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Colonies of funnel ants show group personality, which affects their success at collecting food and competing with other colonies.

Ants have group-level personalities, study shows

By [Claire Asher](#)

28 August 2015 1:45 pm

If you stuck to Aesop’s fables, you might think of all ants as the ancient storyteller described them—industrious, hard-working, and always preparing for a rainy day. But not every ant has the same personality, according to a new study. Some colonies are full of adventurous risk-takers, whereas others are less aggressive about foraging for food and exploring the great outdoors. Researchers say that these group “personality types” are linked to food-collecting strategies, and they could alter our understanding of how social insects behave.

Personality—consistent patterns of individual behavior—was once considered a uniquely human trait. But studies since the 1990s have shown that animals from great tits to octopuses exhibit

“personality.” Even insects have personalities. [Groups of cockroaches have consistently shy and bold members](#), whereas damselflies have shown differences in risk tolerance that stay the same from grubhood to adulthood.

To determine how group behavior might vary between ant colonies, a team of researchers led by Raphaël Boulay, an entomologist at the University of Tours in France, tested the insects in a controlled laboratory environment. They collected 27 colonies of the funnel ant (*Aphaenogaster senilis*) and had queens rear new workers in the lab. This meant that all ants in the experiment were young and inexperienced—a clean slate to test for personality.

The researchers then observed how each colony foraged for food and explored new environments. They counted the number of ants foraging, exploring, or hiding during set periods of time, and then compared the numbers to measure the boldness, adventurousness, and foraging efforts of each group. They also measured risk tolerance by gradually increasing the temperature of the ants’ foraging area from 26°C to 60°C. Ants that stayed out at temperatures higher than 46°C, widely considered to be the upper limit of their tolerance, were considered risk-takers.

When they reviewed their data, [the scientists found strong personality differences between colonies](#), they reported online this month in *Behavioral Ecology*. Some were bold, adventurous risk-takers with highly active foragers. Others were shy, risk-averse, and fearful of new environments. Their foragers were less active, and they were less inclined to search for food at very high temperatures. When the team performed the same tests 11 weeks later, they saw that these differences persisted over time. More than half of all variation between colonies fell into distinct categories known as “behavioral syndromes.” These syndromes—similar to personality types among humans—are present across the animal kingdom and include categories like “proactive” (animals are bold, aggressive, and risk-prone) and “reactive” (animals are shy, calm, and risk-averse).

So how do these personality types affect how ants interact with each other? To find out, the researchers gave two colonies access to a shared foraging area. They observed how the laboratory colonies interacted with intruders and how well they competed with other colonies for food. They found that—not surprisingly—bold, risk-taking colonies were more aggressive toward other ants and were more efficient at collecting food. But the authors speculate that those colonies would experience higher mortality in the wild because of their risk-taking tendencies. As a result, they concluded that such behavioral strategies represent a tradeoff.

This idea is supported by a 2014 study that investigated colony-level personality in the rock ant, *Temnothorax rugatulus*, which ranges from northern Mexico to southern Canada. Researchers found that wild colonies with high levels of aggression were also bolder in their foraging efforts. What’s more, they found that [ants at the northern end of the range were on the whole more aggressive than ants in the southern region of the range](#). This suggested that environmental factors—perhaps the short foraging season in the north—could select for certain group personality types.

But the new study is unique in that all of the ant workers started with a clean slate—they hadn’t been exposed to interactions with other colonies that might incline them to act in one way or another.

“The findings are interesting and suggestive,” says evolutionary biologist Andrew Bourke from the University of East Anglia in the United Kingdom, who was not involved in the work. He adds that the results would be even more intriguing if they could be linked to reproductive success. Boulay is already on the case: His next step is to compare the effects of different personalities on the ability to sire offspring, as well as investigate the group personalities of invasive ant species.

Bourke says he would expect group personality to emerge only when all ants benefit. This could happen during nest construction, nest defense, and foraging, for example. Boulay agrees, and says that one common way of explaining collective ant behavior—calling them a “superorganism—can be useful, but it doesn’t capture the whole picture. Unlike the cells in our body, ants are still independent units with different goals and needs. Only when these goals and needs align should we expect to see characteristics like personality emerge at the level of the colony.

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Science | DOI: 10.1126/science.aad1684