

Expertise seeks rewards: Error-related negativities and defensive motivation in spelling decisions

Lindsay Harris

Northern Illinois University, DeKalb, Illinois, United States

Benjamin Rickles

University of Maryland, College Park, Maryland, United States

Luis Lopez

Northern Illinois University, DeKalb, Illinois, United States

Charles Perfetti

University of Pittsburgh, Pittsburgh, Pennsylvania, United States

Abstract

The error-related negativity (ERN) is an event-related potential (ERP) component generated in anterior cingulate cortex that reflects reward sensitivity and error aversion (Hajcak & Foti, 2008). In a spelling decision task that included a monetary reward for good performance, Harris, Perfetti, and Rickles (2014) found that mean ERN amplitude was associated with an offline behavioral measure of spelling knowledge, suggesting that expert spellers are more error-averse during a reward-based spelling task than those with less expertise. However, task performance alone is an imperfect indicator of expertise, because a correct response could result from guessing or motor error. In the present study, we investigated whether the left-lateralized N170, an ERP component directly tied to orthographic expertise, was associated with ERN effect size in the spelling decision task. We found that mean N170 amplitude correlated positively with mean ERN amplitude, indicating that experts experience greater aversion to errors than non-experts.