Nicotine Abstinence Moderates Electrophysiological Markers of Salience to Social Reward

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Abstract (300 word limit)

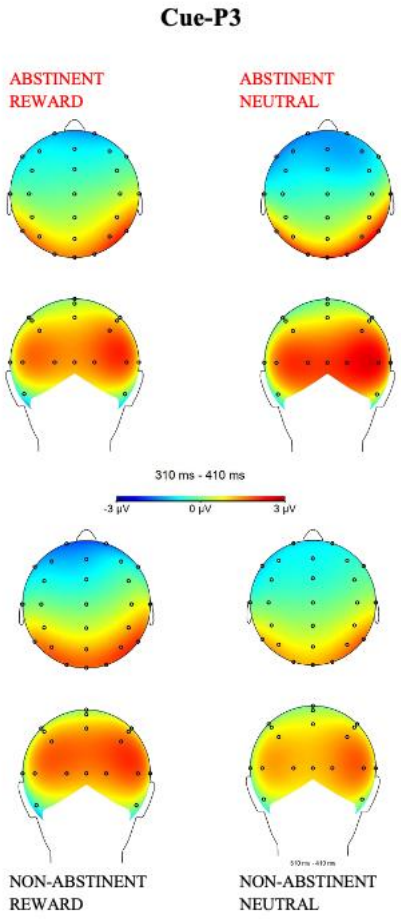
Statement of the Problem: Exposure to peer network nicotine use consistently predicts greater relapse rates for individuals in cessation. Furthermore, chronic use results in heightened sensitivity to substance cues coupled with blunted response to natural rewards. This study elucidates how abstinence impacts the response to social reward processing in chronic nicotine users by quantifying the difference in electrophysiological response to anticipating and receiving social reward.

Methodology & Theoretical Orientation: This was a within-subjects event-related potential (ERP) study that used a social incentive delay paradigm. 29 participants completed the task under 12-hours nicotine abstinence and use *ad libitum* while undergoing EEG recording with a 32-channel cap. There were three ERPs of interest during the anticipation period and three during outcome. A wavelet transform was performed to extract layers corresponding to delta and theta frequency bands, which encode reward liking and salience, respectively.

Findings: Nicotine abstinence moderated the amplitude of cue-related P3, such that salience of the reward cue was significantly greater than the neutral cue in non-abstinence, but not in abstinence. The amplitude of all three feedback-locked ERPs were sensitive to social reward, but not significantly affected by abstinence. Time-frequency analysis revealed theta activity during the outcome period to be trend greater in abstinence, suggesting heightened salience of feedback. This study also investigated the impact of individual differences using self-reported variables of reward sensitivity and affect.

Conclusion & Significance: Short-term nicotine abstinence impaired the ability to modulate attention towards cues predicting natural rewards in the environment, but did not affect reward liking. Therefore, individuals in cessation could benefit from the built-in network that peer support groups provide, as abstinence results only in deficits of identifying social reward cues. Further research is needed to extend these findings to individuals in recovery from other substance use disorders.

Image



Recent Publications

1. Liu X, Read SJ (2024) Development of a multivariate prediction model for antidepressant resistant depression using reward-related predictors. Frontiers in Psychiatry 15:1349576.
2. Liu X, Read SJ, Rabin A, Pollard KA, Files BT (2023) Prevention focus and conscientiousness drive accurate responding in stimulus detection. Journal of Research in Personality 107:104430.

Photograph



Biography (150 word limit)

Xiao Liu recently completed her doctoral studies in brain and cognitive science at the University of Southern California, where her research focused

on the impairments of motivational mechanisms in psychiatric disorders. Xiao's work is translational and aims to elucidate the variable contribution of anticipatory wanting and consummatory liking to the transdiagnostic factor of anhedonia. Prior to her studies at USC she obtained an MSc in cognitive science at University College London, where she studied the effects of acute alcohol use on prospective memory in the Clinical Psychopharmacology Unit.

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Notes/Comments: