

Cultural evolution is a unifying field for interdisciplinary research on cultural emergence and change. It shares many ambitions and interests with game theory and economics, for example on understanding how individuals adapt to social and strategic situations, make choices and how this feeds back to how social systems change over time, often with the help of formal modelling. Models in the field tend to study traits in isolation, often for good reasons, since the purpose is typically a tractable simplification of core aspects of evolutionary processes. However, complex traits like norms and belief systems are characterised by the relation to other traits and their interdependence. For example, the belief in Shiva is harder to spread if the potential recipients already believe in a monotheistic god.

We here propose a mathematical modelling framework that considers cultural traits within a network of relationships, enriched with social significance and evaluated, filtered, sequentially against existing beliefs. Through analysis, simulations, and a case study on moral opinion change, we illustrate how structural properties and individual filters can give rise to different patterns of change at the population level, and how belief systems can self-organise and can generate group phenomena such as polarisation of opinion, accounted for by cultural systems dynamics, as an alternative to innate machinery or rational choice.