

The Abilities of Children With Mental Retardation to Remember Personal Experiences: Implications for Testimony

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Investigated the abilities of children with mental retardation to remember the details of a personally experienced event. A simulated health check was administered to 20 children with mental retardation and 40 normally developing children, half matched on mental age (MA) and half matched on chronological age (CA) with the children with mental retardation. The children's memory was assessed immediately after the health check and 6 weeks later. Overall, the children with mental retardation accurately recalled the health check features, provided detail, and resisted misleading questions about features that did not occur. The group with mental retardation performed similarly to the MA matches on virtually all of the memory variables. The children with mental retardation performed worse than the CA matches on most of the memory variables, although they were able to recall a similar number of features. The findings are discussed in terms of the ability of children with mental retardation to provide accurate testimony.

Although children's testimony has been studied extensively in recent years (see Ceci & Bruck, 1995), the vast majority of investigations have focused on normally developing children. Children with intellectual disabilities are at an increased risk for abuse (Elliott & Elliott, 1992; Schilling, Kirkham, & Schinke, 1986; Zirpoli, Snell, & Loyd, 1987), yet little is known about their abilities to remember their experiences over time, to report those experiences accurately, and to resist others' suggestions (Gordon, Jens, Hollings, & Watson, 1994). Furthermore, little information is available about what interviewing techniques would help these children provide accurate and complete accounts of their experiences (Bull, 1995; Dent, 1986).

Even though little attention has been directed to testimony of children with mental retardation, two areas of literature are relevant: studies of the autobiographical memory performance of normally developing children and explorations of the basic memory skills of children with mental retardation. In the autobiographical memory literature, age differences in the abilities of normally developing children to remember personally experienced events routinely have been reported. These studies (see, e.g., Baker-Ward, Gordon, Ornstein, Larus, & Clubb, 1993; Ornstein, Baker-Ward, Gordon, & Merritt, 1997) indicate that younger children typically recall less information than older children, both immediately after an event and after time delays of various durations. Younger children also show more forgetting over time than do older children and are more susceptible to misleading questions. Given these age differences, it seems reasonable to expect that children with mental retardation would not remember the details of their personal experiences as well as normally developing children of the same chronological age (CA).

Consistent with this expectation, the literature on the basic memory skills of children with mental retardation suggests that children with moderate levels of mental retardation routinely perform below the levels of their age-mates on many but not all types of memory tasks. For example, although children with mental retardation may not exhibit a deficit in comparison with their normally developing peers in terms of their per-

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formance on some recognition (Brown, 1974) and incidental memory tasks (Fox & Rotatori, 1980), they lag behind on other recognition tasks (McCartney, 1987) and especially on tasks involving the deployment of a wide range of mnemonic strategies (e.g., Belmont & Butterfield, 1969; Brown, 1974; Campione & Brown, 1977; N. R. Ellis, 1970). What is less clear, however, is how children with mental retardation fare in comparison with younger children of normal intelligence who are matched on mental age (MA). Advocates of a "developmental" approach (Weisz, Yeates, & Zigler, 1982; Zigler, 1969) as opposed to a "difference" approach (e.g., Milgram, 1973) to mental retardation predict that when children with retardation without known neurological features are compared with normally developing children who are matched on MA, no differences should be observed in performance on a wide variety of cognitive tasks (see also Landesman-Dwyer & Butterfield, 1983; Perry & Wrightsman, 1991).

Although the difference approach seems to have been supported with regard to comparisons involving Piagetian tasks (Weisz & Yeates, 1981), the evidence with regard to other information-processing tasks is more mixed (Weiss, Weisz, & Bromfield, 1986). For example, in contrast with the developmental position, Burack and Zigler (1990) reported that adolescents with familial mental retardation performed below the level of younger children who were matched on MA on a number of measures of intentional memory. Moreover, in their meta-analysis of the performance of MA-matched retarded and nonretarded samples, Weiss et al. observed substantial deficits for the children with mental retardation in the domain of memory. These deficits, however, varied considerably across memory tasks, with the children with mental retardation and their MA controls performing equivalently on some tasks. Unfortunately for an analysis of the abilities of children with mental retardation to provide effective testimony, the data do not permit a clear-cut statement concerning the areas of memory in which performance supports either the developmental or the difference perspective. Still, it seems likely that the groups will differ on tasks that involve deep processing and the application of memory strategies (Ornstein & Corsale, 1979) but not on incidental tests of the recall of the salient details of well-understood events such as visits to the doctor. Nonetheless, resolution of the discrepancies in the literature is clearly important.

