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ABSTRACT

Memory studies involving older adults have typically been conducted in laboratory settings and have usually employed experimental tasks. Most results support cognitive decline. Most naturalistic experimental studies relate to spatial memory and test younger respondents. When older respondents are tested, the old sometimes outperform and sometimes underperform the young. Practice has not always been controlled. The rate at which respondents forget has not been examined. A study was conducted to examine everyday memory by investigating adults' memory for their daily experiences as volunteer participants in the Baltimore Longitudinal Study of Aging (BLSA). Subjects were 43 men and 36 women between the ages of 23 and 93 who took part in the BLSA. Younger and older respondents were given equal practice on everyday items and were tested three times within a 2-year period. Results demonstrated effects for time, with similar forgetting rates for young and old on almost all items. On two of three atypical items, the old forgot more slowly than did the young. These results suggest that for everyday memory items, at least, although absolute performance may be influenced by age and passage of time, the rate of forgetting may not be so influenced. (Author/NB)

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EVERYDAY MEMORY: WITH EQUAL PRACTICE DOES AGE INFLUENCE  
FORGETTING IN A TWO YEAR PERIOD?

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## Abstract

Memory studies involving older adults have typically been conducted in laboratory settings and have usually employed experimental tasks. Most results support cognitive decline. Most naturalistic experimental studies relate to spatial memory and test younger respondents. Where older respondents are tested, the old sometimes outperform and sometimes underperform the young. Practice has not always been controlled. The rate at which respondents forget has not been examined. In this study, a continuation of my previous work (Sinnott, 1986), younger and older respondents were given equal practice on everyday items and tested three times within a two year period. Results demonstrated effects for time, but similar forgetting rates for young and old on almost all items. On two of three atypical items, the old forgot more slowly than the young. These results suggest that for everyday memory items, at least, although absolute performance may be influenced by age and passage of time, the rate of forgetting may not be so influenced.

Everyday memory: When old and young have equal practice do they forget at equal rate over two years?

Memory studies involving older adults have typically been conducted in laboratory settings and usually have employed experimental tasks. Most results have supported the notion of cognitive decline (see Kausler, 1982, for a review). Memory failure and its consequences are concerns of both professionals and older adults, but as Hartley, Harker, & Walsh (1980) have stated, it is not known how ecologically valid some of the tasks may be on which older adults show decline. If tasks directly represented the cognitive demands that adults typically face, or could be validated with everyday memory performance, concerns about decline would be on clearer ground. Even more important gains in knowledge about memory processes might be made in the context of more naturalistic studies. Neisser (1978 & 1982) has argued that orthodox memory research has shown us too little. He noted that, for example, in animal research, great progress was made when more naturalistic ethological studies were combined with traditional approaches. This argument for everyday tasks was again made recently by Cavanaugh (1982) in regard to memory.

Relatively few experimental studies used naturalistic materials or situations, however restricted in scope, and most of these related to spatial memory (e.g., Baroni, et al., 1980; Evans & Pezdek, 1980; Kirasic, 1983; Light & Zelinski, 1983; Perlmutter, et al., 1981; Pezdek, 1983; Pezdek & Evans, 1979; Salmaso, et al., 1983; Sherman, et al., 1980; Waddell & Rogoff, 1981). Studies of other than spatial memory, for example, those

by Brewer & Dupree (1983), Moscovitch (1982), Poon & Schaffer (1982), Thompson (1982), West (1984) and Wilkins and Baddeley (1978), described memory for goal-directed or prospective events and for unique personal events. Only eight of the sixteen studies just listed (Kirasic; Light et al.; Moscovitch; Perlmutter; Pezdek; Poon et al.; Waddell et al.; West) included older participants, the group of interest here. In three (Light et al.; Perlmutter et al.; Pezdek), using maps and household objects as stimuli, the old performed more poorly than the young. In Moscovitch's and Poon & Schaffer's studies the old performed better than the young. Waddell et al. and Kirasic each found that the young outperformed the old only in unfamiliar settings (object arrays and model towns) which demanded additional learning. West found complex differences depending on the question analyzed.

Recent work by Sinnott (1986a in press, b in press, c) reported several of the results of everyday memory tasks involving prospective and incidental memory. One question not addressed in those analyses concerned the effect of practice on memory for everyday events which had the attention of the participant. Given equal practice on these everyday items, would there be similar declines in performance over time by younger and older respondents?

The purpose of this study was to examine everyday memory by examining adults' memory for their daily experiences as volunteer participants in the Baltimore Longitudinal Study of Aging. The intent was to provide greater understanding of aging-related declines in the kinds of cognitive performance needed for daily life. For this study respondents went through

their daily routines for two and a half days as research subjects at the Gerontology Research Center. Their experiences were somewhat structured. Since they lived at the Center during testing, they experienced the need to go back to their living quarters, eat meals in a cafeteria, find their way to the Center, and go back to their homes, all ordinary salient demands on memory. Volunteers were queried about certain experiences, details, and persons at one point during their stay. Some items were unimportant and incidental; others were salient or needed for future action. Some were experienced for the first time during that stay and so practice could be controlled.

It was hypothesized that if items were equally practiced by older and younger respondents, memory as represented by item scores would be equally influenced by passage of time in both age groups. There would, in other words, be significant effects for Time but not for Age, and there would be no interactions. It was further hypothesized that the three-point slopes would not be influenced by age.

