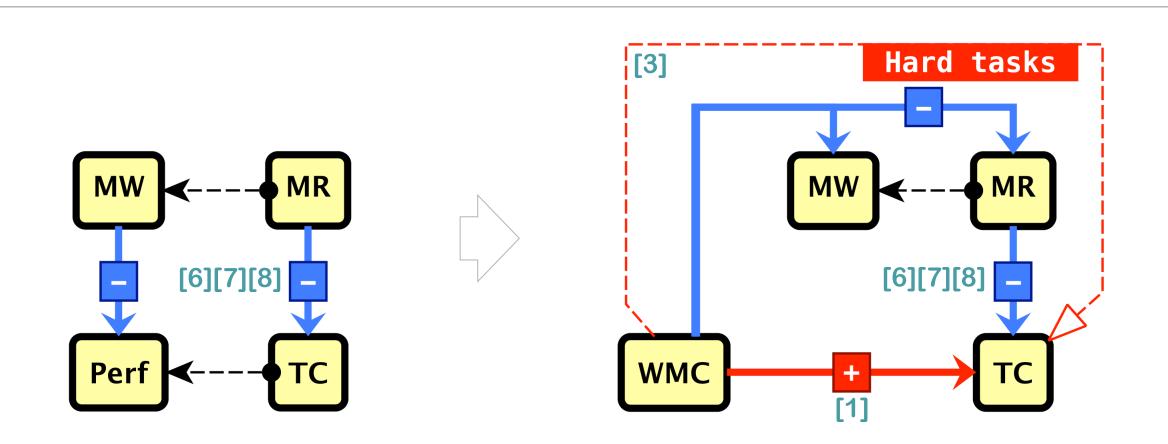
# The effects of mind-wandering and working memory capacity on text comprehension

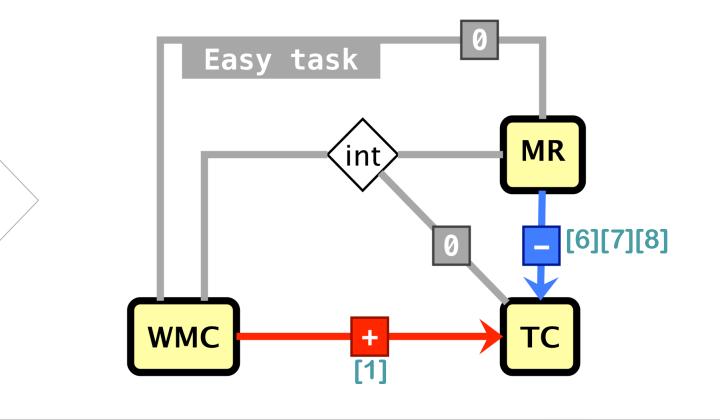


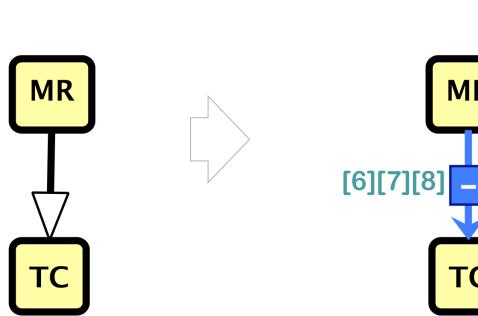


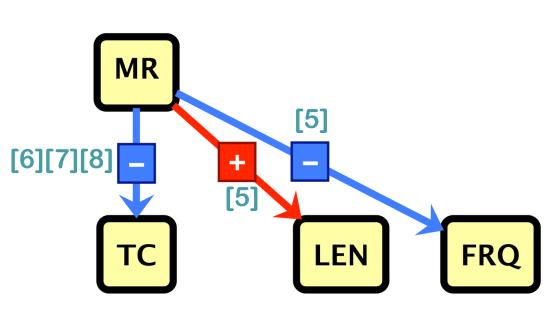
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### 1. Motivation

- Several studies found a negative correlation between *mind* wandering (MW) and performance.
- Some of those studies involved reading as a task and *text* comprehension (*TC*) as a measure of performance [6][7][8].
- Consistently with those earlier reports, in our study, we have recorded a decrease in TC associated with an increase in MW.
- Although it is possible that mind wandering causes degraded text comprehension, the reverse relationship is also plausible: Less skilled readers experience more comprehension difficulty and thus mind-wander more.
- In this research, we attempt to understand the cause-effect relationship between MW and TC.