Another issue central to evaluations of the extent to which children with mental retardation can provide accurate testimony concerns the types of questions that may produce optimal recall. As is the case with younger, normally developing children (Baker-Ward et al., 1993; Gordon & Follmer, 1994), when probed with open-ended questions, children with mental retardation provide relatively little information, and interviewers need to rely on the children's responses to yes/no ques-

tions (Sigelman, Winer, & Schoenrock, 1982). Unfortunately, however, yes/no questions do not appear to promote accurate recall. Sigelman and colleagues (Sigelman, Budd, Winer, Schoenrock, & Martin, 1982; Sigelman, Winer, & Schoenrock, 1982) found that children with mental retardation provided less but more accurate information in response to open-ended questions, whereas when yes/no questions were added, the responses became more complete but less accurate. Dent (1986) concluded that the very specific cues that are necessary to extract complete information from children with mental retardation decrease response accuracy, and some researchers have suggested that yes/no questions should be avoided completely when questioning children with mental retardation (Budd, Sigelman, & Sigelman, 1981; Sigelman, Budd, Spanhel, & Schoenrock, 1981).

The abilities of children with mental retardation to resist suggestion also influence evaluations of their capacity to testify. Because suggestibility is negatively correlated with IQ at the lower end of intelligence (Gudjonsson, 1988), it seems reasonable to expect that children with mental retardation would be more vulnerable to suggestion than their CA matches. However, studies comparing children with mental retardation to intellectually normal children matched for MA generally have found few differences in their responses to questions about events that did not occur (Gordon et al., 1994; Jens, Gordon, & Shaddock, 1990). The evidence suggests that when these questions are phrased neutrally, children with mental retardation can perform as well as their MA counterparts (Jens et al., 1990). It remains unclear, however, whether these findings would hold true for questions phrased in a purposefully suggestive manner. Because children with mental retardation are highly sensitive to cues provided by adults and are often eager to please authority figures, they may be more likely than typically developing children to give the answer they think is desired (Ellis & Luckasson, 1985; Sattler, 1992; Sigelman et al., 1981). Indeed, some studies have demonstrated that children with mental retardation are more likely to acquiesce to misleading questions, even when compared with intellectually normal children matched for MA (Budd et al., 1981; Sigelman et al., 1980, 1981; Zigler & Balla, 1981).

Together, the available research leaves many unanswered questions about how the memory performance of children with mental retardation compares to that of normally developing children. This study was designed to address these questions by examining the abilities of children with mental retardation to remember the details of a personally experienced event. A primary goal was to determine whether MA was a better predictor of memory performance than CA for the children with mental retardation. We chose a simulated health check as the stimulus event so that the children's experience

could be controlled, while providing a salient, real-world experience that could be generalized to some extent to testimony situations (Ornstein, Gordon, & Baker-Ward, 1992). To assess long-term memory, we interviewed the children both immediately after the health check and again 6 weeks later. In addition to questions about the component features of the health check, questions about activities that had not occurred were also included. In this way, various aspects of the children's accuracy and their susceptibility to suggestion could be assessed. A final goal of the study was to clarify the existing literature on how to question children with mental retardation to strike the best balance between completeness and accuracy, both of which are crucial to effective testimony.

Method

Participants

Three groups of 20 children each were recruited. One group was composed of children with mental retardation, whereas the others included normally developing children comparable to those with mental retardation on either MA or CA. These 60 children were recruited with the cooperation of an urban school system in a medium-size southern city. First, letters were sent to parents of children who were classified as educably mentally handicapped (EMH) by the school system. Families who expressed an interest in participating by mailing a return postcard were contacted by telephone and given a further description of the study. Second, to obtain a rough estimate of MA, the Peabody Picture Vocabulary Test-Revised (PPVT-R) was administered to each EMH child who agreed to participate. Third, based on the MA and CA of the EMH children, letters were then sent to parents of normally

developing children who matched the age parameters so that comparison groups could be formed.

The average CA and MA for each group are indicated in Table 1, along with information concerning socioeconomic status, sex, and racial composition. The sample was predominantly middle and upper class, although a greater proportion of the EMH children fell into the lower class, as assessed with the Hollingshead (1975) measure. Moreover, 75% of the participants were Caucasian, and 63% were boys. The children were not matched on sex because of constraints on the number of participants available as well as the absence of sex differences in previous investigations of children's memory for salient medical experiences (e.g., Baker-Ward et al., 1993). Detailed information about the EMH children's diagnoses (e.g., including the presence of neurological features) was not available.

