

INTELLIGENCE AND LEARNING IN PARROTS

Studies with captive birds have given us insight into which birds are the most intelligent. While parrots have the distinction of being able to mimic human speech, studies with the African Grey Parrot have shown that some are able to associate words with their meanings and form simple sentences. Along with crows, ravens, and jays (family Corvidae), parrots are considered the most intelligent of birds. The brain-to-body size ratio of psittacines and corvines is actually comparable to that of higher primates. One argument against the supposed intelligent capabilities of bird species is that birds have a relatively small cerebral cortex, which is the part of the brain considered to be the main area of intelligence in other animals. However, it seems that birds use a different part of their brain, the medio-rostral neostriatum/hyperstriatum ventrale, as the seat of their intelligence. Not surprisingly, research has shown that these species tend to have the largest hyperstriata, and Dr. Harvey J. Karten, a neuroscientist at the University of California, San Diego who has studied the physiology of birds, discovered that the lower part of the avian brain is functionally similar to that in humans. Not only have parrots demonstrated intelligence through scientific testing of their language using ability, but some species of parrot such as the Kea, *Nestor notabilis*, of New Zealand are also highly skilled at using tools and solving puzzles.

Learning in early life is apparently important to all parrots, and much of that learning is social learning. Social interactions are often practised with siblings, and in several species creches are formed comprising several broods, and these as well are important for learning social skills. Foraging behaviour is generally learnt from parents, and can be a very protracted affair. Supra-generalists and specialists are generally independent of their parents much quicker than partly specialised species which may have to learn skills over a long period of time as various resources become seasonally available. Play forms a large part of learning in parrots, it can be solitary, and related to motor skills, or social. Species may engage in play fights or wild flights to practice predator evasion. An absence of stimuli can retard the development of young birds, as demonstrated by a group of Vasa Parrots (*Coracopsis* spp.) kept in tiny cages with domesticated chickens from the age of three months; at nine months these birds still behaved in the same way as three month olds, but had adopted some chicken behaviour. In a similar fashion captive birds in zoo collections or pets can, if deprived of stimuli, develop stereotyped behaviours and harmful behaviours like self-plucking. Aviculturists working with parrots have identified the need for environmental enrichment to keep parrots stimulated.

Many species can imitate human speech or other sounds, and the results of a study by Irene Pepperberg suggested a high learning ability in an African Grey Parrot named Alex [see our December 2009 edition Ed.]. Alex was trained to use words to identify objects, describe them, count them, and even answer complex questions such as "How many red squares?" with over 80% accuracy. A second example is that of N'kisi, another African Grey, which has been shown to have a vocabulary of approximately a thousand words and has displayed an ability to invent as well as use words in context and in the correct tense.

Parrots do not have vocal cords, so sound is accomplished by expelling air across the mouth of the bifurcated trachea. Different sounds are produced by changing the depth and shape of trachea. African Grey Parrots of all subspecies are known for their superior ability to imitate sounds and human speech. This ability has made them prized as pets from ancient times to now. In the Masnavi, a writing by Rumi of Persia, AD 1250, the author talks about an ancient method for training parrots to speak. Although most parrot species are able to imitate, some of the Amazon parrots and the Australian Long-billed Corella, *Cacatua tenuirostris*, are generally regarded as the next-best imitators and speakers of the parrot world.

The question of why birds imitate remains open, but those that do often score very high on tests designed to measure problem solving ability. Wild African Grey Parrots have been observed imitating other birds. But most other parrot species have not been observed exhibiting this behaviour in the wild.

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