Semantics Task

# Overview of the Experiment

The experiment aims to study the identification of word pairs that match based on a specific feature. Specifically, it aims to seek how the number of correct answers and reaction times vary across conditions of different features being matched, these features include meaning (high and low semantic association), colour, size, texture, and shape. It is hypothesised that words with high semantic association will be easier to identify, and therefore have a higher percentage of correct answers and a quicker reaction time, than words with low semantic association. Additionally, it is hypothesised that the high and low conditions will be easier than the conditions matching based on the other features.

# Running the Experiment

## Initial Setup

To install PsychoPy, go to <https://www.psychopy.org/download.html> and follow the instructions to install the software suitable for your operating system. Once downloaded, open PsychoPy and ensure you are looking at the *Coder* window.

## Loading the Script

To open the script, click **File** then go to **Open**, this will open a file browsing window in which you should select the script (‘semantics\_task.py’) and click **Open**, this will load the file into the *Coder* window. The libraries used in this experiment are imported at the beginning and consist of:

* Visual, core, and GUI from psychopy,
* Datetime from datetime,
* Random,
* Keyboard from psychopy.hardware.

## Execution

To begin the experiment, click the second of the green play buttons which will show the text ‘Run experiment’ when hovering over it. This will open a dialogue box in which the participant must enter their participant ID and press **OK** to start the experiment which will then open in a fullscreen window.

## Participant Instructions

The study consists of 6 blocks, with short breaks in between blocks. Within each block the participant will be presented with a target word and will be asked to select which of the three different word options is most similar to the target word based on a specific feature for that block. To choose the left word the participant should press 1, to select the middle word the participant should press 2, and to select the right word the participant should press 3. The participant may exit the study at any point by pressing the esc key. Responses are recorded throughout the experiment in which the key pressed, the reaction time, and the time at which the stimulus was presented are recorded and saved to a file in the directory of the script.

# Parsing the Outputs

Each time the experiment is run, a file is created in the directory of the script named ‘Par\_X\_XDATE.csv’ where X is the participant’s ID that they enter at the beginning and XDATE is the date and time of the experiment in the format YearMonthDate\_Time.

Each file contains the following columns:

* Condition: the name of the block i.e. which feature is being matched (high, low, colour, size, texture, or shape)
* Target: the target word
* Word1: the left word choice
* Word2: the middle word choice
* Word3: the right word choice
* Answer: the participant’s response (1, 2, 3, or blank if no response was given)
* Correct Answer: the correct response (1, 2, or 3)
* RT: the participant’s reaction time (NA if no response was recorded)
* IsCorrect: whether the participant’s response was correct (1 = correct, 0 = incorrect)
* Time: the time of the trial relative to the beginning of the experiment (when the participant pressed ‘space’)

# Technical Notes and Special Considerations

Key features of the script:

* Dialogue box for participants to enter ID
* Escape function when ‘esc’ key pressed
* Dictionary of data made to iterate through randomised order of blocks and randomised order of trials
* Responses and reaction times are recorded and saved to a file

The script will not run if the ‘trials.csv’ file containing the stimuli is not saved in the same directory as the script, this can be solved by downloading the file from [here](trials.csv) and saving it to the same folder as the script.

Comments are included throughout the script to describe what each section of code is doing, facilitating the accessibility and comprehension of the code. The script could be modified or extended for future experiments by adding additional conditions to the stimuli and adding or changing the list of conditions in the script.