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## News



### Fish can solve problems collectively

19 April 2017

Some fish can pool their experience to solve problems collectively, according to new research from scientists at the University of St Andrews.

While individual fish might only have a little bit of information about their environment, within a large group, different individuals might have separate but complementary information about a particular problem - some may know where to find food but not how to access it, while others might know how to get at it but not where it is hidden.

In a set of experiments, scientists at the School of Biology used sticklebacks to determine whether leadership – the pulling of the group by informed members – could allow groups of animals to pool their experience in order to solve problems collectively.

Their findings, which could have implications for businesses and even bio-inspired swarm robotics, are published on the Nature Ecology & Evolution website.

Dr Mike Webster said: “To tackle this question we presented shoals of stickleback fish with a two-part problem, in which they had to first find and then access some hidden food. Individual fish were either inexperienced or had experience of just one of the stages.

“We found that in shoals that comprised individuals trained in each of the stages more fish did indeed access the food, and did so more rapidly, compared with other shoal composition which only contained fish trained to one or to neither of two parts of the problem.

“Supporting our idea that leadership played a role in this, we found strong effects of having experienced members in the group, with the presence of these greatly increasing the likelihood of untrained fish completing each part of the problem.”

Researchers have long noted that larger groups tend to outperform smaller groups and lone individuals when completing certain tasks, and a number of ideas have been put forward to explain why this might be the case.

The new study shows that experience pooling, whereby subsets of the group assume leadership roles when completing the specific part of a task in which they have knowledge or competence, is a plausible mechanism by which this might occur.

Immediate applications of this kind of research centre on wildlife management and conservation, since knowledge of how groups process information can allow us to understand how animals use their environment and how they navigate and migrate.

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Professor Kevin Laland said: “There may be lessons to be learned for human behaviour too. Businesses and institutions already make good use of teams with diverse skills sets, and the natural world might provide further inspiration for how these groups might be put together and organised.

(Image courtesy of the University of St Andrews).

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