

The Amazing Secret Visual Worlds of 8-Eyed Jumping Spiders

By Marc Bekoff, Psychology Today / Animal Emotions

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Source: Pixabay/Pexels

A "spider-centric" view of the world opens our eyes to their remarkable senses.

KEY POINTS

- Jumping spiders have eight eyes that can operate both independently and together, serving a number of functions.
- They can see a wider range of colors than humans do, giving them advantages in avoiding danger and mating.
- Spiders' amazing vision reminds us about how much we still have to learn about animals and the world around us.

Recently, Simone, an avid student of spider behavior, told me about Betsy Matson's [fascinating essay](#) "Jumping spiders' remarkable senses capture a world beyond our perception," and after I read it, I thought about other people who have asked me to write more about spiders and the ways in which they sense and make sense of their hidden worlds, which often include our homes. I also thought about the small-brained spider I had gently removed from under my pillow that morning and wondered what he or she was seeing and feeling as I placed them outside, a short trip for me but perhaps a huge journey for them. Research shows that [small brains](#) can do amazing things.

Matson's piece is an outstanding summary of the fascinating visual capacities of jumping spiders, and it made me think more about how narrow our anthropocentric—human-centered—views of the world are when we consider the amazing diversity of other animals who also have to negotiate their own worlds.

Spiders are amazing animals

Here are a few snippets about how the eight eyes of jumping spiders, some of whom are smaller than a sesame seed, work independently and together to help them figure out what they need to do to survive in the many different situations they face each day.

- Jumping spiders have camera-type eyes like we do that have one single lens. Bees and flies, on the other hand, have compound eyes that have numerous lenses.
- Their main, forward-looking eyes help jumping spiders locate tiny animals and are only around 5-10 times less sensitive than ours.
- There are two more pairs of eyes on the side of the spider's head which allow them to see behind them.
- Each of the four pairs of eyes operates independently, but they can also work together. Matson writes: "A jumping spider's principal eyes can concentrate on preparing to pounce on dinner, while the other eyes notice and ignore any number of less relevant things. But if those secondary eyes spot something that's getting bigger, well, that could be an approaching predator that requires immediate [attention](#). It's a nifty design—one that could make an easily distracted human [jealous](#)."
- Jumping spiders see a wider range of colors than humans. Seeing red allows them to avoid danger, and seeing new colors may be important in courtship. Experiments show that males "employ a combination of movement and color that seems specifically designed to capture and hold a female's attention by playing to her various eyes." Matson notes, "The males of one species Morehouse [a visual ecologist at the University of Cincinnati] studies, *Habronattus pyrithrix*, have a dazzling red face and beautiful lime-green front legs. Yet, the females seem most impressed by the orange knees on the males' third set of legs. When a male first spots a female, he raises his front legs like he's directing a plane into its gate and skitters side to side, hoping to catch the attention of her secondary eyes. When she turns his way, he comes closer and starts flicking the wrist joints at the end of his raised front limbs. You can almost hear him saying, 'Hey lady, over here!'"
- Jumping spiders also communicate using vibrations and chemical sensors on the tips of their legs that allow them to taste what they walk on.

Small brains can do amazing things

A "spider-centric" view of the ways in which the eight eyes that jumping spiders use in their worlds opens our own two eyes to the remarkable ways in which they are able to survive and thrive in very demanding and challenging environments, many of which we dominate and in which we try to get rid of them.

By de-centering humans and considering the ways in which other animals negotiate their own worlds that usually intersect with our own, we should come to appreciate and respect them more and let them live alongside us as they've evolved to do. For those who worry that I'm throwing [human exceptionalism](#) out the window, I'm not. We're surely exceptional in many ways, and so too are countless other animals.

Each time I think about the sensory landscape of jumping spiders, my mind immediately goes into a whirlwind of ideas about a myriad of other animals and what's going on in their minds, tiny as they and their brains may be. Clearly, we shouldn't minimize or dismiss the cognitive skills of small-brained

animals who don't look like or behave as we do; a good deal of research shows just how smart and adaptive they truly are. As I was writing this piece, I realized I couldn't possibly imagine managing eight eyes and all of the information with which they're continually bombarded, given how difficult it sometimes can be to deal with a mere two eyes.

I look forward to further studies on what it is like to be a member of other species who are confronted with the same or similar challenges we constantly face, along with those about which we know little or nothing. There are many [secret worlds](#) out there, and while we know a lot about some of them, there still is much to learn.