



**LEFT:** Beluga Whale Brain **RIGHT:** Human Brain

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# The World's Most Intelligent Species?

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Cetaceans - whales, dolphins and porpoises - have intrigued the public and scientific communities for decades. We've known for a long time that whales and dolphins are intelligent and socially complex animals with large brains that are organized differently from our own. And we've known that the neocortex of a whale or dolphin brain has more folds than ours (part of the cerebral cortex involved in higher-order brain functions such as sensory perception, cognition, generation of motor commands, spatial reasoning and language). All those folds mean that the surface area is greater and therefore may have more units to process information.

Little is known however, about how their brains function, especially when compared with their terrestrial relatives. The cetacean brain has been relatively inaccessible because of its size, difficulties in obtaining fresh specimens and the welfare considerations that rule out invasive recordings or tracer studies.

But the advent of neuroimaging, especially MRI, has provided a new set of possibilities for understanding cetacean brain organization in non-invasive ways. So recently, when we used this special imaging technique to study the brain of a dolphin (who had died naturally), we were astonished by what we learned.

While we humans and most other animals have a single pathway from the inner ear up to the first "stopover" for

auditory information coming into the brain, it turns out that dolphins have two! (And orcas, although we commonly refer to them as whales, are the largest species of dolphin.)

This could mean that they process echolocation echoes in one region of the brain and whistles and other sounds in another. But we're still trying to understand how these two kinds of sound information come together.

Another research team has found that the part of the brain in orcas that's involved in problem-solving and social- and self-awareness is proportionally larger than in humans. This could suggest they have a more complex sense of self than we do – so they may experience life both as an individual and as a member of their pod. And this kind of mental life might require a lot more processing of information than is the case with humans.

There is still much to clarify about these findings - how they compare with brain auditory systems in other taxonomic groups and how they contribute to a fuller understanding of central auditory processing in cetaceans. But it does raise the question: Are we humans the most intelligent species on the planet?

***Clearly, evolution has found a way to create more than one kind of complex intelligence.***

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