Lexical access speed in English and Bulgarian in a cross-language lexical decision task: The effect of formant manipulation in English words

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Background: It is known that non-native speakers of a language can find non-native speech in that language easier to process than native speech. In a related investigation, Szakay, Babel, and King (2016) showed that a sociolinguistic link between a language and a variety of a different language, can improve processing times. Māori (L2) / English (L1) bilinguals who have been immersed in Māori process Māori English words faster when the words have been primed by a Māori translation compared to a standard New Zealand English prime. **Questions:** Do words with a stronger Bulgarian accent (BA) in English (modulated by vowel formant structure) lead to faster processing for Bulgarian (L1) / English (L2) bilinguals? Does the sociolinguistic link between Bulgarian words and Bulgarian-accented English representations improve RTs compared to Bulgarian and RP-like English representations?

Design: Reaction times of Bulgarian (L1) / English (L2) bilinguals were measured in a lexical decision task. The participants were 20 Bulgarian (L1) / English (L2) bilingual adults (7 female) with high English proficiency. The auditory prime-target pairs contained English words and Bulgarian (translations or unrelated) words. Half of the English stimuli were recorded with a strong Bulgarian accent (BA) and half with an approximation of RP. All non-filler English words had stressed /ɪ/. The F1 and F2 of /ɪ/ in half of the strong BA words and in half of the RP-like words were manipulated to resemble the structure of the Bulgarian equivalent /i/. This resulted in a continuum of English words with 4 different strength of BA (raw RP-like < manipulated RP-like < raw strong BA < manipulated strong BA), rated as such by native English listeners in a separate experiment. The lexical decision task contained 8 cross-language blocks (Bulgarian priming each of the 4 members of the English continuum, and vice versa) and 3 monolingual blocks (Bulgarian priming Bulgarian, weak BA priming weak BA, strong BA priming strong BA). Each block contained 2 semantically matching pairs (translations in cross-language blocks or equivalents in monolingual blocks), 1 semantically non-matching pair, 1 pair with a non-word target, and an equal proportion of fillers. For the purposes of a larger-scale experiment, half of the participants heard a sentence in the accent they were about to hear before each block and half did not hear such a sentence.

Results and Discussion: A linear mixed effects model showed significant main effects of *Priming language*, *Target language,* and *Semantic relationship,* and significant interactions between: *Prime* and *Target language; Priming language* and *Semantic relationship; Target language* and *Semantic relationship*, *Target manipulation* and *Semantic relationship*; *Target language, Prime language* and *Semantic relationship*. The results suggest that the native accent in L2 of both the priming and target language can affect the speed of processing of bilinguals. Bulgarian primes led to faster RT overall, possibly related to a direction of priming effect. However, the more Bulgarian-like the target, the faster it is recognised. In addition, in semantically matching trials the formant manipulation led to faster reaction times than unmanipulated words, suggesting that the phonetic resemblance of the English stressed vowel to the Bulgarian equivalent can improve L2 processing.

References: SZAKAY, A., BABEL, M. and KING, J., 2016. Social categories are shared across bilinguals' lexicons. Journal of Phonetics. vol. 59, pp. 92-109.