Callous-unemotional Traits and Pre-Ejection Period (PEP) in Response to Reward

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Abstract

Callous-unemotional (CU) traits have important utility in distinguishing individuals with more severe, persistent antisocial behavior, and our understanding of reward processing and CU traits contributes to behavioral modification. However, research on CU traits often investigated reward alongside punishment and examined only the average reward reactivity instead of the trajectory features in response to reward (e.g., habituation). This study assessed individuals’ pre-ejection period (PEP), a sympathetic nervous system cardiac biomarker with specificity to reward, in a simple reward task to investigate whether and how CU traits were linked to average reward reactivity and reward responding trajectory. A heterogeneous sample of 126 adult males was recruited from a large metro city in the US. Participants self-reported their CU traits and completed a simple reward task while impedance cardiography and electrocardiogram were recorded to derive PEP. Results revealed no association between average PEP reward reactivity and CU traits. However, CU traits predicted both linear and quadratic slopes of the PEP reactivity trajectory: those with higher ICU scores had slower habituation initially but their habituation caught up quickly in later blocks. Findings highlight the utility of modeling PEP reward trajectory and incorporating habituation rate to reward when studying CU traits. We discussed the implications of individuals with high CU traits having the responding pattern of slower initial habituation followed by rapid habituation to reward and the possible mechanisms.

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