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# Effect of load on availability of cues in prospective memory performance: Comparing event and mixed cues

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## INTRODUCTION

- Prospective memory (PM) is remembering to perform a delayed action in the future. Depending on the type of occasion for retrieval, it can be initiated by event, time, or mixed-cues (time and event). In mixed prospective memory, both event and time cues facilitate information retrieval (Gan et al., 2021).
- In everyday life, it is common for people to have multiple delayed intentions at once which can lead to forgetfulness.
- In present study, we investigated participants' performance in event and mixed-based tasks under high and low loads.

## METHODOLOGY

Participants : 50 healthy (22.5 ± 0.4 years) participants.

**Encoding**: Four English alphabets (*e,h,y,w*) as PM targets.

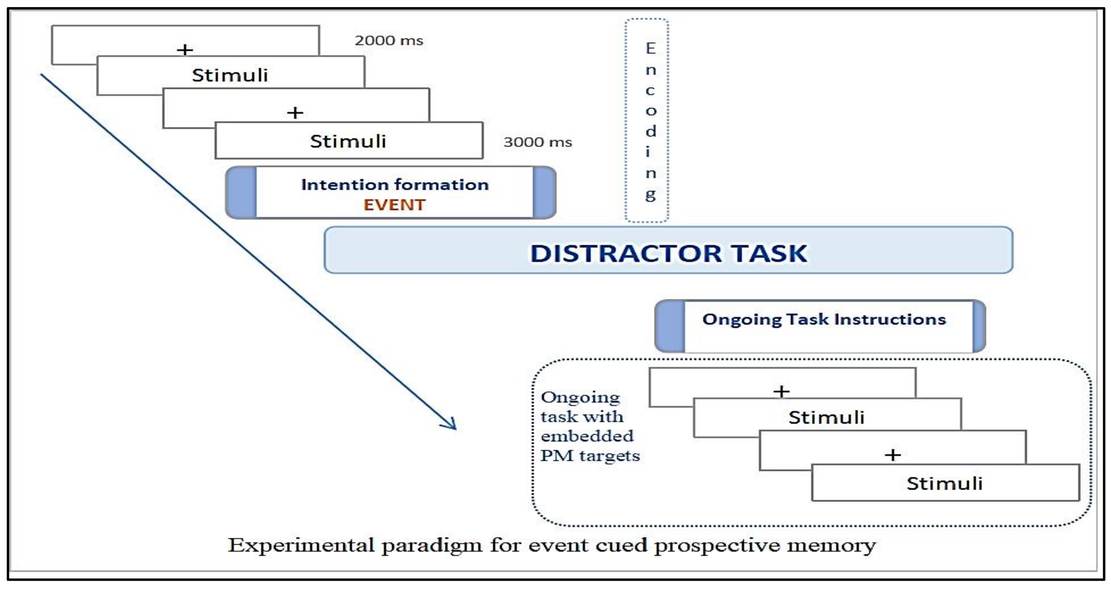
**PM intention** : Low load condition - press 'SPACE' key for one particular PM target (*h*) in the upcoming working memory (1 back) task.

High load - to press 'SPACE' key to all the encoded targets (*e,h,y,w*) in the upcoming working memory (1 back) task.

