

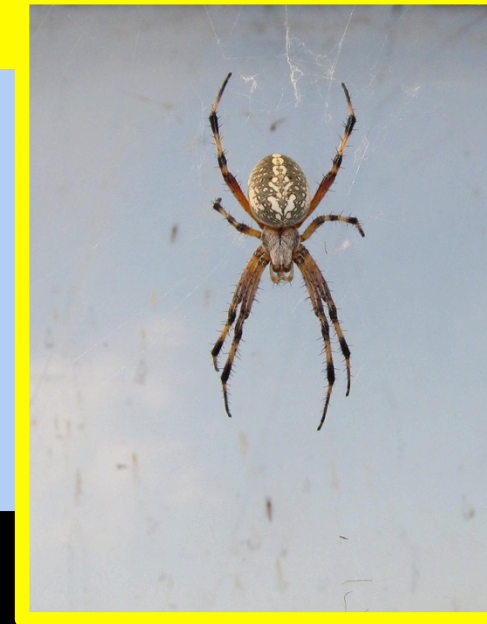
Do spotted orbweaver spiders have aggressive personalities?

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Reed College Bio342

We explore aggressive personality in *Neoscona crucifera*, the spotted orbweaver spiders that inhabit the Reed College canyon.

How aggressive are spotted orbweavers towards prey? How aggressive are they in response to a threat?



Neoscona crucifera

- Found across the United States and in Mexico
- Females are 0.37-0.75 inches long, males are smaller
- Golden orange color with alternating bands of white and black on the legs
- Research by Hoffmaster (1985) suggests that unless high quality websites are in short supply, distance between webs is not affected by spider aggression in orb-weaving spiders

Methods

- 12 spiders were taken from the canyon and tested for aggression
- Feeding assay and prodding assay were performed on rotating schedule

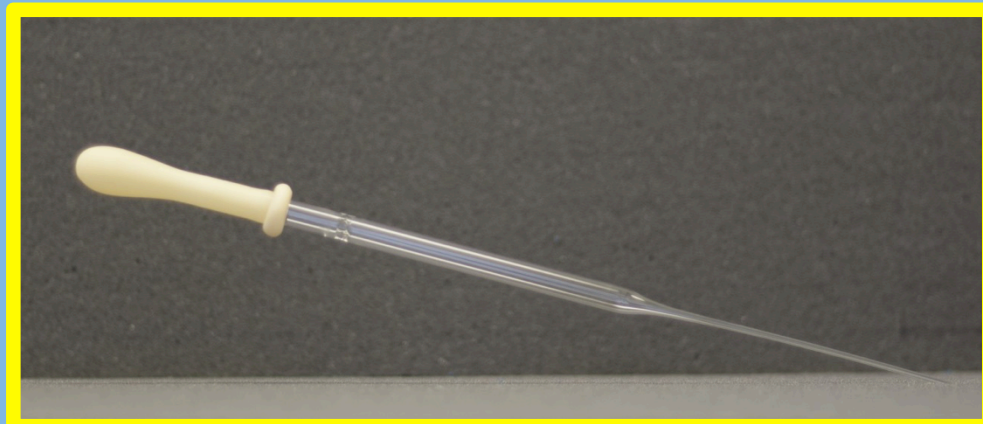


Hedrick et al. (1989) showed that latency to attack prey is a good measurement of aggression

Feeding assay - Crickets were dropped into the spider's web, latency to attack was recorded. Ability for web to catch and hold cricket is good analogue for spider health

Pruitt et al. (2013) used a prodding assay to assess colony-level and individual spider aggressive personality

Prodding assay - Spiders were prodded on anteriormost leg with pipette, aggressive response ranged from 0-6



Aggression Score	Behavior
0	Huddling
1	Walking away from prod
2	Turning away from prod
3	No reaction
4	Lurching
5	Threat posture
6	Strike

Spiders act aggressively more often than submissively

- 11 instances of aggressive behaviors (4-6)
- 5 instances of submissive behaviors (0-2)
- Only 1 instance of striking behavior (6)