Approximately 15% of the families who received the initial letter expressed an interest in participating in the project, and of these, 90% actually completed the study. Data from 15 of the MA matches were dropped after data collection, when testing revealed that these children did not match the MAs of the EMH children. In addition, one EMH child, whose standard score on the PPVT-R was in the average range, was dropped. These 16 participants were replaced, to form three groups of 20 participants. One child from the MA-matched group, however, withdrew from the study between the first and second interviews, leaving 59 children for the 6-week interview.

Procedure

At the outset of the study, written informed consent to participate was obtained from each parent and verbal assent was obtained from each child. The children were not told the purpose of the study or that they would be interviewed again. On the second visit, the parents were

Table 1. Chronological Age, Mental Age, Socioeconomic Status, Sex, and Racial Composition of the Three Groups

	Educably Mentally Handicapped ^a	Mental Age ^b	Chronological Age ^a
Chronological Age (Years/Months)			
<i>M</i>	11.7	6.3	11.7
Range	9.4-14.1	4.8-8.10	9.4-13.11
Mental Age (Years/Months)			
<i>M</i>	6.7	6.3	13.5
Range	5.0-8.4	4.10-8.3	8.2-33.8
Hollingshead Scores (Range = 8 to 66)			
<i>M</i>	44	54	50
Range	14-64	34-66	40-59
<i>SD</i>	15	8	5
Sex			
Boys	14	11	13
Girls	6	9	7
Race			
Caucasian	12	16	17
African American/Other	8	4	3

^a*n* = 20. ^b*n* = 19.

asked if their child had made any trips to the doctor since the health check. Ten of the 60 children, distributed evenly among the three groups, had intervening medical experiences such as visits to the doctor or school-based health screenings.

PPVT-R (Dunn & Dunn, 1981). To obtain an estimate of MA, the PPVT-R was administered to each child before the health check. Although the PPVT-R is not a substitute for a comprehensive test battery, it is highly correlated with measures of general verbal intelligence (Sattler, 1992) and can be used to provide a rough estimate of general intellectual functioning for research purposes (Dunn & Dunn, 1981). As expected, the PPVT-R standard scores for the MA matches ($M = 104$, $SD = 10$) and the CA matches ($M = 109$, $SD = 20$) were close to average. In contrast, the PPVT-R standard scores for the EMH group were substantially below average ($M = 58$, $SD = 14$).

Health check. After administration of the PPVT-R, the children were given a simulated health check. The health check, which lasted approximately 10 min and was videotaped, was administered in a university setting by one of five trained research assistants. The health check was composed of the 15 components that are indicated as "present features" in Table 2. These features resemble those that would normally be experienced in a routine well-child physical examination and were always administered in the same order. In addition, to provide a novel, unexpected feature that would not normally occur during a check-up, each child's photograph was taken with an instant camera. Recall of the photograph was later examined to determine if the children were remembering this health check or past visits to the doctor.

Memory interview. The children's recall was assessed by one of two trained research assistants im-

mediately after the health check and again 6 weeks later (± 6 days). In each case, the interview was performed by a different research assistant than the one who had administered the health check. The same interviewer was used for both the immediate and delayed interviews. Because the memory interviews took place in a separate room from the health check, the children did not have environmental cues to aid their memory.

A standard interview protocol was used to probe for the children's recall of the features of the health check (see, e.g., Baker-Ward et al., 1993). The questions were hierarchically organized, beginning with open-ended inquiries and progressing to more specific probes. Each interview began with an open-ended prompt ("Tell me what happened during your health check") and then moved to more specific questions (e.g., "Did the woman check any parts of your face?") and to yes/no questions about particular components of the health check that had not yet been reported (e.g., "Did she check your eyes?"). For each feature mentioned, the child was asked an elaboration question: "Tell me how she did that." If the child could not provide elaborative detail, the interviewer posed an even more specific yes/no question (e.g., "Did she shine a light in your eyes?").

Questions were also asked about 12 features that did not occur during the health check, and these are indicated as "absent features" in Table 2. One half of these questions were phrased in a neutral way (e.g., "Did the woman check your private parts?"), whereas the other half were phrased in a more suggestive manner (e.g., "The woman checked your private parts, didn't she?"). When children falsely reported that an absent feature had been included in the health check, they were asked to elaborate. These absent feature questions constituted the measure of suggestibility.

