CHAPTER 2

Factors Affecting the Capacities and Limitations of Young Witnesses

Because young suspected victims are often the only available sources of information about what has happened to them, it is crucial to know how well children can remember and describe stressful experiences when they are victims or witnesses of forensically important events. For this reason, many researchers have examined children's accounts of abusive incidents. Our goal in this chapter is to review our current understanding of the capacities and limitations of young witnesses. Specifically, we discuss in turn relevant research designed to explore and describe the development of children's abilities to remember and communicate information about their experiences before turning to aspects of their social behaviour and social awareness that affect their reliability as informants.

Over the past 25 years, it has become abundantly clear that both the amount and the reliability of information reported by children may be enhanced or reduced by several factors, including those pertaining to the developmental level of the child, characteristics of the event in question, and the techniques used by interviewers to elicit testimony. Numerous studies have shown a developmental progression in the amount of information that children report, with younger children typically reporting less than older children (e.g., Gee & Pipe, 1995; Goodman, Aman, & Hirschman, 1987; Goodman & Reed, 1986; Marin, Holmes, Guth, & Kovac, 1979; Oates & Shrimpton, 1991; Saywitz, 1987). Age in itself is not sufficient to account for these differences,

however, because variability among children of similar ages is common (Leichtman, Ceci, & Morse, 1997; Pipe & Salmon, 2002; Quas, Goodman, Ghetti, & Redlich, 2000; Quas, Qin, Schaaf, & Goodman, 1997). Furthermore, when task demands are manipulated experimentally by changing the types of questions asked, differences are attenuated or even eliminated (Ceci, Ross, & Toglia, 1987b; Cole & Loftus, 1987; Jones, Swift, & Johnston, 1988; Saywitz, 1987), indicating that age-related differences in performance reflect factors other than memory. Age, it seems, does not determine children's ability to recount personal experiences (Goodman & Schwartz-Kenny, 1992) but rather serves to encapsulate the influence of a number of variables relating to children's abilities, the effects of which may differ across interview/recall contexts.

In most studies, researchers have studied children's descriptions of carefully staged events in order to isolate, manipulate, and evaluate the impact of specific factors that may affect encoding, retrieval, and reporting. These laboratory analogue studies have been extraordinarily valuable, but interpretation of their results is often complicated by doubts about their ecological validity: Although interviews about staged events are meant to mimic questioning about abusive incidents, the staged incidents and interviews inevitably differ from 'real world' events in many ways. In field studies, by contrast, researchers study children's accounts of actual abusive incidents in order to elucidate the impact of uncontrolled and interdependent variables on encoding and retrieval. Field studies are typically non-experimental in nature, however, and the absence of control over potentially important factors may affect their conclusiveness as well. In this chapter, we try to build a picture informed by the complementary results of both field and analogue studies.

THE DEVELOPMENT OF COMMUNICATIVE SKILLS

The clarity and completeness of children's testimony is clearly affected by their developing communicative abilities. Young children often do not articulate individual sounds consistently even after they seem to have mastered them (Reich, 1986), so it is quite common for interviewers to misunderstand children, especially preschoolers. In addition, the vocabularies of young children are much more limited and less descriptive than those of adults (Brown, 1973; Dale, 1976; de Villiers & de Villiers, 1999), and their statements are likely to lack adjectival and adverbial modifiers. Misunderstandings between children and interviewers may also occur because children's rapid vocabulary growth

often leads adults to overestimate their linguistic capacities and thus use words, sentence structures, or concepts that are age-inappropriate and exceed the children's competencies (Saywitz & Camparo, 1998; Saywitz, Nathanson, & Snyder, 1993; Walker, 1994). Despite their apparent maturity, young children – especially preschoolers – frequently use words before they know their conventional adult meaning, may use words that they do not understand at all, and may understand poorly some apparently simple concepts, such as "any", "some", "touch", "yesterday", and "before" (Harner, 1975; Walker, 1994).

The accuracy of children's accounts is greatly influenced by the linguistic style and the complexity of the language addressed to them by questioners, especially in legal contexts (Carter, Bottoms, & Levine, 1996; Imhoff & Baker-Ward, 1999; Perry *et al*., 1995). For example, children are often asked to negate adult statements or to confirm multifaceted "summaries" of their accounts (e.g., "Is it not true that . . . ?"), and are expected to understand unfamiliar words and syntactically complex or ambiguous compound sentences (Dent, 1982; Pea, 1980; Perry & Wrightsman, 1991; Saywitz, 1988; Walker, 1993; Walker & Hunt, 1998; Warren *et al*., 1996). Brennan and Brennan (1988) showed that fewer than two-thirds of the questions addressed to 6- to 15-year-olds in court were comprehensible to their peers. Perry and colleagues (1995) similarly showed that kindergarten- through university-age students had much more difficulty correctly answering complex questions as opposed to more simply phrased questions about the same witnessed event. More importantly, the kindergarteners did not even recognise that they misunderstood the complex questions, responding at chance levels on a task measuring how well they monitored their own comprehension.

The more impoverished the children's language, the greater the likelihood that their statements will be misinterpreted or that the children will misinterpret the interviewers' questions and purposes (King & Yuille, 1987; Perry & Wrightsman, 1991; Walker, 1993). When interviewers misrepresent what children say, furthermore, they tend not to be corrected, and thus the mistakes, rather than the correct information, may be reported by the children later in the interview (Roberts & Lamb, 1999). Following up on this finding in the laboratory, Hunt and Borgida (2001) found that disagreement with mistaken assertions was uncommon, with adults significantly more likely than children to disagree when interviewers distorted their answers. In subsequent interviews, 4- and 5-year-old children were more likely than older children or adults to incorporate the interviewers' earlier distortions into their later reports about witnessed events, suggesting that their memories of the event might have been distorted. This further underscores the extent to which the interviewers' behaviour – particularly their

vocabularies, the complexity of their utterances, their suggestiveness, and their success in motivating children to be informative and forthcoming – profoundly influences the course and outcome of their interviews.

In addition, children frequently interpret words very concretely and restrictedly (e.g., a child may not respond to a question about something that happened "in your house" if the child lives in a "flat"), make references that fall outside of the listener's knowledge base (e.g., "he looked like my English teacher"), thus making their accounts ambiguous. Their vocabularies, of course, may also be very idiosyncratic.

