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

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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.

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