



Research News

Creativity feels (really) good for some: Aha! + Aaaah

Study shows that some people experience creative insights as intrinsically rewarding

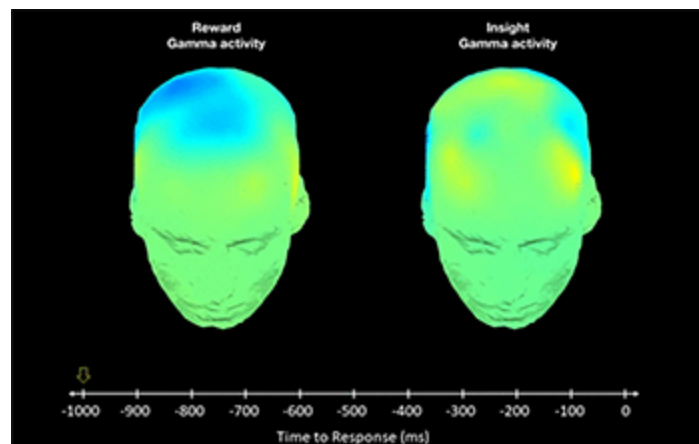


Image showing insight-related brain activity and neural reward-related activity.

[Credit and Larger Version \(/discoveries/disc_images.jsp?cntn_id=300487&org=NSF\)](https://www.nsf.gov/discoveries/disc_images.jsp?cntn_id=300487&org=NSF)

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Creativity is one of humanity's most distinctive abilities and enduring mysteries. But what drove the evolutionary development of creativity? A new neuroimaging study, [funded by a grant from the National Science Foundation](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1125596&HistoricalAwards=false) and led by Drexel University's Yongtaek Oh and John Kounios, points to an answer.

The study, published in *NeuroImage*, discovered that, in some people, creative insights, colloquially known as "aha! moments," trigger a burst of activity in the brain's reward system -- the same system that responds to delicious foods, addictive substances, and other basic pleasures.

Because reward-system activity motivates the behaviors that produce it, individuals who experience insight-related neural rewards are likely to engage in additional creativity-related activities, potentially to the exclusion of other activities -- a notion that many puzzle aficionados, mystery-novel devotees, starving artists and underpaid researchers may find familiar, according to Kounios.

"The fact that evolution has linked the generation of new ideas and perspectives to the human brain's reward system may explain the proliferation of creativity and the advancement of science and culture," said Kounios. Many people report that insights are accompanied by a mind-expanding rush of pleasure.

The team recorded people's electroencephalograms, EEGs, while they solved anagram puzzles, requiring them to unscramble a set of letters to find a hidden word.

Importantly, the test subjects also filled out a questionnaire that measured their "reward sensitivity," a basic personality trait that reflects the degree to which an individual is generally motivated to gain rewards rather than avoid losing them.

The study showed that some people experience creative insights as intrinsically rewarding. Because the reward-related burst of neural activity occurred so quickly after the initial insight, only one-tenth of a second, it did not result from a conscious appraisal of the solution.

Low-reward-sensitivity test subjects experienced nearly as many insights as the high-reward-sensitivity ones, but their insights did not trigger a significant neural reward response. Thus, neural reward is not a necessary accompaniment to insight, though it occurs in many people. This study suggests that measurements of general reward sensitivity may help predict how different people connect motivation, rewards, and creativity.

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