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Escape behavior of the Grammostola rosea tarantula and Phidippus regius spider in response to heat stimuli

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Escape Behavior of the *Grammostola rosea* Tarantula and *Phidippus regius* Spider in Response to Heat Stimuli

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An Honors College Project Presented to

the Faculty of the Undergraduate

College of Science and Mathematics

James Madison University

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by Madison Deanne Thomas

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Accepted by the faculty of the Department of Biology, James Madison University, in partial fulfillment of the requirements for the Honors College.

FACULTY COMMITTEE:

Project Advisor: Corey L. Cleland, Ph.D.
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PUBLIC PRESENTATION

This work is accepted for presentation, in part or in full, at Society for Neuroscience (November 2017), Undergraduate Research Symposium in the Chemical and Biological Sciences (October 2017), Biosymposium (April 2018), SYNAPSE (April 2018), Beta Beta Beta National Convention (May/June 2018).

ABSTRACT

Insects respond to aversive stimuli such as wind, looming and heat by escaping in a direction opposite the stimuli. Spiders have 8 legs, which offers the spider more gait options for escape than insects, which have 6 legs. However, there are few published studies on the escape response of spiders, and there is no information that shows how location or direction of the stimulus will affect escape patterns. Therefore, the specific goal of my research was to determine the relationship between the stimulus location and direction of response in two species of spider – Regal Jumping spiders (*Phidippus regius*) and juvenile Chilean Rose tarantulas (*Grammostola rosea*) - for heat stimuli delivered to the spider's eight tarsi (legs). Results show that spiders will always move away from the heat stimulus. Additionally, spiders will translate almost directly away from the stimulus without turning. The initial position of the leg does not affect response, demonstrating that there is no proprioceptive feedback (feedback on where the body is in space) when exposed to aversive heat stimuli.