of the earliest memories reported by 5- to 13-year-olds was significantly less than 3.5 years, and some of the memories dating from a young age contained information about who, what, when, and where (Tustin & Hayne, 2010). Early memories tend to fade: However, when children discussed their earliest memories in one session and again 2 years later, the recollections of the younger children shifted several months later in the second session, and these children tended not to describe the same events across times (Peterson, Warren, & Short, 2011). Language development is one of the factors believed to play a role in developmental gains in event recall because it is rare for children to describe events using words

that were not in their productive vocabularies at the time of the event (Jack et al., 2012; for a discussion of children's errors dating past events, see Wang, Peterson, & Hou, 2010).

Despite enormous improvements on memory tasks across childhood, some basic principles that govern adults' event reports apply to children's as well.

Dual-process theories explain important memory phenomena. People can easily sort memories into information they remember (because they have a sense of consciously recollecting contextual details of past situations) and information they merely know had occurred (because the information sparks feelings of familiarity). Because behavioral and neurological evidence confirms this distinction between remembering and knowing, memory theorists describe two types of memory traces: verbatim traces, which are rich in the vivid perceptual details that promote feelings of recollection, and gist traces, which correspond to the overall meanings that produce feelings of familiarity (Brainerd & Reyna, 2012; Gruber, Tsivilis, Giabbiconi, & Müller, 2008). Recollection is supported by a widely distributed brain network that has a protracted developmental course, with substantial improvements occurring in middle childhood followed by continued development into adolescence (Ghetti & Bunge, 2012).

Dual-process conceptualizations of memory are helpful for understanding false memories. Because children and adults extract patterns and meaning from events (albeit to different degrees in different contexts), their narratives often contain inaccurate information that is associated with event specifics. For example, an 8-year-old boy who participated in one of our memory studies produced a long description of a drop ceiling in the room where he had experienced an event, complete with information about the percentage of tiles that were replaced with light fixtures. This description reflected his knowledge of typical school buildings but did not describe the university building he had visited (which did not have drop ceilings). Realistic details like these are often regenerated when children and adults reconstruct experiences from gist (through a process called *phantom recollection*). Because relational,

meaning-based information (i.e., gist traces) tends to survive longer than perceptually-based information (i.e., verbatim traces), spontaneous errors of this sort can survive longer than accurate memories do (Brainerd & Poole, 1997).

Developmental differences in memory accuracy usually favor older witnesses, but dual-process approaches explain the situations in which children are less prone to errors than adults (i.e., developmental reversals in false memories; Brainerd & Reyna, 2012). That is, because children draw upon fewer experiences than adults when reconstructing memories, they are sometimes less likely than adults to inaccurately report false but gist-consistent information. Memory theory, which summarizes principles derived from thousands of memory studies, helps professionals decide when discrepancies between testimony and other evidence are typical of memories for experienced events and when they are not.

Memory performance is influenced by the way memory is tested. Two popular ways of testing memory are recall and recognition. During recall tests, individuals generate information in response to general prompts (free recall, e.g., "Tell me everything that happened.") or when cues direct attention to specific information (cued recall, such as "What color was the car?"). For recognition tests, individuals see or hear information and are asked whether that information was experienced (e.g., "Did you see this man?"). Recall tests require individuals to initiate mental searches and to activate memory traces prior to deciding which memories are relevant and which are not. This process activates a broader network of neural circuitry than is activated by recognition tests, which eliminates the self-directed search process (Cabeza et al., 1997). Consequently, recall is generally considered the more difficult task.

The challenges of searching memory are compounded by immaturity. In childhood, the brain areas responsible for self-initiated activity and the circuitry that supports episodic memory are not fully mature. Also, young children hold less information in working memory than do older children and adults (which makes it harder to plan a cohesive narrative), have less experience constructing

event narratives, and have less developed language skills. As a result, young children's testimony usually results from a few open-ended prompts delivered by interviewers, supplemented with many directive ("When did that happen?") and option-posing questions ("Did he touch you over or under your clothes?"; Orbach, Hershkowitz, Lamb, Esplin, & Horowitz, 2000).

Preliminary instructions and the type of question can shift whether children will be more likely to access verbatim or gist memories. For example, "Tell me about the last time this happened" encourages children to retrieve a particular instance of a repeated event, whereas "Tell me what usually happens when . . ." asks only for typical features (which is called a script; Nelson, 1986). Children who have difficulty describing a specific instance may be more responsive to prompts that are worded to elicit scripts.

Despite the fact that adults often find recognition tests (e.g., multiple choice tests) easier than recall tests (e.g., essay exams), recognition questions pose problems in forensic contexts. For example, recognition questions include information witnesses have not yet generated, which could impact later memory for events. Also, questions that require only a "yes" or "no" answer are risky for young witnesses, who are prone to impulsive responding. Mapping children's accuracy across various types of instructions and questions is one of the major goals of research on interviewing children.

The content of individual event descriptions does not overlap perfectly. Regardless of whether the to-be-remembered material involves word lists, conversations, or complex events, children and adults often remember things at one point in time that they did not recall earlier. This phenomenon, called *reminiscence*, occurs across questions in a single interview and across interviews, with the amount of *reminiscent inconsistency* being greater when interviewers use different cues to tap memory. As Gilbert and Fisher (2006) explained, "An instance of *reminiscence* in a real-world setting should not, by itself, give rise to concerns of having tainted the witness's memory or other extraordinary explanations" (p. 734).

Across the lifespan, *reminiscent details* tend to be less accurate than consistent details, especially

when there is a long time between memory retrievals (La Rooy, Katz, Malloy, & Lamb, 2010), but more accurate than details that are inconsistent with prior testimony (Gilbert & Fisher, 2006; Salmon & Pipe, 1997). With children's testimony, however, special knowledge is required to decide when details are truly inconsistent, because children interpret some questions restrictively and use language differently than adults do, so their answers are influenced by the way interviewers phrase questions (Walker, 1999). When analyzing transcripts, experts disregard inconsistencies that could be due to peculiarities in the way children respond to various words or types of questions. For example, it is not remarkable when a child replies "No" to "Did anything happen?" and then, later in the interview, describes a significant event (because questions with the word "any" often elicit a "no" answer from children).

What Are the Testimonial Consequences of Neurological Immaturity?

Eyewitness testimony is not simply a product of how much information people store in memory and how effectively they access it. To participate in conversations, witnesses also need to maintain attention to the task at hand, keep the topic and recent questions in working memory (along with recently retrieved information from long-term memory), suppress irrelevant information and responses (through response inhibition), plan answers (often quickly and under pressure to respond), and monitor their performance. Cognitive psychologists use the term "cognitive control" to describe this set of skills that guides goal-directed behavior. The neural foundations of these skills are in place early in development but are not yet invoked quickly or efficiently. As a result, cognitive control improves dramatically across childhood and adolescence as individual brain regions mature, distant regions form functional circuits, and circuits become increasingly specialized (Bunge & Crone, 2009; Luna, Padmanabhan, & O'Hearn, 2010).

In early childhood, immaturity in the brain areas that support memory binding and cognitive control produce some interesting parallels between

children's behavior and the behavior of adult patients with specific neurological conditions and types of brain damage (Schacter, Kagan, & Leichtman, 1995). Variability from child to child and across situations is large, however, so the most striking examples usually involve only a subset of children.

