The effects of caffeine on attention during reading

Note Pad

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- Within-subjects control-experiment.
- Eye movements as dependent and coffee consumption as independent variables.
- Non-probabilistic sampling.
- 13 participants (7 ♀, 6 ♂).
- Reading texts under conditions: control, placebo, coffee consumption.
- Eye-tracker device to record fixation and saccades while reading.

Drinking coffee before reading improve attention performance by helping readers going along the text faster, meaning doing less stops through the text but increasing the focus on specific areas where readers should stop longer and making shorter saccades.

Procedure

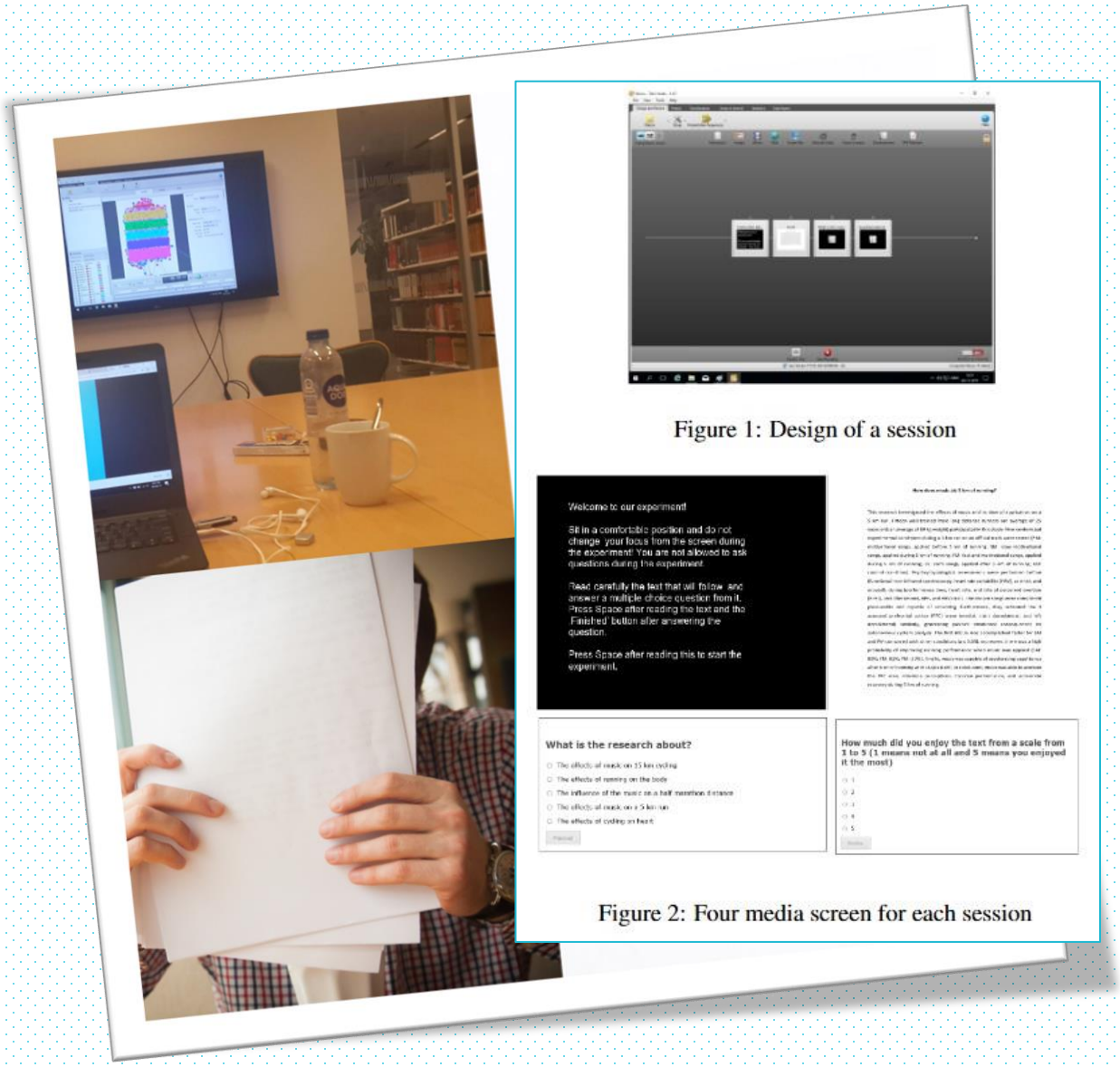


Figure 1: Design of a session

Figure 2: Four media screen for each session

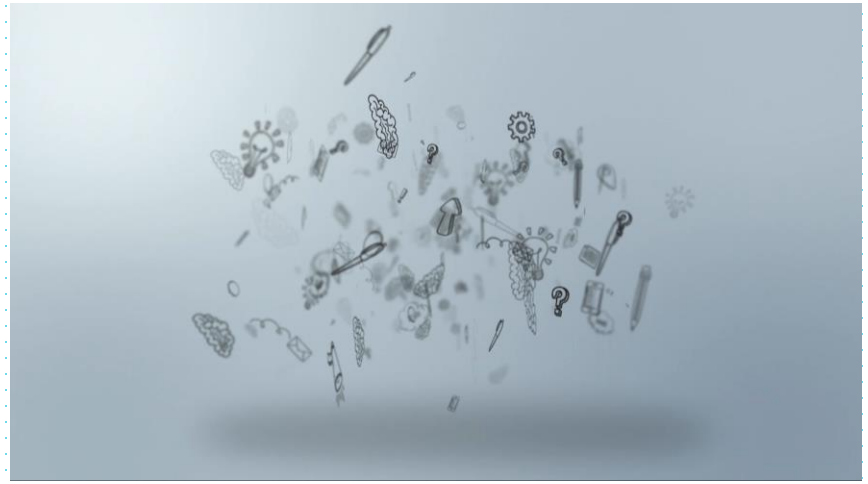
1) Informed consent and instructions given.

2) First session: No coffee. The recording starts after calibration. Each screen has guidelines (fig. 2). Only one full text to read in each session.

3) After reading the text, the participant answers a multiple-choice questionnaire, but correctness of answers are not considered for analysis.

