Table S1

*All possible multiplications between 6 and 18 (10, 11 and 15 are excluded), sorted by difficulty and classified into three different levels (Level 1 being the easiest and Level 3 being the hardest).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Level 1** | |  | **Level 2** | |  | **Level 3** | |
| Removed | 5 | 12 |  | 7 | 16 |  | 13 | 15 |
| 5 | 13 |  | 8 | 14 |  | 14 | 14 |
| 5 | 14 |  | 9 | 13 |  | 12 | 17 |
| 6 | 12 |  | 7 | 17 |  | 13 | 16 |
| 5 | 15 |  | 8 | 15 |  | 14 | 15 |
| 6 | 13 |  | 7 | 18 |  | 12 | 18 |
| Selected | 5 | 16 |  | 9 | 14 |  | 13 | 17 |
| 6 | 14 |  | 8 | 16 |  | 14 | 16 |
| 7 | 12 |  | 9 | 15 |  | 15 | 15 |
| 5 | 17 |  | 8 | 17 |  | 13 | 18 |
| 5 | 18 |  | 8 | 18 |  | 14 | 17 |
| 6 | 15 |  | 9 | 16 |  | 15 | 16 |
| 7 | 13 |  | 12 | 12 |  | 14 | 18 |
| 6 | 16 |  | 9 | 17 |  | 15 | 17 |
| 8 | 12 |  | 12 | 13 |  | 16 | 16 |
| 7 | 14 |  | 9 | 18 |  | 15 | 18 |
| 6 | 17 |  | 12 | 14 |  | 16 | 17 |
| 8 | 13 |  | 13 | 13 |  | 16 | 18 |
| 7 | 15 |  | 12 | 15 |  | 17 | 17 |
| 6 | 18 |  | 13 | 14 |  | 17 | 18 |
| 9 | 12 |  | 12 | 16 |  | 18 | 18 |

*Note.* The table shows the three levels of arithmetic task difficulty that were used in the experiment. It was assumed that multiplications with a lower outcome were easier than those with a higher outcome. The digits 10, 11 were excluded, since they were considered to be too easy. This left 63 possible multiplications, with the assumption that AxB and BxA were equally difficult. The multiplications were distributed over three different levels of difficulty (easy, medium, and hard), each containing 21 possible multiplications. In order to make a clear distinction between the three levels of difficulty, the first six multiplications were removed from each level. Table S1 shows the removed and selected multiplications of the three levels. Note that the smallest digit of a pair is noted down first, but during the experiment they were presented to the participant in randomized order.

**

*Figure S1*. Sample of the recordings of the eyelid opening showing a typical blink (blue) and the threshold (red) used to identify it.

During a blink, the eyelid opening rapidly diminishes to zero and then increases in a few tenths of a second until it is fully open again (see Fig. S1, solid blue line). It is impossible to track the pupil’s diameter while blinking. These instances in time should therefore be removed from the data. The recordings of the eyelid opening were used to identify the blinks in the pupil diameter data. A threshold of 75% of the mean eyelid opening was used to make a distinction between blinks and no blinks as depicted in the figure by the dashed red line. As can be seen in the figure, it takes some time to cross the threshold and the blink has not been completed after the eyelid opening signal crossed the threshold line for the second time. This is why 12 additional data points (~0.1 s) were removed from the data before each blink and 36 additional data points (~0.3 s) after each blink.

Table S2

*Mean pupil diameter (MPD) for level 3 of the multiplications. The means (M) and standard deviations (SD) for correct and incorrect responses are shown. P1–P8 refers to the eight points in time.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | ***M* (*SD*)** | | ***p* (*dz*)** |
|  | **Correct (*N* = 29)** | **Incorrect (*N* = 26)** | **Incorrect vs. Correct (*df* = 24)** |
| P1 | 3.870 (0.508) | 3.870 (0.494) | 0.179 (-0.28) |
| P2 | 3.957 (0.524) | 3.941 (0.550) | 0.050 (-0.41) |
| P3 | 4.047 (0.538) | 4.064 (0.566) | 0.544 (-0.12) |
| P4 | 4.106 (0.526) | 4.118 (0.589) | 0.603 (-0.11) |
| P5 | 4.116 (0.534) | 4.157 (0.577) | 0.558 (0.12) |
| P6 | 4.097 (0.529) | 4.191 (0.599) | 0.087 (0.36) |
| P7 | 4.117 (0.517) | 4.192 (0.556) | 0.218 (0.25) |
| P8 | 4.074 (0.516) | 4.198 (0.575) | 0.072 (0.38) |