Poor source monitoring. Source monitoring is the process of specifying when, where, and how something was learned (e.g., Did you turn off the stove or only imagine turning it off? Did you see the cute puppy on television or in real life?; Johnson, Hashtroudi, & Lindsay, 1993). Accurately recalling the source of a memory depends on your ability to connect contextual information about an event at encoding and at retrieval, along with the integrity of your decision process. As a result, maturation of the hippocampus and prefrontal cortex, two brain regions that orchestrate these components of episodic memory, support large improvements in source-monitoring ability between 3 and 8 years (Roberts, 2002), with continued improvement through adolescence (Ghetti & Angelini, 2008). Across childhood and into adulthood, conditions that compromise frontal lobe function often cause deficiencies in memory source monitoring (Schacter et al., 1995).

To understand why source monitoring can be challenging, consider a child who has two competing representations of an event: one from experience and one from listening to adults talk about the event. Reporting what was actually experienced may require (a) the realization that knowledge comes from somewhere (e.g., from direct experience or being told by someone else; Wimmer, Hogrefe, & Perner, 1988), (b) the ability to simultaneously hold multiple representations (sources) in working memory (Templeton & Wilcox, 2000), (c) the ability to inhibit competing information from non-target sources (Ruffman, Rustin, Garnham, & Parkin, 2001), (d) the availability of adequate contextual detail about the conflicting events, and (e) a logical strategy for thinking about the qualities of a memory (i.e., metamemory skills, including an awareness that memories rich with perceptual detail, such as how

things sounded or tasted, are likely to have been experienced rather than just overheard, suggested, or imagined; see Ghetti, Lyons, Lazzarin, & Cornoldi, 2008).

Because these skills take time to develop, young children sometimes fail to accurately report the source of their knowledge. In one study, for example, an experimenter or a puppet taught children new facts, and children who remembered each fact were asked how they had learned it (Drumme & Newcombe, 2002). More than half of the time, the 4-year-olds attributed their knowledge to a source outside the experimental setting, whereas 6- and 8-year-olds did so less frequently.

A propensity for false recognitions. Some adults with frontal lobe damage make frequent errors by saying "Yes, I saw (or heard) that" when presented with novel items (Schacter et al., 1995). Interestingly, one patient showed virtually no false recognition errors when the studied information was organized around one theme and novel test items represented another theme. The overall pattern of recognition errors suggested that deficient memory for event details (or deficient binding of details in memory), together with decision strategies that rely on general characteristics of events (i.e., gist), are responsible for expectedly high rates of false recognition (Schacter, Curran, Galluccio, Milberg, & Bates, 1996). The fact that frontal lobe deficiencies lead to reliance on gist is consistent with the fact that it is easier to induce children to report inaccurate information when they have schematic knowledge of an event (Pezdek, Finger, & Hodge, 1997).

Confabulations. Some adults with frontal lobe injuries spin grossly inaccurate tales of their lives, and young children also sometimes interject fantastic yarns into their descriptions of events. Confabulations can be plausible or clear inventions, and it is probably this process (also known as

*mental surfing*³) that colored famous day-care abuse cases with bizarre allegations.

Weak conversational skills. Language pragmatics, which refers to the social uses of language, includes conversational skills such as staying on topic, contributing appropriate amounts of information, and structuring cohesive narratives about events. Adults with Parkinson's disease who have impairments in frontal lobe function show deficits on tests of pragmatic skills (McNamara & Durso, 2003), as do young children.

One behavior that frequently causes confusion is children's tendency to drift off topic. In laboratory studies, even school-aged children sometimes begin talking about unrelated events when interviewers ask questions such as, "Can you tell me more?" rather than, "Can you tell me more about (the topic of discussion)?"—despite the fact that these children just answered numerous questions about a particular event, which should have made the intended topic obvious (Poole & Lindsay, 2001). When professionals fail to realize that children are no longer on topic, allegations can expand as unrelated stories of adults, locations, and situations become woven into investigators' hypotheses about what happened.

Greater dependence of behavior on the immediate environment. Some adults with injuries to the right frontal lobe are highly influenced by their immediate environment. Distinctive symptoms include interacting with objects when it is inappropriate to do so and imitating other people's gestures (e.g., Besnard et al., 2011).

Dependence on external cues, handling objects, and imitating other people sounds like a recipe for building a child because these are the tendencies that prompt children to learn about their physical and social worlds. The tendency to lose track of the purpose of conversations when reacting to external cues may explain why young children sometimes explore and play with objects during interviews, such as when they insert fingers into the holes of

³We picked up this phrase from Stephen Ceci and find it useful for conveying how some children creatively weave ideas together into narratives. Sometimes we can trace the origin of a child's confabulation (e.g., the plot is that of a well-known children's book, or the story incorporates themes from an upcoming holiday), but most of the time we have no idea how children came up with their invented stories.

anatomical dolls (e.g., Bruck, 2009). In the eyewitness literature, this behavior is often referred to as responding to the “affordances” of objects (i.e., actions that are possible with an object). The need to reduce unwanted exploration and imitative responses drives some of the recommendations that aim to reduce suggestive influences during interviews.

The consequences of neurological immaturity can combine to produce unexpected behavior. In one of our pilot studies, for example, a female experimenter asked children to label parts on a body outline, asked whether a man had touched them in a prior session, administered a set of developmental tests, and then asked if she had touched them on their bodies. Despite the fact that the experimenter had met each child only minutes before this interview, some children nonetheless accused her of touching. For example, one 5-year-old said that, yes, she had touched him, pointed to the belly on the diagram, and then explained that “you touched me here so you could feel me am I burning up or not.” Notice that this brief interaction contained a false recognition (“Yes, that is familiar”), an impulsive point, and an on-the-spot confabulation. How often and under what circumstances behaviors like these occur are two of the questions that motivate eyewitness research with children.

Do Other Developmental Milestones Influence Children’s Testimony?

While neurological development and accumulating experiences are working to improve memory and cognitive control, other facets of development are also influencing what children say about their lives. For example, research on the development of pretense has shown that preschoolers can and do lie (often, according to mothers’ diaries; Stouthamer-Loeber, 1986) but that young children are poor at maintaining a ruse and generally lack a mature understanding of lying (e.g., Ahern, Lyon, & Quas, 2011; see Chapter 8, this volume for a review of deception detection). Other research has documented normative sexual behavior (Poole & Wolfe, 2009) and the silly joking about body parts and bathroom topics that is common around 6 years of age (Ames & Ilg, 1979). Perhaps

the most frequently used information comes from studies of language development, as this information helps professionals ask age-appropriate questions and make sense of children’s answers (Walker, 1999). These examples illustrate why broad knowledge of development is necessary for working with child witnesses.

How Are Basic Processes Affected by Individual Differences?

Developmental psychologists have a dilemma: Professionals want to know what to expect from children of various ages, but variability ensures that rules of thumb will not apply to all children. One source of variability is individual differences in knowledge and experiences. In one study, for example, children’s ages were not predictive of recalling a target event, but children who had talked to their parents more about the event after it happened were more likely to describe it than children who had not (Jack et al., 2012). Other research has found that parents who talk with their children about past experiences, and especially those who elaborate upon their children’s responses, have children who report more information about events (Peterson, Sales, Rees, Fivush, 2007). In a general sense, children learn how to build memories and organize meaningful narratives, so those who engage more often in social conversation with adults about past events tend to generate richer and more complete accounts of their experiences (Fivush, Reese, & Haden, 2006).

Life experiences affect testimony in other ways. For example, gist-based memory errors reflect children’s knowledge of particular topics, and willingness to discuss sexual issues is influenced by parental attitudes about nudity and sexual education. In addition to differences stemming from children’s learning histories, differences in temperament and impulsivity lead to dramatic differences in the amount and accuracy of information provided by children of the same age. Finally, many school-aged children show behaviors that are typical of younger children due to conditions such as cognitive impairments and language disorders (e.g., Brown, Lewis, & Lamb, 2012).