Times Behavior was Performed

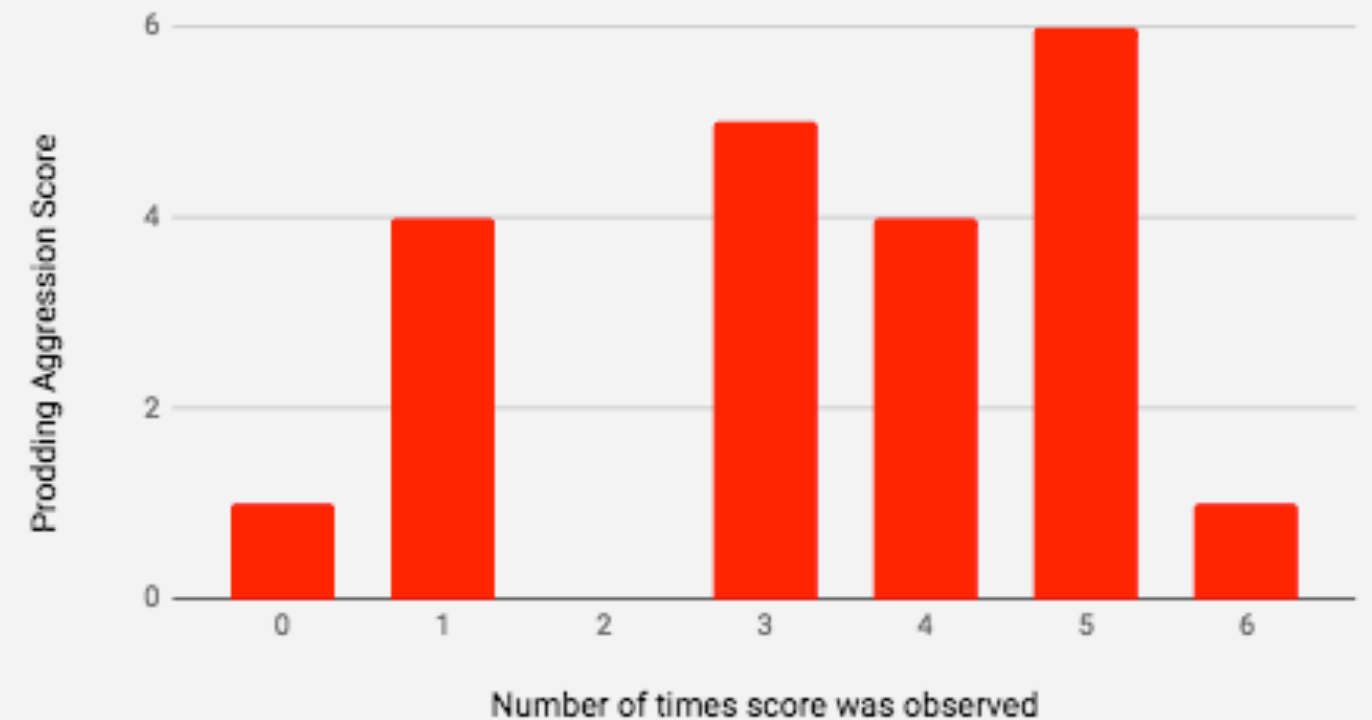


Figure 1. Total number of each behavior exhibited throughout the course of the experiment. Spiders were prodded with pipette twice on anterior leg, and the aggression score of exhibited behavior was recorded. The most common response was threat posture, an aposematic threat display.

