Accommodation to a tongue height obstruction: Acoustic outcomes and aftereffects

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Language acquisition involves learning the mappings between articulatory configurations and their somatosensory and auditory outcomes, creating a close interaction between speech production and perception. Previous work has shown that these processes can influence one another both in infancy and in adulthood.

This study investigates how articulation manipulation and access to one's own auditory feedback affect speech production. In earlier work (Zhang et al, 2023), we found that speaking with a tongue-height obstruction did not alter sound categorization behavior along an /ɪ/–/ɛ/ continuum. Here, we examine the corresponding production data. We compared /ɪ/ and /ɛ/ productions under normal and obstructed conditions, and further assessed the role of auditory feedback by contrasting speakers with access to their own obstructed speech against those whose feedback was masked by speech-shaped noise.

Results demonstrate that the obstruction altered both F1 and F2, albeit in different directions and magnitudes, and that auditory feedback does play a role in adaptation to the altered articulatory configuration. Crucially, no aftereffects emerged: once the obstruction was removed, speakers reverted to their baseline productions. Together with the lack of perceptual change, these findings point to the stability of stored speech sound representations, suggesting that short-term articulatory perturbations do not readily reshape underlying phonological categories.

References

Zhang, X., Schoonen, R., Janse, E. (2023) Sound categorization after speaking with a bite block [pdf] In R. Skarnitzl & J. Volín (Eds.), *Proceedings of the 20th International Congress of the Phonetic Sciences (ICPhS) (pp. 157-161)*.