APPLIED COGNITIVE SCIENCE

CLASS WEEK 7: MIND OVER BODY

**Introduction**

In this class we are going to collect data on physical endurance (measured through wall-sitting) and investigate if it is affected by solving a secondary task at the same time.

**1. Data collection**

Data collection takes place pairwise (but can also be done alone if you are not present in class). One person is the experimenter, the other is the participant. After each block, roles are switched to give the participant the chance to rest.

IMPORTANT: Keep the experiments for the two participants running on two different laptops in order to keep track of who is who and allow randomization of order.

The experiment consists of 6 “Wall-sitting” blocks with or without an interference task.

*Wall-sitting:* Wall-sitting consists of squatting with your knees bent in a 90 degrees angle and your back resting against a wall. The task is to sit like this for as long as possible.

*Interference tasks:* While wall-sitting, the participant is faced with a two-back memory interference task. A two-back memory task involves keeping track of the stimuli presented, and deciding whether the current stimulus is the same as the one shown two trials ago, i.e. if the stimuli were a sequence of letters like this: X-A-X-W-E-W-A, then the participant’s job would be to determine that the 2nd X and the 2nd W were stimuli that had been presented two trials ago, while the remaining letters were either not shown before or repeated with a longer interval. In the present experiment, the interference tasks are either a 2-back auditory word memory task, or a 2-back visual figure memory task. The 3rd condition is a no-interference control task.

*Script and stimulus files:* The experiment is run with a Psychopy script (“wallsit\_interference\_applied\_CS\_22.py” file) which is uploaded to Brightspace. It requires two folders (“polygons\_2.zip”; “pseudo\_EN.zip”) with stimuli to be located in the same folder as the main script. Remember to unzip these before running the experiment. The script generates a data folder and saves a .csv file with the data here. **If the sound is very horrible when PsychoPy plays sound files, try going to Preferences 🡪 Hardware 🡪 ‘audio latency mode’ and set ‘audio latency mode’ to ‘0: Latency not important’.**

*Uploading data:* After running the experiment, please upload the .csv file to Brightspace. This is done through an Assignment found under the Class 07 folder. Hopefully, we will be able to download it again…

**2. Data analysis and reporting (to be solved in study groups)**

**Data**

Once the data are uploaded to Brightspace, Mikkel and/or Johanne will collect the files into a .zip-file (“Class07\_wallsitting\_data.zip”) and upload it to the Class 07 Brightspace folder.

**Script**

A script which is supposed to be able to analyze the data can also be found on Brightspace (“Class07\_wallsitting\_analysis.Rmd”).

**Tasks and things to think about**

1. Load and inspect the data. How many unique participants are in the data that you are using for your analyses? No demographic information was collected for this experiment. If you were to include three questions on participant demographics, what would they be and why?
2. Inspect the data. Are there any outliers in the data? What would you do if you observed outliers? Would you have a stringent strategy for when to remove problematic datapoints?
3. Consider the potential trade-offs between the main task and the interference task. What are the different strategies that the participants could use to solve this task (assuming that the different subtasks are not independent)?
4. What would you say in order to instruct a participant to solve the task in a manner that would be most beneficial for testing the hypothesis you stated above?
5. There are strategies by which you can get very high accuracy on the interference task without remembering anything. Please discuss why this is so. Using d’ (d-prime) as a performance measure allows us to counter this problem. Please give a short description of what d’ is (e.g. see here <https://dictionary.apa.org/d-prime>).
6. How could this experiment be developed further? If there are no results, could something be done to enhance the chances of getting results. If results are found, what other domains could this method be applied to?