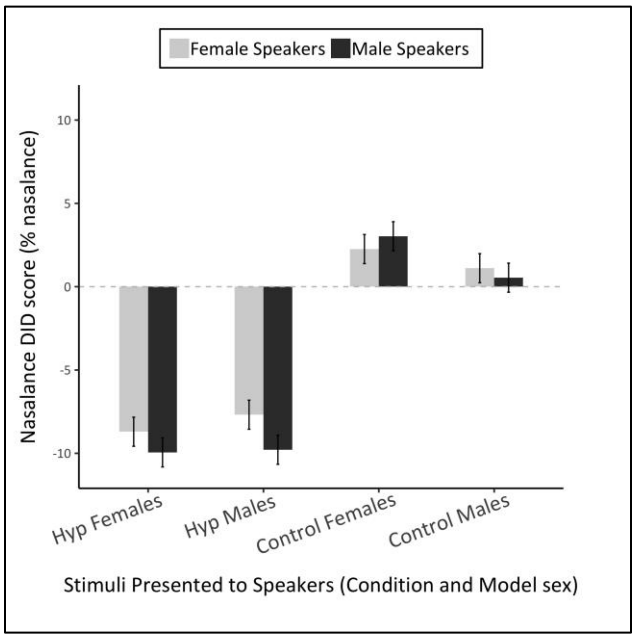
Phonetic Accommodation to Hypernasal Speech

Tardif, M.C.[1], Pardo, J.[2]., Bressmann, T.[3]
[1] Boston University, Boston, MA, USA
[2] Montclair State University, Montclair, NJ, USA
[3] University of Toronto, Toronto, ON, Canada

Purpose: Speech accommodation is a process in which an individual's speech becomes more (convergence) or less (divergence) similar to their interlocutor's speech. Individuals converge to increase commonality but diverge to increase social distance between conversation partners (Shepard, Giles, Le Poire, 2001). Hypernasality is a speech disorder resulting from excessive acoustic energy emanating from the nasal cavity. It is socially perceived as negative (Blood & Hyman, 1997; Watterson, Mancini, Brancamp, & Lewis, 2013). Since individuals diverge in negative social contexts (Shepard et al., 2001) and hypernasality is negatively perceived (Blood & Hyman, 1997; Watterson et al., 2013), we hypothesized that speakers would diverge from hypernasal speech.

Method: We trained four voice actors to produce hypernasal stimuli sentences. Four control models produced the same sentences. Voice actors successfully produced higher nasalance scores (M = 72.4, SD = 8.40) compared to controls models (M = 30.3, SD = 8.00). We presented the model utterances to the research participants in a quasi-conversational paradigm: participants were asked to listen to sentences and respond with different sentences (Borrie & Liss, 2014). We recorded their speech with a Nasometer headset and calculated nasalance scores.

Results: We calculated the difference between the model's nasalance scores and the prompted utterances from the speakers at baseline and during the experimental task using the formula: DID = |Baseline Difference| - |Exposure-Response Difference| (Figure 1). Positive DID scores indicated convergence and negative DID score indicated divergence. A mixed-effects ANOVA found a main effect of condition (F (1, 27) = 124, $p < .001$, η_g^2 = .75) and model sex (F (1, 27) = 10.4, p = .003, η_g^2 = .01), but no effect of speaker group



(F (2, 27) = 1.98, p = .16, η_g^2 = .04). The mean nasalance DID scores were significantly lower in the hypernasal condition (M = -9.08, SD = 3.32) than in the control condition (M = 2.55, SD = 3.64). Additionally, we also found an interaction between condition and model sex (F (1, 27) = 59.85, p < .001, η_g^2 = .03).

Conclusions: Speakers diverged in the hypernasal condition, and converged in the control condition. Male participants diverged more from hypernasal models. Participants converged more with female controls than with male controls. The effect size for this interaction was small (η_g^2 = .03). Consistent with previous studies (Zellou et al., 2017; Zellou et al., 2016) individuals converged to typical levels of nasality in model speakers. While Borrie & Liss (2014) found accommodation to dysarthric speech, participants in the current study diverged from hypernasal speech.

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