Due to the large variability in performance during childhood, developmental norms can be highly

misleading. The problem is that psychologists typically report the age when a skill is mastered as the age when some percentage of children (often 50% or 75%) have mastered that skill. As these ages infiltrate the literature, there is a tendency for professionals to forget that many children have not mastered skills by the listed ages. Due to this error, professionals sometimes believe that a particular question or technique is safe for 4-year-olds, 5-year-olds, and so forth when, in fact, this assumption disregards the significant proportion of children who have not acquired the skill by the typical age of mastery. As we move on to review how basic principles translate into trends in eyewitness testimony, keep in mind that age is not the only variable determining individual children's capabilities and limitations.

RESEARCH REVIEW

Principles of memory and development are the starting point for discussing eyewitness testimony, but this basic information does not instill a sense of how children typically report past experiences—or what happens when we ask them about events that did not happen. To address these issues, we first review studies that documented children's event reports when there were no intentional efforts to influence their memories. Next, we highlight key results from research on children's suggestibility, focusing on memory errors stemming from social interactions. Keeping these "best case" and "worst case" scenarios in mind, we then address how testimony changes across multiple interviews and describe children's ability to identify previously unfamiliar people they encountered during a past event.

Children's Reports of Meaningful Events

After a presentation on children's eyewitness testimony, an audience member asked why a child who saw a trapeze artist fall during a circus performance did not later remember this horrifying event. From a parent's perspective, the crowd's reaction and the clearing of the tent were distinctive features that should have burned the disturbing image into memory. Now consider this incident from the child's perspective: Why would a child who has no concept of a circus—which is an event containing such things

as sword-swallowing and fire throwing—realize that something had gone wrong? In situations like this one, it is not surprising that children often remember peculiar details, such as a clown's enormous shoes or the cotton candy they were allowed to eat, rather than features adults consider to be central (Poole, Warren, & Nunez, 2007).

In general, children's interest in and understanding of events predict how well they remember. Consequently, even young children demonstrate impressive memory when they are allowed to choose events to discuss or when adults ask about salient situations such as injuries and unpleasant medical procedures. Even for these types of events, however, eyewitness performance depends on children's ages, how much time has elapsed, and the types of questions that are asked.

The structure of children's event reports. The most impressive examples of children's testimonial ability involve reports of situations that evoked strong emotions because a personal goal was obtained, threatened, or blocked. Children and adults use similar language to raise such topics, as in the following examples:

"I got my favorite Ninja toys."
(3-year-old)

"My grandpa is gonna die soon."
(4-year-old)

"He was gonna hurt me if I didn't shut up." (4 1/2-year-old)

"She told me that I had passed the exam." (woman)

"My dad told me that Jason had died."
(man)

"I knew the end was near, he changed so rapidly." (man) (Stein, 2002, p. 250)

In the study that generated these examples, there was amazing continuity from 3 years to adulthood in the logical structure of narratives about personally significant events (Stein, 2002). As expected, young children recalled less information than did older children and adults, but individuals of all ages conveyed the causal structure of the events, including information about what happened, who or what was responsible for the change in goals, what beliefs

were violated, how the personal goals were affected, and what outcomes were unintended. Remarkably, when 3- to 6-year-olds were re-interviewed 10 years later, the majority of children still recalled these events. For example, 90% of the children remembered events that had evoked intense fear, and 76% remembered events that had provoked anger. Results were not as impressive when the researchers asked about events discussed 10 years ago that did not have the same emotional significance: Most of these happenings were not remembered years later, and the narratives children did produce about these events contained a higher percentage of clauses that were inconsistent with their initial reports.

More detailed findings come from a program of research on children's reports of injury events. For years, Carole Peterson's research assistants have greeted parents and children in an emergency room in Canada. Parents who agreed to enroll in a memory study were later interviewed about the events, and assistants then interviewed the children one or more times to map the characteristics of their reports. Unlike the children in Nancy Stein's research, who all reacted strongly to the target events, the children in these studies differed widely in their emotional reactions to unexpected injuries (Peterson, 2010). Five conclusions capture the quality and evolution of these children's testimonies over time:

1. *Even young children reported useful information soon after meaningful events.* Older 1-year-olds sometimes described events that occurred months ago (Peterson, 2002), and 2-year-olds could report (on average) nearly half of the event components when interviewed within a few days of their injuries. There was a jump in the completeness of children's recall at 3 to 4 years of age and again at 5 to 6 years of age. Remarkably, when interviewed shortly after injuries, these young but school-aged children recalled almost as many event components as 12- to 13-year-olds did (Peterson, 2011).
2. *Episodic memories were fragile when children were just learning to talk.* Among a group of children who were too young to be interviewed after an event, half recalled nothing 18 months later, and the others reported very little. Five years later, reports from former 1-year-olds, if they recalled anything, contained almost one intrusion (error) for every correct detail recalled. Memory improved greatly for events experienced when children were about 26 months of age, but delayed reports from 2-year-olds included erroneous information interwoven with accurate information (Peterson, 2002, 2012).
3. *Event reports contained inaccuracies at all ages and delays, but accuracy improved with age.* Human memory is not designed to store and retrieve literal copies of events—even when those events are very important to us. In one analysis, for example, 6% of the information that 5- and 6-year-olds reported in an initial interview was wrong, as was 2% of the information reported by the 12- and 13-year-olds. A year later, these percentages grew to 13% and 6%, respectively (Peterson, 2011).
4. *Accuracy declined when interviewers asked specific and yes-no questions.* When adults ask questions that request specific information (e.g., "What did the man do for a living—what was his job?"), it is well known that children often comply by providing a response—even when there is no reason they would know the requested information (Poole & White, 1993). The tendency to answer impulsively and to fill in for memory gaps is evident even when adults ask about personally significant events. In one study of injury reports, less than 10% of the errors children made occurred during the free recall portion of the interview; the majority of errors appeared in responses to wh- and yes-no questions (Peterson & Bell, 1996).
5. *Children's event reports got worse and better over time.* Although it is typical for memory accuracy to decline after an event (and to do so most steeply during the first year), developmental improvements in language and understanding of events produced a nuanced pattern of performance in Peterson's data. Reports of major components of injury events tended to remain constant for years after the events had occurred, but children typically recounted more elaborate detail as they matured. For example, a child

who initially said, "We were at my Nan's" later explained, "We were at my Nan's by the green shed that's next to her house" (reports from the initial interview and 2-year follow-up; Peterson, 2011, p. 289).

Other studies support these conclusions and provide additional information about variability in memory for significant events. For example, ground-breaking research on children's reports of a stressful medical procedure (urethral catheterization) found that better understanding of the event and sympathetic parental communication were associated with fewer inaccuracies (Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997). Surprisingly, the amount of stress that children experienced, as indexed by crying, has not been a good predictor of memory for injuries and medical events, perhaps because these events are likely to be recalled regardless of children's reactions (Goodman et al., 1997; Peterson, 2012). For discussions of relationships between stress and memory in maltreated and non-maltreated children, see Howe (1997), Howe, Goodman, and Cicchetti (2008), and Wallin, Quas, and Yim (2009).

