The Undoing Effect of Positive Emotions: How positive emotions impact recovery in esports context

Project objectives

This study aims to test the undoing hypothesis in esports context. Esports players experience a wide range of intense emotions during gaming (Behnke et al., 2021) and face emotional burdens related to tournaments (Sharpe et al., 2024). They are in a state of physiological arousal that mobilizes energy reserves necessary for action, observed through specific cardiovascular reactions, without the possibility of targeted physical activity. This makes esports an ecologically valid context for studying the psychophysiology of emotions.

Positive emotions broaden the repertoire of thoughts and actions, creating lasting emotional, social, and cognitive resources, and they can "undo" the psychophysiological effects induced by negative affect (Fredrickson, 2013; Shiota et al., 2017). In this project, we will investigate whether eliciting low-approach positive emotions, such as amusement (Gable & Harmon-Jones, 2013), after esports performance accelerates gamers' psychophysiological recovery through subjective positive affective experiences and improved cardiac efficiency. We will focus on cardiovascular activity parameters to understand how positive emotions influence human physiology.

This will be the first study to apply the undoing hypothesis to esports, using active methods to elicit emotions through gaming-related video stimuli and esports performance, along with continuous physiological measurements using impedance cardiography. This approach will allow us to detect subtle changes in physiological recovery during esports activity.

Applied research methodology

To address the project aims, we will conduct a large-scale laboratory study involving 200 adult male Counter-Strike 2 players. The study will include continuous, non-invasive measurements of cardiovascular activity and behavioral changes using state-of-the-art physiological equipment during real-life esports activities, based on our previous research (Behnke et al., 2020; Behnke et al., 2024). Participants will undergo a 5-minute resting baseline measurement, complete affective state questionnaires, and then play six 2-minute matches against bots on the Dust II map in Counter-Strike 2. We chose Counter-Strike 2 because it elicits intense emotions and strong physiological arousal (Behnke et al., 2021; Behnke et al., 2024). After each match, participants will watch a 2-minute video clip designed to elicit enthusiasm, amusement, or a neutral state, and then assess their emotional state. Our previous study has shown that 2 minutes are sufficient for recovery after a match (Behnke et al., 2024). The entire study will last about 120 minutes, and participants will receive full information about the study and a participation voucher. This project allows us to observe the impact of different positive emotions on the psychophysiological recovery of esports players.

Rationale for research topic and expected results

Given the demanding nature of esports competitions and their growing popularity, there is a pressing need to explore and implement evidence-based strategies to support gamers' well-being, mental health, and enjoyment (Yin et al., 2020). The undoing hypothesis, which will be tested in this project, offers a promising and straightforward mechanism for emotion regulation and recovery. This will be the first study to focus on psychophysiological recovery after esports performance using the undoing effect and the most comprehensive study in terms of research methods, utilizing impedance cardiography to capture cardiovascular parameters.

By exploring the undoing hypothesis in esports, we will break new ground in understanding emotional regulation and recovery in competitive gaming. Our findings will inform tailored mental training techniques for esports players, addressing their unique psychological challenges. This research will validate physiological indicators of cardiovascular activity in esports. We anticipate that our outcomes will provide innovative insights for top-tier academic journals, stimulating renewed interest in esports research. This will broaden the applicability of our findings and advance both theoretical understanding and practical interventions for esports. This project will yield novel outcomes relevant across multiple disciplines, including affective science, sports psychology, and psychophysiology.