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Bidirectionality of language contact: Spanish and Catalan vowels

Background

- Mutual phonological space of L1 and L2 (Flege 1995, 2002)
 - Perceptual **dissimilation** with strong L2 input and influence
 - Maintenance of distinct categories cross-linguistically
- Dissimilation observed among Spanish and Catalan back mid vowels (**Figure 1**) in Mallorca (Simonet 2011)

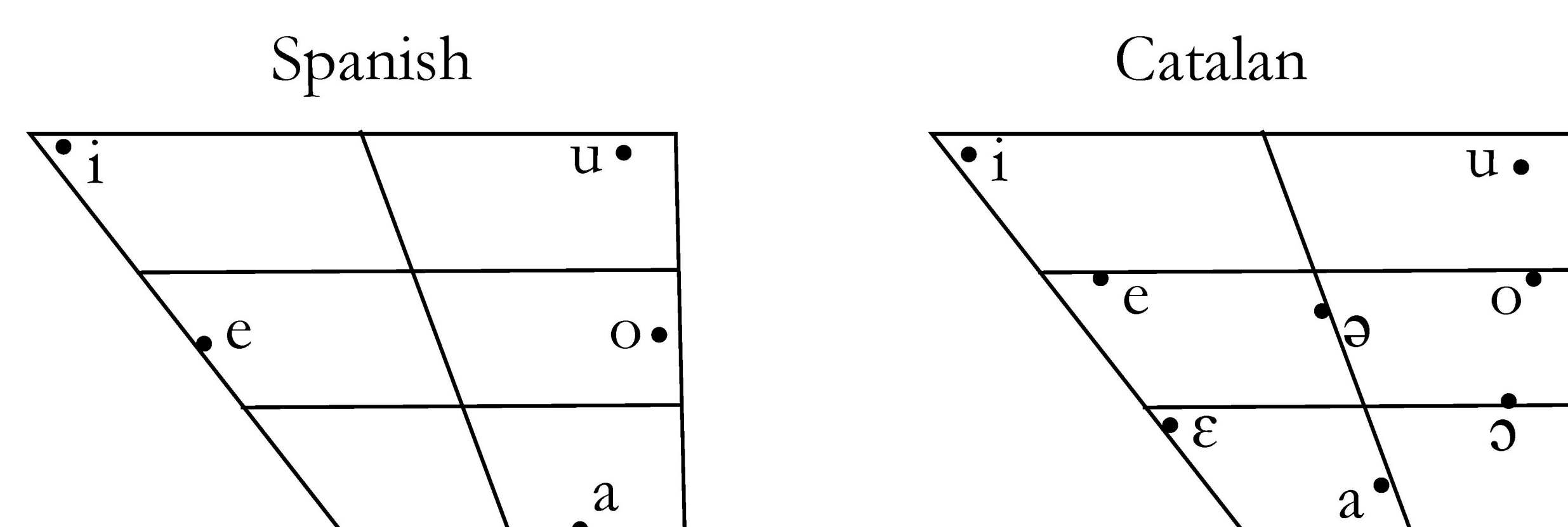


Figure 1. Vowel spaces of Spanish (Ladefoged & Johnson 2015: 237) and Catalan (Carbonell & Llisterri 1999: 62). Vowels differ primarily across F1.

- Re-evaluation of Barcelona and bidirectionality
 - Research bias towards contact effects only in Catalan (Arnal 2011), despite the widespread societal bilingualism and strong Catalan linguistic policies in Barcelona
 - Production of Catalan front mid vowel contrast depended on neighborhood (Cortés et al. 2019)
- Hypothesis regarding front mid vowel production in Barcelona:**
 - Dissimilation** will be evidenced by the production of a Spanish /e/ distinct from Catalan front mid vowels

