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Don't worry, bee happy: Bees found to have emotions and moods

Happily buzzing
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By **Emily Benson**

Whoa! I feel nice, like sugar and spice… Bumblebees may experience something like happiness after getting a treat that makes them appear more optimistic.

We normally think of an emotion as the internal awareness of a feeling, but there's more to it than that, says Clint Perry at Queen Mary University of London. Physical changes to your body and shifts in your behaviour accompany sensations of happiness or sadness.

"Many of these things actually cause the subjective feeling that we have," says Perry. "Those are all necessary parts of emotion." Researchers can measure those adjustments in behaviour when they're studying emotions in animals, he says.

When humans feel happy, we're more likely than normal to respond to an ambiguous situation with optimism. If you're happily eating a chocolate bar, for example, you

might view a newcomer as a friend instead of a possible foe, says Perry.

Happiness also makes us quicker to shrug off a negative experience, such as getting cut off in traffic.

Sugar rush

To see whether bumblebee behaviour follows similar patterns, Perry and his colleagues trained 24 bees to associate particular locations and colours in the lab with cylinders of sugar water or plain water.

They then closed these cylinders off, gave half the insects a dollop of water spiked with sugar – the bee equivalent of a bit of chocolate – and measured the time it took them to enter a separate container. This was located midway between the two closed cylinders and had an intermediate colour, to make the bees unsure whether it contained rewarding sugar water or not.

Bumblebees that received the sugar jolt were faster to enter the ambiguous middle station than those that didn't, as if they were more optimistic about the possibility that it contained food.

And it wasn't simply that they were more active because of the energy boost. Sugar-dosed bees and their sugarless peers were equally quick to visit a container that the insects knew contained food, and equally slow to visit a station with just plain water.

To see if the sugary morsel could also help bees bounce back from a negative experience, the researchers mimicked a predator attack by gently squeezing 35 insects in a trap before releasing them. This mimicked ambush by sit-and-wait predators such as crab spiders that bumblebees in the wild often survive after a brief struggle.

Those that received a dose of sugar water beforehand then flew to a feeder about four times quicker than those that didn't, suggesting that sweet food can increase positive

emotions and improve a negative mood in bees – just as it does in humans.

Giving the bees a drug to block the neurochemical dopamine, which is related to the reward system in humans, largely reversed the effects of the treat, indicating that these effects were down to dopamine making them feel good.

This suggests that bumblebees experience the behaviours that go along with feelings, says Perry.

"Does that mean they feel this positive emotion?" he says. "We don't know, but we're opening up the possibility of exploring that."

Like-minded species?

This study brings us one step closer to pinpointing what we mean when we call something an emotion, says Ralph Adolphs at the California Institute of Technology in Pasadena.

"One challenge for the field is to come up with a longer, more comprehensive list of criteria that we could apply across species," says Adolphs.

In the meantime, it's exciting to see a clear demonstration of something like emotions in bumblebees, says Eirik Søvik at Volda University College in Norway – although he isn't surprised at the insects' behaviour.

"They have brains that function in pretty much the same ways as ours," he says. "The hard part is demonstrating it."

But even though the same neurochemicals are involved, it's a step too far to say that bees experience happiness in the same way that humans do, he adds. "It's hard to know if or what bees could possibly think," he says.

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