INTENTIONAL BINDING TASK

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REPORT

Github Link: https://github.com/twaritashah/PSY310\_TwaritaShah/tree/Intentional\_Binding\_Task

INTENTIONAL BINDING TASK

Sense of agency means the sense of starting and regulating actions in order to have an impact on external world. When a movement is under one's own voluntary control, intentional binding refers to the compression of the perceived interval between a movement and the results. Participants in the standard version of this paradigm evaluate the onset of either voluntary actions (such as pressing a key) or sensory events (such as a tone) that are presented 250 milliseconds after the action. It has recently been suggested to distinguish between explicit and implicit aspects of sense of agency.

When compared to baseline conditions where the action does not produce a tone, the apparent onset of the action is shifted later in time. Additionally, as compared to baseline conditions where the tone is provided without any action, the perceived onset of the tone is shifted earlier in time. It only has a binding impact when it is voluntary. Participants do not exhibit any binding when an action is passively prompted (in fact, there is a reversal of this effect). Hence, this is the reason that intentional binding is an implicit indicator of sense of agency. There is currently a lot of evidence supporting this perspective.

# Method

The aim of this priming experiment is to compare the difference in interval estimation between expected and unexpected frequency through a binding task

**Participant/s**

The test was performed by the experimenter as a part of the Lab in Psychology course at Ahmedabad University.

**Materials and Procedure**

The experimenter received the video explaining the study 24 hrs before it was created and performed. The material used during the creation of the experiment was the experimenter’s personal laptop equipped with the latest version of PsychoPy.

Firstly, a circular polygon was for the duration of 1 sec with the size 0.2X0.2 in the trial routine. Another such polygon with the colour green was also starting at 1 second. Meanwhile, the keyboard response was kept as ‘space’. For the beep routine, a sound variable was added with variable onset time ($delay) and variable frequency ($freq) for 0.3 seconds. Lastly, in the response routine, the following text was added:

‘Report the delay between the key press and the beep sound (0-999); Click submit after entering the value.’

Then, a textbox for typing the answer was added along with a submit button to click once the participant was done. Then, the experiment was given a test run to see whether it worked reliably before the actual trials started.

**Testing Conditions**

The participant was asked to perform a total of 60 test trials in one session. Hence, she was told to ensure that she was not distracted or disturbed by her surroundings and could perform the task continuously without breaks. These conditions were met sufficiently.

**Data Collection**

PsychoPy directly stores the data it gathers during the experiment in a new Excel file within a predefined folder. Hence, the data was stored reliably and then, cleaned to retain values related to the bidning task. The data was categorized by the experimenter into expected and unexpected frequencies measured through reaction times, to find the difference in the estimated interval.

**Results**

The average reaction time for the 15 unexpected frequency trials is 0.884090553s while the average reaction time for 45 expected frequency trials is 0.709168444s. The difference in the interval between expected and unexpected frequency is 0.174922109s. Hence, we can see that the response is faster for expected frequencies and slower for unexpected frequencies.

**Discussion**

In order to better understand the SoA, more researchers have recently been using implicit measures. There are many reasons why implicit measures can be appealing. Implicit measurements, for instance, may lessen the possibility that participants may guess an experiment's objectives and change or over think their responses to please the experimenters. Moreover, using implicit measures of SoA allows the researchers to tap into different processes underlying intentional binding than what explicit measures test. However, implicit measures only evaluate low-level, non-conceptual and the pre-reflective state of an individual. It cannot measure higher-order judgements that are formed in an individual as an agent. Hence, it is necessary that we find methods that can use both implicit and explicit measures to understand the sense of agency through the intentional binding task.

REFERENCES

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