Talent Identification, Development & Bio-banding in Badminton

BWF World coaching conference 2019

Johan Pion (HAN / The Netherlands) & Tengku Fadilah Tengku Kamalden (UPM / Malaysia)
Talent Identification and Development

Talent Identification

Talent Development
Talent Identification and Development

Badminton
- Talent Identification
  - Selection
    - Development

Fencing
- Talent Identification
  - Selection
    - Development

Gymnastics
- Talent Identification
  - Selection
    - Development

Basketball
- Talent Identification
  - Selection
    - Development
Talent Identification and Development

Talent Identification
- Coaches’ eye
- Physical tests

Talent Selection
- Selection = Deselection
- Advantage for early maturers

Talent Development
- Early specialisation
- Over exposure injuries
- Motivation / Demotivation
1. Neither the coaches’ judgement nor the anthropometric and physical characteristics were sensitive enough to predict performance.

2. For the elite, a non-sport-specific motor test battery correlated strongly with the competition result, with more than 40% of the variation in competition performance being explained by the result on that test 2 years earlier.
Talent Identification and Development

Accepted Manuscript

Title: The Use of the Körperkoordinationstest für Kinder in the Talent Pathway in Youth Athletes: A Systematic Review

Authors: J. O’Brien-Smith, R. Tribolet, M.R. Smith, K.J.M. Bennett, J. Fransen, J. Pion, M. Lenior

PII: S1440-2440(18)30219-6
DOI: https://doi.org/10.1016/j.jsams.2019.05.014
Reference: JSAMS 2080

To appear in: Journal of Science and Medicine in Sport

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Detected champions at baseline

- **Judo** (European champion and bronze medal)
- **Gymnastics** (World champion)
- **Taekwondo** (World champion)
- **Basketball** (4th World Championships)
- **Alpine ski** (Silver youth olympics)
- **Volleyball** (Bronze European Championships)
Talent Detection

Skipped phase

Talent Detection
Talent Identification
Talent Development
Development of a Tool to Assess Fundamental Movement Skills in Applied Settings

Sebastiaan Platvoet¹, Irene R. Faber²,³, Mark de Niet¹, Rianne Kannekens¹, Johan Pion¹,⁴, Marije T. Elferink-Gemser⁵ and Chris Visscher⁴
HAN FMS-test

KTK Balance Beam
HAN FMS-test

KTK Jumping Sideways
HAN FMS-test

KTK Moving Sideways
HAN FMS-test

Eye Hand Coordination (Faber)
Development of a Tool to Assess Fundamental Movement Skills in Applied Settings

Sebastiaan Platvoet, Irene R. Faber, Mark de Niet, Rianne Kannekens, Johan Pion, Marije T. Efferink-Gemser, and Chris Visscher
Talent Orientation

Skipped phase

Talent Detection | Talent Orientation | Talent Identification | Talent Development

Missing link
Talent Orientation

Talent Development
Selection
Identification
Development
Selection
Identification
Development
Selection
Identification
Development
Selection
Identification

Badminton
Fencing
Gymnastics
Basketball

Talent Orientation
Talent Detection
Primary schools (N > 20,000)

Elite sport schools (N > 2,000)

Clubs (N > 30,000)

2019
Primary schools N > 15,000

2020
Primary schools N > 25,000

2022
Primary schools N > 70,000
Talent Orientation: Stature

Badminton
Basketball
Fencing
Gymnastics
Handball
Judo
Ski
Soccer
Taekwondo
Table tennis
Tennis
Triathlon
Volleyball
Cycling

70 85 100 115 130 FQ
Talent Orientation: Endurance shuttle run

Badminton
Basketball
Fencing
Gymnastics
Handball
Judo
Ski
Soccer
Taekwondo
Table tennis
Tennis
Triathlon
Volleyball
Cycling

70 85 100 115 130 FQ
Talent Orientation: Jumping sideways

Badminton
Basketball
Fencing
Gymnastics
Handball
Judo
Ski
Soccer
Taekwondo
Table tennis
Tennis
Triathlon
Volleyball
Cycling

70 85 100 115 130 FQ

SPORT KOMPAS
I DO

HAN UNIVERSITY OF APPLIED SCIENCES
Talent Orientation: Throwing shuttles

Badminton
Basketball
Fencing
Gymnastics
Handball
Judo
Ski
Soccer
Taekwondo
Table tennis
Tennis
Triathlon
Volleyball
Cycling
Benchmarks for orientation

Boy 10y

Stature 135 cm

SBJ 147 cm
Tools for orientation

Custom-made box

450
430
1200

Assembled for tests 01 - 02 - 04
Talent Identification and Development in Badminton

Training the test examiners

University Putra Malaysia
and
HAN University of applied sciences

2016 n=20
and
2017 n=20
Talent Identification and Development in Badminton

Quality control

University Putra Malaysia
HAN University of applied sciences
Ghent University

Video feedback

materials - procedures – examiners
Talent Identification and Development in Badminton

