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Rhotic Production Training in Beginner Spanish Learners with L1 Canadian English

Spanish and English differ greatly in their rhotic inventories. Spanish has two alveolar rhotics, the tap and the trill, which contrast only intervocalically (*pero* “but”, *perro* “dog”) (Hualde, 2014; Schwegler, Kempff, & Ameal-Guerra, 2010). Canadian English has an alveolar approximant rhotic phoneme, possible in any position (*road*, *trace*, *caring*, *afraid*, *fort*, *car*), and a post-tonic, intervocalic apico-alveolar flap allophone of /t/ and /d/ (*later*, *ladder*), similar (but not identical) to the tap (Hualde, 2014; O’Grady & Archibald, 2016; Schwegler et al., 2010).

Target-like production of L2 Spanish rhotics is difficult and may vary depending on the linguistic variables of rhotic type (Face, 2006), phonological environment (Hurtado & Estrada, 2010; Olsen, 2012, 2016), and phonetic parameter (Colantoni & Steele, 2008), as well as the learner variables of L2 proficiency (Face, 2006), formal instruction in rhotic pronunciation (Hurtado & Estrada, 2010; Weech, 2009), and length of residence in a Spanish-speaking country (Weech, 2009). Following various models of L2 phonology (Flege, 1995, among others), as well as neuroscience studies on and theoretical approaches to perception and production (Calvert et al., 1997; Fowler, 1986; among others), target-like rhotic production may be linked to target-like perception of Spanish rhotics. Target-like perception of the tap-trill contrast (perceptually associating the correct rhotic with the correct word) may be difficult for L2 learners to achieve (Daidone & Darcy, 2014; Scarpace, 2014). However, Herd, Jongman, and Sereno (2013) have provided evidence for the effectiveness of phonetic training for perception and production of intervocalic taps and trills in L2 Spanish learners with L1 American English.

This study addressed the following research question: Can beginner L2 Spanish learners with L1 Canadian English improve their production of Spanish rhotics with phonetic training? It was hypothesized that for target taps and target trills, improvement would be greater intervocalically than pre- or post-consonantly or word-initially, and that for optional taps or trills, improvement would be smaller than for obligatory intervocalic taps or trills (following Hurtado & Estrada, 2010). Over one 50-minute session, participants completed a pre- and post-test reading task (70 stimuli, 10 per rhotic type/position), a perception training task (35 stimuli, 5 per rhotic type/position), a production training task (70 stimuli, 10 per rhotic type/position), and a distracter task (between the training tasks) to clear stimuli from short-term memory.

Results for this study showed that: (1) For target taps, improvement with training toward target-like or near-target-like productions occurred for the parameters of voicing and manner, respectively, but not for duration. (2) For target trills and optional taps/trills, improvement with training toward target-like productions occurred for both voicing and manner, with duration already being target-like at pre-test. (3) Taps and optional taps/trills were produced as approximants at pre-test and as approximants or trills at post-test.

This study provides some evidence that, with a short amount of phonetic training, beginner L2 Spanish learners with L1 Canadian English may show more production improvement for trills or for optional taps or trills than for taps. In addition, it provides some evidence that order of acquisition of parameters may vary depending on rhotic type, with duration acquired after voicing and manner for target taps and optional taps or trills, and before voicing and manner for target trills. These conclusions follow Flege’s Speech Learning Model (1995), since more production improvement occurred for the trill, a new sound for these learners, than for the tap, a similar sound. Also, they expand on findings by Colantoni and Steele (2008), that for L2 Spanish learners, simultaneously acquiring multiple parameters for taps in different phonological environments may be difficult to achieve.

References for Abstract:

- Calvert, G. A., Bullmore, E. T., Brammer, M. J., Campbell, R., Williams, S. C. R., McGuire, P. K., ... David, A. S. (1997). Activation of auditory cortex during silent lipreading. *Science*, 276(5312), 593-596. DOI: 10.1126/science.276.5312.593
- Colantoni, L., & Steele, J. (2008). Integrating articulatory constraints into models of second language phonological acquisition. *Applied Psycholinguistics*, 29(3), 489-534. <https://doi.org/10.1017/S0142716408080223>
- Daidone, D., & Darcy, I. (2014). *Quierro comprar una guitarra*: Lexical encoding of the tap and trill by L2 learners of Spanish. In R. T. Miller et al. (Eds.), *Selected Proceedings of the 2012 Second Language Research Forum*, 39-50. Somerville, MA: Cascadilla Proceedings Project. Retrieved from <http://www.lingref.com/cpp/slrf/2012/paper3084.pdf>
- Face, T. L. (2006). Intervocalic rhotic pronunciation by adult learners of Spanish as a second language. In C. A. Klee & T. L. Face (Eds.), *Selected Proceedings of the 7th Conference on the Acquisition of Spanish and Portuguese as First and Second Languages*, 47-58. Somerville, MA: Cascadilla Proceedings Project. Retrieved from <http://www.lingref.com/cpp/casp/7/paper1274.pdf>
- Flege, J. E. (1995). Second language speech learning: Theory, findings and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233-277). Timonium, MD: York Press.
- Fowler, C. A. (1986). An event approach to the study of speech perception from a direct-realist perspective. *Journal of Phonetics*, 14(1), 3-28.
- Herd, W., Jongman, A., & Sereno, J. (2013). Perceptual and production training of intervocalic /d, r, r/ in American English learners of Spanish. *The Journal of the Acoustical Society of America*, 133(6), 4247-4254. <http://dx.doi.org/10.1121/1.4802902>
- Hualde, J. I. (2014). *Los sonidos del español*. Cambridge, UK: Cambridge University Press.
- Hurtado, L. M., & Estrada, C. (2010). Factors influencing the second language acquisition of Spanish vibrants. *The Modern Language Journal*, 94(1), 74-86. Retrieved from <http://www.jstor.org/stable/25612288>
- O'Grady, W., & Archibald, J. (2016). *Contemporary linguistic analysis: An introduction*. Don Mills, Ontario: Pearson Canada.
- Olsen, M. K. (2012). The L2 acquisition of Spanish rhotics by L1 English speakers: The effect of L1 articulatory routines and phonetic context for allophonic variation. *Hispania*, 95(1), 65-82. Retrieved from <http://www.jstor.org/stable/41440363>
- Olsen, M. K. (2016). Limitations of the influence of English phonetics and phonology on L2 Spanish rhotics. *Borealis: An International Journal of Hispanic Linguistics*, 5(2), 313-331. Retrieved from <http://dx.doi.org/10.7557/1.5.2.3898>
- Scarpace, D. (2014). The acquisition of the tap/trill contrast within and across words in Spanish. *Proceedings of the International Symposium on the Acquisition of Second Language Speech. Concordia Working Papers in Applied Linguistics*, 5, 580-596. Retrieved from http://doe.concordia.ca/copad/documents/37_Scarpace_Vol5.pdf
- Schwegler, A., Kempff, J., & Ameal-Guerra, A. (2010). *Fonética y fonología españolas* (4th ed.). Hoboken, NJ: John Wiley & Sons.
- Weech, A. M. (2009). Second language acquisition of the Spanish tap and trill in a contact learning environment. (Master's thesis, Brigham Young University). Retrieved from <http://scholarsarchive.byu.edu/etd/2031/>