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Expectancy and cued recall

MARION QUINN LEWIS-SMITH
State University of New York at Plattsburgh, Plattsburgh, New York 12901

A multitrial examination of cuing categorized lists showed that practice with cues was not necessary for cuing to increase retrieval of higher order category information relative to noncued category recall. There was a modest increase in within-category item recall over a series of cued lists. Reversed cuing conditions on the last trial showed that subjects who did not anticipate cues did increase in category recall but not within-category item recall. The subjects who had anticipated cues declined in number of categories recalled but not number of items recalled per category.

In the recall of categorized lists, it is generally considered that more information is available in memory than may be immediately accessible for unaided recall. Providing category labels or items as cues at recall has been shown to increase recall relative to noncued conditions by increasing the number of categories recalled. Words per category were unaffected by cuing (Lewis, 1974; Tulving & Pearlstone, 1966). Tulving and Pearlstone described two independent retrieval processes for organized material: (1) recall of higher order units (categories), dependent on number of categories and availability of recall cues, and (2) within-category recall, apparently dependent only on recall of the category itself and unrelated to recall cues.

Lewis (1971) reported that differences between cued and noncued recall increased under multilist conditions. This suggests that there may be cumulative effects of cuing on retrieval processes. In the present experiment, cued and noncued recall were examined over several lists. To the extent that a strategy may be involved in cued recall, repeated experiences with cues should facilitate its development. Intuitively, it seems that subjects who anticipate cues might focus memory processing attention on the category items because the cues would provide access to the categories at recall. The subjects not anticipating cues could not specialize their memory processing attention in this way. This implies essentially a differential storage strategy, as subjects anticipating cues may attempt to store somewhat different category and item information than subjects not anticipating such cues.

Alternatively, or additionally, increasing differences over multiple lists between cued and noncued recall may be attributable to influences of proactive inhibition (PI) or fatigue. To the extent that overall noncued recall is high, the possibility of even higher recall with cues is limited. If PI reduces noncued recall on later trials, then cues which overcome its effect may lead to increasing differences over trials by maintaining a consistent level of cued recall while noncued recall declines.

In the present experiment, subjects received a series of five categorized lists, either all cued or all noncued. On the sixth list, cuing conditions were reversed for half the subjects to explore strategy-expectation affects.

A summary of the research was presented at the meeting of the Midwestern Psychological Association, Chicago, 1974. Requests for reprints should be sent to Marion Lewis-Smith, Department of Psychology, State University of New York at Plattsburgh, New York 12901.

METHOD

Stimulus Lists

Six 48-word lists were presented. Each list consisted of eight Battig and Montague (1969) categories, with six contiguously presented words per category. Four different orders of the lists were tape recorded at a 2-sec rate.

Procedure

A 6-sec backward counting task preceded written recall. After the distractor task, the experimenter turned over a card. For cued recall, category label cues were printed on the card. For noncued recall, the card contained only the instruction to begin recall. The recall interval was 2 min. The subjects were tested in small groups of two to four. For half of the subjects, all the Lists 1-5 were cued; the other subjects received no cues on these lists. On the sixth list, cuing conditions were reversed for half of each group.

Subjects

The subjects were 64 undergraduate students enrolled in psychology classes at the State University of New York at Plattsburgh. They received course credit for participation.

RESULTS

Separate analyses of variance examined total recall, category recall, and words per recalled categories over Lists 1-5 and for List 6. Linear trends were examined for cued and noncued total recall on Lists 1-5. Differences between Lists 5 and 6 were examined by t tests.

Total recall, category recall (defined as recall of at least one word from a category) and mean words per recalled category (WPC) are shown by percentages in Figure 1 for all cued recall (CR), noncued recall (NCR), and shift conditions.

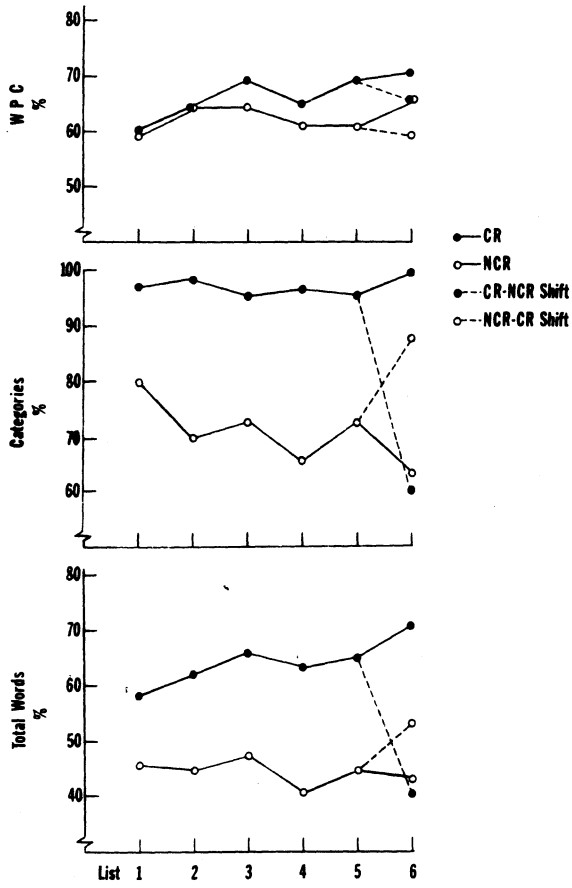

Figure 1. Per cent words per recalled category (WPC), category recall and total recall.

