EACH year, hundreds of thousands of children suffer or witness crime; some of them then serve as witnesses in forensic investigations and legal proceedings. This is especially true in sexual abuse cases where the offense typically is committed in secrecy (Bala, Lee, & McNamara, 2001), and often there is no visible injury or physical evidence, so that the children’s eyewitness memory accounts take center stage (Keeney, Amacher, & Kastanakis, 1992; Myers, 1993a). However, children witness and experience many other crimes as well, such as domestic violence, homicide, war atrocities, school shootings, and kidnappings. Children who are crime victims or witnesses may be questioned by police officers, child advocacy workers, social workers, and attorneys. Additionally, they may need to testify at depositions, preliminary hearings, and trials and, if a defendant is convicted, a sentencing hearing (Quas & Goodman, 2012; Troxel, Ogle, Cordon, Lawler, & Goodman, 2009).

When adults do not believe a child’s accurate testimony, it can have devastating consequences. If child victims are not believed, a perpetrator is free to commit other crimes, and the victims may be placed in further danger due to retaliation against them by the perpetrator. For example, when a 14-year-old told her minister that she and her five sisters were being sexually abused by their parents, the minister warned her parents before alerting authorities. Because of this, her parents, Bruce and Glenda Dutro, subjected all six Dutro children to several days of confinement, beatings, rape, and starvation. When social workers finally visited the home, the girls were too terrified of their parents to disclose the abuse. The assaults continued, and it was not until several years later that authorities were alerted again and the parents were finally convicted. Bruce Dutro is currently serving a 300-year prison sentence, and his wife, Glenda, is serving a 15-year sentence (People v. Dutro, 2012).
However, when children’s accounts are inaccurate, believing them can also lead to injustices that include conviction of the innocent. Take the case of David Wiggins. In July 1988, a 14-year-old girl opened her back door to let out her dog, and a man forced himself inside her home. He pushed her to the floor, put a towel over her face, and raped her. The child saw the man’s face briefly. She called 911 shortly after her attacker left and was taken to the hospital. Two days after her assault, the child was shown a photo lineup that included Wiggins’s photo. The child wrote next to Wiggins, “looks familiar.” The following day, Wiggins, who had been arrested for riding in a stolen car, was placed in a live lineup. The child identified him as her attacker during the lineup and again at the trial. Wiggins was convicted and sentenced to life in prison. Later DNA testing indicated that Wiggins was not the perpetrator, and the prosecutor agreed that a wrongful conviction was likely. Wiggins was released after serving over 20 years in prison (Innocence Project, 2012).

Such real-world cases illustrate why children’s eyewitness abilities are of paramount interest for legal professionals and researchers. Children’s reports are the linchpins in many legal proceedings, especially when physical evidence is absent. Research on the abilities of child eyewitnesses may be particularly important in assisting investigators when children’s reports are the only piece of evidence, as is often the circumstance in child sexual abuse cases. In this chapter, we discuss factors that may influence the accuracy and perception of children’s reports. This review is not exhaustive, but we hope to draw attention to areas of consensus and foster dialogue about areas of controversy that will assist in building theoretical understanding and optimal legal application concerning children’s eyewitness reports.

MEMORY DEVELOPMENT

Before delving into research and theory on children’s eyewitness abilities, it is important to have a basic understanding of age trends in memory development. Children undergo marked changes in encoding, knowledge base, and retrieval with age (Howe, 2011). Although memory development continues into adolescence and adulthood, a qualitative jump occurs after the early preschool years. On eyewitness memory tasks, it is particularly challenging to obtain complete and accurate information from young preschoolers (e.g., Goodman & Reed, 1986). Compared to older children and adults, younger children recall less information in response to free recall questions and open-ended questions (e.g., “What happened?”), and they make more errors in response to direct questions, such as yes/no queries (e.g., “Was his shirt red?” “Did he shut the door?” “Did he kiss you?”), option-posing queries (“Did he have a knife or a gun?” “Was her hair straight, curly, or braided?”), and misleading questions (e.g., “He took your pants off first, didn’t he?” when in fact, he did not; Dent & Stephenson, 1979; Goodman, Bottoms, Schwartz-Kenney, & Rudy, 1991; but see Ceci, Papierno, & Kulkofsky, 2007). Postevent misinformation that is stated as a presumption (e.g., “How fast was the car going when it passed the barn on the country road?” when in fact there was no barn) is also more likely
to contaminate young children’s memory reports than those of older children and adults (Ceci, Ross, & Toglia, 1987; Schwartz-Kenney & Goodman, 1999), although adults can also be susceptible to such false information (Loftus, 1979). Although by about the age of 5 or 6 years, children often can identify a culprit as accurately as adults when presented with photo lineups that contain the perpetrator (Goodman, Hirschman, Hepps, & Rudy, 1991), younger children are also more likely than older children and adults to falsely identify an innocent person in photo lineups that do not include the offender (Pozzulo & Lindsay, 1998). There are, however, marked individual differences at any age; for example, some children as young as 2 or 3 years can be highly accurate and resistant to false suggestions (Harris, Goodman, Augusti, Chae, & Alley, 2009).

Children are likely to have weaker memory traces than adults and to have greater difficulty with source monitoring (Howe, 2011; Johnson & Foley, 1984). This then naturally leads to questions, such as whether children can maintain accuracy of their memory reports as time goes on and as memory traces become weaker or source monitoring becomes more difficult. Such questions have obvious legal relevance because some crimes are not readily reported; children may need to recall a forensically relevant event that occurred days, months, or even years earlier. Recently, Peterson (2011) suggested that children’s reports about personally salient, stressful events remained accurate even with the passage of years. Yet how researchers assess the accuracy of these reports affects whether one concludes that accuracy is maintained or declines over time.

Overall, memory performance tends to improve across childhood and into adulthood, including on eyewitness memory tasks. However, the research base mainly concerns children’s memory for unfamiliar people and briefly witnessed events. Situations about which children testify often involve familiar people and events that are traumatic or stressful.

TRAUMA, STRESS, AND MEMORY

Many criminal events are traumatic for children to witness or experience or, because of their potential for violence, cause child witnesses to experience considerable distress and anxiety. Thus, research investigating the impact of violence and stress on memory is of crucial importance to understanding children’s eyewitness testimony. The extent to which children can remember and accurately report personally traumatic and stressful events is a topic of active research. Many children can, under a variety of circumstances, provide forensically relevant, accurate information about highly traumatic events they have witnessed or experienced (e.g., D. P. H. Jones & Krugman, 1986; McWilliams, Narr, Goodman, Ruiz, & Mendoza, 2013). In both children and adults, such events typically are recalled more accurately and for a longer period of time relative to benign or ordinary events (e.g., Peterson, 2012). Highly distressing events can also be recalled with error and are not immune to forgetting.
and distortion, including false memory, in adults and children (e.g., Hirst et al., 2009; Neisser & Nicole, 1992; Terr, 1983).

In considering the research on children’s memory for traumatic and stressful events, it is important to consider whether memory is assessed in field studies, in which witnesses of actual crimes are interviewed (Orbach, Lamb, La Rooy, & Pipe, 2012; see Paz-Alonso, Ogle, & Goodman, 2013, for review), or laboratory studies, where witnesses’ emotional responses to and memories of more standardized incidents (e.g., slide-depicted or staged events) are examined. In particular, questions arise concerning the external validity of laboratory research (e.g., how well laboratory research sufficiently mimics the levels of distress induced by criminal events) and the internal validity of field research (e.g., how well field researchers can pin down cause-effect relations). Ideally, findings from laboratory and field research lead to the same conclusions, but this is not always so. For example, in a series of studies on children’s memory for child sexual abuse, Leander and her colleagues (e.g., Leander, Christianson, & Granhag, 2007; Leander, Granhag, & Christianson, 2005) and Cederborg, Lamb, and Laurell (2007) found that children avoided detailed reports of child sexual abuse they had experienced (e.g., as documented by photographs of the assaults found in perpetrators’ possession) and that some children completely denied that the abuse occurred, even when shown photographs of the molestations, likely due to embarrassment, feelings of guilt or complicity, or desire to protect the abuser. Such factors have rarely been studied in laboratory research (but see Saywitz, Goodman, Nicholas, & Moan, 1991) yet may have a profound effect on children’s memory for actual crimes.

In any case, it is clear that many factors play a role in children’s memory for traumatic and stressful events—too many to review in this chapter. Here we first consider some of the theoretical issues involved in memory for stressful and traumatic experiences. We then turn to a subset of the factors that affect children’s memory for stressful events, such as age when events occurred, language and parental factors, centrality of the to-be-remembered information, whether the individual is a participant or a bystander witness, and whether events are repeated or single occurrences. Additionally, we review research on physiological stress responses—research that is furthering our knowledge about how stress affects children’s memory of traumatic and stressful events. Clearly, a complex multivariate model of children’s memory for stressful events is needed to integrate disparate findings.

Theoretical Issues

There has been considerable theoretical debate as to whether memory is diminished or enhanced for highly stressful experiences (e.g., Christianson, 1992; Deffenbacher, Bornstein, Penrod, & McGorty, 2004). Christianson (1992) argued that with heightened distress, attention becomes particularly focused on the central stressor as do elaborative processes later, resulting in particularly accurate memory for the main stressor. Deffenbacher et al. (2004) countered that in the studies reviewed by Christianson, sufficiently high levels of distress had not been achieved to uncover
decrements in memory that occur when people are confronted with life-threatening situations.

However, a growing body of research indicates that memory is particularly robust for highly stressful experiences and that neural circuits involving, for example, hippocampal and amygdala structures, support memory for highly emotional information (Phelps, 2004). When stimuli are high in arousal and negative in valence, memory is particularly likely to be robust (Kensinger, 2009; Mather & Sutherland, 2009). Perhaps relevant to memory for violent criminal events, Nairne, Thompson, and Pandeirada (2007) have proposed that, due to evolutionary forces, human memory is tuned to information that was relevant to survival in our ancestral past, a theoretical idea known as survival-based processing. Being the victim of a violent crime or observing others being assaulted would be particularly relevant to survival, both in our ancestral past and in the present, and thus one would expect especially accurate and robust memory for such acts. One possible reason for improved retention is that a specialized memory module exists for processing information important for survival.

Other possible mechanisms include that stressful, survival-relevant experiences are more emotionally arousing, more distinct, and more self-relevant, leading to better retention (Howe & Otgaar, 2013). Researchers still debate if robust memory for traumatic experiences reflects such basic memory processes (Howe, 2011) rather than emotional and neurobiological factors associated with trauma (Cordón, Pipe, Sayfan, Melinder, & Goodman, 2004). In any case, it is clear that, despite relatively strong retention, memories of highly stressful and traumatic events still may be subject to distortion and forgetting in children and adults (Otgaar & Smeets, 2010).

Chae, Goodman, and Edelstein (2011) argued that Christianson’s and Deffenbacher et al.’s perspectives may have merit, depending on individual differences in the processing of emotional information, including for children. For example, individual differences in attachment-related insecurities influence the extent to which individuals encode, elaborate on, and later retrieve and report negative information. In particular, attachment-avoidant individuals (i.e., people who avoid intimacy and do not want to be emotionally needy) are likely to engage in “defensive exclusion” of information and emotions related to reminders of upsetting events (Bowlby, 1982). Defensive exclusion may in turn influence the processing of and memory for negative experiences: Compared to less attachment-avoidant individuals, more avoidant ones are less likely to have discussed their traumatic experiences with others and less likely to retain accurate memory over time (Edelstein et al., 2005). Thus, although memory in general is often particularly accurate and enduring for central details of events relevant to survival (Christianson, 1992), defensive processes may inhibit encoding, storage, and/or retrieval of memories of such experiences, leading to memory deficits or distortions in some individuals (Deffenbacher et al., 2004).

