

Do rats like to be tickled?

September 21 2020



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Not all rats like to be tickled but by listening to their vocalizations it is possible to understand in real-time their individual emotional response, according to new research by the University of Bristol. The study, published today in *Current Biology*, suggests that if this same relationship is observed for other situations, then it may be possible to use call

patterns in rats to measure their emotional response and understand how best to improve their welfare.

Rats emit high frequency vocalizations which, when produced during human-simulated play or 'tickling', are thought to be similar to human laughter. Human laughter is complex and when a person is tickled, they may laugh even if they do not find the experience pleasurable. In rats, it has been impossible to know how much any individual rat 'likes' the experience because of limitations in method to directly measure their [emotional response](#). In order to ask the question 'Do rats like to be tickled?' the researchers used a [behavioral test](#) developed at Bristol which provides a sensitive measure of an animal's individual emotional experience and they compared the data from this test with the animals vocalizations during 'tickling'.

The researchers found not all rats like to be tickled and that some rats emitted very high numbers of calls whilst others did not, and these calls are directly related with their emotional experience. Rats which emitted the most calls had the highest positive emotional response to tickling but those who did not emit any or few calls did not show a positive response.

Emma Robinson, Professor of Psychopharmacology in the School of Physiology, Pharmacology & Neuroscience, who led the research, said: "Being able to measure a positive emotional response in animals is an important way to improve their welfare. What we have shown in this study is that the vocalizations made by rats in response to tickling are an accurate reflection of their emotional experience and something which is easy to measure.

"Should this be the case for other situations, measuring vocalizations could provide the simple, graded measure of emotional experience needed to better understand and improve the welfare of rats in a laboratory."

This work is important for two reasons. Related to tickling-induced laughter in rats, the team's findings support previous work that shows that these vocalizations indicate a positive experience. However, rats seem to be more 'honest' with their response to tickling than humans or non-human primates and the amount they laugh directly relates to how positive they find the experience. The findings also suggest that the high frequency vocalizations which rats emit can provide researchers with a simple, graded measure of their individual affective experience.

Being able to assess the welfare of animals accurately and objectively is important but is difficult to achieve. Without being able to ask an animal how it feels, researchers must rely on other methods which have their limitations. Researchers at Bristol have previously shown that the affective bias test used in this study can provide this type of objective measure, but it is highly specialist and time consuming to run so not readily applied in the wider laboratory animal setting. This research has found that human-simulated play or 'tickling' rats can cause a positive emotional state but not for all [rats](#) and by recording vocalizations it is possible to quickly identify which [animals](#) benefit from this type of enrichment.

The research team is seeking further funding to expand this work to look in more detail at the relationships between [vocalization](#) patterns and emotional state using the Bristol developed affective bias test developed to provide an objective baseline measure. The research team want to look at whether similar associations are found between vocalizations and positive and negative emotional experiences.

More information: 'Rat 50kHz calls reflect graded affective responses' by Justyna Hinchcliffe et al, *Current Biology* (2020).

Provided by University of Bristol

Citation: Do rats like to be tickled? (2020, September 21) retrieved 18 April 2024 from <https://phys.org/news/2020-09-rats.html>

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