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CULTURES OF CHANGE SOCIAL ATOMS AND ELECTRONIC LIVES

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Problems of Social Consensus: Voting, Language, Culture...

The issue of social consensus is currently being addressed from general concepts and methods used to understand collective phenomena in Statistical and Nonlinear Physics: The problem is to determine when and how the dynamics of a set of interacting agents that can choose among several options leads to a consensus in one of these options, or when a state with several coexisting options prevails. Examples include opinion dynamics and political vote, language competition (death or coexistence of languages) and cultural dissemination (globalization-polarization transitions). The answer to these questions depends on the two basic ingredients characterizing interactions among the agents: 1) the mechanism of agent-agent interaction, 2) who interacts with whom (the social network). Current models implement separately different mechanisms with the aim of establishing cause-effect relations. Some of these mechanisms are random imitation, following local majorities, homophily or strengthening of similarities, individual thresholds against social pressure, etc. Social networks considered come either from real data (for example data on mobile phone or email interactions) or from current theories of complex networks, including networks with long range links (small world), networks with hubs (scale free) or networks with well characterized community structures.

A pedagogical example is the one of interaction by random imitation of agents with two options. Reaching consensus in one of the two options for large social groups crucially depends on the network topology. An important counterintuitive result is that long range links (interactions among distant agents) do not promote reaching consensus, but lead to a dynamical coexistence in which agents keep changing their option. Such long range interactions typically exist in our global society (internet) as opposed to traditional local village interactions.

Maxi Sanmiguel

Following pioneering work by the political scientist Robert Axelrod, problems of cultural dynamics have been analyzed in some detail for the perspective of statistical physicists. The question addressed by Axelrod was: "if people tend to become more alike in their beliefs, attitudes and behavior when they interact, why do not all differences eventually disappear?" He proposed a model to explore competition between globalization and the persistence of cultural diversity. Culture is defined as a set of individual attributes subject to social influence. The model implements a mechanism of homophilic interactions and illustrates how an interaction mechanism of local convergence can generate global polarization (persistence of cultural diversity).

However, culturally polarized states have been shown to be unstable against phenomena of cultural drift in a fixed social network. Persistence of cultural diversity can be understood as a consequence of co-evolving dynamics of agents and network: The social network evolves in tandem with the collective action it makes possible (Circumstance makes men as much as men make circumstances or Cultures of change/Changing cultures). Concerning the effect of mass media in the processes of cultural globalization two important claims follow from these studies: 1) Perhaps surprisingly, a strong mass media message leads to social polarization, but mass media is efficient in producing cultural homogeneity in conditions of weak (and local) broadcast of a message (the power of being subtle). 2) The role of the social network.

Social interactions can lead to a social consensus in a direction different from the one broadcasted by mass media provided that there are long range links in the network of interactions. Long range links make possible that collective self organization defeats external messages.