

resources, and/or social interactions (Toscano et al. 2016). Indeed, individuals likely differ consistently in their habitat preference (Webber et al. 2020) rather than in their habitat use. Thus, for example, if certain individuals prefer a particular type of food, their movements may be consistent even if relocated (Figure 1) because of the distribution of their preferred food, rather than because of an inherent spatial personality. Similarly, preference for certain habitats and/or social interactions may result in observed spatial personalities.

Finally, spatial personalities may emerge from a feedback between spatial behavior and spatial information. An individual's movements determine the amount of spatial information they have (Spiegel and Crofoot 2016). The value of spatial information depends on the rate at which the environment changes, and the interaction between information and environmental change will inform future movement patterns, such as where to settle and forage. For example, in highly variable environments with scarce resources, individual differences in movement patterns could emerge from differences among individuals in spatial information. Thus, the environmental conditions under which animals are observed and the amount of spatial information they possess could influence inferences about the existence and the causes of spatial personalities.

The strong dependencies between environmental conditions and animal movement patterns highlight the challenges awaiting future research on spatial personalities. These challenges will require combining diverse experimental approaches (e.g. natural experiments, translocations, and habitat manipulations) to deepen our understanding of the genetic, physiological, behavioral, social, and ecological mechanisms that underlie consistencies in spatial behaviors and their ecological and evolutionary consequences for wildlife populations in a changing world.

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Received 24 November 2021; editorial decision 17 January 2022; accepted 24 January 2022.

<https://doi.org/10.1093/beheco/arac009>

FUNDING

O.S. and N.P.-W. were supported by the NSF-BSF grant (NSF IOS division 2015662/BSF 2019822).

Conflict of interest: The authors declare no conflict of interest.

Handling Editor: Leigh Simmons

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