Children also *learn* how to participate in conversations. They must learn how to stay on topic, how to adapt their speech appropriately to different audiences (e.g., a "strange" interviewer who does not know their family members and was not present during the event in question), and how to structure coherent narratives about past events (Warren & McCloskey, 1997). The challenge confronting investigators is to obtain organised accounts that are sufficiently rich in descriptive detail to permit an understanding of the children's testimony. Unlike adults and older children, furthermore, young children cannot draw upon an array of past experiences to enrich and clarify their descriptive accounts (Johnson & Foley, 1984).

The richness and usefulness of children's accounts of abusive experiences are also influenced by social or pragmatic aspects of communication. For example, when asked questions such as "Do you remember his name?" "Do you know why you are here today?" or "Can you show me where he touched you?", older children usually read between the lines and provide the desired information, whereas younger children may simply answer literally "Yes" or "No" (Walker & Warren, 1995; Warren *et al*., 1996). In addition, young witnesses are typically unaware of the amount and type of information being sought by forensic investigators and are unaccustomed to being viewed as informants rather than novices being tested about the quality of their knowledge. As a result, interviewers need to communicate their needs and expectations clearly, motivating children to provide as much information as they can.

Increases in the amounts of information reported by children as they grow older may also reflect their increasingly sophisticated skills as narrators. Young children are still developing their meta-linguistic abilities – coming to know what listeners want to know, and how to report information coherently, monitor the success of their communication, and modify strategies as necessary to ensure that the listeners have understood (Lamb & Brown, 2006; Saywitz & Snyder, 1996). For this reason, young children may not understand that their intended audience (e.g., the interviewer or jury member) is naïve with respect to what they have experienced and thus fail to provide sufficient detail

to ensure complete and accurate reports. Children are used to being questioned by adults who are already knowledgeable about the topic of conversation (Lamb, Orbach, Warren, Hershkowitz, & Esplin, 2007). By contrast, alleged victims of abuse are often the sole sources of information about the suspected events. If children fail to appreciate that the interviewer has little, if any, knowledge of the alleged events, or attribute superior knowledge to the adult interviewers (e.g., Ceci, Ross, & Toglia, 1987a, 1987b), they may refrain from reporting all they know. In addition, if children infer that interviewers would prefer particular responses, they may compromise their accounts rather than communicate their actual experiences in order to appear cooperative (Ceci & Bruck, 1993, 1995). In the forensic context, therefore, interviewers must be sensitive to children's perceptions of their knowledge and status. To facilitate comprehensive and accurate reporting by children, for example, interviewers should emphasise that they do not know what the children experienced, and that it is thus important for the children to tell as much as they know (e.g., Sternberg, Lamb, Esplin, Orbach, & Hershkowitz, 2002).

Unfortunately, however, forensic interviewers frequently ask very specific questions (such as "Did he touch you?"). Young children (those under 6) have special difficulty answering specific questions, and may exhibit a response bias (e.g., Fivush, Peterson, & Schwarzmeuller, 2002; Peterson, Dowdin, & Tobin, 1999), or a reluctance to give "don't know" responses in the absence of knowledge (Davies, Tarrant, & Flin, 1989; Saywitz & Snyder, 1993). In addition, Waterman, Blades, and Spencer (2000, 2001, 2004) showed that children (5- to 9-year-olds) often attempt to answer impossible (nonsensical) or unanswerable (where the information has not been provided) questions, especially if they are phrased as yes/no rather than wh- questions. The type of questions asked and the context in which they are introduced thus determine whether they enhance or degrade the reliability of children's reports (Poole & Lamb, 1998; Saywitz & Lyon, 2002).

THE DEVELOPMENT OF MEMORY

Earliest Memories

It was not until the late 1970s that researchers began to focus on children's memory for events in which they had been participants or witnesses (see Fivush & Hudson, 1990; Hudson, Fivush & Kuebli, 1992; Nelson, 1986, 1993, for reviews). The earliest studies by Nelson and her colleagues indicated that, as children grow older, the length,

informativeness, and complexity of their recall narratives increase, and these findings have been widely replicated (see Fivush, 1997, 1998; Poole & Lamb, 1998; Saywitz & Camparo, 1998; Schneider & Pressley, 1997, for reviews).The early studies also showed that even very young children can provide temporally organised and coherent narratives (Davies, Tarrant, & Flin, 1989; Flin, Boon, Knox, & Bull, 1992; Nelson & Gruendel, 1981; Saywitz, 1988). In addition, although young children tend to provide briefer free narrative accounts of their experiences than do older children and adults, these accounts are generally quite accurate (e.g., Goodman & Reed, 1986; Johnson & Foley, 1984; Marin, Holmes, Guth, & Kovac, 1979; Oates & Shrimpton, 1991). As time passes, both children and adults forget, making errors of omission much more common than errors of commission (Oates & Shrimpton, 1991; Steward, 1993). These errors are a special problem where young children are concerned because their accounts – especially their recall narratives – are often so brief.

From the time they are two or three years of age, it is clear that young children can remember and verbally recount a great deal of information about many of their experiences when questioned after both short delays of, for example, one month or less (Baker-Ward, Gordon, Ornstein, Larus, & Clubb, 1993; Cassel & Bjorklund, 1995; Fivush & Hamond, 1990; Pillemer, 1993) and sometimes also after much longer delays (Fivush & Schwarzmueller, 1998; Hamond & Fivush, 1991). Indeed, even before the acquisition of language, very young infants clearly remember, sometimes over long time periods, if appropriate non-verbal measures of memory are used (Hildreth, Sweeny, & Rovee-Collier, 2003; Rovee-Collier, Hartshorn, & DiRubbo, 1999; see Rovee-Collier & Hayne, 2000, for review).

