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Eavesdroppers and snoops in the scrub

By ARCHBOLD BIOLOGICAL STATION

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A model Florida Scrub-Jay mounted on the top of a 15-foot pole appears to be “on sentinel,” scanning its surroundings for predators. A rope and pulley system allows the researchers to raise the box below the model, causing the sentinel to “disappear.”

KEITH TARVIN PHOTO

Have you ever noticed how strange or awkward it feels when a murmuring crowd suddenly goes quiet for no apparent reason? As a member of such a crowd, perhaps in an auditorium before a speech or performance, chances are you never really notice the murmuring until it stops. But once it ceases, you may look up and scan the room to see what caused the sudden hush — is there a problem? Does someone know something that you don't?

It can be surprising how much we are tuned in to 'public information' that is produced — even inadvertently — by other individuals, but that is not necessarily produced for our consumption or benefit. Interestingly, it turns out that humans aren't the only species that 'eavesdrops' on such public information. Many animals also eavesdrop on their neighbors, even when those neighbors are other species! For example, squirrels eavesdrop on the alarm calls of chickadees, gazelles listen in on alarm calls of impala, and warthogs and ostriches each exploit the alarm calls of the other. Deer hunters are keenly aware of this phenomenon, especially once their presence is revealed by a squirrel or blue jay giving alarm calls, almost guaranteeing that the hunt is over!

Animals clearly can learn about imminent danger by eavesdropping on the alarm calls of other species, but do they still benefit from listening to their neighbors when the environment is relatively safe?

Oberlin College biology professor Dr. Keith Tarvin and his students Eli Haines-Eitzen, Abby Parker, and Natasha Radic are studying how northern mockingbirds weigh the importance of cues of alarm and cues of safety produced by Florida Scrub-Jays at Archbold Biological Station. Scrub-jays live in family groups, with one individual usually serving as a 'sentinel' that perches high above other family members to watch for predators. In response to danger, the sentinel typically gives an alarm call and dives into the scrub.

Hence, a quiet bird on sentinel implies safe conditions, while the disappearance of a sentinel accompanied by alarm calls spells danger. Because mockingbirds and scrub-jays share similar predators, mockingbirds could benefit from eavesdropping on scrub-jay alarm calls and cues of safety.

To assess how mockingbirds weigh cues of alarm versus cues of safety, the Tarvin lab experimentally manipulated the kinds of public information that mockingbirds were privy to this past January. To do this, the team mounted scrub-jay models on 15-foot poles and used pulleys to raise a box up and down to either hide or reveal the 'sentinel jay.' Scrub-jay alarm calls given in response to a fake flying Cooper's Hawk model (dubbed "Good Luck Chuck") were recorded in the field prior to experimentation and then played through a portable speaker during experimental trials.

During these trials, focal mockingbirds were subject to different combinations of the two variables: presence/absence of a "sentinel jay" and presence/absence of a jay alarm call. To really make sure the mockingbirds were paying attention, Cooper's Hawk calls were played at the beginning of each trial to 'prime' the mockingbirds to be vigilant during the treatments. The lab was especially interested in the vigilance behavior of mockingbirds when cues of danger and cues of safety were incongruous—if an alarm call (cue of danger) was paired with a quiet perched sentinel (cue of safety), for example, to which cue would the mockingbird give more legitimacy?

For each trial, one team member operated the pulley system and playbacks, and the other observed and counted behavioral states (foraging, preening, perching and singing etc.) and vigilance events (head turns, changes in position) over a seven-minute period. Although federal and state permits weren't required for this

observational study, the study design was evaluated and approved by the Oberlin College Institutional Animal Care and Use Committee to ensure that the animals were treated humanely. This past January, the group completed 14 trials with early results, and they plan to return to Archbold next year to continue the study and hopefully garner enough data to answer the question. Stay tuned!

Many studies have shown that animals of all stripes eavesdrop on alarm calls produced by other species. However, the Oberlin study may reveal that cues of safety are just as important as cues of danger, allowing eavesdropping animals to reduce their own vigilance when in the presence of reliable public information. Reducing their own vigilance may free up more time for foraging, finding mates, and other important aspects of life in the scrub.