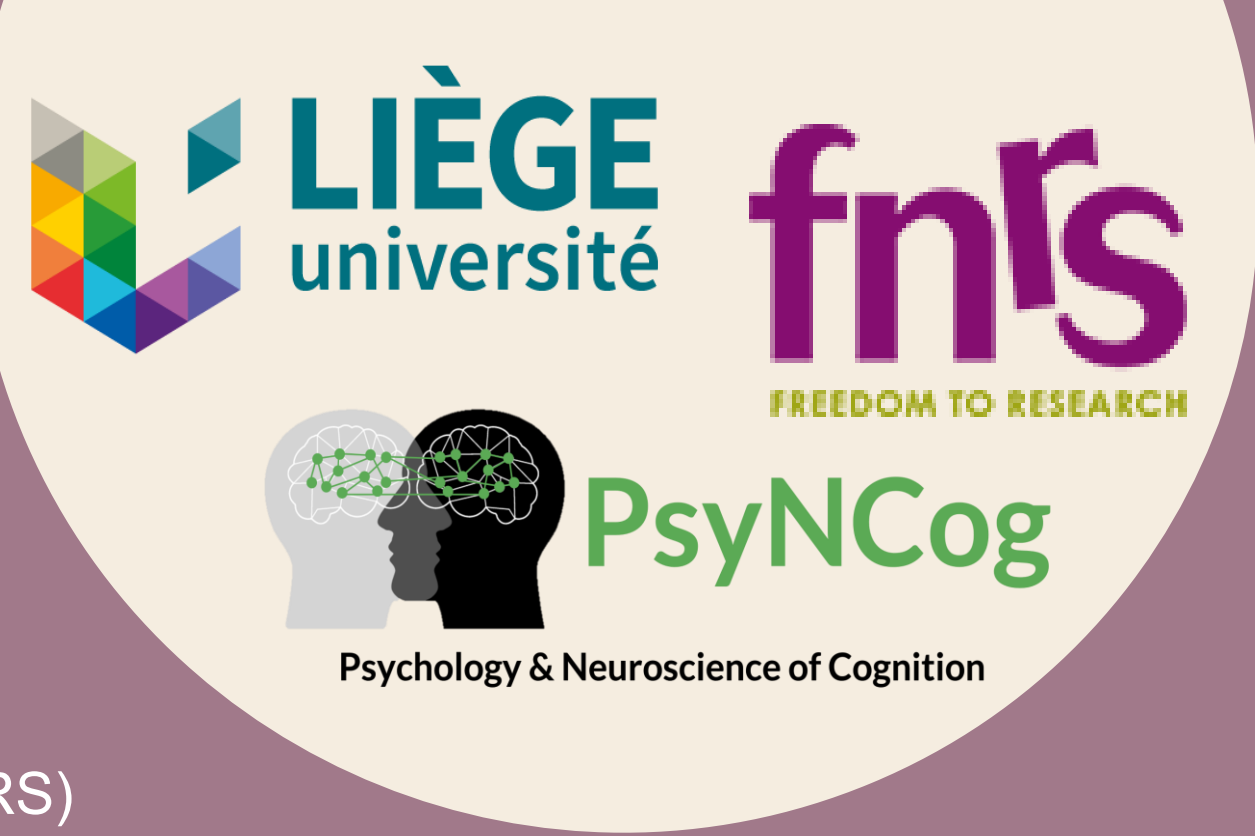


Development of a Method to Estimate the Duration of Mind-Wandering Episodes

