Talent Identification and Development in Badminton

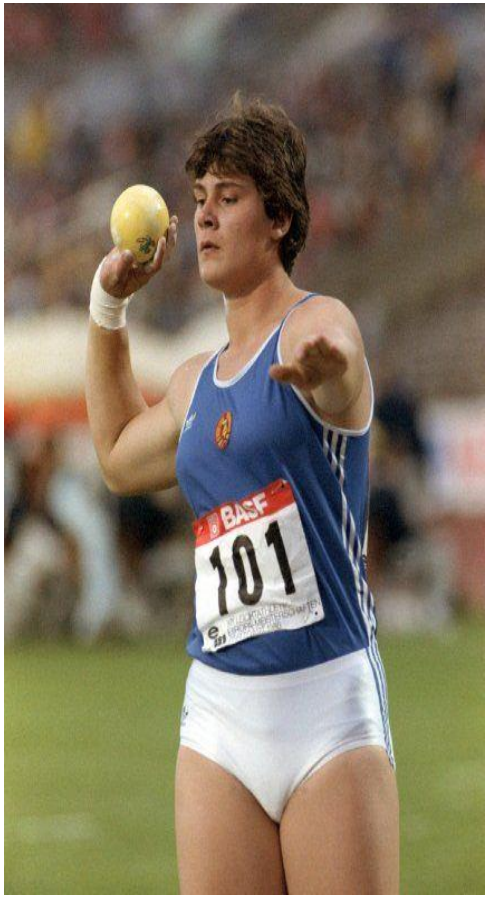
Johan Pion, PhD
HAN University of Applied Sciences Nijmegen (NED)
Ghent University (BEL)

6th World Congress of Racket Sport Science

A brief history of sports talent research

"The Big Bang TID"

German Democratic Republic 'State Plan 14-25'

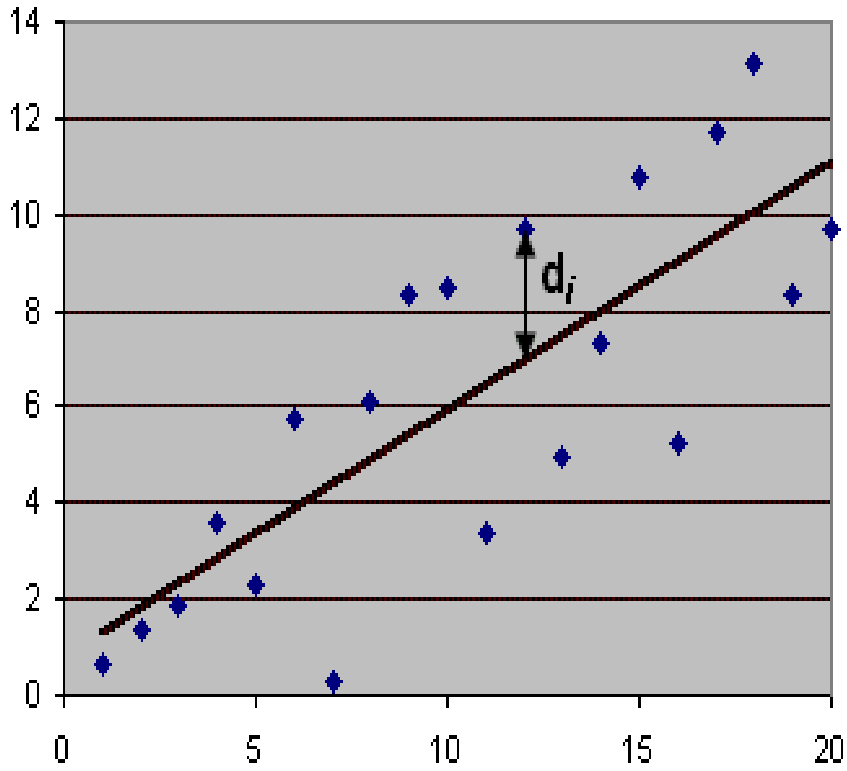


19 68 | 19 72 | 19 76 | 19 80 | 19 84 | 19 88 | 19 92 | 19 96 | 20 00 | 20 04 | 20 08 | 20 12 | 20 16 | 20 20

Wolkow (1974) 'Coach Opinion'

19
74

Bar-Or (1975) 'Statistics - Regression'



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Gimbel(1975) 'Deslected towards recreational sports'

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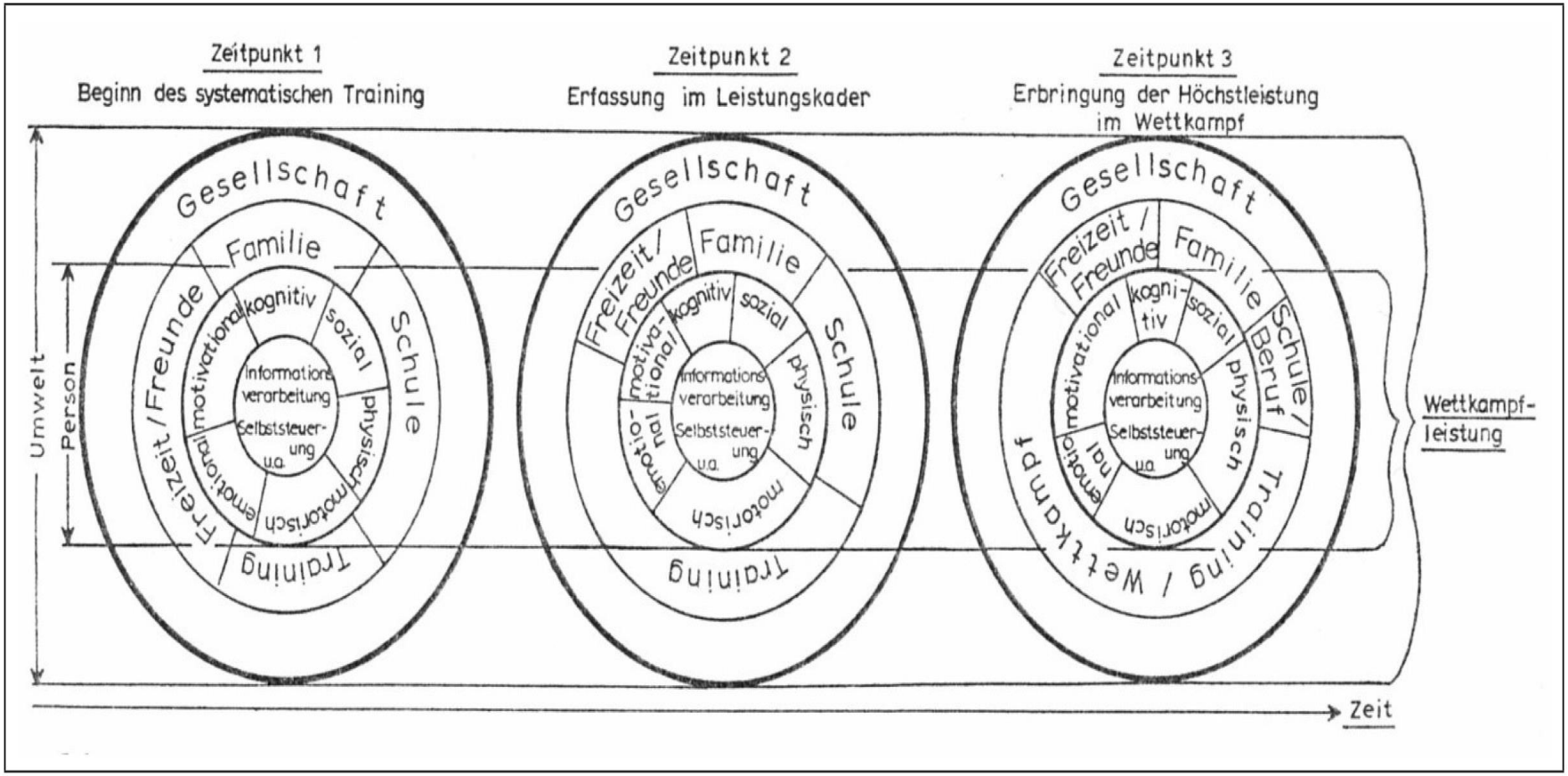
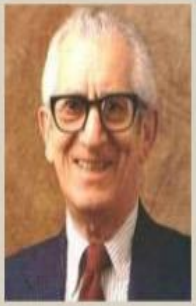
Gabler & Ruoff (1979) 'Performance Predictors'



Bloom (1985) 'Retrospective Study'

Benjamin Bloom (1913-1999)

- Educational Psychologist, authored: *Taxonomy of Educational Objectives (1956), All Our Children Learning (1980), Developing Talent in Young People (1985)*
- Known for: Bloom's Taxonomy of Educational Objectives
- Contributed to: Theory of Mastery Learning



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Australia 'AIS'

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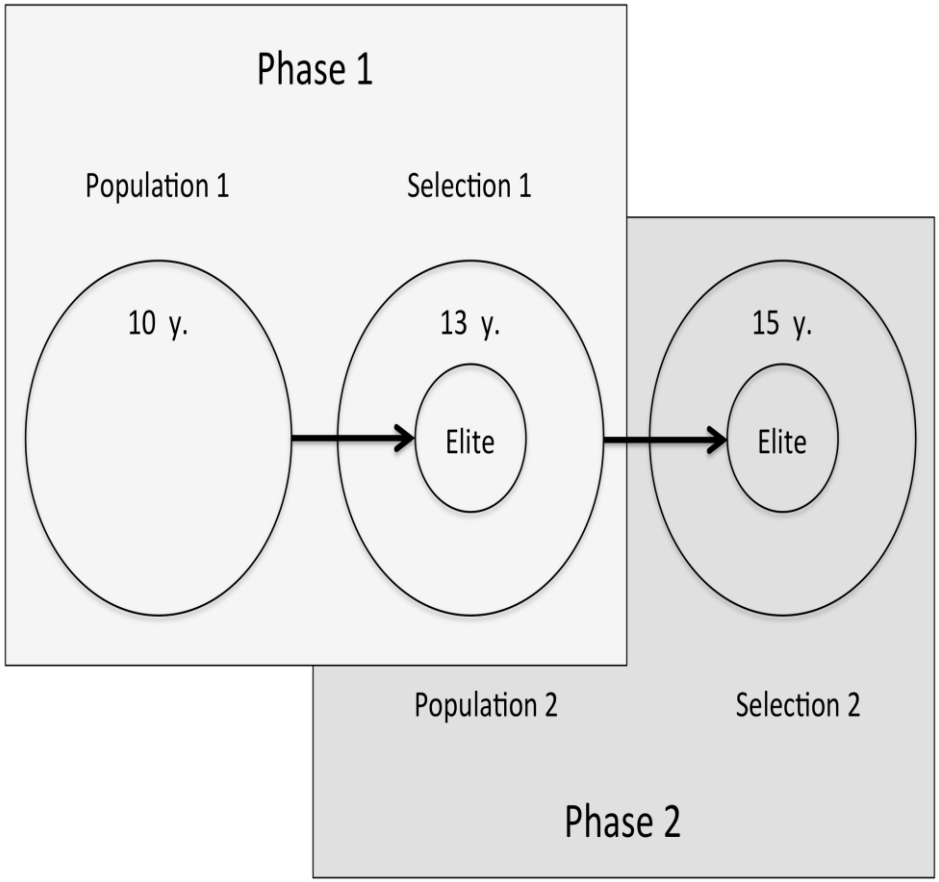
Règnier et al (1993) 'Sliding Population'



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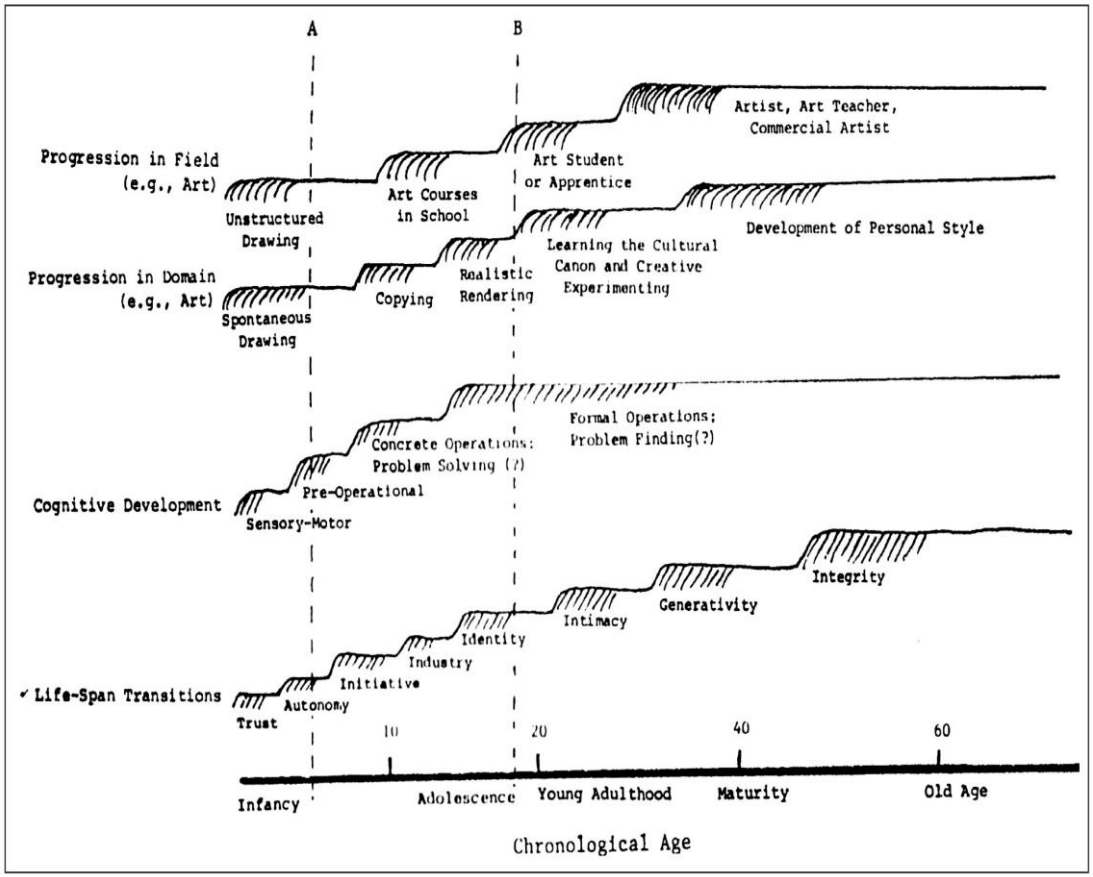
Csikszentmihalyi (1993) 'Prospective Study'



