

What people with musical anhedonia might tell us about social interaction

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Assistant music professor Psyche Loui and assistant psychology professor Ajay Satpute are asking if the phenomenon that makes music undesirable to some people could also be what impairs social bonding. Student Kieran McVeigh demonstrates how headphones will be used during this study. Credit: Ruby Wallau/Northeastern University

Once upon a time, there was a man. He loved art and photography, but when friends would talk about the concerts they'd gone to over the weekend, he couldn't bring himself to care.

This man has musical anhedonia, a neurological condition that causes about five percent of people to not enjoy [music](#). He is also patient zero in a new Northeastern University study, which puts his social predicament front and center. Considering the close link [between music and social behavior](#) (think mixtapes, live performances, or shared headphones), professors Psyche Loui and Ajay Satpute are asking if the phenomenon that makes music undesirable could also be what impairs social bonding, something associated with [autism spectrum disorders](#).

The reason this question even warrants asking, says Loui, is because it doesn't really matter whether there's a link or not—either scenario means better understanding how music engages the [reward system](#). And that could help develop more effective treatments for neurological conditions.

For instance, imagine that brains affected by autism—which disrupts the connection between reward and social connection—and those affected by musical anhedonia—which appears to disrupt the connection between reward and music—have similar breakdowns of communication.

If that's the case, then figuring out who has musical anhedonia could rule out music therapy as a potential treatment for them. Loui has seen firsthand how singing can help nonverbal children with autism recover some of their verbal faculties. But she's also seen it fail. Better understanding why this treatment works could make it less of a shot in the dark.



Credit: Ruby Wallau/Northeastern University

But if the autistic brain is experiencing something different than the musically anhedonic brain? Then, within autistic brains, you could specifically direct music therapy at the part malfunctioning within musically anhedonic brains, since, inside the former, it still works. Then, wielded more deliberately, [music therapy](#) could potentially benefit even those it doesn't work for currently.

Capitalizing on the technology available in Northeastern's Biomedical Imaging Center, Loui and Satpute will conduct MRIs to look closely at how the reward system responds to music, as well as how it connects to auditory regions in general, in musically anhedonic brains. This quest builds on existing knowledge of which areas get involved during which activities.

"When I look at a person I love," says Loui, "the areas of the [brain](#) that get active when I'm eating really good food? Or having sex? Or gambling? Those same areas are active. But that pattern of activities is less in people with autism."

This population shows less reward from these connections, and people with autism also struggle to read the cues that help other people accurately make predictions. Loui thinks that most people love music because it plays with those same predictive tendencies: Both continuous melodies and the occasional departures from them tickle the reward centers of our brains, a payoff for correctly anticipating what will happen next.

This control that music wields is visible from outside the body, too; you can even quantify people's responses to music by measuring, basically, how sweaty they get while listening—more technically known as skin conductance. To show that musical anhedonics don't have this response at all, one group of researchers contrasted it with their skin's response to gambling.



Credit: Ruby Wallau/Northeastern University

"With the gambling game, they showed normal responses," says Loui.

Skin conductance jumped. Their brains were aroused. But when music

played, conductance flatlined.

Loui and Satpute will use a similar physiological test, in addition to issuing two kinds of surveys, to triple-check that their participants truly have musical anhedonia. This is opposed to general anhedonia, or disinterest in certain subjects, which can be a symptom of depression.

"You can fake lots of things on surveys," Loui says, "but skin conductance is a little harder to fake."

It's not clear why someone might pretend to have musical anhedonia. Considering how music is at the core of experiences as varied as interpersonal relationships and historical events, it can be isolating to not enjoy it.



Credit: Ruby Wallau/Northeastern University

The musically anhedonic photographer is just one example.

"He always knew there was something different about him," Loui says. "He actually likened it to a coming out process when he told friends about this difference he's always had."

This difference, however, may prove to be an asset. The first case in Loui and Satpute's project, he approached them to participate and will serve as an example as they evaluate future participants.

Perhaps it's ironic, then, that this project recently received a grant from the Grammy Museum, an educational branch of the same organization that bestows the title of "Album of the Year," among others. After all, when the winners of these better-known Grammys are announced each winter, it's unlikely patient zero even blinks an eye.

More information: Psyche Loui et al. White Matter Correlates of Musical Anhedonia: Implications for Evolution of Music, *Frontiers in Psychology* (2017). [DOI: 10.3389/fpsyg.2017.01664](https://doi.org/10.3389/fpsyg.2017.01664)

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