

Study shows people who aren't moved by music have less functional connectivity between some brain regions

November 9 2016, by Bob Yirka



Credit: Human Brain Project

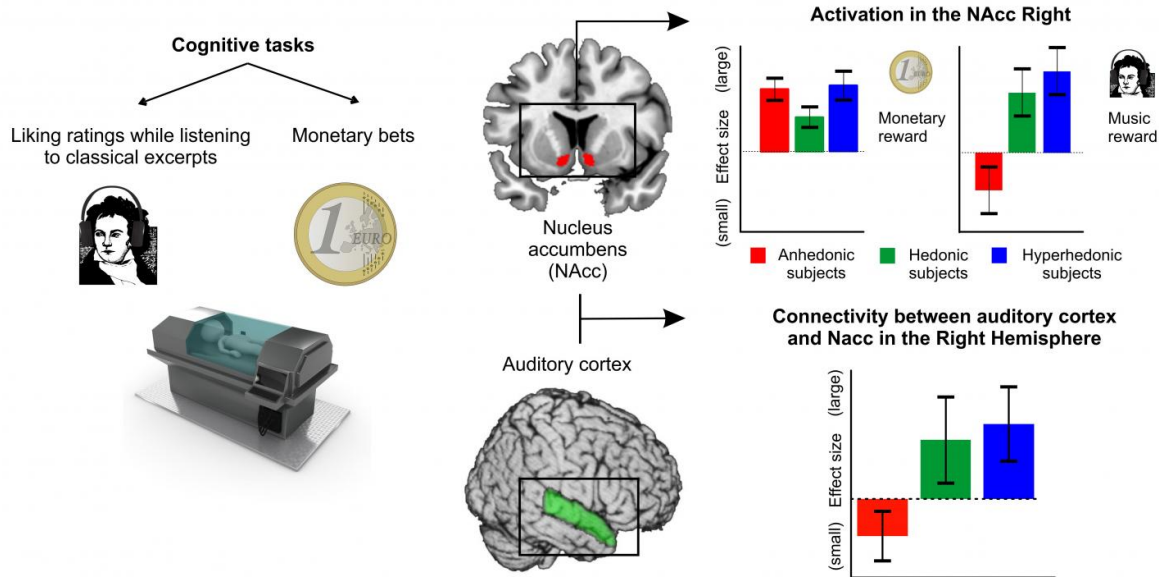
(Medical Xpress)—A team of researchers from Spain and Canada has found evidence that suggests people who are not emotionally moved by music have less connectivity between the regions in the brain responsible

for processing sounds and those involved in managing emotions. They have published their results in *Proceedings of the National Academy of Sciences*.

Scientists have long known that there are some people in any given culture that simply do not respond emotionally to music—any kind of music. While some in the field have theorized that it is likely due to reduced communication in the [brain](#) between the regions responsible for processing music and those responsible for generating a response, none have actually tested the idea. In this new effort, the researchers have done just that.

To get a better idea of what goes on in the brains of those who feel no response to music, the researchers enlisted the assistance of 15 such people asking them to undergo fMRI scans while they listened to music playing. To provide a basis for comparison, the researchers recruited 30 more volunteers, 15 of whom believed themselves to respond in an average way to music they liked and 15 individuals who believed they responded more strongly to music they liked than the [average person](#). Both of these groups also underwent brain scans while listening to their favorite music.

In comparing the scans, the researchers found that those who felt no response to music had less blood flowing to a part of the brain known to be involved in processing rewards than did the other two groups. They also report that all three groups responded nearly identically when engaged in other pleasure-evoking activities. This, the researchers suggest, indicates that a lack of music appreciation does not mean there is a difference in the reward system part of the brain. The researchers noted also that there was a clear difference in communication between the auditory processing parts of the brain and the rewards system.



Neural correlates of specific musical anhedonia. Credit: IDIBELL

Still not clear, however, is if one part of the scenario causes the other—does the lack of [music](#) appreciation cause a reduction in brain connectivity, or is it perhaps the other way around? More research will have to be done before that question can be answered.

More information: Noelia Martínez-Molina et al. Neural correlates of specific musical anhedonia, *Proceedings of the National Academy of Sciences* (2016). [DOI: 10.1073/pnas.1611211113](https://doi.org/10.1073/pnas.1611211113)

Abstract

Although music is ubiquitous in human societies, there are some people for whom music holds no reward value despite normal perceptual ability and preserved reward-related responses in other domains. The study of these individuals with specific musical anhedonia may be crucial to understand better the neural correlates underlying musical reward.

Previous neuroimaging studies have shown that musically induced pleasure may arise from the interaction between auditory cortical networks and mesolimbic reward networks. If such interaction is critical for music-induced pleasure to emerge, then those individuals who do not experience it should show alterations in the cortical-mesolimbic response. In the current study, we addressed this question using fMRI in three groups of 15 participants, each with different sensitivity to music reward. We demonstrate that the music anhedonic participants showed selective reduction of activity for music in the nucleus accumbens (NAcc), but normal activation levels for a monetary gambling task. Furthermore, this group also exhibited decreased functional connectivity between the right auditory cortex and ventral striatum (including the NAcc). In contrast, individuals with greater than average response to music showed enhanced connectivity between these structures. Thus, our results suggest that specific musical anhedonia may be associated with a reduction in the interplay between the auditory cortex and the subcortical reward network, indicating a pivotal role of this interaction for the enjoyment of music.

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