Visual Memory Support: An Effective Mnemonic Device for Older Adults

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Based on recent research on visual support for memory in the elderly, a simple mnemonic was developed. Respondents retained a visually distinctive plastic plate in a prominent place in their homes, and used it as a base for items to be recalled and for reminder notes of future activities. Specific instructions were given for the use of the plate and notes. In two experiments, this system was shown to reduce the frequency of everyday memory errors by an average of 57-65%.

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Craik (1986; Craik & Jennings, 1992) has proposed that contextual support for recall may be more critical for the memory performance of older than of younger adults; elderly adults may obtain greater benefit from visually distinctive cues, such as color, texture, and shape, because such cues reduce the effort required to initiate the relevant mental processes. This “environmental support hypothesis” has been confirmed in a number of research areas, notably in the area of spatial memory. In a study involving a series of table-sized and navigable “contexts” which differed in terms of the level of available environmental support (i.e., in the visual distinctiveness of cues to location), it was shown that elderly adults recalled spatial locations at levels comparable to the performance of college-aged adults when strong visuospatial support was available (Sharps & Gollin, 1987). However, the performance of elderly adults was substantially depressed in the absence of distinctive cues. Although this effect may be limited or eliminated by a variety of factors (e.g., Arbuckle, Cooney, Milne, & Melchior, 1994; Cherry & Park, 1993; Park, Cherry, Smith, & LaFronza, 1990; Sharps, 1991), it has been replicated and extended in a number of experiments (Sharps, 1991; Sharps & Gollin, 1987, 1988; see also Craik & Jennings, 1992, for discussion).

This work was extended into the area of free recall, recall for items themselves as opposed to their locations (Sharps & Gollin, 1988). Young and elderly adult respondents were asked to recall the identity (as opposed to the location) of items placed within contexts which differed in the availability of visually distinctive cues to location. Relatively sparse contexts produced significant performance differences between young and elderly respondents. However, as in the location recall work discussed above, visually distinctive cues eliminated the free recall performance disparity between young and older adults.

These results suggest that visually distinctive contextual support for recall might provide the basis for a practical, inexpensive mnemonic device. If older adults are provided with a concrete, visually distinctive aid to recall, their internal representations of this memory aid, when coupled with elements of prospective memory, should reduce mental effort in the manner suggested by Craik and provide for better recall of the associated elements. The present experiments served as a test of this hypothesis. Respondents’ ages ranged from the early 60s to the mid-80s, the age range addressed in the experiments discussed above. Because environmental support manipulations were successful with this age range in our earlier work, we expected that practical interventions based on such support would also prove effective for adults within this range.

**Experiment 1**

**Method**

Subjects. — This pilot feasibility study employed seven elderly adults, enrolled in an “Aging and the Mind” course sponsored by Club 55+ at St. Agnes Medical Center, Fresno, California. This course was a simple introduction, at the freshman-psychology level, of biological, psychological, and sociological changes that occur with normal aging. Mnemonic training was not a part of the course. There were four female and three male respondents (mean age 72.4 years, SD 6.4, range 65–82). All were active, community-dwelling individuals.

Materials. — Garish yellow-green plastic picnic plates, with internal portion dividers, were obtained

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from a discount store. These were deliberately selected to clash with the decor of most homes, and were rated as “extremely ugly” by three staff and five faculty members of the Department of Psychology at California State University, Fresno. The intention here was to provide materials that were as distinctive as possible within the intended setting of use. Pads of 7.6 cm square yellow self-adhesive notepaper were also obtained.

Procedure. — Respondents were informed that they would participate in a study of memory. They were given identical stenographer’s notebooks and were asked to record, at a rate of one page per day, all the “instances of forgetting” that they incurred. Respondents were asked to keep the steno books on their pillows during the day, so that they would have to encounter them at bedtime and thus remember to keep up their recording. This regimen was maintained for one week. At the end of this week, a plate and a notepad were given to each respondent. They were given the following instructions:

1. The plate was to be kept on the dining or kitchen table, where most meals were eaten. The plate could be removed for company or necessity, but had to be replaced as soon as possible.
2. Items to be recalled were to be placed on the plate (e.g., reading glasses, car keys, bills to be paid, correspondence to be answered, medications to be taken).
3. Things to be done (e.g., “water the lawn,” “go to the pharmacy,” “dinner with son”) were to be written in large, block printing on self-adhesive sheets from the notepad. These were to be stuck to the plate. Respondents were asked to stick them to the plate at odd angles and in orientations that protruded from the edge of the plate, in order to make them more noticeable. One event was to be recorded per note, and the notes were to be simple (e.g., “WATER THE LAWN” rather than “set sprinklers in front for 30 minutes and then move hose to side of house”). The reason for this was to increase the size, and distinctiveness, of the individual printed words in the message; the details omitted would presumably be handled in the routine course of the activity named.

Respondents were instructed to continue with their recording of instances of forgetting for an additional week. Instances of forgetting were then tabulated for equal one-week periods prior to and after the distribution of plates and notepads.

