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Paper Title:	Predictive Coding and Surprisal Effects on N400 Amplitude: An ERP Study Using BERT-Based Language Models in Japanese Contexts
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Abstract

This study aims to reevaluate the role of the N400 component in language processing from the perspective of predictive coding theory and investigate the impact of surprisal on N400 amplitude. An ERP experiment was conducted using three surprisal conditions (Best Completion, Unrelated, Implausible) with a BERT-based model optimized for Japanese contexts. Analysis of EEG data revealed distinct N400 amplitudes and brain connectivity patterns across the surprisal conditions. Notably, changes in alpha-band phase synchronization reflected cognitive processes related to the degree of mismatch between predicted and actual input in each context. These findings suggest that higher levels of surprisal lead to increased cognitive load, manifesting as dynamic changes in brain network activity.