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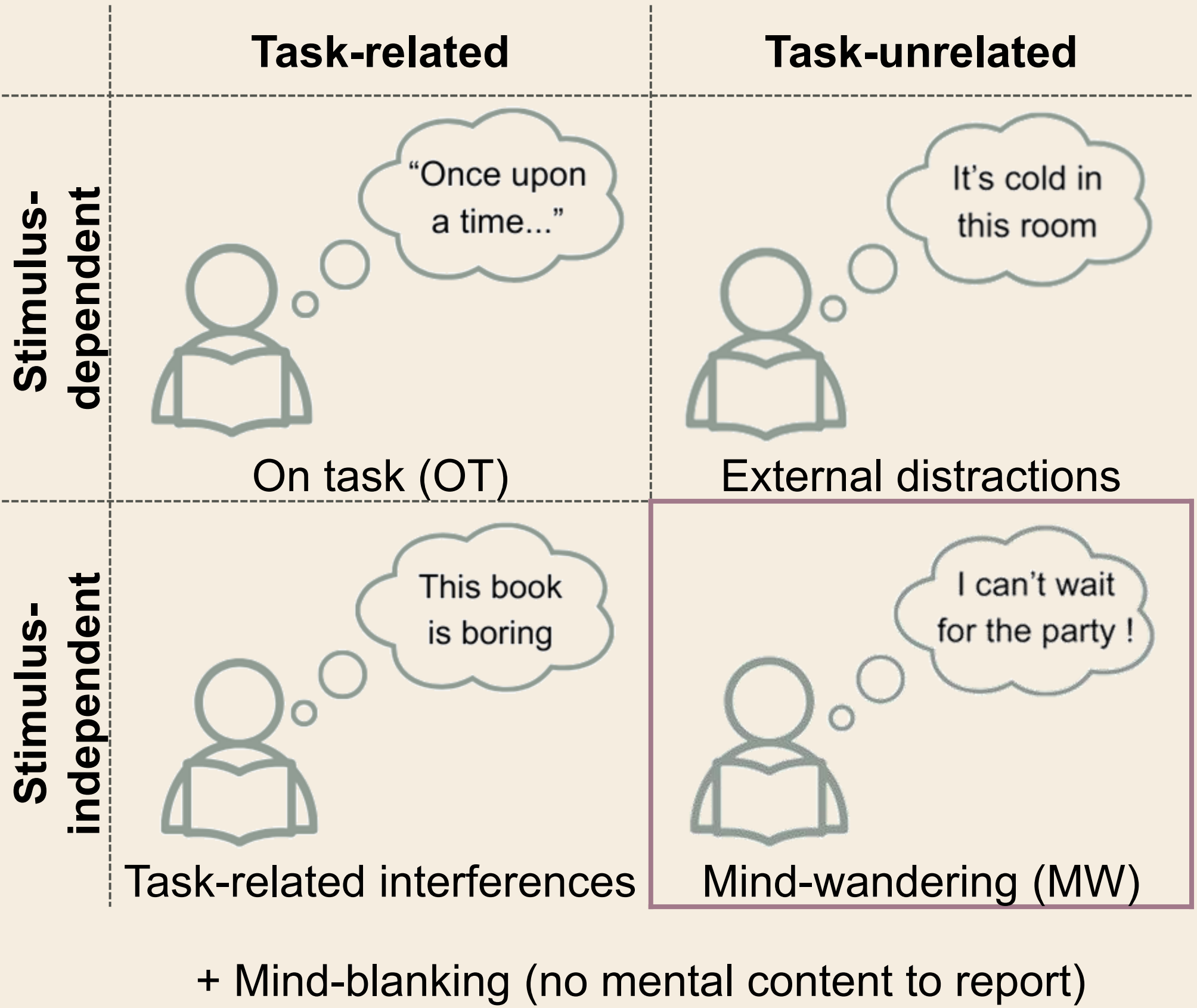
