Category names as cues for the recall of category instances¹

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Two experiments were conducted to extend the Tulving and Pearlstone (1966) finding that providing Ss with category names facilitates their recall of category instances. Experiment 1 demonstrated that this facilitation does not depend on the presence of the category names during the learning trial. Experiment 2 showed that the effectiveness of the category name as a cue for recall depends on the strength of the pre-established connection between the category name and the instance of the category to be recalled.

Tulving & Pearlstone (1966) presented lists of words belonging to categories together with the category names of the words (e.g., four-footed animals: cow, rat; weapons: bomb, cannon) to Ss and had them attempt to recall the words. The Ss were instructed that they would not be required to recall the category names. The variable of particular interest was the presence of the category names (e.g., four-footed animals, weapons) as cues for recall. All the Ss were presented the category names during the learning trials, and one-half of the Ss were cued with the category names at recall. The major finding was that cued recall was better than noncued recall.

Wood (1967), using cues that were unrelated to the words to be recalled, instructed Ss to make an association between each word to be recalled and each cue during the learning trial. Groups instructed to make this association and given the cues during recall had better performance than Ss not presented with cues during learning and recall. Since the cues were initially unrelated to the words to be recalled, the effect of cueing during recall was dependent on the presence of cues during the learning trial. Since Tulving and Pearlstone presented the category names during learning, there is no evidence that cueing at the time of recall can facilitate recall when the cues and words to be recalled are not presented contiguously during the learning trial. Experiment 1 was designed to test whether the effect of cueing during recall is dependent on the presence of the cues during learning when category names are used as cues.

EXPERIMENT 1

Design and List

The presence or absence of cues during the learning and recall trials was manipulated in a 2 by 2 factorial design. A total of 64 students enrolled in undergraduate psychology courses at Michigan State University was assigned to the four conditions by preparing 16 random orders of the four conditions and assigning Ss to conditions in the order of their appearance in the laboratory. A list of 40 words from 40 different categories was presented. The word for any one cate-

gory was determined by randomly selecting the second, fourth, sixth, or eighth ranking word from each of 40 categories presented in the Connecticut Norms (Cohen, Bousfield, & Whitmarsh, 1957).

Procedure

Ss were run in multiples of four (4, 8, 12, or 16) so that all conditions were represented in any one session. Each S was given a five page booklet consisting of a cover page, an instruction page, two answer sheet pages, and a filler sheet between the answer sheets. The instruction page of the booklet contained standard free recall instructions plus special instructions for the groups presented cues during learning. The groups receiving cues during learning were told that 40 words (category names) would be presented on their answer sheets. These groups were instructed to link each successive word on the answer sheet with each successive word to be recalled. The order of presentation of the words was such that cued Ss attempted to link each category name with the instance of that category. All Ss were told that 40 words would be read at a rate of one word every 3 sec.

After all Ss assured E that they understood their instructions, they were asked to turn to the first answer sheet. There were two different answer sheets. The noncued (NC) answer sheet had 40 lines for S to recall the words presented. The cued (C) answer sheet had the 40 category names in addition to 40 lines on which Ss were to recall the words presented. The instructions on the top of the C answer sheet stated that each of the words described one of the words to be recalled; therefore, these words should aid recall. Two groups received the C answer sheets; two groups received the NC answer sheets. The list of 40 words to be recalled was read immediately after the Ss turned to their first answer sheet. Following the presentation of the list, the Ss were told to turn to the last page in their booklets and write down as many of the words that were read as they could. However, one-half the Ss received a different answer sheet for recall than for learning. Thus, the four conditions of the experiment, C-C, C-NC, NC-C, and NC-NC were determined by the answer sheets presented during the learning and recall trials. Two min was allowed for recall.

