

Mathematical models of language shift

Anne Kandler
(UCL)

The contemporary global language 'extinction crisis' has been analyzed by several linguists using concepts from ecology. Following these attempts, we investigate the dynamics of language shift as a demographic as well as a cultural process, using a mathematical diffusion-reaction model. Here 'language shift' is defined as a process whereby a community switches from speaking one language to speaking another, a process which has been a recurrent feature of human history. Our demographic model may lay out some groundwork that enables inference of the process associated with past episodes of language replacement, based on post-shift frequencies of neutral genetic markers of membership of one or other of the communities in contact. Based on our proposed model of language shift we derive environmental and demographic conditions which may favour the extinction of languages or contrary, favour the coexistence of language.