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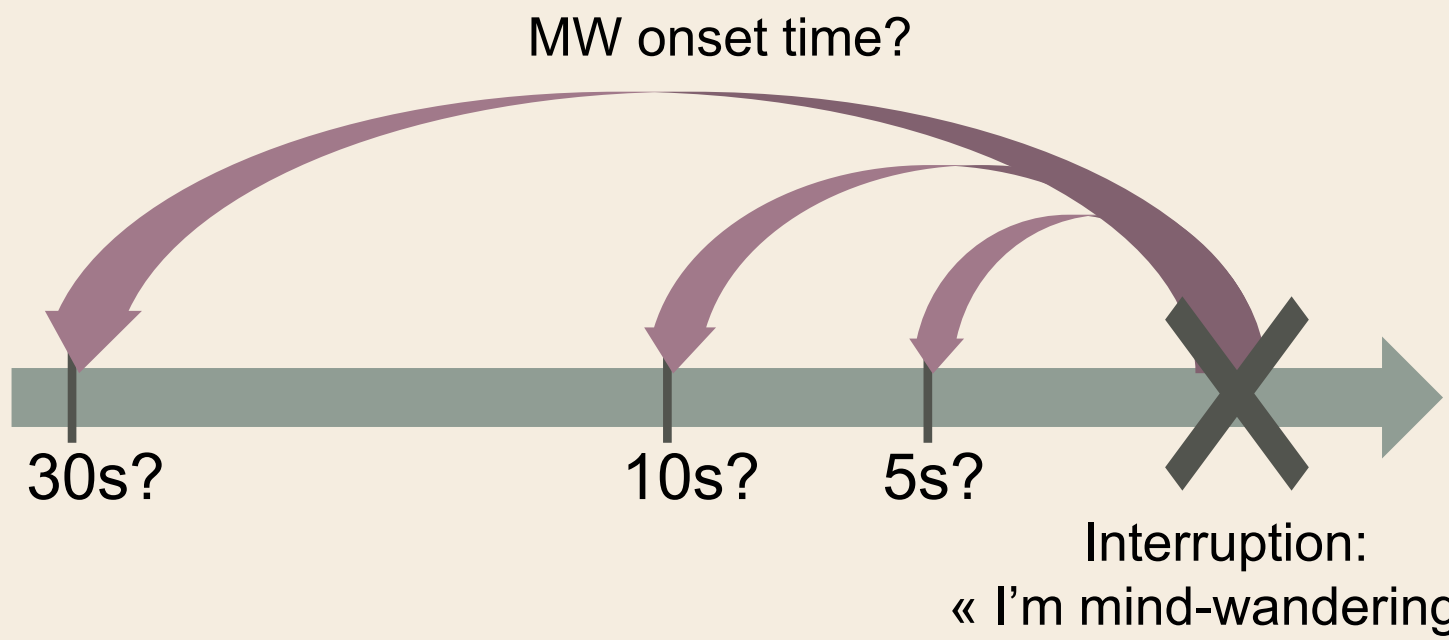
Introduction

