

Why musicians make us weep and computers don't

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Music can soothe the savage breast much better if played by musicians rather than clever computers, according to a new University of Sussex-led study published in the online, open-access journal *PLoS ONE*.

Neuroscientists looked at the brain's response to piano sonatas played either by a computer or a musician and found that, while the computerised music elicited an emotional response – particularly to unexpected chord changes - it was not as strong as listening to the same piece played by a professional pianist.

Senior research fellow in psychology Dr Stefan Koelsch, who carried out the study with colleagues at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, played excerpts from classical piano sonatas to twenty non-musicians and recorded electric brain responses and skin conductance responses (which vary with sweat production as a result of an emotional response).

Although the participants did not play instruments and considered themselves unmusical, their brains showed clear electric activity in response to musical changes (unexpected chords and changes in tonal key), which indicated that the brain was understanding the "musical grammar". This response was enhanced, however, when the sonatas were played by musicians rather than a computer.

Dr Koelsch said: "It was interesting for us that the emotional reactions to the unexpected chords were stronger when played with musical

expression. This shows us how musicians can enhance the emotional response to particular chords due to their performance, and it shows us how our brains react to the performance of other individuals."

The study also revealed that the brain was more likely to look for musical meaning when the music was played by a pianist.

"This is similar to the response we see when the brain is responding to language and working out what the words mean," says Dr Koelsch. "Our results suggest that musicians actually tell us something when they play. The brain responses show that when a pianist plays a piece with emotional expression, the piece is actually perceived as meaningful by listeners, even if they have not received any formal musical training."

Citation: Koelsch S, Kilches S, Steinbeis N, Schelinski S (2008) Effects of Unexpected Chords and of Performer's Expression on Brain Responses and Electrodermal Activity. PLoS ONE 3(7): e2631. doi:10.1371/journal.pone.0002631

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