Days Since Last Meal vs. Aggression

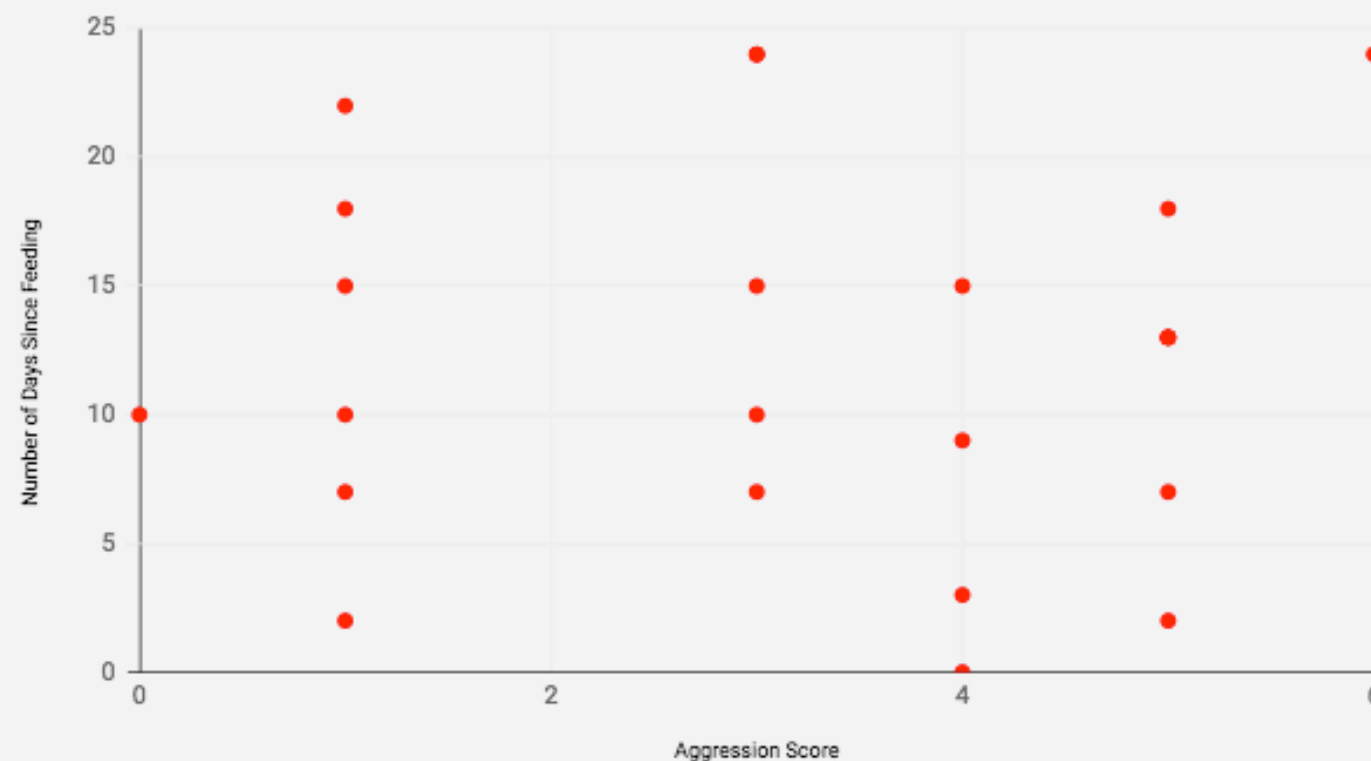


Figure 2. Days since last meal, recorded at time of prodding assay vs. aggression score ($R^2 = 0.0146$).

- Days since eating at time of prodding assay was not correlated with the aggression score
- This suggests that hunger has no effect on aggression

Further research is needed to determine personality

Conclusion: Our data suggests that spotted orbweaver spiders may have unique aggressive personalities but further study is needed.

Future Directions:

- Spiders should be tested more frequently and under different conditions
- Study connection between web robustness and aggression