Mind-wandering¹:

- **Stimulus-independent** and **task-unrelated** thought
- Around **30% of daily cognitive activity**
- Can be **disruptive** to task performance
- Could play a **functional role** in planning or creativity



Commonly used experience sampling methods for MW assessment **cannot pinpoint the exact moment when a MW episode begins²**.



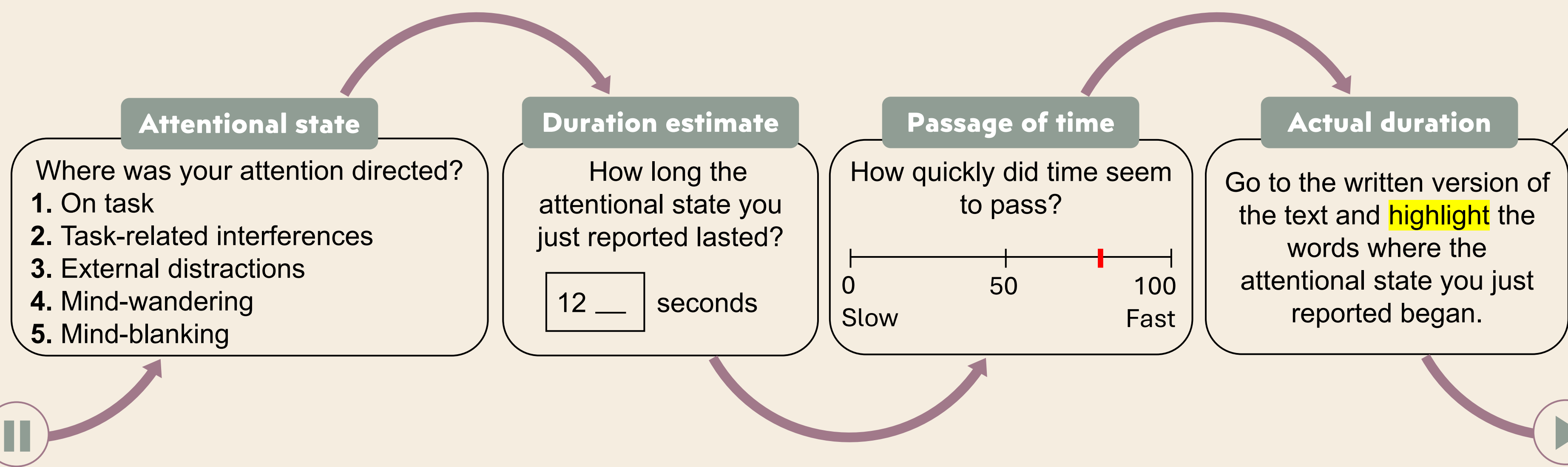
This methodological gap **limits the dynamic understanding of MW²** and its **cognitive consequences³**, particularly regarding **time perception⁴**.