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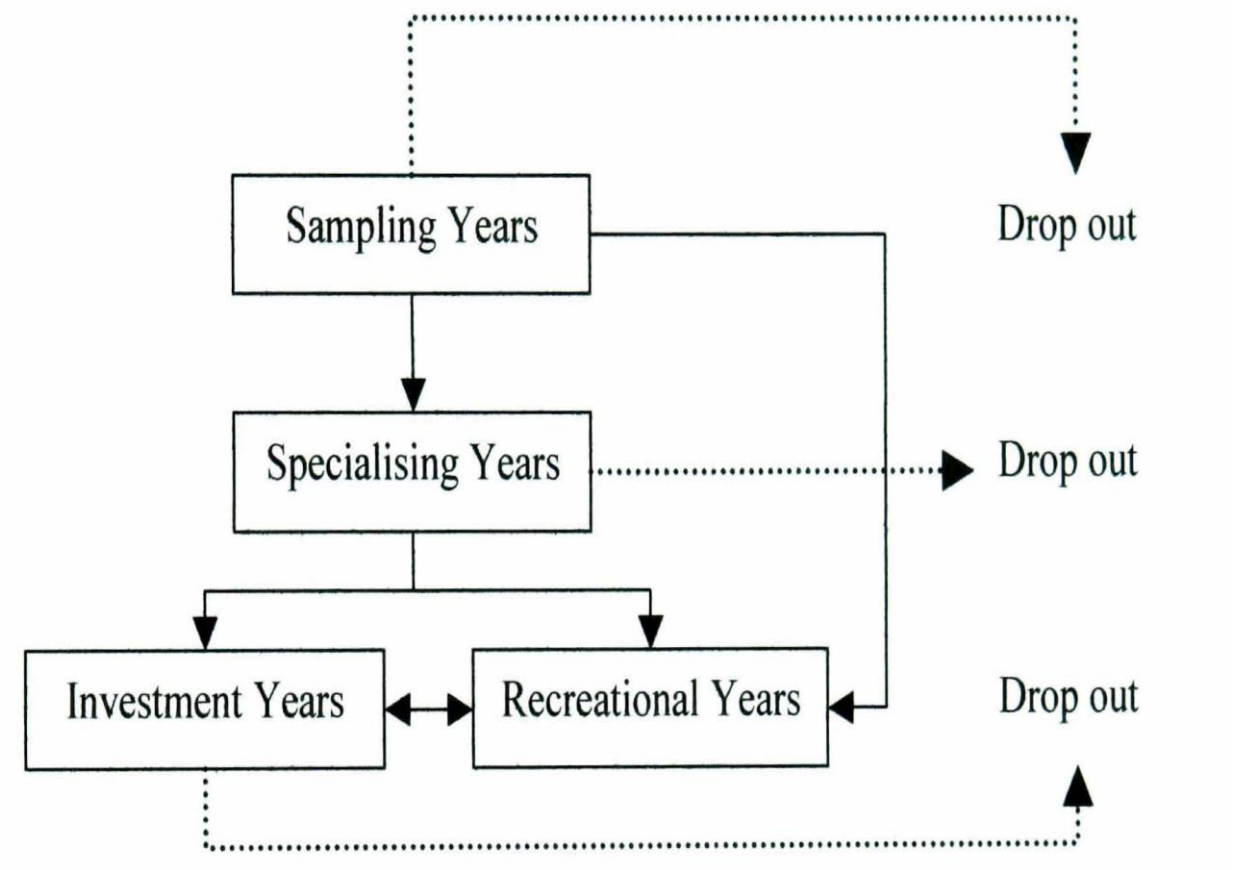
Coté (1999) 'Specialising and Sampling'



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China 'Project 111'

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Abbott & Collins (2004) 'Multidimensional concept'

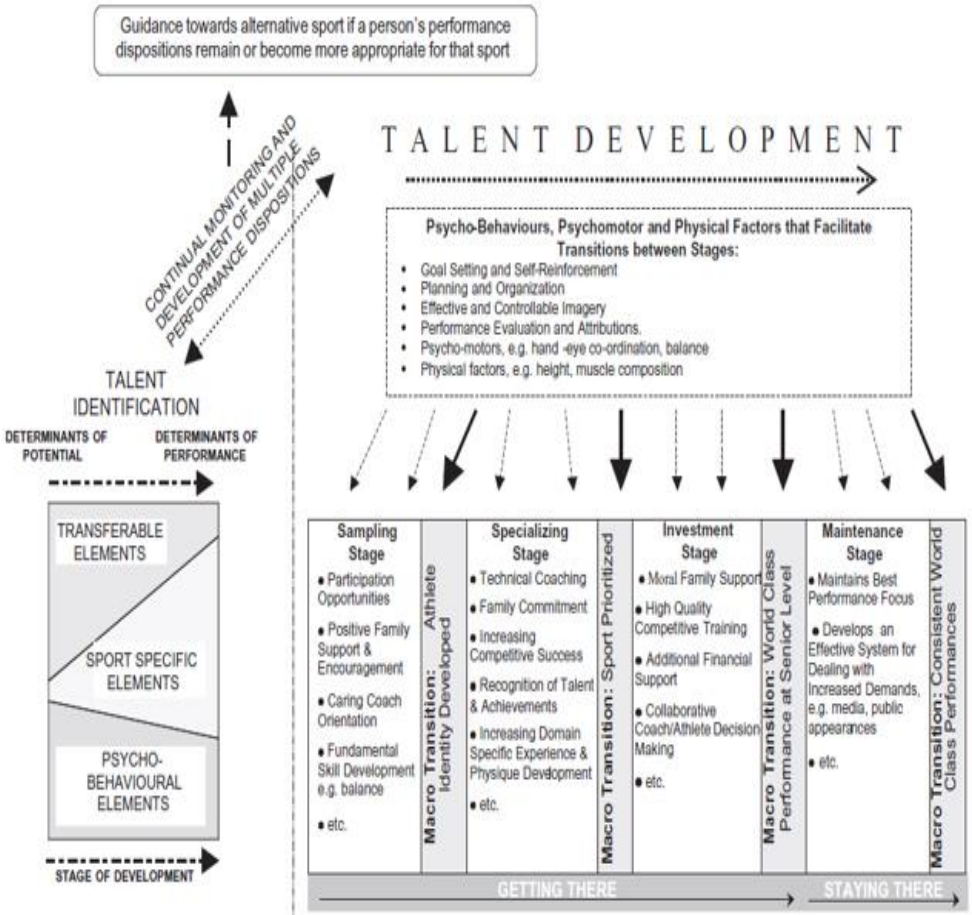
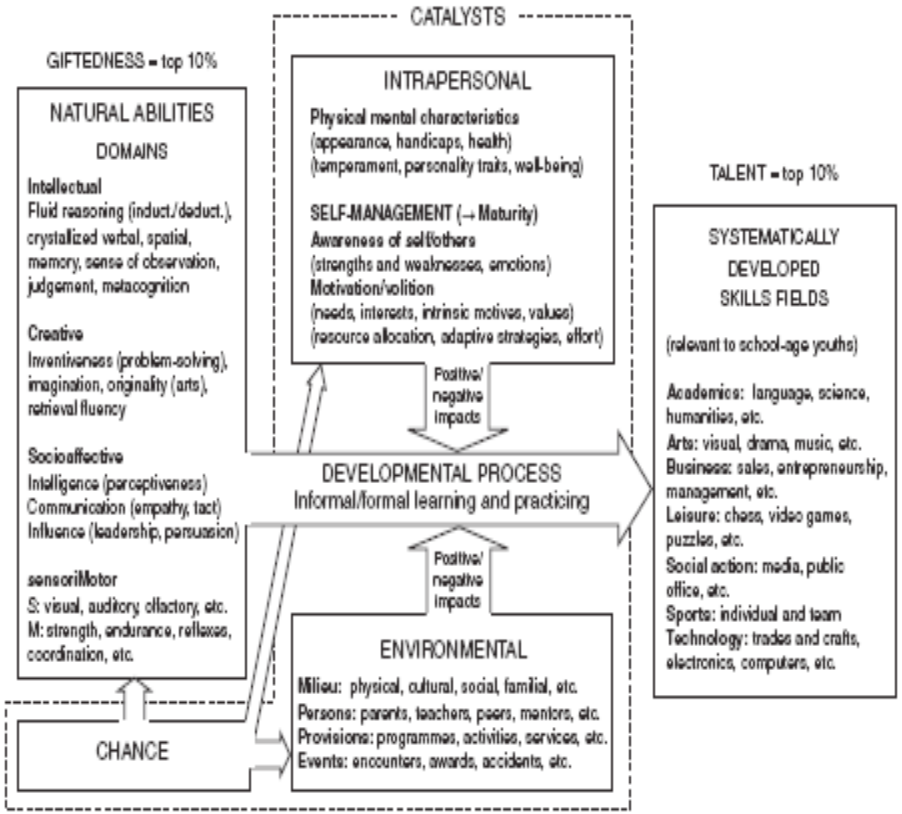


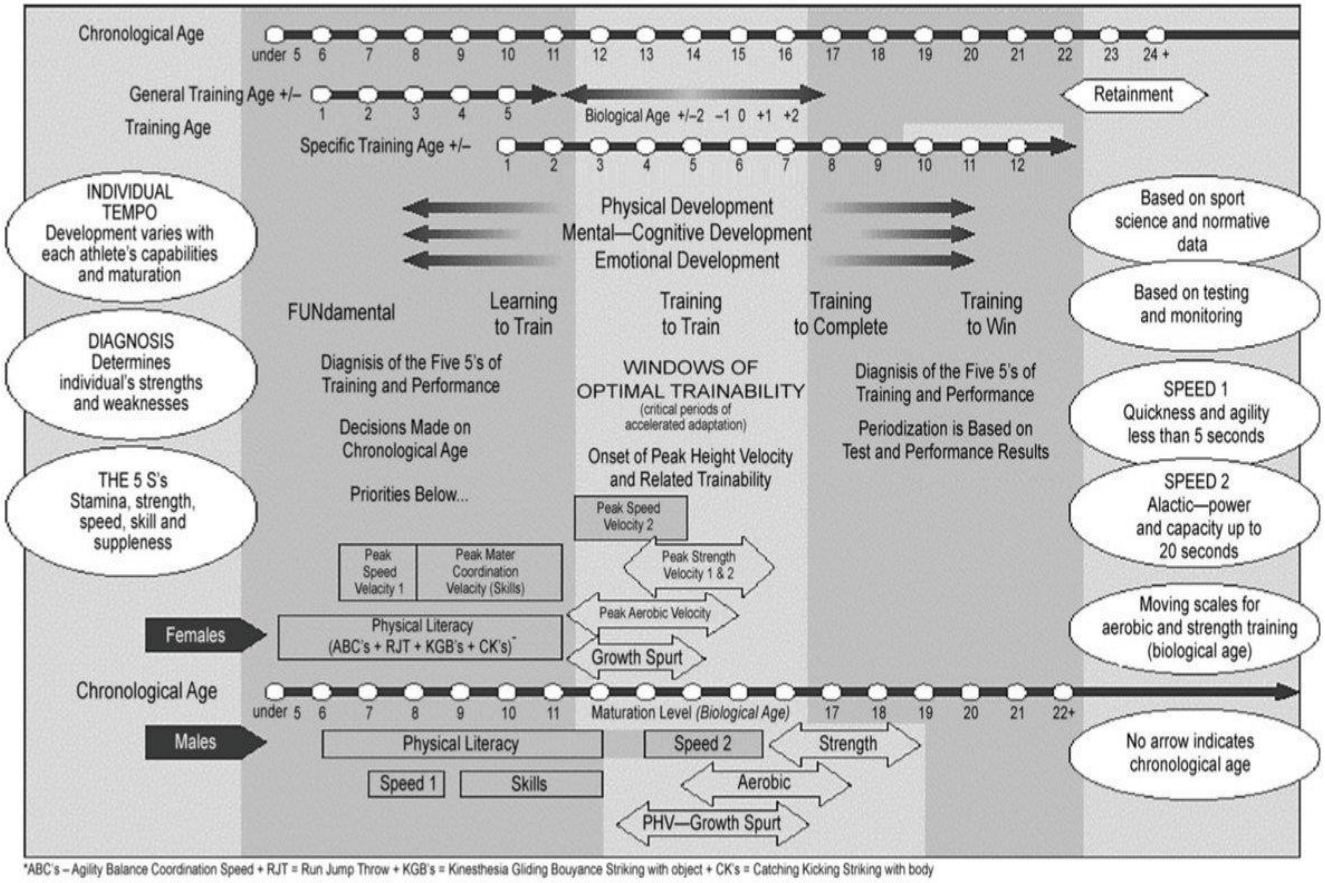
Fig. 2. The role of psycho-behaviours in facilitating the successful negotiation of developmental transitions within a multidimensional and dynamic concept of talent.

20
04

Gagné (2004) 'Giftedness and Talent'



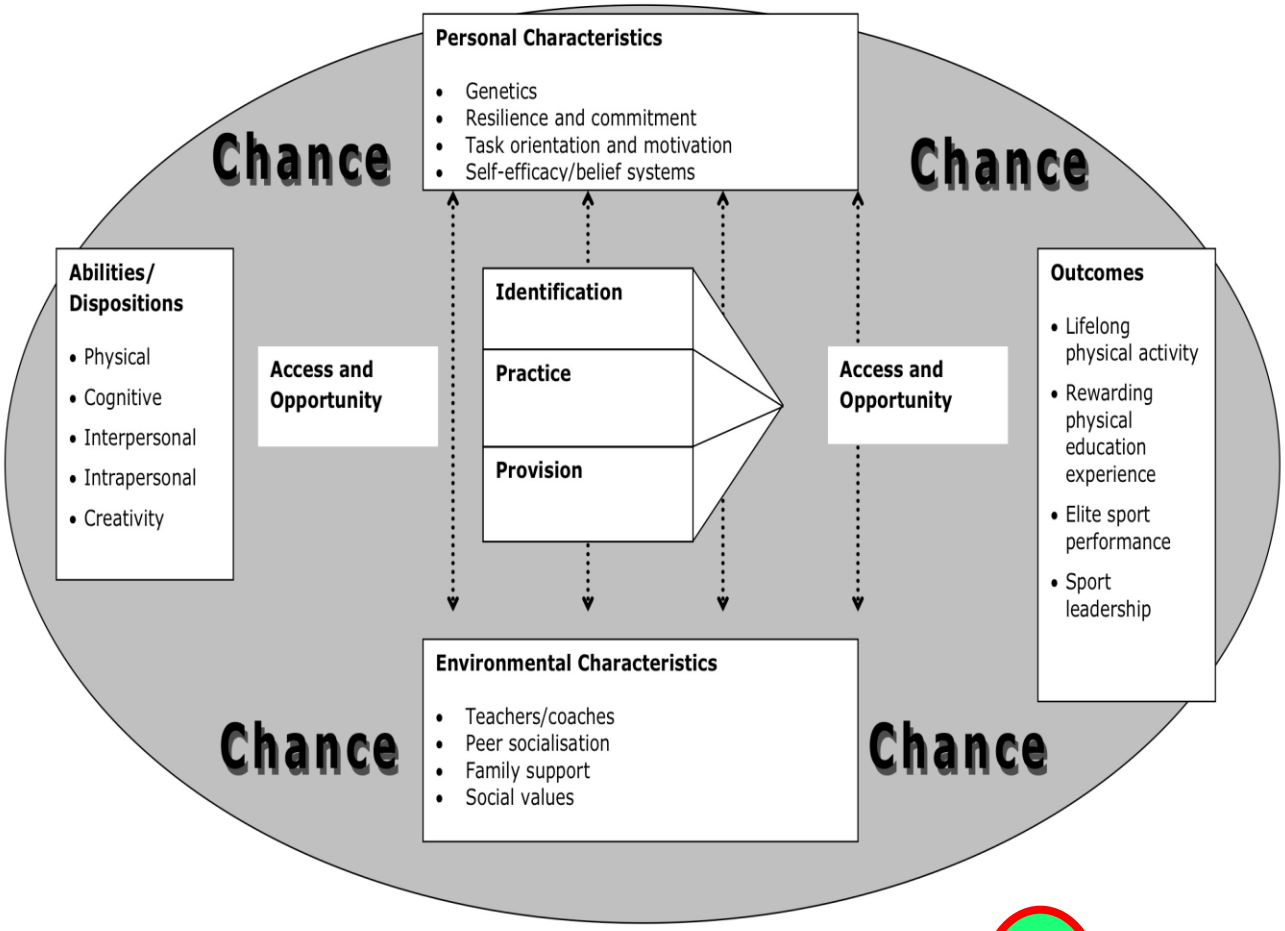
Balyi & Hamilton (2004) 'LTAD'



*ABC's – Agility Balance Coordination Speed + RJT = Run Jump Throw + KGB's = Kinesthesia Gliding Bouyance Striking with object + CK's = Catching Kicking Striking with body

Figure 1. Adaptation to training and optimal trainability (adapted from Balyi & Way, 2002; in Balyi & Hamilton, 2004).