Four different versions of the interview were used. To control for order effects, questions about the features of the health check were asked in two different random orders. Moreover, within each of these two orders, each absent feature question was phrased either neutrally or more suggestively. Thus, some children were questioned neutrally about the shot, for example, whereas others were questioned suggestively about this feature. Each child was assigned randomly to one of the four interview protocols, which was then used for both interviews.

Coding Systems

The interviews were videotaped for subsequent analysis and then transcribed and coded according to scoring procedures used by Baker-Ward et al. (1993). Coders were blind to group membership. These coding procedures were designed to determine the particular features that were remembered, the level of questioning that was required to elicit the response, and the completeness of

Table 2. Features of the Health Check

Present Features	Absent Features
Take Blood Pressure	Measure Size Around Head
Measure Height	Touch Nose With Finger
Measure Weight	Follow Pencil With Eyes
Check Vision (With Eye Chart)	Check Urine
Take Temperature	Check Private Parts
Check Hair	Give Medicine
Check Eyes	Put Band-aid on
Check Ears	Check Bottoms of Feet
Check Nose	Check Tummy
Check Mouth	Give a Shot
Rotate Foot/ankle	Take Blood
Check Knee Reflexes	Touch Toes
Check Elbow Reflexes	
Check Heart (With Stethoscope)	
Check Back (With Stethoscope)	

the elaborative detail that was provided. To assess interrater reliability, two research assistants independently evaluated 25% of the 119 interviews coded. Interrater agreement for the types of coding reported subsequently ranged from 90% to 94%, with kappa values (Landis & Koch, 1977) of .93 ($p < .001$) or greater.

Recall. Each health check feature that was reported was coded for correct recall, a measure of accuracy reflecting whether the feature named actually happened, and for the level of prompt (e.g., open-ended vs. more specific questions) that was necessary to elicit the information. We considered a feature to be recalled correctly if it was reported in response to either type of question, regardless of how much elaboration was provided.

Elaboration. Each feature remembered was also coded for quality and quantity of elaboration provided. Elaboration represented how much detail a child could generate about the features of the health check. Responses were given a score of 0 (*no elaboration*), 1 (*incomplete elaboration*), or 2 (*for complete elaboration*). To receive a score of 2 for a particular feature, the child had to state the instrument the health checker used (e.g., a stethoscope), the action she performed (e.g., listening), and the location on the child's body (e.g., the chest), or as many of these categories as were applicable for that particular feature. For each child, we calculated an average elaboration score by summing over the three categories of instrument, action, and location and dividing by the total elaboration that was possible for each feature.

Absent features. The children's responses to the 12 absent feature questions about medically plausible events that were not part of the health check were also analyzed. Each child received a correct denial score that reflected the percentage of features that he or she was able to indicate correctly did not happen. When the children incorrectly stated that an absent feature had occurred, their responses were also scored for elaboration, using a 0 to 2 scale. A 0 was given for no elaboration, whereas a 1 was awarded when information given in the question was repeated, and a 2 was assigned only when original elaboration not included in the question was provided.

Intrusions. Intrusions involved the spontaneous provision of incorrect information in response to open-ended questions. The children's responses were coded for two different types of intrusions. A "feature intrusion" occurred when a child falsely stated that a feature had been included in the health check when this had not been the case, and an "elaboration intrusion" occurred when incorrect elaborative detail about a feature that was present in the health check was provided.

Results

Preliminary analyses indicated no significant differences as a function of child's sex, interviewer, health checker, interview protocol, or intervening medical experiences. Therefore, the data were collapsed over these variables for further analyses. The general analysis strategy involved the use of a series of 3×2 (Groups \times Times) repeated measures analyses of variance on the 59 participants who completed both interviews. These analyses of variance were followed, when appropriate, by preplanned contrasts to compare the performance of the different groups.

Recall

The proportion of features correctly recalled by the children in the three groups is displayed in Figure 1. The levels of overall recall were quite impressive at both the immediate (left panel) and delayed (right panel) interviews and did not vary substantially as a function of group. There were, however, marked differences in remembering in response to open-ended questions. Indeed, the shaded areas of the bars depicted in Figure 1 indicate that at both assessments, the open-ended recall of the CA control group was superior to that of both the EMH group and the MA control group, $F(2, 56) = 20.77, p < .0001$. Preplanned contrasts confirmed that the open-ended recall of the children in the EMH and MA control groups was comparable and below that of the CA matches, $F(1, 56) = 29.94, p < .0001$. As indicated in Figure 1, the overall and open-ended recall of all three groups declined over the 6-week delay interval, $F_s(1, 56) > 14.14, p_s < .001$.

