

MUSIC LEARNING HELPS LITERACY

What connects music learning and language, reading and literacy skills?

A large body of rigorous and validated research points to a strong connection between music education and language development. This line of inquiry emerged from the observation that musically trained children tended to perform better in standardised tests on language,^{1 2} acquire language³ including words, syntax and prosody more effectively and earlier, and utilise language more effectively.⁴

Research studies have now found that this is possibly due to the overlapping of brain regions recruited during music and language processing.^{5 6} Further research has found that music education trains the auditory processing network to make meaning from sound with greater accuracy and reliability.⁷

Music education has been found to have significant measurable impact on reading readiness⁸ and reading skills.⁹ Research in the field of neuroscience and music has indicated that dyslexia is primarily a disorder within the auditory processing network and that music education is an effective learning activity to correct this language processing disorder.¹⁰

One specific area of research into music education and language learning has been with children living in disadvantaged circumstances. Music education interventions lasting 2 or more years have been found to have a far greater impact on these students, as their literacy development delays have been found to be caused in large part by the underdevelopment of their auditory processing systems.¹¹ Across US, UK and Australian based studies, music education interventions have raised

disadvantaged students' literacy levels from well below benchmark standards to achieving at standard within 2 years.

The connections between music learning and language acquisition through to highly developed literacy was one of the first breakthroughs in the neuromusical research field. This is because the overlapping neural network was identified very early in the exploration of the field, during the late 1990s and early 2000s. There are now enough randomised, longitudinal and replicated studies to confidently point to a causal relationship between music learning and language and literacy enhancement.

Australian-based research¹ has found that music learning improves:



Language Acquisition

At least 1 year gain



Language Syntax

At least 1 year gain



Reading Skills

Up to 3 year gain in auditory processing



Listening Skills

Up to 2 year gain



Attention Skills

Up to 2 year gain for pre teens

Summary of research findings

Music Learning and Literacy

The cognitive processes involved in learning to read and play music and learning to say and read words use overlapping neural mechanisms in a child's brain.¹² Music learning improves cognitive and auditory skills that:



Assist with **word decoding**¹³



Increase the speed at which children **learn new words**¹⁷



Improve **comprehension** in beginner readers¹⁴



Increase the understanding of how to **use new words in language**¹⁸



Improve **comprehension** in those students experiencing **reading difficulties**¹⁵



Improve young readers' **understanding of language syntax**¹⁹



Improve **phonological awareness** for specific language sounds more than direct phonological training¹⁶



Counteract the negative effects of low SES on **children's literacy development**.²⁰

The length of music training has a significant impact on these findings: **the longer children learn, the better**. The positive effects of improved auditory processing on reading skills are most significant when formal music learning is commenced **between the ages of 4 and 9 years of age**.

References

- ¹ Caldwell, B., & Vaughan, T. (2011). Transforming education through the arts. *Routledge*.
- ² Fitzpatrick, K. R. (2006). The effect of instrumental music participation and socioeconomic status on Ohio fourth-, sixth-, and ninth-grade proficiency test performance. *Journal of Research in Music Education*, 54(1), 73–84.
- ³ Jentschke, S., & Koelsch, S. (2009). Musical training modulates the development of syntax processing in children. *Neuroimage*, 47, 735–744.
- ⁴ Patel, A. D. (2008). Music, language, and the brain. *New York: Oxford University Press*.
- ⁵ Koelsch, S. (2006). Significance of Broca's area and ventral premotor cortex for music-syntactic processing. *Cortex*, 42, 518–520.
- ⁶ Patel, A. D. (2008). Music, language, and the brain. *New York: Oxford University Press*.
- ⁷ Kraus, N., & White-Schwoch, T. (2016). Neurobiology of everyday communication: What have we learned from music?. *The Neuroscientist*, 1073858416653593.
- ⁸ Tsang, C. D., & Conrad, N. J. (2011). Music training and reading readiness. *Music Perception: An Interdisciplinary Journal*, 29(2), 157–163.

References

- ⁹ Tierney, A., & Kraus, N. (2013). Music training for the development of reading skills. *Applying Brain Plasticity to Advance and Recover Human Ability Progress in Brain Research*, 207, 209–241.
- ¹⁰ Besson, M., Schön, D., Moreno, S., Santos, A., & Magne, C. (2007). Influence of musical expertise and musical training on pitch processing in music and language. *Restorative Neurology and Neuroscience*, 25(3–4), 399–410.
- ¹¹ Slater, J., Strait, D. L., Skoe, E., O'Connell, S., Thompson, E., & Kraus, N. (2014). Longitudinal effects of group music instruction on literacy skills in low-income children. *PLOS ONE*, 9(11), e113383.
- ¹² Bonacina, S., Krizman, J., White-Schwoch, T. & Kraus, N. (in press). Clapping in time parallels literacy and calls upon overlapping neural mechanisms in early readers. *Annals of the New York Academy of Sciences*.
- ¹³ Ahissar, M., Protopapas, A., Reid, M., & Merzenich, M. M. (2000). Auditory processing parallels reading abilities in adults. *Proceedings of the National Academy of Sciences*, 97(12), 6832–6837.
- ¹⁴ Corrigan, K. A., & Trainor, L. J. (2011). Associations between length of music training and reading skills in children. *Music Perception: An Interdisciplinary Journal*, 29(2), 147–155.
- ¹⁵ Corrigan, K. A., & Trainor, L. J. (2011). Associations between length of music training and reading skills in children. *Music Perception: An Interdisciplinary Journal*, 29(2), 147–155.
- ¹⁶ Patscheke, H., Degé, F., & Schwarzer, G. (2016). The effects of training in music and phonological skills on phonological awareness in 4- to 6-year-old children of immigrant families. *Frontiers in Psychology*, 7, 1647.
- ¹⁷ Dittinger, E., Chobert, J., Ziegler, J. C., & Besson, M. (2017). Fast brain plasticity during word learning in musically-trained children. *Frontiers in Human Neuroscience*, 11, 233.
- ¹⁸ Dittinger, E., Chobert, J., Ziegler, J. C., & Besson, M. (2017). Fast brain plasticity during word learning in musically-trained children. *Frontiers in Human Neuroscience*, 11, 233.
- ¹⁹ Jentschke, S., & Koelsch, S. (2009). Musical training modulates the development of syntax processing in children. *Neuroimage*, 47(2), 735–744.
- ²⁰ Slater, J., Strait, D. L., Skoe, E., O'Connell, S., Thompson, E., & Kraus, N. (2014). Longitudinal effects of group music instruction on literacy skills in low-income children. *PLOS ONE*, 9(11), e113383.