Methodology

- Random stratified sampling (along age and gender, n=17) with Bilingual Language Profile (Birdsong et al. 2012).
- Tasks:
 - Spanish word list (n=60), stratified by Catalan cognate status (cognate /e/, cognate /ɛ/, no cognate)
 - Catalan word list (n=40), stratified by prescriptive vowel (/e/, /ɛ/)
- Acoustic analysis: F1 and F2 extracted at the midpoint in Praat (Boersma & Weenink 2019), Lammert and Narayanan ΔF Normalization (Johnson 2018)
- Statistical analysis:
 - Degree of overlap: Fixed effects linear regression model of Pillai scores obtained per speaker measuring overlap of Spanish /e/ and combined Catalan productions. Interaction term of gender and age.
 - Category variance (Amengual 2011): Variance of male F1 production across language and age.

Results

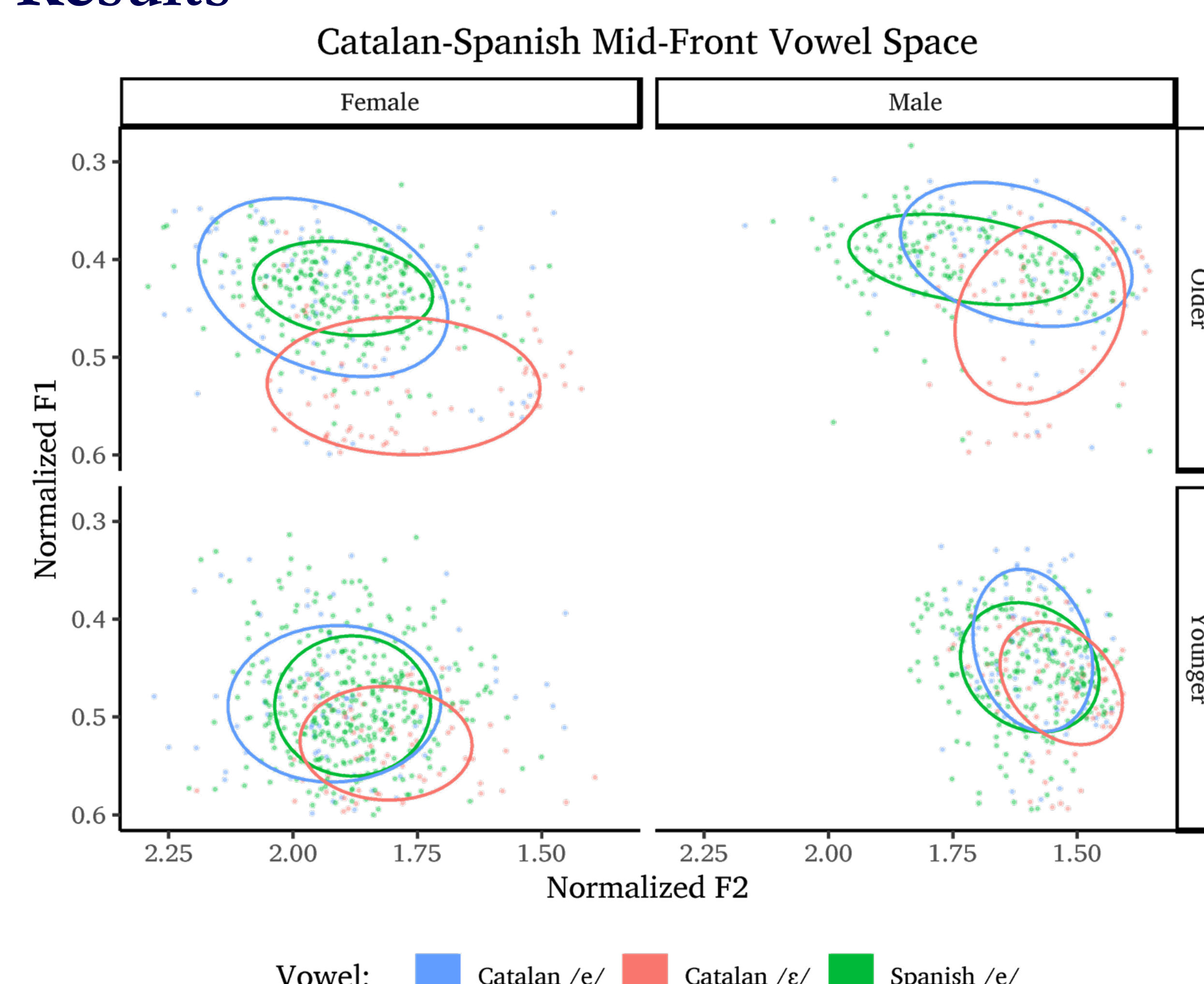


Figure 2. Vowel space plot showing distribution of three vowel categories in acoustic space, and displayed across social factors of age and gender.

- Younger males have more overlap of vowel categories than older males ($p < 0.01$) and younger females ($p < 0.001$) (**Figure 2**). Possible male-led change in apparent-time towards assimilation of Spanish and Catalan categories.
- Greater variance in Catalan F1 than Spanish F1 for older males ($p < 0.001$) and for younger males than older males in Spanish ($p < 0.05$) (**Figure 3**).

