Effects of Acute Alcohol Intoxication on Mind-Wandering and Related Attentional States During Working-Memory Tasks

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Introduction

- Mind-wandering (MW) represents thoughts that are self-generated, task-unrelated, and stimulus-independent[1], accounting for around 30% of daily cognitive activity[2].
- MW has detrimental effects on performance[3], but also contributes to self-related and motivational processes[4].
- Little is known regarding the effects of alcohol on MW.
- Previous studies [5,6] showed increased MW under alcohol intoxication but did not distinguish mental states or investigate task-demand effects.

Aims

(1) Replicate alcohol's effects on mind-wandering using more precise probing

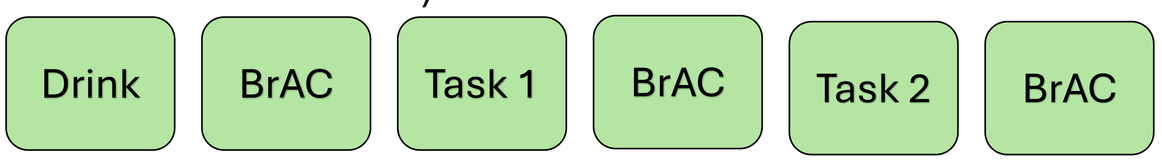
(2) Compare effects across different mental states (OT, TRI, ED, MW, MB)

Participants

- Two groups:
  Placebo: *N* = 22 (11F, 11M; age = 23.2, *SD* = 1.86)
  Alcohol (0.65g/L): *N* = 22 (11F, 11M;age = 23, *SD* = 3.61)
- All participants were fluent in French

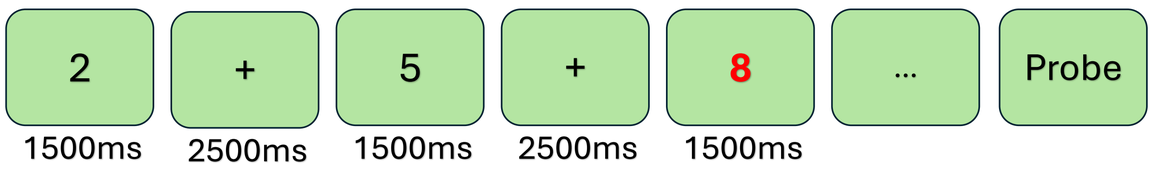
Method

- **Design**
  - Two (counterbalanced) tasks, BrAC (Breath Alcohol Concentration) three times

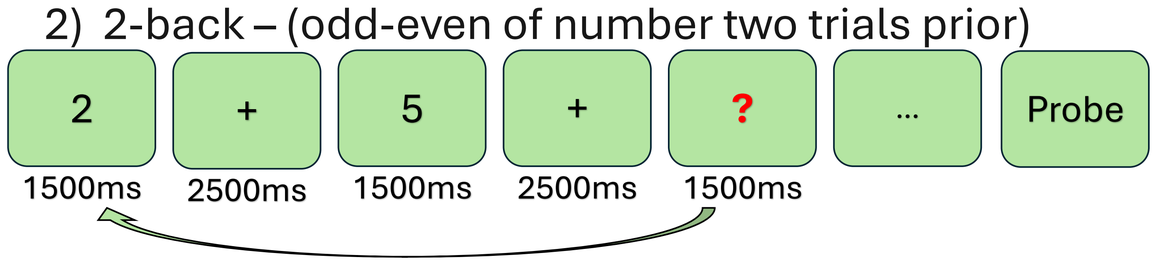


- **Tasks**

1) 0-back – (odd/ even of red number)



2) 2-back – (odd-even of number two trials prior)



- **Thought Probes**

12 thought probes per task
Categorization of thoughts into **5 categories :**
(OT, TRI, ED, MW, MB)

« Where was your attention directed prior to the interruption ? »
1. On Task (OT)
2. Task Related Interference (TRI)
3. External Distraction (ED)
4. Mind-Wandering (MW)
5. Mind Blanking (MB)

