

Do you remember...???

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a.k.a. THE EFFECT OF VERBAL REMINDERS ON MEMORY REACTIVATION IN 2-, 3-, AND 4-YEAR-OLD CHILDREN.

Introduction

The term memory reactivation was first introduced by Spear and Parsons (1976) and refers to the fact that memories, rendered inaccessible due to forgetting, can be reactivated using a reminder treatment. In Spear and Parsons' (1976) study, 16-day-old rat pups were trained in an active avoidance task and tested 7 days later. Twenty-four hours prior to the test, some subjects received a reminder treatment. Spear and Parsons (1976) found that the subjects in the reminder condition exhibited excellent retention while subjects who received no reminder treatment exhibited no memory of the original training event. Thus, exposure to the reminder alleviated the forgetting that had occurred over the 7-day delay.

In the seminal demonstration of memory reactivation with human infants, Rovee-Collier et al. (1980) demonstrated that a single non-verbal reminder treatment alleviated forgetting in 3-month-old infants after delays of 13 or 27 days. Since Rovee-Collier et al.'s (1980) original study, a large number of studies have demonstrated the effectiveness of non-verbal reminder treatments. In contrast, we know very little about the effectiveness of verbal reminders on memory reactivation. In the present study, using the visual-paired comparison (VPC) paradigm, we attempt to identify the age at which children are first able to exploit verbal reminders.



Method

Table 1
Number of Children in Each Condition for Each Age Group.

Condition	2 year olds	3 year olds	4 year olds
Control	$n = 20$	$n = 20$	$n = 20$
Neutral	$n = 20$	$n = 20$	$n = 17$
Reminder	$n = 20$	$n = 20$	$n = 20$

Table 2
Familiarization Period, Delay Interval, and Test Trials for Each Age Group.

Age	Familiarization	Delay	4 year olds
2 y	10s	1 week	2 x 10-s trials
3 y	10s	2 weeks	2 x 10-s trials
4 y	5s	2 weeks	2 x 10-s trials

Results

Table 3
Mean Percent Fixation to the Novel Stimulus (Novelty Preference Score) During the Test Trials as a Function of Age group and Condition.

Age	Control	Neutral	Reminder
2 y	$M = 52.4$	$M = 49.8$	$M = 55.7^*$
3 y	$M = 53.9$	$M = 50.9$	$M = 56.9^*$
4 y	$M = 54.3$	$M = 50.4$	$M = 58.4^*$

Table 4
Mean Number of Gaze Shifts Per Second During Test Trials as a Function of Age Group and Condition.

Age	Control	Neutral	Reminder
2 y	$M = 0.38$	$M = 0.36$	$M = 0.47$
3 y	$M = 0.38$	$M = 0.39$	$M = 0.52$
4 y	$M = 0.47$	$M = 0.42$	$M = 0.56$

Discussion

At all ages, children who received the verbal reminder exhibited a novelty preference during the test. Importantly, children of the same ages in the no question control condition and the neutral question control condition who were familiarized for the same period of time and who were tested after the same delay, but who did not receive a verbal reminder, exhibited a null preference during the test (Table 3). Taken together, these findings replicate those originally reported by Morgan and Hayne (2007) for 4-year-old children, and, to the best of our knowledge, provide the first evidence that a simple verbal reminder can reactivate an inaccessible memory in children as young as 2 years of age.

Although the primary measure was the novelty preference score, we also found that children who received the verbal reminder exhibited significantly more gaze shifts during the test, relative to children who were in the no question control condition and the neutral question control condition (Table 4). The finding is somewhat surprising as one might expect that children in the reminder question condition would display fewer gaze shifts. A higher frequency of gaze shifts, however, may actually be further evidence that children identified the familiar stimulus and engaged in an active comparison process (Colombo et al., 1988). Although this interpretation is speculative, it provides an interesting avenue for future research.

References: Colombo et al. (1988). Child Development, 59, 1198–1210; Morgan & Hayne (2007). Developmental Science, 10(6), 727-733; Rovee-Collier et al. (1980). Science, 208(4448), 1159-1161; Spear & Parsons (1976). Processing of animal memory, pp. 135-165.