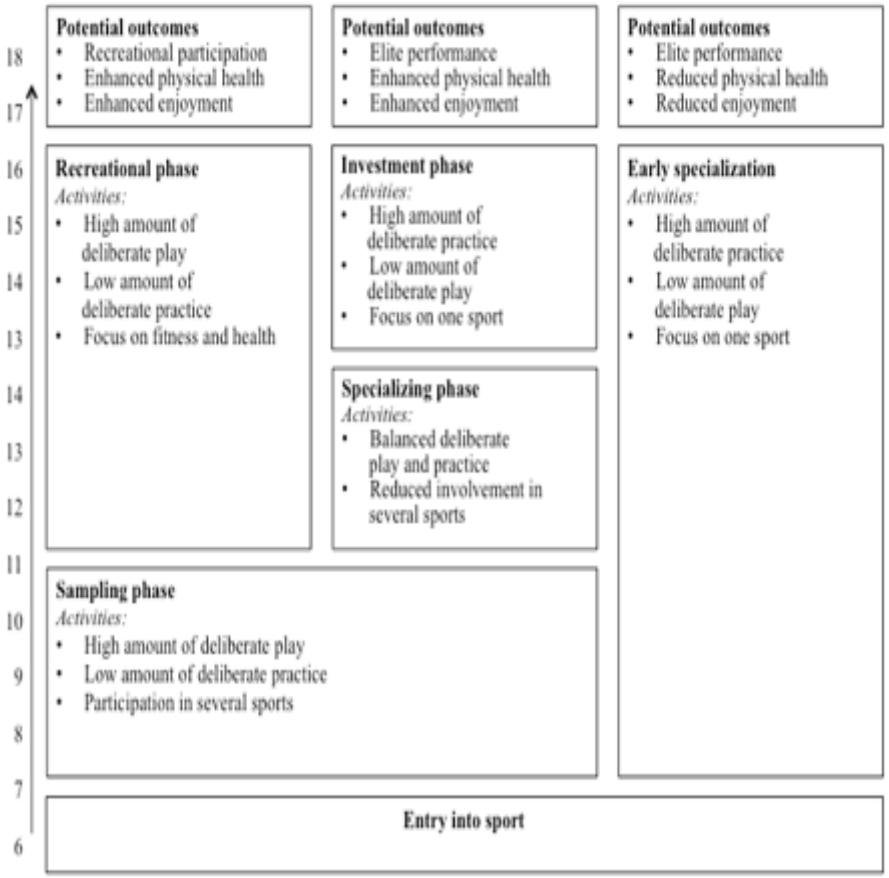
Bailey & Morley (2004) 'Potential in PE'



Great Britain 'UK Sport'

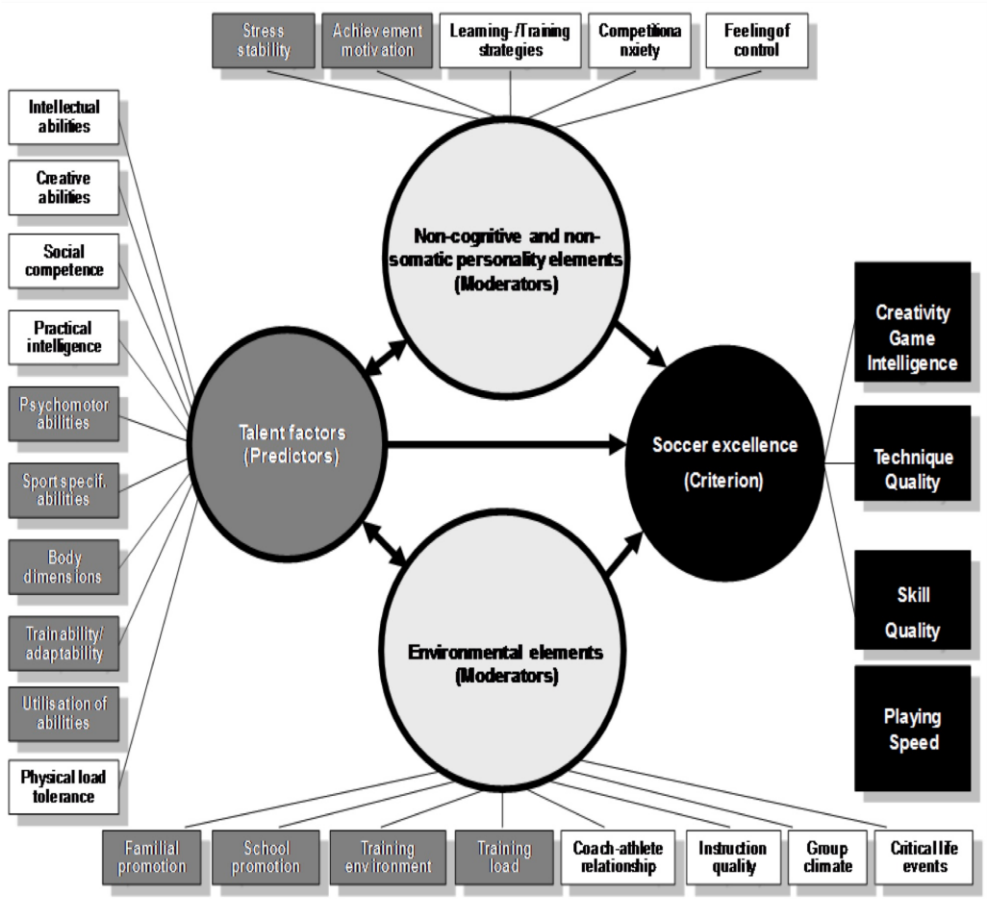
19 68 | 19 72 | 19 76 | 19 80 | 19 84 | 19 88 | 19 92 | 19 96 | 20 00 | 20 04 | 20 08 | 20 12 | 20 16 | 20 20

Coté (2007) 'Sports Participation'

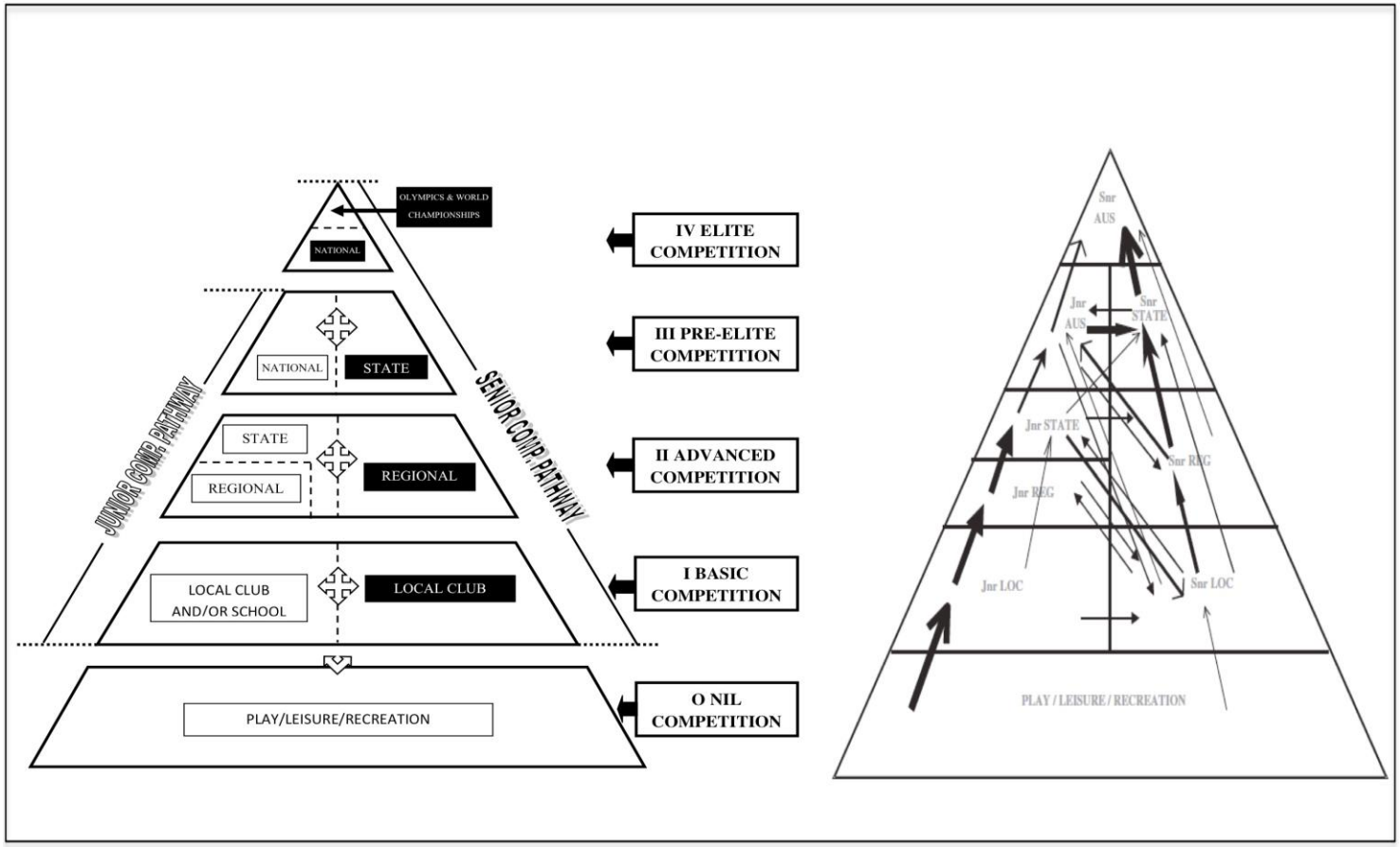


2007

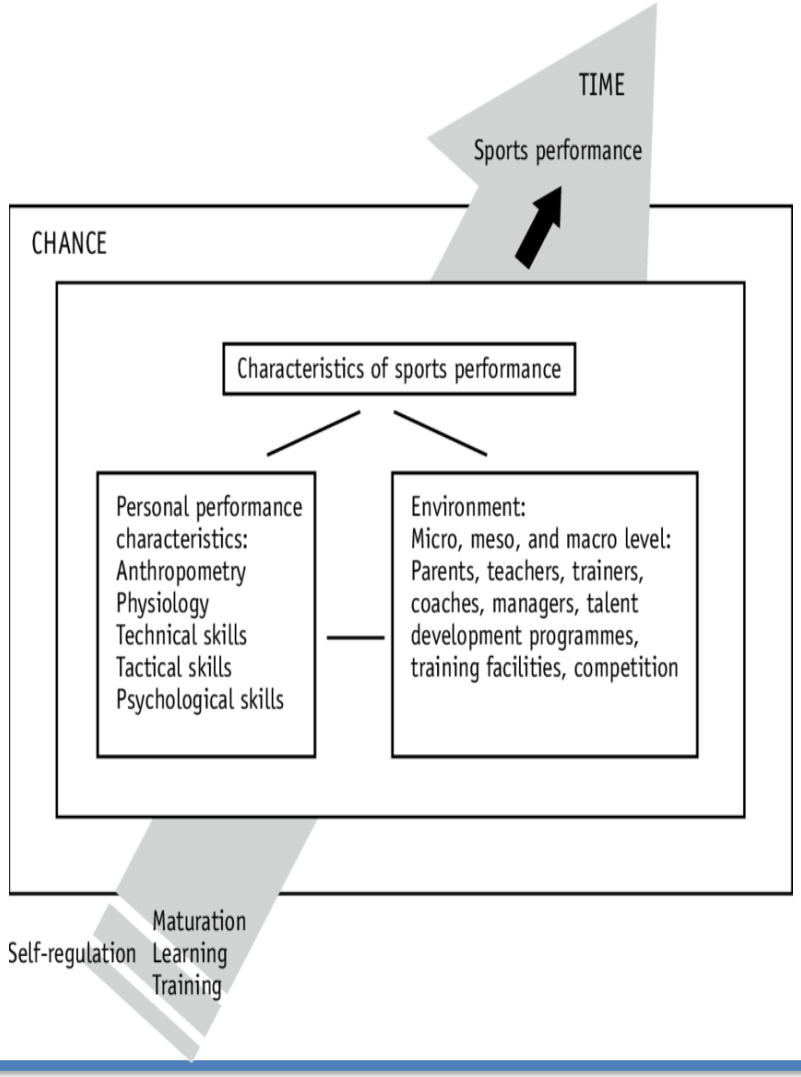
Hohmann (2009) 'High Ability'



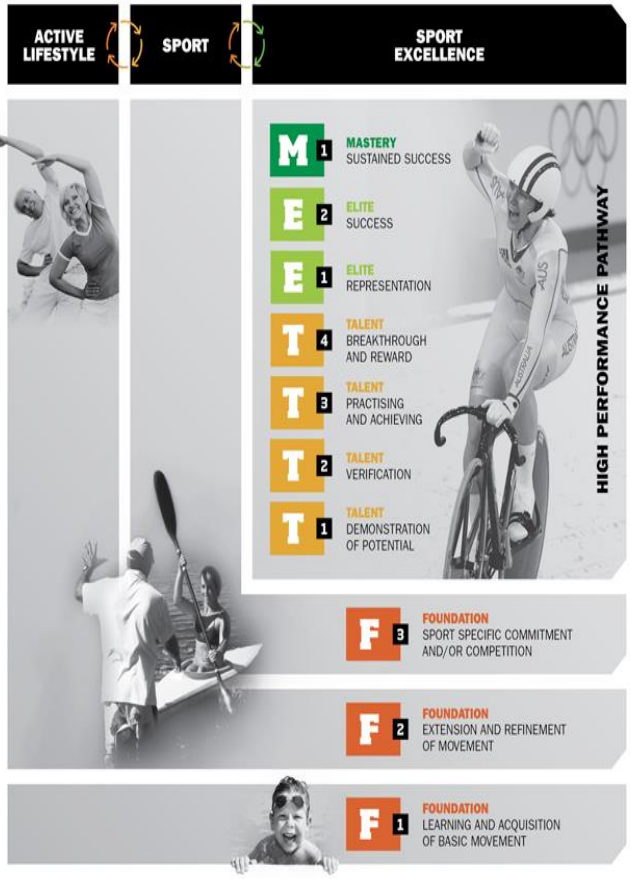
Gulbin (2013) 'Performance Development'



