

Why we like the music we do: New study suggests that musical tastes are cultural in origin, not hardwired in the brain

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A photograph depicting the experimental setup. Sounds were presented over closed headphones via laptop. Credit: Josh McDermott

In Western styles of music, from classical to pop, some combinations of notes are generally considered more pleasant than others. To most of our ears, a chord of C and G, for example, sounds much more agreeable than the grating combination of C and F# (which has historically been known as the "devil in music").

For decades, neuroscientists have pondered whether this preference is somehow hardwired into our brains. A new study from MIT and Brandeis University suggests that the answer is no.

In a study of more than 100 people belonging to a remote Amazonian tribe with little or no exposure to Western music, the researchers found that dissonant chords such as the combination of C and F# were rated just as likeable as "consonant" chords, which feature simple integer ratios between the acoustical frequencies of the two notes.

"This study suggests that preferences for consonance over dissonance depend on exposure to Western musical culture, and that the preference is not innate," says Josh McDermott, the Frederick A. and Carole J. Middleton Assistant Professor of Neuroscience in the Department of Brain and Cognitive Sciences at MIT.

McDermott and Ricardo Godoy, a professor at Brandeis University, led the study, which appears in *Nature* on July 13. Alan Schultz, an assistant professor of medical anthropology at Baylor University, and Eduardo Undurraga, a senior research associate at Brandeis' Heller School for Social Policy and Management, are also authors of the paper.

Consonance and dissonance

For centuries, some scientists have hypothesized that the brain is wired to respond favorably to consonant chords such as the fifth (so-called because one of the notes is five notes higher than the other). Musicians

in societies dating at least as far back as the ancient Greeks noticed that in the fifth and other consonant chords, the ratio of frequencies of the two notes is usually based on integers—in the case of the fifth, a ratio of 3:2. The combination of C and G is often called "the perfect fifth."

Others believe that these preferences are culturally determined, as a result of exposure to music featuring consonant chords. This debate has been difficult to resolve, in large part because nowadays there are very few people in the world who are not familiar with Western music and its consonant chords.

"It's pretty hard to find people who don't have a lot of exposure to Western pop music due to its diffusion around the world," McDermott says. "Most people hear a lot of Western music, and Western music has a lot of consonant chords in it. It's thus been hard to rule out the possibility that we like consonance because that's what we're used to, but also hard to provide a definitive test."

In 2010, Godoy, an anthropologist who has been studying an Amazonian tribe known as the Tsimane for many years, asked McDermott to collaborate on a study of how the Tsimane respond to music. Most of the Tsimane, a farming and foraging society of about 12,000 people, have very limited exposure to Western music.

"They vary a lot in how close they live to towns and urban centers," Godoy says. "Among the folks who live very far, several days away, they don't have too much contact with Western music."

The Tsimane's own [music](#) features both singing and instrumental performance, but usually by only one person at a time.

Dramatic differences

The researchers did two sets of studies, one in 2011 and one in 2015. In each study, they asked participants to rate how much they liked dissonant and consonant chords. The researchers also performed experiments to make sure that the participants could tell the difference between dissonant and consonant sounds, and found that they could.

The team performed the same tests with a group of Spanish-speaking Bolivians who live in a small town near the Tsimane, and residents of the Bolivian capital, La Paz. They also tested groups of American musicians and nonmusicians.

"What we found is the preference for consonance over dissonance varies dramatically across those five groups," McDermott says. "In the Tsimane it's undetectable, and in the two groups in Bolivia, there's a statistically significant but small preference. In the American groups it's quite a bit larger, and it's bigger in the musicians than in the nonmusicians."

When asked to rate nonmusical sounds such as laughter and gasps, the Tsimane showed similar responses to the other groups. They also showed the same dislike for a musical quality known as acoustic roughness.

More information: Indifference to dissonance in native Amazonians reveals cultural variation in music perception, *Nature*, [nature.com/articles/doi:10.1038/nature18635](https://www.nature.com/articles/doi:10.1038/nature18635)

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