'Stupid strategies' could be best for the genes

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Blindly copying what your parents did – no matter how stupid it may seem – could be the best strategy for the long-term success of your genes, according to research by the Universities of Exeter and Bristol.

The findings of the study, published in Ecology Letters, show that apparently mindless survival strategies – such as the long-distance migration of many animals to breed at the place they were born – may not be as impractical as they appear.

Using mathematical models, researchers compared the evolutionary success of straightforward copying strategies with that of more dynamic approaches that focused on adapting to new information to make key lifestyle decisions.

Dr Sasha Dall, from Exeter's Centre for Ecology and Conservation in Cornwall, said: "From an individual perspective, sometimes sticking to what your parents did may seem a ridiculously stupid thing to do, especially when they can be out of touch with current events. However, it's a different story when you look at it from the perspective of your genes.

"What we actually found is, in certain circumstances, it can be a more effective method of ensuring long-term survival of your genes than more nuanced strategies. So, surprisingly, this kind of mindless strategy can actually be more effective than the more sophisticated alternative of adjusting to changes you detect in your environment."

The conclusion centres around what they are calling the 'multiplier effect'. This states that if you are in exactly the right environment for your genotype, you will thrive and breed. So, over generations, more and more individuals will find themselves in conditions to which they are suited if they just do what their parents did.

Those in the wrong place for their genotypes will not do well and others who behave like them will leave fewer and fewer descendents – leaving those being born in the right places to dominate the population.

Professor John McNamara from the Bristol's School of Mathematics added: "The sheer fact you are alive is a big clue, because your parents must have got it right. If you follow their lead, you should get it right too.'

"Using a mathematical model, we've shown this is more successful than the alternative approach of adjusting behaviour to current conditions when the environment changes a bit, but not too much, between generations, and where there is a choice of both good and bad places to be.

"When you try to adapt to your environment, you can make mistakes which could prove costly or even fatal. Also, this approach may require a lot of time and effort – which again could limit the success it brings on an evolutionary basis."

This conclusion explains some of the seemingly impractical lifestyles seen in nature. For example, many sea turtles return to the same beach they were born on to lay their eggs, even though they swim past perfectly good beaches on the way.

While this may not seem like an efficient strategy, in the right conditions it can be a successful way of ensuring the long-term survival of your

'selfish' genes.

Dr Dall said: "This may not seem very smart, but those turtles are actually sticking to the safest bet there could be – the spot where they know their parents successfully gave birth to them.

"We're not saying that this works for every species or all of the time, but it does shed a bit of light on this interesting area of animal behaviour and evolutionary biology."

Provided by University of Exeter