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A new EEG neurofeedback training approach in sports: the effects function-specific instruction of EEG and motor skill performance

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INTRODUCTION:

Neurofeedback training is a technique used to train brain activity using real-time feedback. The results of traditional electroencephalography (EEG) neurofeedback training (NFT) protocols for changing EEG activity and improving sports performance have been inconclusive. These traditional approaches mainly rely on nonfunctional directed verbal instructions. This means that traditional training does not provide participants with a specific strategy (i.e., how to regulate a certain brain region) for change their mental state. However, a new approach to EEG NFT, namely the function-specific instruction (FSI) approach, may provide an more effective way to change EEG activity and impact sports performance. The FSI approach is based on the idea that the verbal instructions that consider the meaning of the brainwave function in the target region and the EEG power magnitude can induce mental states. To test the effectiveness of the FSI approach, we replicated Wang et al., 2022's study which partially failed to show a significant relationship between changes in Mu power activity that has been associated with motor control and golf putting performance in the traditional approach.

METHODS:

To do so, thirty novice golfers were randomly assigned to either the traditional increased Mu rhythm approach group (T), increased Mu rhythm FSI group (FSI), or sham group (S). In addition, we used EEG-NFT to manipulate Mu rhythm during a golf putting task (complex visuomotor skill).

RESULTS:

We mainly found that only the FSI group showed a slightly increased Mu rhythm and decreased motor performance after training.

CONCLUSION:

We suggest that the function-specific instructional approach may be more effective in guiding participants to change their state of mind in EEG-NFT.

Topic: Psychology

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