# MUSIC EDUCATION BENEFITS EVERY CHILD

# EVIDENCE FROM NEUROMUSICAL RESEARCH

**Dr Anita Collins** 

Neuromusical Educator
Founder of Bigger Better Brains



# MUSIC LEARNING IS FOR EVERY CHILD NOT JUST THOSE WHO ARE INTERESTED

There is a commonly held belief that learning music should only be for those students who are identified as **talented or interested**. Neuromusical research has shown that music learning **can benefit all students** in terms of cognitive development.

Our auditory (sound) processing network has been found to be our **largest information-gathering sense**. Our auditory processing network is our first active sensory network at birth, it never turns off even when we sleep, and it is often overlooked in educational settings.

The **only learning area** that develops our auditory processing network to a high level is music. This is why so many skills that children learn through music are transferable to all other learning areas.

There is also a commonly held belief that **music should only be learned by those who will excel at it.** Talent as we know it may not be an on-and-off switch, rather music learning looks and feels easier to some students because of their genetic predispositions.

MUSIC LEARNING, ESPECIALLY BETWEEN 3-12 YEARS OF AGE, SUPPORTS THE NEURAL FOUNDATIONS FOR ALL LEARNING.



# MUSIC LEARNING HELPS LITERACY & NUMERACY

Music learning has been found to improve language learning and literacy as well as numeracy processing.

# Literacy



# **DECODING**

Music learning assists with word decoding



### LANGUAGE SYNTAX

Music learning improves young readers understanding of language syntax



# **LEARN NEW WORDS**

Music learning increases the speed at which children learn new words



# **DISADVANTAGED**

Music learning counteracts the negative effects of low SES on children's literacy development



# **PHONOLOGICAL AWARENESS**

Music learning improves phonological awareness for specific language sounds more than direct phonological training



# COMPREHENSION

Music learning improves comprehension in beginner readers



## **READING DIFFICULTIES**

Music learning improves comprehension in those students experiencing reading difficulties

# **Numeracy**



# **COGNITIVE CONTROL**

Music learning improves cognitive control



# **NUMERICAL COGNITION**

Music learning improves numerical cognition



### **DIVERGENT THINKING**

Music learning enhances divergent thinking



### **ANXIETY**

Music learning reduces mathematical anxiety symptoms



# **TASK SWITCHING**

Music learning enhances tasks switching efficiently



### **COGNITIVE PROCESSING**

Music learning increases cognitive processing speeds



### **IQ SCORES**

Music learning increases IQ scores by an average of 7pts



# MUSIC LEARNING HELPS EXECUTIVE FUNCTION & SOCIAL SKILLS

Music learning has been found to improve learning habits as well as social skills and wellbeing.

# **Executive Function**



# **WORKING MEMORY**

Music learning improves our memory for procedure



# **FOCUSED ATTENTION**

Music learning improves young readers attention for language learning



### **DIVERGENT THINKING**

Music learning develops creative and innovative thinking patterns



# INHIBITORY CONTROL

Music learning enhances the ability to stay on task and not get distracted



### **COGNITIVE SPEEDS**

Music learningincreases congitive speeds and brain syncronicity



# **VERBAL MEMORY**

Music learning improves memory for spoken instructions and directions



# **ATTENTION STAMINA**

Music learning increases students ability to maintain attention

# Social Skills & Wellbeing



# PROSOCIAL BEHAVIOURS

Music learning improves empathy and kindness



### SOCIAL ENGAGEMENT

Music learning promotes greater levels of social engagement through life



# MANAGE DEPRESSION

Music learning give greater capacity to manage depressive periods



# TRUST & RESPECT

Music learning assists the development of trust and respect in social groups



### WELLBEING

Music learning improves psychological wellbeing and self-regulation



# **DECISION MAKING SKILLS**

Music learning improves personal decision making skills



# **BRAIN HEALTH**

Music learningimproves immune and brain health



# FURTHER NEUROMUSICAL RESEARCH TO EXPLORE

Ahissar, M., Protopapas, A., Reid, M., & Merzenich, M. M. (2000). Auditory processing parallels reading abilities in adults. *Proceedings of the National Academy of Sciences*.