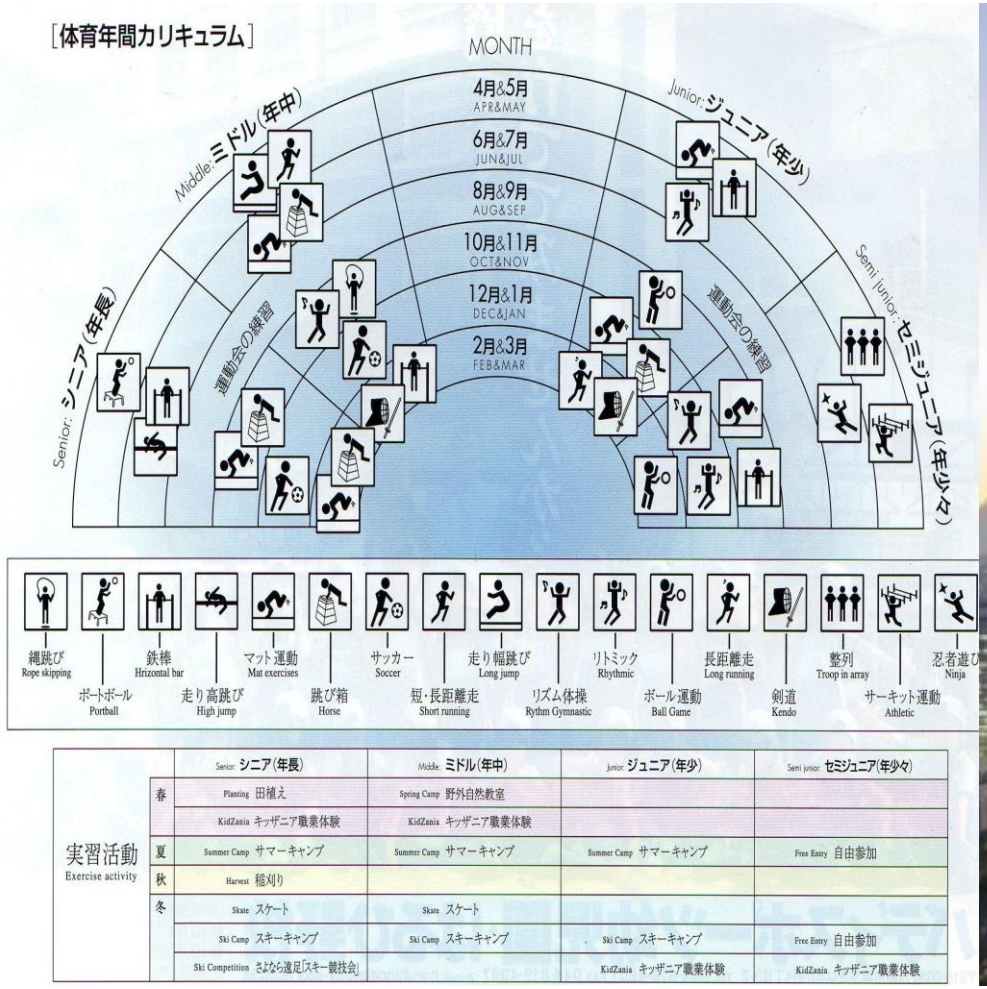
Elferink-Gemser & Visscher (2013) 'TID and TDE'



Weissensteiner et al (2016) 'FTEM'



Tokyo 2020 'Pathways to Tokyo'

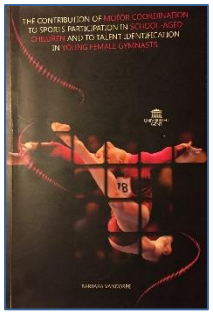


実習活動 Exercise activity		Senior: シニア(年長)	Middle: ミドル(年中)	Junior: ジュニア(年少)	Semi junior: セミジュニア(年少々)
	春	Planting 田植え	Spring Camp 野外自然教室		
		KidZania キッザニア職業体験	KidZania キッザニア職業体験		
	夏	Summer Camp サマーキャンプ	Summer Camp サマーキャンプ	Summer Camp サマーキャンプ	Free Entry 自由参加
	秋	Harvest 稲刈り			
	冬	Skate スケート	Skate スケート		
		Ski Camp スキーキャンプ	Ski Camp スキーキャンプ	Ski Camp スキーキャンプ	Free Entry 自由参加
		Ski Competition さよなら遠足[スキー競技会]		KidZania キッザニア職業体験	KidZania キッザニア職業体験

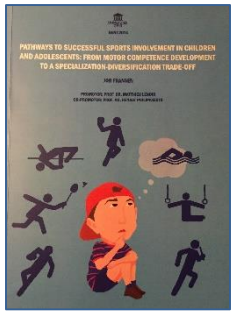
Lessons learned

Starting up a sustainable system for badminton

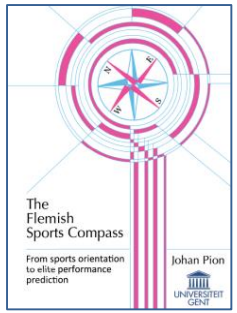
Talent Identification and Development in Badminton



B. Vandorpe



J. Fransen



J. Pion

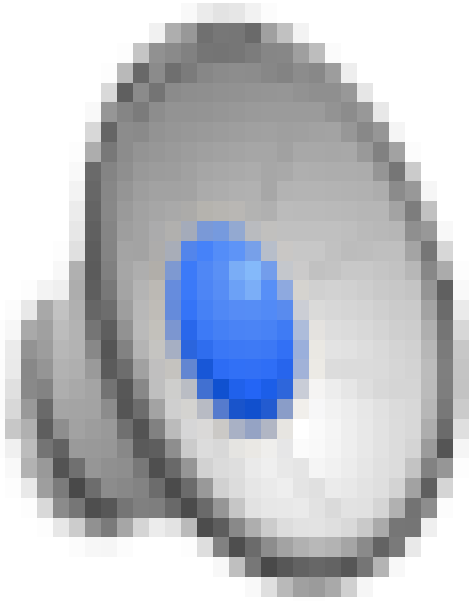
Detecting (Generic) Sports Potential

Detecting Sports Potential

Detecting Sports Potential

Detecting Sports Potential

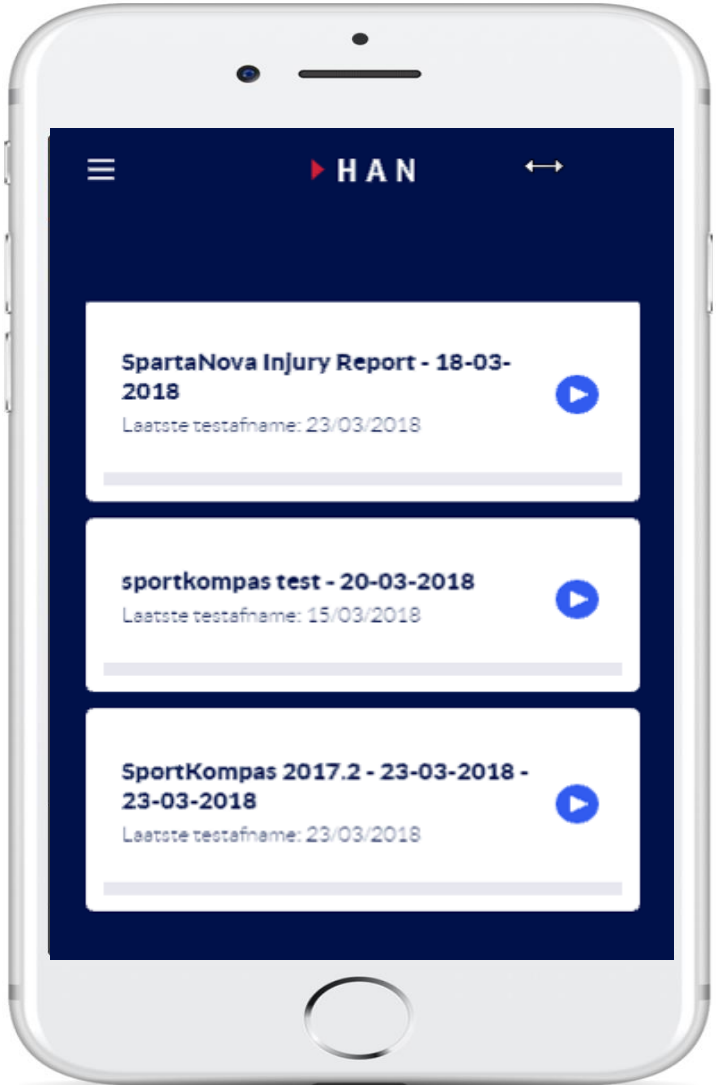
Detecting Sports Potential



Detecting Sports Potential

Online input Internet (WiFi or 4G)

Start new test
Select participant
Manual
Clock
Data input
List of tested participants

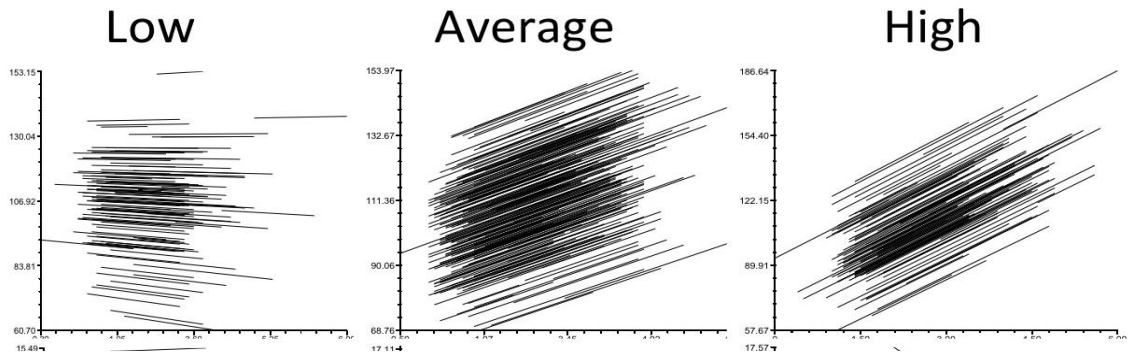


J. Pion

Developing (Generic) Sports Potential

Developing (generic) Sports Potential

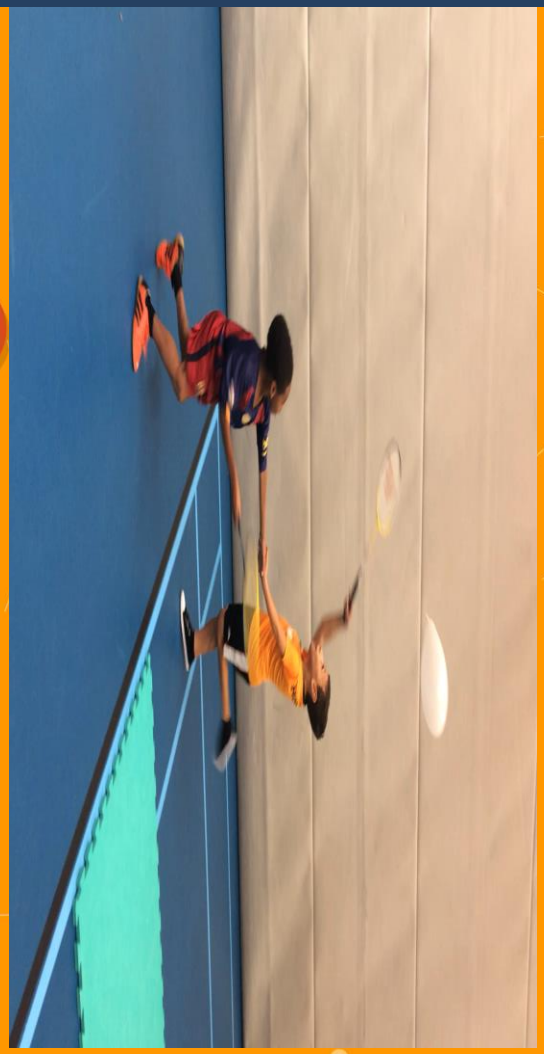
Standing long Jump



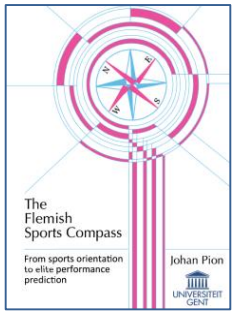
Rodrigues, Stodden and Lopes
Developmental pathways of change in fitness and motor competence are related to overweight and obesity status at the end of primary school
Journal of Science and Medicine in Sport (2015)

Developing (generic) Sports Potential

Developing (generic) Sports Potential



Developing (generic) Sports Potential



J. Pion

Orienting Sports Potential

Orienting Sports Potential

SPORT
KOMPAS

Sports orientation tool
for children between
8 and 10 years old.
at primary schools and local
communities

Orienting Sports Potential

SPORT
KOMPAS

> 20.000

children in primary schools

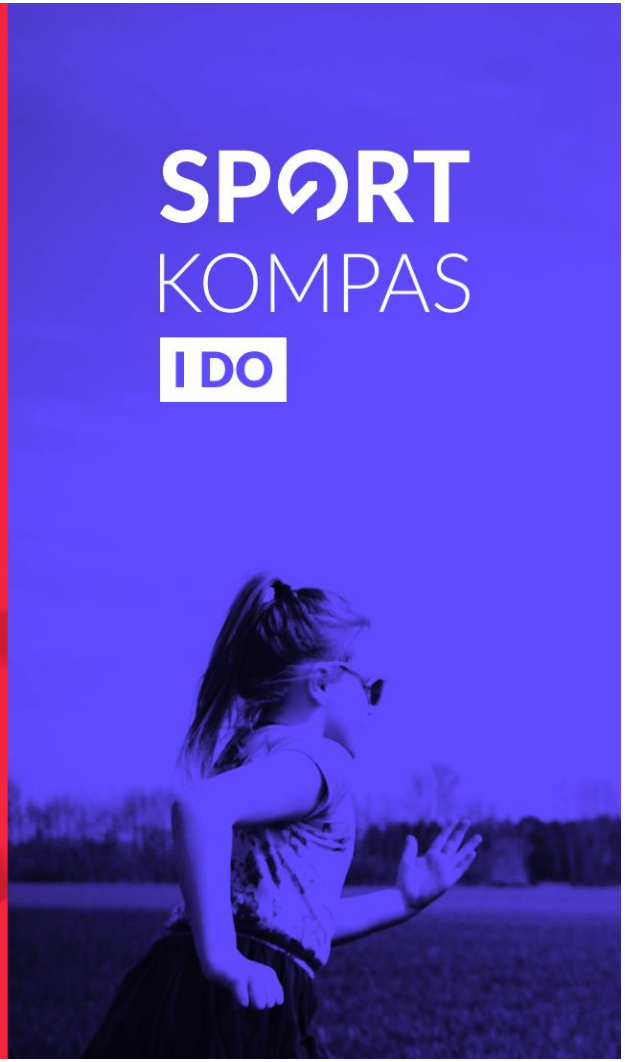
> 2.000

elite sports schools

> 30.000

participants in clubs

Orienting Sports Potential

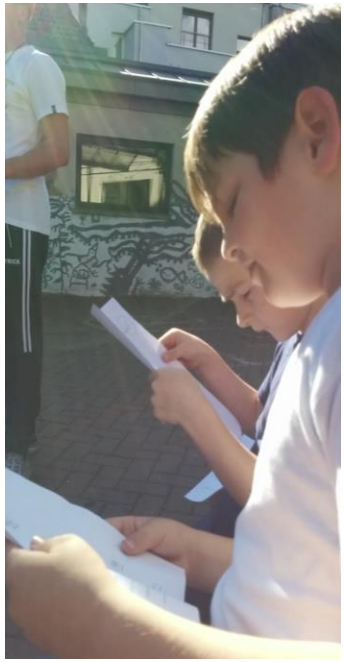


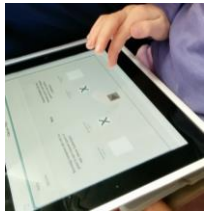
Orienting Sports Potential

“Why do you play sports?”