Recalling multiple instances of related events. We mentioned earlier that people develop scripts (i.e., general representations) that describe what usually happens when they have multiple experiences with similar events (Nelson, 1986). Young children's scripts include fewer details and are less flexible than those of older children because they have difficulty incorporating variations (i.e., predictable or typical changes from episode to episode) and deviations (i.e., exceptions that were not compatible with the event script) into their understanding of events (Hudson, Fivush, & Kuebli, 1992). Consider these examples, which illustrate how 4-year-old and 8-year-old children typically describe swimming lessons:⁴

Four-year old: You put on your bathing suit, and you go in the water. Then you do, ah . . . circle time and you have to always do your kicks, and then you come out and go home.

Eight-year-old: Well, once you're ready to go in the water, you come out to the pool and get your name checked off, and then you . . . , well, sometimes you start off with dives to get in the water, or jumps, like star, cannonball, spin . . . , or if there's a game at the beginning, you just get in normally. Then you have some time for practicing different swims, and usually there's always a game at the end, like Marco Polo or freeze. And then you get changed and go home, or sometimes we go for ice cream.

Note that both scripts are coherent and temporally organized, but the script from the older child contains more information and displays greater flexibility (i.e., sometimes X, sometimes Y).

Children of all ages have strong memories for details that are usually or always present across event occurrences, and even 3-year-olds are able to describe the typical details of familiar events in an organized and logical fashion (Nelson & Gruendel, 1981). Although all children show resistance to suggestions about typical details, young children are less likely than older children to retrieve details that are optional or that vary across events (Farrah & Goodman, 1990), and they are more likely to make errors when matching these details to the correct occurrence (Powell, Roberts, Ceci, & Hembrooke, 1999; Roberts & Powell, 2001).

It can be difficult to provide details associated with specific episodes because as scripts become stronger, it becomes harder to recall the specific details associated with any one event (Nelson, 1986). According to dual-process memory theories, repeated similar experiences strengthen the gist for "what usually happens," while the verbatim traces associated with specific episodes weaken (Brainerd & Reyna, 1990, 2004). Thus, retrieving gist information promotes the reporting of generic details, but there may be confusions across event occurrences as details compatible with the gist are misattributed. Only the specific verbatim traces associated with individual occurrences can aid in retrieving the correct alternative. As illustrated by the examples in Table 1.1

⁴These are composite examples derived from raw transcripts; summary data appeared in Brubacher, Roberts, and Powell (2011).

TABLE 1.1

Examples of Event Reports That Rely on Gist Versus Verbatim Information

Gist information	Verbatim information
Usually after school, she . . .	The last time it happened right before bed. One time it happened right after we ate dinner.
While mum is out of the house . . .	The first time, mum had gone to work. One time it happened when mum went to the shops for only 10 minutes.
He touches me when we're on the couch.	The first time he put his hand in the front of my shirt. The last time he took my pants down and touched my bum.
I'm usually wearing my house clothes.	The time he took my pants down I was wearing my purple pajama set. The first time I hadn't changed yet and still had on my school uniform.
And after, he sometimes says not to tell.	The first time he said, "If you tell anyone I'll get taken away." The time mum went to the shops he said, "You'd better keep quiet."

gist-based accounts preserve the general meaning and structure of what transpired but do not capture rich, incident-specific information.

A source-monitoring approach to recalling repeated events focuses on how the decision-making processes that occur at retrieval can help children accurately attribute specific details to the correct event occurrence even if memory traces have weakened. For example, children might use perceptual information to reason that a strong memory must be from a recent occurrence, or they might decide that abuse in a vacation cottage must have occurred in the summer (because the cottage is not visited at other times of the year). Although these reasoning skills improve markedly from 3 years to 8 years of age, such decisions remain challenging when event occurrences share many similar perceptual features. In the case of repeated abuse, for example, individual episodes may share the same actors (child and perpetrator), the same locations (e.g., the bedroom), similar circumstances (e.g., mother is always out of the house), and similar acts of abuse.

Source monitoring may be especially difficult for children who experienced ongoing abuse because stress can alter attention in ways that impair feature binding in memory (Mather et al., 2006). There may also be motivational reasons why some children provide little information about individual event occurrences. For example, compared to children who make

single-event allegations, children who make allegations of a repeated nature are more likely to say they expected negative consequences following disclosures of abuse (Malloy, Brubacher, & Lamb, 2011). Although many maltreated children are not motivated to share their experiences (Orbach, Shiloach, & Lamb, 2007), this finding suggests that those who have experienced abuse on multiple occasions may be even less so.

Suggestibility of Children

We trust our memory machinery to give us an accurate accounting of our lives, yet memory malleability is a fact of life across the lifespan. Seminal studies of the "misinformation effect" showed that certain question wordings altered adult witnesses' reports of event details, and narratives about fictitious childhood incidents produced false reports of having experienced those events (e.g., Frenda, Nichols, & Loftus, 2011). Sometimes, simply asking about an event leads a subset of adults to believe they were witnesses. For instance, 40% of the participants in one sample claimed to have seen nonexistent video footage of a bus exploding from a terrorist attack, and many of these suggestible adults reported details of the phantom media coverage (Ost, Granhag, Udell, & Roos af Hjelmsäter, 2008).

Compared to adults, children are at a disadvantage when it comes to resisting suggestions that threaten the reliability of their reports.⁵ For

⁵Memory researchers are interested in separating reporting errors due to conformity from errors resulting from changes in underlying memory representations. Detailed discussion of the mechanisms underlying reporting errors is beyond the scope of this review, but there is evidence both for compliance-based and memory-based false reports (Otgaar, Verschuere, Meijer, & Oorsouw, 2012).

example, children under 12 years of age have difficulty reflecting on social influence (London, Bruck, Poole, & Melnyk, 2011), which can make them less aware than adults of efforts to modify their testimony. As we described earlier, the mental architecture that supports sophisticated reasoning about memory is incomplete during childhood (e.g., "How do I know this?", "Is there a contradiction between these two memories?"). A working understanding of the impact of immaturity on vulnerability to suggestion requires (a) information about the circumstances that distort children's eyewitness reports and (b) clear thinking about the many myths that circulate about children's suggestibility.

Distorting influences. Research on children's suggestibility utilizes a wide range of procedures, from videotaped events followed by tests of memory for details (e.g., "What was the boy wearing?") to studies of how well children recall central features of meaningful experiences. Although critics frequently dismiss findings from events that were not very memorable, doing so misses an important point: In most cases, researchers compared children's accuracy across two or more conditions to identify the influences that impair testimonial accuracy. Although, resistance to suggestion improves as target events increase in salience, the order of conditions generalizes from mundane to significant events, so conditions that produce a greater number of errors in the former case also tend to produce a greater number of errors in the latter.

The easiest way to foster errors is to ask specific and misleading questions. Adults and children often answer such questions—even when they do not know the correct answer, and even when interviewers have warned that it is all right to say "I don't know." After watching a videotape, for example, one sample of kindergarteners answered 43% of the specific questions inaccurately (e.g., "Can you tell me who owned the bike?"). Second and third graders performed better, but these older children still erred 31% of the time (compared to the adults' error rate of 16%). The kindergarten children also performed poorly in the face of explicitly misleading questions (a 61% error rate to questions such as, "The bike

was the girl's, wasn't it?"), and they were more likely than older children to change accurate responses when interviewers pressed them for desired but wrong answers (Cassel, Roebbers, & Bjorklund, 1996). Many studies have found a gradual decline with age in interrogative suggestibility (i.e., conformance to interviewing pressures; Hünefeldt, Lucidi, Furia, & Rossi-Arnaud, 2008), with adult-like responses achieved at different ages for different procedures.

