Phonetic cross-linguistic similarity

Anna Balas (Adam Mickiewicz University, Poznań) & Romana Kopečková (University of Münster)

The field of non-native speech acquisition has used the notion of cross-linguistic similarity from simplified one-to-one relationships to perceived similarity, but there is still no consensus on the most appropriate method of measuring it. This is rather troublesome considering that the most influential models of the acquisition of second language (L2) speech center around the notion of similarity.

Flege's (1995) Speech Learning Model (SLM) and its revised version (SLM-r; Flege and Bohn 2021), advance that a new phonetic category can only be formed when a learner notices phonetic differences between the L2 sound and the first language (L1) sound that is closest to it in phonetic space. As the degree of perceived cross-linguistic phonetic dissimilarity between an L2 and an L1 sound increases, the likelihood of equivalence classification decreases, and L2 category formation becomes more likely. The formation of new phonetic categories for L2 sounds is further hypothesized in the model to depend on the precision of L1 categories at the time L2 learning begins (Flege and Bohn 2021). According to Best's (1995) Perceptual Assimilation Model (PAM) and its L2 variant (PAM-L2; Best & Tyler 2007), it is the perceived similarity of the articulatory gestures in a target-language contrast to the gestures in the L1 that determines discrimination predictions. Similarly to PAM/ PAM-L2, the Second Language Perception Model (L2LP; Escudero and Boersma 2004, Escudero, 2009) juxtaposes new and similar L2 contrasts, but, following the SLM, this model uses acoustic information to predict cross-linguistic categorization.

Speech sounds with a special status also seem to be attested, as shown by the Natural Referent Vowel framework (Polka and Bohn 2003, 2011), and as suggested for the alveolar place of articulation and stops for the category of consonants (Bohn 2020). Do other sounds with such a special status exist? To what extent does the (development of) perceived phonetic cross-linguistic similarity of such sounds differ from other sounds?

This workshop aims to address the latest developments in understanding phonetic cross-linguistic similarity both in second and third language (L3) acquisition. Comparisons between speech sounds or prosodic systems of two languages tend to be challenging, yet operationalizing differences between three phonetic systems seems to be urgently needed in the light of growing interest in phonetic aspects of L3 acquisition. Perception tasks targeting cross-linguistic similarity between the sounds in a multilingual's repertoire would be very much welcome in the field.

We envisage the focus of the workshop on how cross-linguistic phonetic similarity can be best measured in L2 and L3 speech learning contexts, respectively. Also, related issues need addressing. How does perceptual similarity compare to acoustic similarity (cf. Georgiou 2023, Balas et al. 2023)? Can we understand similar sounds as differing by a limited number of processes as conceived by Natural Phonology (Donegan 1985, Dziubalska-Kołaczyk 1990)? How does language distance affect cross-linguistic similarity? Can studying reciprocal perceptual similarity and ecphoric similarity bring us closer to an understanding of what is

comparable in different languages (Cebrian 2022)? How does perceived phonetic cross-linguistic similarity change over time (cf. Gut, Kopečková, and Nelson 2023)? Do metacognitive abilities moderate the perception of phonetic cross-linguistic similarity (Kartushina, Soto, and Martin 2022)?

We are interested in an array of applications of examining phonetic cross-linguistic similarity, from research-oriented to applications in non-native language learning and teaching (cf. Ringbom 2006).

References:

Balas, A., Wrembel, M., Kaźmierski, K., Weckwerth, J. et al. (2023). Determining perceptual and acoustic similarity between native and non-native vowels. In R. Skarnitzl & J. Volín (eds.), *Proceedings of the 20*[th] *International Congress of Phonetic Sciences* (pp. 2617-2621). Prague: Guarant International.

Best, C. T. (1995). A direct realist view of cross-language speech perception. In W. Strange (ed.), *Speech Perception and Linguistic Experience: Issues in Cross Language Research* (pp. 171-204), Timonium, MD: York Press.

Best, C. T., and Tyler, M. D. (2007). Nonnative and second-language speech perception. In O. S. Bohn and M. J. Munro (eds), *Language Experience in Second Language Speech Learning: In honor of James Emil Flege* (pp. 13-34), Amsterdam: John Benjamins.

Bohn, 0.-S. (2020). Cross-language phonetic relationships account for most, but not all L2 speech learning problems: The role of universal phonetic biases and generalized sensitivities. In M. Wrembel, A. Kielkiewicz- Janowiak, & P Gąsiorowski (eds.), *Approaches to the study ofsound structure and speech: Interdisciplinary work in honour ofKatarzyna Dziubalska-Kolaczyk* (pp. 171-184). Abingdon, England: Routledge.

Cebrian, J. (2022). Perception of English and Catalan vowels by English and Catalan listeners. Part II. Perceptual vs. ecphoric similarity. *Journal of the Acoustical Society of America* 152, 2781-2793.

Donegan, P. 1985. *On the Natural Phonology of vowels*. New York: Garland Publishing Inc.

Dziubalska-Kołaczyk, K. 1990. *A theory of second language acquisition within the framework of Natural Phonology.* Poznań: Wydawnictwo Naukowe Uniwersytetu im. Adama Mickiewicza w Poznaniu.

Escudero (2009). Linguistic perception of 'similar' L2 sounds. In P. Boersma & S. Hamann (eds.), *Phonology in perception* (pp. 151-190). Berlin: Mouton de Gruyter.

Escudero, P., and Boersma, P. (2004). Bridging the gap between L2 speech perception research and phonological theory. *Studies in Second Language Acquisition* 26 (4), 551–585.

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), Baltimore, MD: York Press.

Flege, J. E., and Bohn's, O.-S. (2021). The Revised Speech Learning Model (SLM-R). In R. Wayland (ed.), *Second Language Speech Learning: Theoretical and Empirical Progress* (pp. 3-83), Cambridge: CUP.

Georgiou, G.P., and Dimitriou, D. (2023) Perception of Dutch vowels by Cypriot Greek listeners: To what extent can listeners' patterns be predicted by acoustic and perceptual similarity?, *Attention, Perception, & Psychophysics* 85, 2459–2474.

Gut, U., Kopečková, R. & Nelson, Ch. (2023). *Phonetics and Phonology in Multilingual Language Development*. The Cambridge Elements in Phonetics, Cambridge: CUP.

Kartushina, N., Soto, D., and Martin, C. (2022). Metacognition in second language speech perception and production, *Language Learning* 73(2), 508-542.

Polka, L. and Bohn, O.-S. (2003). Asymmetries in vowel perception. *Speech Communication*, 41(1), 221–231.

Polka, L., and Bohn, O.-S. (2011). Natural referent vowel (NRV) framework: An emerging view of early phonetic development. *Journal of Phonetics*, 39(4), 467–478.

Ringbom, H. (2006). *Cross-linguisitc similarity in foreign language learning.* Bristol: Multilingual Matters.