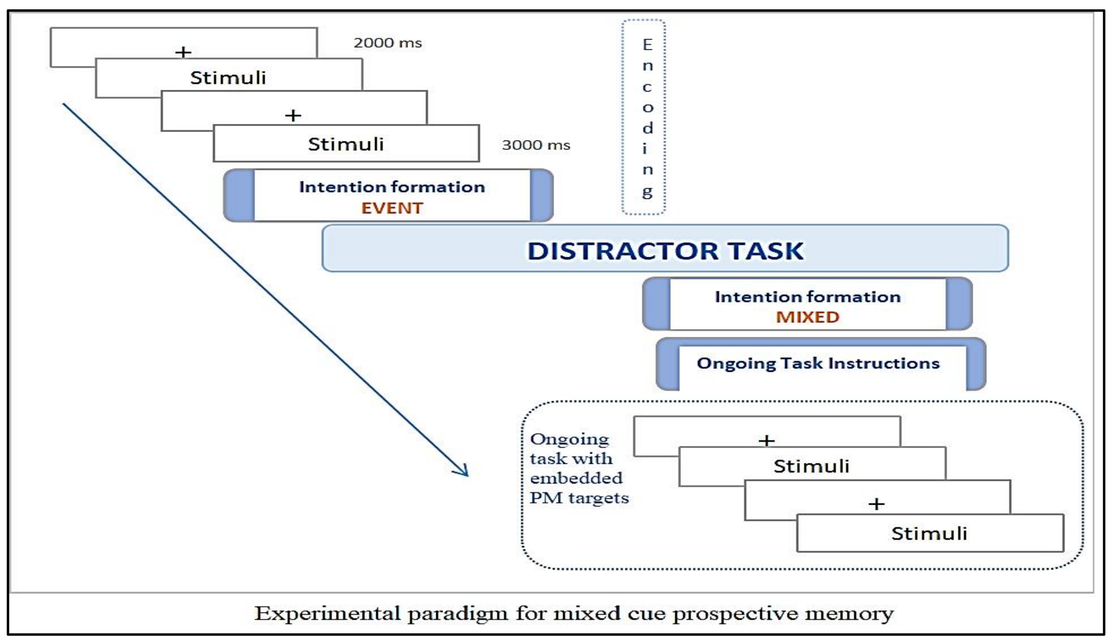
**Distractor Task:** Arithmetic problems for thirty minutes to reduce mental monitoring of the intention.

**Retrieval :** Four blocks (20 trials in each block) of PM embedded working memory (*1-back*) task with PM target appearing once in each block.

Participants in mixed PM retrieval were told when the event cue would appear in working memory. Mixed cue is this extra time cue linked to event cue. The procedure for event and mixed prospective memory tasks was identical except for this presentation.