“What are you good at?”

“What do you like?”





Orienting Sports Potential

Orienting Sports Potential

SPORT
KOMPAS
I DO

Physical characteristics = Actual performance

Orienting Sports Potential

SPORT
KOMPAS
I DO

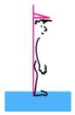
Motor coordination = Sports potential

Orienting Sports Potential

Generic tests

Flemish Sports Compass (2015)

Anthropometry



Stature

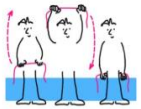
Sitting height

Weight

Fat %

Physical performance

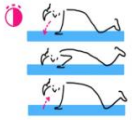
Sit and reach



Shoulder rotation

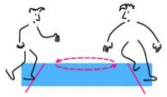
Hand grip

Standing Broad Jump



Knee Push-ups BOT 2

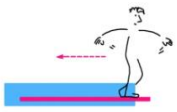
Curl-ups BOT 2



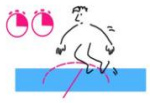
Shuttle run (10x5m)

Endurance shuttle run

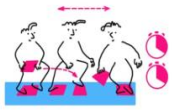
Motor coordination



Balancing backwards KTK



Jumping sideways KTK



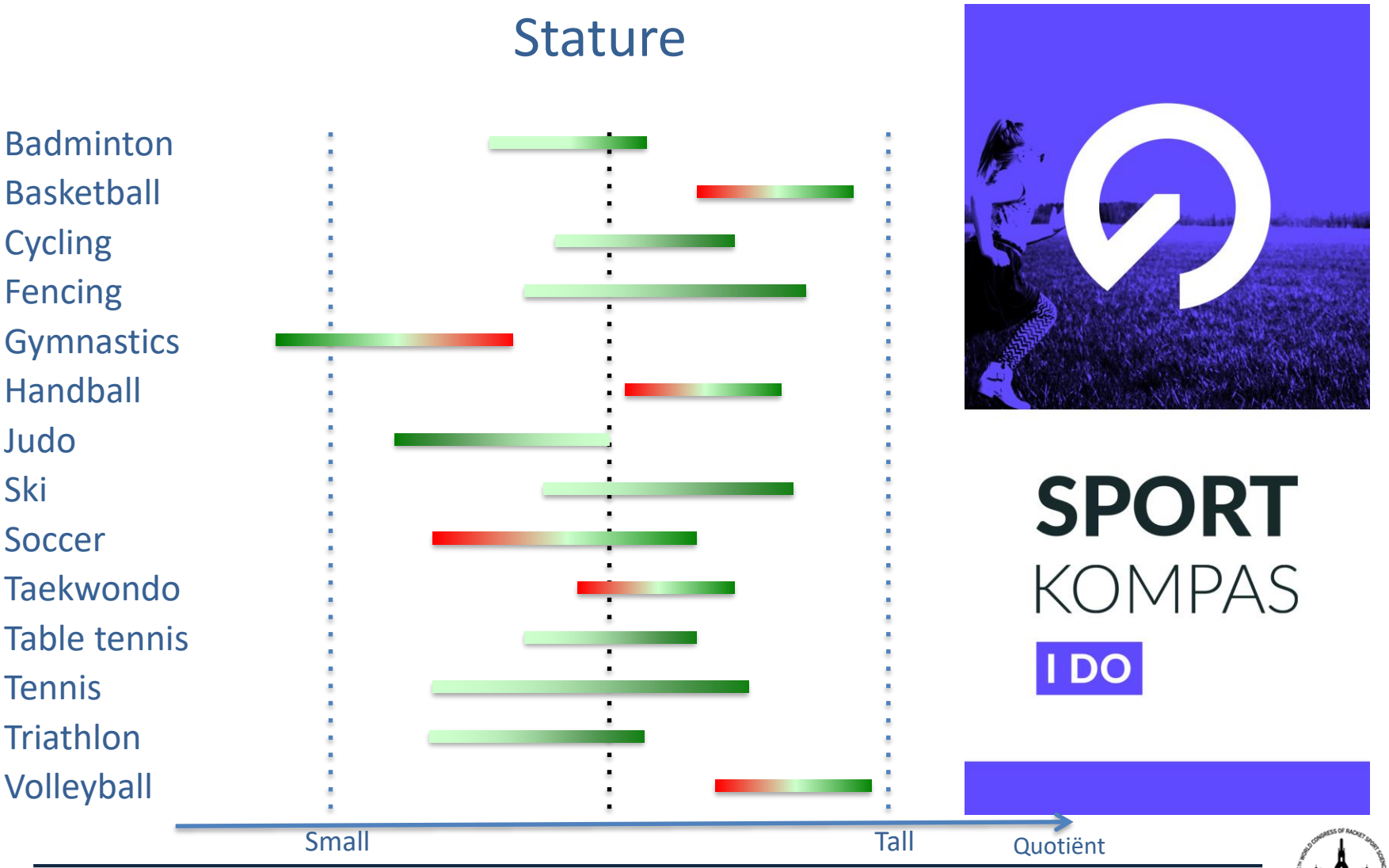
Moving sideways KTK

Dribbling

SPORT KOMPAS

I DO

Orienting Sports Potential

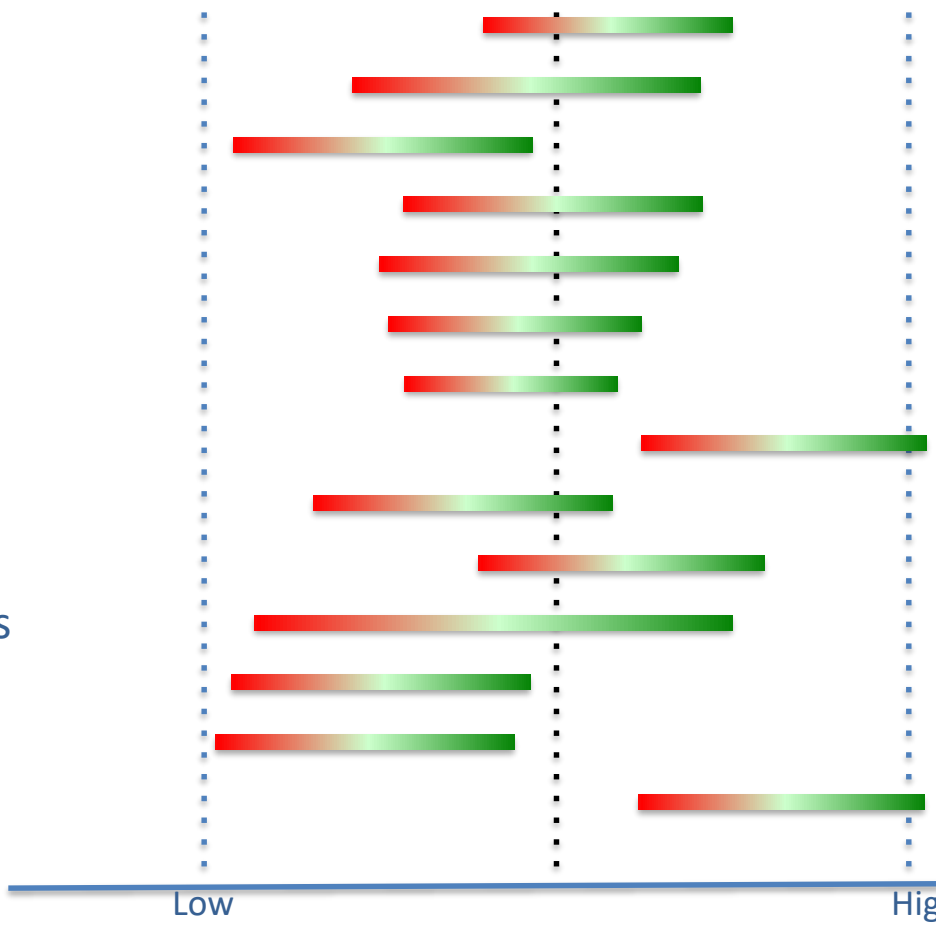


SPORT KOMPAS

I DO

Orienting Sports Potential

Counter movement jump



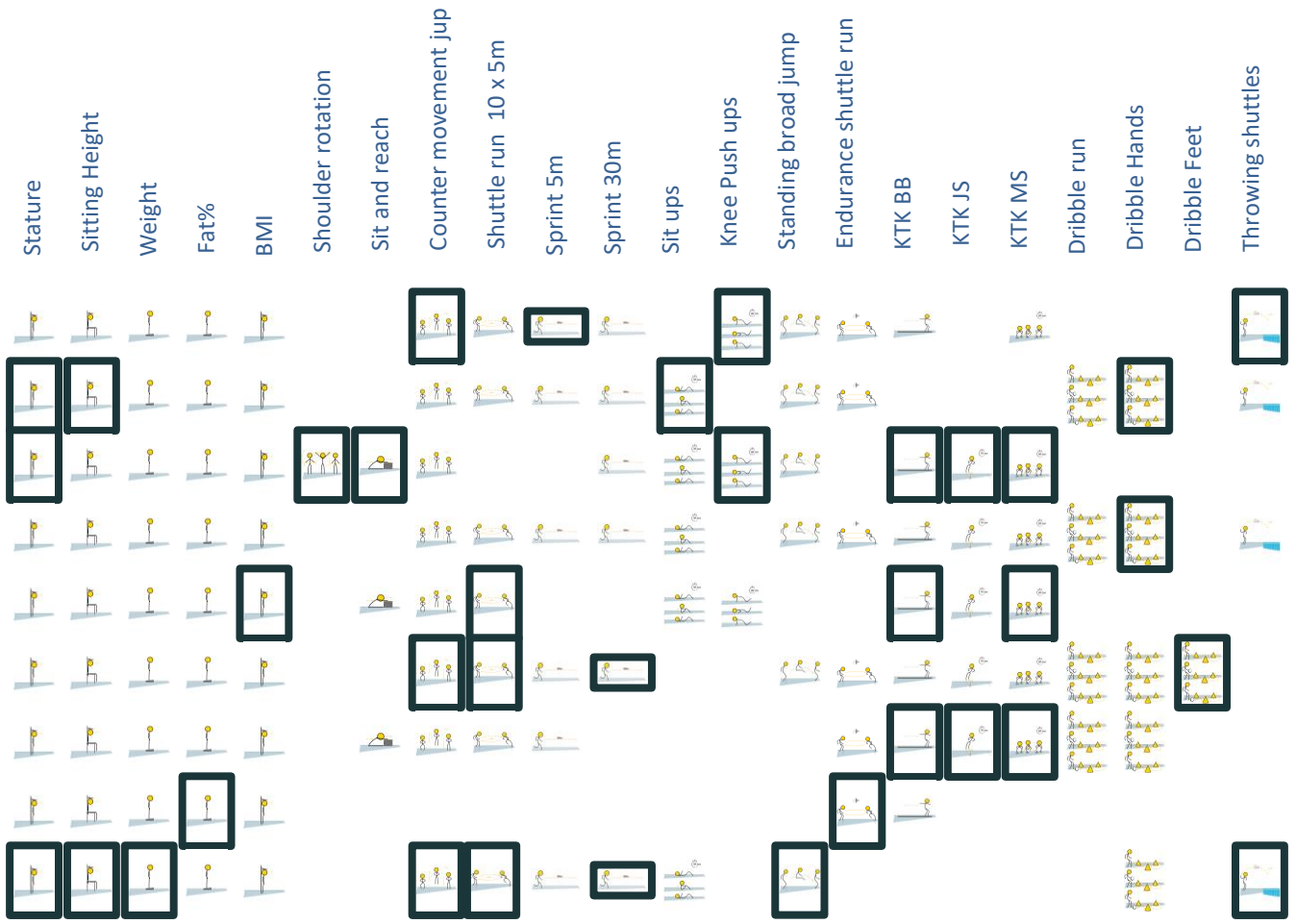
SPORT KOMPAS

I DO

Orienting Sports Potential

D.A. correctly classified

Badminton	**96% - 83%**
Basketball	91% - 80%
Gymnastics	98% - 92%
Handball	84% - 46%
Judo	98% - 71%
Soccer	93% - 86%
Table tennis	96% - 81%
Triathlon	90% - 82%
Volleyball	94% - 92%



Generic anthropometric and performance characteristics among elite adolescent boys in nine different sports

Johan Pion, Veerle Segers, Job Fransen, Gijs Debuyck, Dieter Deprez, Leen Haerens, Roel Vaeyens, Renaat Philippaerts and Matthieu Lenoir European Journal of Sports Sciences (2014)

Orienting Sports Potential

European Journal of Sport Science

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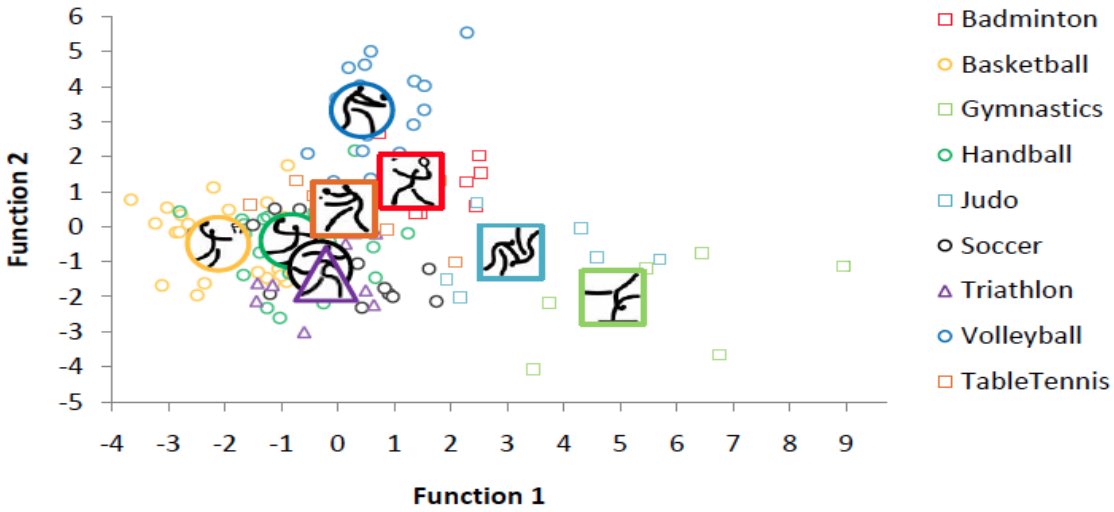
[a] Faculty of Medicine and Health Sciences, Department of Movement and Sports Sciences, Ghent University, Ghent, Belgium

Published online: 21 Aug 2014.



