Why Practice? Investigating Why Males Perform "Mating" Displays with No Female Present

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Introduction

For both humans and other animals, repeating learned behaviors, particularly those that relate to motor skills, is fundamental to that behavior's improvement (Ericsson, 1996). For many species of bird, mating displays involve intricate dances that require developed motor skills. For example, Java Sparrows (Lonchura oryzivora) routinely practice their courtship displays, and this behavior might be necessary for their motor learning and establishing coordination and socialization (Soma, 2019). Here I tested two hypotheses about why males practice in the lance-tailed manakins (Chiroxiphia lanceolata), a tropical passerine bird that performs complex cooperative mating displays for females involving two males: an alpha and a beta (DuVal, 2007). Though two males take part in the songs and dances that attract females, only the alpha gets to copulate, or mate with, the females they attract. These birds are a perfect fit for a question on practice because they are often seen doing their mating displays without a female present (DuVal, 2007), a behavior that we here refer to as "practicing". Practice displays are performed by individual males, pairs, or even three males at a time. Despite decades of research on the displays lance-tailed manakins perform for females, no one has yet investigated the context in which "practice" displays occur in this species.

Figure 2: Two adult male manakins preparing to display together

Methods

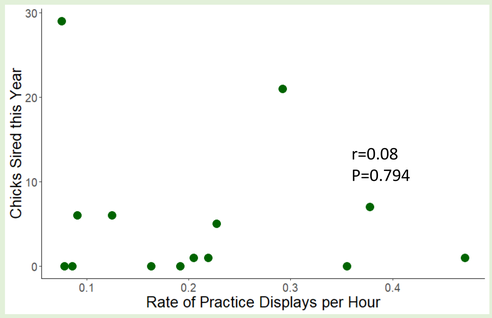
- We used 2013 video footage recorded in a population of lance-tailed manakins on Isla Boca Brava, Panama. Birds are color-banded for individual identification and display sites have been monitored annually since 2000.
- Recordings were previously scanned by a team of FSU graduate and undergraduate students to identify the occurrence of displays.
- From the existing database, we examined displays performed without females at all sites with 10+ days of video monitoring. For each display area, we extracted the dates, times of day, types of display, number of males present, and identified the color bands of males present when available.
- We used information from field monitoring and genetic paternity testing to identify the alpha male at each site, their years as alpha, and number of chicks sired.
- To calculate rates of practice, we summed the hours total of recording at the 21 most active displays sites, as well as sorted displays into 1 male, 2 males, or 3 males present. Then, for each site, we took the number of displays and divided it by the hours of video recorded to get a total rate of displays.
- We used Spearman's Rank Correlations to test the key predictions of my hypotheses.

Hypotheses

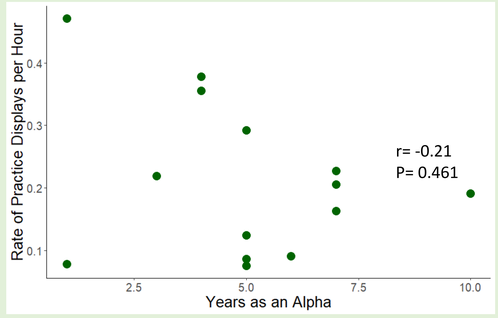
Hypothesis 1: Males practice to increase reproductive success.
Performing the display without a female present may increase the quality of a display, making it more likely to end with a copulation when performed for a female. This predicts that male who practice would sire more chicks.

Hypothesis 2: Males practice to establish social roles and their place in the dominance hierarchy.
Males need to dance with others to figure out who is the alpha and beta, who will work together, and so on. This predicts that, (a) non-alpha males or less experienced males will display more with others, and (b), that established alpha males will only practice with their established partner.

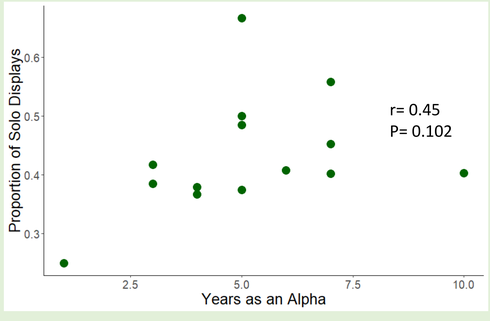
Results



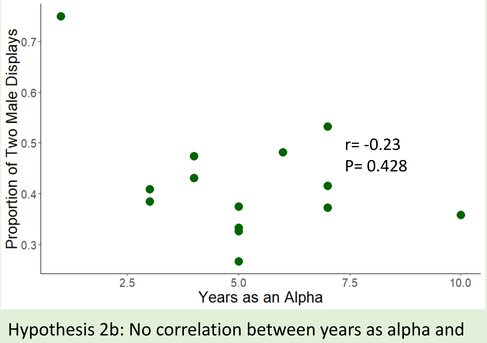
Hypothesis 1: No correlation between practice and reproductive success



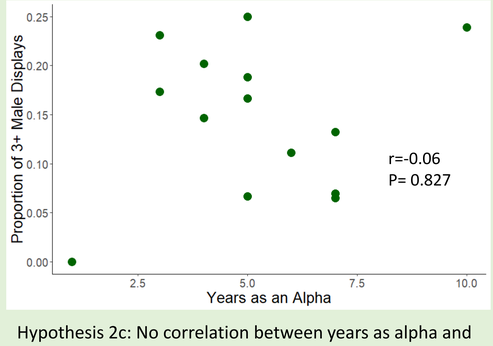
Hypothesis 2: No correlation between years as an alpha and rates of practice



Hypothesis 2a: No correlation between years as an alpha and proportion of solo displays



Hypothesis 2b: No correlation between years as alpha and proportion of two male displays



Hypothesis 2c: No correlation between years as alpha and proportion of 3+ male displays

Figure 1: An adult male lanced-tailed manakin seen alone

Conclusion

- Both tested hypotheses were rejected, there was no statistically significant correlation between any of the variables
- This leads me to believe there is not any one reason these birds do practice displays, but multiple interacting reasons
- Correlations may not be strong because I did not look at individuals or exclusively at alphas, but instead looked at activity based on each dance perch. This may not be the most accurate representation because this method includes any males displaying at the site, not just the alpha males.
- Benefits of practice may emerge over a longer timeline. I did not look at data over a lifetime but instead just one breeding season, but the birds are long-lived (up to 17 years). Longer-term effects of practice displays are an interesting area for future research.

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