

Genetics, practice more important than childhood start for musical skill: twin study

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A genetic predisposition for music, along with practice time and family environmental influences, may have a larger impact on the success of professional musicians than the age at which they began studying music, new research found through a study of professional musicians and twins.

Laura Wesseldijk, a musician, a postdoc researcher at the Karolinska Institute in Stockholm, Sweden, and lead author of a new [paper](#) published in *Psychological Science*, has studied a range of factors that affect musical ability. But she was curious about the relationship between music training start age and success later in life based on anecdotal evidence from her involvement in the music community.

Wesseldijk told *The Academic Times* that there is discussion among musicians and researchers about the relevance of the start age for beginning musical training in childhood, and whether training during a certain, “sensitive” time period is actually crucial for skill acquisition.

It is common for adults to assert that they started music training too old, perhaps in their teens, and believe that they could have been more successful if they had an earlier start, Wesseldijk said. On the contrary, others believe they began training too young to develop a talent, because they abandoned music after losing interest.

Wesseldijk sought to examine if start age had a significant effect on musical achievements in adulthood by comparing a sample of 310 professional musicians and a sample of 7,786 twins who had played music at some point in their life. Both samples consisted of adults residing in Sweden.

“In this field, when you want to really investigate the effects of when you start playing music, it’s very informative to take into account genetics and family environment. And that is something which had never been done before [this study],” Wesseldijk said.

“The present study is, to our knowledge, the largest and only genetically informative study to focus on whether starting musical training at a younger age leads to higher levels of musical expertise,” the authors said in the paper.

Using the twin sample, which contained both identical and fraternal twins, was critical, according to the paper. Monozygotic twins, or identical twins, share 100% of their DNA and 100% of their family environment, while dizygotic twins, or fraternal twins, on average share 50% of their DNA as regular siblings do, and 100% of their family environment.

“Because of the existence of these two types of twins, we can actually estimate [how] much individual differences are explained by genetics, family environment and a unique environment,” such as musical traits, Wesseldijk said. “Twins offered the possibility to look at how much our genetics are at play.”

The twin participants were asked about the age of onset of their musical training, hours of practice, musical aptitude and musical achievement. Musical achievement was also measured in the musician sample, using subtests of pitch, melody and rhythm discrimination.

Among the monozygotic twins, who had identical genetic and family influences, the research team specifically looked at the sets of twins who started music training at different ages. This was their “unique environment.”

The results showed in both the twin sample and the professional musician sample that an earlier age of onset training was associated with higher aptitude and achievement in music.

However, the researchers determined that among the monozygotic twins, the twin who started music training at a younger age was not more musical and had not achieved more in music in adulthood than the other twin. This led Wesseldijk to conclude that a genetic predisposition for music is thus an important factor in musical aptitude.

There are several reasons why the “sensitive period” for skill acquisition theory is so popular, she explained, because genetic factors can contribute to a child starting musical training at a younger age. If a child is genetically inclined to music and tends to reach for musical instrument toys over other types of toys, for example, it's likely that the parent will provide the child at an earlier age with music classes.

“A genetic predisposition for music may make children start musical training at a younger age. Thus, our findings provide little direct support that early training has a specific, causal effect on later performance and achievement,” the authors said in the study.

Though the study used data on participants from Sweden, Wesseldijk said results would be very similar throughout Europe, and in countries like the U.S. and Australia. She noted that there may be differences in cultures where children are less likely to grow up taking music classes or having access to musical instruments at home.

Wesseldijk said the findings are important for the music industry and beyond, since it is also commonly believed in sports, for instance, that beginning at a young age is critical to achievement and success. Though the current study found no strong evidence against the existence of a “sensitive period” in general, it shows for the first time that other factors are also important. And she noted that the study relied on participants self-reporting their age of

onset of musical training, which could be inaccurate and skew the data.

Future research on the topic should continue to take into account familial factors and account and control for time spent practicing, Wesseldijk suggested. She is currently studying the relationship between making music and the presence of mental health symptoms for depression, anxiety or schizophrenia.

The study, “Why Is an Early Start of Training Related to Musical Skills in Adulthood? A Genetically Informative Study,” was published in the Psychological Science journal on Dec. 14. Laura W. Wesseldijk of the Karolinska Institute was the lead author. Miriam A. Mosing and Fredrik Ullén, both of the Karolinska Institute, served as co-authors.

This story has been updated to clarify the factors analyzed in the study.