The case of a non-native-like first language: ERP evidence of first language (L1) attrition in lexical and morphosyntactic processing

Kristina Kasparian [1], Francesco Vespignani [2], Karsten Steinhauer [1]

[1] *School of Communication Sciences & Disorders, McGill University*

[2] *Department of Psychology and Cognitive Science, Università degli Studi di Trento*

The notion of a *critical-period* for second-language-learning is controversial; it is unresolved whether maturational constraints on neuroplasticity limit the "native-likeness" of neurocognitive mechanisms underlying L2-processing, or whether other factors (e.g. *exposure* or *proficiency*) have a greater impact than *age-of-acquisition* on language processing in the brain. First-generation-immigrants who move to a new country in adulthood offer insight on this question, as they become highly-proficient in the late-acquired L2, while experiencing difficulties or "*attrition*" in their native-L1.

Using ERPs and a range of behavioral measures, we examined Italian lexical-semantic and grammatical processing in 24 Italian-English immigrants who reported experiencing attrition in Italian, compared to 30 Italian native-speakers still residing in Italy.

Exp.1 tested whether attriters confuse similar words ("*mento*" (chin) vs. "*menta*" (mint)), and fail to automatically detect when a word is swapped with its minimal pair in a sentence context. These "swap" violations were compared to outright "mismatch" violations, where the target noun was replaced by an unrelated word ("*mento*" vs. "*colpa*" (fault)). Both violations elicited large N400-effects in Italian native-speakers. Attriters, however, showed a significant N400 only for the "mismatch" condition, but a large P600-effect for the "swap" condition, revealing more elaborated processing further downstream. When attriters were split into two subgroups by L1-proficiency, attriters in the higher-proficiency range showed N400-effects for both violations, whereas attriters in the lower-proficiency range did not automatically detect the "swap" (no N400).

Exp.2 tested the acceptability and online-processing of relative-clauses – a structure subject to cross-linguistic differences: while 4 word-orders are permissible in Italian, 2 of these are ungrammatical in English. Also, Italian readers typically use semantic cues and subject-verb agreement in sentence interpretation, whereas English readers rely on word-order. As we expected, attriters - immersed in English - rejected Italian word-orders that are ungrammatical in English, not benefitting from semantic cues such as strong agent-patient relationships (e.g.*policeman/arrests/thief*). Attriters showed morphosyntactic-violation effects (LAN or P600), whereas Italian controls showed reliance on semantic cues (N400) and garden-path effects (P3a). Splitting the attriters based on acceptability ratings revealed that low-raters (those who transferred English preferences to Italian) deviated most from Italian-controls in their ERP patterns.

These findings show that (1) attrition effects in both vocabulary and syntax can be revealed during online processing, (2) attrition can be conceptualized as a continuum based on L1-proficiency-level, whereby attriters with lower L1-proficiency show less native-like processing patterns, and (3) L2-L1 transfer occurs in cases of cross-linguistic differences. This research is among the first to explore the neurophysiological correlates of L1-attrition, and challenges the notion of a maturationally-privileged, hard-wired L1.

Presented by: Kasparian, Kristina

Symposium 24: Brain signatures of language learning and forgetting: ERP studies on first and second language acquisition and attrition (Csépe & Steinhauer)