

Cleaner fish respond to the shadow of the future (w/ Video)

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The image shows Bicolor cleaner fish cleaning inside the gills of Monocle Bream. Copyright Joseph Fenton.

(PhysOrg.com) -- Tropical fish alter their behaviour with an eye to the future, researchers at Cambridge have found. This is the first time such behaviour has been seen in any animals except humans.

Economists use the term "shadow of the future" to describe how humans change the way they behave towards another person depending on the likelihood that the two will meet again in the future. If a future meeting is likely, people tend to behave more cooperatively, while if they are unlikely to meet again they are more likely to cheat each other.

Jenny Oates and colleagues from the University of Cambridge and

University of Neuchatel in Switzerland studied tropical cleaner [fish](#) (*Labroides bicolor*) in their natural environment among the [coral reefs](#) of the South Pacific and found that these fish - like humans - respond to the "shadow of the future".

As their name suggests, cleaner fish feed by removing parasites from the skin, mouths and gills of many other fish (known as client species), including [sharks](#) and puffer fish. However, they also sometimes feed by taking a sneaky bite of mucous from the clients' skin.

While removing parasites is cooperative behaviour, benefiting both species, eating mucous is potentially harmful to the client fish because the mucous is part of its immune system.

Oates, a PhD student, found that the cleaner fish behave differently in different areas of their home range. They behave more cooperatively - feeding off clients' parasites - in the parts of their home range where they spend most time and are therefore more likely to meet the same client fish again.

By contrast, they cheat - eating clients' mucous more often - in the parts of their home range that they visit less often, and where they are less likely to re-encounter the client fish they cheated.

According to Oates: "We can spot when a cleaner fish eats parasites from a client and when it takes a sneaky bite of their mucous because eating mucous makes the client fish jump.

"The results suggest that, like humans, cleaner fish are able to take account of the future rather than just the immediate consequences of their actions."

More information: Current Biology - www.cell.com/current-biology/home

Provided by University of Cambridge

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