Human fear of spiders draws scientific focus

6 April 2015, by Nancy Owano

Female comb-footed spider (family Theridiidae), Enoplognatha ovata. Photographed in the wild at DuPage County, Illinois, USA. Size = 15mm. Credit: Bruce Marlin/Wikipedia/CC BY 3.0

A fear of spiders, arachnophobia, is in our DNA. You don't learn to freeze at the site of these creatures; you're born with the fear. Even the sight of hypodermic needles and houseflies does not trigger a similar response. Scientists pin that fear on survival instinct. The theory goes like this: Humans evolved in Africa where being able to spot a spider was of necessity.

Some dangerous spider species may have been common during our evolutionary history. A number of species with potent venoms populated Africa before hominoids and have co-existed there for tens of millions of years. A black widow spider bite in the ancestral world even if not fatal could leave one incapacitated for days or weeks.

Joshua New, Department of Psychology, Barnard College and colleague Tamsin German, wrote "Spiders at the cocktail party: an ancestral threat that surmounts inattentional blindness," which has been published in *Evolution and Human Behavior*. The paper stated that the human visual system may retain ancestral mechanisms uniquely dedicated to the rapid detection of immediate and specific threats, such as spiders and snakes, which persistently recurred throughout evolutionary time. The authors concluded that "Spiders may be one of a very few evolutionarily-persistent threats that are inherently specified for visual detection and uniquely 'prepared' to capture attention and awareness irrespective of any foreknowledge, personal importance, or task-relevance."

New and German asked their participants to look at abstract shapes and data on computer screens. Among those images were needles and flies. Results, as reported in the *Daily Sun*: "Of the 252 people reviewed in the study, most recognized the spiders much quicker than other images known to induce fear, such as flies and needles."

Spider images got more attention; the viewers spotted them and knew what they were. The authors reported that, "Despite their highly marginalized presentation, iconic spiders were nonetheless detected, localized, and identified by a very large proportion of observers."

Their test, said the authors, made use of the "inattentional blindness paradigm" in which an unexpected, peripheral stimulus is presented coincidentally with a central task-relevant display. Last year, *Inside Science* turned to the spider study which had been published online. *Inside Science* described how the study was designed: "To see if there is something special about spiders, the researchers showed people a cross shape that flashed in the middle of a screen for an eighth of a second. The participants' task, as far as they knew, was to judge which of the two bars on the cross was longer. During the first three trials, only the cross appeared. On the fourth trial, another image appeared at the same time. The possible images

included a spider, a hypodermic needle, a housefly, and abstract shapes made by rearranging the lines of the spider."

People were asked if they saw anything other than just the cross and, if so, in which part of the screen. They also tried to identify the image by selecting it from a lineup.

New's study reflects a question that scientists have posed before about human reactions to spiders: In 2008, the study "Do infants possess an evolved spider-detection mechanism?" appeared in *Cognition*. Babies looked at spiders longer than they looked at other images. Authors David Rakison and Jaime Derringer talked about "an evolved predator recognition mechanism that specifies the appearance of recurring threats."

The results, they said, supported the hypothesis that humans "may possess a cognitive mechanism for detecting specific animals that were potentially harmful throughout evolutionary history."

Rakison said in *Inside Science* that "At least with children, there's very little conflicting evidence that spiders and snakes have some kind of privileged nature in human visual processing."

More information: Spiders at the cocktail party: an ancestral threat that surmounts inattentional blindness, *Evolution and Human Behavior*, dx.doi.org/10.1016/j.evolhumbehav.2014.08.004