Experimental paradigm for event cued prospective memory



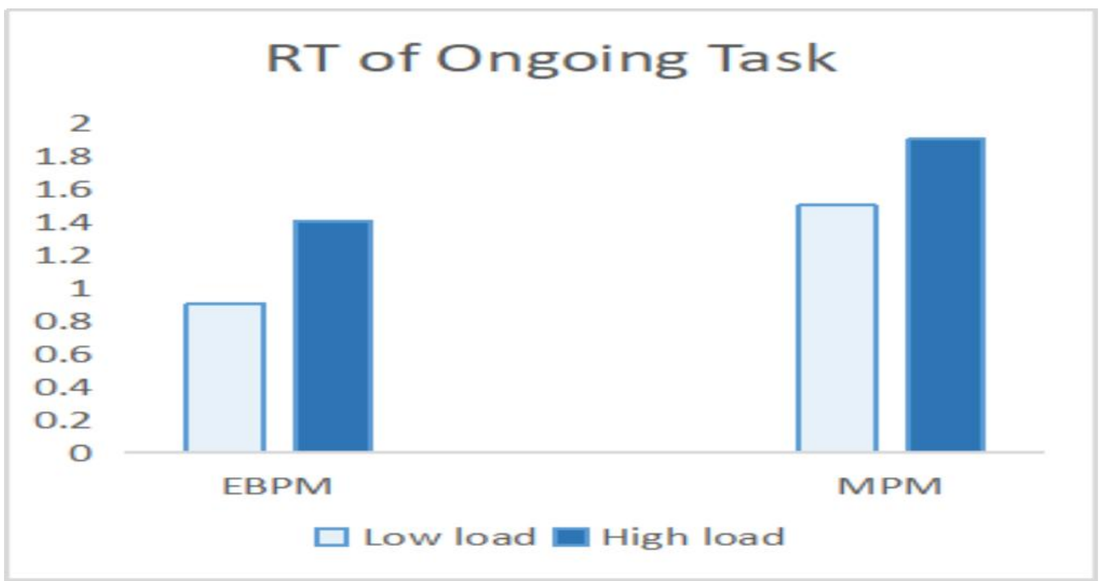

Experimental paradigm for mixed cue prospective memory

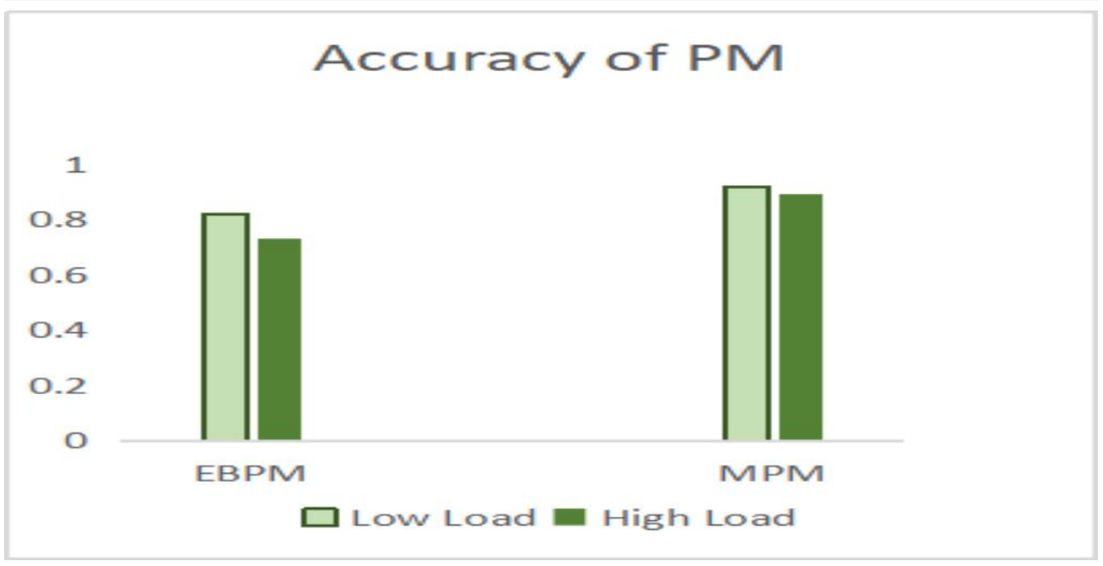
## RESULTS

- **PM Accuracy** : Mixed model ANOVA [Load (low, high) (between subject) x Intention type (event, mixed) (within subject)] ANOVA revealed significant main effect of load [$F(1,48)=11.8$, $p<0.05$, partial eta squared = 0.4) and PM type [$(F(1,48)=4.5$, $p<0.05$, partial eta squared=0.37].
- **RT of ongoing task**: To analyze the effect of interference caused due to carrying prospective memory intention, reaction time of non target trials in the working memory task was calculated and significant main effect of load [$(F(1,48) = 4.1$, $p < 0.05$, partial eta squared= 0.4)] was found.

The accuracy of prospective memory and reaction time (seconds) of ongoing task (M ± SD)

| | Prospective Memory(Accuracy) | | Ongoing Task(RT) | |
|---|---|---|---|---|
| | Event | Mixed | Event | Mixed |
| Low Load | 0.82 (0.07) | 0.92 (0.16) | 0.9 (0.70) | 1.5 (2.1) |
| High Load | 0.73 (0.04) | 0.89 (0.19) | 1.4 (1.9) | 1.9 (.98) |




## CONCLUSION

- Mixed cue (time with event cue) enhances target predictability, thereby increasing the accuracy of target cue detection .
- PM performance varies with the load. High load reduces individuals' likelihood of attending or successfully recognizing a target during the task.
- High load requires more monitoring processes during retrieval, thereby increasing the working memory task cost.

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