# Stochastic effects in the dynamics of opinion formation

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There is a growing interest in the application of statistical physics tools to analyze the dynamics of opinion spreading in a society. Recently introduced models aim to characterize the conditions under which a society can converge towards complete consensus on a topic or split into non-overlapping groups. In so-called continuous models, the opinion held by an individual is represented by a real variable taking values in a compact interval. Opinions evolve by interactions within neighbors using the bounded-confidence mechanism by which two individuals only influence each other if their opinions differ by less than a given amount, the confidence parameter. Once interaction does take place, individuals tend to converge towards a common value of their opinions. Most important models differ in the definition of who interacts with whom at once. The two more widely used scenarios being pairwise encounters or interactions amongst all members of a large group. In all cases there is a consensus-polarization transition as the confidence parameter varies. A main feature of the models is that, while the interacting individuals are chosen randomly with some rules, the subsequent evolution is completely deterministic. Furthermore, except by the possible dispersion in the initial condition, all individuals are supposed to be identical. In this talk, I will summarize recent works which have introduced additional elements of randomness, both at the individual, the connectivity network and the dynamical level. The aim is to incorporate to the models the ingredients of heterogeneity and self-thinking or free-will at the individual level. As a result, interesting phenomenology appears, including new phase transitions and resonance phenomena.