In birds, personalities can be a question of weather

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Waxbill. Credit: bico de lacre

We all know about people's personalities, and anyone with a dog or a cat will also tell you about their temperaments. More surprising, though, is how many others, from octopuses to frogs and even spiders have them. But why behave according to a personality, when flexibility could allow smarter choices?

A study by Portuguese researchers using a novel approach - where a bird colonization is a proxy for the animal evolution over time – have now found that the emergence of different personalities can be associated to climate variation. The study, on common waxbills, shows how in regions with more variable climate birds explore less autonomously and are more attentive to their peers, than those in areas with a more stable weather. "This is probably because" – says Carlos Carvalho the first author of the study - "with resources and food more unpredictable, social learning, in opposition to bold exploration, allows better informed choices that may increase the animals chance of success". T

The study from the Centre for Research in Biodiversity and Evolutionary Biology (CIBIO) of the University of Porto, Portugal is out on soon in the journal *Behavioural Ecology*.

For a long time animal personalities were seen as random variation by researchers worried of anthropomorphism accusations. But with the discovery that these behavioural differences were often for life and extremely common, the scientific world's interest eventually woke up. Researchers went to discover that animal personality comprised traits very similar to ours, from aggressiveness and boldness to docility, sociability and cooperativeness. But the reason why these different temperaments co-existed within a species remained less clear. Ultimately, a flexible behaviour should allow animals to adapt better and, consequently, improve survival as well. So what is the point of fixed ones (personalities)?

Using a recent invasion in Portugal of the common waxbill (Estrilda astrild) in the work now published, Carvalho, Gonçalo and colleagues attempt to answer this question. Waxbills are small birds native to Sub-Sarah Africa that, due to their popularity as pets and often escape from captivity, are now everywhere. Their Portuguese colonization is recent, around 40 years, but particularly well documented - from the climate and

ecology of the different colonized environments, to the size and age of the different waxbill populations. The researchers' idea was to use the birds' territory expansion as a mimic to their evolution in time and, with the help of this extensive amount of data, search for links between behavior/personality and ecology

Analysis of various waxbill populations found that personality differences emerge rapidly, with birds in areas with more variable climates exploring less and responding more to social stimuli than those in more stable weather conditions This suggested that they relied more on cues from the other animals in what could be an adaptation to their unstable environment. After all individuals vary in their abilities and experience, so being attentive to conspecifics should increase the efficiency of problem solving and a good idea in unpredictable environments.

In more stable environments, however, the birds could afford a "not think much" approach and make decisions based on past experiences. Having a fast response would make them more competitive even if the chances of absolete responses increased. This was not much of a problem though since in stable environments the location of food and resources is more predictable.

The next step was to investigate how the different behaviors emerge. "They didn't change with age or season suggesting a genetic or long-term developmental basis. " says Cardoso " So, we investigated a gene known to be implicated in avian personality but could find nothing."

This does not invalidate a genetic cause behind waxbills' personalities though - not only genetic influences tend to be the sum of many genes but also behavioral genetics is still much in its infancy with much (other genes) to be found.

In conclusion, since environmental changes (in this case climate) can cause populations to rapidly diverge in personality, then environmental fluctuations over time (very common in nature) are probably an important factor contributing to keep a mix of distinct temperaments within populations.

Understand what determines behavioural changes in animals is important for animal management and conservation but Gonçalo Cardoso, the senior scientist in the research, points that the results are relevant for humans as well.

"The study of animal behaviour allows us to ask questions that would be much more difficult to test with human personality, because cultural adaptations can make it hard to demonstrate the underlying biological and psychological influences. For an extreme example, think of those hyperactive children that, like the waxbills in more stable environments, are impetuous and less motivated towards conventional social learning – could animal behaviour help us understand this type of diversity among people too?"

More information: Carvalho, C. et al. Personality traits are related to ecology across a biological invasion, *Behavioral Ecology*, May 2013. doi:10.1093/beheco/art034

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