## 2. Experiment

- 112 subjects Age: 18.73 (1.23) 39% males 2h
- Reading span task [1]
  - Secondary task accuracy: 0.88 (0.08)
  - Full-load composite score: 0.42 (0.20)
- Reading task
  - EyeLink 1000
  - Sense and Sensibility by Jane Austin
  - Time: 72m 0s (9m 41s)
  - Amount
    - 50.5 (14.1) pages
    - 15,607 (3,791) words
  - Speed: 219.86 (61.15) wpm
  - Text comprehension (TC)
    - Method: Forced-choice, 1 out of 4
    - Score: 0.68 (0.17)
- Mindless reading (MR)
  - Sampling method [7][5]
    - Probes
    - Self-reports
  - Outcome
    - Probes: 13.25 (6.43)
    - Self-reports: 14.62 (13.01)
    - Probes + self-reports: 18.01 (13.10)
    - Probe-caught ratio: 0.24 (0.21)

# The family of Deshvood had long been settled in Susses. Their setate was large, and their residence was at Norland sax, is the centre of their property, where for many questions, the had lived in a vergentials a manner as to engage the general good opinion of their percenting expectations are considered by the control of the late was a single man, who lived to a very savened as and well for many years of his late to a contain companion and housekeeped in his state, but her death was the percent of the family of his nephew Mr. Henry asswered, the legal inheritor of the Norland states, and the percent of whom he intended to begueath it is the society of his nephew Art legal inheritor of the Norland states, and their children, the old Gentleman's days were confortably spent, its attachment to them all licensess to constant statestion of Mr. and Mrs. Henry Deshwood to his waste with the proceeded nor nerely from interest; but from goodness of heart, sew him every degree of solid confort which his age could receive so the cheerfulness of the children added a reliab to his customes. by from marriage, Mr. sunry Deshwood had one sons by his present leav, three daughters. The sons, assess and half of which devolved on his on his possible to the family provided for by the fortune of his southern which happened noon strawards added to his waste to the latest to the family important as to his limited to the from the accession to the Norland estates was not as really important as to his linearity for their fortune; for the soccasion to the Norland estates was not as really important as to his linearity for their fortune; for the seminary linearity which nothing and that father only seven themselves to be but small. Their mother had nothing and that father only seven the common of the seven of

