Human body

We can't tell if we have goosebumps

People seem to incorrectly report when piloerection makes their hairs stand on end

Michael Le Page

YOU might think you know when something has made your hair stand on end, but a study shows we generally can't tell whether or not we have goosebumps, or where on our body they are.

Jonathon McPhetres at Durham University, UK, and his colleagues have been studying goosebumps for the past few years. "There's very, very little research on them and it's just fascinating because it's one of those things that we're so familiar with," says McPhetres. "One of the things that we noticed was that people are self-reporting goosebumps and we're also watching goosebumps objectively on the camera, and they just don't match."

So the researchers filmed the thighs of 50 volunteers as they watched videos that give most people goosebumps. While expressions such as "it made my hairs stand on end" or "it gave me goosebumps" are often used figuratively, the participants were asked to press a button when they thought they had goosebumps and hairs standing on end, known as piloerection, as opposed to merely feeling "chills" or other emotional responses.

The volunteers were seated at a desk, so were able to look at their arms to see if they had goosebumps, but it was hard for them to see their legs. The team found that, in most cases, those with goosebumps that were visible on camera weren't pressing the button, and vice versa.

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In case the participants were getting goosebumps on, say, their thighs but not their arms, the researchers added another three cameras to monitor their arms and calves as well. They then tested another 40 volunteers, but the extra cameras made hardly any difference to the results.

Overall, nearly 60 per cent of the total 90 volunteers did get piloerection and 50 per cent reported getting it, but only in a third of cases did the observed piloerection correspond with the participants' reports.

Only 16 per cent of the volunteers did any better than would be expected when guessing, and not by much. "The highest levels of accuracy were still not very accurate," says McPhetres.

In a follow-up online survey, an additional 500 people were asked where they get goosebumps when they get them. More than 40 per cent said on their forearms, yet the tests with many cameras showed that goosebumps appear at the same time on the arms and legs, rather than just on one specific site (bioRxiv, doi.org/knkz).

Our ability to know if we have piloerection is an example of what is known as interoceptive awareness. Other studies have linked poor awareness of what is happening physically to the body to poor mental health.

"People are just not very good at distinguishing between different physiological sensations," says McPhetres. "It probably takes a level of acuity that we don't possess to distinguish between chills and actual goosebumps."

Many mammal species use piloerection to protect themselves from the cold and to make themselves look bigger when threatened, such as cats raising their hackles. In people, it is no longer thought to have such an important role. However, McPhetres says he has found that piloerection still raises skin temperature in humans. ▮

Space

NASA misplaces Voyager 2 then finds it again a week later

NASA has reestablished full communication with the Voyager 2 spacecraft after losing touch with it in late July. The space agency has confirmed that the craft, which is nearly 20 billion kilometres away from Earth, is operating normally.

Voyager 2 launched in 1977 and has been hurtling towards the outer edges of the solar system and into interstellar space since then. It is now the second-most distant spacecraft from Earth after its sibling craft, Voyager 1, which is almost 24 billion kilometres away. Several of its science instruments, including its magnetometer and its cosmic ray detector, are still working 46 years after launch and sending data back to Earth.

On 21 July, a series of commands from mission control inadvertently shifted the orientation of the spacecraft, pointing its antenna just 2 degrees away from Earth. That meant that the signals from the probe weren't reaching satellite dishes on the ground, and operators couldn't send any signals to try to turn it back towards us.

Thankfully, on 31 July, NASA detected a faint hint of what is called a "carrier signal" from Voyager 2. "We see the 'heartbeat' signal from the spacecraft… so we know the spacecraft is alive and operating," Suzanne Dodd, the manager of the Voyager project at NASA's Jet Propulsion Laboratory in California, told *New Scientist*.

NASA/JPL

An artist's impression of NASA's Voyager spacecraft

Generally, if the antenna was aligned properly, this signal would contain real-time data from the spacecraft, but because it wasn't aligned, the signal wasn't strong enough to extract anything from it.

In an attempt to point the antenna back towards Earth, NASA's Deep Space Network facility in Australia sent a new command to Voyager 2 to reorient itself. "There is a low probability that this will work," Dodd said at the time. It took 18.5 hours for the "interstellar 'shout'" to reach the craft and another 18.5 hours to receive the response, which came in on 4 August, NASA announced in a press release. Voyager 2 began sending telemetry data, showing that is was operating normally and on its expected trajectory. ▮

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