

The benefits of music education

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Does a music education make you smarter? The answer — a qualified “yes”.

Did you know that Thomas Edison, Albert Einstein, Robert Oppenheimer and Stephen Hawkins, all famous scientists, were also musicians? Surprised? Perhaps we should not be, since many years of scientific studies appear to show that those with a strong music education will excel in many professions. Are these studies definitive, or do they misrepresent the role of music in educational achievement? And if there is a link between music training and later educational achievement, what relevance does this have to the value of music in its role as an artistic endeavour?

Right at the outset, it is important to ask why we should care whether musical education has an effect on the non-musical side of an individual's education. It's unlikely that we have the same concerns about other subjects taught at school or university. For instance, we would be unlikely to value a maths education less if we were told that proficiency in maths failed to improve proficiency in music, drama or art. The most likely explanation for the apparent disparity between the treatment of music and some other subjects is that music's status as an art form apparently reduces its status as a discipline. Studying music is considered to be *“the icing on the cake in a typical scholarly meal, whereas mathematics and science are the meat and potatoes. As such, music is more likely than other subjects to be eliminated from the school curriculum when budgets are reduced.”* [Schellenberg 2006]

Consider these facts...

- Medical doctor and biologist Lewis Thomas studied the undergraduate degrees of medical school applicants, and found that two thirds of applicants with a music degree were admitted. This was the highest proportion for any graduate group. By contrast, 44% of biochemistry graduates were admitted [Miller & Coen 1994].
- Rauscher, Shaw and Ky [1993] reported superior spatial abilities for participants who listened to a recording of music composed by Mozart compared with those who sat in silence or listened to relaxation instructions, a finding that became known as the “Mozart effect”.
- A ten-year study attributed to James Catterall [1997] tracking over 25000 students showed that those who studied or played music received higher test scores when compared with those with no music background. These improvements were evident regardless of socioeconomic background.

It is tempting to suggest that these studies (and there are many more) suggest a definitive link between music education and educational achievement. But is this true? Could the noted effects simply be statistical quirks, or a product of the socioeconomic background of the favoured music students? Certainly the conclusions of some of these earlier findings, notably the Mozart effect, could not be replicated by later studies [Chabris *et al.* 1999]. Is it simply the case that intelligent students happen to also like music, or (worse), are merely forced by their parents to learn music? In other words, is the assumption of a causal relationship between music education and achievement false?

At this stage it is important to make a clear distinction between an associative and a causal relationship. If music education early in life (say) *necessarily* leads to an improvement in educational achievement (all other things being equal), then we can say that educational achievement is *causally* linked to music education. By contrast, if students with a high educational achievement just *happen* to also engage in music-making, then we might say that educational achievement is *associatively* linked to music education, but is not causally-linked to it. So, which of these is true?

Studies showing a causal relationship between music training and educational achievement are notoriously difficult to demonstrate. For a start, the participants in the study should be similar in all respects, except of course in the inclusion of music in their training. To be totally convincing, the inclusion of music education should be assigned randomly between students, while both teachers and students should be unaware of the purpose of the study, lest they inadvertently affect the results. In practise, these conditions are difficult or perhaps impossible to achieve, and as a result the studies in the literature merely provide glimpses of the true complex relationship between music-making and educational achievement.

Consider these studies

- Dana Strait and colleagues from Northwestern University (USA) found that people with extensive music training outperformed those with little to no musical training on tests of auditory attention, frequency discrimination, and backward masking (the ability to distinguish one sound from another that comes after it). As part of the study, the researchers controlled for IQ and differences in hearing, and there was little difference between the two groups on tasks that controlled visual attention [Strait *et al.* 2010]. The findings suggest that long-term music training fine tunes the neural mechanisms that lead to better performance in auditory-specific tasks.
- Parbery-Clark and colleagues [Parbery-Clark *et al.* 2009] found that musicians were better than non-musicians in their ability to identify speech presented in a background of interfering noise. Musicians with more years of musical experience were better able to detect speech in noise when compared with their colleagues of lesser experience, which suggests that the auditory system has some degree of plasticity that adapts to changing demands over time.
- Schellenberg [2004] conducted the only controlled experiment to that date that included random assignment of individual children to music lessons or comparison conditions. A total of 146 six-year-olds were administered a standardised IQ test at age six, and again at age seven. In the interim, two groups of children received 36 weeks of either keyboard or vocal instruction, while two control groups received either drama lessons or no lessons. While all four groups had reliable increases in IQ from the first to the second testing session, as might be expected from attending schooling, the increase in IQ was greater for the music groups than for the control groups.

The common feature of the above studies is that they identify causal links between musical training and some function of the brain's auditory processing. The key requirement is that rigorous and long-term music practise and performance is required — merely listening to music does not appear to do the trick.

The bottom line

Does music improve the educational performance of students? The answer is a qualified yes. Qualified, because active long-term engagement in music-making is required; merely listening to

music, or engaging for a short period is not enough. The good news is that one does not necessarily have to be a musical genius to gain benefits from long-term exposure to music training; the key is long-term active engagement.

Why does an education in music confer these benefits? Here we have few clues. But it may be due to the wide range of perceptual functions that are involved in music making. Gottfried Schlaug (Harvard Medical School) put it thus: "It'd be difficult to find another activity (besides music training) that takes up so much real estate in the brain".

At Muscepts we believe that it is with thoroughness in training in the elements of music through a visual, audio, and kinaesthetic approach that students become confident and competent musicians. Our resources provide an introduction to music literacy for students, and establish the basic practical skills and confidence to enable them to further explore and enjoy music performance and composition.

References

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