Interestingly, however, although early experiences undoubtedly influence cognitive, social and/or emotional development, they generally do not become part of children's "autobiographical memory" systems (Howe & Courage, 2004) because infantile amnesia prevents us from recalling our earliest memories consciously (Cowan & Davidson, 1984; Pillemer & White, 1989). This difficulty in recalling events from the first years of life is not restricted to adults; young children, having acquired the language necessary for verbal recall, also have difficulty recalling their earliest memories. Further, although some events are more likely than others to be recalled from early ages (Neisser, 2004), even highly traumatic events do not appear to be available for later explicit recall when the events occurred very early in life. Terr (1988), for example, found that children who experienced traumatic events (e.g., dog bites) when they were younger than 18 months of age were unable to verbally recall the events when they were tested at older ages,

whereas detailed and coherent accounts of events were provided by children who were at least 2.5 to 3 years of age at the time of the experience. Researchers examining children's memories of stressful experiences, such as medical procedures and injuries, have reported similar findings (Howe, Courage, & Peterson, 1994).

Explanations for why these early experiences should be so difficult to recall, despite functional memory systems capable of encoding and retaining information over long time periods, are numerous and controversial (Howe & Courage, 1993; Howe, Courage, & Edison, 2003; Neisser, 2004; Nelson & Fivush, 2004). Language clearly plays a role: Memories acquired during infancy are very fragile, in part because these memories are only encoded in nonverbal modalities, involving perceptually-based attributes (Hayne & Rovee-Collier, 1995). In order to recall nonverbal representations of events verbally, these memories must be recoded into language form. Although some anecdotal evidence suggests that this recoding is possible (e.g., Myers, Perris, & Speaker, 1994), the recoding of nonverbal memories into verbal form appears to depend to some extent on children's linguistic abilities when they initially experienced the event (Bauer & Wewerka, 1997; Simcock & Hayne, 2002). Simcock and Hayne (2002) provide compelling evidence that verbal, although not pre-verbal, memories are accessible to very young children. In their study, 27-month-olds observed a novel event and were asked to verbally recall the event 6 months or 1 year later. Although the children had the vocabulary to verbally recall the events at the time of testing, they failed to do so and could only recall the events using photographs and behavioural re-enactments. Bauer and colleagues (2004) have shown, however, that events occurring at an even younger age (20 months) were recalled verbally when prop items (but not photographs) were presented at the time of recall, 3–6 months later.

Social-interactionist perspectives on the emergence of autobiographical memory also highlight the importance of language development. For instance, Nelson and her colleagues argued that children start to form long-term memories only when they begin talking about their experiences with others, thereby creating meaningful and enduring autobiographical records of their experiences (Nelson, 1989, 1993; Reese, 2002). This social construction of personal narratives influences the quantity and quality of children's narratives (Hudson, 1990b; Ratner, 1984; Reese, Haden, & Fivush, 1993). In addition, the development of children's self-concepts (Howe & Courage, 1993; Howe *et al.*, 2003) and their awareness of how memories were acquired (i.e., "source" knowledge), affect the emergence of autobiographical memory (see Howe *et al.*, 2003; Nelson & Fivush, 2004; Perner, 2000).

Developmental Changes in Children's Verbal Accounts

Once children begin to recall and talk about their experiences, their abilities are often impressive, although significant developmental changes continue through early childhood. Young children typically recall significantly less information than older children, particularly in response to very general prompts such as "Tell me what happened" and although their recall responses are not less accurate than those of older children they may omit much information that adults consider important (see Ornstein, Baker-Ward, Gordon, & Merritt, 1997; Saywitz, Goodman, Nicholas, & Moan, 1991; and Schneider & Pressley, 1997, for review). Four- and five-year-olds thus typically require more specific prompts from interviewers (Hamond & Fivush, 1991) to which they respond less accurately than older children do (Bjorklund, Bjorklund, Brown, & Cassel, 1998; Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1994). Nevertheless, recent field research shows that children as young as four years of age provide proportionally as much information in response to open-ended questions as older children, although the brevity of their responses makes it necessary for interviewers to prompt for additional information, using the child's prior responses as cues to trigger further recall (Lamb *et al.*, 2003; Lamb, Orbach *et al.*, 2007 and Chapter 6).

Developmental differences in children's recall are not restricted to mundane experiences or those with a positive emotional valence, but are also evident when children are interviewed about painful, distressing, and traumatic experiences, such as accidental injuries and intrusive medical procedures (e.g., Cordon, Pipe, Sayfan, Melinder, & Goodman, 2004; Goodman *et al.*, 1994; Howe *et al.*, 1994; Howe, Courage, & Peterson, 1995; Merritt, Ornstein, & Spicker, 1994; Ornstein, 1995; Peterson, 1999; Peterson & Bell, 1996; Peterson, Moores, & White, 2001; Peterson & Whalen, 2001; Salmon, Price, & Pereira, 2002). Goodman *et al.* (1994), for example, found differences between 3- to 4-, 5- to 6-, and 7- to 10-year-old children in the amount and accuracy of information they recalled about the VCUG, a painful diagnostic procedure involving genital contact (see also Baker-Ward, Ornstein, & Principe, 1997). Similar age differences are evident in children's accounts of abusive experiences (Lamb, Sternberg, & Esplin, 2000; Sternberg, Lamb, Orbach *et al.*, 2001). As discussed in Chapter 6, Lamb *et al.* (2003) reported near linear increases with age in the total amount of information and the amount (though not proportion) of information elicited in response to open-ended prompts as well as in the amount of information provided in the average responses provided by alleged victims describing their experiences. Although most studies do not report

developmental changes in the *accuracy* of open-ended free narrative reports, the accuracy of responses to prompts and questions is likely to decrease markedly for the younger children, particularly when they must disagree with the interviewer to answer correctly (Cassel, Roebers, & Bjorklund, 1996; Greenstock & Pipe, 1996).

In sum, even though young children can accurately describe previous experiences, developmental changes in remembering nonetheless take place. Age emerges as an important determinant of event memory in part because it is correlated with other variables that influence memory, including children's prior knowledge and understanding of events, and the effectiveness of the retrieval strategies used. As we shall see, it is sometimes possible to eliminate or reduce developmental differences in memory when the confounding effects of variables usually associated with age, such as knowledge, are controlled.

