

Perception of Attachment Security, Neurodynamics of Emotion Recognition, and Social Skills in Late Childhood and Early Adolescence: A Hierarchical Multilinear Modeling Study

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Abstract

This study explored the link between Perception Attachment Security (PAS), neurobehavioral dynamics during emotion recognition, and social skills using a hierarchical multilinear EEG model. We used facial expression recognition tasks, behavior, and socio-affective measures to model a lower-dimensional parameter (LDP), which we built to encapsulate specific task-related neurobehavioral patterns influenced by personal history. We hypothesized that higher PAS levels would correlate with better emotion recognition performance and social skills. Our results showed an early midline occipital LDP/PAS increase at around 70 and 170 ms, suggesting that attachment security influences the nervous system's organization and early neurobehavioral processes. We suggest this implies higher attachment security individuals might be better at perceiving and understanding emotions, leading to improved social competence. Social competence was found to affect early LDP dynamics over right hemisphere sensors, emphasizing the role of positive social skills and attachment security in processing facial expressions of emotions. In later temporal stages, LDP dynamics linked with antisocial behavior showed an increase around 200 ms post-stimulus, suggesting cognitive resources might be used to disengage from or maintain emotional processing, possibly hindering the consideration of interpersonal interactions and contextual factors vital for social skill development. This underscores the need to consider a wide range of factors to fully understand social competence.

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