**Experiment 2:** **Intentional Binding Task**

The procedure for this task was based on that described by Moore et al., (2010). In the task, participants sat in front of a computer screen displaying a clock face (7 cm in diameter) with a single hand. The clock was marked with the conventional intervals (e.g. 5, 10, 15, etc, through to 60). The rotation of the clock hand was initiated by the experimenter and, beginning from 0, the hand rotated at one revolution every 2560 ms.

There were four blocks in the task: two action –effect (agency) conditions and two baseline conditions (see Figure 2).

In the **two action-effect conditions**, the participants pressed the left mouse button with their right index finger at a random moment of their own volition, after the clock was started by the experimenter. The button press caused the presentation of a brief tone (1000 Hz, 75 ms duration) that was presented 250 ms after the action, and the clock hand continued to rotate for a random length of time after the tone (between 1500 ms and 2500 ms) after the button was pressed. Participants then gave a time estimate for where the rotating clock hand had been, either when they pressed the button (**Action condition**) or when they heard the tone (**Effect condition**), as demonstrated in Figure 2. Estimates were reported verbally and recorded by the experimenter. The conditions were presented in blocks, such that the participants always estimated either the action times only, or the tone times only.

In addition, **two baseline conditions** were included. In the **baseline action condition**, participants pressed the button at a moment of their choosing as before. However, the button press did not result in a tone, and they simply judged the time of their button press. In a **baseline tone condition**, participants were instructed not to press any button, but instead wait for a tone which was generated by the computer at a random time (relative to the rotation of the clock hand). Here the participants provided an estimate for the time of the tone onset.

**Thus, there were a total of four conditions in the Intentional Binding task, and each condition was preserved in a block. The four blocks were presented in randomised order, and each block consisted of 20 trials**.

For all estimates, participants were instructed to be as accurate as they could, and not to only to provide responses that were multiples of five according to the numbers displayed. This task took approximately 20 minutes. As dependent variables, the mean error between estimated and actual times was calculated for each condition.

**Attachments:**

- Sophie’s Presentation codes

- Joseph’s MRP project



**Figure 2.** Trial structures for the Intentional Binding task (based on Moore et al., 2010). Participants were faced with a clock consisting of a rotating hand. In the two baseline conditions, participants *either* pressed the button (action only baseline) *or* listened for a tone without needing to press the button (effect only baseline). They then gave their respective time estimates for button press or tone. In the two Action-Effect conditions, participants pressed a button that produced a tone. They then gave estimates either for the button press or for the tone, depending on the respective experimental block.

**Example Results: Figure 4**



**Figure 4.** The intentional binding effect for the Non-Checking group (n = 23) and Checking group (n = 22) (figure based on Moore et al., 2010). The block arrows represent the mean binding shifts (milliseconds) with respect to the relevant baselines (dashed lines), and are represented approximately to scale. Standard deviations are in brackets.