Encoding Personal Experiences

Knowledge and understanding affect how much both children and adults remember. To the extent that there are age-related changes in the understanding, knowledge, and perceived significance of experiences, age differences in memory are likely to occur. In the classic comparisons of expert and novice chess players, for example, adult experts recalled more chess positions than adult novices did. Similar findings have also been obtained with children (Bjorklund, 1987; Bjorklund & Thompson, 1983; Bjorklund & Zeman, 1982; Chi, 1978; Chi & Ceci, 1987; Chi & Koeske, 1983; Landis, 1982), such that the usual age differences in memory can be eliminated or reversed when knowledge and age are pitted against each other (Chi, 1978; Lindberg, 1980). To quote Neisser (2004), "Because young children are less skilled and less knowledgeable than adults, they generally do not structure their experience in memorable ways" (p.2). Children who have more knowledge about experienced events later recall more details about those events than children with less knowledge (Greenhoot, 2000; McGuigan & Salmon, 2004; Sutherland, Pipe, Schick, Murray, & Gobbo, 2003).

For very young children, especially, direct experience is an important source of event knowledge (e.g., Nelson, 1986, 1996). In general, directly participating in an event is likely to result in stronger and/or more accessible memory traces, for both adults and children, than being a bystander, observer, or audience for a story about the same event (Murachver, Pipe, Gordon, Fivush, & Owens, 1996; Roediger, McDermott, Pisoni, & Gallo, 2004; Rudy & Goodman, 1991; Tobey & Goodman, 1992). Tobey and Goodman (1992), for example, found that

four-year-old children who participated in a real-life event (a Simon Says game) freely recalled central actions more accurately than children who merely observed the same event on video, and Rudy and Goodman (1991) found that four-year-olds who were direct participants in a real-life event were less susceptible to misleading questions than children who observed the real-life event. Similarly, Murachver *et al*. (1996) found that children who participated in a contrived interaction with an adult "pirate" recalled more information than those who read a story about "visiting the pirate". Their free recall was also more accurate than that of children who only watched the event or heard about the event. Even when recall was supported by behavioural re-enactment, children who were read the story were significantly less accurate than those who had participated or observed. Whether direct participation leads to stronger memories than other sources for younger children has not been examined directly, however.

A common explanation for the enhanced recall of direct experiences is that participation strengthens the resulting memory trace. Theorists agree that memory trace strength can vary (Brainerd & Reyna, 1990; Ceci, Toglia, & Ross, 1988), such that stronger or weaker memory traces can be created. Comparing 3- and 5-year-old children's memories of events about which they heard a story (narrative condition) or in which they directly participated, Gobbo, Mega, and Pipe (2002) found that children who participated recalled more details accurately than children in the narrative condition. To determine whether this difference in recall was due to differences in the strength of the memory traces created by participating rather than only hearing a story about the event, Gobbo *et al*. (2002) equated children's level of learning (or encoding) by having children in each condition reach a criterion level of learning. This criterion was achieved by exposing children to the event repeatedly. Children who heard about the event to a criterion level of learning recalled as many details as children who participated in the event (see Murachver *et al.*, 1996, for compatible findings). Thus, although participating in an event creates a stronger memory trace than merely being told about it, repeated experiences can reduce or eliminate these differences.

Adults often talk to children about anticipated as well as past events, and discuss the activities in which they are taking part (Fivush, 1998; Fivush, Haden, & Adam, 1995; Haden & Fivush, 1996). Talking about events while (Ornstein, Principe, Hudson, Gordon, & Merritt, 1997; Tessler & Nelson, 1994) or after (Goodman *et al*., 1994; Hudson, 1990b) they are taking place may enhance children's event recall. In Tessler and Nelson's (1994) study, children's recall of an event in which they had participated reflected those aspects of the event talked about by

the parent and/or the child during the event. Ornstein, Principe *et al*. (1997) reported compatible findings in a study of children's memory of a painful medical procedure (see also Haden, Ornstein, Eckerman, & Didow, 2001). Goodman *et al*. (1994) similarly found that parents' retrospective reports of their post-event interactions with their children concerning a painful medical procedure that they had experienced were correlated with the children's subsequent ability to resist misleading questions about the procedure. In other words, although parental discussion was not related to correct recall, it was negatively correlated with errors in response to misleading questions. Further, Sutherland *et al.* (2003) found that information presented *prior* to an experience is also useful, at least when the information is specific to the experience rather than being globally related to the topic (in particular, DeMarie-Dreblow, 1991), although talk during and after an event is more effective than talk before (McGuigan & Salmon, 2004).

Event-related discussion may strengthen memories for several reasons. Discussing events in advance, for example, increases knowledge about the event, thereby rendering it more memorable, whereas post-event discussion may ensure rehearsal, which consolidates the memory or, following long delays, fosters retrieval and reactivation of the memory. Moreover, prior, contemporaneous, or retrospective discussions may all highlight important factors on which children should focus, and provide appropriate verbal labels for actions and objects, thereby facilitating memory.

Many of the experiences explored in forensic investigations may have been poorly understood by alleged victims, especially when the alleged victims were young children. In addition, disclosures of sexual abuse are often made months or even years after the abusive incident(s) (see Hershkowitz, Horowitz, & Lamb, 2005, 2007; Hershkowitz *et al*., 2006; Hershkowitz, Orbach *et al*., 2007; London, Bruck, Ceci, & Shuman, 2005, 2007 and Chapter 8) with little or no discussion with others in the intervening period. Victims of childhood sexual abuse are frequently embarrassed, afraid, or have been threatened not to tell (Cederborg, Lamb, & Laurell, 2007). In the absence of discussion and opportunities for verbal recall, such experiences may not be remembered in detailed or coherent narrative form.

In all, research on the development of autobiographical memory show that younger children's impoverished reports, relative to those of older children and adults, may be due, in part, to limited retrieval skills, meta-linguistic deficits, and immature narrative skills. Encoding and retrieval strategies develop with age and experience, and the use of effective retrieval strategies is usually associated with improved recall and reporting of information. Developmental differences in the

selection and use of cognitive strategies affect children's ability to talk about past events, and therefore the amount of support they may need to help them describe events completely. As they grow older, children learn to use strategies automatically, allowing them to alllocate more attention and effort to retrieval, whereas younger children may need explicit instruction in the use of specific strategies, although they still do not benefit from such instructions as much as older children do (Flavell, Miller, & Miller, 1993). As children become older, they also become better at generating internal retrieval cues, which makes them less reliant on external support provided during the interview (Quas *et al*., 2000).