Several studies uncovered links between parents’ attachment-related insecurities and children’s memory for and suggestibility regarding stressful experiences.
For example, children of parents who score relatively high on measures of attachment avoidance provide less accurate memory reports and display heightened suggestibility regarding highly stressful medical procedures (e.g., Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997). Moreover, parental attachment insecurities are among the few individual difference variables that consistently predict children’s suggestibility (Bruck & Melnyk, 2004).

While theoretical issues continue to be debated and researched, empirical evidence of children’s memory for stressful events continues to mount and likely will constrain theory as the field moves forward. In the meantime, a number of factors have been found to affect children’s memory for stressful events, some of which we turn to next.

**Children’s Age**

Age at time of a stressful or traumatic event can affect how well it is remembered later on. Children can at times recall things that happened years before when they were quite young (Peterson, 2012). However, it is extremely unlikely that children (or adults) can remember and report events that occurred before age 1 (Peterson). Additionally, many individuals cannot remember traumatic or nontraumatic events that occurred before age 3 (Malloy & Quas, 2009; Terr, 1988), a phenomenon often referred to as infantile amnesia. Although the age at which the infantile amnesia barrier is considered to take hold has been gradually lowered by researchers (e.g., some older children and adults can recall information down to 2 years of age; Usher & Neisser, 1993), the offset of infantile amnesia usually is thought of as around 3 to 4 years of age, such that most older children and adults cannot accurately retrieve memories of events that occurred before those ages (Peterson, 2012). In any case, children’s ability to remember and accurately report events continues to improve with age.

Peterson (2012) described results from her longitudinal study examining 2- to 13-year-old children’s memories of traumatic injuries (e.g., broken bones or lacerations) as well as for the emergency room treatment that resulted. The children were interviewed at the time of the injury and emergency room treatment and again several years later. In terms of memory completeness regarding the injury, when interviewed after a 5-year delay, all children who were 2 years old or older at the time of the injury remembered it nearly as well as they had 5 years previously. However, older children’s memory accuracy for their injuries was better compared to that of younger children, and all children’s memory accuracy decreased over time (see Peterson). The biggest decrease in accuracy occurred during the year following the incident. Of interest, children’s memories for hospital treatment declined in both completeness and accuracy. Still, the children’s completeness and accuracy declined from about 92% to 85%, showing substantial robustness of memory even after a 2-year delay.

In a study of 3- to 10-year-olds, Goodman et al. (1997) found that age was positively related to the accuracy of memories of a stressful urinary catheterization procedure...
involving genital penetration. In that study, memory was tested within a week to a month after the medical procedure. Results of a study evaluating children’s memory for enucleation (removal of an eye due to retinoblastoma) showed that children who were older than 24 months talked more about the procedure than those who were younger. Unfortunately, memory accuracy was not assessed (Norgate & Littleton, 2011).

**LANGUAGE AND PARENTAL COMMUNICATION**

Also related to children’s memory are language and parent/child communication factors. Some research has shown that children who remember an event up to 14 months after it occurred do not use language in their descriptions that was not in their vocabularies when the event occurred (Hayne & Simcock, 2009). Although such findings suggest that preverbal memories cannot be recalled verbally, more recent research indicates that some children can, at times, recall information for which they did not have those specific words earlier (Morris & Baker-Ward, 2007). These findings have fascinating legal implications, especially given the fact that children’s competence to testify is assessed at the time of testimony rather than at the time of the alleged offense (Lyon, 2011).

In any case, once children develop language ability, opportunities increase for parent–child discussion about events. Peterson, Sales, Rees, and Fivush (2007) evaluated the relation between parent–child conversation and 2- to 5-year-old children’s memories for an injury and subsequent emergency room treatment. Age and parental elaborative conversation style were the two most significant predictors for children’s memory for both the injury and hospital treatment. In fact, parental elaboration was the most significant predictor of children’s memory accuracy for hospital treatment, an event that appears to be more difficult to remember compared to an injury that prompts hospital treatment (Peterson, 1999, 2002). These findings suggest that discussions parents have with their children about traumatic events can assist with the encoding and storage processes necessary for memory retrieval (Chae, Ogle, & Goodman, 2009).

**PARENTING STYLE**

Another parental factor related to children’s memory for traumatic and stressful events is parenting style. Children with parents who have a more traditional parenting style with a focus on obedience and parental authority remember less about a somewhat stressful event than children who have more authoritative parents (Burgwyn-Bailes, Baker-Ward, Gordon, & Ornstein, 2001). The researchers suggest that their findings may stem from children with authoritarian parents distrusting their own interpretation and memory of events. Furthermore, children may model their parents’ coping behaviors, which may include avoidance or anxiety in response to stressful events (Brumariu & Kerns, 2010), both of which can affect memory (Chae et al., 2011).
CEN_\text{TRAL~VERSUS~PERIPHERAL~DETAILS}

An important factor that plays a role in memory for events in general is the centrality of the information (i.e., how central or peripheral the details are that need to be remembered). For traumatic events, however, a “tunnel effect” can occur in memory, with heightened memory for central details and diminished memory for peripheral details (Christianson, 1992). Typically (albeit not always), in criminal investigations, central details are of most importance. As a general rule, crime witnesses are most likely to encode and remember central aspects of the crime better than more peripheral details. This trend holds for older and younger child witnesses, as least once children reach the age of approximately 5 years (e.g., Eisen, Goodman, Qin, Davis, & Crayton, 2007).

Of interest, the classification of a to-be-remembered detail as a central or peripheral event may differ depending on how relevant that detail is to an individual’s goals. For example, an individual whose goal is to suppress emotion may remember an emotional event less well than an individual not so motivated (Levine & Edelstein, 2009). Contradictory findings about memory for central and peripheral details may result in part from a lack of consideration of individual goals as well as from differences in how centrality is defined across studies (Paz-Alonso, Goodman, & Ibabe, in press).

Even if children remember fewer peripheral compared to central details or remember peripheral details incorrectly, memory for central details still can be quite accurate. However, heightened memory for central versus peripheral details is not consistently found as a function of age across studies. In the Peterson (2011) study, which was briefly described earlier, younger children accurately remembered more central details relative to peripheral details, whereas older children remembered central and peripheral details equally well. In contrast, Eisen et al. (2007), in evaluating children’s memories for an anogenital exam and blood draw, reported that older children (ages 6 to 11) made fewer errors on central-specific questions compared to peripheral-specific questions, whereas this was not the case for younger children (ages 3 to 5). In a study of 9- to 12-year-old children’s memory for an impromptu speech and stressful math task, as self-reported stress increased, memory accuracy for central details increased, whereas memory accuracy for peripheral details decreased (Rush, Quas, & Yim, 2011). These contrasting findings may reflect not only differences in how researchers operationalize centrality distinctions but also differences in what children of various ages consider to be central versus peripheral to the main stressor.

PARTICIPANT~VERSUS~BYSTANDER~CHILD~WITNESSES

Many child eyewitness memory studies concern bystander witnesses—for example, children who view others performing actions. However, there is evidence to suggest that children who actively participate in events, more as a victim might, remember the event better than do bystander witnesses (e.g., Rudy & Goodman, 1991).
Pipe, Lamb, Orbach, and Esplin (2004) also note that people tend to recall events they experienced better than events they witnessed. Greenhoot, McCloskey, and Glisky (2005) evaluated adolescents’ memory of family violence that had occurred 6 years previously. Adolescents remembered abuse that was committed against them better than they remembered abuse of their mothers. However, Christianson (1992) cited studies in which there were no differences in the accuracy of victims’ and witnesses’ memories. An important factor in the participant-over-bystander memory advantage may be activation of self-schema. That is, when self-schema are activated, a richly elaborated memory structure may help maintain storage of the memory. Although self-schema are likely to be activated when one is actively involved in an event, such schema may also be activated when watching an event unfold, which could then support accurate memory (Baker-Ward, Hess, & Flannagan, 1990; Howe & Otgaar, 2013), perhaps especially when the event has high personal relevance to a child’s life (McWilliams et al., 2013).

Repeated Events

How frequently events are experienced is another factor likely to affect how well a stressful event is remembered. Unfortunately, little rigorous scientific research has examined children’s memory for single versus repeated stressful or nonstressful events that were highly stressful. Goodman et al. (1997) found that children who experienced a single invasive medical procedure remembered it as accurately as children who experienced it multiple times. Discriminating between different instances of repeated events can be difficult for anyone (Pipe et al., 2004), and it is especially difficult for young children (Lyon & Saywitz, 2006; Pipe et al., 2004). For example, children who are victims of incest or repeated sexual assault are not always able to remember the details of each incident or whether a certain act occurred during the first or 50th assault (Bala et al., 2001). This is especially true if similar abuses are experienced repeatedly. Farrar and Goodman (1992) evaluated 4- and 7-year-old children’s memories for repeated similar nonstressful events. The 4-year-olds merged the events more so than did the 7-year-olds. Relative to their older counterparts, the younger children had more difficulty separately recalling features of each event. Children may confuse details across events yet still may report the gist accurately (Pipe et al., 2004). More research is needed, however, on children’s memory for repeated stressful events.

Physiological Distress

Researchers are just beginning to evaluate children’s physiological distress in relation to children’s memory for stressful events. Quas, Yim, Edelstein, Cahill, and Rush (2011) uncovered a positive relation between 9- to 12-year-old children’s cortisol levels and their memories for a stressful experience. Quas and Lench (2007) found an interaction between increased heart rate during encoding (watching a
frightening video) and nonsupportive interviewing for the video 1 week later. Specifically, the most memory errors were committed by 5- and 6-year-old children who had the largest increase in heart rate and were interviewed by an unsupportive interviewer. Of interest, in a study by Quas, Carrick, Alkon, Goldstein, and Boyce (2006), children’s age and sympathetic nervous system reactivity (a measure of physiological distress) were significantly related to decreased memory accuracy for a stressful event (a 1-minute fire alarm).

CONCLUSION

Because attention is limited, people cannot encode everything about real-life events, particularly those as complex as most crimes. We have reviewed some of the factors that are related to how well children remember traumatic and stressful events. A complex multivariate model may be needed to create a clearer picture of children’s memory for such experiences.

EFFECTS OF MALTREATMENT AND TRAUMA-RELATED PSYCHOPATHOLOGY ON MEMORY

Child abuse and neglect are major risk factors for anxiety, substance abuse, psychosis, and personality disorders (Felitti, 2002). Exposure to early abuse may affect the development of the hippocampus, a brain structure important for memory (Teicher, Anderson, & Polcari, 2012). Furthermore, when maltreated children are removed from their homes by protective services staff, the removal itself is likely to be traumatic (Baugerud & Melinder, 2012), as can be many of the social service and legal experiences that follow (e.g., Block, Oran, Oran, Baumrind, & Goodman, 2010; Quas, Goodman, et al., 2005).