Results and Discussion

The results were consistent with the hypothesis that these procedures and materials would constitute an effective mnemonic. All respondents made entries in their notebooks on a daily basis, and all entries were substantive, indicating that the respondents were using the notebooks reliably, consistently, and appropriately (as was also the case in Experiment 1, below). Prior to plate distribution, the mean number of forgetting instances per person was 8.14 over the seven-day period (SD 6.31). Utilizing the mnemonic, however, this number dropped to 2.86 (SD 4.26), a reduction of approximately 65%. This difference was significant, F(1,6) = 9.66, p = .021. Improvement from the initial condition was exhibited by 86% of respondents.

Clearly, this visual memory support system (VMS) was effective. However, there were a number of alternate explanations for this, including placebo effect. Also, these were adults enrolled in an “Aging and the Mind” course, perhaps atypical of the general population. In view of these considerations, Experiment 2 was conducted to test the system further.

Experiment 2

Method

Subjects. — Thirty-four active, healthy elderly adults (24 female, 10 male; mean age 72.94 years, SD 8.07, range 61–83), recruited through Club 55+, St. Agnes Medical Center, Fresno, California, volunteered to participate for the two-week period that this experiment required. These were divided at random into three groups of twelve, ten, and twelve respondents.

Procedure. — All respondents were given steno books, as in Experiment 1, and were asked to record instances of forgetting in them for a 2-week period. The instructions were identical to those of Experiment 1. The three groups were instructed differently as follows:

Group 1: Members of Group 1 (the “VMS” group, for visual memory support) were given plates and notepads, and were instructed to use these for 2 weeks; the instructions were identical to those of Experiment 1.

Group 2: Members of Group 2 (the “notebook” group) were given a small bound pocket-sized notebook and were asked to write notes to themselves concerning future activities, locations of items including those that they often or sometimes misplaced, times and places of appointments, etc. They were asked to do this diligently, and to carry the notebooks continually and refer to them as frequently as possible for 2 weeks. This group provided a strong mnemonic comparison for the VMS group.

Group 3: Members of Group 3 (the “control” group) did nothing but record instances of forgetting in their steno books for the 2-week period. After 2 weeks the books were recovered from all three groups and the results tabulated.

Results and Discussion

Two respondents dropped out of the experiment. The results of the group manipulation were significant, F(2,29) = 5.72, p = .008. A series of planned comparisons (p < .05) demonstrated that the num-
number of instances of forgetting in the VMS group \((M = 10.83, SD = 5.86)\) was significantly lower than in the control group \((M = 25.20, SD = 14.08)\) or in the notebook group \((M = 18.7, SD = 8.97)\). The performance difference between the notebook and control groups was not significant. Of the VMS group, 92% had fewer errors than the average for the notebook group, and 100% of the VMS group had fewer than the average for the control group.

The results of this experiment showed that the VMS system reduced reported instances of forgetting by approximately 57% from the control group. The probability of a placebo effect was effectively removed in this experiment, in that such an effect would be expected to be incurred from the notebook condition as well as from the VMS condition; indeed, one would expect some placebo influence simply from the recording of instances of forgetting, and the consequent increase in the vigilance of memory monitoring, derived from the steno book recording used in all conditions. These respondents, recruited from the general membership of Club 55+, in Fresno, were also clearly representative of the elderly population in the community. Thus the VMS system was effective in reducing instances of everyday forgetting in the real world relative to a notebook reminder system and to a vigilance-enhancing control task.

General Discussion

Earlier work (Sharps, 1991; Sharps & Gollin, 1987, 1988) demonstrated that under specific conditions, significant enhancement of recall in older adults can be obtained through the use of simple, visually distinctive cues, both in spatial memory and free recall. The present research extends these results to prospective recall, memory for items and activities to be dealt with in the future, the most effortful area of human memory. The application of the visual memory support (VMS) system outlined above reduced the number of everyday memory errors reported by an elderly population by an average of approximately 57% (65% in Experiment 1). Respondents were uniformly positive in their praise of the system, which is simple and economical: the materials (plate and self-adhesive notepad) cost 60 cents per respondent, and less than half an hour was required to explain the method to any given group.

The VMS system will require considerable practice application before all of its limits and advantages are known, and we must anticipate that a variety of population- and context-based limitations on these effects will no doubt be identified. Even so, the results discussed above indicate that we should anticipate some benefit with any normal aging population.

There are a variety of practice applications of the VMS. One obvious use is for the individual aging patient or client who is beginning to experience prospective memory loss; the practitioner can easily provide the VMS as described above with immediate benefit. What may prove more critical, however, is the fact that the VMS as used above was provided effectively on a group basis. This may be important to facility practitioners faced with the memory problems of large numbers of older adults residing in the same place. Group provision of the VMS has proven successful in the studies reported above; such administration may alleviate frustration and aggravation, as well as practical memory problems, for residents. It may also reduce staff time spent on residents’ memory-related problems and reduce staff “burn-out” by alleviating this source of frustration. The VMS technique may also prove useful for patients exhibiting minimal or incipient symptoms of dementia, although further research will be needed to determine this.

The results of this study demonstrate an effective, inexpensive mnemonic device based on the environmental support theory and on extensive empirical work on visual memory in normal aging populations. Further research will be needed to clarify the generality of these findings.

References


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