**RSPAN** task

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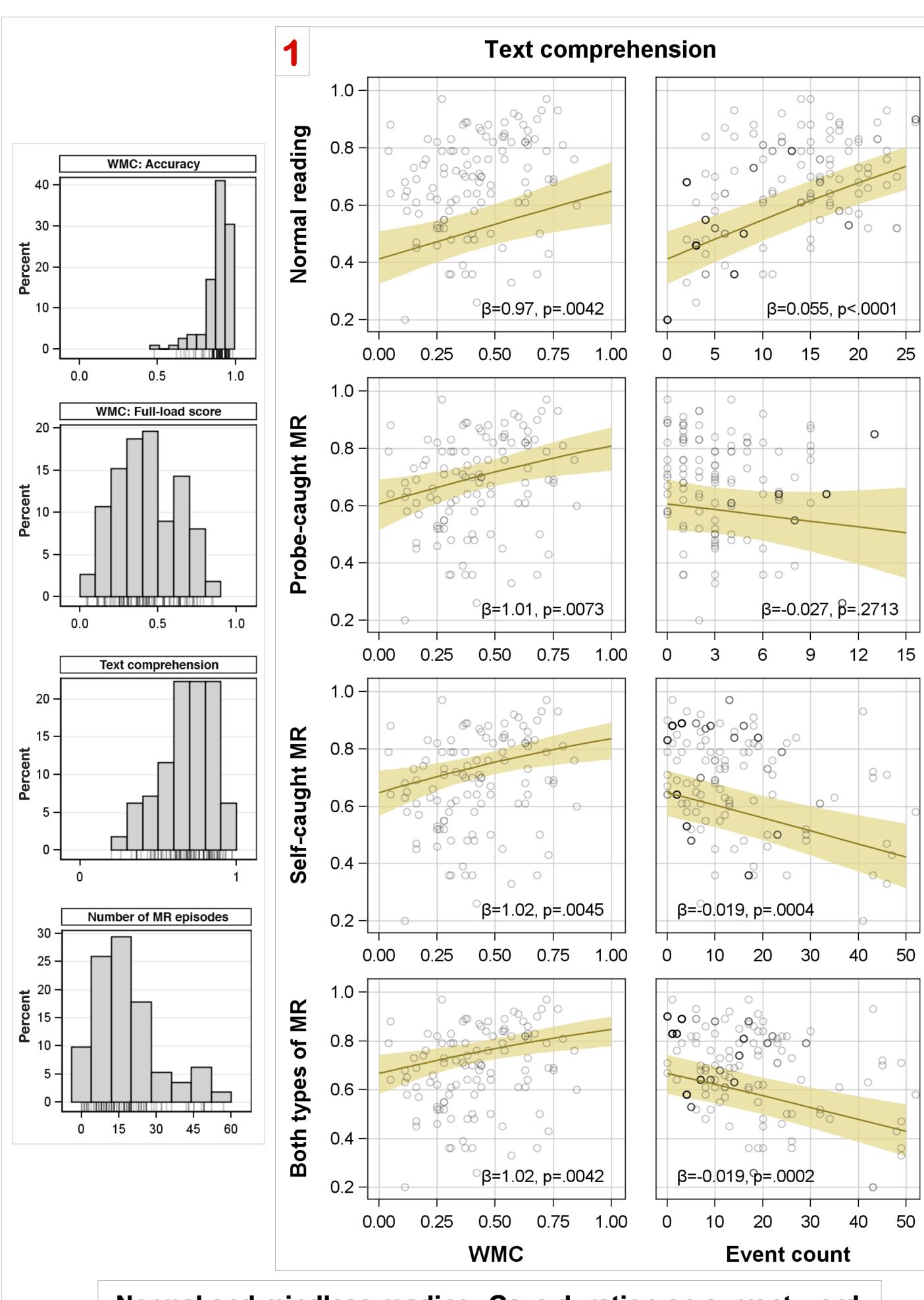
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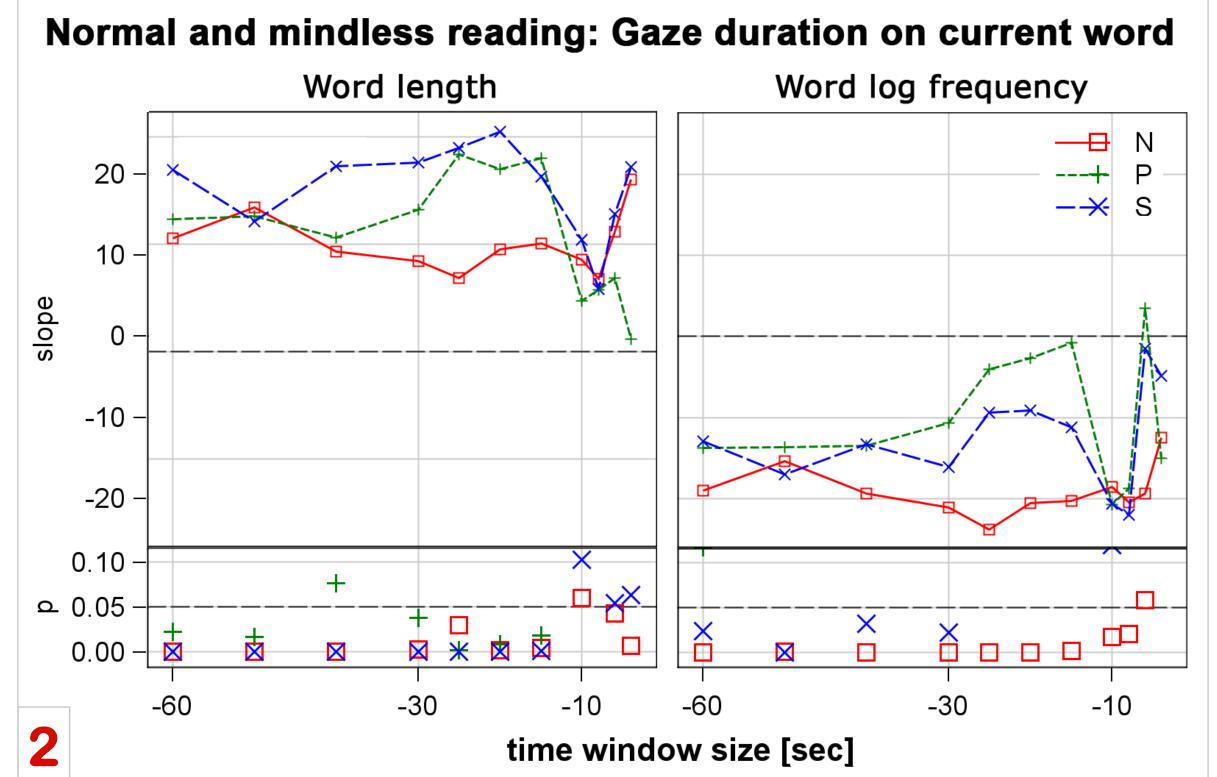
## 3. Results and argument (behavioral)

- Working memory capacity (WMC) is a direct [1] and indirect [2] [4] predictor of task performance, including reading [3]. WMC mediates via MW (i.e., WMC predicts MW, and via MW predicts performance).
- In our study, WMC correlated positively with text comprehension (Fig. 1).
- However, WMC did not predict MW or interact with MW to predict TC. Therefore, we have found no evidence that WMC affects comprehension via MW.
- An explanation for this discrepancy between previous and current results is that WMC has been found to play a mediating role in cognitively demanding tasks [2]; our text (Sense and Sensibility) was probability easy to understand, being rated 11.9 on the Flesch-Kincaid index (indicating that it should be easy to understand for 18 year olds).
- Because text difficulty did not cause comprehension problems, MW is likely the cause of comprehension problems and not vice versa.

# 4. Results and argument (eye movements)

- To better understand the cognitive processes during MR, we investigated the effects of perceptual (word length) and lexical (word frequency) variables on fixation durations during both normal and mindless reading.
- The modulation of fixations durations by word frequency was attenuated during MR (Fig. 2).
- This suggests that readers encoded text more superficially during MR.
- This result corroborates earlier reports [5] and explains how MR impairs text comprehension.





## References

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