

RESEARCH

Preliminary Findings from the University of California, Davis, Child Memory Study: Development and testing of interview protocols for young children

—by Margaret S. Steward

Young children must find it very tiresome to be interviewed by adults. Adults often can't understand that children say, or don't understand what children mean — and when adults finally understand, they don't necessarily believe children's stories.

In the early-1980's, my colleagues and I drew together an interdisciplinary research team with expertise in child development, pediatrics, early childhood education, child clinical psychology, and law. All of us had worked in some capacity with sexually abused young children, and we were profoundly disturbed by the uneven, and often uninformed handling of children by law enforcement and the courts. It seemed to us that the courts knew little about young children's thoughts, words, actions, curiosity, or dependency on adults. Courts too often view what children say through the lens of research on adult eyewitness behavior. Reliance on such research raises two important issues. First, much eyewitness research focuses on situations in which adults observe events but do not participate. Is research focused on non-participants relevant when the task is understanding the report of a child who participates directly in an event? Second, children may perceive, remember, and report experiences differently from adults.

There are critical differences in the kind and quality of information that a bystander and a victim experience. These differences are driven by judgments of importance, mobilization of attention, and differences in the processing of sensory, kinesthetic, proprioceptive and sometimes nociceptive (painful) stimuli. Our team had repeatedly observed that children in medical settings remember with great detail and accuracy medical procedures that involve the touch and handling

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of their bodies. When children experienced painful medical or surgical procedures, children's memory was often better than that of the staff or parents. Anyone who believes in the easy malleability of young children's memory has never tried to take a child back to the doctor who gave the child a shot on the previous visit.

How do children's memories differ from adults'? Pillemer and White (1989) proposed a dual memory theory that helps frame our understanding of children's memory. The first memory system is present at birth and predominates in early childhood. Memories in the first system are organized and evoked by persons, locations, and emotions. Memories in the first system are not easily "transportable" outside the original experience. To access these memories, one must use images of face and place, actions, or feelings. It is as though one has to return to the child's original experience in order to access these memories. The second memory system is ver-

bally mediated, begins to develop in early childhood, and stores experiences in narrative form. Memories can be cued by words, and stories can be reviewed by the self and shared with others.

With the dual memory system, two- to six-year-olds might store different facets of a single experience in each of the two systems, depending on their level of cognitive development, their language skill, and the intensity of their emotional response to the experience. To get the "whole story," an interviewer would need to tap into both memory systems. Pillemer and White believe the first memory system is available throughout life. When an experience is so emotionally powerful that a person is left speechless, that event may be stored in the first rather than the second memory system regardless of how old or verbally articulate the person is.

As my colleagues and I studied the complexity of memory, and young children's difficulty using language to report what they remembered, we came to believe that the most important issue with regard to young children's memory is not suggestibility or errors of commission, but rather under-reporting of information children remember. Our concern was that because children did not report all they knew, they were not being believed or protected. We set about to design and test interview protocols that included cues and props to enhance children's ability to reach into both memory systems to report their past experiences.

Our research team (Steward, 1989, 1992; Steward, Steward, Farquahar, Reinhart, Joye, Myers & Welker, 1992) has completed a study of three- to six-year-old children's reports of the experience of a visit to one of seven outpatient clinics at our medical center. The children in our study were touched by our medical staff "from head to toe." The typical child was touched on a dozen different places. About half the children experienced genital touch, and some experienced a wide range of potentially stressful medical procedures. Shortly following the medical procedure, the children were interviewed. Children rated their own distress about body touches on a face scale originally designed by Australian school children (Bieri, Reeve, Campton, Addicot, & Ziegler, 1990). The medical professional who administered the procedure rated the child's distress on a 6 point Likert scale. We videotaped both the pediatric visits and subsequent interviews so that we could study three different measures of memory: (1) accuracy of children's memory for the procedure, (2) completeness of children's reports, and (3) consistency of children's reports over time. Of the original 130 children, 128 were available for follow-up interviews one month later. Seventy-four children were interviewed 6 months later.

