

Abstract:

The theory of costly signaling (Spence 1973) is a well-established paradigm in economics and theoretical biology, where it is also known as the Handicap Principle (Zahavi 1975, Grafen 1990). Nevertheless, while costly-signaling games have been extensively studied in classical game theory (focused on Nash equilibrium and its refinements), evolutionary dynamics in costly-signaling games are relatively unexplored. In this talk, I give an overview of recent work with Josef Hofbauer on evolutionary dynamics in two canonical classes of games with two states of nature, two signals, and two possible reactions to signals: a model with differential costs of one costly signal (as in Spence's 1973, respectively Grafen's 1990 model) and a model in which different sender types prefer different signals (as in the prominent beer-quiche game studied by Cho and Kreps 1987). Our study is based on a structural approach: For each of these classes, we make a detailed case distinction varying the cost and benefit parameters as well as the prior probability on the sender's types and use index theory to characterize the equilibrium structure for each subclass (which also yields a necessary condition for the dynamic stability of the equilibria in these games). Then, we study the replicator dynamics and the best-response dynamics for each of these classes. Finally, we relate our findings to equilibrium analysis based on classical equilibrium refinement methods that test for the plausibility of beliefs 'off the equilibrium path.'