4) Second session: Decaffeinated coffee given and end-time annotated. After 20 min., the second recording starts with same design.

5) Third session: Plain regular coffee given; no milk/sugar added. + 20 min. counted. No food allowed during the experiment. The participant could decide to leave at any time.



ANALYSIS

- Kruskal-Wallis H test: first fixation duration, total fixation duration and percentage of dwell time.
- Statistically significant differences ($p \leq 0.05$) between total fixation duration and percentage of dwell time, in which the coffee treatment has the highest percentage of dwell time.
- Caffeine (100mg approx.) improves sustained focus attention while reading, by increasing the number of fixation duration during a dwell in AOIs.

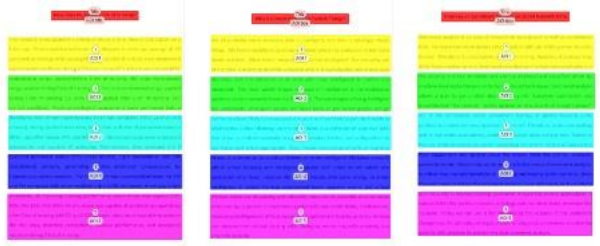


Figure 3: Group of AOIs

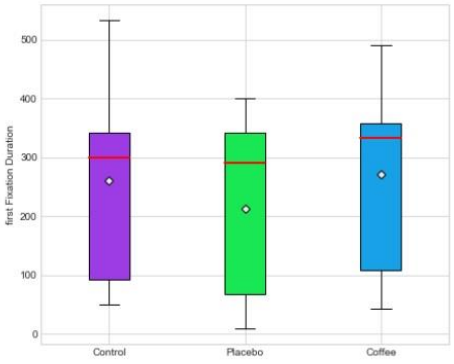


Figure 5: Boxplot of First Fixation Duration

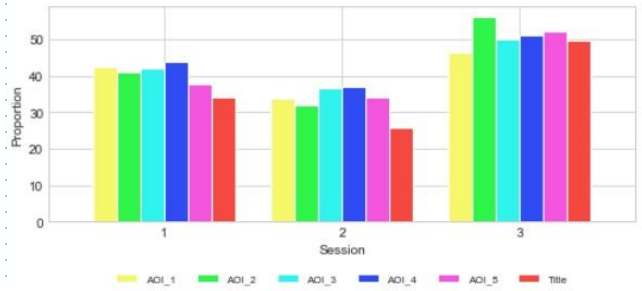


Figure 8: Percentage dwell time plot for each session

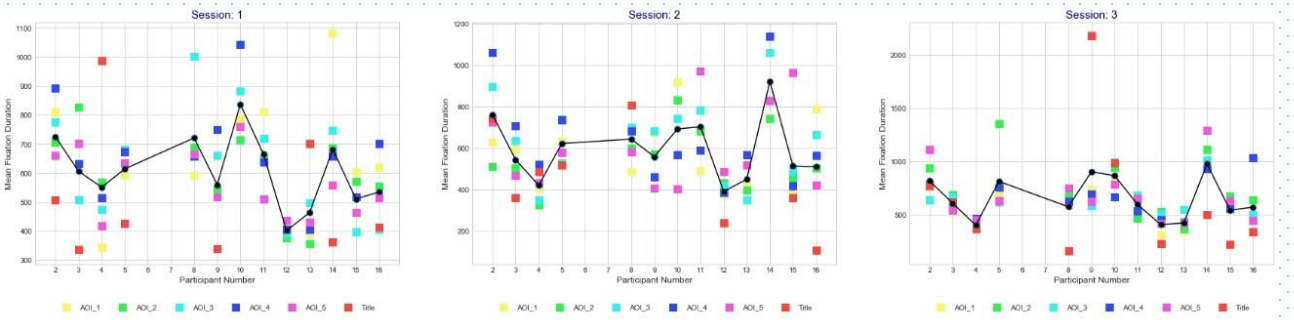


Figure 10: Dwell time by participant