Toward a developmentally sensitive model of articulatory timing

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Mature adult phonologies are a function of the (potentially deviant) developmental processes that learners go through en route from novice to expert behavior. Thus the variation speech scientists observe in adult speech has its genesis, at least in part, in the divergent paths learners take to acquire their language. My specific research addresses the development of timing pertaining to syllables in different populations in order to better understand (1) the role of perception on timing production and how different distortions of the input, be it by language transfer in the case of interference from non-dominant languages or hearing loss, affect the production of timing patterns; (2) the intermediate stages of development en route from novice to expert-level behavior; and (3) the transformation of holistic productions to more segmentally defined speech over time. To this end, I perform studies that help me to tease apart effects of language transfer, phonological knowledge and normal and atypical speech motor development on syllable-timing production. For this talk, I will address a few of the past and ongoing studies I have performed with different populations (bilingual children, bilingual children with cochlear implants, monolingual children with cochlear implants and L2 speakers) in order to a expand on developmentally sensitive views of the phonology, and offer ideas on how to model this developmentally sensitive view of the phonology by combining task dynamics and long-short term memory models.

Suggested readings:

A few great papers on ecological/dynamical views of the phonology.

1. Gafos, A. & Benus, S. (2006). Dynamics of Phonological Cognition. *Cognitive Science*, 30, 905–943.

https://onlinelibrary.wiley.com/doi/epdf/10.1207/s15516709cog0000_80

2. Gafos, A., Hoole, P., Roon, K., Zeroual, C. (2010). Variation in timing and phonological grammar in Moroccan Arabic clusters. Laboratory Phonology 10: Variation, Detail and Representation, Ed. Cécile Fougeron (Mouton de Gruyter: Berlin/New York).

https://www.ling.uni-potsdam.de/~gafos/papers/GHRZ_LP10_Revised_WithFigures.pdf

3. Shaw, J., Gafos, A., Hoole, P., Zeroual, C. (2011). Dynamic invariance in the phonetic expression of syllable structure. Phonology 28, 455-490.

https://www.ling.uni-potsdam.de/~gafos/papers/2011-c-Shaw_Gafos_EtAl_dynamic_invariance_PHONOLOGY.pdf

4. Gafos, A., Goldstein, L. (2012). Articulatory representation and phonological organization. The Oxford Handbook of Laboratory Phonology.

https://www.ling.uni-potsdam.de/~gafos/papers/LPHB_gafos-goldstein_pre-publisher.pdf

5. Goldstein, L., Pouplier, M., Chen, L., Saltzman, E. & Byrd, D. Dynamic action units slip in speech production errors. Cognition (103/3), 386-412.

https://www.phonetik.uni-muenchen.de/~pouplier/Goldsteinetal_final_ms_withfigures.pdf

6. Kochetov, A. & Pouplier, M. Phonetic variability and grammatical knowledge. An articulatory study of Korean place assimilation. Phonology, 25(3), 433-468.

https://www.phonetik.uni-muenchen.de/~pouplier/KochetovPouplierPhonology2008.pdf

7. Pouplier, M. The atoms of phonological representations. In Marc van Oostendorp, Keren Rice, Beth Hume, Colin Ewen (eds). The Blackwell Companion to Phonology. Wiley-Blackwell.

Some great articles on phonological and speech motor development.

8. Noiray, A., Popescu, A., Killmer, H., Rubertus, E., Krüger, S., & Hintermeier, L. (2019). Spoken language development and the challenge of skill integration. Frontiers in Psychology, Language Sciences.

https://www.frontiersin.org/articles/10.3389/fpsyg.2019.02777/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publication&field=&journalName=Frontiers_in_Psychology&id=470799

9. Noiray, A., Wieling, M., Abakarova, D., Rubertus,E., & Tiede, M. (2019). Back from the future: nonlinear anticipation in adults and children´s speech. Journal of Speech, Language, and Hearing Research, 62(8S), 3033–3054.

https://pubs.asha.org/doi/10.1044/2019_JSLHR-S-CSMC7-18-0208

10. Redford, M.A. (2019). Speech production from a developmental perspective. Journal of Speech, Language, and Hearing Research,62, 2946–2962.

Most of these are dealt with in my paper:

https://www.sciencedirect.com/science/article/pii/S0095447018300056