
Learning to Spite and the Evolution of Envy

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Abstract

Session: Exploring the evolution of culture and social behavior (Steve Downes, Patrick Forber, Matt Haber, Fiona Jordan, Elisabeth Lloyd, Rory Smead)

ABSTRACT:

The occurrence of spite in nature presents an evolutionary puzzle similar to that of the evolution of altruism: if spite is costly how could it ever evolve? Hamilton identified that spite could evolve if the behavior was directed at non-spiteful individuals. In recent years, other accounts of the evolution of spite have been developed which suggest that there are several possible explanations for the evolution of spite: anti-correlation of types in a population, out-group conditional behavior, or even reciprocity-like mechanisms. However, one possible explanation that has received relatively little attention is that spiteful behavior may be learned.

Of course, this raises other evolutionary puzzles. If learning mechanisms lead to costly behavior such as spite, why should we expect those learning mechanisms to evolve as opposed to some other learning mechanisms? Furthermore, learning to spite may require some degree of cognitive sophistication such as the ability to recognize the payoff of others. These mechanisms are, presumably, more costly because of the increased complexity, which makes the evolutionary questions even more pressing. This paper presents a model of the evolution of learning that explores this issue. Learning rules that are "envious" (i.e. negatively react to the payoffs of others) have a tendency toward spite in some games. And, this tendency toward spite can generate strategic advantages in some interactions that are not possible if individuals are simply trying to maximize their own payoffs. Consequently, such learning rules may be evolutionarily successful despite their apparently detrimental properties.

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