Does Response Selection Use Working Memory?

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Background
- To flexibly control behavior, our current goals and actions must be represented in the brain. It is widely assumed that response selection processes engage working memory (WM) to select responses. However, this assumption is usually underspecified and has received little systematic study.
- Previous studies have demonstrated that the amount of interference produced by holding items in WM on an intervening task depends on the similarity between the type of information held in WM and the output modality.

PURPOSE OF STUDY
- We propose that the current stimulus and its associated information held in WM, leading to modality-specific patterns of interference.
- The critical manipulations were the type of information held in WM and the output modality for the choice RT task.

Overview of Procedure

Two tasks: WM task & Choice RT

Trial: WM load → Choice RT → WM Probe

- WM task: Either presented with auditory information or visual information (a binding of color and location). Probe consisted of determining if the probe matched one of the previously presented stimuli.
- Choice-RT task: Categorize visually presented words (3 appeared in succession). Words were types of bugs, foods, or trees. Subjects responded vocally or manually.

Task Order
- Auditory: Depending on the experiment, the auditory stimuli were either tones or non-sense syllables.
- Visual Binding: Consisted of binding a sequence of 4 color squares to a location.

Results: Capacity

Results: Choice RT task

Results: Primacy & Recency

Conclusions
- These findings suggest that response selection processes activate information in WM, leading to modality-specific patterns of interference.
- Binding condition demonstrated that a vocal response did not lead to more interference.
- Future direction: Use a purely spatial WM task.

References

Keywords: Working Memory, executive function, response selection, interference.