Laboratory findings generalize to interviews conducted by trained professionals. In one study, clinical psychologists with experience interviewing children for the courts were given a set of props and allowed to question children as they saw fit. Compared to police detectives who were not given props, this group spent more time off the topic, asked fewer free-recall questions, and elicited more errors from the children (Melinder et al., 2010).

Pairing props with specific questions is a two-edged sword: When interviewers ask about touching, concrete cues elicit more reports of experienced touching but also elevate false reports (for reviews, see Poole & Bruck, 2012; Poole, Bruck, & Pipe, 2011; Poole & Dickinson, 2011). Across studies, rates of false reports of genital and anal touching range from low to alarming, depending upon children's ages, the time that has elapsed since target events, and the interviewing procedures. For example, only 3% of 5- and 7-year-old children who had not experienced vaginal touching falsely said that they had when interviewed with anatomical dolls in one study (Saywitz, Goodman, Nicholas, & Moan, 1991), whereas 15% of 3- to 6-year-olds who were interviewed with props did so in another (Steward & Steward, 1996, 1-month interview). Existing studies, however, did not incorporate the atmosphere of concern about touching that characterizes sexual abuse investigations, so children's ability to resist the suggestive force of props paired with specific questions is not yet adequately tested.

There are many ways to wear down children's ability to resist suggestions. In the famous "Mouse-trap" studies, assistants visited 3- to 6-year-olds multiple times to ask them if events printed on

index cards had actually happened or not. ("We made this list up by talking to your mother and father to get them to tell us about things that really happened to you when you were younger, but not all of the things that I am going to read to you really happened . . ."; Ceci, Huffman, Smith, & Loftus, 1994, p. 394.) Children assented to an unexpected number of nonexperienced events in one study, with 3- and 4-year-olds accepting 44% of the fictitious events in the first interview and 5- and 6-year-olds accepting 25% (Ceci, Huffman, et al., 1994). In a second study, instructions to picture the events in their heads led children to increase their false assent rate across repeated interviews to 45% and 40% in the last interview among younger and older children, respectively (Ceci, Loftus, Leichtman, & Bruck, 1994). Importantly, suggestible children often generated detailed narratives about these fictitious events and sometimes resisted when assistants explained that these events had not, in fact, occurred.

Drawing inspiration from techniques that interviewers used in the *McMartin Preschool* case, Sena Garven and her colleagues (1998) compared the testimonial accuracy of 3- to 6-year-old children in the face of a suggestive interview (with questions such as "Did Manny tear the book while he was reading it?") to accuracy rates when interviewers added social incentives to suggestive questions. In the latter condition, interviewers told children that "big kids . . . said that Manny did some bad things," verbally reinforced children for desired responses, and expressed disappointment after undesired responses. Although children of all ages sometimes went along with misleading questions, adding social incentives elevated the rate of false responses to over 50% (Garven, Wood, Malpass, & Shaw, 1998). Errors produced by interviewer pressure do not reflect just temporary cooperation on the part of children; instead, some errors persist into interviews conducted a year later (London, Bruck, & Melnyk, 2009).

Suggestive information encountered outside interviews can also infiltrate children's freely recalled narratives and compound the force of suggestive questioning. One form of influence is to convey stereotypes about other people that are

consistent with the desired responses. Assistants for the *Sam Stone* study did this by visiting preschools, where they sometimes told stories that depicted Sam Stone as a clumsy, bumbling person (Leichtman & Ceci, 1995). After an uninteresting visit by Sam, children who had heard these stories and those who had not were repeatedly interviewed in neutral or suggestive ways. Thus some children were not exposed to stereotypes or suggestive interviewing (i.e., the control condition), some experienced only the negative stereotype, some experienced only suggestive interviewing, and others experienced both types of influence. Accuracy followed this condition order, with the best performance in the control condition and the worst performance in the stereotype-plus-suggestions condition. In the suggestion-only and stereotype-plus-suggestion groups, false accusations even infiltrated children's free-recall testimony.

To investigate what happens when adults feed children specific information prior to interviews, researchers developed the *Mr. Science* paradigm. After spending time with an unfamiliar man, children heard stories from their parents that described experienced and nonexperienced events, including information about events involving innocuous touching. Although the parents never explicitly said that the fictitious events actually happened, some children nonetheless described these events in response to open-ended questions about what happened with Mr. Science (Poole & Lindsay, 2001, 2002). False reports were even more frequent when interviewers progressed to specific yes-no questions: In this phase of the interview, over a third of the children confirmed recently heard information, including children who were 7 and 8 years of age (Poole & Lindsay, 2001). Unlike younger children, however, the older children were better (though not perfect) at correcting these errors when interviewers took the time to explain the difference between experienced and heard events, trained the children that it is okay to say "no" when appropriate, and revisited each question that elicited a "yes" response (i.e., "Did Mr. Science really . . . ?").

Intentional efforts are not required to spread false reports, however; naturally occurring social interactions will have the same result. In a series of

studies on rumor-mongering, Principe and her colleagues arranged for some children to experience an event and tracked the spread of information through peer groups (Principe & Schindewolf, 2012). Information children could only have received from their peers consistently showed up in responses to open-ended questions, and children frequently claimed to have witnessed these events with their own eyes. Importantly, levels of false reports were higher than what is typically observed with other suggestibility paradigms, and natural social interactions produced more elaborate false narrative accounts. These findings, along with detailed information about relationships between conversations and subsequent reports (collected by belt-clipped recorders), explain how multiple children can come to describe the same, but false, events. In a similar manner, giving parents misinformation and asking them to discuss an event with their children is sufficient to foster false reports (Principe, DiPuppo, & Gammel, 2012).

Myths about children's suggestibility. Numerous misunderstandings about children's testimony crop up in articles and courtroom testimony, including the following (e.g., Ceci, Kulkofsky, Klemfuss, Sweeney, & Bruck, 2007):

Myth #1: Only young children are suggestible. Due to neurological immaturity, younger children are more likely than older children to confuse memories from different sources, respond inappropriately to specific questions and interview props, and interject mind-wanderings into reports of recent events. These tendencies do not disappear suddenly, however, as is vividly illustrated by studies of false confessions by adults (see Chapter 9, this volume). Even children 11 years of age and older are susceptible to forming false memories of bizarre events, such as alien abductions (Otgaar, Candel, Merckelbach, & Wade, 2009; see also Strange, Sutherland, & Garry, 2006), and to blending suggestions and reality (see Hershkowitz, 2001, for discussion of a suggestion-induced rape allegation from a 10-year-old victim of indecent exposure). Because many mechanisms contribute to false reports, age trends vary across situations

and performance measures. For example, 8-year-olds in the Mr. Science paradigm are no more accurate than younger children on some measures, perhaps because their motivation to show researchers what they know camouflages their superior source-monitoring skills (e.g., Poole & Lindsay, 2001).

Myth #2: Answers to open-ended questions are highly accurate. Rates of detail errors are low (on average) when children experience events and then respond to general prompts to describe what happened, but this is not always the case among children who have been exposed to suggestive influences before interviews (e.g., Leichtman & Ceci, 1995; Principe & Schindewolf, 2012).

Myth #3: Mild suggestions do not taint reports. Although some suggestibility studies used multiple forms of suggestive influence, children's testimony can be tainted without heavy-handed techniques. For example, the Mr. Science procedure exposed children to only minutes of narrative (most of which described experienced events; e.g., Poole & Lindsay, 2001), and natural conversation tainted testimony in Principe's studies of rumor transmission (Principe & Schindewolf, 2012).

