Polly picks a preference: Parrots reveal link from the eye to the foot

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(PhysOrg.com) -- The preferred use of one limb over another to physically explore the environment is a common trait among vertebrates. New research by Macquarie University Director of Advanced Biology, Dr Culum Brown, suggests the side of the brain used to view and analyse the world around us corresponds to the limb on the opposite side of the body we use to manipulate objects.

Published recently in the Royal Society journal *Biology Letters*, Brown and Macquarie University Honours student Maria Magat, examined foot preferences in 16 species of Australian parrots and found that the foot used to manipulate potential food items is strongly associated with the eye used to view the item prior to manipulating it.

“Australian parrot species vary tremendously in their foot preferences when manipulating food items,” said Brown. “We now know that not only do different species use different hands, but that individuals within a species have hand preferences. Some are left handed, others are right handed and others are even ambidextrous.”

Brown says we now have a potential mechanism to explain why animals use one hand over the other.

“Ninety per cent of humans are right handed,” said Brown. “That level of species bias is really very rare in animals. There is no precedent for it in primates, and parrots are as close as you can get in terms of those biases.”

The real question is why are we handed at all he says.

Brown’s findings revealed that foot preference is strongly correlated with the eye used to scrutinize potential food items and fixation on a potential food item using a preferred eye, explains ninety nine per cent of the variation in foot use when the parrots grasped the item.

“The results suggest that cerebral lateralization, the partitioning of information processing, is directly linked to behaviourally lateralized traits and provides a functional explanation for the evolution of handedness in vertebrates,” said Brown.

Brown says that despite the fact that the two hemispheres of the

vertebrate brain look similar, they both perform specialised cognitive functions. One side generally processes rapid responses whereas the other side is involved in responses that require more consideration of alternative responses.

“Our data also suggests that functional partitioning of information processing in each hemisphere of the brain is highly correlated with the evolution and development of limb preferences while performing particular tasks.”

Only one species of parrot continues to defy explanation.

“The relationship between hand and eye preference in just one species remains a mystery,” Brown said. “The Cockatiel shows the opposite eye to hand preference, a relationship which is very difficult to understand. We still don’t know why it’s so unusual.”

Provided by Macquarie University