

Does Environmental Enrichment While Studying Improve Recall?

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Previous research suggests that studying audio and visual stimuli in two different rooms increases verbal recall, as compared to studying twice in only one room (Smith, Glenberg, & Bjork, 1978). The present study utilized this paradigm, and also separated the room and modality factors as sources of environmental enrichment. In Experiment 1, subjects learned a list of 40 common English words twice, in either one or two different rooms, and were tested in a third room ($N = 60$). In Experiment 2, subjects learned the same word lists, using either one or two modalities (audition and vision), and again were tested in a third environment ($N = 59$). As predicted from the theory of Smith and Vela (2001), the usual improvement in memory from either room or modality enrichment did not occur when short time intervals were used between learning and recall, and the mean recall scores were essentially identical. The enrichment effect is interpreted as involving the development of categorized memory information over time, thus enabling retrieval strategies to operate, rather than an increase in the strength of initial learning. Keywords: verbal learning, recall, two rooms, auditory vs. visual modality, environmental enrichment, context, gender

A familiar finding in studies of verbal memory is that recall performance is better when subjects are tested in the same environment in which they previously learned the material, rather than a new setting. This beneficial effect of reinstating contextual retrieval cues has been reported many times (e.g., Godden & Baddeley, 1975; Sahakyan, 2010; Smith, 1979). Less attention has been paid to a related phenomenon that has been termed environmental enrichment: when subjects learn verbal material in two different rooms rather than twice in the same one, and are tested in a third room, recall performance typically is raised considerably (Smith, Glenberg, & Bjork, 1978; Experiment 1; Smith, 1982; Smith & Rothkopf, 1984).

Lately, however, a recent surge of popular interest in environmental enrichment, or the two-

-room technique raised recall performance by approximately 50% in the study of Smith, Glenberg, & Bjork, 1978.

The experiment of Smith, Glenberg, & Bjork (1978) involved enrichment of the environment that was achieved by using two rooms, each with a different modality for presentation of the learning stimuli (visual for the first room, and auditory for the second). Thus the independent variables of the number of rooms employed and the number of modalities involved were confounded in the experimental design. In the present study these variables were separated. Also, the retention interval was shortened from 3hr to 17 min (from the first presentation of the list), or 7 min (from the second). The study thus tests the hypothesis of Smith and Vela (2001, p.212), generated on the basis of a meta-