Both nonmaltreated and maltreated children show age improvements in the accuracy and completeness of their reports as well as in their resistance to misleading questions (e.g., Eisen et al., 2007). Although maltreated children’s basic memory processes are comparable to those of nonmaltreated children (Howe, Cicchetti, Toth, & Cerrito, 2004), abused children’s memories of life events are at times overgeneralized, indicating difficulties with autobiographical memory (Valentino, Toth, & Cicchetti, 2009).

Maltreatment may affect children’s emotion regulation strategies (Kim & Cicchetti, 2010). The emotion regulation strategies of avoidance of memory or of dissociation are predictors of memory deficits and/or greater suggestibility in general (Qin, Ogle, & Goodman, 2008; J. M. G. Williams, 1996) as well as in maltreated children. Eisen et al. (2007) examined maltreated children’s memory for an anogential examination and venipuncture (blood draw) conducted by doctors in a forensic hospital unit. Controlling for age and gender, children who scored highest on measures of dissociative tendencies, trauma symptoms, and cortisol increase after the medical experiences made more errors on misleading questions.
relative to the remaining children. For highly traumatized children who were high
dissociators, increased cortisol was related to poorer memory; for less traumatized
children who were low dissociators, increased cortisol was associated with better
memory. Melinder, Baugerud, Ovenstad, and Goodman (2013) examined memory
in maltreated children who were being removed from home by protective services
staff. When children’s memory for the removal was studied, parents’ avoidant
attachment style predicted less accurate memory and increased suggestibility.
Presumably, at least according to Bowlby’s attachment theory, children had learned
from their avoidant parents to avoid thinking or talking about stressful, negative
experiences. In a more direct test of the effects of attachment avoidance on memory
of child maltreatment victims, Edelstein et al. (2005) found that child sexual abuse
victims who scored higher on a measure of avoidant attachment were particularly
likely to have memory deficits for the abuse itself if the abuse was especially severe
(e.g., rape at gunpoint or years of incest), whereas child sexual abuse victims
who scored lower in attachment avoidance evinced the opposite trend: The more
severe the sexual assault, the better was their memory. These results are consistent
with those, mentioned earlier, from research on children’s memory for medical
procedures when children appear highly distressed by such experiences (Goodman
et al., 1997). This consistency extending to child maltreatment victims demonstrates
the broad generality of the avoidance and child memory findings and likely reflects
the impact of emotion regulation strategies (Goodman, Quas, & Ogle, 2009).

Child maltreatment places children at risk of trauma-related psychopathology
(e.g., posttraumatic stress disorder [PTSD], depression, dissociation). Evidence
suggests that maltreated children’s performance on eyewitness memory tests for
negative information is more strongly associated with psychopathology than with
maltreatment per se (McWilliams, Harris, & Goodman, 2012).

PTSD has been of special interest to those who study trauma and memory in
maltreated children as well as to those who study traumatized adults (e.g., Rubin,
Berntsen, & Bohni, 2008). It has been proposed that individuals with PTSD develop
“fear networks,” that is, semantic and episodic mental networks that store trauma-
related information in a hyperactivated form and make victims particularly attentive
to such information (Foa & Kozak, 1986). Fear networks may support particularly
accurate memory for trauma in individuals with PTSD. Robust remembrance
of trauma is reflected in flashbacks of traumatic information characteristic of
PTSD, although avoidance of reminders of the trauma is also characteristic of
the disorder. That said, memory monitoring problems in those with PTSD may
increase commission errors for trauma-related or non–trauma-related information
(Bremner, Shobe, & Kihlstrom, 2000; Windmann & Krüger, 1998).

CHILDREN’S SUGGESTIBILITY, FALSE REPORTS, AND FALSE MEMORY
Children’s suggestibility and false memory are crucial issues in the study of
children’s eyewitness testimony. The devastating consequences of children making
false accusations were demonstrated during the 1980s in the McMartin child sexual abuse trial. Preschool-age children made accusations about sexual abuse against the nursery staff. Intense investigation ensued, yet no evidence was discovered to support the children’s claims (e.g., that they were sexually abused in tunnels under the day-care center—no tunnels were found). The prosecution cost millions of dollars and caused great distress for the defendants and families involved.

Generally speaking, age is the strongest predictor of suggestibility and false memory reports; younger children are typically more suggestible and more prone to false memory reports than older children, adolescents, and adults (e.g., Goodman, Bottoms, Rudy, Davis, & Schwartz-Kenney, 2001; Malloy & Quas, 2009). That said, there are important individual differences in suggestibility and misinformation effects within any age-group. Although it is difficult to predict such individual differences, child forensic interviewers should be knowledgeable about the possibility that children may incorporate interviewer suggestions or misinformation and should have appropriate expectations for children relevant to the children’s ages (Lamb, Malloy, & La Rooy, 2011; Malloy & Quas, 2009). It is important for investigators and interviewers to consider how children’s suggestibility can influence their reports.

Suggestibility has been defined as “the degree to which encoding, storage, retrieval, and reporting of events can be influenced by a range of social and psychological factors” (Ceci & Bruck, 1993, p. 404). In the McMartin case, it is largely agreed within the scientific community that the police investigators and parents suggestively questioned the children, which ultimately may have implanted, through misinformation, abuse details in the children’s memories or at least in the children’s reports. This form of suggestibility—that of incorporating misinformation into one’s own memory—not only has crucial legal consequences but it also has important theoretical implications for developmental and cognitive psychology (Ceci & Bruck, 2006; Johnson, Hashtroudi, & Lindsay, 1993; Loftus, 1975; Pezdek & Roe, 1995).

Theoretical Issues

Several theories have been proposed to account for the mechanisms associated with the form of suggestibility that can lead to memory report errors. Memory factors have been emphasized in most of these theoretical accounts. Such factors include trace alteration (Loftus, 1975), trace strength (Brainerd & Reyna, 1998), memory coexistence/retrieval blocking (Bekerian & Bowers, 1983; Eakin, Schreiber, & Sergent-Marshall, 2003), source misattribution (Johnson et al., 1993), and activation-based associative networks (Ayers & Reder, 1998). Although memory factors undoubtedly play a vital role, social factors (e.g., demand characteristics) are also important in producing misinformation effects (Roediger, Meade, & Bergman, 2011).

Cognitive and psychosocial mechanisms that develop throughout childhood bolster one’s abilities to resist suggestion or misinformation. Cognitive and developmental theories assist in identifying the mechanisms that may be associated
with suggestibility’s influence on children’s memory reports (Chae et al., 2011; McWilliams, Bederian-Gardner, Hobbs, Bakanosky, & Goodman, 2012).

From a memory trace theoretical perspective, memories are preserved as traces, a consolidation of current features or attributes related to the person and event. When activated, these traces assist in recalling the details associated with that memory. Pezdek and Roe (1995) asserted that when memory traces are strong (i.e., they contain elaborative details, such as of time, place, individuals involved in the event) and are preserved during memory storage, they will be most resistant to suggestion. Children who have strong memory traces or representations can dismiss externally generated suggestions because they can directly compare information being suggested back to the trace that was recovered and conclude that the two accounts do not match.

However, when traces are weak, children may incorporate suggestions or misinformation because they can no longer counter with their own representations. Pezdek and Roe found support for this claim in their 1995 study examining memories for pictures in 4- and 10-year-old children. Some children viewed target pictures multiple times, which increased the strength of the memory trace through multiple presentations, whereas other children viewed the materials only once. Children then either did or did not receive misinformation by way of researchers reviewing the slides via a narrative. In the misinformation narrative condition, the researcher replaced items that were viewed with items that were not originally viewed (e.g., suggesting the picture item included a cup when in reality it was a dish). In addition to finding typical age differences, with older children recognizing pictures with greater accuracy than did younger children, increased viewing time (i.e., multiple exposures and increased memory strength) resulted in the 4- and 10-year-olds being more accurate and less suggestible than children who had viewed the pictures only once. The minimal exposure left weaker memory traces that enabled them to be tampered by the researcher’s suggestions.

This idea of strong versus weak traces is also relevant to Brainerd and Reyna’s fuzzy-trace theory (FTT, 2002), which stipulates a dual process model for memory encoding and retrieval processes. Memories are represented as either verbatim traces, which hold specific details about the memory, or gist traces, which hold the general meaning of the memory. An example of a verbatim trace would be remembering that you went to the movie Titanic, with your friend Jon, and ate popcorn at the theater; the gist trace would include the details that you went to see a movie with a friend and ate a snack. As verbatim traces hold more details that cannot be maintained for every memory experienced, these traces decay more quickly, often leaving only the gist trace behind. Gist traces are more susceptible to suggestion and misinformation as the original record of the event (i.e., verbatim trace) cannot be recovered to counter the suggestion. This effect is strongest when the suggestion is more similar to the gist trace and cannot be temporally discriminated from the original trace (Brainerd & Reyna, 2004; Reyna & Brainerd, 2011). Abilities to form verbatim and gist traces improve as children develop (Reyna & Brainerd,
2011) with gist trace mechanisms taking longer to develop over childhood than verbatim trace mechanisms (Brainerd, Forrest, Karibian, & Reyna, 2006). Although younger children are more reliant on verbatim than gist traces than are adults, older compared to younger children still have better verbatim traces (e.g., Reyna & Kiernan, 1994). Therefore, older children, who have stronger verbatim traces, should be less suggestible than younger children, according to FTT, although adults may be more subject to certain false memories than children, if the false memories are supported by gist traces (Brainerd, Reyna, & Ceci, 2008).

Source monitoring (SM) theory (Johnson et al., 1993) has also been used to account for children’s suggestibility and misinformation effects. According to SM theory, details for memories are discriminated against one another via a decision process in which one attributes the source of these details using perceptual processes (i.e., perceiving a cue) and cognitive processes (e.g., retrieval strategies). During retrieval, individuals engage in decision processes regarding source information (where, when, what, and with whom details of events). Cues that are retrieved are evaluated with reality monitoring (i.e., deciding if the detail actually occurred in reality or if it was imagined), internal monitoring (i.e., deciding if details actually occurred or only were thought about), and external monitoring (i.e., deciding if details were from this event or another event) processes. The SM theoretical framework assumes that certain cognitive abilities are in place to assist retrieval during more difficult monitoring times (e.g., decision making, metamemory strategies). Such abilities change and improve in children as they develop (e.g., Bjorklund, Dukes, & Douglas-Brown, 2008; Ghetti, 2008; D. S. Lindsay, 2002). For example, Poole and Lindsay (1995) examined source monitoring in the context of children’s suggestibility when children were exposed to misinformation introduced via parents. Their study examined memories of children between the ages of 3 and 7 for a one-on-one experience with “Mr. Science” wherein the confederate, Mr. Science, demonstrated several activities for the children. Following these interactions, each child was interviewed in a nonsuggestive manner (i.e., interviews began with free-recall prompts followed by open-ended prompts, “Can you tell me more about that?”) about what had happened. In this immediate interview, children were highly accurate in their reports.

