

Does sleeping on an idea work? Here's what science says.

Scientists are finding experimental evidence that the transition between wakefulness and sleep is a portal for creative thought.

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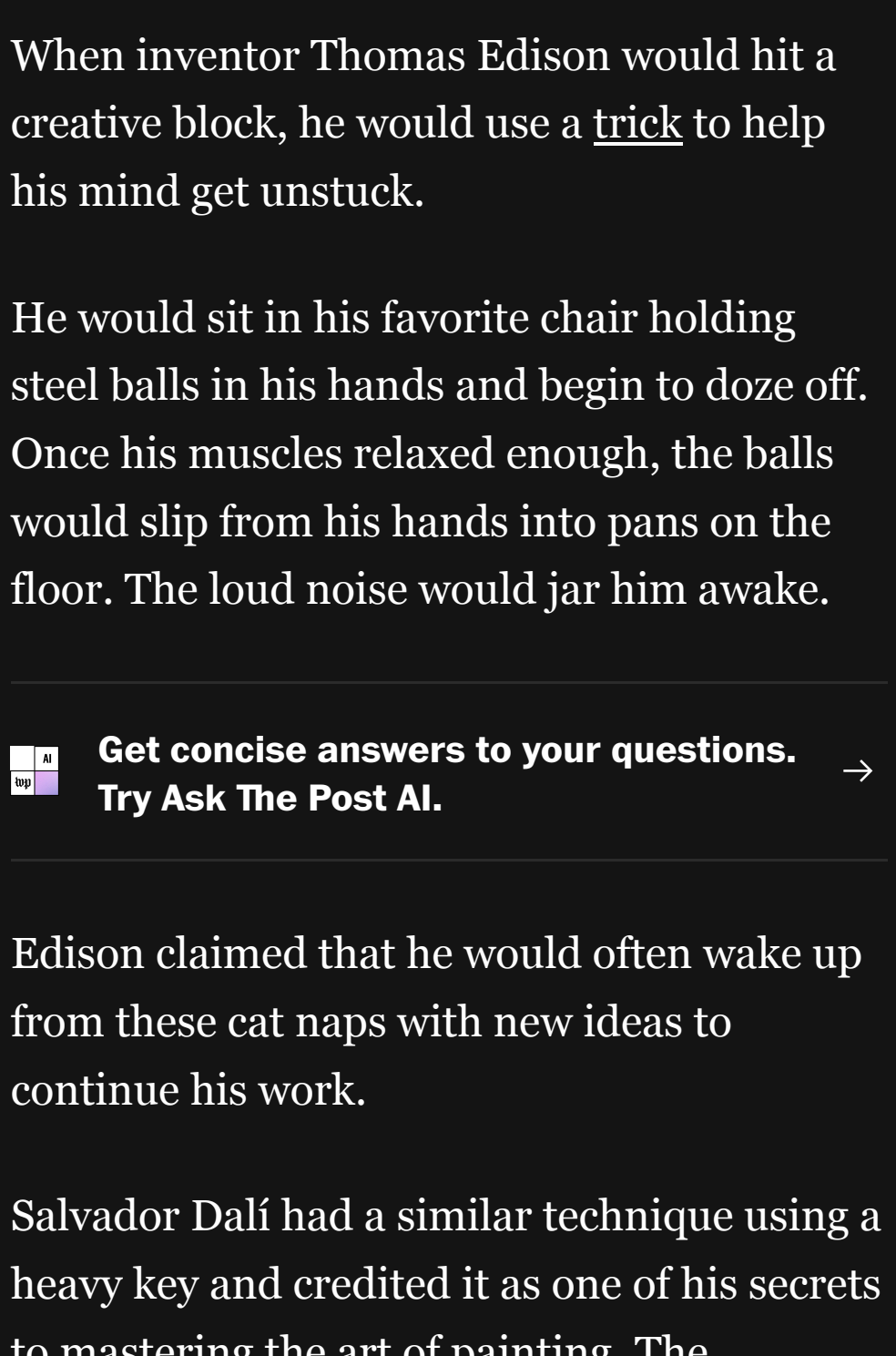
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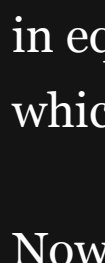




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(George Wylesol for The Washington Post)



By [Meeri Kim](#)

When inventor Thomas Edison would hit a creative block, he would use a trick to help his mind get unstuck.

He would sit in his favorite chair holding steel balls in his hands and begin to doze off. Once his muscles relaxed enough, the balls would slip from his hands into pans on the floor. The loud noise would jar him awake.



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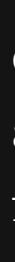
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Edison claimed that he would often wake up from these cat naps with new ideas to continue his work.

Salvador Dalí had a similar technique using a heavy key and credited it as one of his secrets to mastering the art of painting. The “slumber with a key” process, as detailed in his 1948 book, “50 Secrets of Magic Craftsmanship,” was “a repose which walks in equilibrium on the taut and invisible wire which separates sleeping from waking.”

Now, scientists are finding experimental evidence that supports what Edison and Dalí knew all along — that the transition between wakefulness and sleep is a portal for creative thought.

