

Event-Related Desynchronization of the Mu-Rhythm: A Literature Review

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Event-Related Desynchronization of the Mu-Rhythm: A Literature Review

The event-related desynchronization of the Mu-Rhythm, a brain wave, in the somatosensory cortex has been studied as a measure of observational learning, motor imagery, movement, mirror neuron function, and has even been considered as one measure pertaining to the Theory of Mind, most often emphasized in Autism studies. The mu-rhythm desynchronization has been examined using neuro-imaging and other brain-computer interfaces, and has been used to give those with severe physical disabilities a way to communicate with and control their environment through use of motor imagery. This literature review is meant to be an extensive overview of past mu-rhythm research. It was done to elucidate understanding of the human thought-movement process in order to create a background for implementation of efficient brain-computer interfaces that allow for stronger levels of motor control. It examines and compares research involving event-related desynchronization of the mu-rhythm under multiple circumstances, including [1] observation of others doing a movement, [2] imagining performing a movement (motor imagery), and [3] actually performing a physical movement, and it looks at these conditions under varying circumstances, such as with healthy individuals, physically disabled individuals, and autistic individuals. While there has been a great deal of research on each of these circumstances, no research has been done using observation, motor imagery, and physical movement in a single comparison study.

Keywords: Mu-Rhythm Desynchronization, Motor Imagery, Movement, Brain-Computer Interfaces, Mirror Neuron System