

Listening to slow and steady music can help alleviate a fear of testing in numbers

2 December 2015



It can take up to 30 minutes for music to have a relaxing effect on the mind and body of people with mathematics anxiety. Credit: A*STAR Bioinformatics Institute

Sedative music can reduce the heart rate and blood pressure of people with anxiety about mathematics, suggests Samuel Gan from the A*STAR Bioinformatics Institute.

Relaxing music is commonly used to calm the jittery nerves of patients going into surgery. The music is thought to synchronize the listener's heartbeat to a slow tempo of 60 to 80 beats per minute. But while most studies report that subjects report reduced [anxiety](#) after listening to calming music, only a few note the associated physiological changes.

"You might need to first become aware of the music and perceive yourself to be relaxed before that awareness is translated into a physiological response of the body," explains Gan, who is also affiliated with Australia's James Cook University in Singapore. Gan admits to having suffered from the phobia in his youth. "I avoided maths all the way – that is why I became a scientist."

Gan and his psychology student at James Cook University wanted to establish a conclusive link between music and its effect on the body. They recruited 105 undergraduate psychology students, aged 19 to 31, to take a timed maths exam. All students reported on their [anxiety levels](#) before,

during and after the test, and regular measurements were taken of their [heart rate](#) and blood pressure.

One group was lulled by Beethoven's Moonlight Sonata: another group listened to Saint-Saëns's sprightly Allegro Moderato, Symphony No. 3. A control group was not provided with music.

"Many students seemed to be quite stressed out by the maths questions," says Gan. "Some of them even breathed a sigh of relief at the end." Statistical analysis of the students' self-assessments showed that sedative music reduced their anxiety but stimulating music sustained it. Their heart rates, however, were not as easily swayed by the music, and did not show any change.

"We were a little disappointed with our preliminary analysis," says Gan. "So we dug deeper into our data using different statistical tests and found that there was a physiological effect, characterized by a decrease in [systolic blood pressure](#)."

A review of earlier studies suggested an optimal musical relaxation time of 30 minutes. To explain his inconclusive results, Gan proposed a 'Perception to Physiology' or 'P2P' model, which states that time, familiarity with and fondness for the sedative [music](#) helps to decrease [blood pressure](#).

Gan plans to conduct further studies to verify the model. "The implications are not limited to mathematics anxiety."

More information: S. K.-E. Gan et al. The relaxation effects of stimulative and sedative music on mathematics anxiety: A perception to physiology model, *Psychology of Music* (2015). [DOI: 10.1177/0305735615590430](#)

Provided by Agency for Science, Technology and

Research (A*STAR), Singapore

APA citation: Listening to slow and steady music can help alleviate a fear of testing in numbers (2015, December 2) retrieved 17 September 2021 from <https://medicalxpress.com/news/2015-12-steady-music-alleviate.html>

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