What is the **duration** of a mind-wandering episode?
Do these episodes impact **duration estimates**?

Methodology

- **25 thought probes** presented during a **one-hour audiobook excerpt**.
- At each probe, participants reported their attentional state just before the interruption: the **direction of their attention**, **how long they perceived it lasted**, and **how quickly time seemed to pass**.
- They also **marked the words** in the text corresponding to the **onset of their attentional state**.

Henry David Thoreau



« De temps à autre, mon sarclage terminé pour la journée, [...] vers le repère des hommes. »

Word	Start	End	Time from probe
(silence)	0	0.4	148
De	0.4	0.48	147.6
temps	0.48	0.69	147.52
à	0.69	0.78	147.31
autre	0.78	1.1	147.22
[...]	...	...	...
des	147.3	147.59	0.7
hommes	148	148.46	0

THOUGHT-PROBE

The written text was **temporally aligned** with the corresponding audio (using Montreal Forced Aligner), providing the **actual time** between a highlighted word and the probe.

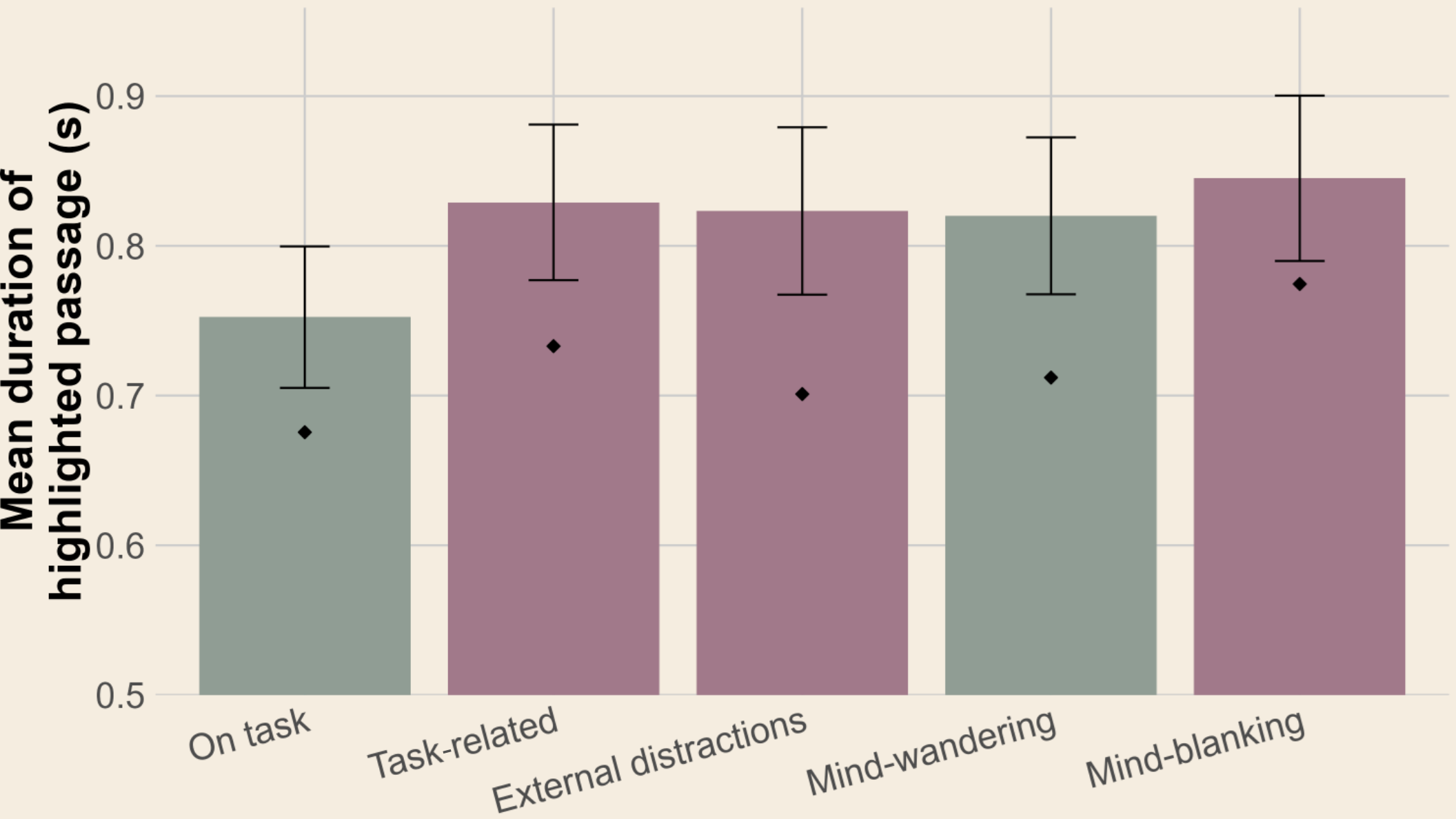
73 college students fluent in French
67 ♀
 $M_{age} = 19.55$ years
 $SD_{age} = 1.99$

