

# Sharp or flat: Gene clues into musical ability

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DNA goes only part-way to explaining musical ability, researchers say

Music surfaces frequently in the great Nature vs. Nurture debate: Why can someone be a virtuoso pianist yet their neighbour be a musical duffer? Does the answer lie in genes or upbringing?

In a study published on Tuesday that compared hundreds of individuals, scientists said the first step towards answering the question may lie in DNA—in several genes that detect and interpret sounds.

Researchers took blood samples from 767 people from 76 families, ranging in age from seven to 94 years. Some families had a strong musical tradition, boasting several professional players.

The scientists unravelled the genetic code from the samples and carried out a comparison between the volunteers, looking for variants in their DNA.

They also asked the volunteers to do three musical tests. The guinea pigs were asked to distinguish between notes that had slightly different tones and durations, and to identify sequences of notes that were subtly different from each other.

Among those who performed well in these tests, the big standout was tiny but significant differences in several [genes](#) located on Chromosome 4 which help determine how we hear and perceive sound.

One variant lies on a gene called GATA2, which is important for the hair cells in the inner ear. The delicate fibres on these cells move in response to different frequencies and transmit a signal through the auditory nerve to the brain.

Another telltale variant was found in a gene called PCDH7, which plays an important role in a part of the brain called the amygdala—believed to be the driver for how we transform sounds into patterns.

These are only a few of what is likely to be a bigger gene haul, but in any case DNA goes only part-way to explaining [musical ability](#), the authors said.

According to a common theory, [musical aptitude](#) has a "primary" component—the physical ability to distinguish tones and sequences—and this is a prerequisite to a "secondary" component, the

skill to play, which is dependent on one's culture and environment.

"Musical aptitude is a complex behavioural trait," the paper said, stressing that their experiments "account for only a part" of it.

"Environmental factors, such as the childhood musical environment, the example set by parents and siblings, and music education affect musical abilities," it added.

Their study, published in the journal *Molecular Psychiatry*, did not look at musical creativity—the ability to compose.

**More information:** The study (A genome-wide linkage and association study of musical aptitude identifies genetic loci containing variants related to inner-ear development and neurocognitive functions) was published in *Molecular Psychiatry* on 24 February 2014.

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