My Italian is not what it used to be: Investigating the neural correlates of L1 attrition and late L2 acquisition

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INTRODUCTION

BACKGROUND & AIM

Longstanding debate about “critical period” for L2: Maturational constraints on brain plasticity?
- Late-learners differ from native-speakers in performance and/or neurocognitive mechanisms?
However, late age-of-acquisition confounded with low proficiency level and/or low exposure?

AIMS: (1) Disentangle proficiency effects from AoA in “minority-language speakers” or “attriters” - low exposure and declining proficiency in L1 due to immigration and low-proficiency exposure to L2; (2) investigate neurocognitive correlates of L1 attrition which are, to date, largely unexplored.

PARTICIPANTS

GROUPS:
(1) Minority-speakers of Italian (L1) + English (late L2) + attriters
(2) L2 speakers of English (L1) + Italian (late L2) + bilingual controls
(3) Italian native-speakers in Italy = monolingual controls
(4) English native speakers = monolingual controls

EXPERIMENT 1: Lexical access in production

RESEARCH QUESTIONS
(1) Do experimental data support anecdotal reports of word-finding difficulties and “confusing words,” especially when similar?
(2) Is there evidence for cross-linguistic competition in attriters?
(3) Are low-frequency items more vulnerable to attrition?

DESIGN & STIMULI
- Translation task (production)  
  - Italian → English (reported here) and English → Italian
- 29 “false-friend” items + 29 “control” items
  - e.g. fabbrica = factory ≠ fabric (fabric ≠ tessuto ≠ fabbrica)
- Matched pairwise on frequency of item and context, length, number of syllables, word category, semantic field
- Words displayed on screen and voice-response is registered (RT)

RESULTS
- Supports anecdotal reports for confusing similar words
- Effects of both condition and frequency suggests that lexical attrition is not only “degradation” or “forgetting,” but that L2-induced interference plays an important role.

EXPERIMENT 2: Lexical access in comprehension

RESEARCH QUESTIONS
(1) Is there evidence of lexical attrition in online comprehension, (aside from behavioral tasks or production)?
(2) Do attriters differ from native-speakers in how the brain processes Italian in real-time?
(3) Can we show effect of “confusing words” within L1 with ERP?

DESIGN & STIMULI
- Nouns differing only in final vowel, but different meaning: e.g. cappello (hat) vs. cappella (chapel); busto (chest) ≠ fabbrica (factory)
- Sentence context created for each word (48 pairs = 96 contexts)
- 3 conditions:
  - (1) Correct (each word in pair occurs in its proper context)
  - (2) Swap (words in pair are switched, e.g. cappello in cappella context)
  - (3) Balanced design: Each target words occurs in each condition
- Task: Acceptability judgment (rating 1-5)

RESULTS
- Swap: to cover his head, the fisherman wears the hat of wool.
- Correct: To cover his head, the fisherman wears the hat of wool.
- Supports anecdotal reports for confusing similar words
- Effects of both condition and frequency suggest that lexical attrition is not only “degradation” or “forgetting,” but that L2-induced interference plays an important role.

EXPERIMENT 3: Online syntactic processing

RESEARCH QUESTIONS
(1) Is there evidence of attrition in morphosyntax (although studies suggest that grammatical knowledge is less vulnerable than lexicon)?
(2) Do attriters process and interpret Italian differently than native controls due to interference from the dominant-L2 grammar?

DESIGN & STIMULI
- Relative clauses: Cross-linguistic differences in grammaticality and in cue strength (semantic cues in Italian; word-order in English)
  - Conditions 1 & 4 are grammatical in Italian (although 2 & 3 are less preferred because they are less frequent)
  - Conditions 2 & 3 are impossible in English (ungrammatical)
- Strong agent-patient relationships (semantic cues)
  - Noun1, Noun2 and verbs matched on length × frequency across conditions, and number counterbalanced per condition
- Task: Acceptability judgment (rating 1-5)

RESULTS
- Controls show an N400 for object condition, suggesting that they process without error first, then a P600.
- Attriters show a different pattern, namely an N400 only for the mismatch condition, and a Large P600, especially for the swap condition.

GENERAL DISCUSSION

Three experiments provide the first evidence of attrition effects in (1) lexical access during translation, (2) online lexical processing, and (3) online syntactic processing.
- The more dominant and highly-proficient L2 influences the L1 lexicon and grammar.
- Online measures such as ERPs provide crucial information about attrition, as some effects are not revealed in behavioral tasks and offline linguistic tests.
- Preliminary evidence of ongoing brain plasticity for L1 and L2, even in adulthood.