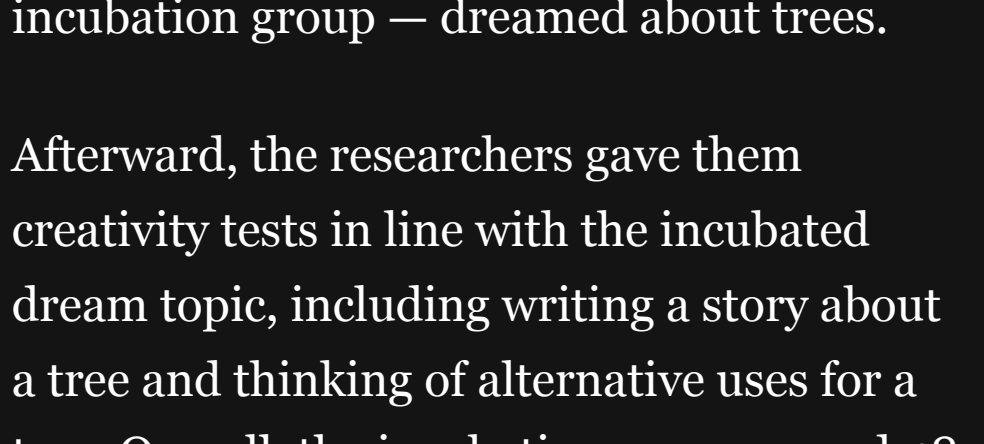


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“Creativity is taking two pieces of information you already have and suddenly seeing how they fit together in a way that you had never thought of before,” said Robert Stickgold, a professor of psychiatry at Harvard Medical School. “When you’re asleep, your brain neurochemistry shifts, making it easier for the brain to travel along pathways that lead to associations you otherwise would be very unlikely to uncover.”

More On Sleep



N1 sleep and creativity

This first stage of sleep, called N1 or hypnagogia, lasts only one to seven minutes but can invoke spontaneous, vivid dreams that often incorporate recent wake experiences. There are five stages of sleep: wakefulness, rapid eye movement (REM) sleep, and non-REM Stage 1, 2 and 3 (N1, N2 and N3).

“N1 sleep is this liminal half-state. It’s totally strange,” said Adam Haar Horowitz, a former postdoctoral associate at MIT. “N1 is more hallucinatory than REM sleep in terms of being a state that mixes elements of wake and sleep, than it is purely like a dream where you’re completely immersed.”

Brain imaging studies have shown that N1 engages networks involved in spontaneous thinking and cognitive control, both instrumental to creativity. More recently, researchers using the Edison method discovered that spending as little as 15 seconds in N1 sleep tripled the chance of participants subsequently having a moment of creative insight on a math problem compared with those who stayed awake or reached deeper sleep.

In a 2023 study, Stickgold, Horowitz and others reported enhanced performance on three creativity tasks after N1 sleep, corroborating previous work identifying N1 as a creative sweet spot. But they went a step further, using targeted dream incubation — a technique that guides the content of dreams — on participants, which led to an even greater boost in creative insight.

They created a device that modernizes and improves on the Edison method by using a hand-worn sleep tracker and app to both influence and record dream content. In the experiment, as participants drifted off to sleep, an audio recording in the device instructed them to “remember to think of a tree.” A non-dream incubation group was simply told to observe their thoughts. Physiological sensors in a sleep tracker automatically detected sleep onset through decreased heart rate and muscle tone, as well as electrical changes in the skin.

After being in N1 for a few minutes, the device delivered an auditory prompt to wake them up and immediately ask about their dream, recording the response. Over 70 percent of people in the incubation group — as opposed to 1.4 percent of the non-incubation group — dreamed about trees.

Afterward, the researchers gave them creativity tests in line with the incubated dream topic, including writing a story about a tree and thinking of alternative uses for a tree. Overall, the incubation group scored 48 percent higher on the creativity metrics than the non-incubation group.

“The people who were asked to think about trees as they were falling asleep had significantly more creative responses than those who were just asked to pay attention to their thoughts,” Stickgold said. “In fact, the more references to trees they had in their dream reports, the higher they scored on the creativity tests.”

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More research on the connection is needed

However, more research is needed to better understand the connection between sleep stages, dreaming and creativity.

A 2024 preprint — a study posted before peer review — that included 90 participants found greater likelihood of insight on a task after N2 sleep, but not N1 sleep. While N1 is considered light sleep, N2 represents deeper sleep where both heart rate and body temperature drop. The brain moves into a synchronized state characterized by sleep spindles, which are short bursts of neuronal firing that occur during memory consolidation.

“It might well be that different forms of insight benefit differently from different sleep stages,” said preprint author Nicolas Schuck, a professor of cognitive neuroscience at the University of Hamburg. “A well-known cognitive function of N2 is that it aids memory formation. In some tasks, that can be a good thing for insight, and maybe in other tasks, it can be a bad thing.”

Experts also emphasize that discrimination between different sleep stages can be fuzzy and somewhat arbitrary. For example, manual scoring and annotation of sleep stages in clinical practice follows guidelines based on electroencephalography observations in healthy young males almost 70 years ago.

Two sleep technicians can come to different conclusions about the same data, with most disagreements occurring during the transition from one stage to another.

“This whole thing of sleep stage classification is drawing, to some extent, artificial boundaries in a biological continuum,” Schuck said. “Sleep stages do exist, and one can see them in the EEG, but especially transitions, like many things in biology, are certainly messier.”

How to use sleep for creativity

For those who want to use dream content for creativity at home, Horowitz recommends not jumping out of bed upon waking from a nap or overnight sleep. Instead, lie still with your eyes closed.

“Try and recall a dream, what sounds you heard, who you met, what things looked like to the left and the right,” he said. “Let it all come back and explore it while you still have all the neurochemistry of sleep lingering in your brain.”

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