Remembering To Remember:
The Connections Between Prospective Memory And Incidental Learning

Madison Rowley & Megan H. Papesh
University of Massachusetts Lowell

ABSTRACT

How do you remember to stop at the pharmacy on your way home from work? Some people accomplish these sort of prospective memory (PM) tasks by setting timers or making lists, but others know that they will spontaneously remember when they drive by their pharmacy on the way home. Relying on contextual cues like this heightens attention as the relevant context approaches. Laboratory PM research typically has participants make decisions about words while monitoring for two specific words. Some participants are also given specific contexts to expect those words to appear in (e.g., in trials where they also see specific shapes or numbers). Prior research has found that when people have contexts that they anticipate as PM-relevant, they will have an improved incidental memory for other items that they encounter in that context . This experiment tests whether attention increases to cause incidental learning of items that do not match prospective memory targets when the context is recognized or when the item violates what is expected by the participant . In this investigation, participants complete a color-matching task while looking for prospective memory targets in the form of specific words. The context in which these prospective memory targets will appear is defined specifically or unclearly for participants, in order to manipulate their expectations about the task. To measure their attentional arousal, we measured pupil size throughout the experiment. Results are interpreted within theories of PM.

BACKGROUND

PM is a type of memory that involves remembering to perform an action in the future. Previous research by Guevara et al. has found that attention is allocated based on expectations about when PM targets will appear, with situations where PM targets are expected capturing more attention than other tasks and facilitating more incidental learning of other items ([1]). Pupillometry, the measure of pupil diameter, can be used as a measure of mental activity to indicate changes in attention in response to PM tasks ([2]).

HYPOTHESES

H_1: Contextual expectations improve PM and slow ongoing tasks

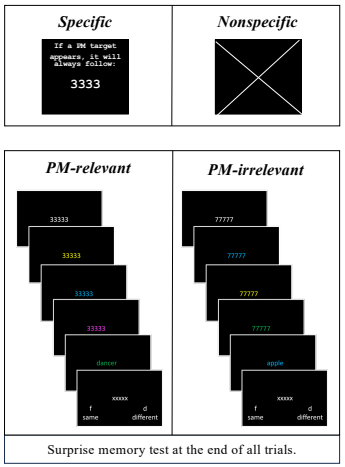
- PM detection will improve in trials with 3333 when participants have been told to expect PM targets.
- Color-matching tasks will be completed slower in 3333 contexts when participants are told to expect PM targets.

H_2: Pupil size will reveal when contextual expectations modify attention

- Possibility 1: Attention heightens when the context is noticed.
- Possibility 2: Attention heightens when the word is not an expected PM target.

GENERAL METHOD

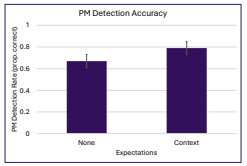
- Participants: n = 22 (M_{age} = 23)
- Design: 2 (Condition: Control, PM) x 3 (Context: Control, Relevant, Irrelevant) mixed model, with Condition between-subjects
- Procedure:

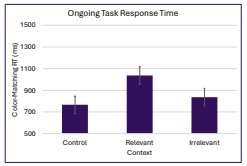


Surprise memory test at the end of all trials.

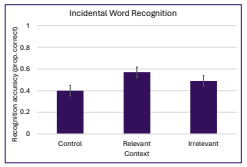
RESULTS

H_1: Contextual expectations improved PM and slow ongoing tasks





- Incidental memory was enhanced when participants expected (but did not encounter) a PM target.



H_2: Data collection is ongoing

DISCUSSION

- H_1: PM detection was improved, but ongoing task performance slowed, when participants had contextual expectations about when the PM words would appear.
- H_2: Incidental recognition data confirm that attention is enhanced, but when it is enhanced is to-be-determined.

Implications for Real Life

- PM tasks present themselves daily in our lives. By understanding the way that their demands impact our attention, performance of other tasks, and incidental learning, we can find ways to optimize our ability to complete them while avoiding mistakes.

REFERENCES

[1] Guevara Pinto, J. D., Papesh, M. H., & Hicks, J. L. (2021). Flexible attention allocation dynamically impacts incidental encoding in prospective memory. Memory & Cognition, 50(1), 112–128. https://doi.org/10.3758/s13421-021-01199-6
[2] Laeng, B., Sirois, S., & Gredebäck, G. (2012). Pupillometry. Perspectives on Psychological Science, 7(1), 18–27. https://doi.org/10.1177/1745691611427305

Corresponding author:
Madison_Rowley@student.uml.edu