

Stickleback fish show initiative, personality and leadership

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Three-spined stickleback.

Researchers have shed light on the distinct, complex personalities displayed by stickleback fish.

These [personality traits](#) include qualities such as leadership and initiative, as well as the tendency to follow others. The results reveal a rather sophisticated [social awareness](#) in fish that was only previously hinted at.

Fish spend a lot of time in groups in order to decrease the risk of predation, but remaining part of a cohesive group is hard, as individuals often want different things. The emergence of leaders and followers settles these [conflicts](#).

'It is a puzzling process as it means that some individuals win, while

others lose out,' says Dr Shin Nakayama, from the University of Cambridge and first author of the research published in *PLoS ONE*.

'It is a matter of compromising all the time. This is a common problem for all animals living in groups, and indeed it's an issue that we face in [everyday life](#), from coordinating with co-workers to deciding which restaurant to go to while on a night out with friends.'

Previous research has shown that, like humans, fish show clear [personality differences](#) in terms of their desire to take risks; some fish are 'shy' and some are 'bold'. These differences influence an individual's desire to take the lead in a group.

However this latest study aimed to understand how the outcomes of actions of fish affected their desire to lead. For example if an individual tried to initiate a foraging trip but was not followed by its partner, did it try again or give up? And if it was followed, did that success affect its tendency to attempt to lead the group in the future?

The researchers found that fish frequently switched between being leaders or followers, and that the extent to which they chose to be leaders depended on how successful they were at recruiting followers.

However, personality did play a part as shy individuals, who were less prone to lead, became easily discouraged if they were not followed, whether bold individuals were not so sensitive and kept on trying.

'Our results point to the complex process by which leaders and followers emerge in groups,' says Dr Andrea Manica, a second author of the paper.

'Most previous work, including our own, had concentrated on finding characteristics that predict which individuals are mostly likely to become leaders. In reality, in many animals, leadership switches on a regular

basis, and thus the badge of leader can be passed around and it depends on one's actions. Effectively, the fish seem to follow the adage "Lead, and they will follow" which has been coined by some social scientists who work on team management in humans,' Manica says.

'There are many more fascinating questions to ask about the behaviour of sticklebacks. One of the most interesting, in my view, is to what extent a leader's ability to find food for the group affects its standing within a group. If a shy [fish](#), which normally prefers to follow, was given the ability to always find food, would it be raised to the status of leader by other group members and overcome its inherent aversion to being in front?' he adds.

More information: Shinnosuke Nakayama, Jennifer L. Harcourt, Rufus A. Johnstone, Andrea Manica, Initiative, Personality and Leadership in Pairs of Foraging Fish, *PLoS ONE* Volume 7 Issue 5, Published May 2012, [doi:10.1371/journal.pone.0036606](https://doi.org/10.1371/journal.pone.0036606)

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