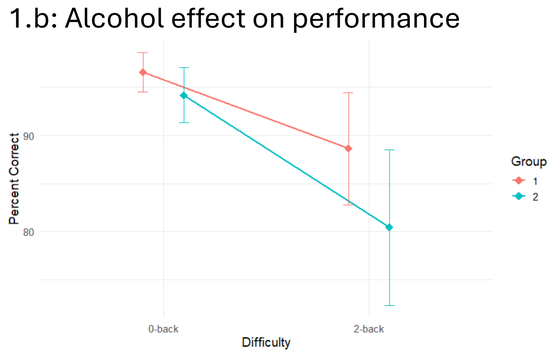
Preliminary results

1. Experimental manipulation

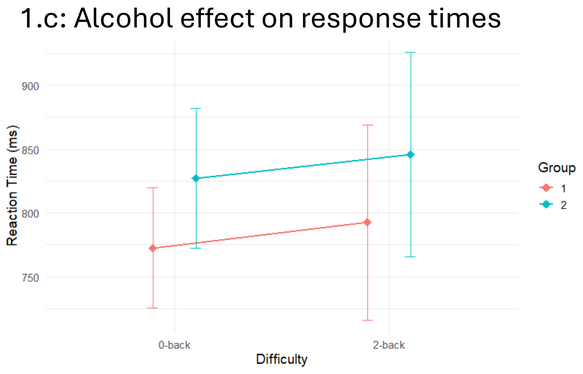
1.a: BrAC over time

	T1	T2	T3
BrAC (alcohol group) : mean, *SD*	0.24 (0.06)	0.27 (0.08)	0.29 (0.07)

1.b: Alcohol effect on performance



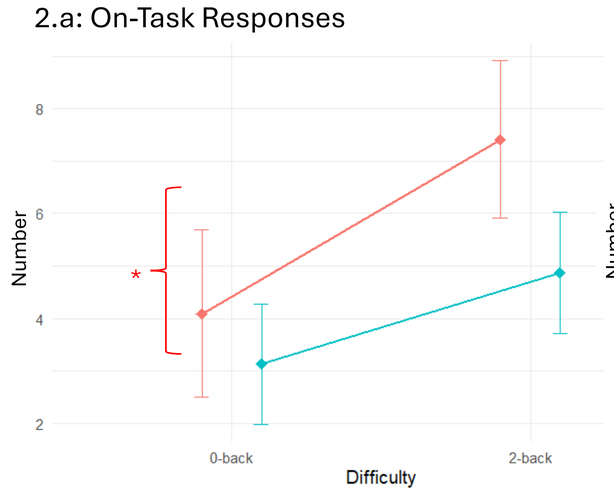
1.c: Alcohol effect on response times



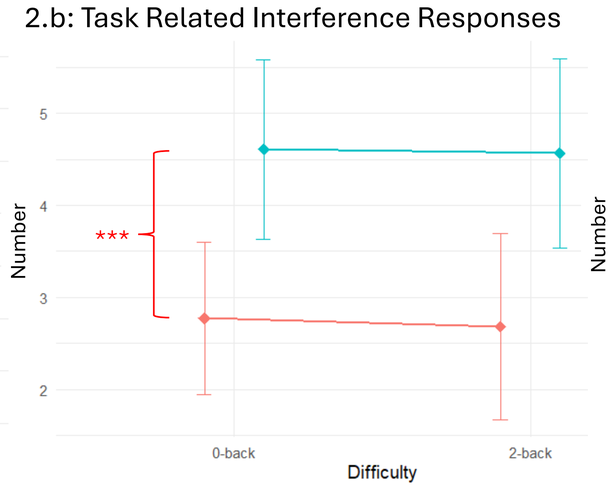
No effect of alcohol on performance (p = .07) or response time (p = .180)