In the weeks that followed this initial interview, the parents of child participants were asked to read a story about Mr. Science to their children. This story included events that happened during each child’s initial interaction with Mr. Science as well as new events that had not been originally experienced. Children were interviewed again, only this time interviews contained misleading questions that included information provided only in the story (e.g., “Did you make paper airplanes with Mr. Science? Tell me more about when you made paper airplanes with Mr. Science”). Children, particularly younger ones, incorporated information that they had heard, but had not experienced, into their free-recall reports (e.g., approximately 41% of 3- and 4-year-olds included details of false events) and succumbed to direct misleading questions. Children were also asked source monitoring questions about
whether they had actually witnessed the activities or heard about the events in the stories. The younger children had considerable difficulty with the source monitoring task. This study is often cited as an indication that children can be led into false reports through source monitoring errors. In this study and others, according to SM theory, younger children likely did not have the cognitive abilities to monitor the source of the information experienced in the event versus suggested by their parents or the interviewer) well enough to answer the questions correctly. However, it is important to note that even young children, despite making more errors than older children, appropriately reject many of the false event details in most of these studies (e.g., Goodman et al., 2001).

False memories of entire events also can be formed based on suggestibility. False memory formation has been explained by theories previously mentioned. Like suggestibility, the ease with which false memories can be implanted tends to decline as children age and acquire more cognitive abilities that allow them to create lasting memories and monitor intrusions (e.g., Ghetti, 2008; Otgaar & Candel, 2011). However, older children and adults succumb to false memories as well (e.g., Loftus & Pickrell, 1995). With ecologically valid false memory paradigms that parallel eyewitness abilities (see Otgaar & Candel, 2011), false memories are more frequently observed in younger compared to older children (but see articles on the Deese-Roediger-McDermott (DRM) false memory illusion; Brainerd, Reyna, & Zember, 2011). It is likely that older children’s experiences and improvements in cognitive abilities permit them to evaluate the plausibility of suggested events.

For example, Pezdek and Hodge (1999) examined instances of false memory in a sample of younger children (5- to 7-year-olds) and older children (9- to 12-year-olds). Children were read four descriptions of events they were instructed they had experienced. In reality, they had only experienced two of these events. After hearing these descriptions, children were asked to remember every detail they could about these events. The latter false events consisted of a plausible event (i.e., getting lost in the mall) or implausible event (i.e., receiving a rectal enema). After hearing these descriptions of the four events, younger children were more likely than older children to recall details from both false events. Although some older children did recall details from the plausible event, none of the older children succumbed to false-memory intrusion of the implausible event. However, some younger children did report false memories of the rectal enema experience. It is possible that the older children were more likely than the younger children to evaluate the plausibility of the events.

So far, we have mainly discussed suggestibility and false memory trends as they relate to theoretical issues. However, it is important to review empirical evidence concerning misleading questions and repeated interviews specifically, because these topics are of considerable legal concern. Our discussion is not exhaustive of all the factors that affect children’s memory, suggestibility, and false memory formation (for review, see Blandon-Gitlin & Pezdek, 2009; Bruck & Melnyk, 2004; Malloy, Johnson, & Goodman, 2013; Malloy & Quas, 2009).
Since the mid-1980s, children’s suggestibility has been examined in relation to interviewer question type, specifically using interviews that include misleading questions about the event the child is recalling. In these paradigms, researchers have children (often preschool age) participate in controlled events and, after a specific period of delay, interview them suggestively. That is, questions asked by the interviewers presuppose or introduce false information about the event to examine whether children acquiesce to these suggestions or appropriately deny them (e.g., the question “Did you see the man knock over and break the lamp?” presumes that the man did knock over and break a lamp). Children’s suggestibility is then scored or characterized by the likelihood or frequency of acquiescence to interviewer suggestions. Typical age trends emerge under this experimental paradigm; older children are less suggestible than younger children, as older children acquiesce less frequently, regardless of whether the event is distressing (e.g., Goodman et al., 1997; Peterson, 2011) or commonplace (e.g., Quas et al., 2007). However, it should be noted that children are often less suggestible about personally significant negative events (e.g., being hit, being naked, having their private parts touched) than about more mundane or positive experiences (Rudy & Goodman, 1991; Schaaf, Alexander, & Goodman, 2008). In some studies, even 4-year-old children’s rates of false affirmation to abuse-related questions were extremely low (Rudy & Goodman, 1991).

A classic study by Leichtman and Ceci (1995) examined preschoolers’ memories for a benign event. The children, ages 3 to 6 years old, experienced a visitor (i.e., a confederate) come into their day-care center who was introduced as “Sam Stone.” He stayed a short time and then waved goodbye as he left. Children were subsequently interviewed weekly for 10 successive weeks to examine effects of misinformation (i.e., false events) and stereotypes (i.e., negative information about Sam) on children’s reports. Children were assigned to one of four interview conditions: (1) a control condition (i.e., contained no misleading questions), (2) a suggestive condition (i.e., contained false misinformation, “Did you see Sam rip the book?”), (3) a stereotype condition (i.e., contained no misleading questions, but negative information about Sam was presented to the children before his visit: “Sam is always getting into accidents and breaking things”); and (4) a stereotype coupled with suggestion condition. Ten weeks after Sam Stone’s visit, children were given a final interview in which they were asked to freely recall his visit and then to respond to probed questions that included previously suggested material (i.e., that Sam had ripped a book apart during his initial day-care visit).

Results indicated that, at the final interview, younger children acquiesced to interviewers’ previous false suggestions more frequently than did older children, both in free recall and in response to probed questions. However, children in the control condition, who were not subjected to stereotypes or suggestions in the weeks following Sam’s visit, were less likely to incorporate false events (e.g., Sam had ripped a book) or report stereotypes (e.g., Sam is clumsy) than were children
in the suggestion, stereotype, or suggestion and stereotyped conditions. The latter of these conditions proved to be where children made the most errors: They were more likely to include stereotyped information during their free recall accounts as well as acquiesce when asked probed questions.

Although these data indicate that children succumb to suggestion when misleading questions are asked, it is difficult to know whether the memory of the event has changed or whether the report of the memory has changed. That is, when children incorporate suggestions in their reports, does this occur because they are experiencing pressure from the interviewer or because their memory of the event has been distorted? This can be a crucial legal issue.

In a similar vein, do these studies accurately portray interviewer–interviewee conversational nuances that characterize forensic interviews with children? Gilstrap and Ceci (2005) addressed this concern by highlighting that most of the laboratory studies assessing children’s suggestibility do so by way of structured interviews in which all the questions are predetermined by the researchers; these interviews are imposed to ensure the scientific merit (i.e., internal validity) of the research. Results from studies that use structured interviews may not apply to forensic interviews wherein interviewers typically are not supplied with a standardized set of questions. Rather these interviews are driven not only by the interviewer’s agenda but also by the child’s report.

Gilstrap and Ceci (2005) argued that these child-to-adult influences are important to address. In their study, 3- to 7-year-olds were interviewed about an event the children had experienced in the previous week. Interviewers questioned the children about the event and were supplied with descriptions of things that might or might not have occurred, similar to the context in which a forensic interviewer might operate when interviewing a child suspected of being abused. In contrast to children succumbing or agreeing with interviewer suggestion as found in several studies (e.g., Leichtman & Ceci, 1995; Poole & Lindsay, 1995), children in the Gilstrap and Ceci (2005) study were more likely to respond to misleading questions with denial. Instead of interviewer bias predicting children’s acquiescence, the children’s own behavior preceding the misleading question was more strongly predictive of whether they succumbed to suggestion. These findings were obtained by a novel approach of analyzing children’s reports, as they occurred in a transactional exchange throughout the interview, rather than considering only the immediate antecedent (i.e., interviewer’s misleading question) of a child’s error. Such statistical designs appear to be particularly ecologically valid as applied to forensic interviews, although more research is needed to validate these findings and tease apart additional effects that children’s reports may have on the type of questions interviewers ask.

It would be an error to assume that empirical studies using structured interviews are flawed. Researchers should embrace multiple approaches to fully understand conditions that minimize or exacerbate children’s suggestibility. And there may be multiple suggestive influences on children. Garven and colleagues contended that it
is not only misleading questions that influence adults’ and children’s suggestibility but the additive factors of reinforcement, social pressure, and imagery (Garven, Wood, & Malpass, 2000).

In the study by Garven et al. (2000) that employed techniques modeled after those observed in the McMartin case interviews, children were questioned about a visit from Paco Perez, a confederate they had witnessed the previous week. Children, ages 5 to 7 years, were interviewed about mundane and unusual events that allegedly occurred during Paco’s visit using one of four approaches: (1) reinforcement (i.e., praise when they agreed and disappointment when they disagreed with interviewer suggestion), (2) co-witness (e.g., “The other kids say Paco took them to a farm. Did Paco take you to a farm?”), (3) reinforcement and co-witness, or (4) a control condition. Here additive factors of reinforcement and social pressure (i.e., effect of co-witnesses) were included to mimic the dynamics in the McMartin preschool case. When interviewed about mundane events, children answered yes to 35% of the misleading questions when they received “reinforcement” from the interviewer compared to a 12% rate when children did not receive reinforcement. This gap between groups widened when children were asked about unusual events; children answered yes to 51% misleading questions compared to 5%, respectively. Moreover, children succumbed to suggestion when they were told that other children reported these same details, yet only for mundane events. Co-witness accounts and reinforcement did not significantly interact, but this research demonstrates that interviewer bias may be conveyed not only through misleading questions but also through such factors as reinforcement. Note that reinforcement that is contingent on a child’s response is different from rapport building between interviewer and child eyewitness, which decreases children’s suggestibility, particularly when recalling distressing events (e.g., Quas & Lench, 2007).

As researchers attempt to replicate real-world circumstances, some have acknowledged that the person to whom children most often disclose certain crimes (e.g., child sexual abuse) is a nonoffending parent, typically mothers. Few parents have training in interviewing child eyewitness, yet their collection of their children’s statements holds forensic significance for whether children’s reports will be seen as believable. Therefore, researchers should study the veracity of eyewitness statements when children disclose to a familiar person, such as a parent.

Goodman, Sharma, Thomas, and Considine (1995) addressed this concern by examining whether 4-year-olds’ reports were influenced by who interviewed them: Mother- and stranger-interviewers were told that the children had participated in play activities with a researcher, with half of the interviewers receiving falsely biasing information about these activities. Interviewers who received biased information asked more misleading questions than those who did not receive such information. This in turn influenced the children’s reports, but only when the interviewer was a stranger: Children made more errors and were less accurate in their reports to strangers but remained accurate in their reports to their mothers. Similar results have been reported elsewhere (e.g., S. Jackson & Crockenberg, 1998).
These findings suggest that children, when comfortable and familiar with the interviewer, correct errors and resist suggestion more easily than with a stranger. These findings offer further support for the importance of rapport building between the interviewer and child eyewitness as well as researchers examining the full range of ecologically valid factors that may influence children’s suggestibility: Research on the effects of misleading questions should address not only what is asked but also how it is asked and by whom.

REPEATED INTERVIEWS

In the forensic context, children are often interviewed repeatedly. For example, first responders, police detectives, social workers, prosecuting and defense attorneys, clinicians, and judges may all need to question child eyewitnesses. It is therefore important to determine whether repetition has deleterious, harmless, or positive effects on the accuracy of children’s reports.

There are several reasons to suspect that repeated interviews may increase errors in children’s reports, especially if misinformation is included in the interviews. For example, SM theory predicts that with each additional interview, children will have more difficulty monitoring whether information or details were actually experienced or were suggested in previous interviews (e.g., Malloy & Quas, 2009; Poole & Lindsay, 1995). In the study described earlier (Leichtman & Ceci, 1995), children were repeatedly interviewed about Sam Stone’s visit to their day care. Children who were given repeated erroneous information made more errors than children in the control condition who were only questioned suggestively during the last interview. The researchers interpreted these findings as evidence that repeated erroneous information (whether encountered during the interview process or elsewhere) can negatively affect children’s reports, whereas children who are interviewed without suggestions or stereotypes can be capable of providing accurate reports.

