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The utility of event-related potentials (ERPs) in understanding food-related cognition: A systematic review and recommendations

Kaylie A. Carbine, Rebekah Rodeback, Erin Modersitzki, Marshall Miner, James D. LeCheminant, Michael J. Larson

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Abstract

Daily dietary decisions have the potential to impact our physical, mental, and emotional health. Event-related potentials (ERPs) can provide insight into cognitive processes, such as attention, working memory, and inhibitory control, that may influence the food-related decisions we make on a daily basis. We conducted a systematic review of the food-related cognition and ERP research in order to summarize the extant literature, identify future research questions, synthesize how food-related ERP components relate to eating habits and appetite, and demonstrate the utility of ERPs in examining food-related cognition. Forty-three articles were systematically extracted. In general, results indicated food cues compared to less palatable foods or neutral cues elicited greater ERP amplitudes reflecting early or late attention allocation (e.g., increased P2, P3, late positive potential amplitudes). Food cues were associated with increased frontocentral P3 and N2 ERP amplitudes compared to neutral or less palatable food cues, suggesting increased recruitment of inhibitory control and conflict monitoring resources. However, there was significant heterogeneity in the literature, as experimental tasks, stimuli, and examined ERP components varied widely across studies, and therefore replication studies are needed. In-depth research is also needed to establish how food-related ERPs differ by BMI groups and relate to real-world eating habits and appetite, in order to establish the ecological validity.

Keywords: event-related potentials (ERPs), food, eating habits, cognition, attention, systematic review