

New study shows that bats are able to navigate complex social relationships

By Christian Science Monitor, adapted by Newsela staff

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You should be generous and share with many people because you never know when you will need a friend to go to bat for you.

According to new research, this is the strategy employed by the common vampire bat. A study published Tuesday in the journal *Biology Letters* looked at the way female vampire bats share meals. Those who shared their meals with a greater number of bats not directly related to them tended to fare better during hard times than those who invested in smaller social networks.

These findings add to a growing body of evidence that humans are far from the only animals that form friendships. Scientists define friendships as preferred relationships with those who are not related to you, social bonds that appear to run deeper than straightforward transactional exchanges. The bat's strategy, which the researchers call "social bet hedging," may play a role in shaping cooperative behavior in other species, including our own.

"Understanding how individuals make cooperative investments based on the returns in more 'simple' social bonds, like in food-sharing vampire bats can help us understand the foundations of more complex relationships like those among humans," says lead author Gerald Carter. He is a researcher at the Smithsonian Tropical Research Institute in Panama.

Bats What Friends Are For

Carter described the blood-drinking bats native to Central America and South America as "a great organism to study for insights into cooperative relationships." Wild females and their young will often roost in groups of eight to 12 in caves or hollow trees. Each night, they leave in search of a blood meal from animals and livestock. Their blood-only diet contains little fat, so the bats cannot store energy for very long. Those who go two or three nights without feeding starve to death.

When a female bat fails to secure a meal for herself, as happens with about a third of young bats and about 7 percent of adults each night, she will groom her roost-mates. She does this so that they will hopefully throw up some of their partially digested meal into her mouth. Help often comes from mothers, daughters or other kin, but bats will also often share their food with unrelated individuals, or their friends.

In research conducted in Costa Rica in the 1970s and 1980s, biologist Jerry Wilkinson observed bats refusing to feed roost-mates that had previously snubbed them. He used numbers and mathematics to describe the costs and benefits of such sharing. These insights, combined with the relative ease with which researchers can replicate the conditions that promote this behavior, have made the bats a model species for studying what biologists call reciprocal altruism. This behavior is when one animal makes a sacrifice to help another with the expectation that the favor will be repaid.

Wilkinson is a professor at the University of Maryland and a co-author on this newest paper. He said people thought bats were trading meals equally and directly. Actually, however, the bats are giving back to each other over longer periods of time.

You Scratch My Back And I'll Scratch Yours

In 2015, Carter and Wilkinson found that the bats would sometimes appear to forgive roost-mates if they did not share because they did not have enough food. Bats who had previously been unable to help would be especially generous later on, almost as though they were compensating for past stinginess.

In other words, each bat appears to navigate a complex social environment. She keeps track of who snubbed her and why, and also works to repair relationships that have been strained.

This most recent finding, based on a four-year study of about 30 captive bats, builds on this research. Some bats feed more unrelated bats than others. Those who cultivated weaker ties with a larger number of friends would usually be fed as often as those who forged stronger bonds with a few friends.

However, when the researchers separated a bat from her primary donor, typically her mother or daughter, the benefits of having a bigger social network became clear. Bats who had invested in quantity instead of quality had an easier time finding donors. Their friends helped them cope with the loss.

The Importance Of Relationships

“When I very first plotted the data, I was overwhelmed with surprise and joy that it looked exactly how I thought it should,” says Carter. “That is a very rare thing in science.”

“I was surprised to see such clear evidence for the value of having backup partners. We’ve not seen that before,” says Joan Silk. She an anthropologist at Arizona State University who has studied social relationships among baboons.

“The great contribution of this paper is that it provides evidence about a completely new way in which having relationships matter,” Silk says. “It makes sense that if relationships are important for individuals, then strategies to deal with the loss of partners may also be very important.”

Forming Friendships Is Only Natural

Like female vampire bats and humans, female baboons are known to form close ties with unrelated baboons. They tend to spend more time grooming more partners following the death of a female relative. Humans tend to report greater happiness from having a small number of close friends as opposed to a larger network of weaker ties. However, in environments where friends are likely to leave, quantity matters more than quality.

Among humans, baboons and bats, these strategies likely operate outside of conscious awareness. People and animals are not seeking out friendship because of the costs and benefits. “In many situations, our first impulse is often cooperative,” says Carter. “We feel emotionally compelled to help others,” he says, “because natural selection has done the calculations for us.”

“You don’t ask your friends to exchange 25 minutes of emotional support for two dinners at your house,” he says. “That’s not how friendships work at all.”

Directions for Response:

This week you need to write a response of TWO paragraphs. This should be done on a separate sheet of paper and follow this format:

- 1) **1st Paragraph:** Write a summary of the article. Make sure you:
 - a) Use your own words
 - b) Choose only the most important details
 - c) Pay attention to the order of the details you include
- 2) *****HELLO HELLO PAY ATTENTION: Your 2nd Paragraph Will Be DIFFERENT This Week!*****
 - a) The article suggests that humans are wired to be cooperative and generous with each other, that “we feel emotionally compelled to help others.” In your experience, is this observation true?
 - b) Do you think the way our society works right now reflects that same observation? In other words, does our society generally try to help each other out? Explain your answer.