From language change to phonetic convergence (and back again)

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I present *Kamoso*, a computational simulation framework based on exemplar theory (Johnson 1997, Pierrehumbert 2001, Wedel 2006) which assumes that perceived speech items are stored fully specified in memory. Production is based on the selection of a specific exemplar from memory as a production target depending on the phonetic quality, recency and social factors. The population of agents is embedded in a social network, facilitating simulations of different types of interactions and network topologies (Watts & Strogatz 1998).

Application 1: Mechanisms of variant competition in language change in Setswana, a language in which post-nasal devoicing competes with voiced realizations (Coetzee & Pretorius 2010). We incorporate social impact theory [Nettle 1999] to model social dynamics and test the effects of networks reflecting a parochial society structure versus more open networks.

Application 2: Phonetic convergence in dyadic dialogs, a phenomenon in which two speakers become more alike in their speech during the course of a dialog. This provides a scenario to investigate intra- and inter-speaker variability and its relation to cognitive processes in speech processing, its underlying psychological and social factors as well as the mental representation and organization of linguistic knowledge. Understanding phonetic convergence may help to understand aspects of language acquisition or the mechanisms of language change. This latter link between phonetic convergence in dialogs and language change within a speech community is of particular interest in this present study. A socio-cognitive model which incorporates both social and psychological *top-down* as well as cognitive and phonetic *bottom-up* mechanisms is implemented based on the Kamoso framework and tested in a series of simulations.

This present work shows how very similar underlying processes are at work in sound change and phonetic convergence. I discuss methodological issues in agent-based modelling and the specific results and predictions of the simulations on sound change and phonetic convergence.

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