Repeated Experiences

Children's knowledge and the resulting memory representations can also be affected by the number of times events have been experienced. Victims of sexual abuse are frequently abused repeatedly, sometimes over long periods of time. When children experience similar events, they tend to form general event representations (or scripts) of "typical" events rather than particular incidents (Farrar & Goodman, 1992; Hudson, Fivush, & Kuebli, 1992; Nelson & Gruendel, 1981). Nelson argued that memories serve to facilitate predictions about the future, and that, as a rule, repeated experiences permit better predictions than experiences that happened only once. As a result, children should be particularly attuned from an early age to "what usually happens" (Nelson, 1986). These general event representations can help children to predict what is going to occur, understand what is happening during an event, and guide the recall and retrieval of familiar events (Brainerd & Ornstein, 1991; Brewer & Nakamura, 1984; Hudson, 1986; Nelson, 1986, 1993; Nelson & Gruendel, 1981). Repeated experience may strengthen event memories, with children recalling more details than if they experienced the event only a single time (Bauer & Fivush, 1992; Fivush, Kuebli, & Clubb, 1992; Hudson, 1990a; Hudson & Nelson, 1986; Murachver *et al*., 1996; see Powell & Thomson, 2003 for review). Memories of repeatedly experienced events may also differ from memories of events occurring a single time because there are repeated opportunities to reactivate the memories by rehearsal. Further, children's memories of details that recur across experiences are also more accurate and more resistant to suggestion and misinformation effects (Connolly & Lindsay, 2001; Gobbo *et al*., 2002; McNichol, Shute, & Tucker, 1999; Powell, Roberts, Ceci, & Hembrooke, 1999).

Prior experiences can also have adverse effects on children's event recall. When events recur with any regularity, accounts are likely to be skeletal, reflecting common components and the basic structure

without the details that may vary from one occasion to another. In addition, both children and adults may blur distinctions among incidents or be influenced by their general knowledge about a class of events when reporting specific events (Martin & Halverson, 1983; McCartney & Nelson, 1981). Aspects of the experience that change across reoccurrences tend to be omitted from children's event reports, so children's accounts lack the details that vary from time to time. The changing components may also be more vulnerable to suggestion, at least under some conditions (Connelly & Lindsay, 2001; Fasig, 1999; McNichol *et al*., 1999; by contrast, see Powell *et al*., 1999; Powell, Roberts, & Thomson, 2000). Conversely, children tend to remember unusual events better than specific events that are congruent with their general or script memories (Farrar & Goodman, 1992).

Because of the forensic importance of obtaining event-specific memories, researchers have begun to examine how to enhance the accuracy with which children recount specific experiences, as distinct from other, similar experiences (see Roberts, 2002; Roberts & Powell, 2001, for review). The ability to recall specific incidents of a repeated event, or distinguish between personal and vicarious experiences, requires engaging in a process known as source monitoring (Johnson, Hashtroudi, & Lindsay, 1993). In order to recall details about specific incidents, children must discriminate the source of the detail, including whether it happened to them the first time or the last time, in one place or another, or whether they only heard about it in the course of discussions with another person. Field work examining relations between children's source awareness and their recall of multiple experiences of alleged abuse support the importance of source monitoring for episodic recall. For example, Thierry, Lamb, and Orbach (2003) found that 3- to 11-year-old alleged sexual abuse victims who were more aware of the source of their knowledge recalled more episodic details (but not more generic details) about multiple experiences of abuse than children who were less aware of source.

Attempts to improve children's source monitoring performance and ability to recall specific events without intrusion of information about other similar experiences have met with mixed success. In general, children are less likely to make source errors when asked for open-ended, free recall accounts than when asked specific questions (Roberts & Powell, 2001). Explicitly asking children about the source of information they have reported – for example, whether it was something that they saw or something that someone told them about – can be useful with older children (Lindsay & Johnson, 1989; Zaragoza & Lane, 1994), but not with very young (3- or 4-year-old) children (Leichtman, Morse, Dixon, & Spiegel, 2000; Quas, Schaaf, Alexander, & Goodman,

2000; see Roberts & Powell, 2001; Roberts, 2002 for reviews). Thierry, Spence, and Memon (2001) found that 5- to 6-year-old, but not 3- to 4-year-old, children who were required to monitor actively the source of information about something they either witnessed or saw on television were better at monitoring source when subsequently asked misleading questions. Poole and Lindsay (2002) also found that having children monitor the source of seen and heard events in a training phase helped 7- to 8- year-olds, but not 3- to 4-year-olds, to distinguish among activities. When given more extensive source-monitoring training, however, the memory accuracy of 3- to 4-year-olds improved (Thierry & Spence, 2002). Conversely, asking children to recall experiences regardless of source and then asking for source attributions appears not to reduce confusion (Thierry, Goh, Pipe, & Murray, 2005; Powell & Thomson, 1997). Moreover, adults who *repeatedly* recalled seen and imagined objects without regard to their source confused more details and made more source monitoring errors in subsequent memory tests (Henkel, 2004).

The passage of time between experience and recall, likely to be months or even years in forensic contexts, increases both the tendency to rely on scripts (Myles-Worsley, Cromer, & Dodd, 1986; Slackman & Nelson, 1984) and the confusion of details from the different episodes (Hudson, 1990a ; Powell & Thomson, 1997; Slackman & Nelson, 1984). In forensic contexts, it may be important to specify exactly what happened on a particular occasion at a specific time. Inaccuracies reflecting confusions across occasions may adversely influence the perceived credibility of the witness, even though such demands for recall of specific episodes may be unreasonable given what we know about memory for repeated experiences. Ornstein and colleagues (1998) showed that, after a 12-week delay, children's recall of a pediatric exam became reliant on their general knowledge, as the children reconstructed their memories of the examination or filled in missing details with information about what usually happens (see also Myles-Worsley *et al*., 1986). That is, with the passage of time, script-related intrusions began to appear in children's accounts. Other sources of knowledge, not only children's own experiences, can also contribute to script-related errors. Fivush, Hudson, and Nelson (1984; Hudson & Fivush, 1991) similarly found that children relied more on general knowledge about an event (visiting a museum) to provide basic information about a specific instance of that event (a visit to an archaeological museum) over time, although they were still able to access some information about specific events after very long delays (of up to six years).

