

/u/-fronting, the spread of sound change, and agent-based modelling

The study makes use of agent-based modelling to explore whether an asymmetric phonetic overlap between two speaker groups contributes to the directional spread of sound change. The investigation was based on diachronic back vowel fronting in Southern British English and specifically on isolated word productions of 14 older and 13 younger speakers of that variety. An acoustic analysis showed that younger speakers' fronted /u/ was probabilistically closer to that of older speakers' retracted /u/ distributions than the other way round. This was attributed to coarticulation and undershoot being more likely to front a retracted /u/ than to retract a fronted /u/. Agent-based modelling was then used to simulate the outcome of random interactions between 11 younger and 11 older speakers. The acoustic parameters were the first three DCT coefficients of the F2 contours thereby encoding dynamic information in the vowels. Little change was observed when either only older or only younger agents interacted with each other. But /u/-fronting in older speaker-agents was much greater than /u/-retraction in younger speaker-agents for the simulation in which all agents interacted with each other. The general conclusion is that sound change is likely to be propagated when a phonetic bias within an individual - in this case for /u/ to front - is further magnified by a bias between speaker groups that is in the same direction.