Elaboration

To understand further the children's recall performance, the elaborative detail that they generated was evaluated on a 0 to 2 scale. The amount of elaboration provided by each of the three groups is illustrated in Figure 2, which shows that the groups differed in the extent to which their reports included elaborations, $F(2, 56) = 29.28, p < .0001$. Consistent with inspection of the figure, preplanned contrasts confirmed that the performance of the EMH group was in general comparable to that of the MA matches but significantly below the level of the CA matches, $F(1, 56) = 51.33, p < .0001$. This group effect, however, was moderated by a Group \times Time interaction, $F(2, 56) = 4.71, p < .05$, indicating that the EMH group was equivalent to the MA matches only at the delayed assessment and was actually somewhat below the MA control group at the initial interview. Indeed, preplanned contrasts conducted on the difference scores confirmed that the elaboration perfor-

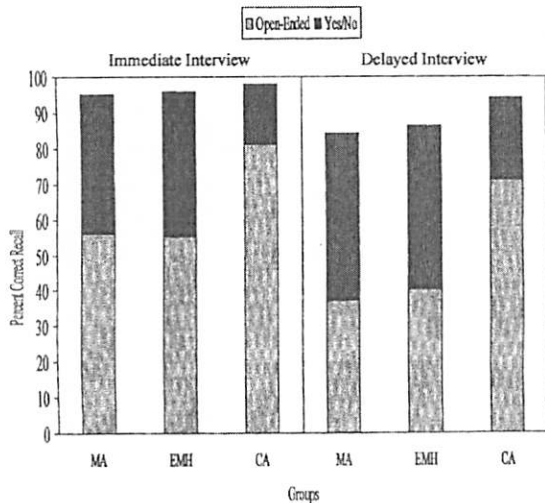


Figure 1. Percentage correct recall and open-ended recall at immediate and delayed interviews for educably mentally handicapped (EMH), mental age (MA) matched, and chronological

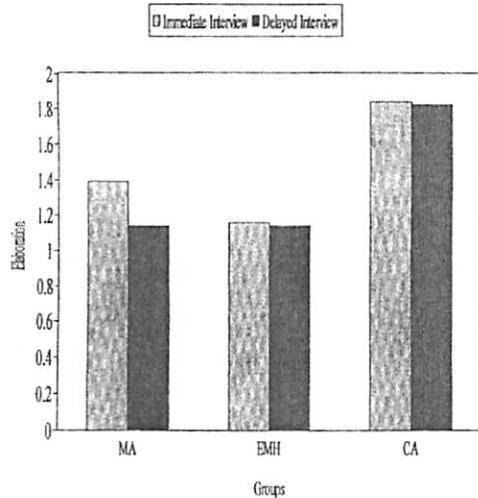


Figure 2. Elaboration scores at immediate and delayed interviews for educably mentally handicapped (EMH), mental age (MA) matched, and chronological age (CA) matched groups.

mance of MA group dropped more over time than did that of the EMH group, $F(1, 56) = 6.67, p < .05$.

Intrusions

The children's spontaneous errors of commission in their accounts of the health check are displayed in Table 3. As indicated, the overall rate of intrusions was relatively low, and a small number of the children accounted for most of the intrusions made. The table indicates the extent to which the three groups made "feature intrusions" by claiming that medical features had been included in the health check, when, in fact, they had not been administered. Although the overall level of fea-

ture intrusions is quite low, these errors increased over the course of the delay interval, $F(1, 56) = 5.26, p < .05$. Moreover, even though the EMH group tended to make more feature intrusions than the two control groups, these differences were not significant.

The extent to which the children spontaneously added incorrect detail about features included in the health check is also illustrated in Table 3. These "elaboration intrusions" increased over the delay interval, $F(1, 56) = 9.04, p < .01$, but group differences were not significant.

