

Introduction

We all experience mental fatigue

Mental fatigue is an ill-defined concept¹

Current literature relies on self-report measures of mental fatigue and lacks consideration of task performance

Aim: develop a method that causes subjective increase in feelings of fatigue as well as reduced task performance

Sample

71 healthy adults aged 18-65 with no known cognitive or uncorrected visual impairments

- 12 withdrew
- 5 had technical error
- 8 discarded due to poor data quality

Final sample size n = 46

Procedures

Cognitive test battery comprising 4 computerized tasks:

- 1) A-X Continuous Performance Test²
Probe – distractor – distractor – target
Press 'k' if probe is A and target is X, 'd' otherwise
Recorded response time and key presses
- 2) N-Back Task³
- 3) Visual Search Task⁴
- 4) Mental Rotation Task⁵

2 sessions on the computer at home:

Training session (< 45 mins)
Practiced each task for 5 minutes

Testing session (~ 2 hours)
10 minutes per task x 3 repeats
AX-CPT first and last
Brunel Mood Scale at beginning and end
Questionnaire immediately following session

Dependent variables

Subjective measure of fatigue

Brunel Mood Scale (BRUMS) fatigue subscale⁶
Score range from 0-16 where 16 is extremely fatigued

Objective measure of fatigue

Balanced Integration Score⁷ calculated using AX-CPT performance measures
Standardised integrated measure of accuracy and reaction time
Higher number = better performance

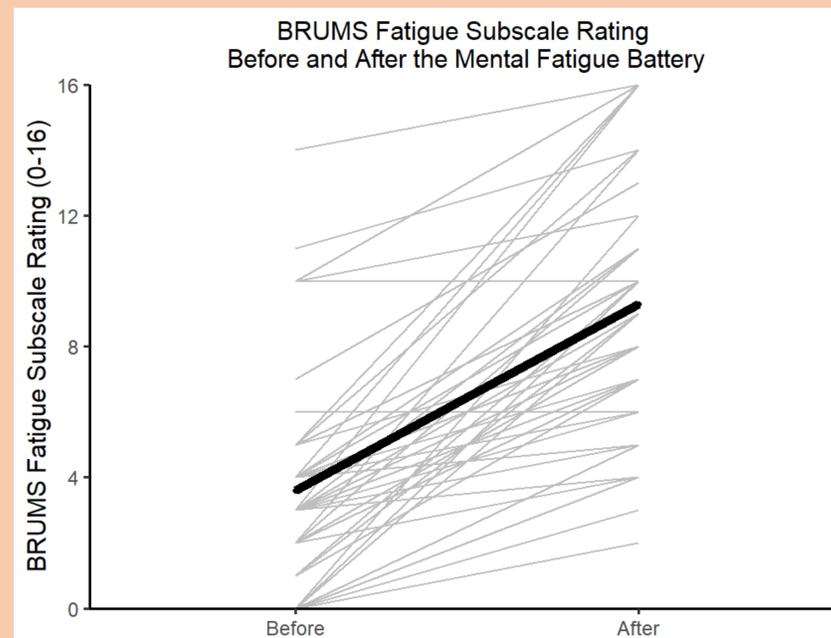
Hypotheses

Completing a 2 hour cognitive test battery will cause an increase in subjective feelings of mental fatigue

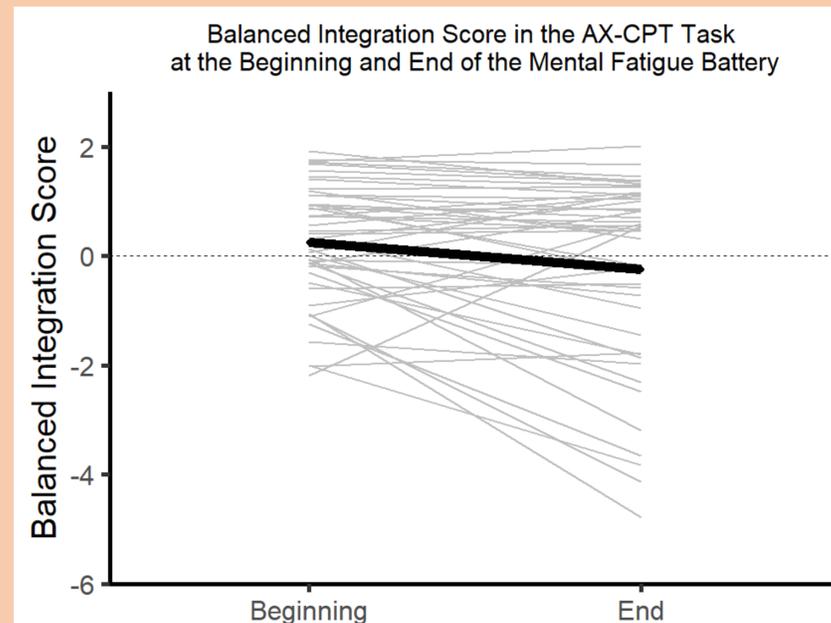
Completing a 2 hour cognitive test battery will cause a decline in performance on a cognitive task

Results

Increase in subjective fatigue



Decrease in cognitive task performance



Discussion

We successfully caused an increase in subjective fatigue and reduced task performance

Our method is suitable for inducing mental fatigue

Our subjective fatigue findings are similar to other literature

The effect of the mental fatigue battery on task performance was significant but very small. Is this a problem for research with smaller sample sizes, that may not be able to reliably detect an effect of mental fatigue on task performance?

Mental fatigue is a complex affective response and consequently can be difficult to induce and detect^{8,9}

Mental fatigue affects everyone but is particularly important for older adults or populations who work in highly demanding environments (healthcare, military, engineering)

Further work: explore effects of age and break duration, qualitative analyses of questionnaire responses, reproduce findings

Conclusions

Our method is suitable for inducing mental fatigue

Mental fatigue is complex

Mental fatigue may still be difficult to detect in smaller sample size

We need to develop a more coherent definition and understanding of mental fatigue so we can reliably study its possible effects

References

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