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Authors

Minami, Sorato
Watanabe, Ken
Saijo, Naoki
[et al.](#)

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Best brain conditions for winning an esports competition: Electroencephalography amplitude in the frontal and parietal cortices associated with esports competition results

Sorato Minami

Kashino Diverse Brain Research Laboratory, NTT Communication Science Laboratories, Atsugi,
Kanagawa, Japan

Ken Watanabe

WASEDA University, Tokyo, Japan

Naoki Saijo

NTT Communication Science Laboratories, Atsugi, Kanagawa, Japan

Makio Kashino

NTT Communication Science Laboratories, Atsugi, Kanagawa, Japan

Abstract

Success in competitive matches hinges on psychological and mental preparations, such as strategic decision and emotional control. Although relevant cognitive functions and corresponding neural activity have been reported in a simple short-term laboratory task, the contribution of neural activity to the outcome of a more complex and prolonged match-format task has not been examined. Therefore, we focused on esports players engaged in a fighting video game (FVG). We examined the association between electroencephalography results in the pre-round of FVGs and consequences of the rounds. The results showed that parietal beta and frontal alpha/gamma activities are associated with winning and losing, respectively, depending on the match's situation. Furthermore, parietal beta activity exhibited approximately 80% accuracy in win-loss predictions using machine learning. Our findings suggest that the performance of skilled video game players is influenced by psychological and mental preparations with fluctuations in neural oscillations.