Animal Science-2013

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference on
Animal & Dairy Sciences

July 23-24, 2013 Embassy Suites Las Vegas, USA

Mixed modalities: Using bioacoustics and optical cues to influence behavior of ring billed gulls, *Larus delawarensis*, in Rouses Point, NY

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Abstract

Biologically meaningful auditory cues, such as alarm calls and threat displays, have the potential to reinforce the perception of risk posed by other risk cues in the environment. Due to the potentially lethal consequences of ignoring these cues, animals are expected to habituate more slowly to biological cues than novel cues. We exposed three populations of ring billed gulls, *Larus delawarensis*, near Rouses Point, NY to alarm calls from conspecifics in the presence, and absence, of optical cues (lasers). The following stimuli were examined within a counter balanced Latin Square Design (LSD): a distress call with optical control, a red visual stimulus with acoustic control; a green optical stimulus with acoustic control; red stimulus with distress call, green stimulus with distress call and a double control. Our response variables included flight (repellence) from the roost, magnitude of response (time to response and flight distance) and circling within the area. Gulls responded significantly more to both optical and auditory cues when combined than when presented alone. Habituation was not observed during our trial. We did observe order effects as, during the later weeks of the trials, gulls were more likely to flee from either treatment (but neither control) as compared to early stages in the trial. Our results suggest that multimodal stimuli (regardless of type of cue) may be more effective in generating behavioral responses over a longer period of time than unimodal cues used alone. Animal responses to multimodal stimuli are complex and require further investigation across a number of species.

Biography

Caitlin Lecker has completed her BS in Natural Science from SUNY Empire State College. Her first research project is now under peer review. She is currently considering Masters Programs in Animal Welfare and Management in the North-Eastern US, and hopes to continue her education through to a PhD.