Orienting Sports Potential

D.A. correctly classified

Badminton 96% - 83%

Knee push-ups (F = 6.041 and P = 0.015),
Sprint 5m (F = 5.535 and P = 0.005)
Counter movement jump (F = 5.262 and P = 0.002)
Throwing distance (F = 31.536 and P < 0.001)

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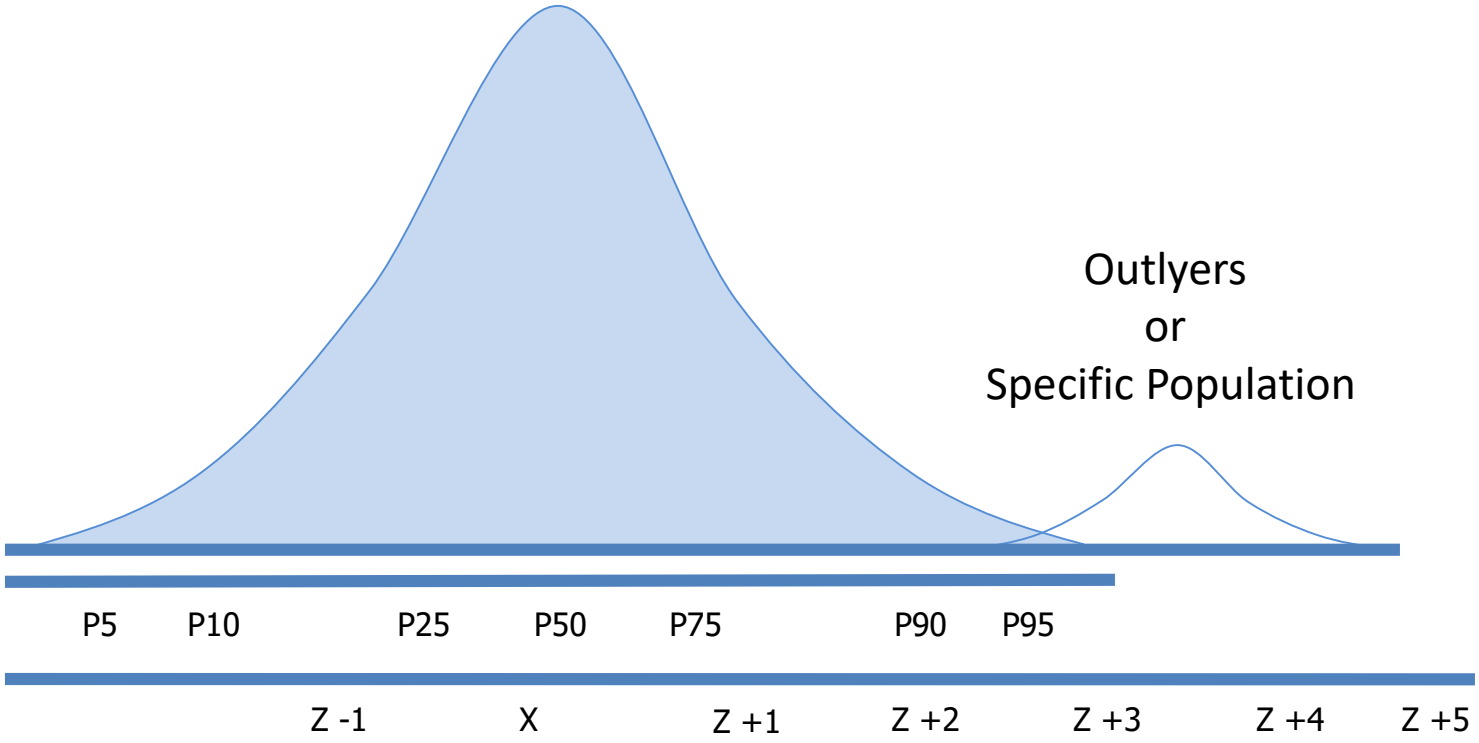
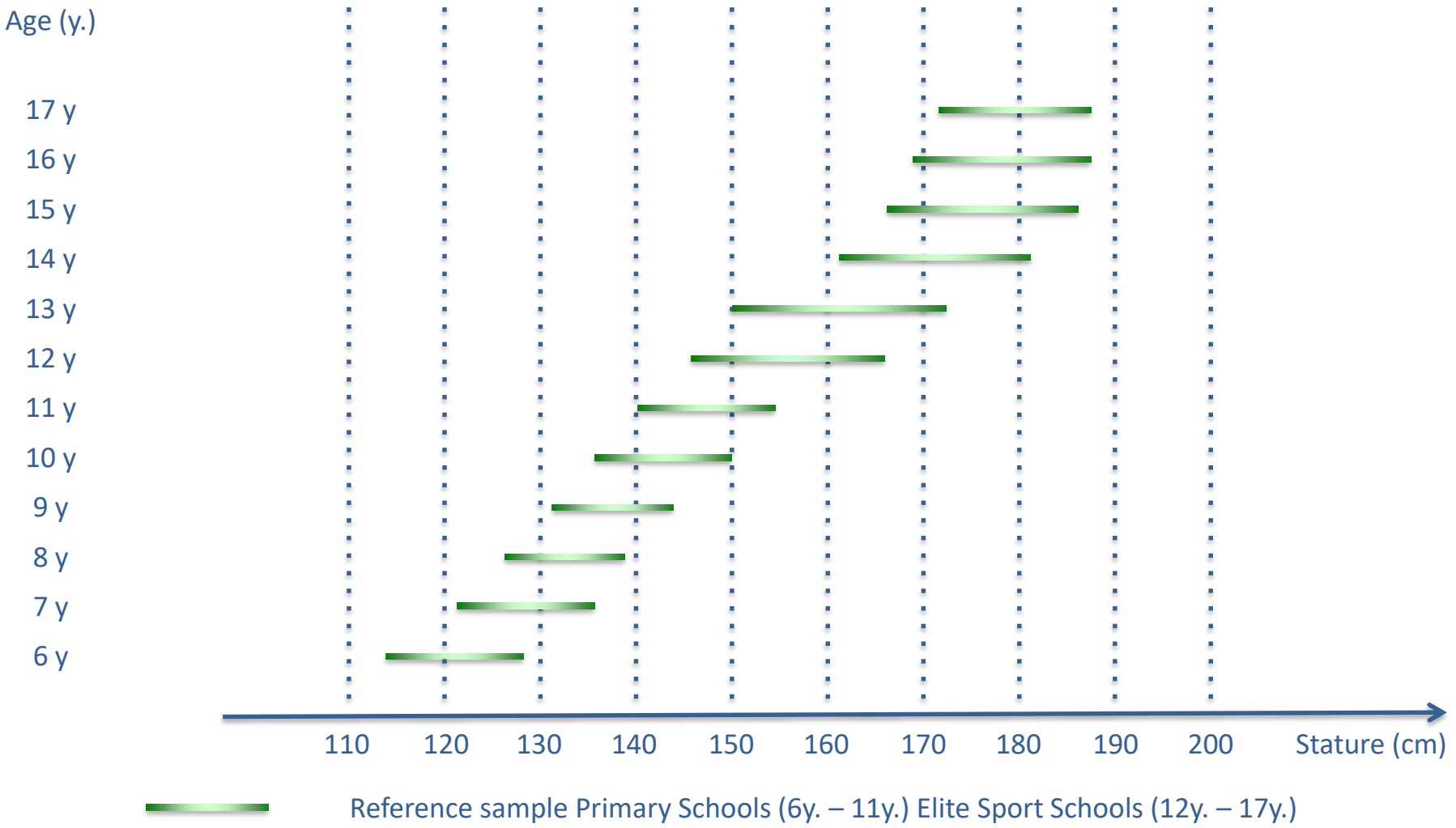
Benchmarks

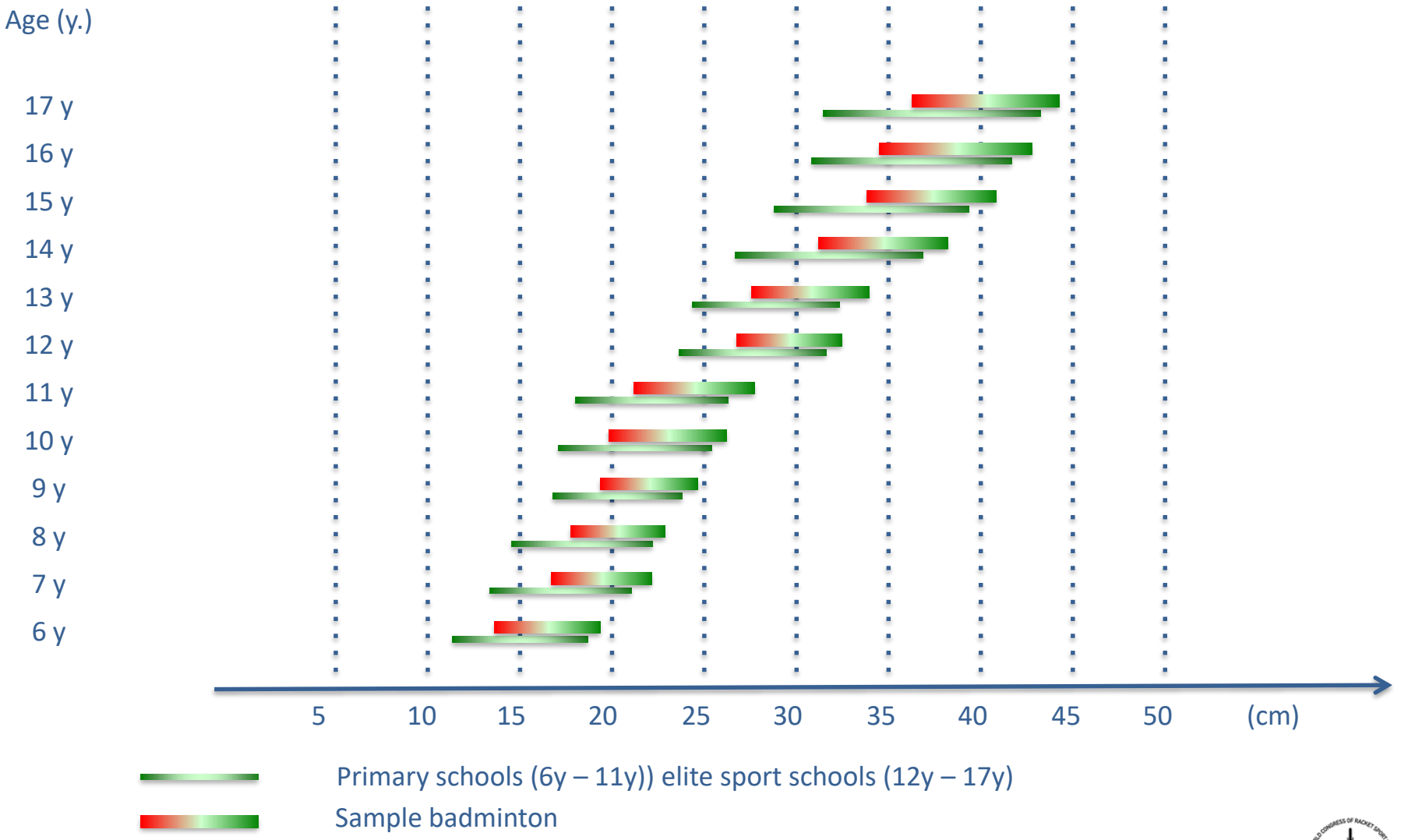
Normalized scores



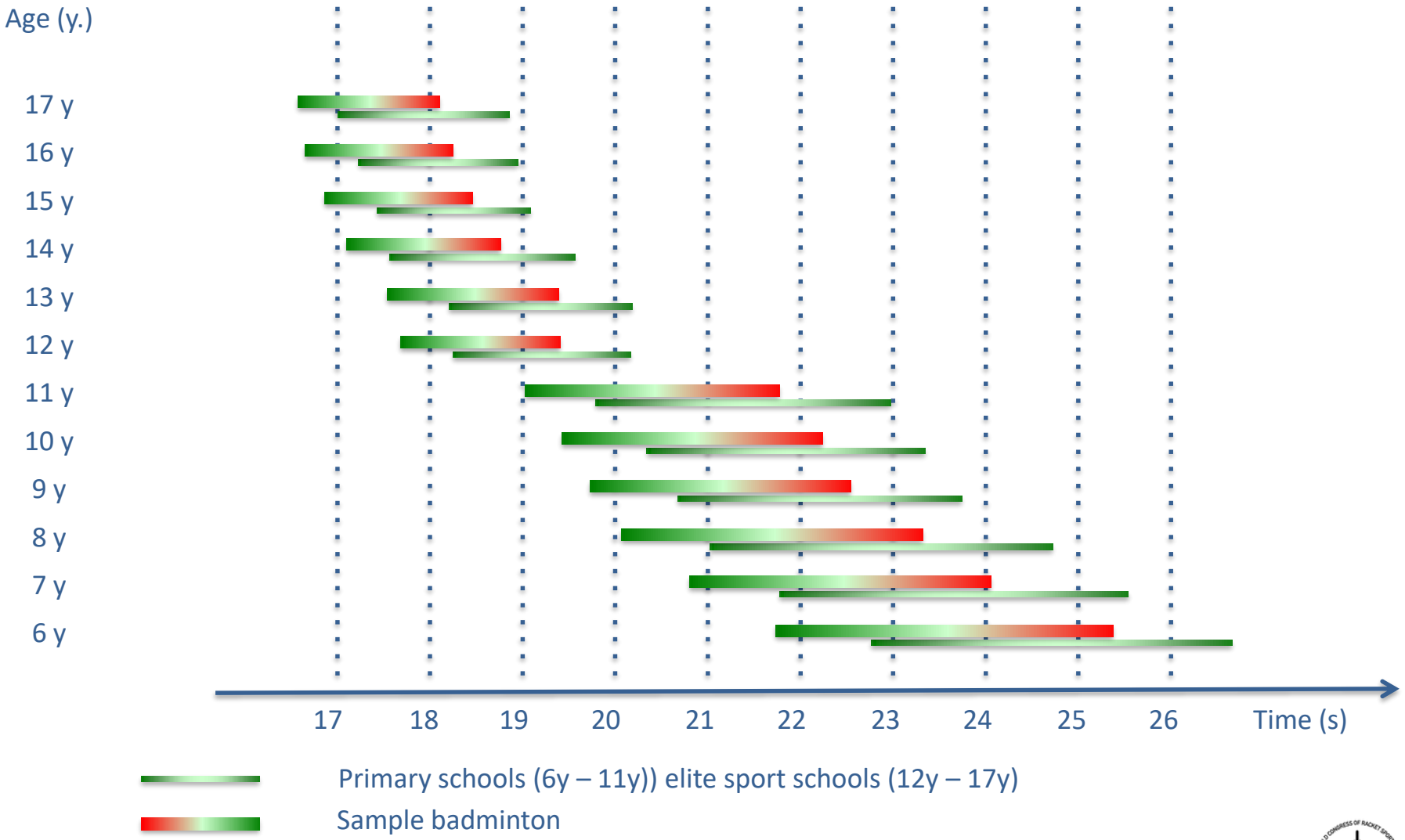
Development Lines for Stature (Boys - Flanders)