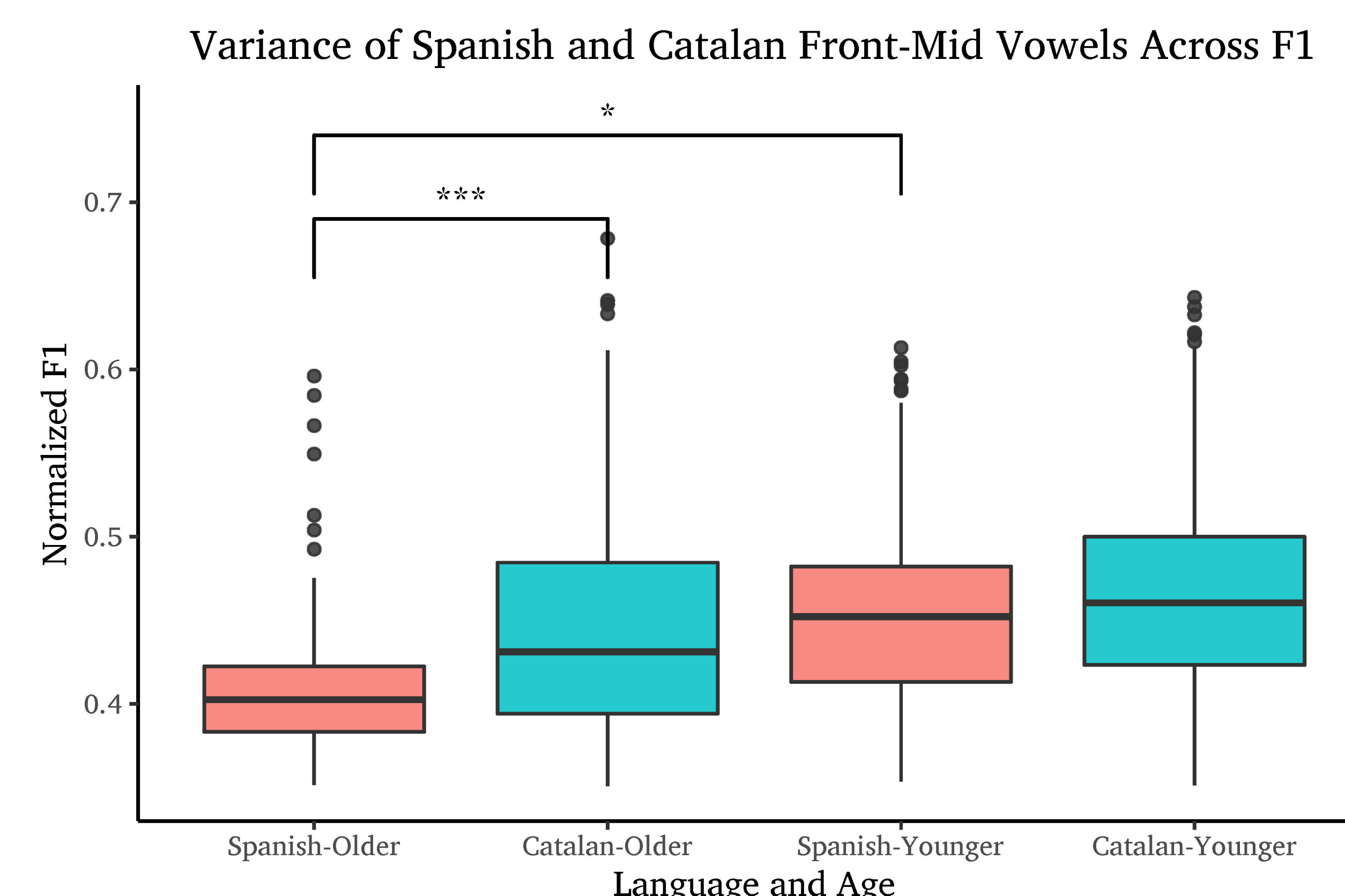


Figure 3. Male Spanish and Catalan front mid vowel productions across F1 in apparent-time

Conclusions

- Male speakers conflate Spanish /e/ and Catalan mid front vowels in apparent-time, demonstrating **assimilation**
- Spanish productions are changing to yield this conflation, Spanish → Catalan
- Potential male-led change: perhaps the social meaning indexed is inaccessible to females? (Chappell 2016)
- Catalan directionality** (therefore **bidirectionality**) can be observed within some regions of Barcelona, despite low percentage of L1 Catalan speakers. Further exploration of production across neighborhoods is still needed.
- Metrics used to establish contact effects should extend beyond cognate effects (no effect found in present study) and monolingual-like F1 and F2 production to reflect bidirectional and dynamic nature of language contact

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References

- Amengual, Mark. 2011. Spanish and Catalan in Majorca: Are There Contact-Induced Changes in the Catalan Vowel System? Proceedings from the 13th Hispanic Linguistics Symposium. 214–223.
- Arnal, Antoni. 2011. Linguistic changes in the Catalan spoken in Catalonia under new contact conditions. Journal of language contact 4(1). 5–25.
- Birdsong, David, Libby M Gertken & Mark Amengual. 2012. Bilingual language profile: An easy-to-use instrument to assess bilingualism. COERLL, University of Texas at Austin.
