**Supplementary materials**

**Table S1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task** | **Task** | **t-value** | **Uncorrected**  **p-value** | **Corrected**  **p-value** |
|  |
| Executive | Attentional | 2.10 | **.0406** | .0994 |  |
| Executive | Emotional | 2.38 | **.0202** | .0527 |  |
| Attentional | Emotional | -0.09 | .9325 | .9960 |  |

**Table S1. Post-hoc analyses (model M1) assessing the difference in sustained PLR according to tasks’ nature.** Correction for multiple comparisons was computed using a Tukey adjustment. Significant p-values are highlighted in bold. Model M1: Total averaged normalized pupil size ~ melanopic \* task + sex + age + BMI + time-of-day.

**Table S2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Light level** | **Light level** | **t-value** | **Uncorrected**  **p-value** | **Corrected**  **p-value** |
|  |
| ***Executive task*** | | | | |  |
| 0.16 | 37 | 12.00 | **<.0001** | **<.0001** |  |
| 0.16 | 92 | 20.76 | **<.0001** | **<.0001** |  |
| 0.16 | 190 | 27.95 | **<.0001** | **<.0001** |  |
| 37 | 92 | 8.76 | **<.0001** | **<.0001** |  |
| 37 | 190 | 15.95 | **<.0001** | **<.0001** |  |
| 92 | 190 | 7.19 | **<.0001** | **<.0001** |  |
| ***Emotional task*** | | | | |  |
| 0.16 | 37 | 10.69 | **<.0001** | **<.0001** |  |
| 0.16 | 92 | 16.14 | **<.0001** | **<.0001** |  |
| 0.16 | 190 | 21.21 | **<.0001** | **<.0001** |  |
| 37 | 92 | 5.46 | **.0001** | **<.0006** |  |
| 37 | 190 | 10.52 | **<.0001** | **<.0001** |  |
| 92 | 190 | 5.06 | **.0002** | **.0012** |  |
| ***Attentional task*** | | | | |  |
| 0.16 | 92 | 18.23 | **<.0001** | **<.0001** |  |

**Table S2. Post-hoc analyses (model M2) assessing, for each cognitive task, the difference in sustained PLR across each irradiance light levels.** Correction for multiple comparisons was computed using a Tukey adjustment. Significant p-values are highlighted in bold. Model M2: Total averaged normalized pupil size ~ melanopic + sex + age + BMI + time-of-day.

**Table S3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Light level** | **Block order** | **Block order** | **t-value** | **Uncorrected**  **p-value** | **Corrected**  **p-value** |
|  |
| ***Executive task*** | | | | | |  |
| ***0.16*** | First | Last | -2.26 | **.0308** | **.0308** |  |
| ***37*** | First | Last | -3.28 | **.0025** | **.0025** |  |
| ***92*** | First | Last | 0.36 | .7224 | .7224 |  |
| ***190*** | First | Last | 1.40 | .1707 | .1707 |  |
| ***Emotional task*** | | | | | |  |
| ***0.16*** | First | Last | -2.37 | **.0253** | **.0253** |  |
| ***37*** | First | Last | -2.66 | **.0132** | **.0132** |  |
| ***92*** | First | Last | -0.46 | .6459 | .6459 |  |
| ***190*** | First | Last | -1.28 | .2125 | .2125 |  |
| ***Attentional task*** | | | | | |  |
| ***0.16*** | First | Last | -3.11 | **.0067** | **.0067** |  |
| ***92*** | First | Last | -1.13 | .2735 | .2735 |  |

**Table S3. Post-hoc analyses (model M3) assessing, for each cognitive task and for each irradiance light levels, the difference in sustained PLR from the first to the last light block.** Correction for multiple comparisons was computed using a Tukey adjustment. Significant p-values are highlighted in bold**.** M3: Block averaged normalized pupil size ~ melanopic\*block order + sex + age + BMI + time-of-day.

**Table S4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Light level** | **Light level** | **t-value** | **Uncorrected**  **p-value** | **Corrected**  **p-value** |
|  |
| ***Executive task*** | | | | |  |
| 0.16 | 37 | 2.22 | **.0453** | .1703 |  |
| 0.16 | 92 | 5.27 | **.0002** | **.0006** |  |
| 0.16 | 190 | 7.86 | **<.0001** | **<.0001** |  |
| 37 | 92 | 3.05 | **.0095** | **.0413** |  |
| 37 | 190 | 5.64 | **<.0001** | **.0004** |  |
| 92 | 190 | 2.59 | **.0228** | .0926 |  |
| ***Emotional task*** | | | | |  |
| 0.16 | 37 | 7.46 | **<.0001** | **<.0001** |  |
| 0.16 | 92 | 13.46 | **<.0001** | **<.0001** |  |
| 0.16 | 190 | 18.81 | **<.0001** | **<.0001** |  |
| 37 | 92 | 6.00 | **<.0001** | **<.0001** |  |
| 37 | 190 | 11.35 | **<.0001** | **<.0001** |  |
| 92 | 190 | 5.35 | **<.0001** | **.0003** |  |
| ***Attentional task*** | | | | |  |
| 0.16 | 92 | 6.34 | **.0011** | **.0011** |  |

**Table S4. Post-hoc analyses (model M4) assessing, for each cognitive task, the difference in total PSD across each irradiance light levels.** Correction for multiple comparisons was computed using a Tukey adjustment. Significant p-values are highlighted in bold. M4: Total normalized PSD ~ melanopic + sex + age + BMI + time-of-day.