

## **Influence from English on the production of the /tʎ/ cluster by Mexican**

### **Spanish—English bilinguals**

In Spanish, we can find the /tʎ/ cluster with modest frequency in word—medial position, particularly in words derived from Greek such as *atlas* (atlas) and *atleta* (athlete). However, the occurrence of this cluster beyond the aforementioned context is restricted to select varieties of Spanish in contact with Amerindian languages. One such variety is Mexican Spanish, which has been in contact with indigenous languages such as Nahuatl for hundreds of years. As a result, in Mexican Spanish, the /tʎ/ cluster has been attested in various contexts: word—initial (e.g. *Tlaxcala*), word—medial (e.g. *cenxontle*), and word—final (e.g. *Popocatepetl*). The less restricted occurrence of /tʎ/ in Mexican Spanish lexicon is accounted for as sourced from Nahuatl lateral affricate /tʎ/.

In English, /tʎ/ clusters word—initially are not permissible, though they occur word—medially and word—finally (e.g. *atlas* and *bottle*; note that the vowel in the latter word is not pronounced). Accordingly, Mexican Spanish and English have a word—medial and word—final /tʎ/ cluster, but only Mexican Spanish has the cluster word—initially. In addition, English production of /tʎ/ is described as a voiced alveolar lateral approximant (e.g. [at.las] ), whereas in Mexican Spanish, this sound is characterized as a voiceless alveolar lateral fricative (e.g. [po.po.ka.te.petʎ]). In other words, in American English, the /l/ sound in the cluster of interest is pronounced like a typical English /l/. On the other hand, the /l/ sound in this cluster in Mexican Spanish is often described as being pronounced in a different manner than a typical Spanish /l/. The sound is, in fact, characterized as being more similar to the /l/ sound in Nahuatl. This happens particularly in words borrowed from indigenous languages, such as city names, spiritual/religious words, and other cultural terminology.

Although bilingual speakers tend to have one language that is more dominant than the other, at least in certain contexts, previous research has shown that, in general, there is bidirectional linguistic influence in the bilingual mind [1]. Other studies have looked at how Spanish-English bilinguals learn the difference between the /l/'s in both languages [2], but to my knowledge, no researcher has explored the difference in production of /tl/ clusters in this population. Consequently, my research asks: Do Mexican Spanish—English bilinguals maintain a uniform [tl]—like acoustic production in their Spanish speech? If not, is variation in production mediated by segment position, since /tl/ clusters are common to both languages only word—medially and word—finally? This can be translated in more general terms to: Do bilinguals maintained the Nahuatl—influenced /tl/ pronunciation found in Mexican Spanish monolinguals or does their knowledge of English have an impact on this pronunciation? And if there is an effect, is it more visible in the context where English has this cluster (i.e. word—medially and word—finally) or everywhere?

To test the former research question, I compare the productions of /tl/ in Greek—derived words, which are cognates with English, to Nahuatl—derived words, exclusive to Mexican Spanish. To address the latter question, I compare the acoustic properties of /tl/ in word—initial, word—medial, and word—final position. This research project is a preliminary study that investigates whether or not English influence in Mexican Spanish /tl/ can be perceived in specific word positions. The study observes the acoustic information obtained from oral productions of this cluster by the population of interest.

To complete this study, I conducted a word—list reading task with 10 Mexican Spanish—English advanced bilinguals born and raised in Mexico. The word—list contained 15 Spanish

words with the cluster /tʎ/ in toponyms (e.g. *Tlaxcala*) and non—patrimonial words also found in English (e.g. *atlas*). In total, 150 tokens were collected and analyzed for voicing, intensity, and rise time. The data were submitted to mixed—effects linear regression models in R, which measured (1) voicing, (2) intensity, and (3) rise time as a function of Word Type (Amerindian/English—cognate) by Word Position. Subject and token were presented as random intercepts. Voicing, intensity, and rise time have been shown to distinguish between an /l/ and an /ʎ/ productions. Thus, these metrics will help determine if the production of this cluster by the participants is more similar to the typical English or Spanish /l/ or to the Nahuatl /ʎ/.

Preliminary results show a difference in Word Type and Position on voicing and rise time only. That is, speakers maintain a [tʎ]—like production for Amerindian words, as well as in word—initial and word—final position, whereas they shift to a bi—segmental production of /tʎ/ in English—cognate words and in word—medial /tʎ/. The differential production of Spanish /tʎ/ by English cognate status suggests a direct influence of English in the pronunciation of this cluster and additionally highlights voicing and rise time as stronger acoustic correlates of liquid ~ fricative sounds than intensity. That is to say, according to the preliminary results, the former metrics are better at comparing /l/ and /ʎ/ sounds than intensity is.

## References

- [1] Barlow, J. A. (2014). Age of acquisition and allophony in Spanish-English bilinguals. *Frontiers in psychology*, 5, 1-14.
- [2] Barlow, J. A., Branson, P. E., & Nip, I. S. (2013). Phonetic equivalence in the acquisition of /ʎ/ by Spanish-English bilingual children. *Bilingualism: Language and Cognition*, 16 (1), 68-85.