

# Concert hall acoustics influence the emotional impact of music

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Vienna Musikverein is a classic shoebox-type concert hall. Credit: Jukka Pätynen

Aalto University researchers have found that the emotional impact experienced by music listeners depends on the concert hall's acoustics.

Earlier research has shown that the strongest [emotional](#) experiences by music listening may elicit shivers or goosebumps in the listener. Much weaker reactions can be detected from the variations in the electrical skin conductance. Based on this knowledge, the researchers presented the test subjects an excerpt of Beethoven's symphony with the acoustics measured in different concert halls. During listening, the skin conductance was measured with sensors attached in the listeners' fingers in order to record the magnitude of the emotional reactions to different acoustic conditions.

The results revealed that an identical performance of classical orchestra music evoked stronger emotional impact when presented in the acoustics of shoebox-type concert halls, such as Vienna Musikverein or Berlin Konzerthaus. The study included identically selected two positions from six European concert halls: Vienna Musikverein, Amsterdam Concertgebouw, Berlin Konzerthaus and Philharmonie, Cologne Philharmonie, and Helsinki Music Centre.



Helsinki Music Centre represents a more modern concert hall design. Credit: Jukka Pätynen

"Some interpretations of a same music piece can evoke stronger emotions than others. Similarly, our study has succeeded in demonstrating that the hall's acoustics plays an important part in the overall emotional impact. After all, emotional experiences are a key factor in [music](#) to many listeners." says Dr. Jukka Pätynen. For decades, researchers on concert hall acoustics have aspired to explain the acoustical success of certain halls with room-acoustic parameters. The study by Finnish researchers is the first to assess the acoustics of existing concert halls as the [emotional impact](#).

Dr. Jukka Pätynen works as an Academy of Finland post-doctoral

researcher in Professor Tapio Lokki's Virtual Acoustics research group. The group aims to understand how room [acoustics](#) affect sound signals, and how people perceive room acoustic properties. Research focuses on improved prediction and understanding of concert halls and other acoustically demanding spaces.

**More information:** Jukka Pätynen et al. Concert halls with strong and lateral sound increase the emotional impact of orchestra music, *The Journal of the Acoustical Society of America* (2016). [DOI: 10.1121/1.4944038](#)

Provided by Aalto University

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