

Japanese Speakers' Second Language Sentence Processing: Behavioral, ERP, and MRI Evidence

シャルボウシュ, ジャナネ

<https://hdl.handle.net/2324/7443210>

出版情報 : Kyushu University, 2025, 博士 (文学), 課程博士
バージョン :
権利関係 :



(様式 3)

氏 名 : シャルポウシュ ジャナネ (SHALPOUSH JANANEH)

論 文 名 : Japanese Speakers' Second Language Sentence Processing: Behavioral, ERP, and MRI Evidence

[日本語母語話者における第二言語の文処理：行動、脳波、MRI による検証]

区 分 : 甲

論 文 内 容 の 要 旨

This thesis investigates how native Japanese learners of English process syntactic, semantic, and phonological information during auditory sentence comprehension, and how these functional processes relate to individual differences in brain structure. Using a cued sentence judgment task, behavioral accuracy and event-related potentials (N400, P600) were recorded while participants evaluated well-formed and anomalous English sentences.

Behavioral results showed relatively high accuracy for control and semantic conditions, but markedly lower accuracy for syntactic and especially phonological violations, indicating domain-specific difficulties in L2 processing.

ERP analyses revealed non-canonical patterns where phonological violations elicited the most robust and sustained neural responses, whereas syntactic and semantic anomalies produced weaker or atypical effects, suggesting reduced automaticity and altered processing strategies compared to native-speaker profiles.

Structural MRI (cortical thickness) analyses identified systematic structure-function relationships in perisylvian and executive-control regions, with both positive and negative correlations between cortical thickness and ERP amplitudes across conditions.

Together, these findings support a view of L2 sentence comprehension as relying on adapted, partially redistributed neural networks shaped by L1-L2 differences, experience-dependent plasticity, and individual neuroanatomical variability.

Keywords: Second language (L2) acquisition; auditory sentence processing; electroencephalography (EEG); event-related potentials (ERP); speech perception; Japanese; syntax; semantics; phonology; structural magnetic resonance imaging (MRI); cortical thickness; neurocognitive processing