

New Scientist

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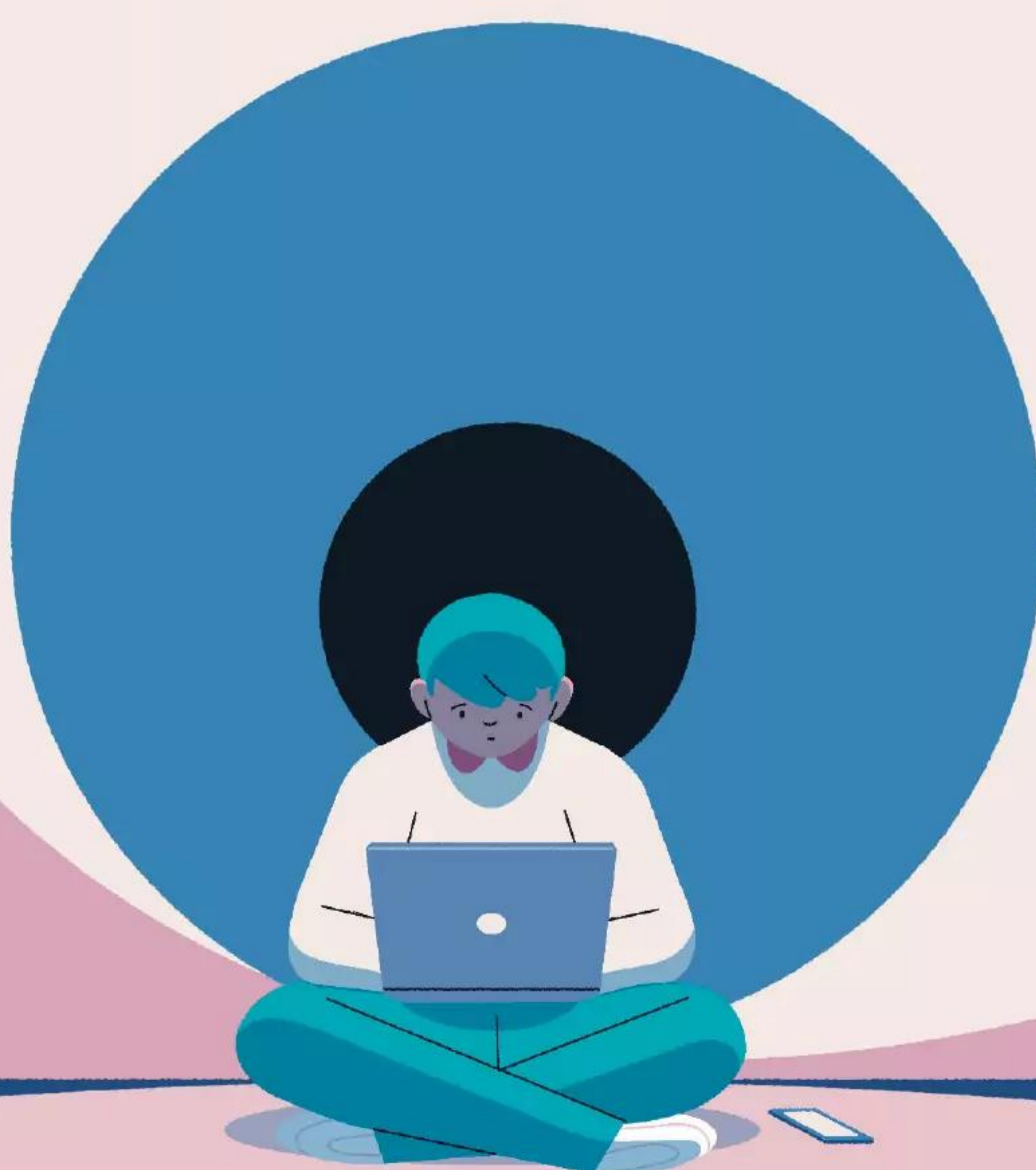
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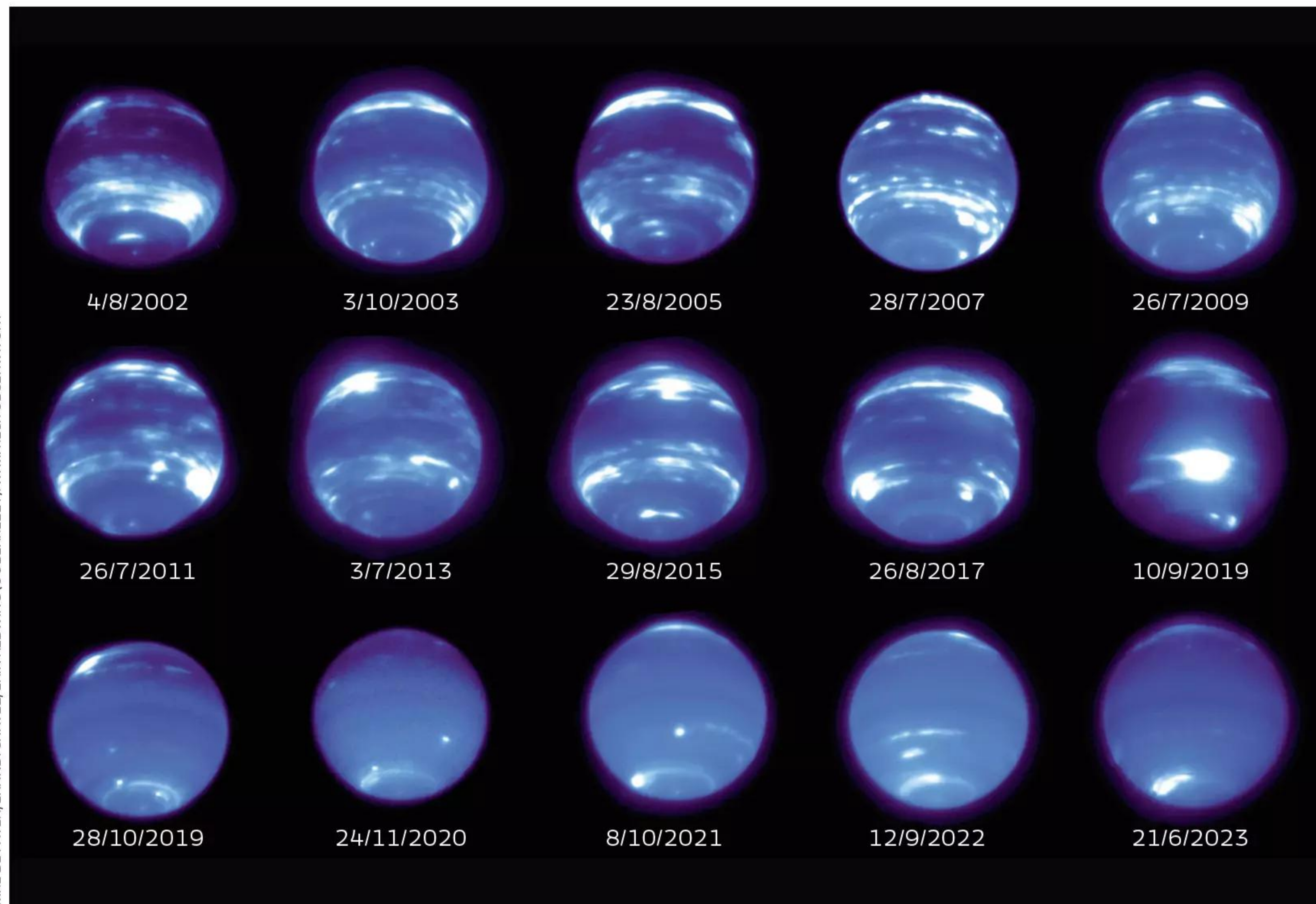
The sun's activity may have stripped away the clouds that usually shroud Neptune