Practice lists

Total cued recall was higher than noncued recall for every list, $F(1.62) = 66.43$, $p < .001$. There was an interaction of cuing condition and lists, $F(4.248) = 3.17$, $p < .015$. Analyses of linear trends showed no linear trends in the noncued recall trial means, $F(4.124) = 1.51$, $p > .10$. There was a reliable linear trend in cued recall trial means, $F(4.124) = 4.24$, $p < .01$, indicating that total cued recall tended to increase on later lists. These effects can be seen most clearly in the figure, examining the all-cued and all-noncued recall groups' Lists 1-6; however, the analyses of practice effects were confined to Preshift Lists 1-5. There were overall differences in Lists, $F(4.248) = 3.05$, $p < .018$. Newman-Keuls comparisons revealed that Lists 1 and 4 were lower in total recall than Lists 2, 3, and 5.

Category recall was much higher for cued than for noncued groups on every list, $F(1.62) = 212.24$, $p < .001$. Cued category recall did not change across lists, but noncued category recall declined after List 1; this interaction was reliable, $F(4.248) = 4.17$, $p < .003$. This tendency was also reflected in the lists effect, $F(4.248) = 3.92$, $p < .005$, with category recall lower on Lists 2-5 than on List 1.

Cued words per category recalled were not significantly higher than noncued words per category, $F(1.62) = 2.83$, $p > .05$. There was a lists effect, $F(4.248) = 6.17$, $p < .001$, with List 1 lower than the following lists, which did not differ reliably. There was no interaction, $F(4.248) = 1.60$, $p > .05$.

Shift Lists

On List 6, the noncued recall to cued recall shift group increased in category recall from their performance on List 5, $t(15) = 3.64$, $p < .01$. However, the overall gain in total words recalled was modest and not statistically significant, $t(15) = 1.44$, $p > .05$. Words per category did not change, $t(15) < 1.0$. On List 6, this shift group was inferior to the all-cued group on total recall, $F(1.30) = 18.19$, $p < .01$, category recall, $F(1.30) = 9.04$, $p < .01$, and words per category, $F(1.30) = 11.93$, $p < .01$.

The cued recall to noncued recall (CR to NCR) shift group's total recall declined, $t(15) = 7.29$, $p < .001$, due to lower category recall, $t(15) = 11.36$, $p < .001$. Words per category did not change, $t(15) < 1.0$. This shift group differed on no measure ($F < 1.0$) from the all-noncued group on List 6.

DISCUSSION

The results relate to several issues: the independence of the retrieval processes for the higher order units (categories) and for the within-category items, the relationship of recall cues to these processes, and the effect of multiple lists on cued and noncued recall.

The data are consistent with the Tulving and Pearlstone (1966) model of independent retrieval processes. Multiple trials affect category and within-category recall differentially. Noncued category recall is highest on the first list, declining thereafter, but there is no such decline in recall for category items. That is, effects of PI appear to affect category recall, but not words recalled per category. With category label cues, category recall remains consistently near maximum over trials, apparently overcoming PI for category recall.

Results of the reversed cuing conditions relate to the issue of experience with cues. The noncued to cued recall shift subjects, who had no experience with cues and presumably did not expect recall cues, did gain in category recall, but not in words per recalled category. To the contrary, they were lower in words per category than any other group. This suggests that with respect to category recall, cues functions rather directly to facilitate retrieval of categories. Experience with cues or developing some particular memory processing strategy is not needed to enable some use of cues for the category retrieval process. In contrast, the lower recall of words per category for the noncued to cued shift group, as compared with the all-cued group, suggests that for inexperienced cued subjects, cue effects on the category item retrieval process are quite different and may even be inhibiting rather than facilitating.

These findings do not appear consistent with the earlier speculation about different memory processing strategies with multitrial cued recall, i.e., that experience with cues or anticipation of cued recall would enable subjects to focus processing attention for memory storage on category items. From such a strategy, it would be expected that subjects in the cued to noncued recall shift group (who presumably would have concentrated on processing category items during list presentation) would have recalled more category items, and fewer categories, than the all-noncued group.

Although Jacoby (1973) reported such results, the present study does not.

Taken overall, results indicate that cues and experience with cues differently affect retrieval processes for higher order categories and for within-category items. Cues appear to function directly in retrieval of category information, whether or not the subjects anticipate cues. However, cues unexpectedly provided to subjects who are inexperienced with cues do not facilitate category item recall or may even lead to reduced item recall.

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