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# Experimental dyspnoea interferes with locomotion and cognition: a randomised trial

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Acute experimental dyspnoea can negatively impact on locomotion/cognition through shared neural substrates. There is a need for clinical interventions to improve non-respiratory symptoms of chronic respiratory diseases by focussing on alleviating dyspnoea. <https://bit.ly/2wGHcjW>

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## ABSTRACT

**Background:** Chronic respiratory diseases are associated with cognitive dysfunction, but whether dyspnoea by itself negatively impacts on cognition has not been demonstrated. Cortical networks engaged in subjects experiencing dyspnoea are also activated during other tasks that require cognitive input and this may provoke a negative impact through interference with each other.

**Methods:** This randomised, crossover trial investigated whether experimentally-induced dyspnoea would negatively impact on locomotion and cognitive function among 40 healthy adults. Crossover conditions were unloaded breathing or loaded breathing using an inspiratory threshold load. To evaluate locomotion, participants were assessed by the Timed Up and Go (TUG) test. Cognitive function was assessed by categorical and phonemic verbal fluency tests, the Trail Making Tests (TMTs) A and B (executive function), the CODE test from the Wechsler Adult Intelligence Scale (WAIS)-IV (processing speed) and by direct and indirect digit span (working memory).

**Results:** The mean time difference to perform the TUG test between unloaded and loaded breathing was  $-0.752$  s (95% CI  $-1.012$  to  $-0.492$  s) ( $p < 0.001$ ). Executive function, processing speed and working memory performed better during unloaded breathing, particularly for subjects starting first with the loaded breathing condition.

**Conclusion:** Our data suggest that respiratory threshold loading to elicit dyspnoea had a major impact on locomotion and cognitive function in healthy adults.