

Creativity and Anticipation

Daniel-Day-Lewis has been called the greatest living actor by some. He has won an array of awards for his acting time and time again. Day-Lewis grew up in a town named Greenwich in Southern London, an incredibly rough area. He was Jewish and labeled 'posh' by the other kids, who then bullied him because of it. Day-Lewis reacted creatively to environmental situation by mastering the accent and the mannerisms of the locals. In his autobiography he says this was the first convincing performance he ever gave.

There are stick insects that mimic leaves to avoid their prey and there are butterflies that look like owl eyes. There are also elephants that play music (who have released two albums, and are working on a third) and bonobo monkeys that can draw symbols that represent a place they wish to go.

The bonobo monkeys draw the symbol because they want to go to another, funner location. The elephants play the instruments because they enjoy it. The elephants that enjoy it the most play the most, and become the best musicians. (<http://video.google.com/videoplay?docid=7850331056304178751&ei=6ZYiSfuXPIigggKKg9XjBg&q=thai+elephant+orchestra&dur=3>)

The stick insects and butterflies adapted to their environment by evolution. This form of mimicry is a product of evolution and can only take on one physical form- the stick insect that's a leaf-like cannot take on the form of a stick.

One method of representation is for survival, one is for fun. One is created by evolutionary tides; one is created by cognitive processes.

So where does the mimic octopus fit in? It can morph into the form of perhaps 15 creatures. [This adaptable octopus is the first known species that can assume multiple guises](#). All the forms it

takes on are for a very specific purpose. Instead of squirting a blast of ink at its attacker and trying to flee (like other octopi), it mimics the attacker's enemy.

The mimic octopus also has foresight outside of the immediate moment –the mimic octopus can mimic the angel fish so it can float through the water high above the ground, instead of creeping across the ocean floor. The angel fish has deadly poisonous spikes that kill prey.

Some birds decorate their nest with shiny/colourful objects. The birds with the shiniest nests get the attention of the most females. This displays some basic response to aesthetics. Do they have a concept of art? Can that question even be posed? Do they enjoy it? Are they being creative? “[Is the 6th chair violinist in the orchestra being creative?](#)” This NPR segment about animals and creativity ends with the question "Are animals creative? Yes, yes they are.”

Below are quotes from the "Dynamic mimicry in an Indo-Malayan octopus" - written by the people who recorded the footage used here, Mark D. Normal, Julian Finn and Tom Tregenza.

The original journal article can be found here: <http://journals.royalsociety.org/content/pp95mdq58uyhe4ru/?p=63a072818265476ba0da85ea7e8d48b5&pi=0>

"Unique foraging behaviour was also observed. In addition to typical speculative foraging (threading long arms down burrows and holes to seize fishes and crustacean prey), animals were observed to enter a tunnel completely and to emerge from another hole up to 1m from the entrance point. We are unaware of any other octopuses that forage through subterranean tunnels."

"In all putative examples of mimicry it is worth considering that the observed similarities may, in fact, be the product of convergent evolution. The mimic octopus may take on the appearance of a sea-snake simply because the same selective forces that make black-and-white bands a useful signal for the sea-snake also apply to the octopus. However, it seems very unlikely that such a remarkable resemblance of animals with radically different morphologies and behaviours is not due to mimicry. It is striking that the most obvious impersonations by the mimic octopus are all of animals that produce strong toxins. Banded sea-snakes produce venom that is injected through fangs, the long bannered spines of lion-fishes are tipped with toxins, and soles (including Zebrias species) possess poison glands at the bases of the dorsal and anal fins."

"The 'dynamic mimicry' (Norman et al. 1999) of the mimic octopus may escape this genetic constraint because it is not employed continuously: all individuals can carry alleles for all forms of mimicry simultaneously. This has been described as a 'neural polymorphism', whereby cephalopods gain the benefits of polymorphism, such as increased apparent rarity, without genetic polymorphism (Hanlon & Messenger 1996). "

"Although the potential for individuals to mimic more than one model may allow them to escape the genetic constraints associated with shifts in model, it does not fully explain how new forms of mimicry evolve. The evolution of new forms in the mimic octopus will depend on there being situations where a novel form of mimicry, even in an undeveloped form, is superior to the existing patterns that might be employed. For genetic polymorphisms the usual explanation is that rare morphs have higher fitness since there are fewer mimics relative to hosts. This may be the case in the mimic octopus, but there is a potential additional benefit of being able to mimic more than one model: dynamic mimicry has the unique advantage that it can be employed facultatively, with the octopus adopting a form best suited to the perceived threat at any given time. Evidence for such sophisticated behaviour comes from our observation that on all occasions when sea-snake mimicry was observed it was exclusively a reaction to an attack by territorial damselfishes. Sea-snakes forage by entering burrows, and are predators of damselfishes (M. Norman, personal observation). The observation that the octopus uses a particular form of mimicry when it is most appropriate suggests that it is indeed able use its powers of deception facultatively."