

# The Influence of Task Factors on Strategy Use

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## Introduction

Task factors such as presentation modality may contribute to observed differences in the use strategies. Studies that have manipulated task variables in order to reduce the amount of verbal processing, such as presenting pictures of to-be-remembered information, have shown increased strategy use (Ornstein, Medlin, Stone, & Naus, 1985). Strategy use may also be related to level of contextual support provided by the task. Gauvain (1993) contends material and symbolic tools may transform thinking. The availability of objects or tools (e.g., manipulatives) provides structure for how an individual attends to and remembers information and may influence the use of a strategy. In addition the effects of memory load or task difficulty may influence strategy use. The present study investigated the three interrelated task factors of presentation modality, availability of tools, and memory load in one task across the entire age range of school-aged children.

## Method

Participants were 256 children, 64 7-, 9-, 11-, and 17-year-olds. Participants heard a story about a haunted house and a friendly ghost and were asked to remember where objects were located in an imaginary room. Subjects were randomly assigned to either auditory presentation (heard sentences like "The book is above the ghost") or to visual presentation (saw pictures with the book placed above the ghost). Half of the subjects in each presentation modality either had objects available during presentation of to-be-remembered information or objects were made available only at recall. There were four between subjects conditions, auditory-with-objects (AWO), auditory-no-objects (ANO), visual-with-objects (VWO), and visual-no-objects (VNO). The number of items to-be-remembered (memory load) on each of 18 trials ranged from 1 to 7. Strategy use was scored from videotapes of the session by one of two raters with reliability greater than 90%. If no strategy use was observed on a trial, a brief strategy-use interview followed that trial.

## Results

Comparisons of the four conditions revealed a significant difference in the overall frequency of strategy use among the conditions,  $F(3, 237) = 6.44, p < .001$ . The overall frequency of strategy use was greater in both with-objects conditions

(AWO 95% and VWO 96%) as compared to both no-objects (ANO 89% and VNO 89%) conditions. There was no significant age effect, with the frequency of strategy use similar across the 7-, 9-, 11-, and 17-year-olds (94%, 92%, 93%, and 90%).

How were specific strategies influenced by task factors? There was a developmental decrease in the use of external strategies without orientation (e.g., pointing to objects or target locations or holding or moving of objects without relation to their final location)  $F(3, 120) = 14.52, p < .001$ . The frequency of external strategies with orientation (e.g., laying objects on a board in the pattern seen in the picture or heard in the sequence) increased with age and with memory load,  $F(12, 480) = 5.09, p < .001$ . There were significant developmental decreases in observed rehearsal [ $F(3, 237) = 13.09, p < .001$ ] and in reports of imagery [ $F(3, 237) = 6.35, p < .001$ ]. For these strategies there were no condition effects.

However, for reported rehearsal there was a main effect of condition,  $F(3, 237) = 5.99, p < .001$ , with more reported rehearsal in both no-object conditions (44% ANO and 42% VNO) as compared to with-object conditions (31% AWO and 25% VWO). There was also a main effect of condition for accuracy,  $F(3, 236) = 61.82, p < .001$ , with VWO (87%) and VNO (83%) conditions having higher accuracy than AWO (73%) and ANO (63%) conditions.

## Conclusions

Interestingly, there were no effects of presentation modality on strategy use. However, the overall frequency of strategy use was higher when tools were available than when they were not available for use lending support to Gauvain's (1993) contention that thinking is influenced by the availability of tools in one's environment. Surprisingly, the overall frequency of strategy use did not increase with age. What did change with age were the types of strategies selected for use.

## References

- Gauvain, M. (1993). The development of spatial thinking in everyday activity. *Developmental Review, 13*, 92-121.
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