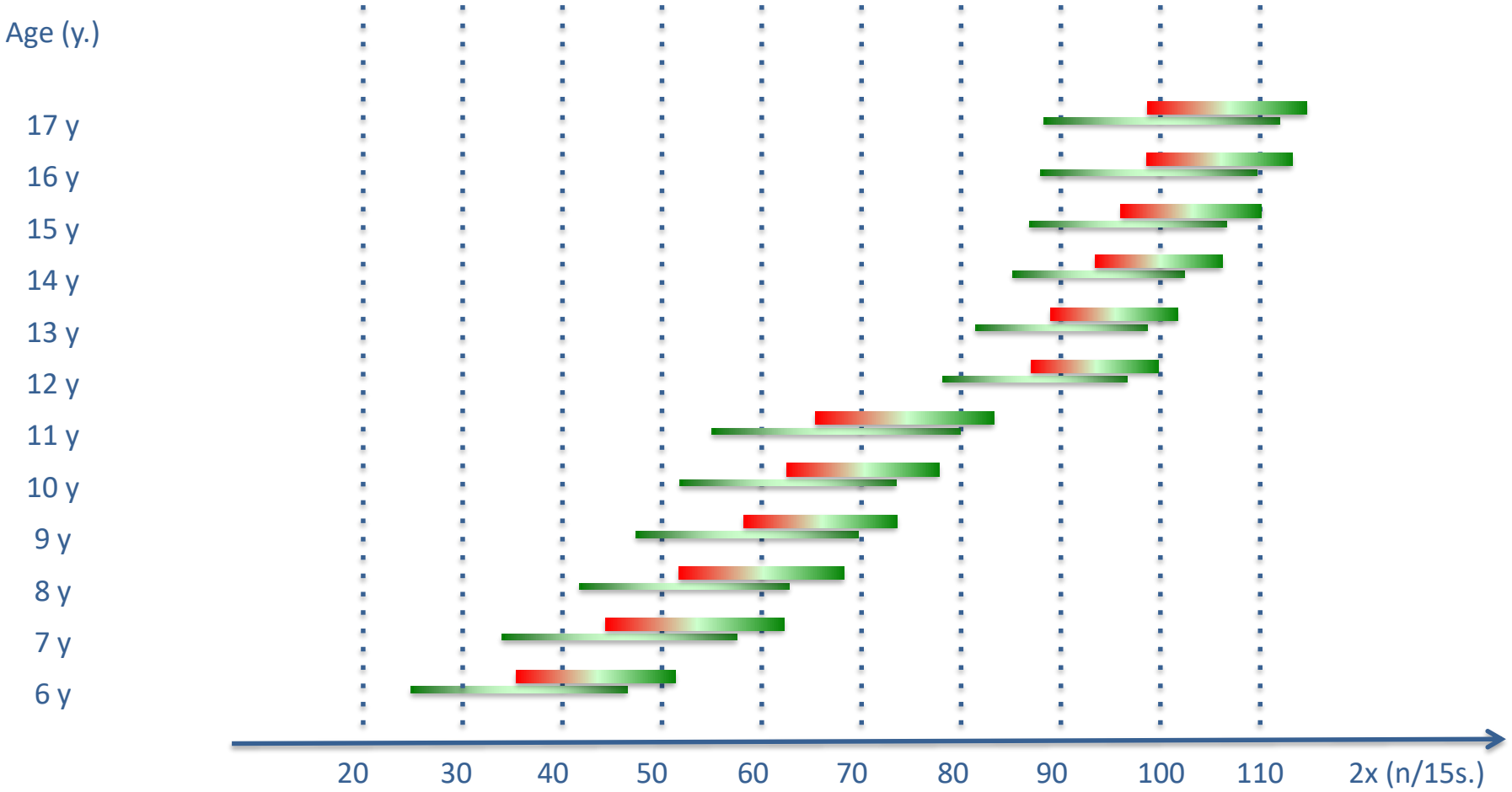
Counter Movement Jump (Badminton Boys)



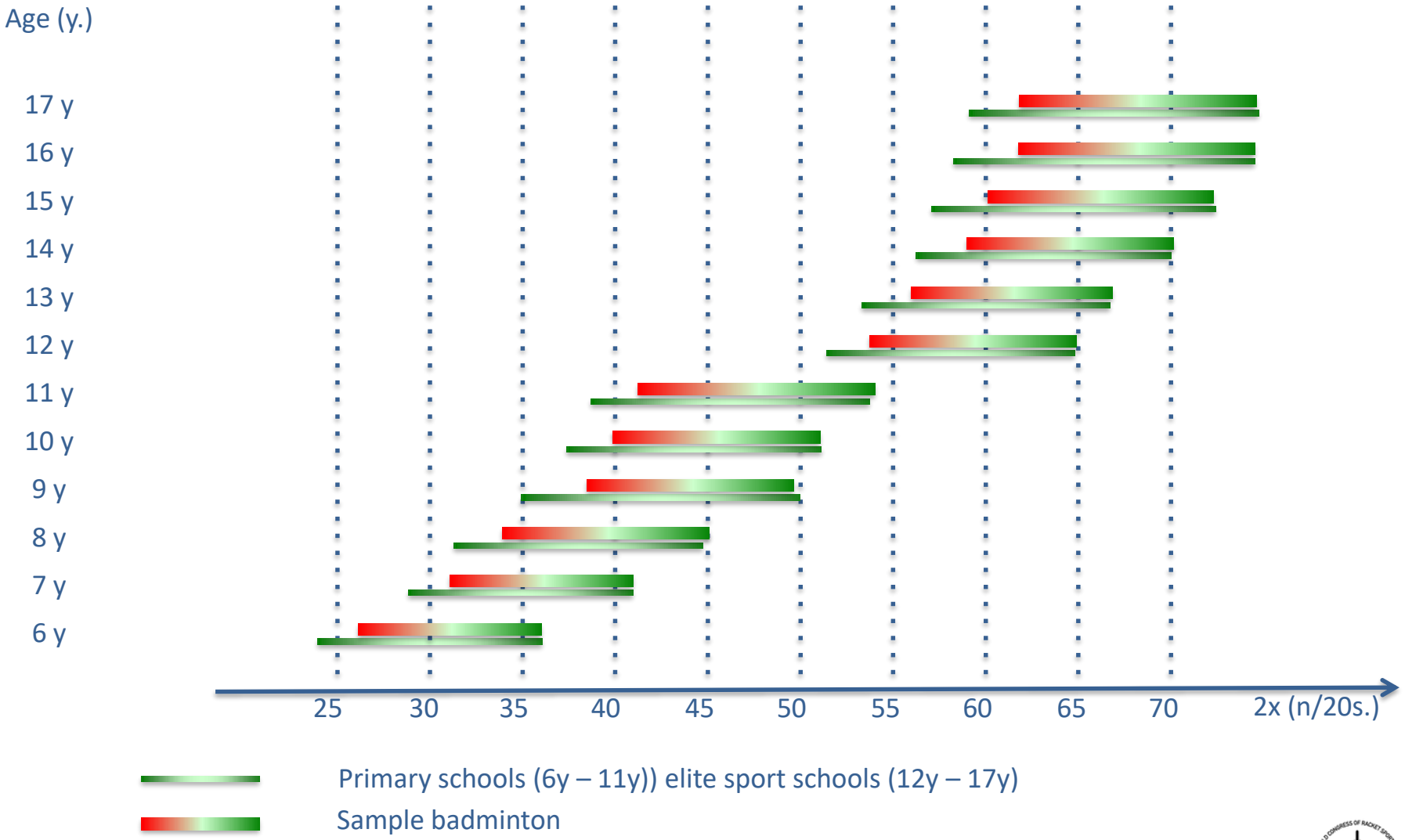
Shuttle Run 10x5m (Badminton Boys)



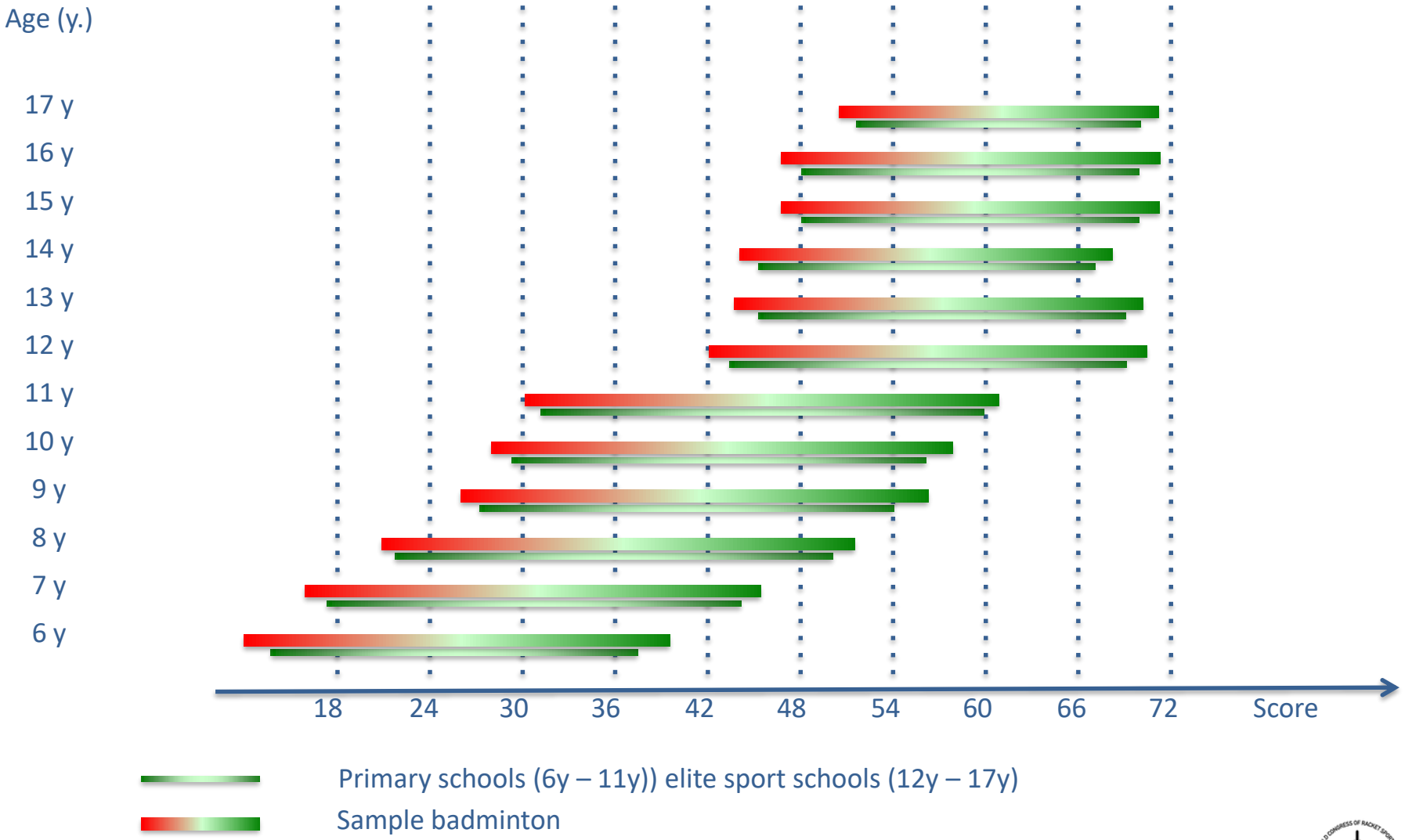
KTK Jumping Sideways (Badminton Boys)



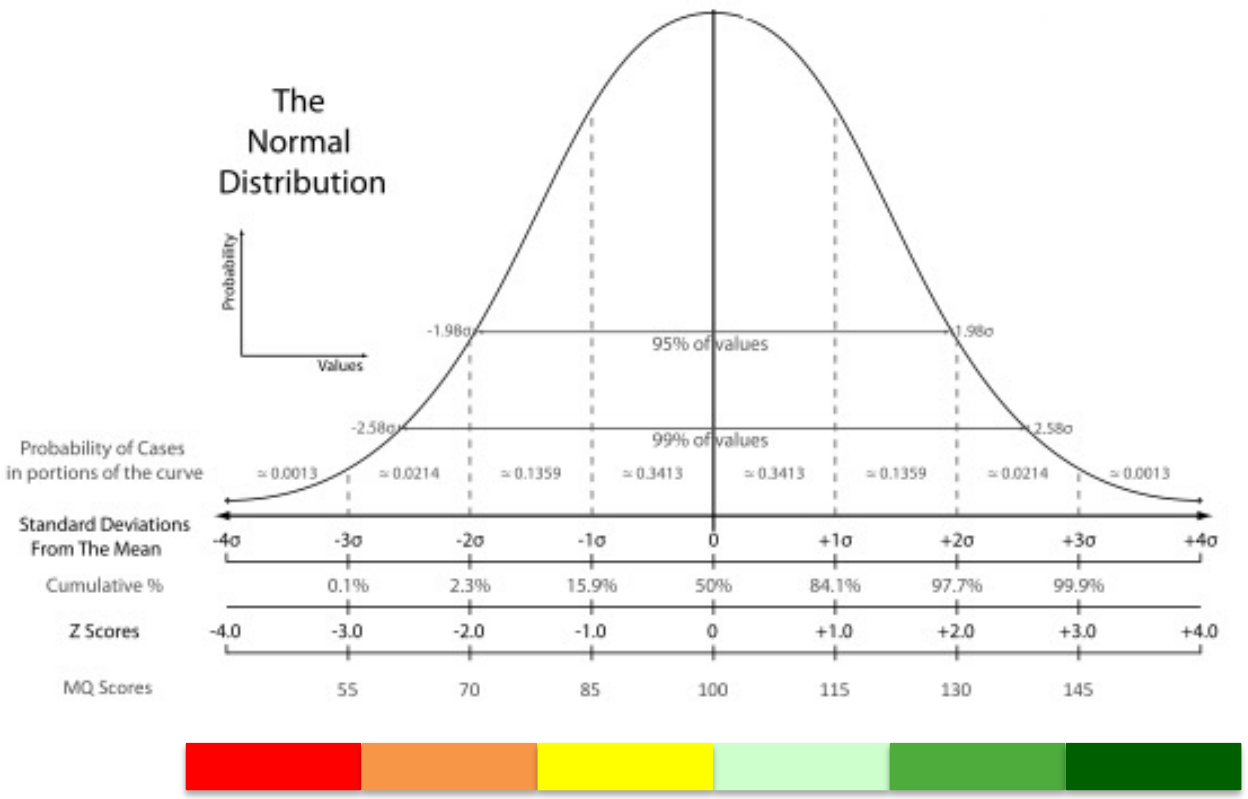
KTK Moving Sideways (Badminton Boys)



KTK Moving Sideways (Badminton Boys)

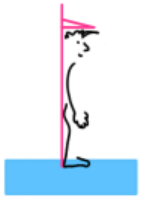


Profiling (Individual Scores)

