

The intelligence of crows

Miyagi Sendai Daisan Senior High School

In general, crows are known as very smart birds. In fact, they can open plastic bags of garbage. Also, they can make their nest from hunger.

The crows that live near our school eat walnuts. From previous research, we have already known that crows attach importance to the size of walnuts when they take it. However, we do not understand if this action is due to instinct or learning.

So, the purpose of our research is to investigate if the action of crows choosing big walnuts is due to learning or instinct. In the experiment, we used real walnuts and fake walnuts.

In result, crows distinguish real walnuts from fake walnuts. Therefore, the action of a crow is due to learning.

1 Background

In Japan, crows live everywhere. They are common birds and are known as very smart. They can make their nest from hunger. The crows that live near our school drop a walnut and then they can get fruit from the walnut. From the previous research we have already known crows attach importance to the size of walnuts when they take it. In other words if there are two walnuts of the same weight, but different sizes a crow takes a larger one. However, there is a limit to the size which crows can carry. Also, we have not known if the action of a crow is due to learning or instinct. So, the purpose of our research is to investigate whether the action of crows choosing a big walnut is due to learning or instinct. If the action of crows is due to instinct, the crow should always take the bigger walnut from the two. Also, if the action of crows is due to learning, the crow should always take the real walnut from the two.

2 Method

To do the experiment, we prepared a 3D printer and motion detection camera. A motion detection camera is a camera which starts recording when something moves in front of it. (fig.1)



fig.1 Deployment

We made observations of crows in our high school courtyard.

First, we made a big walnut by using a 3D printer. (fig.2, fig.3) The size of a real walnut is about 3.5 cm. Fake walnuts were about twice as large as real walnuts, 7cm. So a fake walnut was bigger than a real one. We set a fake walnut and a real walnut in front of the camera, and then the camera started working.

The intelligence of crows



fig.2 Fake walnut(colored)
We put real walnut fruits inside it.

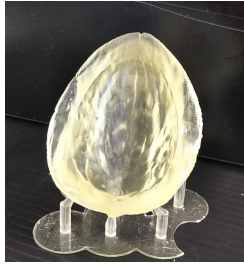


fig.3 Fake walnut(not colored)
This is made from resin.

3 Results

From the experiment, we can get the result like table 1.

table.1 Result of experiment 1
If the crow took a real walnut, it is written ○, and
if the crow took a fake walnut, it is written ×.

回数	結果
1	○
2	○
3	○
4	○
5	○
6	○
7	○
8	○
9	○
10	○

As you can see from this table, the crows took a real walnut in all experiments.

From this result, we think the crow knows real walnuts and fake ones.



fig.5 The action of the crows
The left walnut is real, and the right one is fake.

4 Conclusion

In this experiment,we focused on the action of crows choosing big walnuts and research that this action is due to instinct or learning.

From the result, crows distinguish real walnuts from fake walnuts.

Therefore ,crow's action is not instinct,but learning.

5 Connection to society

If we study about crows,we help decrease damage by crows.In Japan,they are known as Harmful birds because they break our trash bags and clutter garbage.So understanding crows is will useful measures of crow's harm.

6 Future work

In the future, we would like to further our experiment with different conditions.

For example,we want to use real walnuts and fake ones of the same size,or use big real walnuts and small fake walnuts.

Also,we do not consider the color and smell of walnuts. If crows have good eyesight and sense of smell,they can understand the real walnuts from color and smell. So we would like to investigate the crow's eyesight and sense of smell in detail.

Based on that,we change conditions and repeat our experiment.

5 References

- 1) 平成28年度 仙台第三高等学校課題研究
(カラスの採食行動)
- 2) ハクガンの卵認識：模造卵による実験