It appears that the confusion of details across episodes is more likely among younger than older children, particularly over time (Farrar &

Goodman, 1992; Powell *et al*., 1999) and that younger children are more likely to forget the source of their memories than are older children (Foley & Johnson, 1985; Lindsay, Johnson, & Kwon, 1991). Moreover, the passage of time between the experience and recall, which is likely to be months or even years in forensic contexts, increases the tendencies both to rely on general event knowledge (Myles-Worsley *et al*., 1986; Slackman & Nelson, 1984) and to confuse details from the different episodes (Farrar & Goodman, 1992; Hudson, 1990a; Roberts & Powell, 2001; Slackman & Nelson, 1984).

The effects of knowledge and repeated experience on memory are quite significant from a practical perspective. In forensic contexts, especially when child sexual abuse is alleged, it is not uncommon for children to be asked about incidents that have occurred repeatedly, sometimes over long periods of time. In the courtroom, what happened on one specific occasion is often critically important. Yet the requirement that children recall a single episode distinct from other similar experiences may be very challenging for young children. Despite remarkable memory for details of what happened (Fivush & Hamond, 1990; Powell *et al*., 1999), young children are generally not as accurate when identifying details associated with *one particular incident* of a repeated experience (Farrar & Goodman, 1990; Roberts & Powell, 2001). For example, when children between the ages of four and eight years were asked to recall the final instance of an event that was experienced six times, with minor variations in some details but the same basic event structure, children frequently recalled details from the earlier instances, rather than the final instance (Farrar & Goodman, 1992; Powell & Thomson, 1997). Powell *et al*. (1999) similarly found that children provided less accurate accounts of repeatedly experienced events because they reported details from one incident as if they occurred in another incident. These findings indicate that children can maintain accurate memories of what happened even though they may confuse episodes and not remember accurately when or as part of which specific occasion something happened. Such migration of details across episodes and confusion regarding source are more likely among younger than older children, particularly over time.

The fact that children may have difficulty recalling specific incidents of multiply-experienced events has led many court systems in the United States to relax the requirement that child witnesses identify the time of the individual incidents of multiply-experienced events because confusions between episodes do not necessarily cast doubt on the accuracy or credibility of young witnesses (see also Roberts, 2002). Children's general event representations or scripts are, however, affected not only by repeated experiences, but also by conversations,

television, books, and so on (Roberts & Powell, 2001; Sutherland *et al*., 2003).

Traumatic, Distressing, and Other Unpleasant Experiences

In the past, forensic professionals often dismissed the relevance of experimental research on children's memory by arguing that the stressful nature of sexual abuse makes memories thereof distinctly different. In fact, considerable controversy persists in the experimental literature concerning the effects of increased arousal or stress on the accuracy of children's memory. Deffenbacher (1983) concluded that "forensically-relevant" (i.e., high) levels of stress were associated with diminished accuracy. Although some researchers have reported that high levels of stress are associated with poorer memory (Bugenthal, Blue, Cortez, Fleck, & Rodriguez, 1992; Merritt, Ornstein, & Spicker, 1994; Peters, 1987, 1991), however, others have reported that high levels of stress in laboratory setting are associated with improved memory (Goodman, Hirschman, Hepps, & Rudy, 1991; Warren & Swartwood, 1992), and others have reported no relationship at all between stress and recall (Baker-Ward *et al*. 1993; Howe *et al*., 1994). For example, Howe *et al*. (1994) found no relationship between the amount of stress (reported by the parents) and the amount of information recalled by their children either three–five days or six months after an emergency room procedure. By contrast, Goodman *et al*. (1991b) found that children who showed higher levels of arousal during a medical procedure reported the incident more accurately than children who simply had a washable tattoo applied. When Bahrick, Parker, Fivush, and Levitt (1998) classified 3- and 4-year-old children into high, medium, and low stress groups based on the extent of their exposure to Hurricane Andrew, however, they found that children in the high and low stress groups recalled the least information about the hurricane whereas children in the medium stress group recalled the most information, suggesting that some stress improves recall while too much stress impedes it. Even when stress enhances recall, however, memories are still susceptible to the deleterious effects of suggestion and delay (Sales, Goldberg, & Parker, 2001).

Fivush (1998a) concluded that, although children may recall more details about stressful than non stressful events, developmental changes in the representation and recall of these events appear similar. Other scholars have also concluded that the same variables that influence memories of more mundane or positive experiences affect memories of stressful and traumatic experiences (e.g., Cordon *et al.*, 2004; Howe, 1997), but recent work suggests that children may recall negative and positive events somewhat differently (Fivush, Hazzard, Sales, Safati, &

Brown, 2003). For instance, when narrating emotionally *positive* events (e.g., a trip to an amusement park), 5- to 12-year-olds recalled more information about objects and people and included more descriptive details than when recalling emotionally negative events (e.g, illness or death of a family member). When recalling emotionally *negative* events, in contrast, the children included more information about their thoughts and emotions and recounted these experiences more coherently than when recalling positive events (Fivush *et al*., 2003).

Few researchers have studied the association between the severity of abuse (presumably a correlate of stressfulness) and children's recall, probably because there is no consensus regarding the ways in which the severity of abuse should be measured, and a variety of events (ranging from exposure to rape at gunpoint) are defined as sexual abuse. Of course, these differences affect the conclusiveness of field research: Because child witnesses recall different personally experienced events, many factors can make some events more memorable than others. In addition, whether or not the abuse is even stressful to children may vary depending on such factors as the age of the child and the identity of the perpetrator. With better definitions of child abuse and access to accounts of a larger number of cases, researchers may be able in the future to determine whether different types of abuse are recalled differently as a function of the many interrelated factors that characterise real-world experiences of abuse.

Although the association between stress and memory is clearly a complex one (Christianson, 1992), the inconsistent findings may be explained in part by researchers' concerns with levels of stress that were generally low and varied from study to study. Recognising these limitations, researchers have recently examined children's memories of naturally occurring experiences that were more similar, with respect to the intensity and duration of distress, to the experiences children might be asked to recount during a forensic interview. When the studies involved the VCUG, a painful diagnostic procedure involving genital contact, the to-be-remembered experience is also likely to have involved embarrassment or shame.