Results and Discussion

The mean number of words correctly recalled was 20.06, 12.31, 16.16, and 11.69 for the C-C, C-NC, NC-C, and NC-NC groups, respectively. An analysis of variance on these data indicated that the presence of cues during learning, the presence of cues for

recall, and the interaction were all significant ($p < .001$) sources of variance yielding $F = 56.78, 140.67$, and 46.75 ($df = 1/60$), respectively. The finding that providing a cue at recall facilitates recall extends the results of the Tulving and Pearlstone study to show that facilitation does not require that the cues be presented during the learning trial. That is, the NC-C group recalled significantly more words than the NC-NC group ($F = 16.77, df = 1/30, p < .001$). The failure to find a significant difference between the C-NC group and the NC-NC group ($F < 1$) indicates that providing cues during the learning trial has little if any influence on the number of words that are recalled unless cues are also presented at recall. The number of intrusions, recalling a word that was not presented, was also determined. The only variable influencing the number of intrusions was whether Ss were cued during recall. As in the Tulving and Pearlstone study, cued Ss had significantly more intrusions ($F = 8.59, df = 1/60, p < .01$).

Since cueing at recall can be effective even when cues are not presented during learning, the strength of the preestablished association between the category name and category instance is probably the crucial determiner of whether the category name will serve as an effective cue. Yet, no evidence is available concerning whether the effectiveness of a category name as a cue is dependent on the strength of the preestablished association between the category name and the instance of the category. Experiment 2 investigated this problem.

EXPERIMENT 2

Design and Materials

Two groups of 24 Ss each were utilized. The Cued (C) group was presented the category names during the recall trial. The Noncued (N) group was not given cues. The list consisted of one word from each of 40 categories. According to the Connecticut Norms, 20 of the words had a relatively strong connection with the category names (mean taxonomic frequency of 240) and 20 had relatively weak connections (mean taxonomic frequency of 21). The mean frequency of occurrence, as determined by the L-Count (Thorndike & Lorge, 1944), of the two sets of 20 words was essentially equal. Answer sheets essentially identical to those used in Experiment 1 were utilized. The answer sheets were included as the third page in a three page booklet. The first two pages served to prevent the cued Ss from seeing the category names prior to the recall trial.

Procedure

A total of 48 students in undergraduate psychology courses at Michigan State University was run in groups of from 6-14. A random order of the answer booklets was prepared and handed out to Ss according to their seating arrangement. Standard free recall learning instructions were given. Except for the printed instructions on the answer sheet having the category names, no information regarding cueing was given. The E read the list of 40 words at a rate of one word

every 3 sec. Following the presentation of the list, Ss were instructed to turn to the last page of their booklet and recall the words. Ss were given 5 min for recall.

Results and Discussion

The mean number of correct responses for the C group was 7.42 for the words of low taxonomic frequency (TF) and 11.29 for the words of high TF, for a total mean recall of 18.71. The mean number of correct responses for the NC group was 8.12 for the words of low TF and 8.42 for the words of high TF, for a total mean recall of 16.54. An analysis of variance on the total number correct indicated that providing Ss with cues did not significantly influence performance ($F = 1.32, df = 1/46, p > .05$). Words of high TF were recalled better than words of low TF ($F = 26.64, df = 1/46, p < .001$). Of particular interest, however, is the significant interaction between cueing recall and the level of TF ($F = 19.71, df = 1/46, p < .001$). This interaction means that cueing facilitated recall only when there was a relatively strong connection between the cue and the word to be recalled.

The number of extralist intrusions belonging to one of the categories used in the list was determined for the two groups. As expected, the number of categorical intrusions was greater for Ss given cues for recall (mean = 5.79) than for Ss not given cues (mean = 1.25). This difference was significant ($F = 10.62, df = 1/46, p < .01$). Since cueing influenced the recall of words having high TF, an analysis was made to determine if there were more intrusions to category name cues when the instances to be recalled were of high rather than low TF. There were significantly more within category intrusions (3.54 vs 2.25) when the correct response was of low TF ($t = 2.53, df = 23, p < .05$). This may mean that a guess is more likely to be correct when the word to be recalled is of high TF. That is, assuming that Ss are equally likely to guess when the category name has a strong association to the instance as when there is a weak association, the fact that there were more intrusions in the latter case suggests that the guesses were better in the former case. Yet, the 1.29 difference attributable to guessing is not of sufficient magnitude to account for the superior recall of words of high TF in that cued Ss recalled a mean of 3.87 more words of high than low TF. The presence of the category names seems to aid the recall of category instances having a high TF.

References

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Note

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