

**Optimizing Neuroscience to Achieve Performance Excellence**

Camille Powell

University of Western States

LEAD 6335 / LEAD 7140 Positive Coaching

Dr. Nicole Detling

## **Introduction**

Positive coaches can use neuroscience in their coaching practices, especially when coaching young adults in the following ways. Developing a functional awareness regarding how neuroanatomical factors influence contextual interpretation and performance, especially in stressful situations, provides positive coaches with the tools to optimize the autonomous functions of breathing to create a space for athletes and performers to respond in stressful performance environments versus just reacting off instincts (e.g., fight or flight) (Cheatham, 2017).

### **Optimizing Neuroscience to Support Performance Excellence**

According to Cheatham (2017), performance and operational risk stem from the brain's natural maturation and survival-based responses and both young and mature adults are capable of good and bad decision-making. However, mature adults have a fully "wired" brain to make informed decisions over uninformed instinctual reactions, whereas young adults are still developing the mechanisms for making these otherwise informed decisions made by adults (Cheatham, 2017). Understanding how the neuroanatomical limitations present in young adults make them more vulnerable to committing errors than their mature adult counterparts, allows positive coaches the opportunity to develop strategies that compensate for these neuroanatomical limitations present in their stage of development (Burton & Raedeke, 2008; Cheatham, 2017). For example, positive coaches can implement diaphragmatic breathing and mindfulness strategies that mechanize the parasympathetic nervous system processes, providing them a space to process threat-related stimuli versus just acting off reflexive impulses dominated by their

lower and mid brain processing at their cognitive stage of development (Burton & Raedeke, 2008; Cheatham, 2017).

Current neuroscience research indicates that human brain maturation requires at least 26 years, and can go well-beyond 30 years, starting from the bottom of the brain to the top, moving from the back of the brain to the front, making the frontal lobe (i.e., where “good” judgments are made, and self-control behavior is present) the last to develop (Cheatham, 2017). According to Cheatham (2017), as the young-adult brain matures, the primitive autonomic brain systems integrate progressively to reach the high-functioning cognitive systems that aid in optimal decision making and self-control. A young adult brain is thus ill-equipped to make appropriate decisions in threatening situations (Cheatham, 2017). When positive coaches incorporate the preceding understandings while working with young adults, they can help the young adults to develop strategies for optimal decision making in stressful situations and provide them with tools for optimizing their strengths to support them (Cheatham, 2017; Gordon & Gucciardi, 2011).

Positive coaches can use the understandings of the parasympathetic nervous system that helps regulate heart rate, breathing, and digestion, to assist athletes in deactivating the sympathetic nervous system that is activated when individuals perceive a threat, mitigating any reactionary decisions in the young adults (i.e., due to lack in self-control and proper judgement from an underdeveloped frontal lobe that is often present in the developing brains of young adults) (Cheatham, 2017). While positive coaches cannot “force” or “expedite” biological development, they can establish conditions that enable optimal change and cognitive development (Cheatham, 2017).

For example, in addition to the preceding, positive coaches can create awareness of young-adult-specific brain functions and biological limitations as well as develop a deliberate practice culture to aid in the necessary biological changes for optimal brain functioning (Cheatham, 2017). According to Cheatham (2017), young adults would benefit from understanding that a cognitive gap exists, as this, in and of itself, will elicit behavior change. When young adults become aware of the limitation in their brain functions it creates a motivation to want to reduce those gaps, resulting in an active participation in intellectual and professional efforts to diminish this gap (Cheatham, 2017).

Putting an emphasis on deliberate practice, builds both motor and decision-making skills that support young adults' brain development and optimal decision-making (Cheatham, 2017). Deliberate practice aids in the myelination process (Cheatham, 2017). According to Cheatham (2017), myelination increases integration between rear-sensory and front-motor cortices and the frontal cognitive system's synaptic speed, precision, and efficiency. Myelinated neurons deliver signals up to 100 times faster than non-myelinated neurons, helping level the response time deviation between the low road and high road, associated with better decision-making (Cheatham, 2017).

Positive coaches can benefit athletes with the understandings of neuroscience by helping them to understand the plasticity of the human brain, allowing individuals the opportunity to script their own neurobiology (Huberman & Divine, 2021). Increasing individual's awareness of the capacity for plasticity provides individuals with the opportunity to recognize their ability to shape their experiences and potential with daily, consistent, and disciplined practice (Huberman & Divine, 2021).

Positive coaches can support athletes and individuals with the understandings of neuroscience by helping them to recognize that they cannot regulate their psychology unless they can control their physiology, through practices such as Mindfulness (Huberman & Divine, 2021). Mindfulness practices have been described as automatic flow activators, where individuals can experience the ultimate autotelic experience and peak performance (Huberman & Divine, 2021; Jackson & Csikszentmihalyi, 1991). Positive coaches can help individuals to harness the functions of their parasympathetic nervous system, providing individuals “inside out” tools to support them, such as breathing exercises that lower their stress levels and calm them, allowing them to think more clearly to choose their response in a given situation (Huberman & Divine, 2021).

