

MAKE IT REAL

Research Experience in Animal Behavior

by Peter Nichols

Three students huddle around the little LED screen of a camcorder. Each has a notebook and pen. One is monitoring a kitchen timer. A few minutes before, the eye of the video recorder was focused on a VW-size cage while 15 different male cowbird songs played at 60-second intervals from a speaker on the left side. The two plain-brown female cowbirds inside are known to be familiar with some of the males whose songs were burned onto the CD. The students are testing whether the females are more interested in the songs of males they know than in birds that are unfamiliar to them.

Suddenly you hear one of the songs: “Ploink-sleeee!” It has a metallic ring. The undergrad experimenters perk up and watch the screen. After a few moments, they start twiddling and clicking their pens again.

“Nothing’s happening,” Erin Sullivan, C’08, laments.

Justin Flores, C’09, sighs.

A big-bearded, dour-looking Darwin stares down at them from a portrait on the wall.

“One of them keeps getting water,” Hollis Karoly, C’09, observes. “Maybe we should take it out next time.”

“Ploink-sleeee!”

The group leans in and stares hard at the screen.

“I think she’s stuck,”

Sullivan wonders out loud, breaking the silence.

“Sometimes they don’t react at all,” Flores sighs again. “When’s a good time to come to the aviary again? I’m not around Friday to Monday.”

“Oh, wait!” Karoly exclaims. “One flew over at 41 seconds!”

A bird had flitted into the partition where the speaker is

positioned. The experimenters scribble down the data and then turn back to the bird show on the little screen.

The students make up one of four teams that planned and carried out experiments in David White’s hands-on course, Research Experience in Animal Behavior. White, an assistant professor of psychology, is himself an animal behaviorist. It is his brown headed cowbirds (*Molothrus ater*) that Flores, Karoly and Sullivan were experimenting with at his aviaries at the Morris Arboretum, about 30 minutes from campus. The other research groups White supervised studied guppies, mallards and fiddler crabs. The 14 students met only twice as a class: once at the beginning of the semester to present their

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research projects and at the end to report and discuss findings. Their first papers resembled a grant proposal, a description of the methods they would use to test hypotheses. The second followed the conventions researchers use when submitting work to scientific journals.

“When you read a science paper or textbook,” White says, “you can see what step one is and step two and step three. But when you run an experiment yourself, all of a sudden it becomes real. You do step one, and when you get halfway through step two, you realize, ‘This isn’t step two. I’ve missed seven steps in between.

I’ve got to control for this. I’ve got to check that. I’ve done this completely wrong. And what is another possible explanation for this finding I’ve got?’”

The cowbird group ran 13 playback trials to test female preference for the songs of familiar males and found a “statistically significant” preference – one not due to chance – for birds they knew. The females spent more time in the speaker chamber after familiar-male songs (60 percent) played than they did when songs of unknown birds were heard (40 percent). The results show females can discriminate among individuals based on song, and the fact that some birds are recognized as familiar suggests that cowbirds have memories of past interactions. Still, the experimenters could not nail down why cowbirds, who lay their eggs in nests of other species for them to raise, should show an interest in familiar birds, since there is no need to pair up and raise young. “We learned how simple experiments can be,” noted Flores, “and yet how complex the implications are from the results. You never get as complete a picture of the research process in a typical classroom.”

Elizabeth Shayne, C’09, of the fiddler crab group, characterized her experience this way: “Research is not just studying nature. It’s coming up with ingenious ways to disentangle nature while she’s fighting right back to remain tangled.”

Angela Yeh, C’09, a member of the mallard group, had a different take: “I’ve read many science papers throughout college, but I’ve never thought of writing one on my own. Designing and running experiments and writing papers similar to the ones we read has made me realize that doing science is not so out of reach.”



Inside the aviary, from left, Erin Sullivan, David White, Hollis Karoly, Justin Flores