The Benefits of Singing for Children

Professor Graham Welch, Institute of Education, University of London g.welch@ioe.ac.uk



February 2012



Leading education and social research Institute of Education University of London

The physical, psychological, social, musical and educational benefits of singing

There are many different benefits that arise from engaging in singing activities. These apply to all ages, from childhood into adolescence, through into retirement age and beyond. With appropriately nurturing experiences, singing competency will develop (see p3 below). Almost without exception, everyone can sing competently and enjoy singing across the lifespan. Within the various research literatures, there are *five* main areas of reported benefit from singing, i.e., benefits that are physical, psychological, social, musical and educational.

The **physical benefits of singing** relate to:

(1) Respiratory and cardiac function Singing is aerobic in that it is a form of exercise that improves the efficiency of the body's cardiovascular system, with related benefits to overall health. Aerobic activity increases the oxygenation of the blood, which also improves overall alertness. (A study in October 2007, for example, suggested that breathing pure oxygen was more beneficial than caffeine for increasing driver alertness.) Even when seated, singing involves dynamic thoracic activity, with benefits to the underlying structure and function of the breathing mechanism. Major muscle groups are exercised in the upper body. Furthermore, aerobic activity is linked to longevity, stress reduction and general health maintenance across the lifespan. Improving airflow in the upper respiratory tract is likely to lessen opportunities for bacteria to flourish by keeping the airways open (e.g., to counter the symptoms of colds and flu). Overall, there are whole body physical benefits from singing.



The lifelong impact of early singing experience: an example

Formative singing experiences in childhood can be very important because they often have long-term impacts (positive and/or negative) on developing musical identity and on how 'musical' we think we are. For example:

"...Then in Grade 6 [age 11]...I stood up to sing it and she told me to sit down. that I couldn't sing. Well, I was devastated...I'm sure I wanted to cry. Of course you came home, it was no good of telling your parents at the time that something like this had happened to you...And she was such a powerful person in the community...It stayed with me for so long. It was so degrading at the time. Even in high school, if there was anything to do with music, I hated music...I didn't learn it. I couldn't learn it, as I thought... I'm sure that [incident] affected it, in a lot of ways...maybe she just didn't have the knowledge and it didn't come to her-'I am doing something that's going to affect this child for most of her life.' That's probably the way it was." (Laura, aged 43 - cited by Knight, 2010)

- (2) The development of fine and gross motor control in the vocal system The more that the vocal system is used appropriately, such as in healthy singing, the more that the underlying anatomy and physiology realise their potential in terms of growth and motor coordination. This is very important in childhood and into adolescence because it is a time when the underlying basis for lifelong vocal identity and effective communication are established.
- (3) Neurological functioning Singing behaviour is multi-sited neurologically, networked across many different brain areas. These include the development and interaction between parts of the brain dedicated to aspects of music (such as pitch, rhythm, timbre), language (lyrics), fine motor behaviour, visual imagery and emotion. New research also suggested that singing with someone else is not the same as singing alone or with an instrument because it involves neurological areas related to human social interaction and coordination.

The psychological benefits of singing relate to:

- (1) Intra-personal communication and the development of individual identity, both in music and through music Confident and healthy voice use links to a positive self-concept and an ability to communicate. Successful singing promotes self-esteem, general confidence and also self-efficacy. The voice is a key component of who we are; its use reflects our mood and general psychological wellbeing, communicated to ourselves as well as to others.
- (2) Singing is a cathartic activity Singing provides an outlet for our feelings. Through its physical activity and the related endocrine system triggering, singing can allow us to feel better about ourselves and about the world around us. From pre-birth, our earliest auditory experiences are vocal (from first hearing our mother's voice inside the womb) and all voice use, including singing, is interwoven with core emotional states that are central to the human condition, such as joy and sadness.
- (3) Inter-personal communication Healthy singing enables us to maximise our potential to communicate with others. We learn to improve our underlying vocal coordination, to increase vocal colour and impact intentional variety into our vocal communication. Indeed, for 25% of the working population, voice is a critical tool-of-trade (e.g. teachers, lawyers, clergy, telephone salespeople, actors, singers, and business people). Singing exercises the basic voice mechanism and improves its functional capability.

