The Effects of Divided Attention at Encoding on Value-Directed Recognition Memory

Blake L. Elliott, Holly O'Rourke, Gene A. Brewer
Arizona State University

Introduction

- The ability to selectively encode important or valuable information is essential to human memory
- This is tested using reward learning and value-directed memory paradigms
- These paradigms typically assign values or monetary rewards to stimuli and participants try to remember higher value stimuli to maximize their score (e.g. CAR 3.... HOUSE 9)
- Higher Valued stimuli are better remembered than lower valued stimuli (e.g. CAR 3.... HOUSE 9)

Recognition Memory

- The ability to recognize previously encountered words, objects, people, etc.
- Typical paradigm consists of a study phase and a test phase
- Two processes contribute to memory strength during test
  ▶ Familiarity (“knowing” something is old)
  ▶ Recollection (“remembering” something is old)

In the current study, we examine which recognition processes are affected by value-directed encoding and what types of divided attention tasks influence the encoding processes being utilized to better remember high-value stimuli.

Experiment 1

**Study phase:** 40 nouns from the Toronto noun pool assigned either a high value (7 or 9) or low value (1 or 3)

**Test phase:** 80 words, including all 40 from the study phase, self paced responses of either New, Familiar, or Recollect

Study and test phase 1 block, 5 blocks completed

<table>
<thead>
<tr>
<th>Encoding</th>
<th>Retrieval</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 CAR</td>
<td>2000ms</td>
</tr>
<tr>
<td>+ 3 DOG</td>
<td>300-500ms</td>
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<tr>
<th>Experiment 1 Results</th>
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- The results show that higher value words were remembered better than lower valued words. When analyzed in a dual process framework, the effect was seen only for words given a “Remember” response, and not for words given a “Know” response.

**Experiment 2**

**Articulatory Suppression:** Repeated “5” aloud every second on beat to a metronome

**Random Number Generation:** Generated a random number 1-9 aloud every second on beat to a metronome (without repeating or counting sequentially)

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<th>Time</th>
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<tbody>
<tr>
<td>CAR</td>
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<tr>
<td>DOG</td>
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**Experiment 2 Results**

- The effect of value was seen only for recollection. This suggests that value may lead to deeper encoding.
- For total hit rate and recollection, higher values increased memory only if the articulatory suppression condition. This suggests that the effect of value on recollection relies on executive functions opposed to phonological rehearsal. The main effect of value on familiarity may be due to high value words being more salient, and although random number generation prevented deeper processing, higher values still led to increased weak memory (familiarity).

Conclusion

**References**


