



## TAKE NOTE

In [General Health](#), [Sleep,Stress](#) by Donna Shryer June 17, 2021 [Leave a Comment](#)

### **Before bed music can stir up a restless night**

There's a new verse to the old song that passionately sings the praises of music before bed. The update comes from a June 2021 study that found that individuals with "greater music listening habits" before bed are more likely to experience persistent "earworms" and a decline in sleep quality.<sup>1</sup> Interestingly enough, the study said, instrumental music causes the worst sleep quality, leading to about twice as many earworms.

According to the American Psychological Association (APA), earworms are pesky disrupters that get stuck in the brain and repeat over and over and over again. "These songs, often called earworms, are usually faster, with a fairly generic and easy-to-remember melody but with some particular intervals, such as leaps or repetitions, that set them apart from the average pop song," wrote APA researchers.<sup>2</sup>

While many people experience the random earworm during daylight hours, the new research study, published in *Psychological Science* and led by sleep researcher Michael Scullin, PhD, associate professor of psychology and neuroscience at Baylor University, reported that the phenomenon of nighttime involuntary musical imagery, aka earworms, has rarely been explored yet often anecdotally describe.

The lack of scientific data sparked Dr. Scullin's research. After objectively measuring the effects of bedtime music, study results found that the sleeping brain continues to process music for several hours, even after the music stops.

In a press release announcing his study results, Dr. Scullin said, "Our brains continue to process music even when none is playing, including apparently while we are asleep. Everyone knows that music listening feels good. Adolescents and young adults routinely listen to music near bedtime. But sometimes you can have too much of a good thing. The more you listen to music, the more likely you are to catch an earworm that won't go away at bedtime. When that happens, chances are your sleep is going to suffer."

Drilling down into his research results, Dr. Scullin explained that those who experience nighttime earworms one or more times per week are six times more likely to have poor sleep quality compared to people who rarely experience earworms. Noting an unexpected finding, Dr. Scullin added that "some instrumental music is more likely to lead to earworms and disrupt sleep quality than lyrical music."

Admittedly a smaller research project, this study involved a laboratory experiment and a survey that involved 209 participants who completed a series of questions on sleep quality, music listening habits, and earworm frequency, including how

often they experienced an earworm while trying to fall asleep, waking up in the middle of the night, and immediately upon waking in the morning.

As for the lab experiment, 50 participants were brought into Dr. Scullin's Sleep Neuroscience and Cognition Laboratory at Baylor, where the research team attempted to induce earworms and then used a polysomnography – a comprehensive test and the gold standard measurement for sleep – to record the participants' brain waves, heart rate, breathing while they slept.

So what tunes were selected to induce earworms? That would be Taylor Swift's "Shake It Off," Carly Rae Jepsen's "Call Me Maybe," and Journey's "Don't Stop Believin'." Study participants were randomly assigned to listen to the original versions with words or as instrumental versions. Participants responded whether and when they experienced an earworm. "People who caught an earworm had greater difficulty falling asleep, more nighttime awakenings, and spent more time in light stages of sleep," Dr. Scullin said.

EEG readings were also performed on study participants as they slept. This allowed researchers to record electrical activity in the brain and examine physiological markers of sleep-dependent memory consolidation. Memory consolidation is the process by which temporary memories are spontaneously reactivated during sleep and transformed into a more long-term form. "We certainly didn't know that people would report regularly waking up from sleep with an earworm. But we saw that in both the survey and experimental study," Dr. Scullin said.

#### **STOP THE MUSIC**

Knowing now that earworms can negatively impact sleep quality, Dr. Scullin recommends cutting down on music before bed or even avoiding it if earworms are indeed an issue. "If you commonly pair listening to music while being in bed, then you'll have that association where being in that context might trigger an earworm even when you're not listening to music, such as when you're trying to fall asleep," he said.

A second suggestion to reduce nighttime earworms comes from a study conducted by the Sleep Foundation.<sup>3</sup> "When designing a playlist, one factor to consider is the tempo. The tempo, or speed, at which music is played is often measured in the number of beats per minute (BPM). Most studies have selected music that is around 60 to 80 BPM. Because normal resting heart rates range from 60 to 100 BPM, it's often hypothesized that the body may sync up with slower music.

And lest anyone feels that this study is a slam against Taylor Swift, Carly Rae Jepsen, or the band Journey, rest easy. Listen with unbridled joy to these renowned artists and any favored singer – just not before bed.

---

1. Scullin MK, Gao C, Fillmore P. Bedtime Music, Involuntary Musical Imagery, and Sleep. *Psychol Sci*. 2021 Jun 9:956797621989724. doi: 10.1177/0956797621989724. Epub ahead of print. PMID: 34105416.

2. Jakubowski, K., Finkel, S., Stewart, L., & Müllensiefen, D. (2017). Dissecting an earworm: Melodic features and song popularity predict involuntary musical imagery. *Psychology of Aesthetics, Creativity, and the Arts*, 11(2), 122–135. <https://doi.org/10.1037/aca0000090>. Available from <https://psycnet.apa.org/record/2016-53098-001>. Accessed on June 16, 2021

3. Sleep Foundation. Music and Sleep. Available from <https://www.sleepfoundation.org/noise-and-sleep/music> . Accessed June 16, 2021.