Results

Percentage of each attentional state in the sample

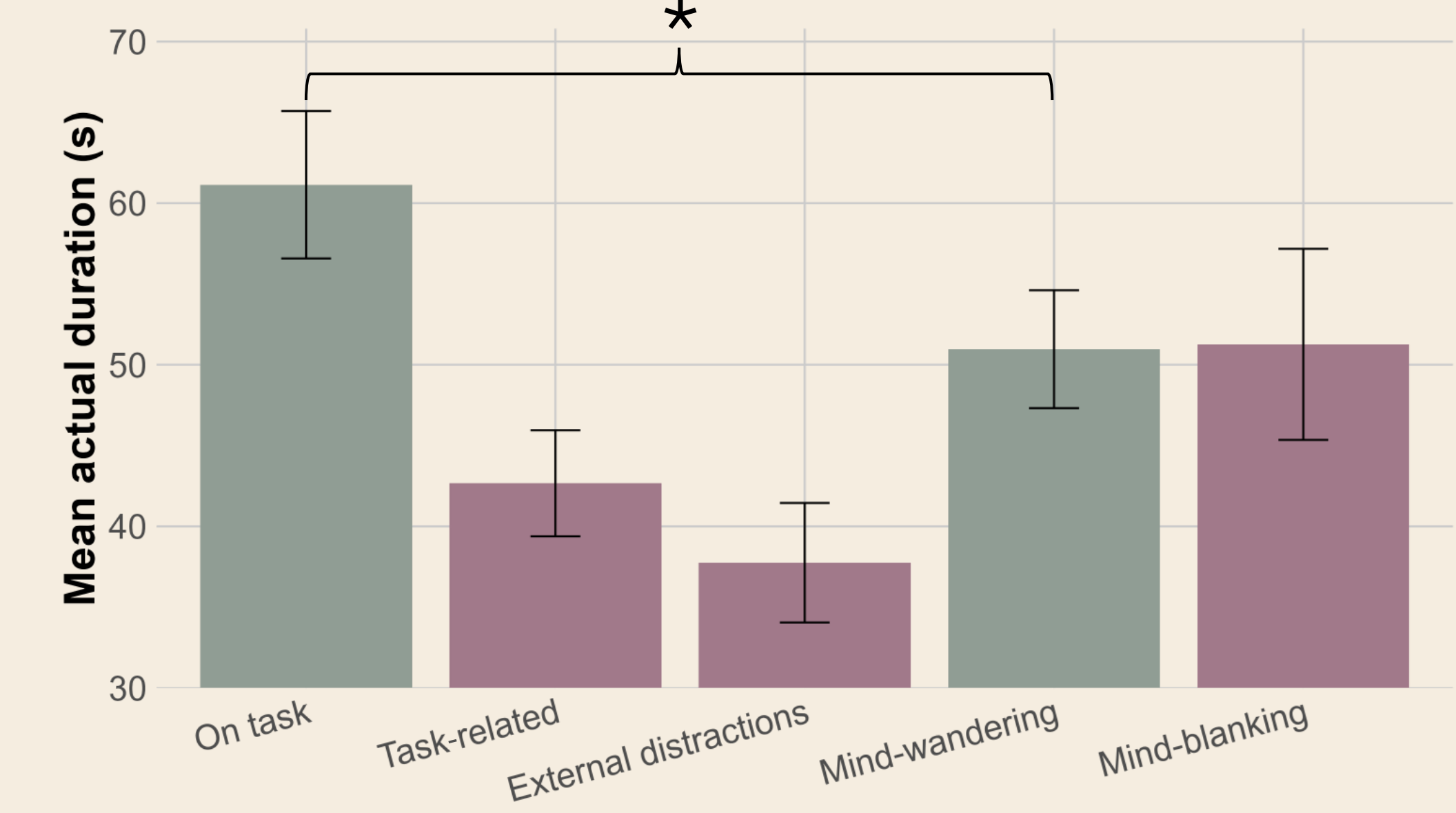
	On task	Task-related	External distractions	Mind-wandering	Mind-blanking
% (SD)	40% (21.23)	17% (8.6)	12% (8.88)	23% (12.43)	8% (9.60)