- Boersma, Paul & David Weenink. 2019. Praat: doing phonetics by computer. [computer program].
- Carbonell, Joam & Joaquim Llisterri. 1999. Catalan. Handbook of the international phonetic association.
- Chappell, Whitney. 2016. On the social perception of intervocalic /s/ voicing in Costa Rican Spanish. Language Variation and Change 28. 357–378.
- Cortés, Susana, Conxita Lleó & Ariadna Benet. 2019. Weighing factors responsible for the production of the Catalan vowel /ɛ/ versus /e/ contrast in three districts of Barcelona. International Journal of Bilingualism 23(6). 1264–1277.
- Flege, James E. 1995. Second language speech learning: Theory, findings, and problems. Speech perception and linguistic experience: Issues in cross-language research 92. 233–277.
- Flege, James E. 2002. Interactions between the native and second-language phonetic systems. In An Integrated View of Language Development: Papers in Honor of Henning Wode. Edited by Petra Burmeister, Thorsten Piske, and Andreas Rhode. Trier: Wissenschaftlicher Verlag, 217–244.
- Johnson, Keith. 2018. Vocal tract length normalization. UC Berkeley PhonLab Annual Report 14(1).
- Ladefoged, Peter F & Keith S Johnson. 2015. A course in phonetics.
- Simonet, Miquel. 2011. Production of a Catalan-specific vowel contrast by early Spanish-Catalan bilinguals. Phonetica 68(1-2). 88–110.