

Similarity and contrast in L1 pronunciation attrition in bilinguals

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Research on L1 pronunciation attrition shows that second language learning has bidirectional effects, with bilingual productions in the L1 as well as the L2 usually falling somewhere between those of monolingual speakers (e.g. voice onset time (VOT) [1, 2]; vowel quality [3, 4]; intonation [5]). In fact, the interplay of the two languages has been found to lead to divergences from monolingual productions in particular in areas of grammar where there are similarities between L1 and L2, and where there is therefore most competition between the systems [6]. In this context, Flege's Speech Learning Model [7] provides a convincing account of bidirectional pronunciation effects, since the phonetic systems of the two languages are predicted to interact in such a way that a single merged category will be used in the production of sounds which are "similar" in both languages, in the L1 as well as the L2; cf. [8].

However, such a merger of similar sounds in the two languages could potentially compromise the maintenance of phonemic contrasts in the L1, depending on the way in which phonetic properties are exploited to signal contrast in the two languages (Spears 2006 for French nasalisation). For instance, nasalisation in French can be used phonemically, contrasting in e.g. /ɛ/ *paix* 'father' and /ɛ̃/ *pin* 'pine', but it also occurs as a coarticulatory allophonic realisation in the context of a nasal consonant, e.g. [ɛ̃] *peine* 'effort/punishment'. In English, by contrast, nasalisation is only coarticulatory, e.g. /ɛ/ *pet* vs. [ɛ̃] *pen*. This implies that if L1 French learners of English were to develop hybrid 'intermediate' realisations across the board, their L1 nasal contrast on vowels like /ɛ/ - /ɛ̃/ could be compromised.

In this paper, we investigate to what extent contrastivity might interact with similarity in the L1 pronunciation of late bilinguals. We analysed nasalisation in tokens of French /a/, /ɛ/ and /u/ in oral and nasal contexts (CVC vs. CVN), contrasting them with nasal vowels /ã/ and /ẽ/, as well as "similar" English vowels /a/, /ɛ/ and /u/ which were also elicited in nasal and oral contexts. A VOT condition was included as a control to verify that our bilinguals were indeed comparable to those reported in the literature [1]. The productions of 5 French late bilingual speakers of English who had all lived in the UK for at least 10 years were compared with those of two monolingual control groups.

The results show that the bilinguals' productions do indeed fall between those of monolinguals (Figure 1) [1, 2, 3, 4], but also that bidirectional effects of a merger driven by similarity are overridden when an L1 contrast is at risk: Contrastive L1 phones which have a corresponding phone in L2 do not show signs of significant merger if contrast needs to be maintained (Figure 2: left and middle bar vs. right bar). We conclude that contrastiveness competes with similarity to determine category membership in the bilingual's shared phonetic space in unexpected ways.

This study confirms that the L1 continues to change under the influence of an L2 during adulthood. Our findings also show that, although similar phones can indeed be merged in the bilingual speaker's system - as predicted by the Speech Learning Model - mergers between similar phones are blocked when they threaten to undermine contrastivity in the native system. Moreover, even contrastive L1 phones which do not exist in the L2 can exhibit signs of change after L2 acquisition, showing L2 effects that are not directly motivated by similarity or contrastiveness. This suggests that bilingual speech development is not only multilayered and systematic, but that the interactions between the L1 and L2 in the developmental process are truly systemic in nature, affecting comparable elements throughout the shared bilingual system in a similar way, while both similarity and contrastiveness between the elements in the L1 and L2 delimit convergence and divergence between the two, cf. [9].

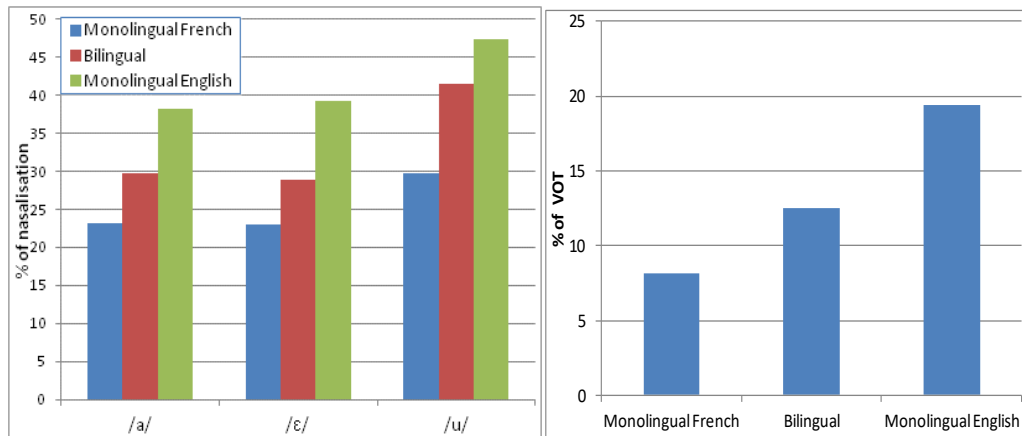


Figure 1. Mean coarticulatory nasalisation as percentage of vowel duration (left) and VOT (/t/ + /u/) as percentage of syllable duration (right) for mono- and bilinguals.

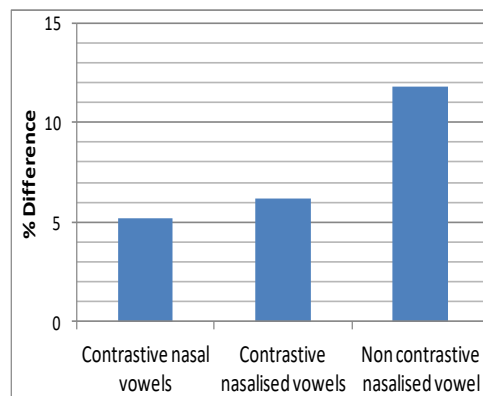


Figure 2. Difference (%) between bilingual and monolingual speakers for contrastive nasal /ã, ẽ/, nasalised allophonic [ã, ẽ] (is contrastive in French) & nasalised allophonic [ũ].

- [1] Flege, J., E. (1987). The Production of “new” and “similar” phones in a foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics* 15: 47-65.
- [2] Major, R. (1992). Losing English as a first language. *The Modern Language Journal* 76 (2): 190–208.
- [3] Jiang, H. (2008). *Effect of L2 phonetic learning on L1 vowels*. Doctoral thesis Simon Fraser University, Canada.
- [4] Chang, C. B. (2012). Rapid and multifaceted effects of second-language learning on first-language speech production. *Journal of Phonetics*, 40(2), 249-268.
- [5] Mennen, I. (2004). Bi-directional interference in the intonation of Dutch speakers of Greek. *Journal of Phonetics*, 32, 543-563.
- [6] Schmid, M.S. (2010). Languages at play: The relevance of L1 attrition to the study of bilingualism. *Bilingualism: Language and Cognition* 13(1), 1–7.
- [7] Flege, J.E. (1995). Second language speech learning: Theory, findings, and problems. In: W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233–272). Baltimore, MD: York Press.
- [8] Lord, G. (2008). Second language acquisition and first language phonological modification. In: J. B. de Garavito & E. Valenzuela (Eds.), *Selected proceedings of the 10th Hispanic linguistics symposium* (pp. 184–193). Somerville, MA: Cascadilla Proceedings Project.
- [9] De Bot, K., Lowie, W., & Verspoor, M. (2007). A Dynamic Systems Theory approach to second language acquisition. *Bilingualism: Language and Cognition*, 10, 7–21.