

## Questions on Crossbills

### Methods

Britta

1. Why did the authors have the requirement that food would not be in the same cone in consecutive trials? It seems that they might be trying to eliminate the chance that the birds will learn which cones have food, but isn't it possible that they would just as easily learn that the same cone never has food in it twice?

Ian

Why is it that the authors placed a crossbill in the left side of the aviary "to reduce the chance that differences between solitary and paired foraging were the result of changes in vigilance"? How does this work?

Zach

What is the benefit of having the crippled bird in one side of the cage during the lone bird foraging trial? Are there any setbacks this could have from the presence of this crossbill when assessing the foraging behavior of the lone crossbill?

Alex

Despite the fact that the researchers used a very large number of trials and that their results were statistically significant, we must remember that they used only five individuals in their experiment. Might this mean that the results can't necessarily be applied to the whole species, or is a sample of five birds enough?

Chloe

The article mentions that in the first study of paired testing, "vicarious" foraging was not significantly observable, so the environment was made "more favorable" to the vicarious foraging behavior. Though perhaps this was to facilitate what would still be natural public information usage, it sounds like the study was affected by confirmation bias and that the change was made simply because the experimenters did not see the desired effect. How is this valid?

### Results

Indrani

Can we please go over why we can assume that if crossbills were foraging in an energy-maximizing manner then changes in sampling behaviour through time were not the result of crossbills acquiring additional experience.

Also, how exactly are the results in Fig. 3 and 4 different?

Britta

2. Why would there be such a significant difference in foraging between pairs and trios?

### **Interpretation**

Neal

Considering the hypothesis of Smith et. al., could the crossbill's movements be effected by the fact that it is safer to forage in groups (instead of public information)?

Hannah

When they offered competition as an alternative to public information accounting for their results, they said "If the results were due simply to competition, then the focal crossbill should have sampled fewer or the same number of cones, not more cones... If differences were the result of competition, then the focal bird should have stayed longer, not shorter, on the good half because the partner birds left early." How do they know that competition would affect their behavior in this way without studying their behavior specifically under competition?

Thorson

what does the lack of significant difference between paired and solitary foragers suggest about the phenomena of local enhancement earlier discussed in the course? is local enhancement the same as public information?

Cara

By using trees that had one half empty and one half with seeds, Smith et al. show that even birds on the side with seeds would leave after observing other members on the opposite side receiving no seeds. The authors use this to suggest that public information is more valuable in assessing poor patches. Why would this, and not the reverse, be the case?

Christine

The authors found no evidence for the use of public information when crossbills were paired with one other crossbill (in terms of mean # cones sampled and time spent on empty tree), though they did not delve into why this might be the case. Should not their explanations and assumptions for the profitability of public information apply to crossbills in pairs? Would you expect the use of public information and/or foraging efficiency to increase in proportion to the number of other individuals present?

Rosie

The authors say that it is very important to first determine whether the behavior of public information is important to crossbills in the wild. How exactly do they define “scroungers” and “producers”? Why would the divisibility of a food affect which behavior is more beneficial?

Charlie

The introduction reveals that other species of birds choose to ignore the foraging behavior of others when searching for food themselves. How might environmental selection pressures differ for these species compared to the red crossbills, who do seem to use public information to increase their sampling efficiency? How might a rogue individual take advantage of either system in order to forage most efficiently itself?

## **Speciation**

Curran

In their discussion the authors mention that observations in the wild indicate that crossbills flock assortatively by call type, but this hasn't yet been quantified. How could you set up an experiment to quantify this?

Jeff

Basically, this paper suggest that staying close to the flock is more important to individuals than successful foraging. Have there been any studies to test the importance of proximity relative to this studies findings on public information?

Jessica

What is the difference between a crossbill that "forages" and a crossbill that "scrounges?"

