

Can a spider actually get bored?

Ximena Nelson *¹, Bonnie Humphrey ¹

¹ University of Canterbury

Paying attention to a stimulus is costly in terms of cognitive resources. Given the high number of stimuli (and low salience of many of them), animals filter out irrelevant information, but exactly this is done is not entirely understood. The decision as to which stimuli to ignore is risky, as mistakes can be fatal. Habituation describes a decrease in response to repeated biologically irrelevant stimuli over time. We investigated habituation characteristics of *Trite planiceps*, a New Zealand jumping spider which is an active visual hunter by measuring their response decay to repetitive visual stimuli. Spiders were tethered in front of two stimulus presentation monitors and were given a polystyrene ball to hold. Movement of this ball indicates an attempt to turn towards a visual stimulus presented to a specific pair of laterally-facing eyes (anterior-lateral eyes). Response decay is easily measured, as moving visual stimuli trigger clear responses, which were recorded as four categorical variables: optomotor (very fast); fast response; general movement; no movement. Visual salience (conspicuousness) of the stimulus, biological salience of the stimulus, and spider hunger all affected the rate of decay (response decrement). We then tested whether the observed response decay was likely regulated in the peripheral nervous system (suggestive of classic sensory habituation) or the central nervous system. In paired tests, we gave spiders a drop of either water or caffeinated water to drink. As caffeine is a central nervous system stimulant, we predicted that responses would be higher and last longer in the caffeine treatment if response decrement was centrally regulated - as proved to be the case. These findings support the hypothesis that response decrement in jumping spiders is centrally regulated.

