

Studies show how copycat feeders benefit by imitating their competitors

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(Phys.org) —Biologists from Trinity College Dublin have shown that individuals with very different, ingrained approaches to trying new foods are influenced by the presence and actions of rivals eating those same new foods.

Through a combination of genetic hard-wiring and environmental influences, animals in a given population conform to one of two foraging strategies. Adventurous consumers (AC) are willing to try new foods and rapidly accept them, while dietary conservatives (DC) are loath to accept new menu items, often refusing to eat them for a very long time.

However, it seems with chicks – as sometimes with young children – that imitation goes hand in hand with development. As expected, the researchers found that AC chicks accepted new food more speedily when they were in competition for it with rivals. DC chicks responded similarly, but only when they could clearly see their competitors were eating the same new food that was also available to them. When the new food was camouflaged by wood shavings, they stuck to their non-adventurous urgings and avoided the new offerings.

Associate Professor and Head of Zoology at Trinity, Nicola Marples, said: "This is particularly interesting because it shows that, unlike the AC individuals, DC chicks actually treat their rivals more as social partners than as competitors. It is fascinating that both these strategies persist in the population, rather than either AC or DC taking over entirely. DC individuals are less likely to eat poisonous foods, and may become better

at handling the foods they do eat, while AC individuals are 'jacks of all trades', eating a wider range of food types, but perhaps accidentally eating poisons more often."

"There must be some benefit to each strategy, but it's not yet clear how they stay in perpetual balance with each other. Although we've not done formal tests with people yet, it would be really interesting to see whether fussy children act like DC birds, and follow suit if they see their older brothers and sisters eating new food at the dinner table."

The research, just published online in the prestigious journal *Animal Behaviour*, has implications for better understanding the ways ecosystems function and change in relation to environmental disturbances that affect food availability as well as for conservation planning when endangered birds are reintroduced to the wild. Exposing birds to novel foods and letting them observe their rivals eating these foods might encourage speedier acceptance of a broad diet, which could in turn increase the chance of survival after release.

In another paper that considered foraging strategies, and which has also just been published online in *Animal Behaviour*, the researchers turned their attention to fish to see whether the food-fussy DC strategy was also present in four different tropical species, as it is in sticklebacks that live in more temperate waters.

Among the most intriguing findings was that, as with chicks, individuals conforming to AC and DC strategies were both present in the same population. From an evolutionary angle, it might be expected that one strategy would be more beneficial than the other and thus lead to total domination set against the backdrop of 'the survival of the fittest'. However, a mixed-strategy population seems to be the best option natural selection can come up with.

Professor Marples said: "If the reason both strategies persist is that the DC individuals are avoiding poisonings, then we would expect there to be lots of DC fish in the tropics where lots of potential food is poisonous. However the tropical fish had a much lower frequency of DC individuals than the fish in Europe, suggesting that AC individuals are actually doing better there. It may be that there is such a wide variety of potential foods in the tropics that just concentrating on a few is not as viable as eating a wide diet."

As with the chick study, the research has widespread implications for our understanding of ecological and evolutionary processes, as well as for more commercial matters, such as rearing fish in the progressively booming aquaculture industry, and understanding the foraging behaviour and associated survival of wild fish in often fragile natural habitats.

Professor Marples added: "Fish raised in hatcheries that are subsequently released into rivers are generally fed a narrow diet of food pellets. Our research suggests that individuals conforming to the DC strategy could struggle to survive in a natural environment, especially if [food](#) stocks are low and these fish lack foraging experience."

More information: Keith McMahon, Allison Conboy, Elise O'Byrne-White, Robert J. Thomas, Nicola M. Marples, "Dietary wariness influences the response of foraging birds to competitors," *Animal Behaviour*, Volume 89, March 2014, Pages 63-69, ISSN 0003-3472, dx.doi.org/10.1016/j.anbehav.2013.12.025.

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Provided by Trinity College Dublin

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