In general, children's accounts of painful and/or distressing medical procedures (Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1994, 1997; Ornstein, 1995; Quas *et al*., 1999; Steward, 1993; Steward, O'Conner, Acredolo, & Steward, 1996), accidental injuries and their treatment (e.g., Howe *et al*., 1994; Peterson, 1999; Peterson & Bell, 1996; Peterson & Whalen, 2001), natural disasters (Fivush, Sales, Goldberg, Bahrick, & Parker, 2004; Parker, Bahrick, Lundy, Fivush, & Levitt, 1998), and forensic accounts of suspected or alleged sexual abuse (Lamb, Sternberg, & Esplin, 2000; Lamb *et al*., 2003; Sternberg, Lamb,

Orbach *et al*., 2001) appear to be influenced by many of the same variables, including age, that affect memory for neutral or mundane experiences (see Cordón *et al*., 2004, for a recent review). Moreover, infantile amnesia curtails the ability of children and adults alike to recall their earliest experiences verbally, whether or not they were traumatic (Fivush, 2002; Howe *et al*., 1994; Nelson & Fivush, 2004; Quas *et al*., 1999). Further, children who have experienced a painful inoculation remembered some aspects of it better than those who witnessed another child experiencing the inoculation (Lindberg, Jones, Collard, & Thomas, 2001), thereby reflecting a general tendency for participants to recall events better than observers (Murachver *et al*., 1996; Tobey & Goodman, 1992). Just as understanding and knowledge influence memory of more mundane events (e.g., Greenhoot, 2000; Ornstein, Shapiro, Clubb, Follmer, & Baker-Ward, 1997; Ricci & Beal, 1998; Sutherland *et al.,* 2003), traumatic experiences that are better understood or explained to children are recalled by them more fully and/or more accurately (Goodman *et al*., 1994).

There is some evidence that memories of negative experiences endure longer than memories of everyday events, however. When children recall neutral or positive events after extended delays, forgetting is often quite marked (e.g., Flin *et al*., 1992; Goodman, Batterman-Faunce, Schaaf, & Kenney, 2002; Hudson & Fivush, 1991; Jones & Pipe, 2002; Ornstein *et al*., 1997; Salmon & Pipe, 2000; Fivush & Schwarzmueller, 1998) whereas memories of painful and stressful experiences may change little over periods of several years (e.g., Burgwyn-Bailes, Baker-Ward, Gordon, & Ornstein, 2001; Merritt *et al*., 1994; Peterson, 1999; Peterson & Whalen, 2001). In one study, for example, children who were very young (approximately three years old) at the time of an experience (a hurricane) reported even more information when interviewed six years later than they had in an initial interview (Fivush *et al*., 2004). Of course, these children were probably reminded of their experiences frequently by family members, friends, interviewers, and even by the media. In contrast, retrospective surveys of adults suggest that young victims seldom discussed their abuse with others in childhood (London *et al*., 2005, 2007) and we know that events not discussed may not be well remembered (Fivush, Pipe, Murachver, & Reese, 1997; Fivush, 2004a, 2004b). In the only field study examining the effects of delay on children's recall of alleged sexual abuse, Lamb, Sternberg *et al*. (2000) reported that children interviewed within a month of the alleged abuse were more likely to provide information in response to the interviewers' open-ended prompts and questions than children interviewed following long (5–14 month) delays, although, very surprisingly, children interviewed early provided no more details in total than those

interviewed following the longest delays. The absence of differences in the total number of details reported may have been attributable to the poor quality of the interviews studied.

In sum, it is unclear whether memories for traumatic experiences involve unique mechanisms or can be accounted for by the same mechanisms that affect memories of other events (Cordón *et al*., 2004). Traumatic experiences are often distinctive, so memories thereof might be retained over time better than memories of less distinctive or meaningful events (Howe, 1997, 2000, Ornstein, Larus, & Clubb, 1992). Whether or not special mechanisms are involved, however, real-world events such as child abuse may not necessarily be better remembered than memories of events or stimuli studied in the laboratory. First of all, not all incidents of sexual abuse are painful or traumatic, and thus the potentially facilitative effects of arousal and salience cannot be assumed. Relatedly, children's ignorance or misunderstanding of sexual events may make some abusive experiences even less memorable. Second, stress may affect different types of memory encoding and retrieval (e.g., recall, recognition, and reconstructive memory) in different ways. The context in which children are asked to retrieve information about the experienced event – during interviews with child protection service workers, policemen, attorneys, or judges – may be stressful regardless of whether or not the target events were (Goodman *et al*., 1992). Researchers have not yet studied the effects of stress at the time of recall, although some have studied the effects of social support and of supportive interviewer practices which presumably reduce stress (Carter *et al*., 1996; Davis & Bottoms, 2002; Imhoff & Baker-Ward, 1999) and it seems reasonable to expect that stress at the time of recall may hinder retrieval (Nathanson & Saywitz, 2003). Third, whether the event involves shame, perceived responsibility, embarrassment, or guilt, and whether it is talked about, reflected on, kept secret, or even negated, may all affect how experiences of abuse or trauma are remembered and recalled over time. Overall, although salience generally affects the memorability of experienced events, we cannot presume that instances of abuse will always be salient and thus easy to remember.

Following repeated *traumatic* experiences, over-general memory retrieval may occur, with several episodes summarised by reference to their common characteristics despite requests for specific examples, characterised by distinctive information about particular events, times, locations, people, places, or activities (McNally, 1998; Williams, 1996; Williams & Dritschel, 1992). Williams (1996) hypothesised that stressful childhood experiences lead depressed individuals to adopt generic retrieval strategies, typical of earlier stages of development, in order

to minimise the negative affect associated with some specific features of past events. Children who were victims, witnesses, and both victims and witnesses of family violence are significantly more depressed than children who were not victims of physical abuse (Sternberg *et al*., 1993), and among these children the proportion of generic responses in the children's accounts of earlier family experiences were positively correlated with their depression scores (Orbach, Lamb, Sternberg, Williams, & Dawud-Noursi, 2001).

