Syntactic interlanguage speech benefit: an ERP study

Previous experimental evidence suggests that listeners better understand second language (L2) speech if it is uttered by non-native speakers (with whom they share or not their L1) as compared to when it is uttered by native speakers. This advantage is called interlanguage speech benefit and it reflects facilitation in L2 comprehension presumably due to shared linguistic and non-linguistic knowledge between interlocutors. The interlanguage speech benefit has been reported in different linguistic domains (e.g., phonology, semantics), with non-native listeners' advantages in detecting L2 phonological, lexical and semantic cues when produced by non-native speakers as compared to native speakers (Bent & Bradlow, 2003; Hayes-Harb et al., 2008; Smith & Rafiqzad, 1979). The present ERP study is aimed at testing whether an interlanguage speech benefit can be observed even in the syntactic domain. To this aim, we took into account the case of morphosyntactic violations uttered by native (not sharing the L1 with the listeners) and non-native speakers (sharing the L1 with the listeners). Previous ERP studies showed that L2 listeners have difficulties in the processing of grammar errors produced by native speakers, with a concomitant reduction of the brain correlates typically associated with grammar processing (e.g., reduced early negative effects and/or reduced P600 effects -late posterior positive effects- in response to L2 morphosyntactic violations; Rossi, Gugler, Friederici, & Hahne, 2006). The interlanguage speech benefit hypothesis predicts that these difficulties should be reduced when L2 morphosyntactic violations are produced by non-native speakers, with ERP effects of grammar processing becoming more evident.

English-Spanish bilinguals (highly-proficient late learners of Spanish) were presented with one-hundred eighty Spanish utterances which could be grammatically correct or incorrect. Two types of article-noun agreement violations were included: number and gender violations. The utterances were produced by Spanish native speakers and by English-Spanish speakers with a clear English accent when speaking in Spanish. Sentences of both accents showed similar high levels of intelligibility. ERP waveforms time-locked to the onset of the target noun were derived for each experimental condition. Repeated-measures Anovas were conducted on a subset of centro-posterior electrodes (9 channels) in the following time windows: 300-500 ms; 500-1000 ms; 1000-1500 ms. The ANOVAs included Accent (native, non-native), and Grammaticality (number violation, gender violation, grammatically correct sentence) as within-subject factors.

Preliminary ERP results from 10 participants show an effect of Grammaticality in the late time window (300-500 ms: $F(2,18)=1.99$, $p=.17$; 500-1000 ms: $F(2,18)=2.46$, $p=.11$; 1000-1500 ms: $F(2,18)=7.95$, $p<.01$), with a greater P600 for number violations as compared to correct sentences regardless of the accent (number: $t(9)=3.72$, $p<.01$). For the gender violation, exploratory analyses for each accent type showed a P600 effect only in the case of non-native accent (1000-1500 ms, non-native accent: $t(9)=3.04$, $p<.05$; native accent: $t(9)<1$; see Figure 1). However, the interaction Grammaticality x Accent was not significant (300-500 ms: $F<1$; 500-1000 ms: $F(2,18)=1.25$, $p=.31$; 1000-1500 ms: $F(2,18)=2.40$, $p=.12$), probably due to the small sample size.

This trend in the data seems to be in line with the presence of an interlanguage speech benefit even within the morphosyntactic domain, at least in the case of grammatical gender (a domain where L2 listeners typically show persistent difficulties; Kroll & de Groot, 2005). Additional participants will be recruited in order to see whether this trend is confirmed with a larger sample.

References:

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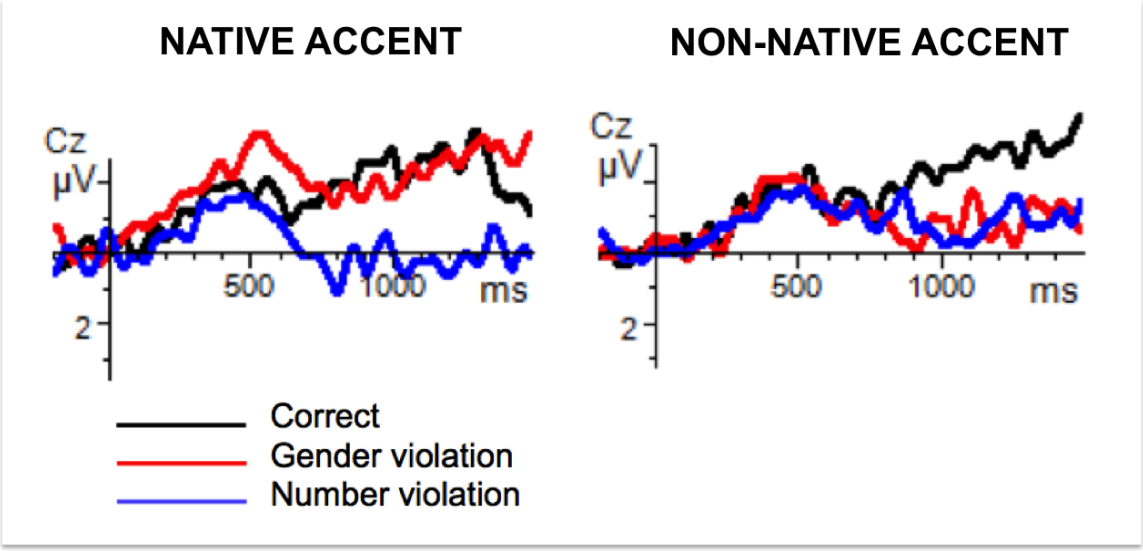

Figure 1. Preliminary grand-average waveforms for each experimental condition (n=10). Negativity is plotted upwards.