The Impact of Personality Traits on Panic-Induced Emotional Contagion and Phototaxis Behavior: Physiological and EEG Analysis

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Abstract

Panic responses often lead to irrational behaviors. This study examines the influence of personality traits on panic-induced emotional contagion and phototaxis behavior, combining physiological measurements (Skin Conductance Level (SCL) and Electroencephalography (EEG)) with personality assessments (OCEAN model). The aim is to reveal the corresponding physiological and neurophysiological changes in panic-driven evacuation behavior across different personality types. 28 participants were divided into high extraversion-neuroticism (HEN) and low extraversion-neuroticism (LEN) groups based on their OCEAN traits. Two virtual reality experiments'results show that personality traits significantly affect phototaxis behavior, skin conductance response, and EEG activity. Specifically, the HEN group exhibited more pronounced phototaxis behavior, while the LEN group showed greater skin conductance increases and a significant reduction in ϑ-band. Additionally, under panic-inducing emotional contagion stimuli, the LEN group exhibited significant increases in both ϑ-band and α-band, whereas the HEN group showed only a notable increase in ϑ-band. These findings highlight the need to account for individual differences in emergency evacuation planning and suggest that personalized evacuation strategies could reduce risks and improve efficiency during emergencies.

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