

## **A SENSE OF FAIRNESS IN MONKEYS**

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A sense of fairness seems ubiquitous among humans, but does such a thing exist in animals as well? In humans, it is proposed that individuals who have a sense of fairness are more likely to be successful in cooperative interactions. Thus, by looking at other highly cooperative species, we can not only learn more about the animals' social behavior, but can learn something about the evolution of cooperation and fairness in humans. Understanding the different stages of the evolutionary development of the sense of fairness allows us to understand more about why this behavior was important and how it could have evolved. The difficulty is that awareness of fairness is proposed to be based on social emotions, like envy, greed, or moral indignation, and it is challenging to uncover animals' emotions.

There are hints that other animals do compare their rewards to those of others. For instance, some animal species live in relatively tolerant societies, in which everyone receives some piece of the pie. While not everyone receives the same sized piece, such a system may lead individuals to expect some level of equity between themselves and others. Individuals who do not get what they think they should receive may react, for instance, by having 'temper tantrums'. While there is good anecdotal or inferential evidence for reactions to inequitable distributions, in observational studies it is difficult or impossible to get at the underlying causation of the behaviors. Thus, we often turn to experimental work for a more controlled situation. To get around this problem of causation, we ran a controlled experiment on capuchin monkeys to see if they reacted when another monkey got a better deal.

This experiment was intended only to elucidate one aspect of a self-centered sense of fairness; it determined whether the capuchins reacted when another individual got a superior reward. We chose capuchin monkeys because they are a tolerant species known to have high levels of cooperation and food sharing, which made them an ideal species for our study. We paired each monkey with a group mate and watched the monkeys' reactions when their partners got a better reward for doing the same amount of work. In this case, the work was a simple exchange in which the experimenter gave the monkey a granite token, which the monkey could immediately return for a food reward. Food rewards were pieces of cucumber, which capuchins are usually happy to work for, and grapes, which, to a capuchin, are far superior to cucumbers. Compared to their reactions when both received the same reward, subjects were much less likely to be willing to complete the work, a simple exchange, or accept the reward, when their partner got the better deal. Moreover, if the partner didn't have to do the work to get the better reward, but was handed it for "free", the subjects were even more likely to quit participating. Of course, there is always the possibility that subjects were just reacting to the presence of the higher value food, and that what the partner received (free or not) did not affect their reaction. However, in a control test in which the higher-value reward was visible, but not given to another monkey, their reaction to the presence of this high-valued food decreased significantly over time. In tests in which their partner received the grapes, the monkeys increased the frequency of their refusals to participate.

Capuchin monkeys judge both the value of the reward and the effort required when deciding whether they are being treated unfairly. This ability to recognize when you are being treated unfairly is almost certainly one of the stages in the evolution of the complex sense of fairness exhibited by humans. Whether capuchin monkeys are, like humans, using emotion to drive these decisions is unknown. However, it is clear that the sense of fairness has a long evolutionary history in the primate lineage.

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