2. Effect of Alcohol Intoxication on Conscious Mental States

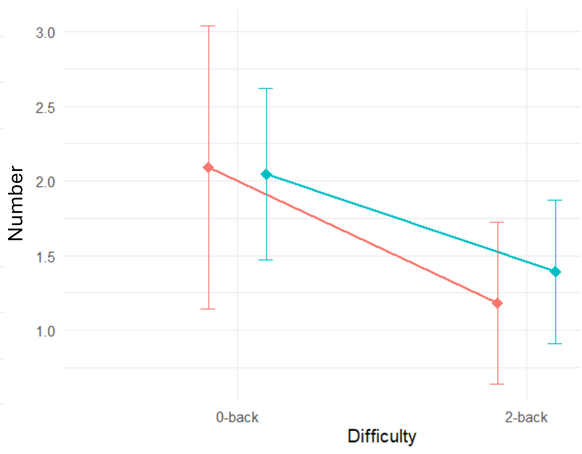
2.a: On-Task Responses



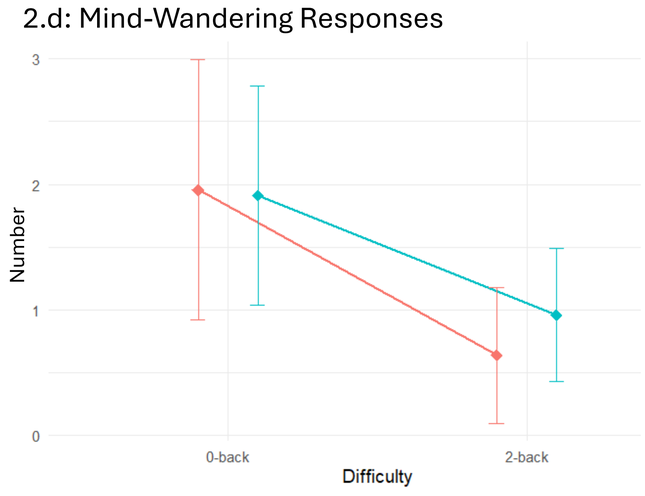
2.b: Task Related Interference Responses



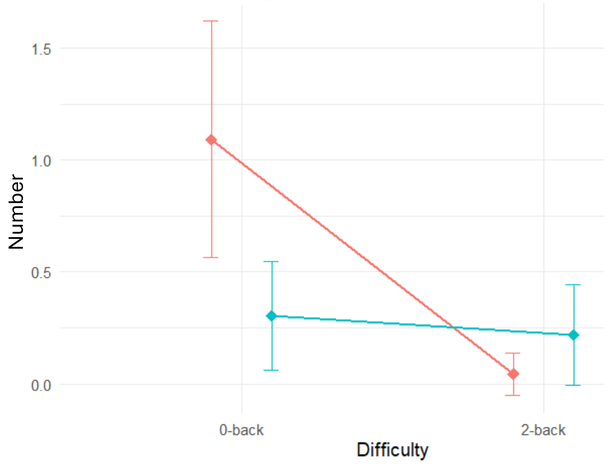
2.c: External Distraction Responses



2.d: Mind-Wandering Responses



2.e: Mind-Blanking Responses



No main effect of alcohol on ED (p = .82), MW (p = .76) and MB (p = .58).
Main effect of alcohol on OT (p = .03) and TRI (p < .001).
Interaction effect for MB (p = .002)
→ This suggests that alcohol did not significantly increase MW specifically.

Discussion

- Alcohol intoxication was induced at all time-points. Alcohol intoxication had no significant effect on response times or task performance.
- No significant effect of alcohol intoxication on MW but increases in TRIs in both tasks.

→ Divergence from past studies may stem from the more detailed categorization approach used in the present study, highlighting the need for distinctions between mental states beyond a simple on-task/off-task split.

References : (1) Smallwood, J., & Schooler, J. W. "The Restless Mind." Psychological Bulletin, vol. 132, no. 6, 2006, pp. 946–958. ; **(2)** Smallwood, Jonathan, and Jonathan W. Schooler. "The Science of Mind Wandering: Empirically Navigating the Stream of Consciousness." *Annu Rev Psychol*, vol. 66, no. 1, Jan. 2015, pp. 487–518. ; (3) McVay, J. C., & Kane, M. J. "Conducting the Train of Thought: Working Memory Capacity, Goal Neglect, and Mind Wandering in an Executive-Control Task." Journal of Experimental Psychology: Learning, Memory, and Cognition, vol. 35, no. 1, 2009, pp. 196–204. ; (4) Smallwood, J., & Schooler, J. W. "The Science of Mind Wandering: Empirically Navigating the Stream of Consciousness." Annual Review of Psychology, vol. 66, 2015, pp. 487–518. ; (5) Finnigan, F., Schulze, D., & Smallwood, J. "Alcohol and the Wandering Mind: A New Direction in the Study of Alcohol on Attentional Lapses." International Journal on Disability and Human Development, vol. 6, no. 2, 2007. ; (6) Sayette, M. A., Reichle, E. D., & Schooler, J. W. "Lost in the Sauce: The Effects of Alcohol on Mind Wandering." Psychological Science, vol. 20, no. 6, 2009, pp. 747–752.

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