

Study finds brain regions respond to familiar and unfamiliar music, even without musical training

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New research suggests that people without musical training have areas of the brain that can identify and respond to music, even if they are unfamiliar with the genre. The study is published ahead of print in the *Journal of Neurophysiology (JNP)*. It was chosen as an APSselect article for April.

Research has shown that exposure to specific sounds can cause long-term changes in the [auditory cortex](#)—the area of the brain that processes sound. Studies of experience-driven plasticity—the ability of the nerve cells (neurons) to change with exposure to sound stimuli—have been done in animals, but less is known about these adaptations in people.

In a new study, researchers used fMRI imaging to look at neural populations that respond more to [music](#) than other kinds of sounds—called music-selectivity—in young adults. Half of the volunteers, considered "nonmusicians," had less than two years of [musical training](#). The other half of the volunteers had an average of 16 years of musical

[training](#) and were considered "musicians" in the context of this study. The musician group started their music training before the age of seven and were currently training at the time of the study. The participants listened to two-second clips of 192 [natural sounds](#), which included several different genres of music. Some of the musical sounds were drums and less melodic in nature, and others were clips of musical genres that most people raised in a Western culture are not accustomed to.

The research team found that music-selective regions in the brain's cortex responded strongly to both the familiar and unfamiliar musical sounds—compared to nonmusical sounds—in both the musicians and nonmusicians. "These results show that passive exposure to music is sufficient for the development of music selectivity ... and [the] responses extend to rhythms with little melody and to relatively unfamiliar musical genres," the researchers wrote.

"One of the most interesting open questions raised by our findings is whether cortical music selectivity reflects implicit knowledge gained through typical exposure to music or whether it is present from birth," the researchers wrote. Further analysis can help answer these questions and explore "the quintessentially human ability for music."

"Music-selective neural populations arise without musical training" is published ahead of print in the *Journal of Neurophysiology (JNP)*.

More information: Dana Boebinger et al. Music-selective neural populations arise without musical training, *Journal of Neurophysiology* (2021). [DOI: 10.1152/jn.00588.2020](https://doi.org/10.1152/jn.00588.2020)

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