We designed four experimental interview strategies: a core verbal interview, and three interviews enhanced with anatomically detailed drawings, anatomically detailed dolls and equipment, or computer graphics. The interview questions focused on children's

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experience of body touch and handling, their ability to describe persons present with them during the clinic visit, and the place where the visit occurred. Parents, children, and medical staff cooperated to allow us to collect a rich set of demographic, behavioral, and experimental information about each child. We examined the predictive power of twelve covariates, assessed in four blocks, organized according to the ease/expense of acquiring the information: (1) child's age, gender, and ethnicity, (2) parental report of child's health history, family stress, parental education, and income, (3) child's experiences during the pediatric visit, including the number of invasive medical procedures, medical staff rating of child's health status, the child's pain judgments, and (4) the number of outpatient and inpatient visits which occurred between the original clinic visit and follow-up interviews at one and six months.

During the initial interview, children's spontaneous reports of body touch were highly accurate (94%), but very sparse. Children reported an average of only 25% of what occurred during the examination. The accuracy of children's descriptions of the persons who touched them (86%), what they were touched with (72%), and the place (86%) were also high.

During the initial interviews, the enhanced interviews did not elicit greater detail than the unaided interview. At the one-month follow up interview, however, the cues offered by the anatomically detailed body outlines and dolls allowed children to report more complete data about body touch without any compromise in accuracy.

During two of the enhanced interviews, children were shown two sets of photographs—we called them "Rogues Galleries." One gallery contained photos of similar looking medical professionals, including the professional who touched the child. The other gallery contained pictures of clinic settings. The photos of professionals and places elicited data that were accurate and much more helpful than children's brief verbal descriptions in identifying medical staff and clinic setting. In sharp contrast, the toys and medical equipment cued increasingly erroneous reports at one and six month follow up interviews of what children were touched with. Children using medical equipment appeared to engage in "routine medical play" with the equipment, rather than demonstrate their own unique experiences from the previous clinic visit.

Children's ratings of distress significantly predicted the completeness, but not the accuracy, of their spontaneous recall of body touch during the initial and one-month follow-up interviews. Distress became a significant predictor of both completeness and accuracy at the 6 month interview.

Across the 6 months, children's reports were consistently more accurate than erroneous. If a child

reported the same information on all three interviews, the information was 25 times more likely to be right than wrong. Older children gave more consistently accurate reports, but no variable was correlated with those few children who repeated inaccurate information. Children continued to report new, accurate information about body touch, including genital touch, at one and six months.

The six covariates that entered significantly into the predictions of accuracy, completeness, and consistency include age, distress, maternal education, income, medical experience and the number of medical procedures a child experienced. The covariates that never came into play included gender, ethnicity, family stress, health status, and number of intervening outpatient or inpatient visits. Children and medical staff did not agree on how distressing touch and handling was. Moreover, medical staff ratings of the child's distress were not significantly related to any of the three measures of children's memory.

The reports of two groups of children were especially interesting: (1) children who reported at least one of the body touches as highly distressing, and (2) children who experienced painful invasive medical procedures but later denied not only the distress, but even the body touch! Children in the first group did not differ from the rest of the children on scores of medical experience, language skills, or family stress, but the high stress children did disclose more information on all three interviews. Additionally, the accuracy of their reports about body touch remained high throughout the study.

Children who underwent painful touch but later denied the pain were more accurate in their descriptions of both the persons present and the clinic room than a parallel group of children who underwent only benign, non-painful touch and handling. It was as though children who received painful touch were saying, "I don't want to be with that person in that place again!" We do not believe the children forgot the painful experience. We are reviewing the videotapes of the clinic experiences to examine adult-child interaction. We are also coding the non-verbal expressions of shame by children when they were interviewed about body touch, hoping that clues from adult or child behavior will help us understand why these children withheld their report of painful body touch. We hope the review will help us understand the under-reporting of children who have been abused.

Mandler (1990) has made two critical points about recall of past events: (1) all recall is cued, and (2) recall is a reconstruction of information to ourselves. We began our research focused on the former, that is, design, development, and testing of four parallel interview protocols that differed in the cues children were offered. We end the project fascinated

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Overview

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stronger than memory for peripheral details

Interestingly, in some cases, younger children can provide *more* accurate information than adults (Lindberg, 1991). For example, if an event is particularly salient (as sometimes happens in cases of trauma), recall may be exceptionally good (Brainerd & Ornstein, 1991; Lindberg, 1991). In a study of children who witnessed a sniper attack at an elementary school, Pynoos and Nader (1989) found that "the sight of injury or blood had a uniquely profound impact on the children's memory" (p. 240). Other researchers have demonstrated that children's memories for meaningful events — including a visit to the dentist (Peters, 1987); a physical examination (Ornstein, Gordon, & Braddy, in press); an inoculation (Goodman, Aman, & Hirschman, 1987); and a class trip (Fivush, Hudson, & Nelson, 1984) — can be very good over extended periods of time.

