



Bird personality linked to climate variation?



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Behavioural ecologists from the [University of Porto](#) and the [University of Coimbra](#) in Portugal have found a link between personality traits and ecological conditions using the biological invasion of a small bird species as a model.

The common waxbill (*Estrilda astrild*) is native to sub-Saharan Africa, but has established colonies across the world due to its popularity as a pet and frequent escapes from captivity. In this study, which is published in the *Behavioral Ecology* journal, the researchers used data on the territory expansion of waxbills across Portugal as a proxy for their evolution across time in order to explore potential links between their patterns of behaviour and the ecology of the regions they invaded.

Senior scientist on the study, Dr Gonçalo Cardoso, is a member of the [Behavioural Ecology Group](#) at the [Research Center in Biodiversity and Genetic Resources \(CIBIO\)](#). Part of the reason he and his colleagues, including lead author Carlos Carvalho, conducted the study was to try to determine the evolutionary advantage of personality when flexibility would seem to be the optimal condition for survival.

"The main attraction of studying personality in animals is that it allows one to investigate the biological underpinnings of behavioural differences among individuals in a simpler way than is possible in humans, with less interference from cultural influences," Dr Cardoso began, in an interview with [ScienceOmega.com](#).

Substantial within-site differences

The researchers found that differences in personality emerged quite quickly among the various waxbill populations that were monitored. Those birds in areas where the climate was less stable responded to social stimuli more and tended not to explore independently. Waxbills living with more predictable weather conditions responded more spontaneously to stimuli and seemed to act based on



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past experiences. I asked Dr Cardoso if he and his colleagues had expected to find such differences.

"We were not particularly surprised since the association we found between behaviour and climate makes sense adaptively," he replied. "In sites with stronger climate seasonality waxbills were, on average, more attentive to social stimuli and explored less autonomously; the reverse was true in more stable climates.

"This makes sense since stronger seasonality implies uncertainty on the location of food and other resources during the year, in which case a predisposition to learn from others might be advantageous."

The different behaviours that emerged did not vary with age or season, and so the team looked to a gene known to be implicated in avian personality. They found no association, but did not rule out underlying genetic factors.

The differences in behaviour and personality that were found among sites showed differences of means. As Dr Cardoso explained, the population at each site is comprised of individuals that behave very differently to one another, and the within-site differences are substantial by comparison to the mean differences among sites.

"Actually, the really interesting questions about animal personality – and human personality too, for that matter – have to do with why personality differences exist within populations," Dr Cardoso continued. "That is where most diversity is, rather than among populations."

Fluctuations in selective pressures responsible?

The use of geographic differences as a short-cut to changes that happened through time, he went on to comment, is relevant to understanding within-population diversity in personality. The colonisation of Portugal by the common waxbill began only about 40 years ago and initially progressed slowly, but the environments colonised and the size and age of the populations inhabiting them have been well-documented throughout this time.

"Since the invasion of waxbills in east Iberia is recent, the geographic differences we found indicate multiple and rapid changes in personality traits as waxbills found novel climatic and ecological regimes," noted Dr Cardoso. "Fluctuations in climate and in selective pressures are also common through time, even at the same location. Thus, the implication of our results is that, in realistic conditions, fluctuations of selective pressures could contribute to maintaining some of the diversity in personality we observe in natural populations."

Anyone who owns a dog, cat or even a guinea pig can tell you about their individual 'personality' traits, but the idea of animal personalities has not gained ground among academics in the scientific community until relatively recently.

"Some 15 years ago animal personality was not much talked of in the scientific milieu, maybe because it was perceived as subjective or excessively anthropomorphic," Dr Cardoso explained. "But it has now been given a testable and objective definition (differences in behaviour among individuals, consistent through time and across behavioural contexts) and is an intensively-studied phenomenon."

So, what can the findings teach us about the evolution of personality in humans? According to Dr Cardoso, they lend support to the hypothesis that fluctuation in selective pressures helps to maintain personality differences in natural populations. This is just one of several proposed and non-mutually exclusive hypotheses to

explain why personality differs within populations, and it may apply generally to many species, humans included.

"In humans the story would not be so simple, because we have very strong cultural influences, and for us the most relevant selective pressures would be social in nature rather than climatic," he added. "In humans the stage for behavioural differences is shared between cultural influences and more biologically-grounded psychological adaptations; culture should interact with, but not rule out, the latter processes."

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