

Voice and the Brain: Evolution, Emotion and Learning

We begin by considering the basic question of why we sing. This is investigated from an evolutionary and anthropological perspective, and gives us insights into the benefits of singing for health and wellbeing. Much of this is found 'hard-wired' into systems in the brain and leads us to the next questions of how we learn the skills that are involved in singing and voice use. There is a great deal of recent research into the acquisition of motor learning skills in sport; much of this is relevant for voice education, some needs to be adapted. We can also glean from the last 50 years of education research: what are the best models for teaching style and learning environments? Alongside this theoretical information, we will look into the neurological systems governing our responses at a much deeper level: the autonomic nervous system, vagal responses, emotions and primal sound.

As we investigate these ideas, we will listen to voices, look at films of singing teachers with newly analytical eyes, and explore the outcomes in small discussion groups.

Day one:

Why would singing have evolved?

Singing (in modern humans) increases wellbeing and cohesion

- Feeling connected
- Positive affect
- Mental health benefits
- Physical health benefits

Singing in groups increases levels of endorphins and oxytocin, and lowers levels of cortisol.

Singing together will enable synchronised activity.

The social brain hypothesis: Group size and group bonding is essential for survival of the species; group size depends on many factors and is reflected in brain size

Sexual dimorphism – the differences between male and female voices

Emotional voice – the difference between speech and song. Singing is closer to emotive sounds than speech, and uses different parts of the brain.

Learning and experiencing – mirror neurons. How empathy is hard-wired into the brain, exploiting these responses for learning.

The responses of the autonomic nervous system – the vagal response and performance anxiety.

On the second day we will look at how the brain learns and how teaching styles need to take this into account in order to enable the student to progress towards autonomy. This will include some small-group discussion work.

Memory

- Short-term and long-term memory
- Working memory
- Explicit and implicit memory

Hierarchy of competence

- Motor learning
- Perceptual learning

Neurology of implicit memory

- Synaptic links
- Myelinisation
- Flexible and consistent circuit skills

Music and singing

- Mapping in the brain
- Brain and speech

The singer's brain

- Kinaesthetic awareness
- Proprioception
- Somatosensory motor control

Schema Theory – Richard Schmidt

- The template
- Focus and adaptation
- Existing and learned templates
- Task or action focus
- Variability, isolation and integration

Focus and attention

- Implicit or explicit focus
- Attention – suppression or stimulation

Embedding the moment

- Challenge
- Practice, how much and in what way?
Feedback – how much and when

Fixed and growth mindset: How the language we choose can influence learning

The clinician's illusion and confirmation bias

What makes a master teacher?

Recommended reading:

Core reading: evolution, singing and wellbeing

Davis, P. (2017). Voice and the Brain. Singing and Teaching Singing. J. Chapman, Plural publishing.

Dunbar, R. (2014). Human Evolution, Pelican.

Mithen, S. (2006). The Singing Neanderthals. Cambridge, Mass., Harvard University Press.

Norton, K. (2016). Singing and Wellbeing: Ancient Wisdom, Modern Proof, Routledge.

Additional reading: evolution

Dunbar, R. (2010). How many friends does one person need?, Faber and Faber.

Lieberman, D. (2013). The Story of the Human Body, Penguin Books.

Leakey, R. and R. Lewin (1992). Origins Reconsidered, Little, Brown and company.

Mithen, S. (1996). The Prehistory of the Mind, Phoenix.

Shubin, N. (2008). Your Inner Fish, Penguin Books.

Tecumseh Fitch, W. (2010). The Evolution of Language, CUP.

Wrangham, R. (2009). Catching Fire, how cooking made us human, Basic Books.

Lieberman, P. (1993). "On the Kebara KMH 2 Hyoid and Neanderthal Speech." Current Anthropology34(2): 172-175.

Core reading: learning

Schmidt, R. A. and T. D. Lee (2011). Motor Learning. Motor Control and Learning. Champaign, IL, Human Kinetics.

All of the 'Mindful Voice' articles in Journal of Singing (at least 20 of them by Lynn Holding and others)

Gardner, H. (1999). Intelligence Reframed. New York, Basic Books.

Verdolini-Marston, K. (2000). Principles of skill acquisition applied to voice training. The vocal vision: views on voice by 24 leading teachers, coaches and directors, Applause books.

Core reading: emotion and voice

Davis, P. (2017). Voice and the Brain. Singing and Teaching Singing. J. Chapman, Plural publishing.

Additional Reading: motor learning, emotion and voice

Hallam, S. (2001). "The development of metacognition in musicians: implications for education." British Journal of Music Education18(1): 27-39.

Hemsley, T. (1998). Singing and Imagination. Oxford, Oxford University Press.

Westney, W. (2003). The perfect wrong note. Cambridge, Amadeus Press.

Molnar-Szakacs, I. and K. Overy (2006). "Music and mirror neurons: from motion to 'e'motion." Social Cognitive and affective neuroscience1(3): 235-241