In contrast, however, others argue that repeated interviews (even those with misleading questions) do not necessarily have negative effects on children’s reports and, under certain conditions, that they actually may assist children in denying new false information by solidifying accurate memories reported previously (e.g., Goodman & Quas, 2008). Repetition of a report may permit children to rehearse their accounts and strengthen or create lasting memory traces, thereby decreasing their chances of succumbing to suggestion or answering misleading questions incorrectly. Quas et al. (2007) found support for this notion: Children, ages 3 and 5, experienced a nonstressful event (playing alone in a room) and were subsequently interviewed either once (after 3 weeks) or three times (weekly up to 3 weeks) about the event. Additionally, biased interviewer manipulations (e.g., providing misinformation through comments and misleading questions) were included in the experimental design. Children who were interviewed once after a 3-week delay made the most errors, particularly when questioned by a biased interviewer.
Of special interest, children who were interviewed multiple times, even when misleading comments were provided and misleading questions were asked, maintained accuracy and reported fewer errors compared to children who received one misleading interview after a delay. This finding suggests that suggestibility effects are more problematic when children’s initial memories are weak. Researchers should therefore avoid overgeneralized assumptions that repeated interviews compromise children’s memory accuracy; instead, these findings should enlighten debates on the complexity of factors influencing children’s reports and their interactive or culminating effects (delay since the event, number of previous interviews, exposure to misinformation, etc.)

INDIVIDUAL DIFFERENCES IN CHILDREN’S MEMORY AND SUGGESTIBILITY

Considerable attention has been paid to individual difference predictors, aside from age, of children’s memory and suggestibility. In legal cases, the question is typically whether the child witness before the court is likely to be accurate, not whether children of a certain age in general tend to be accurate. Thus, being able to determine whether a particular child is accurate is of considerable legal interest. Unfortunately, in research studies, even when significant correlations are uncovered, the predictors account for relatively little variability in performance and thus are not particularly informative for the courts in evaluating a specific child’s accuracy. Here we review a few individual differences that have been examined in child witness research.

INTELLIGENCE

As a possible individual difference that might be related to the accuracy of children’s eyewitness memory, intelligence has captured empirical attention, although the findings are somewhat mixed. Some studies uncover support for intelligence as a predictor of suggestibility (e.g., Chae & Ceci, 2005) whereas others find no support of such a relation (e.g., Geddie, Fradin, & Beer, 2000). Geddie et al. (2000) reported that intelligence was positively associated with children’s accuracy and negatively associated with children’s suggestibility. However, after controlling for additional factors, such as children’s race, age, and socioeconomic status (SES), the relation between intelligence and suggestibility was no longer statistically significant. However, some studies that included both intelligence and other sociodemographic variables still found that intelligence significantly predicted children’s suggestibility (e.g., McFarlane, Powell, & Dudgeon, 2002). For example, McFarlane et al. (2002) examined 220 preschoolers’ suggestibility in relation to their intelligence using a standardized suggestibility measure (i.e., Video Suggestibility Scale for Children). Children with higher intelligence were less suggestible than children with lower
intelligence. Intelligence accounted for 6% of the variance observed in children’s suggestibility scores, whereas SES, although still significant, accounted for less than 3% of the variance.

In their meta-analytic review of individual difference factors that may influence children’s suggestibility, Bruck and Melnyk (2004) concluded that studies that report a significant association between intelligence and suggestibility include a wide range of variability in intelligence scores among young children, mostly preschool age (e.g., Chae & Ceci, 2005; McFarlane et al., 2002; Young, Powell, & Dudgeon, 2003), whereas studies finding no such relation tend to include primarily older children of average or above-average intelligence (e.g., Burgwyn-Bailes et al., 2001; Eisen et al., 2007; but see Roebers & Schneider, 2001). Additionally, Bruck and Melnyk (2004) argued that studies that have found that intelligence relates to children’s memory reports and suggestibility include individuals with developmental delays. Thus, intelligence appears to be somewhat predictive of the accuracy of children’s reports, but primarily when studies include developmentally delayed individuals compared to individuals scoring in the normal ranges of intelligence.

It may be that intelligence can influence a younger child’s report but be less influential in the case of older children of average or above-average intelligence (Bruck & Melnyk, 2004). For older children at least, this suggests that the relations between intelligence and memory and suggestibility are nonlinear: Intelligence levels that are below average will be associated with increased suggestibility whereas intelligence levels that are average or above average will have no significant relation to an individual’s suggestibility. This idea was tested by Gignac and Powell (2006), who examined 158 children’s intelligence and suggestibility. There was a nonlinear quadratic relation between children’s intelligence and their suggestibility performance. That is, the relation between intelligence and suggestibility was linear until a certain point (i.e., an IQ score of 105). Around this mid-average range, the relation plateaued. Intelligence was significantly associated with suggestibility only when intelligence was low. Individuals with particularly lower intelligence may be more suggestible; however, intelligence is unrelated to suggestibility in persons of average to above-average intelligence.

**VERBAL ABILITY**

Although age is linked with verbal abilities, there are wide variations in verbal abilities even when controlling for age statistically or comparing children who are the same age. One might expect that because reporting of past events and responding to interviewer questions in the forensic context are, in effect, verbal conversations, children who have a better understanding of communicative nuances, receptive and expressive language skills, and bigger vocabularies may be better able to articulate their experiences than children who have more limited verbal abilities. Furthermore, verbally skilled children should be able to identify incorrect suggestions put forth by the interviewer (Pezdek & Roe, 1995).
Generally, research reveals that children’s proficiencies in communication assist them in being more accurate in recalling past experiences and more resistant to suggestions from others. For example, Clarke-Stewart, Malloy, and Allhusen (2004) examined 5-year-olds’ verbal abilities in relation to the suggestibility of their reports about a staged event witnessed approximately 9 months previously. Children were interviewed by a “leading” interviewer, who asked leading questions (e.g., “Where did he touch you?”) and accepted any response put forth, or by a “suggestive” interviewer who asked follow-up questions when the children’s answers did not conform to the interviewer’s suggestions (e.g., Interviewer: “And did he touch your bottom?” Child: “Nope.” Interviewer: “No? Didn’t he touch you on your behind?”). Children’s verbal abilities (i.e., a composite score of their receptive and expressive language abilities) and aptitude for effectively communicating with adults (i.e., the child’s score from the Adaptive Language Inventory questionnaire) were inversely related to overall suggestibility, as indexed by children’s responses to misleading interview questions. Additionally, children’s abilities to effectively communicate with adults were also inversely related to whether they succumbed to interviewer suggestions in both the “leading” and “suggestive” experimental groups. These results imply that children with greater verbal skills were more accurate and less suggestible than their peers.

However, in other studies, no significant associations emerged between verbal skill and suggestibility (e.g., Bright-Paul & Jarrold, 2009; Quas & Lench, 2007), and the opposite effect has even been reported, with verbal skills being positively associated with children’s increased suggestibility (e.g., Kulkofsky & Klemfuss, 2008). For example, in Kulkofsky and Klemfuss’s (2008) study, 3- to 5-year-olds who produced high-quality verbal autobiographic memory narratives were more suggestible during their memory interview. That is, children who provided more elaborative details about their own past experiences incorporated more interviewer suggestions when reporting details about a staged event.

This inconsistency could in part be due to methodological differences in how the type of verbal ability (e.g., vocabulary, receptive language, narrative quality) was assessed. For example, Quas and Lench (2007) examined 5- to 6-year-olds’ memories of a fear-eliciting video clip they watched the preceding week. Children’s verbal abilities were assessed using a receptive vocabulary test (i.e., the Peabody Picture Vocabulary Test [PPVT]). No significant relations were observed between children’s scores on the PPVT and their memory accuracy or suggestibility. However, only a single measure of language assessment, primarily one that tapped receptive vocabulary, was employed. Studies that do find significant associations (e.g., Clarke-Stewart et al., 2004) tend to include more global assessments of children’s verbal competencies. One such type of assessment is the quality of the narrative reports supplied by children as they recall their past. In this approach, narrative quality may provide a comprehensive view of children’s verbal fluency as it pertains to the accuracy of their reports (Peterson, 2012).
DISCLOSURE OF ABUSE

In the following section, we discuss various factors associated with disclosure. These include reasons children may delay or avoid disclosing abuse, types of emotions children typically express during disclosure, and possible determinants of lying during disclosure.

FACTORS AFFECTING DISCLOSURE

Children often delay disclosing sexual abuse (London, Bruck, Ceci, & Shuman, 2005). In fact, in an analysis of 10 retrospective studies on the topic, London et al. (2005) reported that an average of only 39% of adults who reported being sexually abused indicated they had disclosed the abuse during childhood. Children may be hesitant to disclose even when there is photographic or video evidence (Paz-Alonso, Ogle, et al., 2013). Research on children’s disclosure and factors that impede it have focused on socio-motivational factors rather than cognitive characteristics, and reveal that sexually abused children delay disclosure for a number of reasons, which may vary as a function of age (e.g., Goodman-Brown, Edelstein, Goodman, Jones, & Gordon, 2003; Malloy, Lyon, & Quas, 2007).

Children may be less likely to disclose if a parent or caregiver is the perpetrator (Lyon, Ahern, Malloy, & Quas, 2010). Lyon and his colleagues examined the responses of 299 maltreated and nonmaltreated 4- to 9-year-olds to hypothetical vignettes of children experiencing misdeeds by an authority figure (i.e., parent, teacher, or stranger). After each vignette, children were asked whether the child in the vignette should report the wrongdoing to another adult or comply with the authority figure to keep it a secret. Children were more likely to disclose when the authority figure was a stranger than a parent. Additionally, younger maltreated children endorsed disclosure less frequently than nonmaltreated children, particularly when a parent was described as the perpetrator.

