

Cognitive and social factors in agent-based models of conversational priming in repetitive responses

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Interactants tend to converge during an interaction regarding their linguistic choices. It has been suggested that such conversational alignment can have long-term effects that may lead to the spread of linguistic innovations (e.g. Trudgill, 1986; Auer and Hinskens, 2005; Nilsson, 2015; Pickering and Garrod, 2017). However, so far the exact interactional mechanisms that facilitate such a spread have not been investigated in detail, a gap we aim to address in this paper using agent-based modelling.

In languages with repetitive responses, polar questions are often answered by repeating the verb (“*Did she work today?*” - “*She did.*”), instead of answering with “yes” or “no” (Holmberg, 2016, pp. 62-72). Repetitive responses can give rise to conversational priming: an individual is likely to respond with the same verb form that was used in the question, even if this is an innovative form they would not use before. On a longer-term basis, if a speaker is repeatedly forced to use an innovative form in this way, the form may become familiar to them and they may use it actively in future interactions and thus pass it on to other individuals (Gipper, 2020). This conversational priming is asymmetric with regard to grammatical person: in many languages with person marking, only the 3rd person, which is the same in question and answer, allows for this priming. If repetitive responses indeed foster the spread of linguistic innovations through priming, then we expect that forms that get repeated and thus undergo and cause priming in repeats will change faster than forms that do not get repeated.

To test this hypothesis, we constructed an agent-based model, in which agents communicate about three concepts: 1SG, 2SG and 3SG, where only 3SG allows for conversational priming. This model, however abstract, is inspired by the (socio)linguistic situation of the Lithuanian dialects of Lazūnai (Vidugiris, 2014) and Zietela (Rozwadowski, 1995). A minority of the agents is initialized with mostly innovative forms, while a majority uses conservative forms. The basic model can be described using differential equations, which gives extra possibilities to analyse the dynamics. We also created a model where forms are learned by the listener according to their surprisal, which gives stronger priming effects for forms which are more unexpected to a speaker, favouring innovative forms (Bernolet and Hartsuiker, 2010; Jaeger and Snider, 2013). The results (Fig 1) show that the persons for which conversational priming takes place (3SG) converge faster to a stable state, where forms have evened out over the population, than the persons for which no priming takes place (1SG, 2SG). To see what happens if innovative forms are even more being privileged, we will perform experiments for different community structures. Previous computer models of community structure have shown that average language users are sources of innovations (Pierrehumbert et al., 2014) and that the forms used by a minority can influence the population (Josserand et al., 2021).

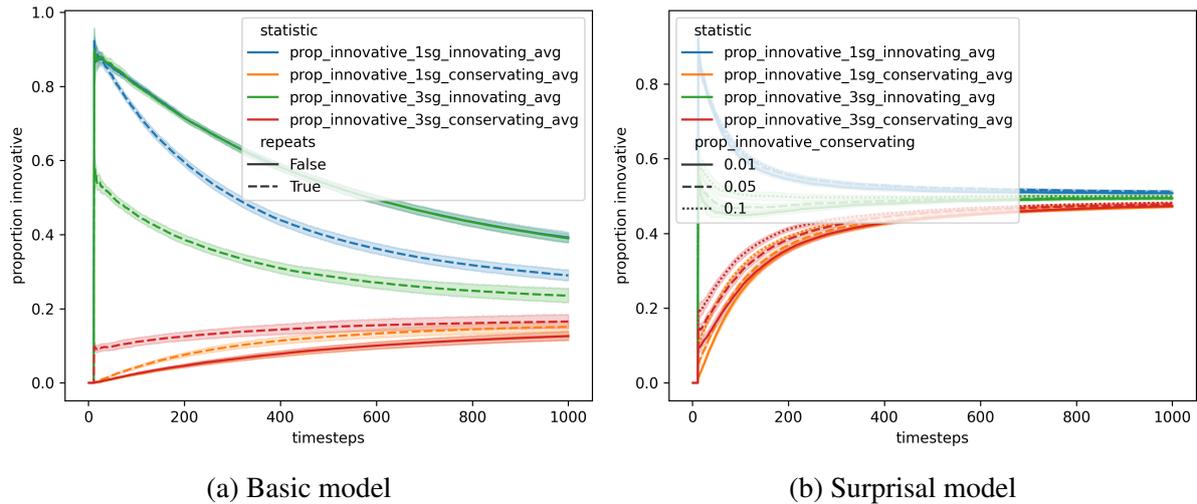


Figure 1: Proportion innovative forms for speakers which are initialized conservative and innovative, for 1SG and 3SG. A model with repetitional responses (dotted) converges faster than a model without (solid). The 3SG proportions (green/red), which underwent priming, converge faster than the 1SG (blue/orange) proportions.

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