**Talent Identification**
- Coaches’ eye
- Physical tests

**Talent Selection**
- Selection = Deselection
- Advantage for early maturers

**Talent Development**
- Early specialisation
- Over exposure injuries
- Motivation / Demotivation
Identifying the high potentials

Benchmarks junior elite
Tests in Elite Badminton School (Kuala Lumpur)
(april 2018 n=60 and april 2019 n=60)
New players $n=33$ (September 2018)
Baseline tests
Benchmarked with junior elite players
Talent Identification and Development in Badminton

Talent Identification
• Coaches’ eye
• Physical tests

Talent Selection
• Selection = Deselection
• Advantage for early maturers

Talent Development
• Early specialisation
• Over exposure injuries
• Motivation / Demotivation
Talent Identification in Badminton

Part 1: Anthropometry (boys n= 6 + 27 and girls n= 6 + 17)
Talent Identification in Badminton

Part 2: Physical performance (boys n= 6 + 27 and girls n= 6 + 17)

<table>
<thead>
<tr>
<th>Physical performance tests</th>
<th>Lowest</th>
<th>-1 Z</th>
<th>mean</th>
<th>+1 Z</th>
<th>highest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit and reach (cm)</td>
<td>24,5</td>
<td>18</td>
<td>26</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Sprint 5m (s)</td>
<td>1,090</td>
<td>1,380</td>
<td>1,270</td>
<td>1,191</td>
<td>1,113</td>
</tr>
<tr>
<td>Sprint 30m (s)</td>
<td>4,740</td>
<td>5,61</td>
<td>5,31</td>
<td>5,019</td>
<td>4,73</td>
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<tr>
<td>Shuttle run 10x5m (s)</td>
<td>19,600</td>
<td>20,42</td>
<td>20,08</td>
<td>19,063</td>
<td>18,04</td>
</tr>
<tr>
<td>Counter Movement Jump (cm)</td>
<td>40,6</td>
<td>30,0</td>
<td>36,2</td>
<td>43,1</td>
<td>49,9</td>
</tr>
<tr>
<td>Standing Broad Jump (cm)</td>
<td>169</td>
<td>151</td>
<td>157</td>
<td>180</td>
<td>203</td>
</tr>
<tr>
<td>Curl ups (N/30s)</td>
<td>19</td>
<td>19</td>
<td>24</td>
<td>33</td>
<td>42</td>
</tr>
<tr>
<td>Knee push ups (N/30s)</td>
<td>33</td>
<td>14</td>
<td>19</td>
<td>34</td>
<td>50</td>
</tr>
<tr>
<td>Plate tapping (s)</td>
<td>10,20</td>
<td>18,51</td>
<td>14,56</td>
<td>12,194</td>
<td>9,83</td>
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<tr>
<td>Endurance Shuttle Run (min)</td>
<td>9,0</td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>11</td>
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</table>
Talent Identification in Badminton

Part 3: Motor competence (boys n= 6 + 27 and girls n= 6 + 17)

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<th>Coordination tests</th>
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<th>mean</th>
<th>+1 Z</th>
<th>highest</th>
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<tbody>
<tr>
<td>Balance beam KTK 6 - 4,5 - 3</td>
<td>67</td>
<td>24</td>
<td>33</td>
<td>44</td>
<td>56</td>
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<tr>
<td>Jumping sideways KTK</td>
<td>83</td>
<td>47</td>
<td>65</td>
<td>77</td>
<td>89</td>
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<tr>
<td>Moving sideways KTK</td>
<td>34</td>
<td>24</td>
<td>25</td>
<td>36</td>
<td>46</td>
</tr>
<tr>
<td>Faber Eye/Hand</td>
<td>55</td>
<td>35</td>
<td>41</td>
<td>49</td>
<td>58</td>
</tr>
<tr>
<td>Throwing Shuttles</td>
<td>36,8</td>
<td>29</td>
<td>32</td>
<td>34</td>
<td>36</td>
</tr>
</tbody>
</table>
Boys ranked by Motor Quotient

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Name</th>
<th>Competition Result</th>
<th>Stature</th>
<th>% Adult Stature</th>
<th>Predicted Stature</th>
<th>MQ</th>
<th>Sprint 5m</th>
<th>SB Jump</th>
<th>CM Jump</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reference Boy 12y Ranked 4th</td>
<td>5.4</td>
<td>148</td>
<td>88.1</td>
<td>168.0</td>
<td>112</td>
<td>1,190</td>
<td>192</td>
<td>41</td>
</tr>
<tr>
<td>2</td>
<td>Reference Boy 12y Ranked 5th</td>
<td>5.5</td>
<td>159</td>
<td>92.3</td>
<td>183.0</td>
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<td>1,160</td>
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<td>49</td>
</tr>
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<td>3</td>
<td>Reference Boy 12y Ranked 6th</td>
<td>5.6</td>
<td>159</td>
<td>86.9</td>
<td>183.0</td>
<td>108</td>
<td>1,080</td>
<td>190</td>
<td>52</td>
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<tr>
<td>4</td>
<td>Reference Boy 12y Ranked 2nd</td>
<td>5.2</td>
<td>158</td>
<td>90.3</td>
<td>175.0</td>
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<td>1,160</td>
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<td>5</td>
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<td>1,130</td>
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</tr>
<tr>
<td>7</td>
<td>Qil Yi Ping</td>
<td></td>
<td>144</td>
<td>83.7</td>
<td>172.0</td>
<td>104</td>
<td>1,150</td>
<td>191</td>
<td>43</td>
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<tr>
<td>8</td>
<td>Mohid Al Imran</td>
<td>176</td>
<td></td>
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<td>9</td>
<td>Aaron Tai Wei Qin</td>
<td>135</td>
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<td>81.8</td>
<td>165.0</td>
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<td>1,230</td>
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## Boys ranked by Sprint (5m)

