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Peer Review

Review of: "Social and Spatial Drivers of the Multitiered Structure of Zebra Finch Social Networks"

Oded Keynan[1]

1. Dead Sea-Arava Science Center (DSASC), Jerusalem, Israel

Review of the Paper "Social and Spatial Drivers of Zebra Finch Social Networks"

This paper offers a unique methodology and provides important insights into the social network of relatively large colonies of passerines (Zebra finches). The authors, known for their innovative methodologies and use of advanced technologies, manage again to introduce a novel approach to investigating social interactions within large populations. Using advanced tracking systems and broad statistical analytical frameworks, the authors reveal that zebra finches exhibit multitiered social networks characterized by consistent egocentric structures, fractal patterns, and stable social ties over time. Additionally, the study highlights the differentiation between spatially driven and socially driven interactions and scaling patterns of relationships across tiers. These findings significantly enhance our understanding of zebra finch social dynamics. I believe addressing a few additional points could further broaden the scope and impact of this work.

Novel Methodology, Generalization, and Species-Specific Context: The paper introduces a novel methodology for studying social interactions among large populations, particularly in birds, and provides valuable insights into egocentric social networks and fractal patterns. However, the authors attempt to draw overly broad conclusions about social structures without adequately addressing the species-specific context. While certain findings, such as fractal patterns, have general relevance across species, others are more specific to zebra finches and their unique social structures, such as their colony-based, pair-bonded nature. A stronger emphasis on the adaptive and ecological significance of zebra finch sociality would improve the generalization of these findings and ensure a better balance between general and species-specific insights.

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Integration of Social and Spatial Processes: While the distinction between social and spatial influences is essential, the authors should acknowledge that clumping, while a strong proxy for social interactions, may be just one of the various interactions that may contribute to the network structure (acoustic communication, for instance).

Fractal Behavioral Limits: The observation of fractal behavioral limits in social networks is intriguing and may point to cognitive or physical constraints. It would be interesting to discuss this aspect further, perhaps regarding brain capacity or ecological pressures.

Consistency of Social Preferences: The consistency of egocentric networks and the stability of social ties across tiers are interesting. The authors propose that "*it is also possible that the multitiered structure of multilevel societies could arise first", and that "the resulting interdependence among individuals may then select for increased social stability, eventually leading to the formation of stable groups."* While intriguing, this assumption is highly ambitious and demands a discussion of more significance. Whether social structures emerge bottom-up through individual interactions or top-down due to environmental and ecological constraints is a complicated question. The findings presented, while significant, may not be sufficient to support such a conclusion fully and should be framed with greater caution.

The paper provides important insights into zebra finch social networks and their multitiered structures. It offers a methodology that could significantly enhance our ability to study social structures in large animal colonies. The findings are interesting and relevant, particularly in their exploration of fractal patterns and stable egocentric networks. However, while these findings hold great potential for improving our understanding of animal sociality, care should be taken when generalizing to adaptive and evolutionary explanations for social structures in birds and mammals. Addressing these aspects with greater caution will strengthen the paper's contribution to the field.

Declarations

Potential competing interests: No potential competing interests to declare.