Effects of Delay

Once remembered, how durable are children's memories of their experiences? When children (and adults) recall neutral or positive events over long time periods, forgetting is typically extensive (e.g., Jones & Pipe, 2002; Ornstein, Baker-Ward *et al*., 1997; Salmon & Pipe, 2000) and children may require many cues and props to facilitate recall (Hudson & Fivush, 1991; Fivush & Schwarzmueller, 1998) if, indeed, they can do so at all (Goodman, Batterman-Faunce, Schaaf, & Kenney, 2002; Pillemer *et al.*, 1994). Pillemer and colleagues showed, for example, that although both 3- and 4-year-old children remembered what happened at school when a fire alarm went off and they were interviewed soon after, none of the younger and only some of the older children remembered it when interviewed seven years later (Pillemer, 1993; Pillemer *et al*., 1994; see also Drummey & Newcombe, 1995).

Children can remember other experiences after very long, forensically-relevant delays. Ornstein and colleagues showed that even quite young children recalled a paediatric examination extremely well after delays of up to six weeks (e.g., Baker-Ward *et al*., 1993; Clubb, Nida, Merritt, & Ornstein, 1993; Merritt *et al*., 1994; Ornstein, Shapiro *et al*., 1997). Medical examinations are likely to be familiar events for many young children, and the good recall in this study might reflect children's knowledge about and understanding of the examination. Other studies suggest that some traumatic experiences about which children presumably had little prior knowledge may be remembered better over long delays than more mundane or neutral experiences. In a study of children's recall of the VCUG (the painful diagnostic procedure described earlier), although children did recall somewhat less when interviewed six weeks as opposed to shortly after the test, the change was not statistically significant (Merritt *et al*.,1994). Burgwyn-Bailes *et al*. (2001) similarly reported good recall of hospital treatment that included suturing of facial lacerations. Children who were between the ages of three and seven years at the time of the injury recalled a

similar number of features when interviewed one year later as they had both a few days and six to eight weeks after the suturing. However, more false alarms occurred in response to suggestive questions after the long delay, suggesting that the memory representations did change over time.

Children also remembered injuries, and the hospital treatment that resulted, in studies by Peterson and her colleagues (e.g., Peterson & Bell, 1996; Peterson & Whalen, 2001). When children were interviewed six months after the injury, they reported significantly less information about both the injury and the hospital events than when they were interviewed soon after the events (Peterson & Bell, 1996), but when re-interviewed two years and five years after the injury, the children recalled less about the hospital event than they had soon after, but as much as before about the injuries (Peterson, 1999; Peterson & Whalen, 2001). Nonetheless, the children's accounts of both the injury and hospital events were less accurate after the very long delays than in the initial interview, suggesting changes in the content of the memories, if not in the amount recalled.

Reinterviewing children about Hurricane Andrew, however, Fivush *et al*. (2004) showed that those children's reports can become *more*, rather than less, detailed after long delays. The children, who had been three to four years old at the time of the hurricane, were re-interviewed six years later. The effects were quite dramatic, with the now 9- to 10-year-old children reporting almost twice as much information as when interviewed shortly after the event (Parker *et al*., 1998).

Regardless of the research setting, delay between the occurrences of the to-be-remembered event and questioning has adverse effects on the strength of the memory trace. Lamb, Sternberg, and Esplin (2000) have shown that after delays of more than one month, children report fewer new details about alleged abuse than do children recalling abuse that allegedly happened more recently. It is thus preferable to question child witnesses as soon as possible after the alleged incident(s). Interviewers should recognise that children interviewed after a substantial delay might require more time to retrieve details from recall memory, and they should also be more cautious when questioning children after long delays because such children are more susceptible to suggestion.

Although children are more likely to be misled about staged events (Ceci, Loftus *et al*., 1994; Leichtman & Ceci, 1995) and report fewer event details about them the longer the delay (Baker-Ward *et al*., 1993; Ornstein *et al*., 1992), recent research (Roberts & Powell, 2007) shows that the timing of both misinformation and test interviews as well as the type of details mediate children's suggestibility after repeated experiences. Although 5- to 6-year-old children who experienced the

to-be-remembered (TBR) event once were more suggestible when the misleading information was introduced longer after the event than when it was presented shortly after, children who experienced the event repeatedly were more accurate after longer delays between the events and misinformation, but only when questioned about invariant details.

TYPES OF QUESTIONS USED TO PROMPT MEMORY RETRIEVAL

Seemingly regardless of the types of experiences being remembered or reported, the methods used by interviewers to elicit children's accounts of their experiences affect both the quantity and quality of information elicited from children. The distinction between recall and recognition testing is crucial. When adults and children are asked to describe events with free recall prompts ("Tell me everything you remember . . . "), their accounts may be brief and sketchy, but are more likely to be accurate. When provided with open-ended prompts like "Tell me more about that" or "And then what happened?", children often report additional details. When interviewers prompt with leading questions such as "Did he have a beard?", "Did he touch you with his private", or "Did this happen in the day or in the night", however, they shift from recall to recognition testing, and the probability of error rises dramatically (e.g., Dent, 1982, 1986; Dent & Stephenson, 1979; Hutcheson, Baxter, Telfer, & Warden, 1995; Lamb & Fauchier, 2001; Oates & Shrimpton, 1991; Orbach & Lamb, 2001). When memory is probed using open-ended prompts, respondents attempt to provide as much relevant information as they "remember", whereas children may have to confirm or reject information provided by the interviewer when focused questions tapping recognition memory are asked. Recognition probes refocus the child on domains of interest to the investigator and exert greater pressure to respond, whether or not the respondent is sure of the response. Recognition probes are more likely to elicit erroneous responses in eyewitness contexts because of response biases (i.e., tendencies to say "yes" or "no" without reflection) and false recognition of details that were only mentioned in previous interviews or are inferred from the gist of the experienced events (Brainerd & Reyna, 1996). Effective interviewers should thus maximise the reliance on free recall by offering open-ended prompts so as to minimise the risk of eliciting erroneous information. Free recall reports are not always accurate, of course, especially when the events occurred long before the interview or there have been opportunities for either pre- (Leichtman & Ceci, 1995) or post-event contamination (Leichtman & Ceci, 1995; Poole & Lindsay, 1995, 1997; Poole &