

Spider personality study shows evidence of 'social niche specialization'

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Stegodyphus dumicola. Credit: © A. P. Modlmeier

(Phys.org) —A team of researchers with the University of Pittsburgh (and one from the Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm, Germany) has found evidence of "social niche specialization" in a species of social spiders. In their paper published in the journal *Biology Letters*, the team describes how they experimented

with 84 artificially created colonies of the spiders and what they learned about their behavior as a result.

Social niche [specialization](#) is a theory of animal behavior that describes individual behavior within a social group—the idea is that the more social individual members are, the more individual differences emerge, leading to niche personalities for individual members. Groups with member niches are thought to be stronger and more organized.

To find out if *Stegodyphus dumicola*, a social spider native to the Kalahari, conform to the theory, the researchers created 84 web colonies artificially and allowed time for acclimation. Soon thereafter, the colonies were disturbed, causing the need to recreate the structure that bound them together. Some groups of the spiders were allowed to remain together, their initial units intact. Other groups were separated and interspersed. It was by watching how the two different types of colonies emerged that the researchers found evidence of social niche specialization—spiders in the [colonies](#) that remained with their initial units tended to be bolder, indicating a stronger social structure.

The team tested boldness by blowing a puff of air at individual members, causing them to freeze themselves in place, a protective measure. The sooner they resumed activity, the higher their boldness score. The team found that on average, spiders that were forced to start a new life with a group of strangers were shyer than those that were allowed to move forward with known companions. They also found that the [spiders](#) that stayed with their original colony mates not only showed more consistency in their work, but diverged from one another individually, demonstrating niche development.



Stegodyphus dumicola pair. Credit: © C. N. Keiser

The team suggests that the behaviors they've observed are likely similar to other social creatures, including humans. That might mean that groups that are allowed to function together for longer periods of time tend to be more organized and efficient—something that might have an unrealized impact in work or social environments.

More information: Persistent social interactions beget more pronounced personalities in a desert-dwelling social spider, *Biol. Lett.* August 2014 vol. 10 no. 8 20140419. [rsbl.royalsocietypublishing.org ...
ontent/10/8/20140419](https://royalsocietypublishing.org/doi/10.1098/rsbl.20140419)

Abstract

The social niche specialization hypothesis predicts that repeated social

interactions will generate social niches within groups, thereby promoting consistent individual differences in behaviour. Current support for this hypothesis is mixed, probably because the importance of social niches is dependent upon the ecology of the species. We test whether repeated interactions among group mates generate consistent individual differences in boldness in the social spider, *Stegodyphus dumicola*. In support of the social niche specialization hypothesis, we found that consistent individual differences in boldness increased with longer group tenure. Interestingly, these differences took longer to appear than in previous work suggesting this species needs more persistent social interactions to shape its behaviour. Recently disturbed colonies were shyer than older colonies, possibly reflecting differences in predation risk. Our study emphasizes the importance of the social environment in generating animal personalities, but also suggests that the pattern of personality development can depend on subtle differences in species' ecologies.

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