#### Method

##### Subjects

Respondents were 79 men (n=43) and women (n=36) from the Baltimore Longitudinal Study of Aging. Their ages ranged from 23 to 93 years at last birthday. Details of the BLSA subject pool are available in Shock et al (1985). Subjects generally were of high socioeconomic status, white, and were unpaid volunteers. They generally resided in or near the Baltimore-Washington area. On the whole they were highly motivated, well educated and healthy.

### Procedures

Respondents were tested individually. They were selected on the basis of having already had memory and problem solving tests which are given to all BLSA participants. None of those selected refused to take part in this study. The first test session (Time 1) took place during their routine two-and-one-half day stay. Respondents first were given six written Piagetian formal operational problems to solve, and were asked various questions orally about their answers. These problems involved combinatorial reasoning and proportionality, and were sometimes couched in abstract and sometimes in everyday language. The problem solving session was followed immediately by the memory component of the test. The memory component included 13 paper and pencil items typed in random order requiring recall or recognition of events of the test experience. Some of these tested memory for things to be done later (prospective memory=P); some tested memory for actions performed (action memory=A); and some tested incidental memory (=I). Incidental memory in this study was incidental in every sense of the term since, until the point at which the memory test consent form was signed and remembering began, respondents never knew that what they were experiencing was in any way connected to a memory test.

The second test session (Time 2) was given seven to ten days later by telephone when the experimenter called the respondents at a location and sometimes a time selected by the respondent. Virtually all respondents participated at Time 2. Respondents received either set A or B randomly at Time 1; at Time 2 they received both A and B in counterbalanced order.

The third test was given to local respondents by telephone 18 to 21

months after their first test. All respondents contacted responded at Time 3. They received their Time 1 item set again. Therefore two and sometimes three data points were obtained for each respondent.

### Results

2 (age) x 3 (time) ANOVA's were calculated to test the hypothesis for 13 items on which all respondents had equal practice. While curvilinearity did not appear to be a problem from graphed data, it was hoped that these ANOVA analyses would capture any effects whatever the form of the data. Age was dichotomized as  $\leq 55$  or  $\geq 56$  due to sample size ( $N=33$ ). While time was significant for 11 of the 13 analyses, the only Age effects were Age x Time interactions for three. Two of these were incidental memory items, and one was an action memory item. For two of those three the performance of the younger respondents declined at a faster rate than that of the older respondents.

Table 1 displays the ANOVA results for significant age analyses, means, and standard deviations.

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Insert Table 1 about here

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Forgetting slopes over the three time points were calculated for each respondent for each item. Slopes were correlated with age, and Young and Old were compared on slopes using ANOVA. Significant ANOVA results are in Table 2. Only two items' slopes were significantly correlated with age: "number of items on table" (incidental memory item)  $r(18) = -.51, p .01$  and "which questions asked" (action memory item)  $r(18) = -.39, p .05$ .



Age effects were present for only one item slope when age was dichotomized: on "describe a problem" younger respondents forgot at a faster rate than older respondents did.

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Insert Table 2 about here

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### Discussion

The general findings in this study were that age effects are minimal on everyday items practiced equally by young and old. Young and old forgot at an equal rate on most of the items. Such age differences as did occur were equally as likely to be to the detriment of the young as to the detriment of the old. But memory for almost all the items did significantly decline over time, as expected.

Everyday prospective memory items, action memory items and incidental memory items were occasions of differing patterns of results. Age related differences in forgetting occurred disproportionately often on everyday incidental memory items and never on everyday prospective items. This again (Sinnott, 1986c) suggests that motivation is an important factor in memory research.

The fact that on two items respondents improved over time even when they had no chance to increase their real experience with the information may have been due to chance. It also may have resulted from some ability to reconstruct the original experience correctly, later, and to learn from it. Further research is needed here.

A question not addressed in this study would be useful to pursue in

later analyses: given any particular level of everyday memory performance, do young and old matched on that level forget at the same rate? Does original level of performance influence rate of forgetting? Those analyses can be performed when additional data are collected in this study.

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Table 1

Summary of Analyses of Variance With Significant Age Effects, by Item:  
Mean Scores (Standard Deviations)

<u>Items on Table (I)</u>	<u>Time 1</u>	<u>Time 2</u>	<u>Time 3</u>
Younger	2.12 (1.12)	3.00 (1.06)	2.12 (0.64)
Older	3.40 (1.77)	2.90 (1.37)	1.30 (1.05)

$F$  (Time x age) (2,32) = 3.99, p .02

Objects in Room (I)

Younger	2.57 (1.39)	2.57 (1.51)	1.85 (0.89)
Older	0.87 (1.24)	1.73 (1.19)	1.73 (1.06)

$F$  (Time x age) (2,26) = 3.61, p .04

Describe Problem (A)

Younger	2.80 (0.44)	1.80 (1.09)	0.40 (0.54)
Older	1.33 (1.21)	1.33 (1.21)	0.83 (0.75)

$F$  (Time x age) (2,18) = 4.24, p .03

Table 2

Summary of Analysis of Variance With Significant Age Effects on Slope, by Item:  
Mean Scores, Standard Deviation

<u>Item</u> <u>Describe Problem (A)</u>	<u>Younger</u>	<u>Older</u>
Mean	-4.96	5.59
Standard Deviation	5.88	7.02

$F(\text{age}) (1,10) = 7.11, p .02$