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Editorial: Ethology today: learning from the past, mapping the future

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Editorial on the Research Topic

Ethology today: learning from the past, mapping the future

Ethology has been, and still is, much more than just trying to understand why and how animals do what they do: it is a universe of theoretical and methodological approaches. From a historical point of view, it is the story of scholars who, with their hypotheses and intuitions regarding animal behavior, have changed our way of understanding the natural world around us and have influenced the way we interact with other animals, which are increasingly part of our daily lives.

From the beginning of the 20th century onward, ethology has taken many different geographical and cultural directions. In the early days, the naturalistic view of behavior championed by the continental researchers had to confront the more psychological point of view of the American school of thought. From this confrontation, ethology has become more focused and significant. Then, over the years, ethology gave rise (with a sort of budding process) to sub-disciplines, with some, such as sociobiology, threatening its very existence, but this led to re-evaluations that further matured the field.

Ethology constitutes a scientific discipline that grounds its inquiries in rigorous methodological frameworks. Systematic procedures for data collection and analysis provide reliable insights into animal behavior—including that of humans—and into the ways in which behavioral patterns adapt to environmental and social dynamics. Today, standing on the shoulders of giants (never has such a saying sounded more appropriate...), ethology finds a whole series of applications in different fields of investigation, from conservation to neuroscience, from animal welfare to animal ethics, and from eco-ethology to cognition.

The aim of this Research Topic is to provide a limited, although significant, example of how ethology can answer important and contemporary questions, looking at behavioral research both in a comparative manner, as urged by the founding fathers, and from a historical perspective. In particular, the articles presented here relate to two main points: i) reviewing the impact that ethological thinking and its methodological approach can have on different fields of inquiry; and ii) reporting examples of applications to current research illustrating ethological interactions with different fields, including highlighting future developments.

The first paper, by [Abud et al.](#), is a review dedicated to an important topic in ethology, that is, vocal communication. This field of enquiry has proven to be, over time, a very flexible area of research, adaptable (no pun intended) to investigations within each of the

four questions proposed by Niko Tinbergen in his foundational paper published in 1963 (Tinbergen, 1963). The authors of the present paper review 10 years of publications on rodent vocalizations (between 2014 and 2024, for a total of more than 400 papers, covering 88 different rodent species), looking for theoretical and methodological patterns and developments. In relation to the four questions, it was found that naturalistic studies focused mainly on function and evolution, whereas laboratory studies mainly covered mechanisms and developmental processes. At the end of their contribution, the authors confirm the value of rodents for continued research on vocal communication, suggesting that future studies should include more rodent species, more diverse environments, and more observations on the roles of age and sex.

The second paper presented here was co-authored by Gutierrez-Ibanez et al. It is a review and empirical analysis dedicated to a particular behavioral pattern, scratching the head, in birds, in which some species reach their heads by dropping the wing and moving the foot over the shoulder (over wing), whereas others reach the head directly by moving the foot ventrally (under wing). The aim of the paper is to test and contrast two competing hypotheses formulated in the past to explain the origin and distribution of these different tactics: One hypothesis posits a phylogenetic interpretation, with ancestry determining the preferred tactic, whereas the other hypothesis posits a biomechanical explanation, in which the interaction between morphology and environmental factors determines which tactic is used. The two mentioned hypotheses, however, have been proposed based on very limited sample sizes. To test these hypotheses, the authors of the present paper include 1,157 species from 92% of avian families, in order to better analyze morphological traits related to head-scratching.

The results of the impressive comparative analysis suggest that the two forms of head-scratching have evolved independently, thus supporting a modified phylogenetic hypothesis. While some contributions were found for biomechanical factors, they are insufficient to explain the distribution of the two types of scratching across the avian clade.

One of the most exciting developments of the last years in animal behavior studies has been the involvement of ethologists in issues related to animal welfare. In their article, Collarini et al. approach welfare issues with their behavioral study on free-ranging farm pigs, looking at the effects of social dynamics and environmental enrichment on several emotions and social behaviors. These go from the expression of anxiety-related behaviors to post-conflict resolution (inspired by the pioneering work of the late Frans de Waal). With a series of experimental settings, including comparison across groups of different sex composition, as well as the presence or absence of environmental enrichment, such as bags of straw, the

authors highlight the effectiveness of an ethological approach to evaluate pigs' level of welfare. For example, they show how it is possible to prevent undesirable behavior, such as excessive excavation activities, while not preventing the expression of other naturally occurring behaviors, such as prosocial interactions. This latter point provides strong support for one of the leading schools of thought in current animal welfare science.

Finally, we hope that this Research Topic will encourage further research, inspired by the examples of past leading figures, but with an exciting look at the future of our beloved discipline.

Author contributions

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