Correlates of delays in disclosure have been identified in studies of maltreated children (e.g., Goodman-Brown et al., 2003). In child sexual abuse cases, older children are more likely to delay disclosure when they fear that negative consequences (e.g., punishment, embarrassment) would ensue for them or a third party (who was not an offender), such as a sister. Older children were also more likely to report that they perceived themselves to be partially responsible for the abuse. Malloy, Brubacher, and Lamb (2011) uncovered a similar finding in their examination of factors predicting children’s and adolescents’ (5 to 13 years old) disclosure of sexual abuse: Children who mentioned fear of negative consequences (e.g., punishment, embarrassment) delayed their disclosures, again only when these consequences would have affected them or innocent others (e.g., siblings), not the perpetrator. However, according to the London et al. (2005) review, although it may seem logical that when children are more fearful after sexual abuse, they are less likely to disclose, in fact, children are more likely to disclose when sexual abuse involves fear and physical injury.
EMOTIONAL EXPRESSION DURING DISCLOSURE

There are apparently numerous misunderstandings among laypeople about how children disclose sexual abuse. For example, demeanor during disclosure often is used to assess the credibility of child victims (Myers, Redlich, Goodman, Prizmich, & Imwinkelried, 1999; Regan & Baker, 1998). Yet research indicates that, during forensic interviews, children appear less upset than might be expected. Wood, Orsak, Murphey, and Cross (1996) analyzed child sexual abuse interviews of children age 2 to 11 years for emotions and attentiveness. Children were most often rated as relaxed or neutral; however, girls did display more sadness than boys. Sayfan, Mitchell, Goodman, Eisen, and Qin (2008) rated 3- to 16-year-olds’ affect while they were being interviewed regarding maltreatment (for which there was corroborating evidence). Although children alleging sexual abuse were more likely to be upset than children alleging other forms of abuse, most children were not rated as emotional, and most (98%) did not cry. Compared to children who suffered less severe abuse, children who suffered more severe maltreatment (e.g., over a longer period of time) were less likely to display intense emotion. In a direct comparison of disclosers and nondisclosers of abuse, Katz et al. (2012) examined interviews of 40 victims of abuse for whom there was substantial external evidence that the abuse had occurred. Although positive emotions decreased as the interview progressed, there was no difference in positive emotions displayed by disclosers and nondisclosers. Castelli, Sayfan, Mitchell, Culver, and Goodman (2005) also found that, during forensic interviews, positive emotions decrease from the rapport building to the disclosure phase of the interview. Additionally, both disclosers and nondisclosers have shown instances of negative emotions such as shame and guilt when interviewed as adults about child sexual abuse (Bonanno, Noll, Putnam, O’Neill, & Trickett, 2003). The overall picture indicates that, during abuse interviews, children show less emotion than possibly expected. However, they do, on average, show some negative emotions, and their displays of emotion vary over the course of the interviews and as a function of abuse severity.

LYING

When a child discloses information to authorities, concerns may be raised about the child’s honesty. There are many legal situations in which children may be motivated to lie (e.g., if coached not to reveal a parental transgression). An antisocial lie is specifically meant to protect oneself from harm or to provide oneself with personal gain (Talwar & Lee, 2008a). Although children’s antisocial lies can certainly play a role in legal cases (e.g., when the child is accused of delinquent acts), when the child is a witness or victim, concerns usually center on the child being coached to knowingly make a false allegation (e.g., in a custody case, to accuse the father of sexual abuse so that the child can stay with the mother) or protect a culprit who has asked the child to lie or keep a secret.
Lying appears to develop through three main stages: (1) beginning to make untrue statements at around 2 to 3 years of age, (2) lying to conceal one’s own transgressions at 3 to 4 years of age, and (3) being able to maintain lies at 7 to 8 years of age (Talwar & Lee, 2008a). The development of children’s lie-telling is related to Theory of Mind ability (Talwar, Gordon, & Lee, 2007) and executive functioning (Talwar & Lee, 2008b). Of interest, most research has not shown a relation between understanding of lying and actual lying to conceal a transgression (London & Nuñez, 2002; Talwar, Lee, Bala, & Lindsay, 2002). However, understanding of lying was related to lie telling when it involved concealing a transgression by a parent (Talwar, Lee, Bala, & Lindsay, 2004) or when lie telling involved maltreated children making a false allegation (Lyon & Dorado, 2008).

A forensically relevant question with respect to children’s lying is whether the lie is to conceal a transgression committed by someone emotionally close to the children. Children may be unlikely to lie to conceal the transgression of a relative stranger, although younger children are more likely to do so than older children (Pipe & Wilson, 1994). Talwar et al. (2004) examined whether 3- to 11-year-old children would cover up their parents’ transgression and found that most children would disclose the transgression even with the parent in the room at the time of the interview. However, the children were more likely to lie to protect a parent if they themselves could not be blamed for the transgression. In a study of 3- to 6-year-olds, Bottoms, Goodman, Schwartz-Kenney, and Thomas (2002) reported that older children told to keep a secret by their parents were more likely to withhold information about their parents’ transgressions than older children who were not told by their parents to keep the acts a secret. Although such findings provide important insight about children’s lying behavior, it should be noted that the transgressions in these studies were quite mild (e.g., breaking a toy). The dynamics could well change for lies about more serious acts, such as child maltreatment and other types of violent crime.

Children can and do lie to protect themselves and to protect others. When children are lying in such a manner, can these lies be detected? Most studies indicate that adults are not accurate at detecting children’s lies (Crossman & Lewis, 2006; Goodman et al., 2006) and that they are no better at detecting children’s lies than adults’ lies (Goodman et al., 2006). Coached lies by older children may be particularly difficult to detect (K. L. Warren, Dodd, Raynor, & Peterson, 2012). However, Nyssse-Carris, Bottoms, and Salerno (2011) found that adults could detect 3- to 6-year-old children’s lies about their parents’ transgressions at above chance levels. A goal for future research is to better explain the difficulty in detecting children’s lying.

FACE RECOGNITION AND CHILDREN’S EYEWITNESS IDENTIFICATIONS

Eyewitness identifications are crucial in the forensic context. Legal authorities need to know who committed the crime in question. Often when children are victims of or bystanders to crime, they may be presented with a photo lineup or a live lineup
and asked to identify the culprit. Considerable research has examined factors that affect children’s eyewitness identification accuracy.

At the start of this chapter, we described the case of David Wiggins, who had been convicted of raping a 14-year-old girl and who spent over 20 years in prison before being DNA exonerated. The girl had identified him after seeing his picture in a mugshot booklet. Research psychologists would say that the identification procedure was problematic because of phenomena termed “unconscious transference” and “mugshot commitment” (Deffenbacher, Bornstein, & Penrod, 2006). The victim tentatively identified Wiggins in a photo lineup, then subsequently identified him in a live lineup. Because he was the only person who was in both lineups, it is likely that Wiggins looked familiar to the victim because she had already seen him in the photo lineup and unconsciously (mentally) transferred him from the photo lineup to the crime. When she saw him in the courtroom and identified him again, he was even more familiar to her, because she had identified him twice before. (For further discussion of these and related issues, see Ross, Tredoux, and Malpass, Chapter 17 this volume.)

Child bystanders (as opposed to child victims) may also be asked to make identifications. In Northern California, a 10-year-old girl heard some men walking up the stairs in her apartment building and caught a glimpse of their faces as she peeked out the window. She looked again about 30 minutes later when she heard them leaving a neighbor’s apartment. The neighbor was later found dead. The police investigation revealed several suspects, so the officers showed the 10-year-old girl photo lineups that included the suspects. She readily identified them. Her testimony, which was corroborated by other evidence, was crucial at the murder trial.

**Face Processing and Recognition**

Before discussing how research can inform police lineup procedures for child witnesses, we first briefly explain the theoretical underpinnings and mechanisms for face processing and face recognition in children and adults, which can affect crucial cognitive processes involved in picking out a suspect from a lineup.

As is true for memory generally, facial recognition improves as children age (Lawrence et al., 2008). Lawrence et al. investigated the relation between face recognition and age in 6- to 16-year-olds. Participants viewed 50 pictures and rated whether faces were “Nice or Not Nice.” Then participants were shown the faces again, only this time each face seen previously was paired with a new, yet similar, face. Participants indicated which face was previously viewed. Facial identification improved from age 6 to 10 years, remained stable up to age 13 years, and then increased again. This age effect remained even after controlling for intelligence, which was also related to face identification accuracy.

What if the 10-year-old girl described earlier was Caucasian and the men coming up the stairs were of a different ethnicity? In fact, that was the case. With age, cross-racial face identification becomes less accurate than same-race facial identification.
Goodman et al. (2007) reported that 5- to 7-year-olds did not show a cross-racial decrement but that older children and adults recognized own-race faces better than cross-race faces. However, infants as young as 9 months old may exhibit an own-race bias (Liu et al., 2011), suggesting that even within the first year, humans may have conceptual models specialized for processing in-group faces. The result is that an out-group bias for facial processing may begin quite early in life.

There has been considerable theorizing about the cross-racial effect. Of interest to this debate, similar effects have been found for cross-gender and cross-age face recognition accuracy.

One of the theoretical accounts for facial biased processing, the contact hypothesis, states that having face-to-face contact with social partners (e.g., caregivers, siblings) enables the construction of mental models for processing features (Scherf & Scott, 2012; Sporer, 2001). Commonalities among faces lead to effective processing strategies when similar features are observed in new social partners. As a result, a Caucasian individual, who has been primarily exposed to other Caucasian faces, will be able to strategically process facial features of individuals who are Caucasian but would struggle processing an Asian individual’s face. This difficulty in out-group face processing presumably occurs because mental models were previously established for the Caucasian face, permitting additional elaboration of individualized facial characteristics; however, the Asian face required additional processing. A similar process is believed to occur for same gender and same race faces. For the child eyewitness, these results suggest that, for older children and perhaps younger ones as well, race effects may influence eyewitness testimony if the victim and perpetrator are of different races and the victim has not been meaningfully and sufficiently exposed to members of the perpetrator’s race. Similar influences are also at play for identification of faces representing different genders and ages from the eyewitness (Scherf & Scott, 2012).

**Eyewitness Identification and Lineup Fairness**

In face identification studies, where theoretical issues are tested, children and adults typically are briefly exposed to photographs of faces both at study and at test. However, in reality, eyewitnesses observe actual people live over extended periods of time, which likely affects encoding and memory. It has therefore been important to examine eyewitness identification in more realistic studies. Such research reveals that, by the age of about 5 or 6, children are often as accurate as adults in identifying people with whom they have interacted when presented with target-present lineups (i.e., lineups that include the target person—the “culprit”). However, when the actual culprit is not in the lineup (i.e., “target-absent” lineups), even older children (e.g., 10-year-olds) are more likely than adults to falsely identify an individual and less likely to report that the target person is not included in the lineup (Pozzulo & Lindsay, 1999). Target-absent lineups are generally more difficult compared to target-present lineups, even for adults (e.g., R. C. L. Lindsay,
Pozzulo, Craig, Lee, & Corber, 1997; Pozzulo & Dempsey, 2006), as individuals may assume that, because they are viewing a lineup, the perpetrator is included. Some individuals have a tendency to guess. This is a serious concern for criminal investigators, as children and adults may assume that the task is to identify one of the choices rather than to judge whether the perpetrator is present at all (Beresford & Blades, 2006; Humphries, Holliday, & Flowe, 2012).

Eyewitness identification procedures have received heavy criticism for improper or suggestive methods that could taint an eyewitness’s memory (e.g., Wells & Loftus, 2003; Wells & Quinlivan, 2009). Research has identified several factors that promote the fairness of lineups, such as foils appearing similar to the suspect, clear pre-lineup instructions (e.g., “The perpetrator may or may not appear here”), and avoiding use of authority approval or confirmation (Wells & Loftus, 2003). Given children’s greater suggestibility compared to adults, such factors may be particularly important when children are subjected to lineup procedures.

This research has also revealed that simultaneous lineups, wherein the suspect is viewed simultaneously among other foils, have the potential to be suggestive. For example, if the “suspect” is truly innocent yet the foils in a simultaneous lineup do not match the eyewitness description, then the “suspect” is more likely to be falsely identified by mere fact that he or she looks the most like the actual suspect compared with foils who do not match the eyewitness’s description.

Instead of simultaneous lineups, it is suggested that investigators show eyewitnesses a sequential lineup, with the eyewitness making a yes/no judgment for each person. In this way, eyewitnesses are more likely to compare the photograph to their memory representation of the culprit and make an “absolute” rather than “relative” judgment. This method decreases rates of picking the person who looks most like the perpetrator (Wells & Loftus, 2003). Similar success has been demonstrated using an elimination paradigm wherein individuals are asked to eliminate individuals from the lineup who do not match the target (Pozzulo & Lindsay, 1999). This approach has demonstrated some success, with decreasing instances of false identifications in both target-present and target-absent lineups, particularly for children and adolescents (e.g., Pozzulo, Dempsey, & Crescini, 2009; Pozzulo & Lindsay, 1999).