The social benefits relate to:

An enhanced sense of social inclusion

Successful singing ability is strongly correlated with a positive sense of social inclusion, of a feeling of belonging to our community. Singing with others enhances the possibilities of empathic relationships with those around us. Collective singing, such as in a choir or small group, generates a positive group identity, as well as physical and psychological benefits.

The musical benefits relate to:

- (1) The realisation of our musical potential Singing activity fosters our intellectual engagement with music. This includes an understanding of musical structure, phrasing, the development of musical memory (including repetition and variation) and tone colouring, as well as other musical building blocks (such as pitch, rhythm, loudness).
- (2) The creation of an individual musical repertoire (whether as a listener or performer or both) There are concomitant social and personal benefits through increasing the likelihood of empathic understanding of others and ourselves by the kinds of songs (music and text) that we experience, whether alone or in groups.

The educational benefits relate to:

Increasing knowledge, understanding and skills about the world around us, both in music and through music Singing will likely make you more competent in your own language, including an improvement in reading skills. Reading lyrics and reading music are processed in the same neurocortical regions for symbol decoding.

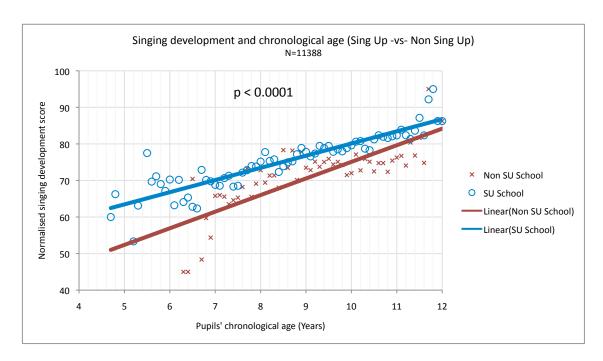
Overall... these combined benefits suggest that singing is one of the most positive forms of human activity, supporting physical, mental and social health, as well as individual development in the same areas.

Singing is important because it builds self-confidence, promotes self-esteem, always engages the emotions, promotes social inclusion, supports social skill development, and enables young people of different ages and abilities to come together successfully to create something special in the arts.





Singing competency develops in a nurturing environment: The evidence from *Sing Up*



The above figure illustrates how singing competency (left-hand scale) develops with age (horizontal scale) across childhood. During the first three years of the National Singing programme Sing Up (2007-2010), a research team from the Institute of Education, University of London assessed the individual singing abilities of n=9,979 children. Some children were assessed more than once across several years, generating n=11,388 singing assessments in total. Two singing development trend lines are evidenced in the figure:

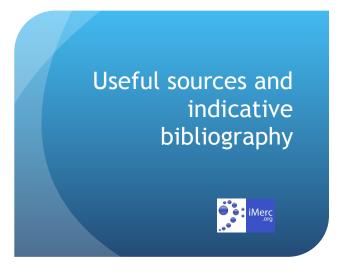
- The lower line (red) indicates that older children tend to be more skilled at singing than younger children, i.e., it is normal for singing competency to develop with age;
- However, the upper line (blue) indicates that children with particular experience
 of the Sing Up programme not only developed singing competency with age, but
 that these children were on average two years in advance developmentally in
 their singing skills compared to their non-Sing Up peers.
- The youngest children were up to three years in advance, suggesting that positive, nurturing experience is likely to have an even greater impact if you provide appropriate singing activities in the first years of schooling.

