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Native language sounds in new, foreign words boost grammar processing: ERP evidence of transfer in initial acquisition

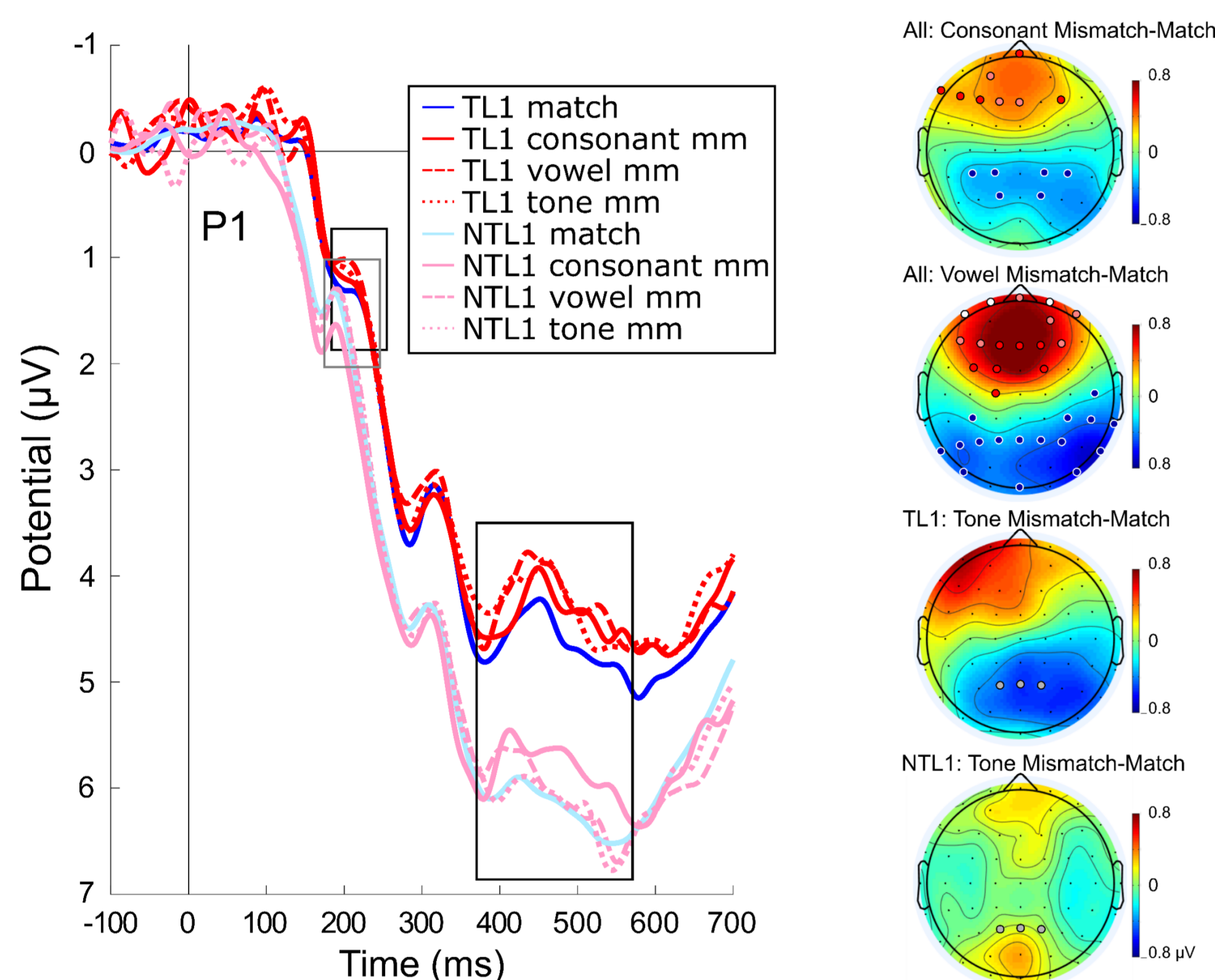
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Introduction

- initial SLA* → fast processing of novel words and grammar
→ dependent on transfer (*2nd language acquisition)
- does transfer influence how grammar errors (embedded in pictures) are processed while language rules are forming?

Methods

- spoken word-picture association learning
 - tones and vowels: morphosyntactic content (gender & number)
 - consonants: lexicosemantic content (profession)
- 23 learners with tonal L1** (Swedish), 23 learners with non-tonal L1 (German)
- 2 days of learning (i.e., 2 x 30 repetitions of 24 test words/pictures)
- occasional word-picture mismatches (~11%) = errors (**native language)



Analysis

... of mismatch trials (pictures)

- 1) gRMS peaks for each group
 - t-tests for peaks between groups in case of different latencies
- 2) cluster-based permutations on gRMS-based time windows for each error type vs. non-error trials

Results

- two gRMS peaks: ~180 ms & 370 ms
- 180 ms = **posterior N1**: timing differences between groups
 - tonal L1 group: overall delayed posterior N1 response (+10 ms)
- 370 ms = **N400**: amplitude differences within & between groups
 - tonal L1 group: larger N400 for consonant, vowel & tone errors
 - non-tonal L1 group: larger N400 for consonant & vowel errors *NOT* tone
- **negative correlation**: the larger the **N400** for vowel & tone errors, the faster the **response times**
- no grammar-related ERP effects (E/LAN, P600)