A study by Beresford and Blades (2006) tested whether 6- to 10-year-olds would benefit from receiving instructions prior to presentation of both target-present and target-absent standard lineups. After witnessing a staged theft, children were instructed that they would view a series of individuals (with format of individuals varying between either static pictures or live videos) and that the thief may or may not be included. This latter portion of the instructions was heavily emphasized, with children receiving instructions that false identifications would lead to negative consequences for that individual. Children who received such cautions, regardless of age, made fewer false identifications than children not so instructed. Additionally, these instructions did not decrease the rate of accuracy for children in target-present conditions. That is, the instructions decreased children’s false identifications on
target-absent lineups while at the same time did not adversely influence children’s identifications on target-present arrays. These results are quite promising. However, beneficial effects of instruction were not observed for elimination lineups.

Researchers should address such discrepancies to identify the most effective means of administering lineups to children. Moreover, instructions to improve lineup performance in young preschoolers (e.g., 3-year-olds) still are sorely needed.

**JURORS’ REACTIONS TO CHILD EYEWITNESSES**

When children testify in court at jury trials, judges and jurors have the difficult task of assessing the accuracy of the children’s testimony. Characteristics of children and of the jurors themselves may affect whether children are believed or not. In some types of cases, such as in child sexual abuse trials, jurors claim they consider child-victim characteristics to be the most important evidence (Myers et al., 1999). It is thus important to understand legal decision makers’ reactions to child witnesses. Much of the research in this area has focused on child victim-witnesses in sexual abuse trials. This is in part because, at least in the United States, children are most likely to testify in criminal proceedings when they are victims of sexual abuse (Goodman, Quas, Bulkley, & Shapiro, 1999).

In mock jury research, two of the most widely studied victim characteristics have been age and gender of the victim. The effects of victim age on jury decisions differ depending on whether witness competence or witness honesty is emphasized (Bottoms, Golding, Stevenson, Wiley, & Yozwiaik, 2007). Young children are viewed as less credible than older children and adults when issues of competence (e.g., memory or suggestibility) are stressed because young children are viewed as less accurate in remembering (Leippe & Romanczyk, 1989). In contrast, younger children are viewed as more credible when issues of honesty and sincerity are emphasized (Ross, Miller, & Moran, 1987) as well as issues of sexual naïveté (Bottoms & Goodman, 1994). As such, younger children may be viewed as more credible than older ones when they are the victims of sexual abuse (Ross, Jurden, Lindsay, & Keeney, 2003). The perception of sexual naïveté also leads mock jurors to view children as more credible when they are testifying about sexual abuse as opposed to nonsexual offenses (McCauley & Parker, 2001). Nightingale (1993, experiment 2) varied the age of the victim in a corroborated sexual abuse scenario from age 6 to age 14, and, as age increased, victims were viewed as less credible. By manipulating the age of the victims incrementally, Wright, Hanoteau, Parkinson, and Tatham (2010) were able to determine more precisely at what ages perceptions of children’s honesty and cognitive abilities changed. Observers’ perceptions of memory reliability increased from ages 3 to 6 but then plateaued whereas perceptions of honesty increased until age 11 but then decreased.

In real trials, child victim gender has not been consistently found to be as influential on jury decision making as child age (Myers et al., 1999). However, there
is some evidence that law enforcement officers and rape crisis counselors once believed male victims of sexual abuse to be weak and effeminate and likely to enjoy sexual assault (Donnelly & Kenyon, 1996). It is hoped that such views have changed in the years since that study was undertaken. Most statistically significant effects of child victim gender on mock jurors’ decisions are through interactions with either defendant gender or juror gender. For example, with teenage victims, opposite-gender sexual abuse is viewed as less abusive than same-gender sexual abuse (e.g., Dollar, Perry, Fromuth, & Holt, 2004). Male but not female mock jurors are affected by victim gender (e.g., Clark & Nightingale, 1997), and women mock jurors favor girl victims while male mock jurors favor boy victims (ForsterLee, Horowitz, Ho, ForsterLee, & McGovern, 1999). In some cases, victim gender interacts with both mock juror gender and defendant gender. Quas, Bottoms, Haecerich, and Nysse-Carris (2002) found that female defendants were less likely to be convicted by male mock jurors when the victims of the abuse were boys. However, regarding juror gender, numerous studies reveal that female mock jurors are more empathetic to child victims overall and more likely to believe them in child sexual abuse cases (Bottoms et al., 2007).

Interest in the effects of race and ethnicity has increased in psychology and the law, and this is also true in research on jurors’ reactions to child victims and witnesses. A common stereotype of minorities is of increased sexual promiscuity and experience (Alley, 2012). As a result, jurors may view sexual abuse of minority children as less heinous and might hold the victim more responsible. There have been few studies examining these questions directly, but evidence so far has shown that mock jurors hold Caucasian victims compared to African American or Hispanic American victims as less responsible for their abuse (Bottoms, Davis, & Epstein, 2004).

Victim demeanor is especially important in jurors’ impressions of witnesses, including children. It is considered so relevant by the courts that jury instructions frequently direct jurors to consider facial expressions when judging the credibility of a witness (A. J. Williams, 2008). Adults who had just served jury duty in child sexual abuse trials rated facial expressions and demeanor as being important in forming impressions regarding the child victims’ believability when providing testimony (Myers et al., 1999). In the first part of a two-part study by Regan and Baker (1998), most undergraduate mock jurors expected a 6-year-old female victim of paternal sexual abuse to cry (81%) and show fear (67%) when confronting the defendant. In the second investigation, undergraduates read a scenario in which the 6-year-old female victim was either calm or crying. The crying victim was rated as significantly more credible than the calm victim, and the defendant was more likely to be judged guilty in the crying scenario.

Golding, Fryman, Marsil, and Yozwiak (2003) varied scenarios of female child sexual abuse by the age of the victim (6 or 15 years old) and the emotion displayed (calm, teary, or hysterical crying) in both the text and in line drawings. Participants found the teary victim to be more believable than the calm or the hysterical victim.
and rendered more guilty verdicts in this scenario. The findings point to mild negative emotion as being considered an appropriate level of distress for female victims of child sexual abuse to display. Wessel and Melinder (2012) also varied the age of the female victim (11 or 13 years old) while varying the type of emotion using child actors who portrayed emotions classified as sad, neutral, angry, or positive during a mock police interview. Participants who viewed the videos perceived the crying victim to be the most credible, followed by the neutral victim, the positive victim, and then the angry victim. Overall research on emotions in legal contexts indicates that adult expectations of children’s emotional displays influence how children are judged.

Most studies of jury decision making involve mock jurors, and, as such, methodological issues limit the generalizability of the findings. Although participants are often undergraduate students who are not representative of actual jurors, the use of undergraduate students as opposed to community members has been validated (Bornstein, 1999), and investigators have found little variation between the decisions made by students and jurors (Diamond, 1997). These studies have not examined the differences between undergraduates’ and actual jurors’ decisions when children’s emotion was the variable of interest. A potentially important difference between students and actual jurors or community samples is that students are less likely to be parents, and being a parent might influence the perceptions of children who are victims of abuse.

Presentation medium is also a concern in jury decision-making research. Methods of presentation vary from written transcripts, to videos, to live performances, and although presentation medium has not led to widely different outcomes in mock jury trials (Bornstein, 1999), the use of video or live performances might be of more importance for research examining the impact of emotions on decisions as a video might better convey the victims’ emotional displays. Research that relies on surveys of mock or real jurors does not usually include the deliberation process that takes place in actual trials. Furthermore, factors that influence individual judgments do not always occur in studies of jury decisions (Devine, Clayton, Dunford, Seying, & Pryce, 2001). The methodological limitations of jury decision-making research should temper the interpretations of the results and their extrapolations to the real world. However, this line of research has been invaluable in both identifying the factors that are most likely to influence actual jurors and the areas in which juror expectations contrast with actual child behaviors.

**JURORS’ REACTIONS TO EXPERT WITNESSES IN CHILD ABUSE CASES**

Under certain conditions, psychologists and other professionals may be asked to provide expert testimony in child witness cases (Myers, 1993b). There is growing consensus that expert witnesses can help jurors evaluate the accuracy of children’s testimony (e.g., Bottoms et al., 2007; Quas, Thompson, & Clarke-Stewart, 2005). Nonetheless, it is still a matter of controversy as to the conditions under which
expert witnesses significantly affect jurors’ decision making and verdicts (e.g., Lyon, 2002) and whether their testimony is simply unnecessary or even detrimental. For example, if jurors already know about children’s suggestibility and the factors that lead them to make errors, expert testimony on these topics may result in unwarranted levels of skepticism on the part of jurors (e.g., Lyon, 2002; see also Buck, London, & Wright, 2011).

Most of the studies on expert testimony that we discuss here concern child sexual abuse cases or “repressed memory” cases involving allegations of past child sexual abuse. These studies typically present undergraduate students with vignettes of trials. However, in a few cases, the researcher analyzed actual legal cases (e.g., Read, Connolly, & Welsh, 2006). In an analysis of 29 studies on expert witnesses, Kwartner (2007) demonstrated that there was a small but significant effect on jurors’ verdicts when the testimony was evaluative (pertaining to the witness at hand) rather than educative (pertaining to general scientific information that could assist jurors in their decision making) in nature. Additionally, Gabora, Spanos, and Joab (1993) found that jurors were more in favor of conviction when expert psychological testimony was specific to the child sexual abuse case at issue (e.g., the expert submitted clinical evidence based on an assessment of the alleged victim) rather than general (e.g., the expert offered social framework testimony about rates of child sexual abuse more generally; see also Kovera, Gresham, Borgida, Gray, & Regan, 1997). Conversely, the findings of Crowley, Callaghan, and Ball (1994) suggest that jurors who hear social framework testimony based on scientific literature rate child victims of sexual abuse significantly more favorably in terms of their memory ability, resistance to suggestion, and ability to differentiate fact from fiction, and therefore are more likely to reach a verdict to convict, relative to those jurors who do not hear such testimony.

There are numerous additional ways that expert witnesses might influence jurors’ decision making. For example, Klettke, Graesser, and Powell (2010) found that the coherence of an expert witness’s testimony and the strength of the evidence presented positively affected the credibility of child sexual abuse victims and the likelihood of a guilty verdict. Of interest, the credentials of the expert had no effect on the mock jurors’ perceptions or decision making. Nuñez, Gray, and Buck (2012) reported that providing mock jurors with multiple reasons to doubt hearsay evidence in a child sexual abuse case influenced perceptions of hearsay witness credibility and verdict decisions more than providing reasons for doubting such testimony. Thus, jurors may need more than one reason to alter their verdict behavior.

Expert testimony could also counteract jurors’ misunderstanding of children’s memory and suggestibility. Quas, Thompson, et al. (2005) examined whether expert witnesses are needed to educate jury-eligible adults or if such adults already have adequate knowledge about children’s memory and suggestibility. Participants did not recognize the powerful influence of stereotypic inductions on children’s accuracy as eyewitnesses. It may be that, even if individuals are knowledgeable and skeptical about some aspects of children’s suggestibility, they are less aware
of adverse effects of subtle but still-influential interview manipulations. There was considerable variability in individuals’ knowledge about children’s eyewitness abilities; individuals had both inaccurate and accurate beliefs, which could indicate that expert testimony is potentially important (Quas, Thompson, et al., 2005).