Useful websites:

- Sing Up http://www.singup.org/
- International Music Education Research Centre http://www.imerc.org
- National Center for Voice and Speech [USA] http://www.ncvs.org
- Voice Care Network UK http://www.voicecare.org.uk
- Chorus America http://www.chorusamerica.org/
- Sydney De Haan Research Centre for Music, Arts and Health http://www.canterbury.ac.uk/Research/Centres/SDHR/Home.aspx



- Bailey, B.A., & Davidson, J. (2005). Effects of group singing and performance for marginalised and middle-class singers. *Psychology of Music*, 33(3), 269-303.
- Beck, R.J., Cesario, T.C., Yousefi, A., & Enamoto, H. (2000). Choral Singing, Performance Perception, and Immune System Changes in Salivary Immunoglobulin A and Cortisol. *Music Perception*, 18(1), 87-106.
- Besson, M., Faïta, F., Peretz, I., Bonnel A.-M., & Requin J. (1998) Singing in the brain: independence of lyrics and tunes. *Psychological Science*, 9, 494-498.
- Biggs, M.C., Homan, S.P., Dedrick, R., Minick, V., & Rasinksi, T. (2008). Using an interactive singing software program: A comparative study of struggling middle school readers. *Reading Psychology*, 29(3), 195-213.
- Brown, S., Martinez, M. J., Hodges, D. A., Fox, P. T., & Parsons, L. M. (2004). The song system of the human brain. Cognitive Brain Research, 20, 363-375.
- Brown, S., Martinez, M.J., & Parsons, L. M. (2006). Music and language side by side in the brain: a PET study of the generation of melodies and sentences. *Eur J Neurosci.* 23(10), 2791-2803.
- Callan, D., Kawato, M., Parsons, L., & Turner, R. (2007). Speech and song: The role of the cerebellum. Cerebellum, 6(4), 321-327(7).
- Chorus America. (2009). *The chorus impact study*. Washington, DC.: Chorus America.
- Cooksey, J., & Welch, G.F. (1998). Adolescence, Singing Development and National Curricula Design. *British Journal of Music Education*. 15(1), 99-119.
- Clift, S., & Hancox, G. (2001). The benefits of singing: findings from preliminary surveys with a university college choral society. *Journal of the Royal Society for the Promotion of Health*, 121(4), 248-56.
- Costa-Giomi, E. (2005). Does music instruction improve fine motor abilities? In Avanzini et al (Eds.) The Neurosciences and Music II: From Perception to Performance. Annals of the New York Academy of Sciences, 1060, 262-265.
- Grape, T., Sandgren, M., Hansson, L., Ericson, M. and Theorell, T. (2002). Does singing promote well-being?: An empirical study of professional and amateur singers during singing lessons. *Integrative Physiological and Behavioural Science*, 38(1), 65-74.
- Hargreaves, D.J., Miell, D. and MacDonald, R.A.R. (2002). What are musical identities and why are they important? In R.A.R. MacDonald, D. Hargreaves and D. Miell (eds). *Musical Identities*. (pp. 1-20). Oxford: Oxford University Press.
- Harries, M.L.L., Griffin, M., Walker, J. & Hawkins, S. (1996). Changes in the male voice during puberty: Speaking and singing voice parameters. *Logopedics Phoniatrics Vocology*, 21(2), 95-100.
- Hyde, K.L., Lerch, J., Norton, A., Forgeard, M., Winner, E., Evans, A.C., & Schlaug, G. (2009). Musical training shapes structural brain development. The Journal of Neuroscience, 29(10), 3019-3025.
- Kenny, D.T., & Faunce, G. (2004). The impact of group singing on mood, coping and perceived pain in chronic pain patients attending a multidisciplinary pain clinic. *Journal of Music Therapy*, XLI(3), 241-258.
- Kleber, B., Birbaumer, N., Veit, R., & Lotze, M. (2007). Overt and imagined singing of an Italian aria. *NeuroImage*, 36(3), 889-900.
- Knight, S. (2010). A Study of Adult Non-Singers in Newfoundland. Unpublished PhD Thesis, Institute of Education, University of London.
- Kreutz, G., Bongard, S., Rohrmann, S., Hodapp, V., & Grebe, D. (2004). Effects of choir singing or listening on secretory immunoglobin A, cortisol and emotional state. *Journal of Behavioural Medicine*, 27(6), 623-635.
- Mithen, S., & Parsons, L. (2008). The Brain as a Cultural Artefact. Cambridge Archaeological Journal, 18, 415-422.
- Parsons, L.M., Himonides, E.T., Craig, N., Vakil, M., Papadakis, N., Turner, R.S., & Wilkinson, I.D. (2007). Simultaneous dualfMRI, sparse temporal scanning of human duetters at 1.5 and 3 Tesla.



