

High-volume portable music players may impair ability to clearly discriminate sounds

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High-volume portable music players may impair ability to clearly discriminate sounds. Credit: KOIDA/NIPS, Japan

Growing numbers of people enjoy listening to music on portable music players or cell phones, and many tend to turn up the volume, especially in noisy surroundings. In a study published March 2, 2011 in the open-access journal *PLoS ONE*, researchers explore the potential effects of this behavior on hearing.

The study was a collaboration between Drs. Hidehiko Okamoto and Ryusuke Kakigi from the National Institute for Physiological Sciences, Japan, and Drs. Christo Pantev and Henning Teismann from the University of Muenster. The researchers demonstrated that listening to

[loud music](#) through earphones for extended periods in noisy surroundings can cause neurophysiological changes related to clear discrimination of sounds, even if the hearing threshold is normal. This auditory abnormality concerns "the vividness of sounds" and cannot be recognized by the usual hearing test in which subjects are examined using a series of individual tones in a silent environment. These results may support a future auditory assessment plan for long-term portable music player users.

The research group examined the brain's response to sound using the biomagnetism measurement device MEG (magnetoencephalography), which makes it possible to measure the [brain activity](#) without any subject's behavioral response. They recorded the brain responses of two groups of 13 young adults; one group had regularly listened to music at full blast, and the other group had not. Subjects listened to a sound of a specific frequency contained in background noises while watching a movie. The inability to dissociate a sound from background noises was considerably more pronounced in the habitual [portable music](#) player users. This difficulty cannot be detected with the current standard hearing test, which yielded the same results in both groups.

According to Dr. Okamoto, "It can be said that listening to music at high volumes burdens the nerves of the brain and [auditory system](#) and can cause a decline in the ability to discriminate sounds, even if the usual hearing test results are normal and the subject is unaware of any changes." He also claims, "It would be better to suppress environmental noises by using devices such as noise cancellers instead of turning up the volume when enjoying a mobile [music player](#) in a noisy place."

Provided by National Institute for Physiological Sciences

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