

## PROBLEM OUTLINE

Trait anxiety (TA) and trait mindfulness (TM) are tend to be inversely linked, e.g. individuals high in trait mindfulness tend to be low in anxiety. Independently, these two traits have been found to affect various cognitive functions. Recently, research has begun to look at their effects on higher order executive functions, and studies have reported interactions with brain areas – such as the pre-frontal cortex – that play a role in these. However, behavioural studies exploring the association between the two traits and performance on cognitive tasks, are lacking.

A recent study by Jaiswal et al (2018) measured attention, cognitive inhibition and visual working memory capacity of healthy young adults. The study investigated the combined impact, when linked, of TA and TM on three major domains of executive function which have a critical role in complex higher order cognitive tasks. These were: conflict monitoring, inhibition, and visual working memory. They compared differences in executive functions between two participant groups. Participants were assigned into one of two experimental groups depending on they were screened as high mindfulness–low anxiety (HMLA) or low mindfulness–high anxiety (LMHA).

One of three behavioural tasks used in this study was a colour Stroop task (CST). The CST (Stroop, 1935) – a classic test of response inhibition, selective attention and processing speed – involves a series of words presented in different colours. Participants have to ignore the word meaning while quickly and accurately identifying the colour used to display the word. This task is therefore useful for measuring cognitive inhibition and assessing how combined TA and TM might affect this.

There are few studies exploring how cognitive inhibition is affected by TA and TM. Previous research found that meditators showed less colour Stroop errors compared to controls, and more generally error rate was negatively correlated with global mindfulness scores (Moore & Malinowski, 2009).

My Stroop program was adapted from this task, and used four different colours: red, green, blue, or yellow. This would be a between subjects design (i.e. HMLA and LMHA group). There were two types of target – congruent targets in which the colour used to display the character matched its semantic meaning, or incongruent targets where the word meaning and display colour did not match, e.g. the word 'red' printed in

green colour. Target stimuli were presented in a randomised order in the centre of a black screen, each being separated by the brief appearance of a central fixation cross. Participants had to respond by pressing the corresponding keys assigned to the colours of the word. Key responses and reaction time will be recorded for analysis.

My experiment aims to investigate how reaction time and accuracy is affected depending on participant group, i.e. combined TA and TM traits. Based on Jaiswal et al (2018), the hypotheses would predict that for the colour Stroop task, the HMLA group would show smaller differences in reaction times (i.e. less of a Stroop effect) and higher accuracy rates than the LMHA group.

## **References**

Jaiswal, S. (2018). Better Cognitive Performance Is Associated With the Combination of High Trait Mindfulness and Low Trait Anxiety.

Moore, A. & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, 18, 176-186.

Stroop, J. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, 18(6), 643-662.