Leah Crane

THE clouds that usually encircle Neptune have disappeared. When the first detailed images of the planet were taken by the Voyager 2 spacecraft in 1989, its cerulean disc was criss-crossed by clouds, but its skies are now almost clear.

Erandi Chavez at the University of California, Berkeley, and her colleagues have tracked Neptune's cloud cover from 1994 to 2022 using images from ground-based observatories and the Hubble space telescope. They have found that the amount of clouds fluctuates roughly in line with the sun's 11-year cycle of activity, albeit with a two-year lag. When the sun is most active, more clouds begin to form, and when it is least active, the clouds dissipate (*Icarus*, doi.org/gsmhms).

This may happen because when sunlight hits Neptune's atmosphere, its energy starts chemical reactions. Those reactions take time, hence the two-year delay. ■



IMKE DE PATER, ERANDI CHAVEZ, ERIN REDWING (UC BERKELEY)/W. M. KECK OBSERVATORY

Mind

Negative emotions really do make time drag

PEOPLE often feel time drag on or fly by, but now there is evidence that our emotional state influences our perception of time passing.

To investigate the phenomenon, Jingyi Wang and Regina Lapate at the University of California, Santa Barbara, asked 80 volunteers to look at pictures of things that either typically induce a negative emotion, such as a coffin, or are neutral, such as a table. The images were shown for 4 seconds, with a 2.5-second gap between them. A grouping of four consecutive negative or neutral pictures constituted an "event".

Between these events, the researchers would either switch the emotion, the colour of the

pictures' borders or both. This was to simulate how life experiences can differ in terms of perceptual details or emotional content.

Wang and Lapate periodically assessed the participants' perception of the time interval between pairs of images they had seen, getting them to indicate this on a slider marked with "very far", "far", "close" and "very close".

The image pairs were always two that had appeared consecutively, but sometimes they were within the same event and at other times they were the fourth image of one event and the first of the next.

When gauging the distance between neutral to negative images from across two events,

the participants judged it as longer. However, participants perceived pairs of negative images from within the same event as being closer together than neutral pairs (bioRxiv, doi.org/kpzc).

"People who generally view things negatively tended to report time passing more slowly"

The researchers used questionnaires to assess people's tendency to view things negatively. Those whose scores indicated a more negative outlook generally reported time passing more slowly during neutral-to-negative switches. "Dwelling on

negative events is associated with anxiety and depression," says Carien Van Reekum at the University of Reading, UK.

This research could one day be useful as an objective warning sign of such conditions, says Wang.

The study didn't include images that induce positive reactions, so it isn't clear if the time-perception changes were due to negative emotions specifically or emotion generally. The researchers are now studying what happens after a positive event and investigating if measures of emotional arousal, such as facial movements, can account for different reactions to the same picture. ■

Simon Makin