Myth #4: True reports contain features that reliably distinguish them from false reports. A persistent myth is the idea that adults can spot suggestion-induced false reports based on features such as how elaborate or coherent the reports are. Individual studies have found mean differences between true and false narratives on various linguistic features, but no consistent patterns have been documented that enable reliable judgments (see Principe, Greenhoot, & Ceci, 2014, for a review). This is cause for concern because adults typically believe children's narratives—even when they know that children participated in a suggestibility study that produced true and false narratives (Laimon & Poole, 2008).

The fact that children sometimes deny their experiences and sometimes convincingly report nonexperienced events is the foundation of a basic principle we revisit later in this chapter: Children's reports are only one part of an investigation and, not always the most important part. Accordingly, analyses of children's testimony should always involve

information about how testimony is situated in children's lives.

Recall Across Multiple Interviews

Partly due to publicity from a series of high-profile day care cases (for examples, see Ceci & Bruck, 1995), policy efforts in the 1980s and 1990s focused on two goals: finding ways to avoid suggestive influences during sexual abuse investigations and reducing the stress children experience from retelling their stories over and over again. These goals directed a two-pronged approach to reform that included the development of interviewing protocols and broader dissemination of coordinated approaches to case investigation (e.g., the child advocacy center concept). Although there was variability in how these movements played out in individual jurisdictions, the result was a widespread belief that is best to avoid interviewing children multiple times.

Even as this belief was gaining momentum, however, memory researchers were contesting the idea that multiple interviews always incurred unacceptable risks. Early reviews concluded that children's accuracy was remarkably stable when interviewers used open-ended questions, and that "misleading information, suggestive questions, or memory reconstructions due to prior stereotypes or the passage of time . . . rather than multiple interviews per se, seem to be responsible for introducing errors into testimony" (Poole & White, 1995, p. 34). In other words, multiple interviews were problematic when interviewing errors compounded, the time between interviews provided additional opportunities for adults to influence children's testimonies, and later interviews were so delayed that inconsistencies entered into evidence due to normal forgetting and memory reconstruction.

Subsequent reviews cautioned against the assumption that any misleading questioning would taint subsequent reports. Because early interviews can strengthen memories for events (at least when conducted soon after those events), even imperfect interviews sometimes produce higher accuracy rates in subsequent interviews than what is observed among children who are interviewed only once at the longer delay. As Goodman and

Quas (2008) explained, "When and how children are interviewed is at least as important for their accuracy as is how many times they are interviewed" (p. 386).

Children's Eyewitness Identification

Awareness of the frequency of false convictions that result from mistaken eyewitness identification, and the fallibility of eyewitness memory more generally, has prompted evidence-based guidelines and mandates for the collection and preservation of eyewitness evidence (e.g., Technical Working Group for Eyewitness Evidence, 1999), including guidelines for improving the accuracy of eyewitness identifications (for a discussion, see Chapter 7, this volume). However, reforms for conducting eyewitness identifications have centered on adult witnesses, perhaps reflecting the fact that most crimes against children are perpetrated by familiar adults rather than strangers (Davies & Noon, 1991).

There is another reason why children are not part of broader conversations about eyewitness identifications: Efforts to improve children's eyewitness identification performance have proven difficult, leading to few concrete practice recommendations. Existing research has, however, provided valuable insight into the strengths and limitations of child witnesses and can therefore be instructive for professionals who need to gauge the reliability of children's eyewitness identifications.

Children's difficulties with eyewitness identification begin with their descriptions of perpetrators. Before witnesses can accurately identify perpetrators, the police must first locate suspects through a process that typically involves witnesses' descriptions of perpetrators' physical appearance. Unfortunately, both archival reviews (analyses of actual cases) and laboratory studies have consistently shown that children (especially younger children) provide significantly fewer crime and person descriptors compared to adult witnesses (Pozzulo, Dempsey, & Crescini, 2009; Pozzulo & Warren, 2003). Moreover, the descriptors they do provide tend to be less accurate than those from adults. For example, although accuracy improves with age, children struggle to provide accurate descriptions of age, height, and weight—some of the most

commonly requested descriptors by investigators (see also Pozzulo, 2007, 2013, for reviews).

Most research on children's identification accuracy has focused on their ability to identify a perpetrator's face from lineups. A meta-analysis found that 4-year-olds were significantly less likely than adults to correctly identify a target who was present in the lineup (47% correct vs. 67% correct, respectively), whereas children 5 years and older performed comparably (Pozzulo, 2007; Pozzulo & Lindsay, 1998). When the perpetrator was absent from the lineup, however, children across all ages were more prone to make identification errors than adults. Even adolescents 12 to 13 years of age struggled to reject target-absent lineups: Adults selected a photo only about a quarter of the time when the perpetrator was not present, whereas adolescents did so over half the time. Thus, school-aged children perform relatively well when the perpetrator is in the photo spread, but their performance decreases significantly when the perpetrator is absent (i.e., when an innocent person is included in the array). Although the phenomenology behind this choosing bias is not entirely clear, the propensity to answer when memory is weak or nonexistent mirrors children's behavior in the face of difficult questions about event details that we discussed earlier.

Efforts to improve children's eyewitness performance have taken two approaches: (a) testing innovations that are known to improve adults' lineup performance and (b) testing innovations designed specifically for child witnesses. The most widely researched innovation for adults is the sequential lineup (the presentation of lineup photos one after the other), which was developed as an alternative to the traditional simultaneous lineup format (the presentation of lineup photos concurrently; Lindsay & Wells, 1985). With adults, sequential lineups have been found to increase correct rejections (i.e., when the target is absent) without significantly decreasing correct identifications (i.e., when the target is present; Steblay, Dysart, Fulero, & Lindsay, 2001; Steblay, Dysart, & Wells, 2011). Unfortunately, the gain in accuracy observed with adults does not apply to children, who perform poorly across both lineup formats (Pozzulo & Lindsay, 1998; Steblay et al., 2011).

One explanation for children's poor lineup performance is that they are more likely than adults to interpret the task as an investigative "demand"—that is, they believe it is their "job" to identify someone because that is what the investigator wants. Unfortunately, attempts to improve children's performance by reducing their choosing bias (e.g., giving children practice lineups, providing cautionary instructions used with adults) have had limited success (Pozzulo & Lindsay, 1998). As a result, researchers have developed more innovative techniques to alter children's strategies.

Pozzulo and Lindsay (1999) tested an "elimination" lineup approach that required children to use a two-step decision strategy: First they were asked to identify the person who most resembled the target (a relative judgment) and then were asked to compare that photograph to their memory for the target (an absolute judgment). When this procedure was paired with cautionary instructions, children's correct rejections of target-absent lineups increased significantly. Importantly, the procedure did not significantly reduce correct identifications when the target was present (Pozzulo et al., 2009).

To test a different approach, Karageorge and Zajac (2011) used a standard simultaneous lineup with one modification: the inclusion of a "wild card." The wild card was a picture with a faceless silhouetted figure, thus giving the children a salient "not there" option to choose if they did not see the target. Compared to the condition without a wild card, across delay conditions (1–2 days vs. 2 weeks) children (ages 5 to 11 years) in the wild-card condition made significantly more correct rejections when the lineup did not contain the target, and this improvement occurred without a loss in accuracy when the target was present.

