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## Sound projection: Are Stradivarius violins really better?

Researchers at the Institut Jean Le Rond d'Alembert (CNRS/UPMC) have shown that recently-made violins have better sound projection<sup>1</sup> than those built by the famous violinmaker Antonio Stradivarius. This study, published in the journal *PNAS* on May 8th 2017, also shows that, despite the prestige of these old Italian violins, listeners prefer the sound made by recent instruments and cannot distinguish the two.

Sound projection is the capacity of a musical instrument to fill the space of a concert hall, to carry to the back of the room, and to rise above the sound of an orchestra. It is particularly important for soloists. Sound projection of 17th and 18th century Italian violins, notably those of Stradivarius, is often considered better than more recent violins. The research group of Claudia Fritz, CNRS researcher at Institut Jean Le Rond d'Alembert (CNRS/UPMC)<sup>2</sup>, in collaboration with the American violinmaker Joseph Curtin, wanted to test this supposed superiority. To do this they conducted two experiments involving 137 listeners: 55 in an auditorium in Paris and 82 in a New York concert hall. The listeners had to judge nine pairs of violins, each consisting of an old violin and a recent one<sup>3</sup>, following two criteria: sound projection and personal preference. So as to avoid bias, the experiments were performed double blind, concealing the identities of the violins from both the musicians and the audience.

The results of the study showed that on average the listeners preferred the recent instruments to the Stradivarius violins and found that they had better projection. Furthermore, neither the violinists nor the listeners were able to systematically distinguish the two kinds of violin. Two other blind studies, conducted by the same team in 2010 and 2012, had already shown that violinists preferred recent instruments to famous Italian violins, while being unable to distinguish between them.

This study reveals that, contrary to popular belief, soloists would do better to favor recently-made violins for their competitions, auditions and concerts, on the condition that the violins' origin remains unknown to the jury and listeners. Moreover, encouraging violinists to do blind tests would allow them to choose an instrument without being influenced by the prestige of the name of a famous violinmaker.

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<sup>1</sup> Sound projection is the capacity of an instrument to fill the space of a concert hall, to carry to the back of the room, and to rise above the sound of an orchestra.

<sup>2</sup> Claudia Fritz was awarded the CNRS bronze medal in 2016. <http://www.cnrs.fr/fr/recherche/prix/bronze/2016.htm>

<sup>3</sup> The violins were selected at random from three recent violins (under 10 years old) and three Stradivarius.



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*Selection of recent violins for a listening test at the Cooper Union, New York aiming to compare three Stradivarius with three recent violins.*  
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*The audience evaluates different pairs of violins, each pair consisting of a Stradivarius and a recent violin.*  
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### For more information

<https://lejournal.cnrs.fr/diaporamas/stradivarius-la-fin-dun-mythe>

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### Bibliography

Listener evaluations of new and old Italian violins, Claudia Fritz, Joseph Curtin, Jacques Poitevineau, Fan-Chia Tao, *PNAS*, 8 may 2017.

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