

Spiders quickly learn eavesdropping to gain ground on the mating competition

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Co-researcher George Uetz, a University of Cincinnati professor of biological sciences, is photographed holding the brush-legged wolf spider. Credit: Joseph Fuqua II/University of Cincinnati

When it comes to courting, one common spider species is quick to learn, and that learning process involves eavesdropping on the visual cues of rivals to win their mate. The latest discovery in a research partnership represented by Alma College, The Ohio State University at Newark and the University of Cincinnati is the featured article in the August issue of the international research journal *Animal Behaviour*.

Previous studies by the researchers explored how brush-legged wolf spiders (*Schizocosa ocreata*) used visual eavesdropping to try to outdo a male rival's leg-tapping mating moves in the wild. In the great outdoors, the males start their show when they smell the pheromones in the silk of a ready-to-mate female.

However, the researchers discovered that courtship behavior becomes a learning experience for male [wolf spiders](#) raised in the lab, and they pick it up quickly. When they were shown videos of other leg-tapping, courting males paired with silk

cues from females, they quickly learned to recognize the behavior as part of the courtship process - in as little as four days. Having learned this connection between courtship of others and the presence of a female, the eavesdroppers then began courtship themselves.

"This discovery has completely changed our way of thinking about this little spider," says co-researcher George Uetz, a University of Cincinnati professor of biological sciences. "We thought because they were invertebrates with a tiny brain, everything about them is genetically regulated in a hardwired nervous system, i.e., they respond instinctively because it's programmed into their nervous system. Over the years, we've found there's a lot more to the story. Males learn to associate the courtship behavior of other males with female cues and they can make this leap. It's a complex set of behaviors for a tiny little brain. Not only do they learn from [visual cues](#) but also from vibration cues."

Uetz adds that sexual selection in mating behavior is an important paradigm in evolutionary biology and is also studied in humans. Research into animal behavior also can provide insights into how human physiology or neurobiology works, says Uetz, although spiders navigate a completely different sensory world from humans.

"There's a lot of eavesdropping that occurs in the natural world, but it's usually associated with more highly social animals with much bigger brains," says Uetz. "It's very common in birds, fish and mammals, but infrequently seen among invertebrates."

Meanwhile, as the male spiders perform their mating dance, the female is sizing them up to consider whether they're worthy mating material. If they don't pass inspection, she'll try to eat her suitor. Uetz adds that about 12 percent of the males that successfully mate still get eaten.

"Courting in response to other males' signals is not without risks to the eavesdroppers," says co-researcher David Clark, an Alma College professor of biology. "The conspicuous courtship signals intended for females may also make [males](#) more visible to predators, like toads or birds searching for their next meal."

Provided by University of Cincinnati

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