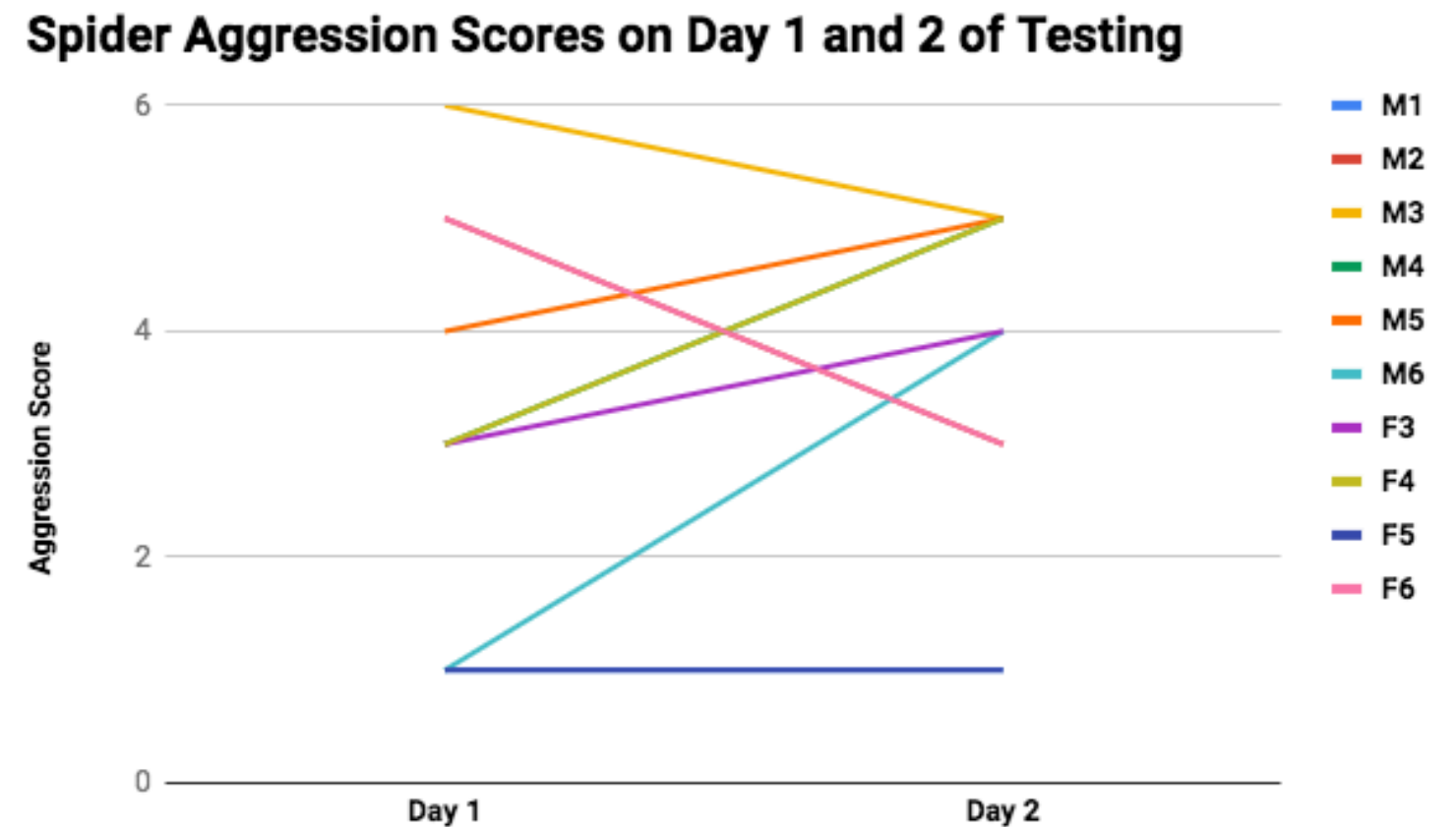


Figure 3. Each individual spider was aggression-scored at least twice during the experiment, with day 2 following day 1 by at least a week. Spiders stayed fairly consistent with their initial level of aggression, yet there was not a statistically significant pattern overall ($R^2 = 0.497$).

References:

- (1) <http://bugeric.blogspot.com/2012/02/spider-sunday-western-spotted-orbweaver.html>
- (2) <https://bandoteam.wordpress.com/tag/spotted-orbweaver/>
- (3) <https://www.thoughtco.com/why-spiders-decorate-their-webs-1968569>
- (4) <http://www.brainbitsllc.com/sterile-9-silanized-glass-pasteur-pipette/>

Hoffmaster, D. K. (1985) Community composition and nearest neighbor relationships in orb-weaving spiders: the product of aggression? *Behav Ecol Sociobiol* 16:4, 349-353.

Hedrick, A. V., Riechert, S. E. (1989) Genetically-based variation between two spider populations in foraging behavior. *Oecologia* 80:4, 533-539.

Pruitt, J. N., Grinsted, L., Settepani, V. (2013) Linking levels of personality: personalities of the 'average' and 'most extreme' group members predict colony-level personalities. *Animal Behav* 86:2, 391-399.

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