Absent Feature Questions (Suggestibility)

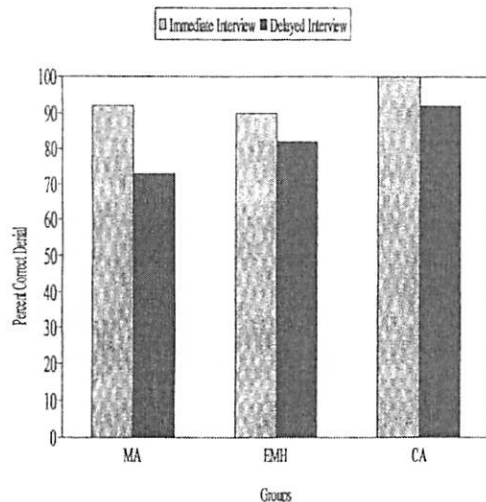
Information concerning the children's suggestibility is provided by inspection of their responses to specific yes/no questions about features that were not included in the health check. There were no differences in children's responses to the neutral versus more suggestive questions concerning absent features. Thus, the data were collapsed across this variable. The tendencies of the children in the three groups to say "no" when presented with absent feature questions, that is, their correct denials, are indicated in Figure 3. The children were effective in denying that the absent features had been part of the health check, although performance clearly varied as a function of group, $F(2, 56) = 7.48, p < .01$. Indeed, the performance of the CA control group was outstanding and superior to that of both the EMH group and the MA matches, $F(1, 56) = 7.16, p < .01$. In addition, performance decreased over time, but more so for the MA group than the others, resulting in a significant Group \times Time interaction, $F(2, 56) = 3.79, p < .05$. Furthermore, the children's performance in response to the specific absent feature question that was most directly abuse related ("Did she check your private parts?") was excellent, with mean correct denial scores ranging from 0.90 to 1.00.

Elaborative Detail in Response to Absent Feature Questions

Given the high levels of the children's correct denials indicated in Figure 3, there were relatively few false alarms or "yes" responses to the absent feature questions, especially at the immediate memory assessment. These false alarms are depicted in the left column of Table 4, and even though they were low-frequency events, they were followed by requests to the children to provide elaborative detail about the absent features that the children claimed were included in the health check. In response to these requests, either the children said that they did not know how the specified absent features had been administered, or they "invented" an elaboration. The two middle columns of Table 4 indicate the proportion of the children's responses to absent feature elabo-

Table 3. Mean Number of Feature Intrusions, Elaboration Intrusions, and Irrelevant Intrusions for Each Group at Immediate and Delayed Interviews

	Educably Mentally Handicapped	Mental Age	Chronological Age
Feature Intrusions			
Immediate Interview	0.3	0.05	0
Total Number of Children Making Intrusions	4	1	0
Delayed Interview	0.4	0.45	0.25
Total Number of Children Making Intrusions	6	4	3
Elaboration Intrusions			
Immediate Interview	0.4	0.35	0.45
Total Number of Children Making Intrusions	6	6	8
Delayed Interview	0.9	0.55	0.95
Total Number of Children Making Intrusions	14	8	12

**Figure 3.** Percentage of absent features correctly rejected at immediate and delayed interviews for educably mentally handicapped (EMH), mental age (MA) matched, and chronological age (CA) matched groups.

ration questions that fell into these two categories. At the immediate interview, the most frequent response of the children in the EMH group was that they did not know how the absent features to which they had made false alarms had been administered, whereas the most frequent response of the MA matches was to make up an elaboration. In contrast, at the delayed interview, high levels of invention were observed in these two groups along with lower but comparable proportions of "don't know" responses. The CA matches correctly denied 100% of the absent features at the immediate interview and therefore were never asked to elaborate, but they made false alarms to 8% of the absent features at the delayed interview and provided invented elaborative detail for all of these features. Differences among the three groups, however, could not be statistically analyzed because of the overall low frequency of false alarms.

Further analyses of the invented responses revealed situations in which the children seemed to have misinterpreted the basic questions that were posed. In these

cases, indicated in the right-hand column of Table 4, not only did the children err by claiming that an absent feature had been included in the health check, but they also provided incorrect elaborative detail by discussing a feature of the health check that they had experienced. The three groups clearly differed in the extent to which they produced these misinterpretations, $F(2, 56) = 6.33, p < .01$, with both the EMH and MA control groups making more errors than the CA control group, $F(1, 56) = 10.57, p < .01$.

