

# **ABSTRACT**

Universität Hamburg, Fachbereich Biologie  
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Putting biology into cooperation theory

Host: Jutta Schneider

As evolutionary theory emphasizes competition, any forms of helping has attracted considerable attention. While altruistic helping can be readily explained with kin selection, a variety of concepts is needed to explain cooperation within and mutualism between species. Borrowing from economics, these concepts are typically illustrated with simple games, of which the iterated prisoner's dilemma is the most famous example. My aim is to share my current thoughts about why we need to get beyond such simple games and how to do that in order to integrate evolutionary game theory and empirical research. In social species, individuals often face uncertainty about their social environment and hence must use various information to choose appropriate behaviours (termed 'social competence'). Modelling such 'large world' problems includes the challenge to be explicit about mechanisms underlying decision-making. Empirical data, for example on learning dynamics, can inform such modelling. I will illustrate my points with thought experiments, stories, and a variety of examples, including our research on marine cleaning mutualism.