Moving forward neuroscience research in the fields of coaching psychology and sport psychology: Would Imagery Based Coaching be a useful area to research?


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Abstract

This discussion paper briefly considers the problems that both coaching psychology and sport psychology researchers can encounter when undertaking neuroscience research. It is proposed that Imagery Based Coaching is an easier area to undertake neuroscience research, in contrast to conversational coaching.

Keywords: *Neuroscience, Coaching Psychology, Sports Psychology, Functional Magnetic Resonance Imaging, Imagery, Visualisation, Imagery Based Coaching*

Coaching Psychology is not alone in its quest to design, implement and learn from experimental research in neuroscience to generate a clearer understanding of its contribution to its end user, the coachee (*see Dias, Palmer, O' Riordan et al, 2015; Grant, 2015; O'Broin, 2015; Shams, 2015*); sport psychology is on a similar though more challenging mission (*Walsh, 2014*).

When we think of exercise and sport we are quite likely to imagine scenes of physical exertion (*Morris, 2010*) and that is certainly what we will be exposed to this summer as we watch the world's elite athletes take centre stage at Rio 2016. If viewed through a superficial lens, the Olympic Games may indeed be viewed as nothing more than a showcase of physical exertion and prowess.

In truth, they are the culmination of an extraordinary journey that has taken skills acquisition, discipline and resilience, not to mention endless repetition, disappointment, sacrifice and fatigue to superhuman levels. In other words, competitive sport is as much about mental conditioning and training as it is about physical mastery (*Earle & Clough, 2001*).

Indeed, "elite athletes have extraordinary abilities covering a whole range of behaviours, from managing stress and fatigue to superior action performance" (*Makris, 2014: 1*). To this end, Walsh (*2014*) considers whether sport may be the "brain's biggest challenge".

Although a plethora of lab-based studies have been conducted in sport psychology, the desire to gain true insight into the brain functioning of elite athletes is endlessly tantalising for the sport psychologist, but endlessly more complex than for other disciplines (*Walsh, 2014*). As Dias and associates (*2015: 25*) point out "neuroimaging and EEG readings cannot be made during speech or neck/head/face movement from the participant" possibly making these techniques redundant in coaching psychology.

Imagine how the limitations raised by Dias and associates are magnified in sport when the brain functioning of athletes is at its most interesting during competition!

While this limitation has distinctly hampered progressive neuroscience research in sport psychology (*Walsh, 2014*), it has not prevented it (*Makris, 2014*). For example, Makris & Urgesi (*2014*) used transcranial magnetic simulation techniques to identify the specific roles of motor, premotor and visual areas in the simulation of soccer action sequences with or without deception.

Of more relevance to coaching psychology, neuroimaging has been used to investigate the effects on the brain (ie, of neuroplasticity) of long-term dedicated training in a particular sport discipline. One such study revealed that the cerebellum of speed skaters were revealed to have larger right hemispheres due to always standing on the right leg while speed skating (*Park, Lee, Kim, Park, Won, Jung et al, 2012*). Similarly, a US government funded project is conducting ongoing research into the 'unique brain' of basketball players who through their sport have developed the ability to read 'on court' cues and to effectively cope with stress. It is hoped that by understanding how such training has modified basketball players' brains, educational and training choices in other disciplines will be more accurately informed (*Young-Rojahn, 2013*).

Coaching psychology researchers could consider a similar approach and actively conduct neuroimaging research on a more relevant abnormal sample: highly competent and successful individuals (assuming definitions of competency and success are agreed upon) such as senior executives and leaders, ie, the elite 'athlete' of the non-sporting world.

After all, to become a successful, high-achieving individual in the workplace will have involved the ongoing practice of many of the interventions and skills coaching psychology subscribes to such as self-reflection, self-awareness, goal-setting including the ability to visualise how to cope or master challenging situations.

Imagery-based coaching and neuroscience research

The use of visualisation and imagery techniques as an intervention within coaching and sport psychology practice have been previously highlighted in the literature (eg, *Janssen & Sheikh, 1994; Morris, 2010; Murphy, 1990; Palmer & Neenan, 1998; Palmer, 2008, 2009; Sheilch & Korn, 1994; Taylor & Shaw, 2002*). In addition, physiological measures of heart rate variability and salivary cortisol responses to compassion-focused imagery have been reported too and are relatively easy to measure. Imagery Based Coaching (IBC) of which the active practice component is usually an internal process for the coachee, may be easier than conversational coaching to investigate and therefore holds much promise for future neuroscience research. It is worth noting that functional magnetic resonance imaging (fMRI) research (*see Jack, et al, 2013; Passarelli et al, 2013*) has already revealed a neural overlap between different styles of coaching and visual attention. (*See Appendix 1 for explanation of MRI and fMRI.*)

Conclusion

Both the coaching psychology and sports psychology disciplines are a long way from where they would like to be in their neuroscience quest, but the eternal glory at the end of that journey would surely be enough to satisfy any Olympic hopeful!

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Appendix 1. Description of MRI vs. fMRI (APA, 2007:3)

If you're having your brain scanned with MRI, you lie on a table with your head inside a giant magnet. Protons inside the atoms in your brain align themselves with the magnetic field, only to be whacked temporarily out of alignment by a pulse of radio waves aimed at your head. As your protons relax back into alignment again, they themselves emit radio waves that a computer uses to create a brain snapshot. With fMRI, researchers rely on two more facts about the body: the fact that blood contains iron and the fact that blood rushes to a specific part of the brain as it's activated. As freshly oxygenated blood zooms into a region, the iron distorts the magnetic field enough for the scanner to pick up.

Biographies

Dr Nollaig Heffernan *is an independent Management Consultant based in Ireland specialising in Leadership and Management, Organisational Psychology, Workplace Performance and Stress Management. She is also a BPS Chartered Sport and Exercise Psychologist, an international rowing coach and has a Certificate in Executive Coaching and Leadership Mentoring (ILM Level 7). She regularly speaks at conferences and Universities as a specialist lecturer or guest speaker and is a contributing author to a number of business books including the Association for Coaching's Psychometrics in Coaching and Leadership Coaching.*

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