Accuracy

Given an understanding of the children's correct and incorrect responses, it is possible to determine their overall levels of accuracy in response to questions about features of the health check. We determined the accuracy of the children's open-ended recall by dividing the number of features correctly recalled at the open-ended level of questioning by the sum of the features correctly recalled and the number of feature intrusions at the open-ended level. Consistent with the data already reported, the information provided by all three groups in response to open-ended questions was highly accurate, ranging from 98% to 100% at the immediate interview and 94% to 98% at the delayed interview. Similar calculations indicated that the accuracy of the children's responses to yes/no questions was high but not at the level of their open-ended recall. We computed accuracy for the children's responses to yes/no questions by dividing the number of features correctly remembered at the yes/no level and dividing it by the numerator plus the number of feature intrusions at the yes/no level and the number of false alarms.¹ With this calculation, children's accuracy ranged from 88% to 90% at the immediate interview and from 74% to 79% at the delayed interview, with no significant differences between the groups.

We also evaluated the accuracy of the elaborative detail provided to questions about the features that were

¹Feature intrusions occurred at the yes/no level when, for instance, the interviewer asked "Did the woman check your eyes?" and the child falsely stated "No, but she checked my eyebrows."

Table 4. Responses to Absent Feature Questions by the Three Groups at the Immediate and Delayed Interviews

	False Alarms	"Don't Know" Responses	Invented Elaboration	Misinterpretation Elaboration
Immediate Interview				
EMH Group	0.08	0.71	0.29	0.06
MA Match	0.10	0.40	0.60	0.08
CA Match	0.00	0.00	0.00	0.00
Delayed Interview				
EMH Group	0.17	0.20	0.80	0.03
MA Match	0.08	0.26	0.74	0.03
CA Match	0.08	0.00	1.00	0.01

Note: EMH = Educably Mentally Handicapped; MA = Mental Age; CA = Chronological Age.

Table 5. Mental Age as a Predictor of Memory Performance

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²
Total Recall				
Immediate Interview	.0002	.0001	.1818	.04
Delayed Interview	.0009	.0004	.3104*	.09
Open-Ended Recall				
Immediate Interview	.0020	.0004	.5405**	.31
Delayed Interview	.0026	.0005	.5909**	.34
Elaboration				
Immediate Interview	.0039	.0008	.5417*	.30
Delayed Interview	.0043	.0010	.5059**	.26
Correct Denial				
Immediate Interview	.0006	.0003	.2727**	.08
Delayed Interview	.0011	.0004	.3667**	.13

* $p < .05$. ** $p < .01$.

included in the health check. In this regard, no group differences were found in the accuracy of the children's elaboration at either interview. The correct elaboration for the three groups ranged between 96% and 97% of the features at the immediate interview and 92% and 93% at the delayed interview. Moreover, the vast majority of the small number of incorrect elaborations were medically plausible and in accordance with standard scripts for visits to the doctor's office.

One final assessment of the children's accurate recall of the details of the health check involves the extent to which they remembered the novel feature that was introduced into the health check. In this regard, at both the immediate and delayed interviews, all but one of the children recalled the novel feature of having their picture taken, indicating that they were remembering this specific health check and not merely drawing on their scripted knowledge of visits to the doctor.

MA and CA as Predictors of Memory Performance

To explore further the extent to which MA contributed to the children's memory performance, we performed a series of stepwise regression analyses on the data from all 59 participants combined. The results of these analyses, displayed in Table 5, indicate that MA was a particularly strong predictor at both memory as-

sessments of the children's open-ended recall and correct denials, with the R^2 values ranging between .26 and .34. Moreover, to a lesser extent, MA predicted the children's elaboration at both interviews and their total recall at the 6-week assessment. That MA failed to predict total recall at the immediate interview most likely reflects the operation of a ceiling effect, because overall recall was nearly perfect at the initial assessment. To explore the combined effects of MA and CA, we carried out a second series of regression analyses with both MA and CA as predictor variables. Comparison of the resulting F values with those obtained in the first series indicated that knowing the CA of a child did not, in general, account for more of the variability in the children's performance. Indeed, including CA in the prediction equation along with MA increased predictability only for the children's elaborations at the delayed interview, with the R^2 value increasing from .13 to .24, but not for any other memory measures.

Discussion

The purpose of this study was to examine the ability of children with mental retardation to accurately remember and report their experiences over time. The research was motivated by the increased risk of abuse for children with mental retardation and the lack of information available about their abilities to provide testi-

mony. Overall, the EMH children were quite successful at reporting the components of the health check. At the immediate interview, these children recalled accurately almost all of the health-check features, and a great deal of this information was retained over the delay interval. In response to open-ended questions, the accuracy of the EMH children was very high, and in response to yes/no questions, their performance, although lower, was still impressive. The EMH children also provided accurate elaborative detail at both interviews and were able to respond correctly at above-chance levels to misleading questions about events that had not occurred in the health checks. Although the performance of all children at the delayed interview was quite good, indicating little forgetting, it could be argued that this was attributable to a "rehearsal effect" of the initial interview. Previous work, however, has shown no effect of an initial interview on delayed recall performance (e.g., Baker-Ward et al., 1993).