Buck et al. (2011) evaluated whether expert testimony helped mock jurors distinguish between well-conducted interviews and poorly conducted interviews of children in descriptions of sexual abuse investigations. Mock jurors who were provided expert testimony were more likely to render guilty verdicts if the interview quality was good versus poor. However, without such testimony, the mock jurors did not consider forensic interview quality when reaching their verdicts. These findings suggest that expert testimony on interview methods may help laypeople make more informed decisions about the reliability of children’s reports.

Finally, although expert testimony might influence the outcomes of trials involving child witnesses, the effects seem to fluctuate depending on the party that uses the testimony and the facts of the case at hand: defense alone, prosecutor alone, or concurrent opposing experts. Some researchers claim that expert testimony in a trial is associated with decreased rates of convictions as compared to trials in which there were no experts at all (Griffith, Libkuman, Dodd, Shafir, & Dickenson, 2002; Read et al., 2006). When defense experts alone testify, there are even more reductions in guilty verdicts, as studied in “historic” child sexual abuse cases involving adults who testify about their childhood abuse experiences (Read et al., 2006). This is probably explained by the fact that defense experts most likely raise issues of reasonable doubt regarding the reliability of eyewitness memory (Connolly, Price, & Read, 2006). However, when the juries are exposed to competing experts, there is no overall effect on trial verdicts (Read et al., 2006).

ACCOMMODATIONS FOR CHILD WITNESSES

Concern about child witnesses experiencing secondary trauma while testifying has resulted in the development of court modifications and system interventions to reduce such trauma (Hall & Sales, 2008). Protective services and legal interventions to ameliorate child witness trauma alleviate children’s emotional distress, promote the well-being of child victims, and support children in providing reliable testimony (Malloy, Mitchell, Block, Quas, & Goodman, 2006; Troxel et al., 2009). These services and interventions include out-of-court testimony, such as closed-circuit television (CCTV) and hearsay testimony via third party interviewers, as well as the use of multidisciplinary service centers or child advocacy centers (CACs).

OUT-OF-COURT TESTIMONY

Like adults, children experience both pre- and posttestimony anxiety, especially if they have to give testimony in front of defendants in open court in criminal actions (e.g., Goodman et al., 1992). To help alleviate potential trauma for child witnesses,
statements made outside of the courtroom (e.g., through interviews with third parties such as forensic interviews, video recordings, or CCTV) are sometimes permitted. Hearsay testimony allows children’s out-of-court statements (e.g., to their mothers or other family members) to be considered evidence in court proceedings on behalf of child victims, at least under certain conditions. In some cases, forensic interviews with child witnesses may be video recorded and presented as hearsay evidence to the court. CCTV allows a child to give evidence outside the courtroom in front of a camera, with the image and sound immediately relayed to the courtroom for viewing while the child undergoes direct and cross-examination.

**Hearsay.** Hearsay evidence is defined as “a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted” (Federal Rules of Evidence 801, 1975). Although use of hearsay evidence may help protect a child witness from secondary trauma and reduce anxiety associated with confronting an alleged perpetrator, there are risks of adults misrepresenting the words and testimony of child witnesses (Lamb, Orbach, Sternberg, Hershkowitz, & Horowitz, 2000). Thus, presentation in court of video-recorded child forensic interviews, a structured form of hearsay, permits triers of fact to hear children’s out-of-court statements directly.

Nevertheless, because the eyewitness statements are made outside of the courtroom, the eyewitness is not subject to cross-examination, and thus such hearsay may not meet the court’s “indicia of reliability” (Goodman et al., 2006). In fact, a United States Supreme Court decision (Crawford v. Washington, 2004) challenged the admissibility at trial of out-of-court testimonials (e.g., children’s videotaped statements to law enforcement), unless the children also appeared as witnesses. This decision results in greater judicial pressure for children to testify live in court before video-recorded forensic interviews can be admitted. Related concerns center on several assumptions about the value and significance of defendants’ abilities to confront witnesses, including (a) the stress of testifying on the stand and facing the accused improves the accuracy of witness testimony; (b) the jury’s ability to detect deception is impeded unless the witness testifies live in court; and (c) the introduction of out-of-court statements may negatively bias the jury’s perception of the defendant and adversely affect case outcome. Using mock trial and juror interview studies, researchers continue to examine these issues in attempts to find a reasonable balance between the rights of child witnesses and the accused (e.g., Landström, Granhag, & Hartwig, 2007; McAuliff & Kovera, 2012).

The assumption that jurors can best detect the truthfulness or deceptiveness of a witness when a witness is testifying live in front of them is not supported by the prevailing research literature. As mentioned previously, the ability of adults to distinguish between deceptive and truthful adults (e.g., Malone & DePaulo, 2001) and children (e.g., Edelstein, Luten, Ekman, & Goodman, 2006) is often not much better than chance. Further, a meta-analysis by Aamodt and Custer (2006) suggests
that most legal professionals, such as judges and law enforcement officers, may be no more accurate in detecting deception than untrained individuals. In an examination of live testimony, videotaped testimony, and adult hearsay testimony, Goodman et al. (2006) found that mock jurors had difficulty discerning between accurate and deceptive statements from child witnesses regardless of live or out-of-court testimony.

The format or mode of testimony may be an important determinant of perceived child witness credibility and truthfulness as children who testify live are generally seen more positively or truthful than children who testify outside of court (Landström et al., 2007). In an examination of prospective jurors’ expectancies for a child sexual abuse case, McAuliff and Kovera (2012) reported that jurors believed it was easier to determine a child’s truthfulness, and fairest to the defendant, when testimony was live in court. These findings support previous research where children testifying live, or more proximal to adult observers, were seen more positively and given greater credibility than children testifying out of court in more distal locations (Goodman et al., 2006; Landström et al., 2007).

For hearsay testimony, Warren, Nuñez, Keeney, Buck, and Smith (2002) found that adults who appear in court to repeat children’s statements were viewed as more accurate than children giving firsthand, live testimony. In that regard, the hearsay testimony effectiveness may depend on the status or perceived credibility of the adult (e.g., doctor, law enforcement officer) who testifies about the child’s out-of-court statements (Ross, Lindsay, & Marsil, 1999). Further research is warranted to determine the impact of hearsay evidence on judicial processes as well as on the well-being of child witnesses.

CCTV. The use of out-of-court testimony for child witnesses is widely accepted and established in a number of countries. In Australia, New Zealand, and the United Kingdom, a two-way closed circuit television (CCTV) approach is employed, allowing interactive testimony between attorneys and the judge while a child witness is outside of court in a separate room. In the United Kingdom, the videotaped forensic interview serves as direct examination in court, and CCTV is used for cross-examination purposes. In other countries, such as Finland, Norway, and Sweden, child witnesses are video-recorded during preliminary police interviews, and those recordings serve as direct and cross-examination. One-way CCTV is employed at times in the United States although it remains controversial as some argue that it violates the 6th and 14th Amendments of the U.S. Constitution, which provide defendants the right to confront their accusers during criminal trials and to due process, respectively (Hall & Sales, 2008). Following a landmark case in which the U.S. Supreme Court decided in favor of the use of one-way CCTV in child sexual abuse cases under certain conditions (Maryland v. Craig, 1990), courts in the United States are being asked to rule on the use of one-way CCTV.

Although the ability to confront a witness is believed to produce more accurate testimony, research has not supported this belief. In examining the effects of
CCTV on mock jurors’ perceptions of child witnesses, Goodman et al. (1998) found that 8- to 9-year-olds generally provided more accurate information than 5- to 6-year-olds in both CCTV and open court but that CCTV was associated with reduced suggestibility for the younger children. It has also been argued that CCTV might hamper jurors’ abilities to determine truthfulness in child witnesses, but this has not held up in the research literature. Orcutt, Goodman, Tobey, Batterman-Faunce, and Thomas’s (2001) research revealed that mock jurors were no better at determining deception when children testified in open court or through CCTV.

One concern about child witnesses testifying through CCTV is the perception of less emotional impact compared to live court testimony (McAuliff & Kovera, 2012). The emotional impact appears to be even less with video-recorded child testimony (Landström, 2008). Orcutt et al. (2001) reported that children testifying via CCTV were seen as less accurate, less believable, less consistent, less confident, less attractive, and less intelligent than children who testified in open court. One rationale for jurors perceiving children in more negative terms when testifying via CCTV is the vividness effect (Nisbett & Ross, 1980), which suggests the closer the witness is in proximity and time, the more positively jurors’ evaluate the witness. McAuliff and Kovera (2012) propose that negative evaluations of children’s testimony given in alternative forms, such as CCTV and video-recording, may be the result of expectancy violations, meaning jurors expect differences in children’s verbal and nonverbal behavior as a result of the CCTV accommodation, but those differences actually may not occur.

**Child Advocacy Centers**

The child advocacy center (CAC) multidisciplinary approach to child forensic interviews is designed to reduce secondary victimization in children by (a) facilitating collaboration between relevant agencies (e.g., child protective services, law enforcement, prosecution, mental health, and medicine), (b) providing child-sensitive interview settings, and (c) limiting the number of interviews a child victim experiences. By providing supportive services to child witnesses, CACs aim to reduce trauma associated with the investigative and legal processes. The 10 core components of a CAC are:

1. Multidisciplinary team
2. Cultural competency and diversity
3. Child forensic interview
4. Victim support and advocacy
5. Medical evaluation
6. Mental health services
7. Case review
8. Case tracking
9. Organizational capacity

Evaluations of CACs are promising and suggest they decrease delays between law enforcement reports and indictment dates (Walsh, Lippert, Cross, Maurice, & Davison, 2008), increase access to medical examinations, improve the experience of nonoffending parents during the investigation process, and decrease the level of fear experienced by children during interviews (L. M. Jones, Cross, Walsh, & Simone, 2007). Although the improvements in the treatment of child witnesses and their families are encouraging, the effects of CACs on prosecution outcomes, false allegations, children’s disclosure rates, and children’s stress reduction are as yet unclear (Saywitz & Camparo, 2009). Data are still emerging relevant to the efficacy of CACs, but the accumulating research suggests CACs are likely to be helpful to child witnesses and families involved in criminal proceedings. CACs are beginning to spread worldwide in countries’ efforts to combat crimes against children and ease children’s involvement in the legal process (Rodrigues dos Santos & Batista Gonçalves, 2009).

CONCLUSIONS

Children pose many dilemmas for the legal system. Yet to protect children and others from harm and ensure justice, society has little choice but to include child witnesses in legal cases, especially when other evidence is lacking or when the children’s testimony plays a key role in a prosecution. The United Nations Convention on the Rights of the Child (UNCRC), which has been ratified by every country in the United Nations except three (including not by the United States), specifies that:

1. [Countries] shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.
2. For this purpose the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, or through a representative or an appropriate body, in a manner consistent with the procedural rules of national law (Convention on the Rights of the Child, 1989).

It is clear that many countries in the world are—or soon will be—struggling with how and when to listen to child witnesses in the legal context. Fortunately, psychological science is in an excellent position to make a meaningful and important contribution to this effort.
REFERENCES


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