Positive coaches can benefit athletes with the understandings of neuroscience by implementing mindfulness practices that harness the mechanisms of autonomic processing, the amygdala, and peripheral states (Huberman & Divine, 2021). Mindfulness practices are “inside out” tools that can help athletes to recognize that their inner dialogue and feelings are a dynamic reflection of brain activities that only hold the value and attention that individuals place on them (Huberman & Divine, 2021). Understanding neuroscience can help positive coaches in assisting athletes to integrate more holistically a deep purpose of existence, including understanding the importance of being healthy physically, mentally, intuitively, and spiritually, through an awareness of their brain functions and how to optimize them respectively (e.g., the parasympathetic nervous system, visual processing) (Huberman & Divine, 2021).

According to Huberman & Divine (2021), understanding the role breath plays in brain functioning is the gateway to connecting the mind, body, and spirit, where the individual reaches

higher levels of awareness and potential. Mindfulness practices provide individuals with the tools to tether between various states of focus, where individuals can optimally manage their energy and awareness to support them (Huberman & Divine, 2021). Individuals can use their breath to breathe into the now, where they can take action to support themselves optimally (Huberman & Divine, 2021). Mindfulness is taking control of the internal mechanisms of thought and feeling, where individuals can choose what they experience (Huberman & Divine, 2021).

Harnessing the preceding with the various mindfulness and breathing practices allows individuals the capacity to experience and entertain the thoughts and feelings that they choose to experience (Huberman & Divine, 2021). Positive coaches can help individuals to understand the power of positive thoughts to inspire them and empower them; every positive thought replaces a negative thought (Huberman & Divine, 2021). How an individual interprets their feelings has the power to empower or impede them (Huberman, 2019). Individuals can change their interpretation of anxiety to excitement, as these physiological responses are identical (Huberman, 2019). An individual's response is 100% attributed to how they interpret any experience (Huberman, 2019). When individuals leverage their anxiety, they win (Huberman, 2019).

Positive coaches can support athletes and individuals with the understandings of neuroscience by helping them to understand that their thoughts are not them, they are the observer and awareness of their thoughts and if they identify with their feelings, they can become trapped by their feelings (Huberman, 2019). Emotions have the potential to make a person feel like the experience will go on forever, and with this understanding individuals can more wisely choose what emotions that they choose to experience (Huberman, 2019).

Positive coaches can support athletes and individuals with the understandings of neuroscience by harnessing the power of dopamine (i.e., the internal reward system) through task completion (Huberman & Divine, 2021). Whenever individuals complete a task, it releases dopamine, giving them a burst of happiness chemicals in their brain, where they experience a boost of elation and vitality (Huberman & Divine, 2021). Positive coaches can support athletes and individuals by helping them to understand the powerful influence of task completion to experience more joy and elation that serves as a powerful motivator, helping them to achieve their long-term goals (Huberman & Divine, 2021). Internal reward systems, such as the release of dopamine, are more powerful motivators than any external reward (Huberman & Divine, 2021).

Positive coaches can support athletes with the understandings of neuroscience by helping them to understand the importance of sleep for recovery and recalibration of the important brain functions that support optimal processing (Huberman & Divine, 2021). Sleep resets energy states and for athletes and individuals to achieve their full potential they need to be operating with their full energy capacity (Huberman & Divine, 2021).

In addition to sleep, understanding that visual processing is energy demanding can help athletes and individuals to be more disciplined and decisive with how they are distributing their attention (Huberman, 2019). Every time an individual foveates (i.e., focuses their visual attention) it activates the autonomic arousal and depletes their energy source, whereas panoramic and peripheral vision is termed a relaxed gaze and is far less energy demanding (Huberman & Divine, 2021). Understanding the preceding, positive coaches can assist athletes in understanding how they can balance their peripheral vision and hyper focus visual attention, allowing athletes

to conserve their energy more systematically (Huberman & Divine, 2021). According to Huberman & Divine (2021), people do not always lack motivation, they just have poorly distributed energy through a lack of awareness of how and when to optimally direct their attention (Huberman & Divine, 2021).

Neuroscience offers positive coaches a unique lens on how to best design training and practice with young adults (Cheatham, 2017). Operating with the understandings provided by neuroscience opens new directions to improve young-adult effectiveness (Cheatham, 2017).

## References

- Burton, D. & Raedeke, T. D. (2008). *Sport psychology for coaches*. Human Kinetics.
- Cheatham, M. J. (2017). Train with the brain in mind: Neuroscience education as a force multiplier. *InterAgency Journal*. 8(4). 81-91.
- Huberman, A. & Divine, M. (2021). Unbeatable mind podcast: Practical uses of neuroscience with Dr. Andrew Huberman. [Podcast]. *NeuroHacker Collective*.
- Huberman, A. (2019). Human optimization hour with Kyle Kingsbury. [YouTube]. Retrieved from: [https://www.youtube.com/watch?v=Dw2D\\_l2pf\\_M](https://www.youtube.com/watch?v=Dw2D_l2pf_M)
- Jackson, S. A. & Csikszentmihalyi, M. (1991). *Flow in sports: The keys to optimal experiences and performances*. Human Kinetics. ISBN: 978-0-88011-876-7.