

Cross-linguistic influence on mid vowels of late Salento Italian-French bilinguals

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Abstract

This study focuses on open and close mid vowels in native language (L1), here the Italian variety spoken in Salento, and second language (L2), here French, of 15 Italians from Salento living in the Paris region (hereinafter bilinguals - B). We investigated the phonetic L1-L2 and L2-L1 influence in their L1 and L2 speech production, by comparing it with the L1 speech production of 15 Italian and 15 French control speakers. Acoustic analysis of formant values shows (1) no L2-L1 influence, and (2) an L1 influence on the B L2 /ɛ/, /e/, /o/, and /ɔ/ as for F1 and/or F2.

Keywords: mid vowels, cross-linguistic influence, Italian, French

Introduction

Today, many people live abroad, i.e., in a non-native language (L1) country, where they daily use a second language (L2). Those who acquired the L2 after the age of six are for Grosjean (2013) “late bilinguals”. Authors have studied the mutual influence of languages known by late bilinguals (i.e., Cross-Linguistic Influence – CLI, see Jarvis & Pavlenko 2008) in their speech at phonetic level. However, they over-focused on late bilinguals whose L1 or L2 was English and rarely examined so-called “bidirectional CLI”, i.e., the influence of L1 on L2 and that of L2 on L1 in the same group of late bilinguals.

This work is one of the few examining bidirectional CLI in a group of late bilinguals for which neither L1 nor L2 is English, specifically Salento Italian-French Bilinguals (hereinafter referred to as B). The B were born and/or grew up in Salento (southern Italy), moved to France as adults, living there for a variable amount of time (here Length Of Residence - LOR), and resided in the Paris region at the time of study. Their L1, i.e. the Italian variety spoken in Salento (hereinafter Salento Italian), and their L2, French, differ in terms of mid vowels: There is no phonological distinction between /ɛ/ and /e/, and /ɔ/ and /o/ in Salento Italian, but there is in French as it is commonly spoken in the Paris region (cf. Grimaldi & Calabrese 2018, Munot 2002). This difference between languages is core when studying CLI, as according to the Speech Learning Model and its revised version (Flege & Bohn 2021; SLM and SLM-r), the L1 and L2 sound

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systems of bilinguals coexist in a shared phonetic space, where they interact and can influence each other. Namely, bilinguals may incorrectly classify an L2 sound into their L1 category leading to its inaccurate pronunciation, which can be improved with their increasing L2 experience as they create a new category for this sound. The classification of L2 sound into L1 categories and the creation of a new L2 phonetic category vary between individuals, as it depends on many factors related to the specific speaker.

Goals and hypotheses

This study aims to investigate CLI in open and close mid vowels of B, i.e. Salento Italian-French Bilinguals, by comparing their L1 and L2 speech production with L1 speech production of Italian (hereinafter I) and French (hereinafter F) control speakers. We hypothesise that:

1. The B will produce French /e/, /ɛ/, /o/ and /ɔ/ inaccurately, i.e., not as F controls, since their L1 front mid vowel will influence their L2 /e/ and /ɛ/, just as their L1 back mid vowel will influence their L2 /o/ and /ɔ/.
2. The B will differ in production of Salento Italian mid vowels from I controls, because their L2 front mid vowels will influence their L1 front mid vowel, just as their L2 back mid vowels will influence their L1 back mid vowel.
3. The higher a B speaker's *LOR*, the more accurate his/her pronunciation of French mid vowels will be, and the less his/her pronunciation of Salento Italian mid vowels will resemble that of I controls.

Method

We recorded the L1 and L2 speech of 15 B (9M, 6F; mean age = 41.13 y.o.; SD = 10.39, *LOR* [year]: 1, 4, 6, 8, 8, 10, 12, 14, 14, 15, 18, 22, 24, 27, 33) and the L1 speech of 15 I and 15 F controls, matched as much as possible for age, sex and education level. I and F controls were born and/or grew up in Salento and in the Paris region, respectively, and have lived there for all or most of their lives. Since L2-L1 influence occurs more in spontaneous than in reading-elicited speech (Hevrova 2021), we elicited speech as spontaneous as possible in a controlled setting, using a set of pictures corresponding to Italian and French words with target vowels (/ɛ/, /e/, /ɔ/, /o/) placed in stress-controlled positions. First, a picture of a word X was shown on the PC screen and the speaker produced the carrier sentence 'I say X'. Second, more pictures were shown on the PC screen and the speaker described the way the experimenter was moving them by using the carrier sentence 'I put X next to Y. I moved X'. Orthographically transcribed recordings were automatically labelled and segmented, and manually corrected in PRAAT (Boersma & Weenink 2025), where F1 and F2 of the target vowel were automatically measured from the middle third of each target. A total of 3928 vowels in 3928 words were analysed. Statistical analyses were performed in R

