



Animals are smart, but not savants

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DO ANIMALS think like autistic savants? Intriguing as that question is, it now seems as if they don't, despite the "savant-like" behaviour many show.

The question was raised in a book by animal scientist Temple Grandin, of Colorado State University, Fort Collins. *Animals in Translation* became a best-seller, and Grandin's views gained widespread attention. Grandin herself is autistic, and it is her experience of processing memories using images rather than words that forms the basis of her theory. "If you want to understand animals, you have to get away from language," she says.

There is no doubt that some animals have amazing abilities. Birds such as Clark's nutcrackers can remember the locations of thousands of caches of nuts;

Australian magpies are able to mimic the entire song of a different species after just one listen. But is this savant-like, or an evolutionary adaptation? Giorgio Vallortigara, of the University of Trento, Italy, and colleagues think it is the latter. "Autism is a pathological condition," he says. "The extraordinary feats of remembering thousands of caches or sounds shown by some animal species are exhibited by healthy animals."

If Grandin is right, there should be similarities between the brains of autistic people and animals. Autism is often associated with a malfunction of the brain's left hemisphere, which

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can lead to an over-emphasis on details at the expense of an understanding of the big picture. Vallortigara and colleagues give the example of an autistic boy who learned the concept of "giraffe" by concentrating on the pattern of the coat. This led him to misidentify a leopard as a giraffe.

To look at animal brain function, Vallortigara and Lesley Rogers, a colleague at the University of New England, Armidale, Australia, have independently carried out experiments using domestic chicks to see which hemisphere of the brain was involved in performing certain tasks. Birds were presented with a familiar and an unfamiliar stimulus, and were allowed to choose between them when either the left or the right eye was covered with a patch. When the left eye was covered, the bird was forced to use only the left hemisphere, and in these cases it could only attend to the detail of the stimulus. When a patch covered the right eye, and the bird could only use the right hemisphere, it was able to process only large, categorical differences.

"These specialisations of the hemispheres are the same as in humans," Rogers says. This shows that only when forced to use one hemisphere over another did animals exhibit "autistic-like" behaviour, indicating that animal brains are more like "neurotypical" humans than autistic humans. The team have reviewed a series of similar experiments by other researchers, which they say back up their findings (*PLoS Biology*, DOI: 10.1371/journal.pbio.0060042).

Howard Eichenbaum, of the Centre for Memory and Brain at Boston University, Massachusetts, thinks Grandin's implication that animals are autistic is ungrounded. However, he warns that there is not yet a consensus on the distinction between the left and right hemispheres in animals. "Both Grandin and Vallortigara compound speculation on top of speculation," he says. ●