Precision Higher score = less precision



$H_a \mu_{OT} - \mu_{MW} \neq 0$
 $W = 1040; p = .317; r = -.139$

Mean actual duration



$H_a \mu_{OT} - \mu_{MW} \neq 0$
 $t = 2.17; p = .034; d = .259$

Note. ♦ indicates medians; a statistically significant effect is indicated by * (* = $p < .05$; *** = $p < .001$).

Discussion

❖ Percentage of MW ≈ 23% → Similar to other studies¹

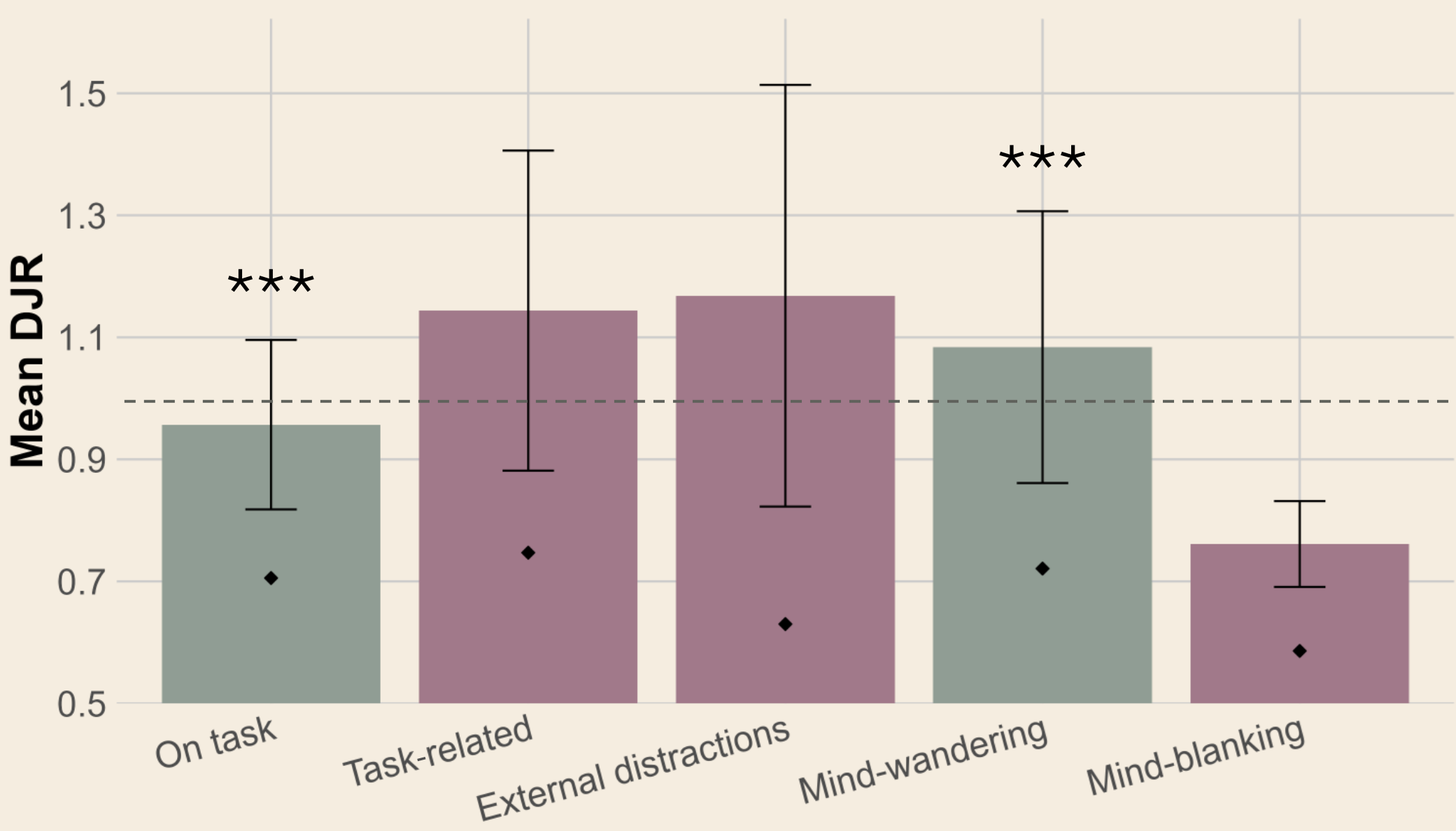
❖ **Precision (< 1s)** suggests that participants are **able** to retrieve the **onset time** of their **attentional state**

❖ **Duration of MW < OT** (but > than arbitrary durations usually used in literature (12-15s)²)

❖ **Duration underestimated for both OT and MW moments**, in congruence with previous studies⁴

❖ **No conclusions** can be made about the **underestimation of duration being greater during MW episodes** compared to being **OT**, or about **time passing more quickly during MW episodes**

Duration Judgement Ratio = DJR = $\frac{\text{Duration estimates}}{\text{Actual duration}}$



$H_a \mu < 1$

OT:

$W = 627; p < .001; r = -.523$

MW:

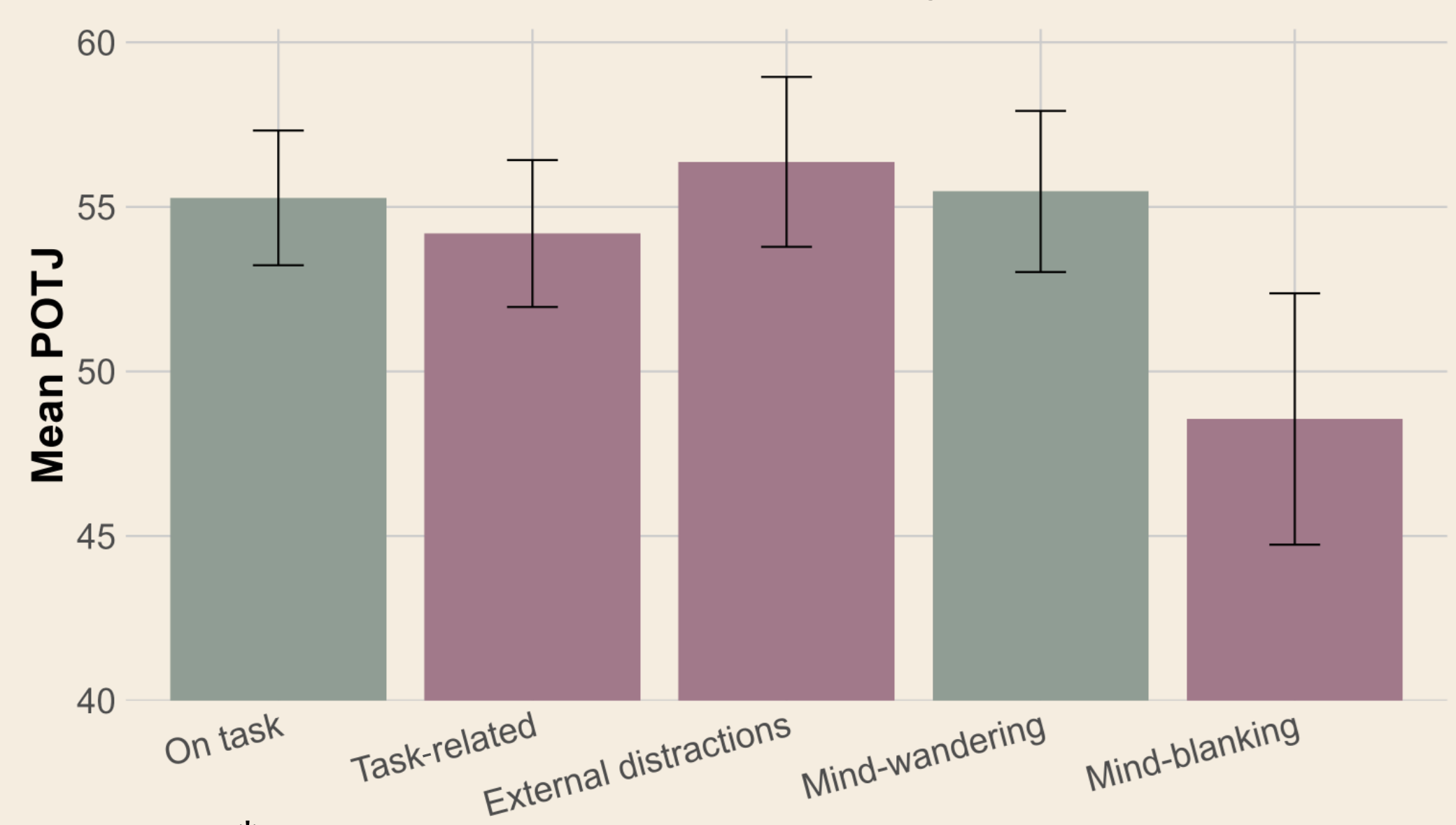
$W = 726; p < .001; r = -.432$

→ Underestimation

$H_a \mu_{OT} - \mu_{MW} > 0$

$W = 1322; p = .323; r = .064$

Passage Of Time Judgement (POTJ) Higher score = time passed faster



$H_a \mu_{OT} - \mu_{MW} \neq 0$

$t = -.295; p = .769; d = -.035$

These preliminary results suggest a promising new method to **understand the dynamics of MW** but should be tested with different audiobooks on a bigger sample coming from the general population.

¹ Smallwood, J., & Schooler, J. W. (2015). The science of mind wandering: Empirically navigating the stream of consciousness. *Annual Review of Psychology*, 66, 487-518.
² Pelagatti, C., Bini, E., & Vannucci, M. (2025). Catching mind wandering with pupillometry: Conceptual and methodological challenges. *WIREs Cognitive Science*, 16(1).
³ Mooneyham, B. W., & Schooler, J. W. (2013). The costs and benefits of mind-wandering: A review. *Canadian Journal of Experimental Psychology*, 67(1), 11-18.
⁴ Terhune, D. B., Croucher, M., Marcusson-Clavertz, D., & Macdonald, J. S. P. (2017). Time contracts and temporal precision declines when the mind wanders. *Journal of Experimental Psychology: Human Perception and Performance*, 43(11), 1864-1871.