The impact of expectations regarding caffeine on the neural correlates of executive functions

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Master thesis in Experimental Biomedical Research

The presented thesis aims at exploring how expectations regarding caffeine influence the neural correlates of executive functions. Therefore, a randomised, single-blind, within-subject design was implemented. Thirty-eight healthy and adult moderate caffeine consumers were recruited to three experimental sessions. Participants where given decaffeinated coffee and being informed that they have received caffeinated (GiveDECA/ToldCAF) or decaffeinated coffee (GiveDECA/ToldDECA), and given caffeinated but being told it was a decaffeinated coffee (GiveCAF/ToldDECA). In each session, three coffees doses were being administrated orally. The first two cups were being consumed, separated by five minutes, and the third one was taken 45 minutes after the first. After the first coffee doses, subjects were also asked to perform two cognitive tasks: The Rapid Visual Information Processing (RVIP) and Go/NoGo tasks. This thesis's analysis focused on the behavioural and electrophysiological effects of expectations. The measures of expectations effects were indexed by contrasting GiveDECA/ToldCAF to GiveDECA/ToldDECA conditions. Although we found no significant influence of caffeine-related expectations on behavioural outcomes, ERP allowed identifying periods showing sustained significant differences between the two conditions (found in the N2 and P3 time-windows). Methodological limitations that could affect outcomes are discussed.

Keywords: Placebo · Caffeine · Expectations · Executive functions · ERP

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