

The role of segmental and suprasegmental information in the perception of foreign-accented English by native and non-native speakers

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In several experiments, listeners were asked to evaluate the personality of a speaker after listening to short samples of speech. Unknown to the listeners, a single talker had produced a single speech sample twice, once in an accented guise and another time with no accent (Anisfeld et al. 1962, Arthur et al. 1974). In other experiments, speech samples produced by larger numbers of both native and non-native speakers were evaluated (Spencer-Rodgers and McGovern 2002, Ryan and Carranza 1975). The consistent finding of such studies seems to be that a person whose speech is accented will be rated less favorably (along subjective rating scales such as intelligent vs. stupid or kind vs. dull) than speakers who talk without a foreign accent.

Often, foreign accents are stigmatized and stereotyped as illustrative of a "broken" form of the language (Hosoda et al. 2007, Lindemann 2005, 2003). Recent research shows that, regardless of social context, foreign accented speech causes a reduction in cognitive fluency, which was found to have a negative effect on credibility (Lev-Ari and Keysar 2010). These findings raise the question of the extent to which linguistic factors such as segmental or suprasegmental (i.e. intonation) properties may also play a part in foreign accent perception. For example, is Italian intonation universally perceived as beautifully sounding, whereas Russian sounds are perceived as 'harsh' and 'guttural' (Lindemann, 2005)?

To address this question, an experiment was designed following in part Winters & O'Brien (2013), with the goal of determining the relative contributions of suprasegmental and segmental features to the perception of foreign accented speech. We recorded sentences in English, spoken by native speakers of Russian and Italian (2 in each group, 1 male and 1 female) who have lived in the US for less than 2 years and exhibited strong foreign accents (as determined by a perceptual experiment with a group of native English listeners). We also recorded 2 native English speakers to serve as a control. The recordings were manipulated to form 3 sets:

(a) **Naturally produced sentences:** no manipulation

(b) **Intonation Only:** the sentences were filtered in Praat with a low-pass Hann filter (400 Hz cut-off), preserving only aspects pertaining to the overall intonation, without any linguistic content in the form of intelligible words or sounds.

(c) **Segmental Only (for the Russian and Italian stimuli):** foreign pronunciation was preserved in terms of consonants and vowels, however, their intonation resembled that of native English speakers. This was accomplished using an imitation task in which the non-native speakers were asked to imitate English sentences uttered by native speakers immediately after listening to them. This method was successful in other studies (Adank et al. 2010), as direct imitation can produce behavior that temporarily exceeds actual competence (Barry, Heoquist, & Nolan, 1989). The similarity of the non-native productions to native ones was also validated by pitch track comparisons in Praat.

Using these stimuli, counterbalanced lists were created and presented to 58 participants residing in New York City (26 native speakers of English and 32 native speakers of other languages). Due to the impossibility of arranging in-person meetings during the Covid-19 crisis, the experiment was conducted online using Google Forms. The experimental

task required participants to rate each utterance in terms of *pleasantness*, *honesty*, *self-confidence*, and *expressiveness* on a 1-5 Likert scale. The analysis consisted of computing mean scores for each variable, and determining the effect of *language*, *sentence type*, and *gender* using univariate ANOVAs.

Preliminary findings based on the responses of the native English speakers only (n=26) show that English was preferred in the natural condition, while no significant differences were found between Italian and Russian in any conditions (Fig. 1). In addition, the Intonation Only condition was the least preferred of the three options. Closer investigation of the different dimensions rated by the listeners revealed a tendency to rate the Italian accent as more pleasant but less confident than the Russian one (Fig. 2). Both Italian and Russian were perceived as less emotional and less pleasant than English. There was no effect of speaker gender.

The analysis is underway for the data collected from 32 non-native speakers of English. Based on previous work, we predict the general pattern will resemble that exhibited by the native speakers, though it is likely that non-native speakers' reactions to foreign-accented English are not as negative (as reflected by higher scores in general).

Our results support previous findings (Sato 1998, Lev-Ari & Keysar 2010). Having a foreign accent causes speakers to be perceived as less emotional and less pleasant, even when the intonation is native-like and even in a multicultural environment like New York City. We thus add to the body of work on foreign accent perception and the mechanisms underlying listeners' reactions. Future work will also address the question whether the native speakers' negative ratings are underlain by sociolinguistic attitudes versus a reduction in cognitive load by including an intelligibility component.

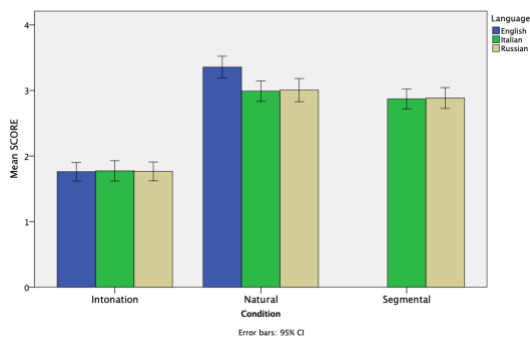


Fig. 1. Overall ratings for the three languages.

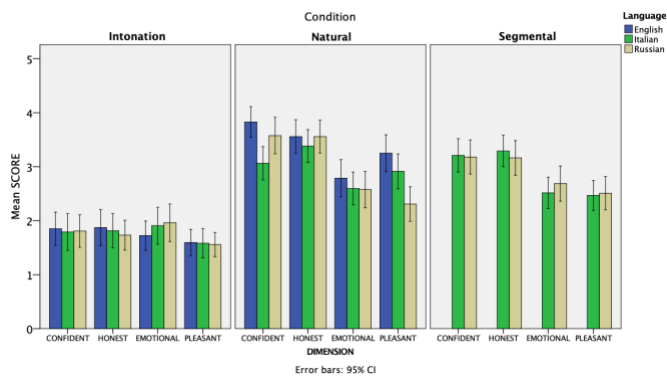


Fig. 2. Mean ratings for the four categories, by language and condition.

Selected References

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