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ANALYSIS OF SIMPLIFICATION OF SYNCHRONOUS MOVEMENTS IN THE EXPERIMENTAL-EXPERIENCE COEL

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The article presents the results of development and approbation of the experimental technique designed to record simultaneous circular movements performed with the two computer mice in a pair of experimenter-test subjects to assess the degree of the motion synchronicity. This technique is meant to be implemented in the experimental studies of the brain mirror system mechanisms under the following conditions: self-paced circular movements with a computer mouse in an arbitrary rhythm; imitation of movements performed by the experimenter; circular motion in an arbitrary rhythm when observing similar

movements performed by the experimenter. The real-time recording of the mouse coordinates was performed with the help of the specifically designed computer program. It registered simultaneously the motion characteristics of the both mice while showing on the two monitors their movement dynamics and the real-time video of the experimenter's hand which moved the mouse. Based on the discrete values of mouse coordinates and the time, the program calculates a number of variables such as motion period, width of span, acceleration values. Following the analysis of the data collected with the help of the program and taking into account the variability related to individual differences, we have designed the algorithm for the total percentage of phase synchronicity. This indicator represents a fraction of the experiment time when the signals were synchronous. The program also processes the motion characteristics to provide their visual display in the form of statistical values and corresponding graphs.

The designed algorithm for simultaneous recording and processing the motion characteristics of the two computer mice allows for assessing objectively the degree of synchronicity of the performed movements in a pair of experimenter-test subjects to estimate in turn the phenomenon of "induced rhythms". Spontaneous synchronization of the test subject's movements with the movements performed by the experimenter can be assessed by means of the analysis of the variables recorded by the program.

The designed technique is intended to be implemented in studying the mechanisms of interindividual coordination of actions in real time, and assessing the level of development of the brain mirror system, including the children with the autism spectrum disorders.

Keywords: movement, synchronism, brain mirror system.

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