As predicted, on almost all memory measures, the performance of the EMH group was similar to that of the MA matches and below that of the CA control group. Thus, consistent with expectation, the differences in the children's abilities to remember the details of an easily understood event are consistent with what would be expected from the developmental perspective on mental retardation (Gordon et al., 1994; Zigler, 1969). According to this view, children with retardation without known neurological features are thought to pass through the normal stages of cognitive development, although their rate of progress is slower and the ceiling is lower than that of their normally developing peers. Nonetheless, we must point out that the informal assessment of the interviewers was that the EMH children were more distractible and harder to keep focused on the task at hand than were children in the control groups, qualities that may make it challenging to interview EMH children in a clinical setting. For example, the EMH children were more likely than the MA and CA matches to make irrelevant comments during the interview about topics unrelated to the health check (e.g., "It's my sister's birthday tomorrow"). In addition, although the overall levels of both feature intrusions and elaboration intrusions were low and did not differ across groups, the EMH children's intrusions were more likely to be medically implausible (e.g., "She checked my fingers by pinching them"; "She checked my nose by making me sneeze into a Kleenex") than were the intrusions of the children in the control groups.

Any attempt to evaluate the abilities of children with mental retardation to provide accurate testimony must also consider the issue of suggestibility. In this study, the EMH children were able to correctly say "no" to probes about the majority of the features that had not been included in their health checks and to perform at rates similar to the MA matches. These high rates of

correct denial demonstrate that intellectual impairment does not necessarily lead to high suggestibility, and that suggestibility among children with mental retardation needs to be independently assessed rather than assumed. Nonetheless, we must emphasize that the absent feature questions—even when phrased somewhat suggestively—were presented in a gentle and nonpressuring manner. It is possible that children with mental retardation would appear more susceptible to suggestion if the questions had been posed in a more forceful manner (e.g., "What color was the medicine?" when no medicine was given), repeated over several successive interviews, or if deliberate attempts had been made to induce "false memories" in the children (see Ceci & Bruck, 1995).

On a more specific level, professionals who encounter children with mental retardation in legal settings need to know what types of questions maximize accurate recall. Although EMH children may pose more challenges for examiners than the younger MA matches, the overall similarity of these two groups of children suggests that interviews in legal settings begin with assessments of cognitive functioning. Although the use of the PPVT-R may be justified for research purposes, it is recommended that broad-based measures of intellectual functioning be used for forensic purposes. Interviewers also must understand the differences between CA and MA and must be prepared to adjust their style of questioning to the level of the children's functioning (Gordon, Schroeder, Ornstein, & Baker-Ward, 1995). In general, the results of this study support Gordon and Schroeder's (1995) recommendation that professionals who interview children with mental retardation should begin with open-ended questions, to obtain as many spontaneous responses as possible, and then proceed to more specific questions. The findings further suggest that yes/no questions are necessary to obtain complete information, and that responses to yes/no questions can be fairly accurate when presented in a neutral, noncoercive manner and when they are designed to examine alternative hypotheses about the child's experience.

Additional research is needed in several areas. First, it is important to examine the extent to which differences might emerge between EMH children and their MA matches if more stressful "to be remembered" events were included. Although the literature on the effects of stress on remembering is not entirely consistent, an emerging consensus (see, e.g., Peters, 1997) indicates that increased levels of stress are associated negatively with performance. Nonetheless, it is essential to consider individual differences in children's abilities to cope with stress. For example, if children with mental retardation are found to cope less well than typically developing children, their recall of stressful experiences might be even more disrupted. Second, research specifically aimed at determining under what condi-

tions children with mental retardation are susceptible to suggestion would be helpful in understanding their testimony. Third, recall performance must be measured over more extended delay intervals. Children in forensic settings typically wait months and even years before being called on to testify. Finally, we need information on the abilities of younger, preschool children with mental retardation as well as those with more severe cognitive deficits. Nonetheless, this study is a useful beginning in the attempt to examine the memory skills of children with mental retardation that are relevant to their abilities to provide testimony. It appears that at least under some conditions, children with mental retardation can provide accurate information about a personally experienced event on a level consistent with children of normal intelligence matched on MA.

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