If the material to be recalled is part of a young child's pattern of daily life (i.e., a script memory), recall may be outstanding. For example, when three- and four-year olds were studied in their own homes, they showed an amazing amount of recall about their daily experiences. Children demonstrated good spontaneous recall as well as good recall in response to questions. Sequences of actions, however, were poorly recalled (Todd & Perlmutter, 1980).

In general, school-age children demonstrate better recall in familiar situations (Johnson & Foley, 1984). This phenomenon was demonstrated in two studies of children who had experienced group trauma. Children who witnessed a sniper attack at their own school (a familiar setting) tended not to err in sequencing or estimating the duration of the event (Pynoos & Nader, 1989). In contrast, children kidnapped and buried in a school bus (an unfamiliar setting) produced significant memory errors in sequencing and estimating event duration (Terr, 1979).

Strategies for and Deficiencies in Remembering

Children have limited ability to use memory strategies. For this reason, children often know more than they can freely recall. When children begin using memory strategies efficiently, their ability to communicate material through the memory system

improves dramatically.

The use of *rehearsal* as a memory strategy is almost automatic for adults. We use rehearsal when we repeat information to ourselves in order to remember a telephone number or the items on a grocery list. Ten-year-olds also commonly use rehearsal to aid memory. Young children, however, have not mastered rehearsal (Harris & Liebert, 1991).

Another memory strategy is imagery, which involves (1) mentally picturing a person, place, or object, or (2) visually associating two or more things that are to be remembered. Children develop imagery much later than other memory strategies. Indeed, some people never learn this memory strategy (Flavell, 1977). Like other techniques, imagery can be used by some young children if they are instructed in its use and given reminders to continue using the technique (as in context reinstatement).

One of the most effective memory strategies is organization, which is the grouping of items around some common element or theme. Preschoolers do not organize material as well as older children because preschoolers are not adept at categorical representation. Although children as young as five can sort items into categories, young children do not use the categories to help them remember (Moely, 1977). For example, when five-year-olds are presented with a list of random words and asked to "put together the words that go together," most of the children can categorize animal-words, food-words, color-words, etc. After completing this task, however, most young children fail to use the organizational information as cues to help remember the words on the list. Similarly, when items are presented to young children in small blocks, one category at a time, children can remember the categories (e.g., fruits, toys, colors). However, when the individual items are presented randomly, most six-year-olds do not organize the material well, even when there are only a few items in each category (Furth & Milgram, 1973).

Another technique that can aid recall is the use of *external cues*, such as the proverbial string tied around the finger. Elementary school children typi-

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with the discrepancy between remembering and reporting. Many children do not tell us what they know. The challenge is finding ways to help children tell.

References

- Bieri, D., Reeve, R.A., Champion, G.D., Addicoat, I., & Ziegler, J.B. (1990). The faces pain scale for the self-assessment of the severity of pain experienced by children: Development, initial validation, and preliminary investigation for ratio scales properties. *Pain, 41*, 139-150.
- Mandler, J.M. (1990). Recall and its verbal expression. In R. Fivush & J.A. Hudson (Eds.), *Knowing and remembering in young children*. NY: Cambridge University Press.
- Pillemer, D.B. & White, S.H. (1989). Childhood events recalled by children and adults. In H.W. Reese (Ed.) *Advances in Child Development and Behavior*. NY: Academic Press.

Steward, M.S. (1989). The development of a model interview for young child victims of sexual abuse: Comparing the effectiveness of anatomical dolls, drawings and video graphics. Final Report of grant #90CA1332 for the National Center on Child Abuse and Neglect, U.S. Office of Health and Human Services, Washington, D.C., Nov. 30, 1989.

Steward, M.S. (1992). Understanding children's memories of medical procedures: "He didn't touch me and it didn't hurt!" In C.A. Nelson (Ed.) *Minnesota symposium on child psychology: Memory and affect in development*. Hillsdale, NJ: Lawrence Erlbaum.

Steward, M.S. & Steward, D.S., Farquhar, I., Joye, N., Reinhart, M., Myers, J.E.B. & Welker, J. (1992). *A visit to the doctor: The accuracy, completeness and consistency of children's memory*. Manuscript in preparation.

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