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Abstract/[Symposia Title](#)

Mental Effort While Conceptual Tasks Solving: an EEG Study

Abstract Text/[Symp. Description](#)

We studied functional brain state dynamics as indicators of mental effort while solving conceptual tasks of various types. We supposed that functional state patterns are different in: 1) performing various types of operations upon concepts; 2) successful and unsuccessful operations made upon concepts; 3) various stages of operations upon concepts. 34 volunteers participated after informed consent, female and male, aged 17 – 33. There were 3 series of intellectual tasks of various types upon concepts. EEG activity while intellectual tasks solving were monitored over 19 scalp locations. The 19 EEG traces were digitized online at 250 Hz, 2244 EEG tests, 1122 responses to intellectual tasks were registered. Statistically significant dynamics of the EEG power were revealed: 1) at the beginning, the band ranges of high frequency dominated, at the end their power decreased; 2) while successful operating upon concepts the EEG power of high-frequency band ranges (both at the beginning and at the end of the process) was lower, and the EEG power of low-frequency band ranges was higher. Mental efforts as a response to the task presentation cause reductions in the incongruence of functional brain activity: they decrease the power of high-frequency band ranges and increase the power of low-frequency band ranges. The simpler is the task, the less effort is needed to solve it, and thus the EEG-signal of less “complexity” characterizes it.

Brief description

We studied EEG-correlates for mental effort while conceptual tasks solving. Mental efforts as a response to the task presentation decrease the power of high-frequency band ranges and increase the power of low-frequency ones.

Topics

084 5.4 Cognition: Thinking processes; reasoning

088 5.8 Cognition: Cognitive neuroscience

083 5.3 Cognition: Concept formation and structures

Presentation Preference

Poster Presentation

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