

Behavioural responses to typical and atypical calls in Black-capped chickadees (*Poecile atricapillus*)

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Introduction

- Both music and birdsong drive emotional responses through their structure (Rothenberg et al., 2014).
- Songbirds and humans exhibit analogous song patterns due to physical predispositions and constraints.
 - This includes sustaining the endnote of a musical or song phrase (Fig 1; Tierney et al., 2011).
- Altering endnote duration can possibly result in an emotional response in birds.
- Behaviours may be an indicator of emotional state.

Purpose

- The current study investigated the impact of typical and atypical chickadee calls on behaviour by measuring specific responses across three playback conditions.

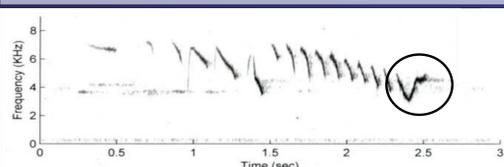


Figure 1. Spectrogram showing the tendency for long endnote durations in the Eurasian Treecreeper (*Certhia familiaris*). From page 4, Tierney et al., (2011).

Methods

Typical and atypical chickadee calls were played to four birds and behaviours were measured.

- Vocalizations, approach, and perch hopping

Vocalizations

Any vocalizations from the bird.

Approach

Any time the bird grasped the cage wall closest to the speaker.

Perch Hopping

Each time the bird jumped to another perch.
 Does not include when landing on a perch from cage walls or floor.

Typical *Chick-a-dee* call

Chick-a-dee call with unaltered endnote duration (CDT).

Atypical *Chick-a-dee* call

Chick-a-dee call with altered endnote duration to the same as the previous note (CDA).

Results

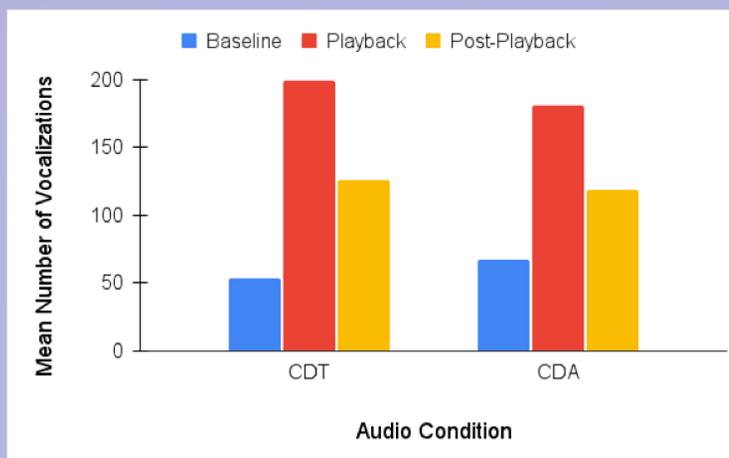


Figure 2. Average number of vocalizations in CDT and CDA during baseline, playback, and post-playback.

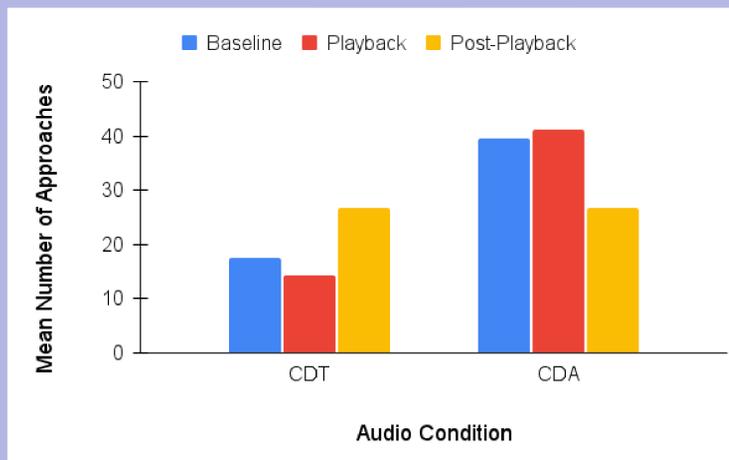


Figure 3. Average number of approaches in CDT and CDA during baseline, playback, and post-playback.

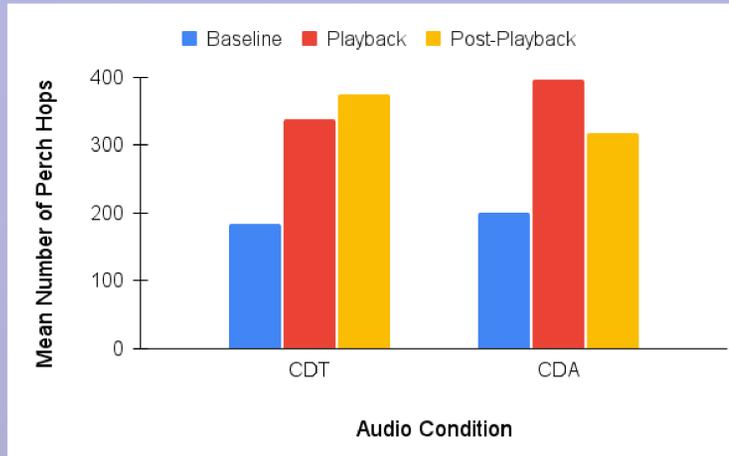


Figure 4. Average number of perch hopping in CDT and CDA during baseline, playback, and post-playback.

Conclusions and Future Directions

- The average number of instances for the measured behaviours remained relatively similar across playback conditions
 - However, birds produced more vocalizations and perch hops during playback than baseline.
- Initial analyses show no significant differences in behavioural responses towards typical and atypical chickadee calls
- With further refinement, results could show how behaviour can be used to indicate the emotional state of a bird.
- Birds have been previously overlooked in research about emotional indicators.
- The present research can provide a non-invasive method for analyzing avian emotion.

References

- Rothenberg, D., Roeske, T.C., Henning, U.V., Naguib, M., Tchernichovski, O. (2014). Investigation of musicality in birdsong. *Hearing Research*, 308, 71-83. <https://doi.org/10.1016/j.heares.2013.08.016>
- Tierney, A.T., Russo, F.A., & Patel, A.D. (2011). The motor origins of human and avian song structure. *Proceedings of the National Academy of Sciences of the United States of America*, 108(37), 15510-15515. <https://www.jstor.org/stable/41352122>
- <https://www.perkypet.com/media/Articles/Perky-Pet/Species-Spotlight-Black-Capped-Chickadee.jpg>
- https://intotheoutdoors.org/wp-content/uploads/2015/05/ito_critter-chickadee.png
- https://uploads.alaska.org/suppliers/attractions-and-points-of-interest/wildlife/birds/_800x418_crop_center-center_82_none/birds-Black-capped-Chickadee.jpg?mtime=20200413131748&focal=none&tmtime=20210611040308
- <https://naturealberta.ca/wp-content/uploads/2020/10/Chickadee.png>

Acknowledgements

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