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This document is part of a collection that serves two purposes. First it is a public archive for data and documents resulting from evolutionary, ecological, and behavioral research conducted by the Ketterson-Nolan research group. The focus of the research is an abundant North American songbird, the dark-eyed junco, *Junco hyemalis*, and the primary sources of support have been the National Science Foundation and Indiana University. The research was conducted in collaboration with numerous colleagues and students, and the objective of this site is to preserve not only the published products of the research, but also to document the organization and people that led to the published findings. Second it is a repository for the works of Val Nolan Jr., who studied songbirds in addition to the junco: in particular the prairie warbler, *Dendroica discolor*. This site was originally compiled and organized by Eric Snajdr, Nicole Gerlach, and Ellen Ketterson.

Context Statement
This document was generated as part of a long-term biological research project on a songbird, the dark-eyed junco, conducted by the Ketterson/Nolan research group at Indiana University. For more information, please see IUScholarWorks (https://scholarworks.iu.edu/dspace/handle/2022/7911).

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Female release of luteinizing hormone (LH) in response to short- and long-range song in a songbird, the dark-eyed junco (Junco hyemalis)

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Introduction

• Male courtship signals affect female reproductive physiology and condition.1
• In songbirds, hearing male song is known to activate HPG-axis leading to sex steroid production and follicle development in females.1,2
• High-amplitude (loud) songs, also known as long-range songs (LRS), have been the focus of all research to date.
• Males of many species also sing low-amplitude (quiet) songs or short-range songs (SRS).
• SRS can be directed exclusively towards females during courtship and are often strikingly divergent in structure from LRS.3

Methods

- Captured free-living females, early breeding season
- Blood Sample after 60-min stimulus
- Plasma assayed for Luteinizing Hormone (LH)

Results

1. Do female dark-eyed juncos upregulate their HPG-axis in response to male song?
2. Do females upregulate differentially to long-range song (LRS) or short-range song (SRS)?

Females receiving sound (LRS or SRS) had significantly higher circulating LH than females left in silence.

SRS elicited detectable LH levels in a higher proportion of females than did LRS or silence.

Research Questions

Discussion

• Female juncos can upregulate circulating LH rapidly in response to male song
• Lack of detectable difference between silence and playback birds may be due to
  o Small sample size
  o Variable Reproductive Condition of subjects (no brood patch to full brood patch)
• Both LRS and SRS appear to elicit LH release and SRS may be a more potent activator of the HPG axis than LRS.
• Results highlight the importance of both SRS and LRS in studies focusing on female preference for male courtship signals.

Future Directions

• Replicate with captive birds and a larger sample with repeated measures design.
• Measure female behavioral preferences for each song type.
• Is a visual stimulus necessary to activate the HPG axis? Possibly augment response?

Literature Cited

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