

Assignment 1

A Good Neuro Experiment

Mille, Aleksander, Aleksandrs, Sirid.

A figure visualizing the old experimental set-up

The participants are divided into control and experimental groups. Experimental group does a 10 minute guided meditation prior to the task. The task is to read 12 pages of War and Peace. At random intervals, a probe appears asking the participants about whether at this moment he/she is mind wandering or not.

1 eye-tracking

2 "are you zoned out?" probe pops up during the task

3 participant either meditated or not before the task

What was particularly good about the experimental control/design?

The probe-caught method is a robust way of getting timestamps for when the participant was mind wandering, and allows for easy comparison of mind wandering episodes between the groups.

What would be necessary to turn this into a neuro-imaging exp.?

When turning this experiment into a neuro-experiment, the eye-tracking part becomes superfluous as this was simply used to determine the characteristics of mind-wandering, which are measured in fixation duration and fixation count. Therefore, the eye-tracking will be "replaced" by a neuro-imaging device.

Then you would have to decide on the neuro-imaging technique, which of course would depend on the research question. As the original research question was directed towards

characterizing *mind-wandering* dependent on whether you did mindfulness or not, the neuro-imaging technique will depend on whether you would characterize “mind-fulness brain activity” in terms of brain waves frequency (hence using EEG) or in terms of activation in various brain areas (hence using fMRI). One could argue that a lot of the literature on activation in the brain and mindfulness is focused on attempting to locate areas associated with mind-fulness and investigating how activating across areas vary, arguing for fMRI. Using neuroimaging would force us to do the experiment in new (and not necessarily very mindfulness-friendly) settings. For example both fMRI and EEG forces the participant to be very still, which might make the participant feel more tense. In addition, using fMRI includes exposing the participant to pretty loud and disturbing noises. It would be part of our assessment that the advantages of doing neuroimaging outweighs the consequences of changing the environment.