Conclusion

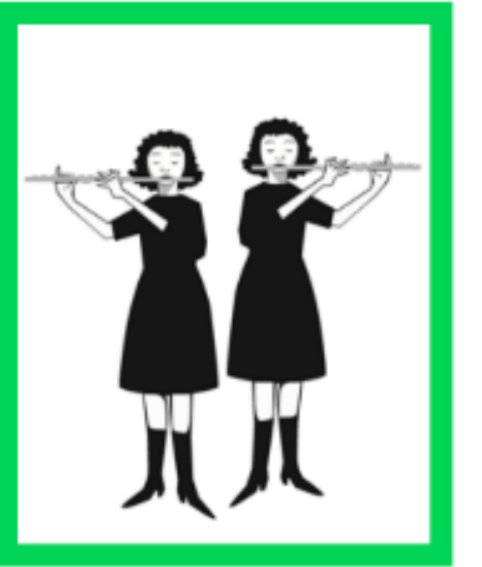
- N400 – hindered processing after lexicosemantic & grammatical errors within 1h of acquisition ← only when based on familiar sounds
→ transfer influences how learners initially process grammar & grammar errors
- N400 rather than E/LAN or P600 because pictures (inherently more semantic)
- N1 - visual processing delayed by attentional demands (3 vs. 2 internalised categories)

Word-picture pair examples

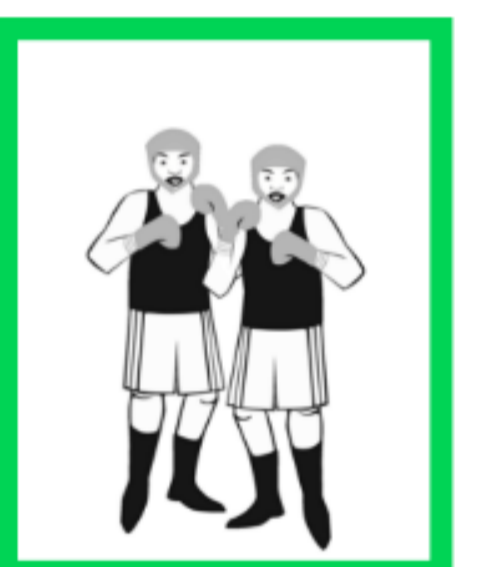
fap
rising tone



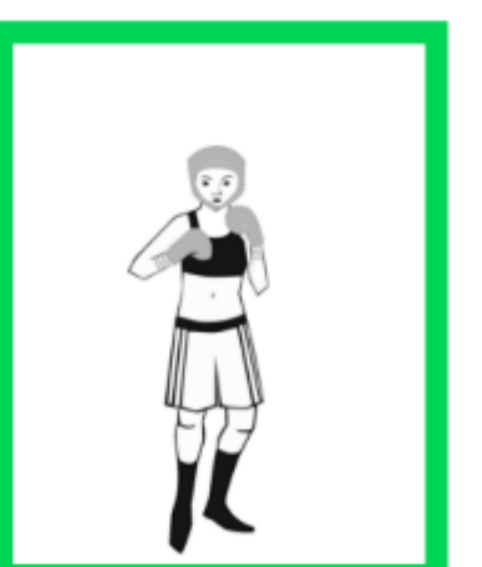
sap
rising tone



fep
rising tone

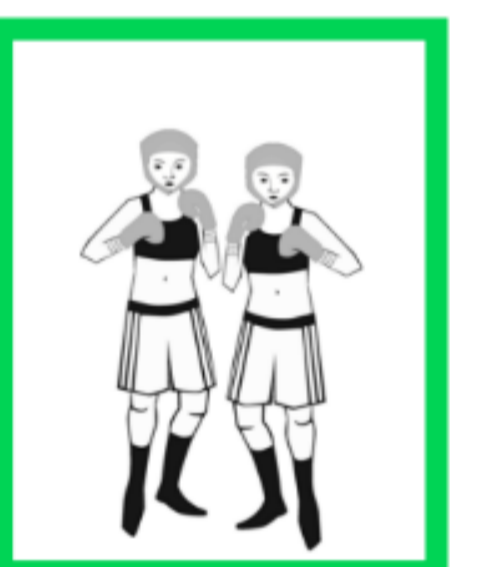


fap
low tone

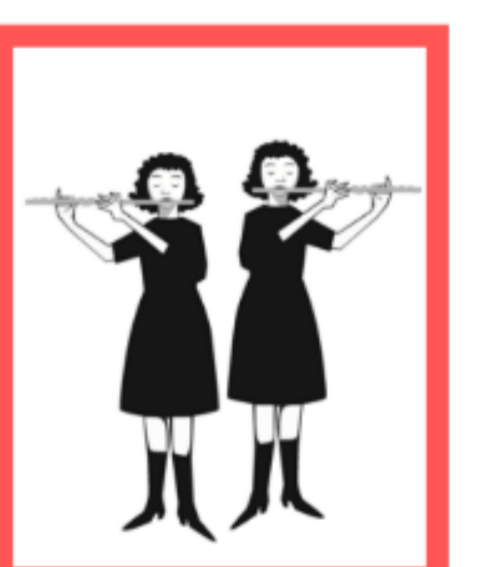


Error types

fap
rising tone



fap
rising tone



Consonant error

fap
rising tone



Vowel error

fap
rising tone



Tone error

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