C A T

Felis catus

Cats and the Stag-Hunt Game

Owing to its mathematical ability to explain social interaction and the decision-making process, the science of game theory pioneered by the mathematician John Nash in the 1950s has been successfully used in fields such as economics and political science to biology, military tactics, and psychology. In game theory, there are basically two types of strategic interaction: cooperation and competition. Both are based on Nash equilibrium, which constitutes the best set of decisions made by the participants in either cooperative or competitive games regardless of what the other participants might choose to do. In other words, each player's gains or losses are influenced by other players' choices and decisions.

The stag-hunt game, first described by Jean-Jacques Rousseau, is one such game wherein the players can either hunt a stag together or each hunt a hare separately. Hence, it yields two Nash equilibria: cooperation (Stag) and non-cooperation, also called defection (Hare, Hare).

Like the prisoner's dilemma, in which two self-interested prisoners paradoxically choose to defect or confess to their crime due to mutual distrust, the stag-hunt game provides a rich context for understanding the ramifications of social cooperation. Defection can thus be regarded as a safe strategy with a reasonable

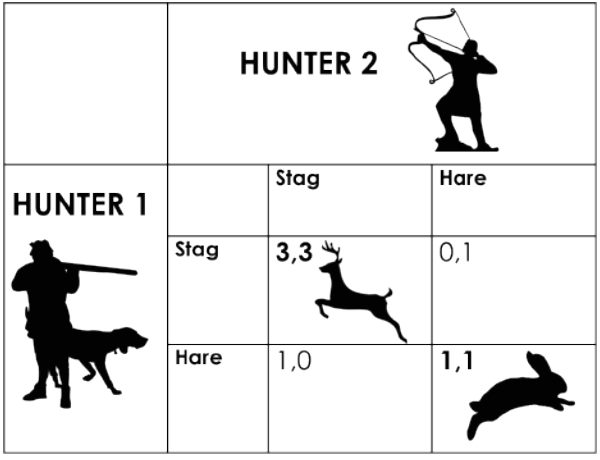

Figure 1. Stag-hunt payoff matrix

payoff (Hare), independent of the other player's actions. On the other hand, while cooperation comes with the risk of one player being left with nothing, it can prove more rewarding if the other player also cooperates.

Surprisingly enough, game theory can also explain the tenets of animal interaction as well as human interconnection. Furthermore, animals seem to have genetically internalised what the father of modern economics, Adam Smith, called the invisible hand: their survival interests could complement each other in such ways that the ecosystem would never have any missing or misplaced pieces, but for human interference.

Stray or feral cats are especially good at playing the stag-hunt game although their version is as ingenious as it is practical. Between catching a pigeon together with an opponent and catching a mouse alone, they would instinctively choose both cooperation and defection most times— that is to say, they would go for both the pigeon and the mouse, thanks to their remarkable hunting skills.

What about feline pets? Are they still able to use their feral instincts to play a well-timed stag-hunt game all the time? Here is a case study that proves that cats will always be cats regardless of the wild or domesticated nature of their environment.

Meet Diddy. She is the shyest cat there is. She likes hanging around with her humans, and she knows how to turn the pages of a good book. Although she lives together with four other cats, Diddy never plays with them, only with her humans.

But that was before wooden tables were added to the radiators.

There are only four radiators in the house but five cats. So, in the winter, one cat will always remain without a radiator if not fast enough to claim it early in the morning. And that cat has always been Diddy—until one day when she decided to befriend Dory, a deaf, ever-small, ever-thin cat with emotional trauma and neurological disorders due to her horrifying past.

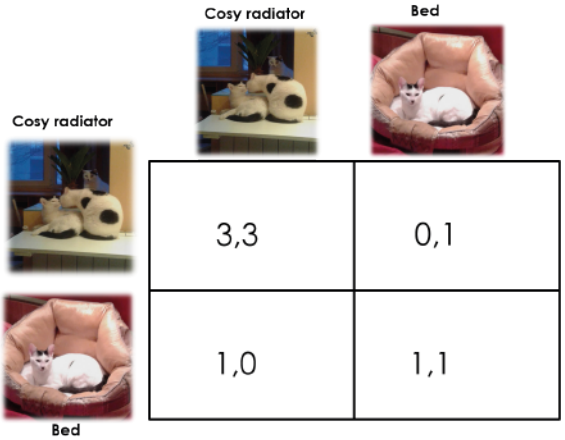

Figure 2. Cosy cat payoff matrix

Diddy is shy and fearful. Dory is authentic and kind-hearted. Diddy and Dory have been sharing a radiator each day for the last five winters. Stag-hunt game solved!

Diddy's example may well indicate the complexity of animalism, where conscious and unconscious features and acquisitions do not occupy well-defined percentages but form a sort of organic melting pot, irrespective of species.

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