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</tbody>
</table>
Talent Identification in Badminton

Statistical validation

Risk for false positives
- player 10
- player 22
- player 29
- player 48
- player 52
- player 57

Risk for false negatives
- player 15
- player 11
- player 20
- player 30

76% correctly classified when applying the test battery
Talent Identification in Badminton

Importance of motor tests

Risk for false positives
- player 10
- player 14
- player 17
- player 22
- player 29
- player 35
- player 48
- player 51
- player 52
- player 57

Risk for false negatives
- player 11

80% correctly classified when applying the motor tests
Importance of characteristics (Artificial Neural Network – MLP)
Bio – banding in Badminton

Growth prediction

- Growth prediction (Khamis-Roche 1994): 164.0
- Growth potential (Khamis-Roche 1994): 14.0
- % adult height (Khamis-Roche 1994): 91.5

Bio-Band

Graph showing growth prediction with age and different stages: Pre-Pubertal, Growth spurt, Post-Pubertal.
Bio-banding in badminton

Early maturing boys and girls tend to become taller and heavier earlier. There tends to be a bias towards earlier maturers in sports which require size and strength.

Early maturing girls and boys are more likely to obtain:
• more playtime
• important roles (leadership)
• specialised coaching

Early maturers are likely to experience early success as they face less physical challenges. They are however ill prepared for future competition against physically matched opponents.
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</table>
Talent pool (boys 12y)
Talent pool (boys 12y)

Ranked by performance (Sprint 5m)

Ranked by maturity status (Khamis – Roche)

Predicted adult stature in %
Development Talent pool (boys 12y)

89% - 95% of predicted adult stature.
High risks for injuries during growth spurt.
Reduce load to facilitate structural changes

85% - 89% of predicted adult stature.
Risks for injuries during first growth spurt.
Focus on neural adaptations and motor learning

Under 85% of predicted adult stature.
Low risks for injuries before the growth spurt.
Provide a broad development
Talent Identification and Development in Badminton

Talent Identification
- Coaches’ eye
- Physical tests

Talent Selection
- Selection = Deselection
- Advantage for early maturers

Talent Development
- Early specialisation
- Over exposure injuries
- Motivation / Demotivation
Talent Development in Badminton

- Specialising
- Broader Specialisation
- Directed Sampling
- Sampling
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<th>Balance</th>
<th>Flexibility</th>
<th>Core Stability</th>
<th>Climbing</th>
<th>Pull Strength</th>
<th>Catching</th>
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**Scores:**
- **Balance:** 63
- **Flexibility:** 81
- **Core Stability:** 82
- **Climbing:** 93
- **Pull Strength:** 100
- **Catching:** 93
- **Rythm:** 59
- **Hitting:** 85
- **Individual / Team:** 82
- **Small / Tall:** 59
Similarities in racket sports

Badminton
Table tennis
Tennis
Talent Development in Badminton

- Agility: 9.5
- Speed: 9.2
- Hitting: 8.9
- Jumping: 8.9
- Balance: 8.4
Talent Development in Badminton

Locomotion: Agility

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Talent Development in Badminton

Locomotion: Speed

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Talent Development in Badminton

Object control: Hitting

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Welkom
Login met je SportalMundi account...

E-MAILADRESS

WACHTWOORD
Wachtwoord vergaten?

LOGIN
Let's Play

SPORT EN BEWEGEN, 'S WERELDS GROOTSTE TAAL

De Sportsinspirator community is 's werelds eerste online videoplatform in de sport, waar op basis van een wetenschappelijk concept, inspiratie voor sport- en beweegactiviteiten gemakkelijk en gratis vindbaar is gemaakt!

Veel inspiratie gewenst,
Het Sportsinspirator team
Take home message 1

Minimise Talent loss
Take home message 2

Change the selection system into a development system
Take home message 3

Enlarge the talent pool
implement motor test in all clubs
Take home message 4

Keep the deselected players in a ‘futures’ pool
Take home message 5

Avoid deselection of late maturers
apply Bio-Banding
Take home message 6

Provide a broad follow up program and prevent injuries