using various packages. Hypothesis 1 and 2 were tested by (1) normalising F1 and F2 values by the Lobanov (1971) method, and (2) building a set of linear mixed-effects models (LME), one for each vowel and each formant. As fixed effects, we entered *group* of speakers (B, I, F) and *language* (French vs Italian) with an interaction term into models. As random effects, we used intercepts for speaker and word. *p*-value were obtained by performing pairwise post-hoc tests with Tukey method of *p*-value adjustment for comparing a family of 4 estimates. Hypothesis 3 was tested by (1) computing average F1 and F2 values per speaker, vowel and language for the B, and (2) building a set of linear regressions, one for each formant of each vowel of each language, with *LOR* as independent variable.

Results

Results reveals that (1) B significantly differ from F controls in their L2 production as for the F1 of / ϵ / ($\beta=-0.18$, $SE=0.07$, $t=-2.80$, $p=0.037$), / e / ($\beta=0.19$, $SE=0.06$, $t=3.21$, $p=0.012$), / \circ / ($\beta=-0.18$, $SE=0.07$, $t=-2.69$, $p=0.048$) and / o / ($\beta=0.35$, $SE=0.05$, $t=6.58$, $p<.0001$), and F2 of / e / ($\beta=-0.18$, $SE=0.05$, $t=-3.63$, $p=0.004$), / \circ / ($\beta=-0.37$, $SE=0.05$, $t=-7.79$, $p<.0001$) and / o / ($\beta=0.12$, $SE=0.04$, $t=2.80$, $p=0.037$), (2) B do not differ in their L1 production from I controls as for F1 and F2 of any studied vowel (see Figure 1), (3) *LOR* does not significantly predict F1 or F2 of any of the B L1 and L2 mid vowels.

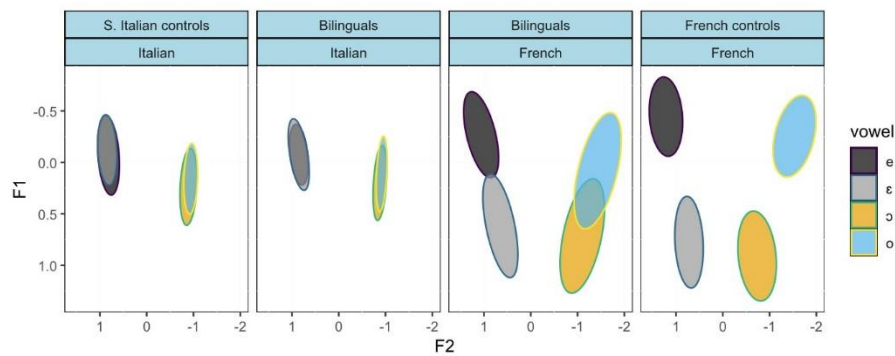


Figure 1. Normalised F1 and F2 values of Salento Italian and French mid vowels produced by the B, I and F controls. The ellipses represent 68% of data.

Discussion and conclusions

This study explored (1) the bidirectional CLI on the B L1 and L2 open and close mid vowels, by comparing the B production with that of I and F controls, and (2) whether *LOR* predicts these CLI. Hypothesis 1 concerned the influence of the B L1 front mid vowel on their L2 / e / and / ϵ /, and the influence of their back mid vowel on their L2 / o / and / \circ / leading to their inaccurate production

of French open and close mid vowels. This hypothesis was almost entirely confirmed as results show that the B differ from F controls in the F1 and F2 of all their L2 studied vowels, except for the F2 of /ɛ/. This result, in line with the SLM supposition that L2 learners attempt to classify an L2 sound into an L1 category wherever possible, is interpreted here as that many B have assimilated French /ɛ/ and /e/ into their L1 category of Salento Italian front mid vowel, and French /ɔ/ and /o/ into their L1 category of Salento Italian back mid vowel, with a consequent inaccurate production of these L2 sounds. Hypothesis 2, concerning an L2 influence on the B L1 mid vowels, was not confirmed as no significant difference was found between vowels produced by B and I controls, meaning that there is no L2 influence on the B L1 mid vowels. Because the B are heterogeneous speakers in terms of *LOR*, L1 and L2 use, L2 proficiency, age of arrival in France and L2 acquisition onset, we assume that L2-L1 influence might be found if only speakers with very strong L2 experience would be included among the B group. We also hypothesised that the *LOR* would predict the CLI in the B L1 and L2 speech, which was not confirmed. To conclude, as a group, Salento Italians living in the Paris region do not differ in their L1 mid vowels from I controls, but they differ in their L2 open and close mid vowels from F controls, indicating L1-L2 influence. The inter-speaker variability of the B has to be analysed in a follow up study as many other factors potentially affect the speaker accuracy in L2.

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