In summary, although research on children's identification accuracy has lagged behind that of adults, the strengths and limitations of child witnesses are well known: Compared to adults, when the photo spread contains the perpetrator, children perform relatively well, but when the perpetrator is absent, children's lineup performance is "profoundly poorer" (Steblay et al., 2011, p. 110). These results make the use of lineups with young children a risky

investigative strategy for identifying unknown perpetrators. A number of innovations designed to improve children's lineup performance have proved promising, but the reliability of these procedures has not been established to the point where they have been widely integrated into best practice guidelines for conducting eyewitness investigations. Moreover, lineup reforms that are effective with adults (e.g., sequential lineups and precautionary instructions) have not been found to significantly improve children's performance.

PRACTICE AND POLICY ISSUES

A fundamental conviction in medicine, education, and psychology is that practice should be informed by the best available research (Stuart & Lilienfeld, 2007). When professional activities involve children's testimony, the intersection of research and practice has four prongs: Expert practice (a) is informed by knowledge of human development, (b) analyzes how testimony is embedded in the context of children's lives, (c) bases decisions on the strength of case evidence, and (d) is guided by professional standards and evidence-based protocols.

Expert Practice Is Informed by Knowledge of Human Development

The tasks of eliciting and analyzing children's testimony require knowledge of language development, cognitive development more broadly, and specific topics that map onto case features (e.g., normative sexual behavior, the developmental trajectories of children with disabilities). Discussions of language development, which dominate the literature on children's testimony, explain an interesting feature of the forensic conversational style: Skilled professionals do not talk to child witnesses the way they talk to children in everyday life. Instead, the forensic style is a unique way of talking that is conceptually simple but "structured to make social and linguistic sense to children" (see Poole & Lamb, 1998, p. 153, for a review of the basic principles of talking to children).

To understand why professionals cannot rely on their natural language habits, consider one example

of the difference between daily conversation and the forensic style. In most situations, it is typical to raise an issue, such as the name of a person, place, or action, and then to replace that word in subsequent utterances with a pointing word (e.g., a deictic), such as *he*, *there*, or *that*. The problem is that children do not always follow the intended meaning of these words (e.g., in questions such as "Where were you when *he* did *that*?"), especially when the question is asked many interchanges after the comment that defined the meaning of the pointing word (Walker, 1999). To help children connect thoughts across many interchanges, trained professionals repeat the topic often, use explicit transition comments when they change topics (e.g., "A few minutes ago you said that Joey took a bad picture of you. What happened?"), and avoid potentially ambiguous words.

Guidelines for talking to children also address the reasons adults sometimes misunderstand children's speech (and ways to avoid misunderstandings), how to select vocabulary and sentence structures that even young children understand, and ways to work around late-acquired concepts (e.g., how to narrow down the time of an event; Poole & Lamb, 1998). When analyzing transcripts, this knowledge helps professionals spot when children might have strayed off topic, when interviewers might have misunderstood something, and when inconsistent answers could have been due to how children interpreted or reacted to related questions that were worded differently.

Information about memory and social influence also shape best-practice guidelines. The idea that professionals should rely as much as possible on open-ended prompts is arguably the golden rule of forensic interviewing because these prompts encourage children to talk about what they remember best. Testimonial accuracy typically declines when interviewers request details that are not well-remembered, phrase questions in ways that allow children to respond by picking among a set of options (e.g., multiple choice questions) or implied options (yes-no questions), or allow young children to respond by pointing or manipulating objects (which is problematic for impulsive children; Poole & Bruck, 2012).

The way interviewers phrase questions has important implications for how children search their memories and respond. When children have alleged multiple instances of abuse, for example, interviewers try to elicit narratives about individual incidents to meet the needs of charging authorities and to provide defendants with opportunities to refute allegations. This can be difficult because, as mentioned earlier, children often confuse details that varied across repeated instances of similar events. Nevertheless, interviewers can help children separate incidents by giving them incident-specific cues (based on information the children previously mentioned; e.g., "Tell me about the day you forgot your towel at swimming"; Hudson et al., 1992). They can also use episodic prompts when episodic information is desired (e.g., "Tell me about *one time* when he touched you." versus "Tell me what *happens* when he touches you."), which encourages children to respond with episodic rather than generic details (e.g., Brubacher, Roberts, & Powell, 2012; Schneider, Price, Roberts, & Hedrick, 2011). Nonsubstantive interview phases are also important: When interviewers give children practice in episodically describing neutral autobiographic events before moving on to substantive topics, the children's subsequent narratives include more episodic information compared to the narratives of children who practiced retrieving generic details prior to the substantive phase of the interview (see Roberts, Brubacher, Powell, & Price, 2011, for a review).

Some influences are subtle. For example, skilled interviewers tolerate pauses in conversation and turn conversation back to children with facilitators (comments such as "Umm hmm"), which keep children talking and reduce the need to deliver focused questions (Roberts & Duncanson, 2011). Interview transcripts usually lack detailed information about pauses, facilitators (which can be appropriate or inappropriate, as when interviewers comment only when children are offering specific types of information), and nonverbal behavior, and transcript content is not always entirely accurate. Therefore, it is best to listen to recordings (when these are available) rather than to rely solely on transcripts. Even an excellent

interview analysis is only part of the picture, though, because influences can shape children's testimony before they participate in investigations. Considering this context is the next principle of forensic work with children.

Forensic Analyses Embed Testimony in the Context of Children's Lives

When eyewitness experts agree to review a case, one of their first tasks is to review (or to construct) the case time line. A time line is a chronological record of events in the family's life (before and after an allegation emerged) that documents possible motivations and opportunities to influence reports. Time lines are useful for (a) tracking details of allegations across informants, time, and interviews; (b) developing alternative hypotheses about the origin of information in children's testimony (or in allegations brought forth by adults); and (c) suggesting what additional information would test these hypotheses. Placing children's testimony in context and engaging in hypothesis testing are the defining features of a forensic approach (Ceci & Bruck, 1995; see State of Michigan Governor's Task Force on Children's Justice and Department of Human Services, 2011, for examples of hypothesis testing during forensic interviews).

The analysis of children's testimony requires a contextual approach because interesting information is often in the details. Consider a sexual abuse case in which a young child used the word *hotdog* to refer to a penis. By itself, this comment seems developmentally appropriate, but your interpretation is different once you know that the term is not used in the child's household, that the child denied knowing that *hotdog* could refer to a penis in one interview, and that a neighbor—who initiated the sexual abuse allegation and has a history of abuse allegations—is the only adult in the child's world who uses this word.

Contextual information can cast doubt on a child's testimony (as in the *hotdog* example), help resolve misunderstandings, and counteract challenges to the reliability of a child's report. For example, suppose a child mentions a toy she does not own in a brief description of sexual contact. If this toy is at her day care center, an investigator's

assumption that the child was reporting abuse in her home will need to be revisited. Time line information can also address defense challenges. For example, the fact that a girl's parents were reluctant to believe her allegation of abuse by a grandfather, and that they lost valued babysitting services as a result of the allegation, reduces the probability that they propagated her story.

Practice Decisions Consider the Strength of Evidence in a Case

The goal of an investigation is to collect information that reflects a child's experiences rather than memory errors or compliance with investigative techniques. The dilemma is that children usually do not provide all the information investigators need after a few open-ended questions, so decisions must be made about when to resort to techniques that are known to elevate rates of inaccurate information. The strength of evidence in the case should be part of these decisions.

Consider the decision to conduct multiple interviews. For cases in which adult influence and inconsistencies due to forgetting are not serious threats, there are reasons why multiple interviews can improve the quality of information obtained from child witnesses. An example at the beginning of this chapter illustrates one reason: Some children do not immediately disclose information that is potentially embarrassing (e.g., sexual abuse) or that could affect their current situation (e.g., removal of a parent from the home). Even when children do disclose in the first interview, the phenomenon of reminiscence makes it highly likely that they will report new information in a second interview (see La Rooy et al., 2010, for case examples of valuable information revealed in second interviews). Narratives also tend to be better organized in later interviews, producing more coherent accounts (Hershkowitz & Terner, 2007).

