

Identification and discrimination of English word-final unreleased voiceless stops by Brazilian EFL learners

Reiner Vinicius Perozzo & Ubiratã Kickhöfel Alves

Federal University of Rio Grande do Sul/CAPES/CNPq

linguistica.reiner@gmail.com, ukalves@gmail.com

Final unreleased plosives constitute one of the most common patterns found in English phonology (Selkirk, 1982; Yavas, 2006; Celce-Murcia *et al.*, 2010; Davidson, 2011). With regard to L2 speech perception, Brazilian learners of English are likely to find it difficult to both discriminate and identify this phonetic aspect, which may hinder their comprehension and put the intelligibility of English words at risk (Abramson; Tingsabhadh, 1999). This study focused on how Southern Brazilian EFL learners perceive, in terms of distinctions in place of articulation, the English unreleased voiceless stops /p/, /t/, and /k/ in word-final position. More specifically, this study aimed to (i) investigate whether one place of articulation (labial /p/, alveolar /t/ or velar /k/) allows for higher accuracy levels in perception (both in sound discrimination and identification); (ii) verify whether the vowel that precedes the final plosive plays a role in the perception of the accurate place of articulation; (iii) investigate whether the learners' proficiency level in the L2 has an effect on the identification and discrimination of these final consonants. Thirty-two undergraduate students, taking their first semester in the English Language course at the Federal University of Rio Grande do Sul (Brazil), took part in the study. All participants filled in a Student Information Questionnaire, in which learners provided their second language learning background information, as well as other extra linguistic details on their learning of English. All participants also filled in a Consent Form, through which they were informed about and agreed to take part in all the procedures taken in the study. Each participant was provided with an identification number, which granted them access to the online perception tests, and also preserved their identities in the analysis of the data. In order to assess their proficiency level in English, all participants sat for the Oxford Placement Test (Allan, 2004), which grouped them in two different proficiency levels: basic and intermediate. In order to determine the perceptual accuracy regarding the place of articulation of the three consonants, two perception tasks were applied: (1) The Perceptual Identification Test, which presented 81 stimuli (27 types produced 3 times, by each one of the three native speakers who had recorded the stimuli) and were shown in a random order. In this task, participants had to listen to the target word and answer to a multiple choice question which asked them to choose which consonant the word ended with /p/, /t/ or /k/. After choosing the alternative they thought correct, learners had to press a button in order to start the next question. After the fortieth question, learners were given a five-minute interval so that they could rest. (2) The Categorical Discrimination Test, which was built in an ABX format (Lieberman *et al.*, 1957) and consisted of 135 questions, which were also presented in a random order. In this test, each question presents a sequence of three words, which could be either a cluster or a catch trial. In a cluster, two of the tokens in the triad refer to the same word and one of them corresponds to a different lexical item (*beep-beak-beep*), whereas in a catch trial the three tokens are productions of the same word (*beep-beep-beep*). In this test, participants were asked to discriminate the final segments that appeared in the triads. There was a 500 millisecond pause between the words in the triad. Learners should choose whether the final consonant in the last word of the sequence was (a) the same as the final consonant in the second word of the triad; (b) the same as the final consonant in the first word of the triad; or (c) the three final consonants in the triads were the same. The words which served as auditory stimuli in both tasks were selected to meet the CVC syllabic structure (e.g., *beep*, *lit*, *sack*) and were equidistributed according to the vowels /i/, /ɪ/, and /æ/, as in *beat*, *bit*, *bat*. The audio stimuli were recorded by three male speakers of American English (Western US), aged between 20 and 21. The recordings took place in a professional studio so that the quality of the audio was guaranteed. For the recordings, a unidirectional microphone was used, with frequency range from 20 to 2000Hz, and sample rate at 44100 Hz. Each one of the speakers read a list containing the target words twice, so that the best token in the two productions of the same word could be chosen in the building of the perception experiment. All participants took the online tests in the Language Laboratory at the university, and it took them about 25 minutes in average to complete both tests. Silence was preserved in the Language Lab while the tests were being taken. The results, which were

interpreted based on the Perceptual Assimilation Model-L2 (Best & Tyler, 2007) and with the support of the literature in Phonetics (Hume *et al.*, 1999; Jun, 1995; Ladefoged & Johnson, 2011; Lisker, 1999), suggest that: (i') the participants identified and discriminated the final segments /p/ and /k/ more accurately than the final segment /t/; (ii') there were higher levels of accuracy in both tasks when the nuclear vowel was short/lax; and (iii') the level of proficiency of the participants was not crucial to ascertain perceptual accuracy, both in the perceptual identification task and in the categorical discrimination task.

References

- Abramson, A.; Tingsabadh, K. (1999) Thai Final Stops: Cross-Language Perception. *Phonetica*, 56(2), pp. 111-122.
- Allan, D. (2004). *Oxford Placement Test*. Oxford: Oxford University Press.
- Best, C., & Tyler, M. (2007). Nonnative and second-language speech perception: commonalities and complementarities. In O.S. B. & M. M. *Language experience in second language speech learning: In honor of James Emil Flege* (pp. 13-34). Philadelphia: John Benjamins Publishing Company.
- Celce-Murcia, M., Brinton, D., Goodwin, J., & Griner, B. (2010). *Teaching Pronunciation: a coursebook and reference guide*. Cambridge: Cambridge University Press.
- Davidson, L. (2011). Characteristics of Stop Release in American English Spontaneous Speech. *Speech Communication*, 53(8), pp. 1042-1058.
- Hume, E., Johnson, K., Seo, M., & Tserdanelis, G. (1999). A cross-linguistic study of stop place perception. *XIV International Congress of Phonetic Sciences* (pp. 2069-2072). San Francisco: University of California.
- Jun, J. (1995). Place assimilation as the result of conflicting perceptual and articulatory constraints. *West Coast Conference on Formal Linguistics* (pp. 221-237). Los Angeles: CSLI Publications.
- Ladefoged, P., & Johnson, K. (2011). *A course in Phonetics*. Boston: Cengage Learning.
- Liberman, A., Harris, K., Hoffmann, H., & Griffith, B. (1957). The discrimination of speech sounds within and across phoneme boundaries. *Journal of Experimental Psychology*, 54(5), pp. 358-368.
- Lisker, L. (1999). Perceiving final voiceless stops without release: effects of preceding monophthongs versus nonmonophthongs. *Phonetica*, 56(1), pp. 44-55.
- Selkirk, E. O. The Syllable. (1982). In: HULST, H; SMITH, N. (Eds.). *The Structure of Phonological Representations*. Dordrecht: Foris Publications, p. 337-383.
- Yavas, M. (2006) *Applied English Phonology*. Malden: Blackwell Publishers.
