

# Have wild and captive keas the same benefits of observational and social learning?

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The kea parrot is the only mountain parrot in the world and on the south island of New Zealand. It lives from 600 to 2000 meters in the mountains. During the spring and summer they fly higher up on the mountains to feed on the berries and fruit while in the winter they seek to the lower forests. Keas are often found around human settlements, such as ski resorts and hotels during the winter. Left overs are an easy meal.

After spending five months being dependent upon their parents, keas live in large social flocks until the males are five and females are four. After this they form breeding pairs where one male can mate with up to four females in his territory.

Keas are omnivorous and is the only known parrot in the world that attacks other birds and animals. It is known to chase sheep off cliffs to get access to the fat around the kidney. In addition to meat they forage on over 100 species of plants, berries, trees and nuts.

Keas are intelligent birds with no fear of humans. They are destructive and have developed a love for rubber. So all cars parked nearby keas should be especially secured. If given the opportunity they will tear everything apart and treat the car as a playground. Its very curious and loves to play and mess around. The estimated lifespan in captivity is about 20 years, less in the wild.

Recent research suggests that parrots have different forms of social learning. Keas fulfill many criteria that researchers believe is essential for social learning, like an extended parental association, production of several offsprings throughout their life, group foraging, opportunism, curiosity and a potentially long lifespan.

To be able to test these abilities in wild individuals Gajdon, Fijn and Huber (2004) had to develop a new suitable apparatus. They came up with a long tilted wooden pole and onto this a tube was put. Inside this larger tube a smaller one was put and to motivate the birds, butter was applied on the inner tube. The aim of the study was to find out whether a problem unsolved by naive birds would be solved if they were given a demonstration by a trained bird. From the baseline and test phase the birds showed little difference. They spent the same amount of time around and manipulating the device without solving it. So the birds



that had observed numerous solvings did not manage to succeed. So individual testings were done on five different birds. Three of them observed solvings, but never managed it themselves. A juvenile male observed 15 times before he managed to do it himself, while a young adult male observed six times. This indicates that there are quite large individual differences in the needs to solve such problems. Some individuals may be able to learn from normal demonstrations while others may need slower progression and maybe a simpler task until they get the hang of it.

Only 3 out of 21 marked birds managed to remove the tube, despite persistent interest in the apparatus from other birds. They observed and investigated but did not succeed. Analyses in this paper revealed that keas did not benefit from observing other birds.

This was a surprising finding since the task is well within the physical abilities of the birds, they showed interest and spent time around the apparatus and with their playful nature and capabilities to manipulate objects with their beaks.

As a reference the same problem was presented to captive birds in Vienna. These birds however showed remarkable capabilities and two of them solved the task in the first session. The other three required a few more demonstrations. But one has to take into consideration that these birds are used to solving human made tasks and that this probably gives them an advantage.

It seemed that the wild birds did not understand the principle of the tube removal so another task was given to them. A task that occurs in the wild. Opening rubbish bins have been observed for a long time, but only in certain individual birds and these were older ones. Four and five year old ones did not manage to open the lids completely. To be able to open the lids fully the birds have to take a step back while holding the lid and this proved to be difficult. This may indicate that individual experience is needed, achieved by trial and error, but the principle of the opening was observed.

Still social experiences are still valuable for the birds. Another study was done on captive keas, again in Vienna. But this time the device consisted of a pin that had to be pulled out before a screw had to be turned and a bolt had to be picked out. This requires more time and provides more repetitions for the observing birds.

By observation a bird may be able to imitate the action afterwards to reach the same goal, but the demonstrator shows the important parts of the task. It draws the attention to the locks and screw and shows what these parts are *able* to do. So the observer learns that some parts are more valuable than others. This is emulation learning.

Two birds were trained so they could demonstrate for the other five birds that was to be tested. A group of non-observing birds were also tested in the same experiment. The observing birds approached the device faster and spent less time exploring, but went for the locks. They proved to be more persistent, had more close contact to the device and solved it more times than the non-observers. These individuals spent more time exploring before they went for the locks and lost interest faster. The amount of energy required to pull out the pin was more than the non-observers put into it. They had not seen what the pin could do. When it did not move they went for other parts instead, they were also observed to pull the wrong end. So it seems that demonstrations have an effect after all.

Again the observers see the possibilities for the different parts of the device and the most important thing is that they are motivated to solve it. But they did not copy the exact details from the demonstrators. It shows that it's not completely imitation of actions, but that the birds have their own device strategy.

Even if the researchers observed little imitation does not mean that keas are unable to. To investigate this ability a new device was developed. It consisted of only one lock which was a

crank that had to be turned about ten times for the hatch to open sufficiently. Two birds were trained in the same technique, but they quickly made their own different ones. Both giving the same result. Then three birds were allowed to observe bird A, three for bird B and four were non-observers. As before the observers focused more on the crank and two of the birds tried to imitate the behavior of the demonstrator, but without succeeding to open the lid completely.

During investigation of technical understanding striking differences between wild and captive keas. So then human influence and previous experience of the birds have to be taken into consideration.

A single string pulling device was presented to keas, which solved the task immediately (not the fledglings, which had problems with their foot-beak coordination. They solved the task first at 7 months of age).

Other species of birds have been tested with the same task and only ravens seemed to understand the string pulling with correlation to reaching the food. As the keas solved it on the first try there were no trial and error so either the birds came up with the solution spontaneously or they observed the device and figured out the solution. But as the birds have come up with a solution that worked they showed little improvement, but a remarkable ability to repeat the actions. Which is true for the other types of the devices presented to the birds. But not all the birds used the same technique. When two strings were presented to them and only two out of seven chose the wrong string. Maybe the birds traced the string down to the food to find the correct one. So to test if this was the case the strings were crossed. But this proved difficult for them to solve. One bird chose the wrong string the first time, but then it seemed to understand the task better because it few mistakes in the next trials. Other birds showed the same, after solving it correctly they did few mistakes.

#### Conclusion:

By observing other individuals keas learn the possibilities of the devices. Then instead of imitation they apply their own techniques or approaches to the problem. But observation is still beneficial, their attention is drawn to the important parts and motivates the birds. It seems that keas learn by emulation rather than imitation. Emulation is a more intelligent and creative way of learning and shows that they have an understanding of the devices involved in the problem, rather than just copying others actions. Keas do not appear to use or make tool like primates does, but having a beak may make it unnecessary to acquire such skills.

From these researchers there appears to be a significant difference between wild and captive birds. Captive individuals showed signs of observational learning and they managed to solve more tasks. Maybe they are used to this type of learning and are more attentive during the demonstration.

Wild ones on the other hand appeared not to learn much from observing others. They showed little improvement. Also the ability to open rubber bins have not spread to all keas in New Zealand, but if they had learned by observation this should be the case.

All in all it seems that they do not benefit equally from observation. It appears that wild individuals instead learn that some objects are valuable and by trial and error they find a way to manipulate it and extract the food. Wild rubbish bin openers were older individuals, while partial openers were 4-5 years old. This may be an indication that some individual experience is required and is gained over time. While captive birds managed to solve several tasks only after a few demonstrations. The reason for captive birds superiority in opening and solving problems may be due their experience in similar tasks and some human influence. So this has

to be taken in to consideration. They also have more possibilities of interact and learn from older individuals than wild birds have.

Sources:

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