- Paper presented to the Annual meeting of the Society for Neuroscience, San Diego, California USA, November 2007.
- Peretz, I., & Coltheart, M. (2003). Modularity and music processing. Nature Neuroscience, 6(7), 688-691.
- Saunders, J.A., Himonides, E., & Welch, G.F. (2010). Engaging with the National Singing Programme: Sing Up Live Field Study. London: Institute of Education.
- Schlaug, G., Forgeard, M., Zhu, L., Norton, A., Norton, A., & Winner, E. Training-induced neuroplasticity in young children. (2009) Annals of the New York. Academy of Sciences, 1169, 205-208.
- Thurman, L., & Klitzke, C. (2000). Highlights of physical growth and function of voices from prebirth to age 21. In L. Thurman, & G.F. Welch (Eds.), *Bodymind and Voice: Foundations of Voice Education*. Revised Edition (pp. 696-703). Iowa City, Iowa: National Center for Voice and Speech.
- Thurman, L., & Welch, G.F. (Eds.), (2000). *Bodymind and Voice:*Foundations of Voice Education. Revised Edition. Iowa City,
 Iowa: National Center for Voice and Speech.
- Titze, I. R. (2008). The Human Instrument. Scientific American, 298(1) [Jan] 94-101.
- Titze, I.R., Hunter, E.J., & Svec, J.G. (2007) Voicing and Silence Periods in Daily and Weekly Vocalizations of Teachers. J. Acoust. Soc. Am. 121(1), 469-78.
- Valentine, E., & Evans, C. (2001). The Effects of Solo Singing, Choral Singing and Swimming on Mood and Physiological Indices. British Journal of Medical Psychology, 74 (1), 115-125.
- Welch, G. F. (2005). Singing as communication. In D. Miell, R. MacDonald & D. J. Hargreaves (Eds.), Musical Communication. (pp.239-259). New York: Oxford University Press.
- Welch, G.F. (2006). Singing and Vocal Development, In G. McPherson (Ed.) The Child as Musician: a handbook of musical development. (pp. 311-329). New York: Oxford University Press.
- Welch, G.F. (2011). Culture and gender in a cathedral music context: An activity theory exploration. In M. Barrett (Ed.), A Cultural Psychology of Music Education. (pp. 225-258). New York: Oxford University Press.
- Welch, G.F., Himonides, E., Papageorgi, I., Saunders, J., Rinta, T., Stewart, C., Preti, C., Lani, J., Vraka, M., & Hill, J. (2009). The National Singing Programme for primary schools in England: an initial baseline study. *Music Education Research*, 11 (1). 1-22.
- Welch, G.F., Himonides, E., Saunders, J., Papageorgi, I., Preti, C., Rinta, T., Vraka, M., Stephens Himonides, C., Stewart, C., Lanipekun, J., & Hill, J. (2010). Researching the impact of the National Singing Programme 'Sing Up' in England: Main findings from the first three years (2007-2010). Children's singing development, selfconcept and sense of social inclusion. London: Institute of Education.
- Welch, G.F., Saunders, J., Hobsbaum, A., & Himonides, E. (2012). *A Research Evaluation of the New London Orchestra* Literacy through Music *Programme*. London: Institute of Education.
- Zatorre, R.J., & Peretz, I. (Eds.) (2001). The biological foundations of music. (Vol. 930). New York: Annals of the New York Academy of Sciences.