There are also practical reasons for allowing multiple interviews. Some situations are too complex to discuss in a single interview, ambiguities in children's responses may not be detected until after an initial interview is reviewed, and new evidence may arise subsequent to that interview. Finally, it can be difficult to cover needed topics in a single interview

when witnesses have disabilities or short attention spans.

On the other hand, investigative teams need to consider the risks and benefits of multiple interviews on a case-by-case basis because children's ages, their competencies as witnesses, and the delay between interviews can affect results. For example, a growing practice is the extended evaluation model, which is a multiple-session protocol for interviewing children who do not immediately verify suspicions of sexual abuse or may not be fully disclosing (Carnes, Nelson-Gardell, Wilson, & Orgassa, 2001; Carnes, Wilson, & Nelson-Gardell, 1999). Although this approach has safeguards to avoid undue influence by therapists, defense experts are receiving cases in which the concept was co-opted to justify extended quests for disclosures, using techniques that are known to produce unreliable reports, during which children were in contact with the caregivers who initiated the evaluations. Concerns about fidelity to the model illustrate the need for studies that describe how interventions are actually delivered once they have been widely distributed.

Among vulnerable groups, the risk that specific questions and props will elicit false information also increases when case evidence is weak. For example, children's tendency to point to someone in a lineup means that investigators should be cautious in their decisions to conduct lineups with child witnesses. One step investigators can take is to strengthen the evidentiary criteria (i.e., the quantity or quality of evidence) for placing a suspect in a lineup, which in turn will strengthen the prior probability that the suspect placed in the lineup is the perpetrator rather than an innocent suspect (Wells & Olson, 2003). In other words, when the decision to conduct a lineup is based on strong evidence, the probability that an innocent suspect will be identified decreases; when weak evidence forms the basis for conducting a lineup, then the probability increases. Given the lack of practical evidence-based recommendations for conducting lineups with children, and their propensity to choose even when the perpetrator is absent, police can lessen the risk of eliciting a false identification by tightening the evidentiary criteria used when deciding whether to conduct a lineup with a child witness.

Forensic Work Is Guided by Practice Standards and Evidence-Based Protocols

Gary Klein and Daniel Kahneman disagreed about the value of intuition: Klein had documented remarkable powers of intuition among highly-experienced professionals, whereas Kahneman consistently found that experts' predictions were flawed. In a rare example of an adversarial collaboration, the two joined forces to explore why data on the same issue produced such radically different conclusions. Together they asked, "When can you trust an experienced professional who claims to have an intuition?" (Kahneman, 2011, p. 235).

The answer seemed obvious in hindsight. The people Klein studied worked in environments that supported learning: (a) There were regularities in these environments (i.e., specific cues were associated with specific outcomes), (b) the tasks provided feedback, and (c) the individuals had sufficient practice to learn these regularities. For example, leaders of firefighting teams seemed to have a sixth sense about impending danger because a storehouse of knowledge told them what was likely to happen when certain conditions were present. Similarly, anesthesiologists can sense when patients are in danger because there are reliable signs of distress and quick feedback in the operating room corrects inaccurate impressions (Kahneman, 2011).

In contrast, some on-the-job experience lacks the characteristics that improve judgments over time. For example, psychologists who make custody recommendations (see Volume 1, Chapter 13, this handbook) may become increasingly confident in their decision strategies, but unless they randomly assign cases with certain characteristics to the various custody arrangements and track children's outcomes over time (which would be unethical to do outside an approved study), they would not have the needed information to correct flawed assumptions, i.e., knowledge of how individual children would have fared with a different custody arrangement (see Dawes, 1994). As Robin Hogarth (2001) explained, "We cannot learn from something that we cannot see" (p. 176).

It is difficult not to form quick impressions about the reliability of children's testimony, but judgment

research helps explain why our initial beliefs may not always be accurate. For example, no amount of experience will help people distinguish coached lies from accurate reports on the basis of narratives alone if those narratives are not sufficiently different (that is, if the environment is not sufficiently regular; Warren, Dodd, Raynor, & Peterson, 2012). Even when useful indicators of truthfulness do exist, experience affords no advantage unless the work environment provides feedback about the percentage of true and false cases that have and do not have the indicator (that is, unless you know which cases are false). Practitioners overcome the limitations of their work environments by relying on knowledge gleaned from journal articles and workshops, but these sources only improve judgments when the information trained is accurate and directly relevant to the judgments being made.

When decision-making tasks involve child witnesses, the problem is clear: It is unrealistic to expect that every practitioner will supplement knowledge of their specialty area with extensive knowledge of human judgment and decision-making, child development (including neurological, cognitive, and socioemotional development), and the growing literature on children's eyewitness testimony. Two remedies help fill the gaps in individuals' knowledge: practice standards, which specify how people should conduct themselves within their professional roles, and interdisciplinary collaborations, which broaden the collective knowledge of professional teams.

One practice standard, which is embodied in ethics codes, states that people should practice within the bounds of their training and experience (e.g., American Psychological Association, 2010). In the child witness literature, this play-your-position recommendation has been augmented with the suggestion that individuals with relevant credentials should serve in either a therapeutic or a forensic role with a given child—but not both (Kuehnle & Connell, 2010).

Because different professionals bring different skill sets to the table, it is also useful to have policies that set basic expectations for various professional roles and for how professionals assuming these roles should cooperate. In the field of child protection,

for instance, model investigative protocols help jurisdictions take a coordinated approach to protecting children (e.g., State of Michigan Governor's Task Force on Children's Justice and Department of Human Services, 1998).

Evidence-based protocols for specific professional tasks provide more detailed guidance. For example, interviewing protocols curtail natural but counterproductive behavior (such as not giving children time to think and asking mostly specific questions), offer suggestions for alternative approaches, address common weaknesses in interviews (for example, by modeling ways to develop and test alternative hypotheses about the origins of children's statements), and help professionals adapt procedures for children with special needs (see Poole & Dickinson, 2013).

Despite efforts to promote evidence-based practice, no formal mechanisms prevent individuals or groups from advocating procedures that have not been adequately tested, and—as we illustrated with the facilitated communication case at the beginning of this chapter—it can take decades for discredited techniques to fall out of practice. For these reasons, frequent consultation across disciplinary lines is a critical component of policy work and case management.

SUMMARY AND CONCLUSIONS

Throughout our lives, autobiographical memories are products of our mental schemas, the characteristics of events, and the social influences that surround events. Memory, however, does not always drive conversations: What we share and do not share is determined by our feelings, goals, and momentary perceptions of what behaviors will promote social harmony. In childhood as in adulthood, event reports are not intrinsically accurate or inevitably flawed; rather, they are dynamic products of a cognitive architecture interacting with a social world.

What happens when children's architecture meets the world is strikingly counterintuitive. Few developmental psychologists would have predicted the average age of earliest memories from the children in one study (a testimony to their remarkable

abilities; Tustin & Hayne, 2010) or the ease with which some 11- and 12-year-olds came to believe they were abducted by aliens in another (illustrating the malleability of memory throughout childhood; Otgaar et al., 2009). Examples such as these reinforce the central conclusion from research on children's eyewitness testimony: There is a need for careful analyses to situate children's reports in the contexts of their lives.

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