Catching the wandering mind with real-time triggers

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Background

Lapses in sustained attention are studied in two main ways:

objectively — consequences for behavior or memory
subjectively — task-unrelated thought (TUT) reports

Here, we assess the predictive utility of a response time speed-based real-time triggering procedure in a continuous performance task to anticipate different indices of lapsing attention.

Do triggers catch both **reduced working memory (WM) encoding** and **TUT self-reports**?

Does the predictive utility of triggers **generalize across individual differences**?

Method

Participants:

$n = 55$ ($M_{age} = 19.91 \pm 1.93$ years; 44 female, 8 male, 3 else)

Procedure:

surveys on individual differences: social desirability bias, motor impulsivity, spontaneous/deliberate mind-wandering →

sustained attention task: 3 blocks of 600 1s trials each (10% infrequent squares, 90% frequent circles)
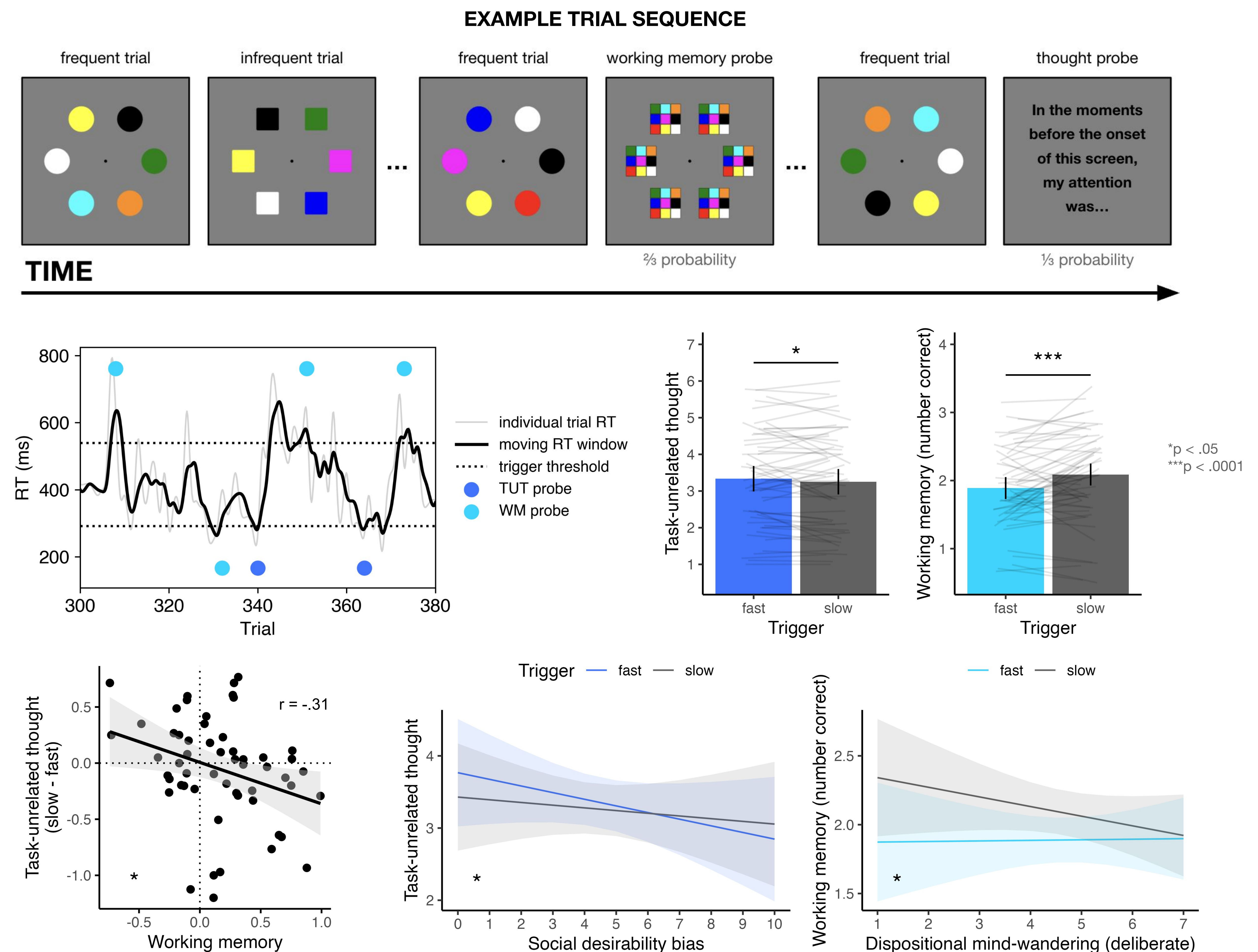
Trigger conditions:

triggered event follows trial i if —

- 60 trials have passed (initialization period for overall M_{RT})
- 3-trial window M_{RT} exceeds $\pm$ 1 SD_{RT} from overall M_{RT}
- trial i is frequent (circles)
- trials i - 3, i - 2, i - 1 were all accurate frequent trials
- no triggered event in the last 5 trials

12.82 $\pm$ 4.54 fast- and 12.82 $\pm$ 4.16 slow-triggered TUT probes

24.96 $\pm$ 7.79 fast- and 25.47 $\pm$ 9.13 slow-triggered WM probes

Results

EXAMPLE TRIAL SEQUENCE

frequent trial   infrequent trial   frequent trial   working memory probe   frequent trial   thought probe

In the moments before the onset of this screen, my attention was...

⅔ probability   ⅓ probability

TIME

individual trial RT
moving RT window
trigger threshold
TUT probe
WM probe

*p < .05
***p < .0001

Summary

Fast triggers catch **reduced working memory encoding** (deBettencourt et al., 2019), but this is weaker for **deliberate mind-wanderers**, who may maintain controlled responding during intentional "tune-outs."

Fast triggers catch **deeper task-unrelated thoughts** only after **accounting for social desirability bias**. Objective and subjective indices of lapsing attention are decoupled for individuals with self-presentation biases.