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Relationships between learnability and individual indices of EEG alpha activity

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Background

Several studies indicate that EEG alpha activity is associated with cognitive performance and learnability (Anokhin and Vogel, 1996, Klimesch and Doppelmayr, 1998). It was demonstrated that resting alpha power is increased under conditions that are associated with enhanced cognitive processing capacity or situations where subjects try to increase their capacity. (Klimesch, 1999) Different parameters of alpha, however, are related to different aspects of cognitive performance and learnability in different ways

Materials and methods

The healthy male volunteers (n = 129) students and teachers of colleges and universities (age from 16 to 50 years old) participated in the study the main objective of which was to determine relationships between individual indices of EEG alpha activity (maximal spectral peak frequency – IFMA, alpha band width – IABW, stability – S, duration – T, and rise time of alpha spindle – CV) and psychometric parameters of learnability.

Results

people showing high IFMA (i.e., in the range of 10–14 Hz) along with high stability and duration of alpha spindle manifest behavioral traits of more effective performance in acquiring empiric knowledge. The best learnability is a distinctive feature of people with the highest IFMA and the widest IABW.

Discussion

Consequently a new and potentially useful protocol has been established to predict learnability, by EEG analysis, which may have applications in a wide variety of activities.

References

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