Altenmüller, E., & Schlaug, G. (2012). Music, brain, and health: exploring biological foundations of music's health effects. Music, Health, and Wellbeing, 12-24.

Corrigall, K. A., & Trainor, L. J. (2011). Associations between length of music training and reading skills in children. *Music Perception: An Interdisciplinary Journal*.

Dittinger, E., Chobert, J., Ziegler, J. C., & Besson, M. (2017). Fast brain plasticity during word learning in musically-trained children. *Frontiers in human neuroscience*.

Fasano, M. C., Semeraro, C., Cassibba, R., Kringelbach, M. L., Monacis, L., de Palo, V., ... & Brattico, E. (2019). Short-term orchestral music training modulates hyperactivity and inhibitory control in school-age children: A longitudinal behavioural study. Frontiers in Psychology, 10, 750.

Gibson, C., Folley, B. S., & Park, S. (2009). Enhanced divergent thinking and creativity in musicians: A behavioral and near-infrared spectroscopy study. *Brain and Cognition*.

Habibi, A., Cahn, B. R., Damasio, A., & Damasio, H. (2016). Neural correlates of accelerated auditory processing in children engaged in music training. Developmental Cognitive Neuroscience, 21, 1–14.

Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. International Journal of Music Education, 28(3), 269–289.

Hallam, S. (2016, June). The impact of actively making music on the intellectual, social and personal development of children and young people: A summary. In Voices: A World Forum for Music Therapy (Vol. 16, No. 2).

Jentschke, S., & Koelsch, S. (2009). Musical training modulates the development of syntax processing in children. *Neuroimage*.

Loui, P., & Wessel, D. (2007). Harmonic expectation and affect in Western music: Effects of attention and training. Perception & Psychophysics, 69(7), 1084–1092.

Marsh, K. (2012). "The beat will make you be courage": The role of a secondary school music program in supporting young refugees and newly arrived immigrants in Australia. Research Studies in Music Education, 34(2), 93-111.



# Find out more at <u>biggerbetterbrains.com</u>

Patel, A. D. (2011). Why would musical training benefit the neural encoding of speech? The OPERA hypothesis. Frontiers in Psychology, 2, 142.

Patscheke, H., Degé, F., & Schwarzer, G. (2016). The effects of training in music and phonological skills on phonological awareness. *Frontiers in psychology*.

Porflitt, F. and Rosas, R., 2020. Core music elements: rhythmic, melodic and harmonic musicians show differences in cognitive performance. *Studies in Psychology*, 41(3), pp.532-562.

Rodriguez, I. A., do Nascimento, J. M., Voigt, M. F., & Dos Santos, F. H. (2019). Numeracy Musical Training for school children with low achievement in mathematics. *Annals of Psychology* 

Roden, I., Könen, T., Bongard, S., Frankenberg, E., Friedrich, E. K., & Kreutz, G. (2014). Effects of music training on attention, processing speed and cognitive music abilities. *Applied Cognitive Psychology*.

Schellenberg, E. G. (2004). Music lessons enhance IQ. Psychological Science.

Schellenberg, E. G., Corrigall, K. A., Dys, S. P., & Malti, T. (2015). Group music training and children's prosocial skills. PLOS ONE, 10(10), e0141449.

Seinfeld, S., Figueroa, H., Ortiz-Gil, J., & Sanchez-Vives, M. V. (2013). Effects of music learning and piano practice on cognitive function, mood and quality of life in older adults. Frontiers in Psychology, 4, 810.

Smayda, K. E., Worthy, D. A., & Chandrasekaran, B. (2018). Better late than never (or early): Music training in late childhood is associated with enhanced decision-making. Psychology of Music, 46(5), 734–748.

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*.

Slevc, L. R., & Okada, B. M. (2015). Processing structure in language and music: A case for shared reliance on cognitive control. *Psychonomic Bulletin & Review*.

Tanja, L., Adriana, S.G. and Mari, T., 2021. Perspectives on the Potential Benefits of Children's Group-based Music Education. *Music & Science*, 4, p.20592043211033578.

Zuk, J., Benjamin, C., Kenyon, A., & Gaab, N. (2014). Behavioral and neural correlates of executive functioning in musicians and non-musicians. *PLOS ONE*.



# Find out more at <u>biggerbetterbrains.com</u>