

# **A Novel Breath-Focused Task: Dissociating Awareness and Physiological Change**

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## Background and Objectives

To better understand the mechanisms underlying the effectiveness of mindfulness meditation we suggest that new measures are needed to dissociate the effects of awareness and appraisal from more implicit effects of physiological change. To support this endeavour we introduce a novel respiration-focused task that experimentally manipulates breathing rate with or without awareness of this change. We also examined the downstream effects of this manipulation on arousal and mood ratings.

## Methods

In two separate studies (both N=100) participants entrained their breath to a computer generated pulsating circle. We included both speed up and slow down trials in which respiration rate either increased or decreased by 20%, 35%, 50% or 65% over the course of a minute long trial. We also incorporated two rates of respiration frequency change ('quick' or 'gradual') to manipulate the probability of awareness of these changes. To measure awareness, participants were asked whether respiration 'sped-up', 'slowed-down' or 'stayed constant' after each trial. In the second study, each trial was also followed by a self-rating of arousal and mood.

## Results

Crucially, in both studies we found a significant main effect of change-type ('quick' or 'gradual') on awareness (Study one:  $t(1523) = 18.00, p < 0.001$ ). In both studies, awareness of 'quick' change trials were modeled by a parabolic function such that there tended to be most awareness of respiration change on the largest speed-up and slow-down trials, whereas the probability of awareness for all 'gradual' change trials were at chance levels. In study 2 there was also a main effect of awareness of respiration change on subsequent appraisals of arousal ( $t(1522) = 11.02, p < 0.0001$ ) and mood ( $t(1522) = 4.51, p < 0.0001$ ).

## Discussion and conclusion

Understanding the interaction between physiological changes in the body and interoceptive awareness/appraisal of these changes is vital for a deeper understanding of mindfulness interventions. Both studies validate our novel measure as a means to manipulate respiration rate with and without awareness. Furthermore, study 2 also revealed that self-appraisal of arousal and mood states is strongly influenced by awareness of these physiological changes. Future applications/research directions are discussed.