The scientific identification and development of talent, through evidence-based coaching

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Overview

• Talent Identification
  – Talent transfer
  – Relative Age Effect / Accumulative Advantage

• Talent Development
  – Volume
  – Individual Deliberate Practice
  – The athletes brain – white matter & grey matter

• Evidence Based Coaching
  – Coaching solutions
Talent Identification

• The process of recognising current participants with the potential to become elite players. (Williams & Reilly, 2000)

• The process by which children are encouraged to participate in sports they are most likely to succeed in based on results of testing selected parameters. (Peltola, 1992)
What is Talent Transfer?

• Structured re-assignment of athletes to sports with similar and transferable characteristics. (Cooke, Cobley, Till, & Wattie. 2010)
Pitch to Podium
Sporting Giants
Early Talent Identification
Talent Identification
Age related models

• **Age**- At what age should Talent Identification take place? This is a sports specific question that should be answered from a physiological and psychological perspective.
Bompa, 1985

- Talent Identification should take place over a number of years in the following three phases:
- **Stage 1: 3-8 years**, Physician’s examination aimed at recognising malfunctions and physical deficiencies that may hinder athletic performance.
- **Stage 2: 9-17 years**, These ages will vary dependant upon the sport and maturation of the athlete. Testing is conducted on athletes already participating in sports and is based on physiology and anthropometry.
- **Stage 3: 16 years +**, This area of TID is concerned with high calibre athletes and is very sport-specific. Focusing on physiological adaptations to training and potential for further improvement is recommended.
Relative Age Effect
Relative Age Effect

Accumulative Advantage

- Why are a disproportionate number of elite Canadian hockey players born in the first few months of the calendar year?
- Since youth hockey leagues determine eligibility by calendar year, children born on January 1 play in the same league as those born on December 31 in the same year.
- Because children born earlier in the year are bigger and more mature than their younger competitors, they are often identified as better athletes, leading to extra coaching and a higher likelihood of being selected for elite hockey leagues.
- "the rich get richer and the poor get poorer“ (Gladwell, 2008)
Talent Development
3 phases of Talent Development

- **Romance**
  - play, exploration, fun, learn fundamental skills and develop a love for their sport

- **Precision**
  - systematic learning, master teacher or coach promotes long-term development and instills technical skills.

- **Integration**
  - continued study with a master coach, many hours training. Translate training & technical skills into personal performance. (Bloom, 1985)
Anders Ericsson
The role of deliberate practice in the acquisition of expert performance

• “Many characteristics once believed to reflect innate talent are actually the result of intense practice extended for a minimum of 10 years.” (Ericcson et al, 1993)
Deliberate Practice

• It can be repeated a lot and is properly demanding
• Feedback on Results is continuously available
• It is highly demanding mentally
• It isn’t much fun
Deliberate Practice

David Beckham was not born with the ability to take a brilliant free kick: these skills were developed as a result of hard work and practice. (Syed, 2010)
Daniel Coyle
the TALENT CODE
GREATNESS ISN'T BORN IT'S GROWN
• The brain is made up of
  – Grey matter (neurons)
  – White matter (nerve fibres & insulation)

• A process in white matter called myelination may play a large role in the development of talent.
Signals are transmitted to different areas of the brain along pathways called axons. The faster and more precise these signals are, the more ability we have to perform complex tasks.

**NEURON**

**AXON**
Carries signals to other neurons.
**AXON**
The entire length of the axon becomes myelinated.

**OLIGODENDROCYTE**
Cell that produces the fatty insulation, called myelin.

**MYELIN**
Insulation that increases the timing and speed of the signal.

Repetitive use of connections in the brain — or practice — triggers cells called oligodendrocytes, which wrap layer upon layer of myelin around those connections. This optimizes the connections, making them more like a broadband Internet connection — than like a dial-up.
Node of Ranvier
Layers of myelin
Axon
Schwann cell
Nucleus of Schwann cell
Axon
Myelin sheath
Nodes of Ranvier
Schwann cell

Message moves quickly (~400 km/h)
Normal nerve – myelin sheath is intact
Sports Coach builds Myelin Factory
• We found significant increase in regional gray matter in the judo players’ group.
• Our findings suggest that motor planning and execution, embedded in judo practice, can induce changes in the brain. (Jacini, 2007)
Can exercise shape your brain?
Cortical differences associated with judo practice

• Experimental animal studies showed physical exercise, associated with planning and execution of complex movements, are related to changes in brain structure.
• Investigation of differences on gray matter volume in judo players using voxel-based morphometry.
• Sample; 8 internationally competitive judo players vs 18 healthy controls
• A significantly higher gray matter tissue density in brain areas of judo players.
• Gray Matter is mostly composed of Neurons.
• Decision-making processes are influenced by neurons. (Haefner et al, 2013)
• What coaching style will produce an athlete who can make their own decisions?
What can the coach do to help the athletes improve their decision making?
The brain is the most important “muscle” for sport

• It contains the Gray Matter which enables decision making.
• It contains the White Matter, with the myelin, to make faster decisions and actions.
Evidence Based Coaching
Evidence Based Coaching

• The dynamic integration of coaching expertise with external research evidence to the benefit of the athlete.

• Creating a coaching process that you know will work, based on evidence; rather than what you think will work based on guesswork.
Coaching Solutions

• Create environments where volume is possible
• Encourage self-managed deliberate practice
• Build a myelin factory
• Coach to encourage decision making
Accessible environments
Deliberate Practice
Create Myelin
Encourage decision making
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References

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