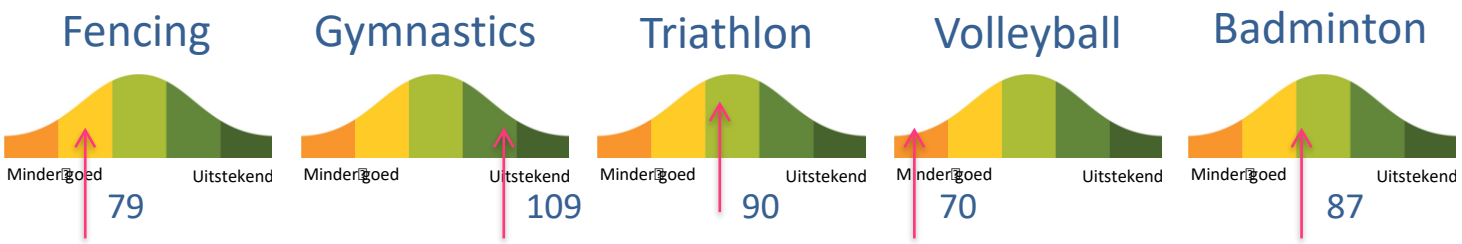


Benchmarks

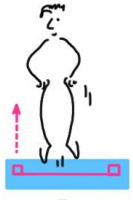
Boy 15y



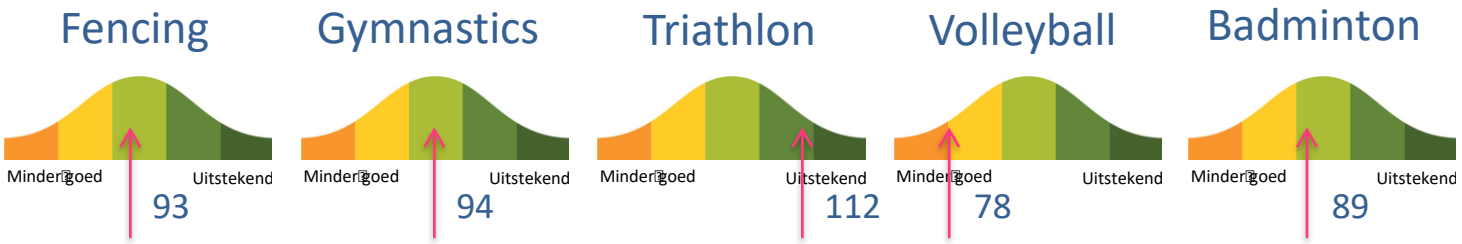
Stature 166 cm



Boy 15y



CMJ 33cm



Orienting Sports Potential

Haenen Nenah

SportKompas

Testdatum: 2/6/2012
Geslacht: Vrouw
Voorkeurshand: Links
Leeftijd: 8,339
Huidige sporten: Lopen

Lichaamsmetingen		Mijn lichaam tegenover leeftijdsgenoten
Lengte	129,2 cm	Eerder kleine gestalte
Gewicht	25 kg	Gemiddeld gewicht
VetPercentage	18 %	Gemiddeld vetpercentage

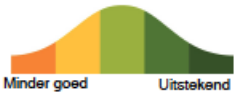
Fysiek	Mijn score	Mijn prestatie tov leeftijdsgenoten
Lenigheid onderlichaam	21,0 cm	
Schouderlenigheid	72,0 cm	
Startsnelheid en wendbaarheid	24,86 sec	
Functionele sprongkracht	116 cm	
Explosieve sprongkracht	14,9 cm	
Krachtuithouding romp	11	
Krachtuithouding bovenlichaam	28	
Uithoudingsvermogen	4,5 min	

Motoriek	Mijn score	Mijn prestatie tov leeftijdsgenoten
Dynamisch evenwicht	27	
Snelle motoriek	64	
Grote motoriek	37	
Dribbelvaardigheid	19	

Mijn algemene prestatiescores tegenover leeftijdsgenoten			
Lichaamsmetingen	-	Kracht	
Lenigheid		Snelheid	
Motoriek		Uithouding	

Hoe Interpreteren?

Je persoonlijke testscores staan in de kolom 'Mijn score'.
Deze scores worden omgerekend naar een quotient dat wordt vergeleken met de gemiddelde score van je leeftijdgenoten in Vlaanderen.



De kleuren geven aan hoe je persoonlijke score tegenover de gemiddelde score ligt.
Donker groen geeft een zeer goede score weer en oranje staat voor een minder goede score.

Better Movers

Orienting Sports Potential

Anna

Athletics Fond
Cycling
Triathlon
Soccer
Swimming
Basketball
Gymnastics
Volleyball
Fencing
Tennis
Taekwondo
Badminton
Judo

Lucas

Athletics Fond
Cycling
Triathlon
Soccer
Swimming
Basketball
Gymnastics
Volleyball
Fencing
Tennis
Taekwondo
Badminton
Judo

Joseph

Athletics Fond
Cycling
Triathlon
Soccer
Swimming
Basketball
Gymnastics
Volleyball
Fencing
Tennis
Taekwondo
Badminton
Judo


All children

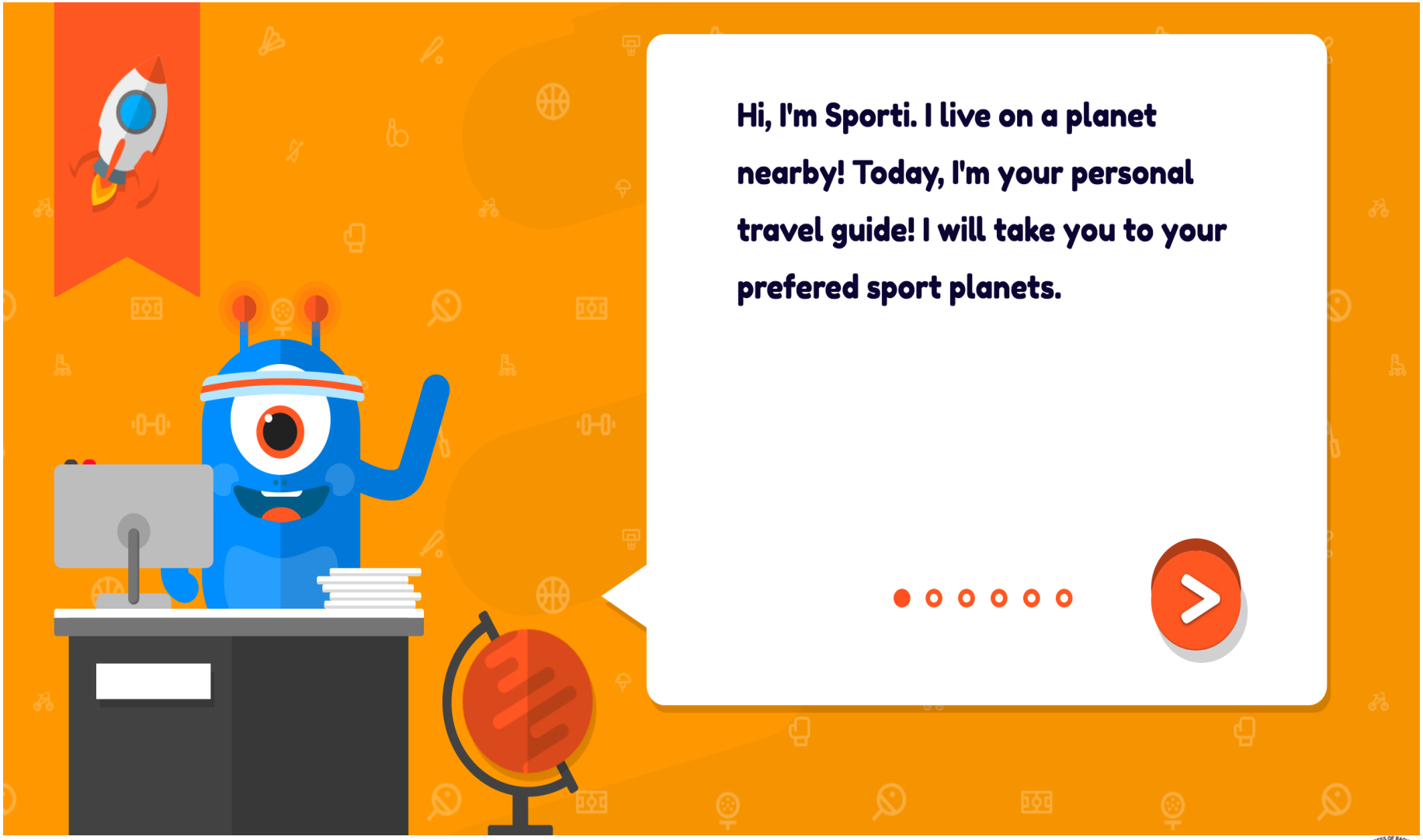
Orienting Sports Potential

Orienting Sports Potential

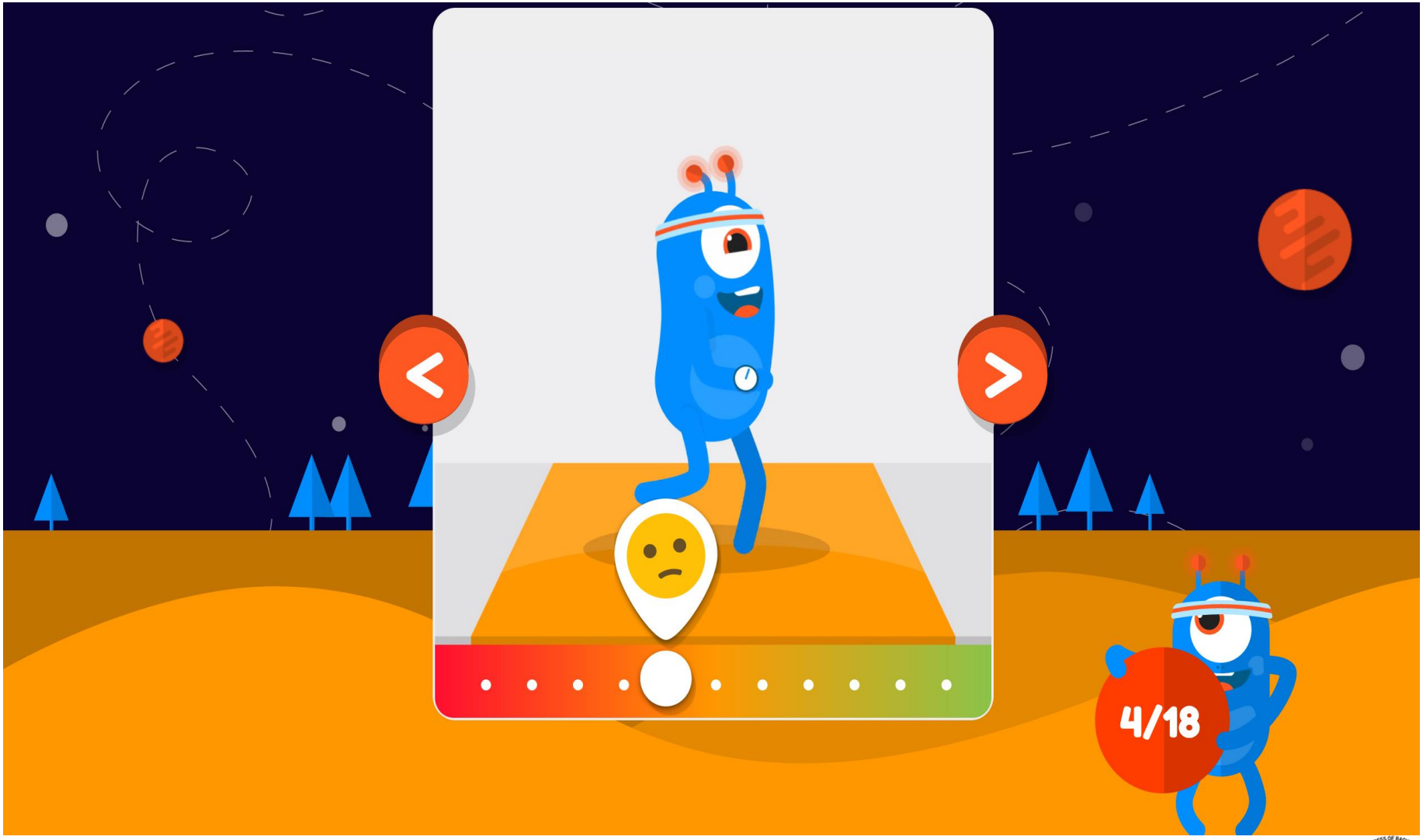
SPORT
KOMPAS
I LIKE

Orienting Sports Potential

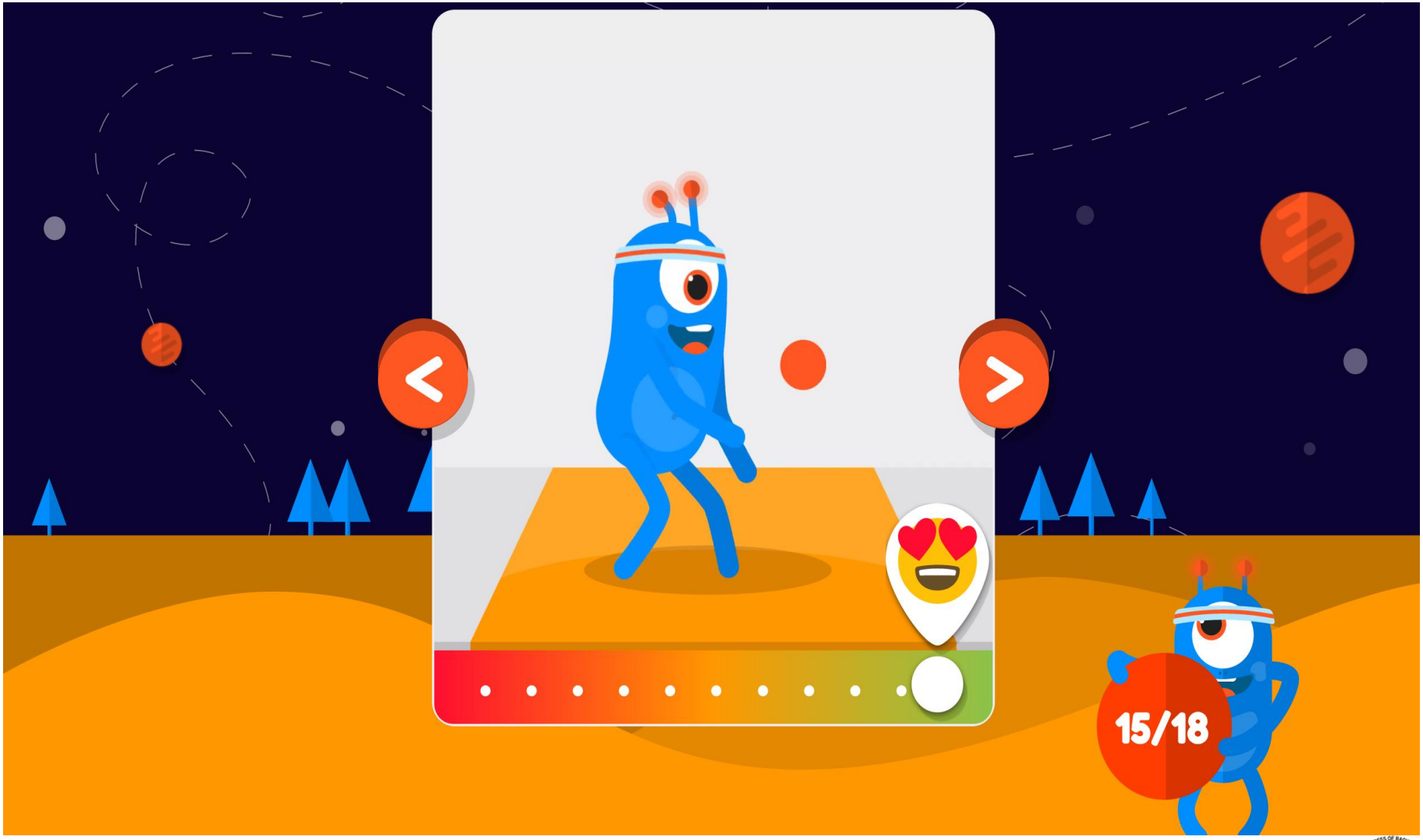
Orienting Sports Potential



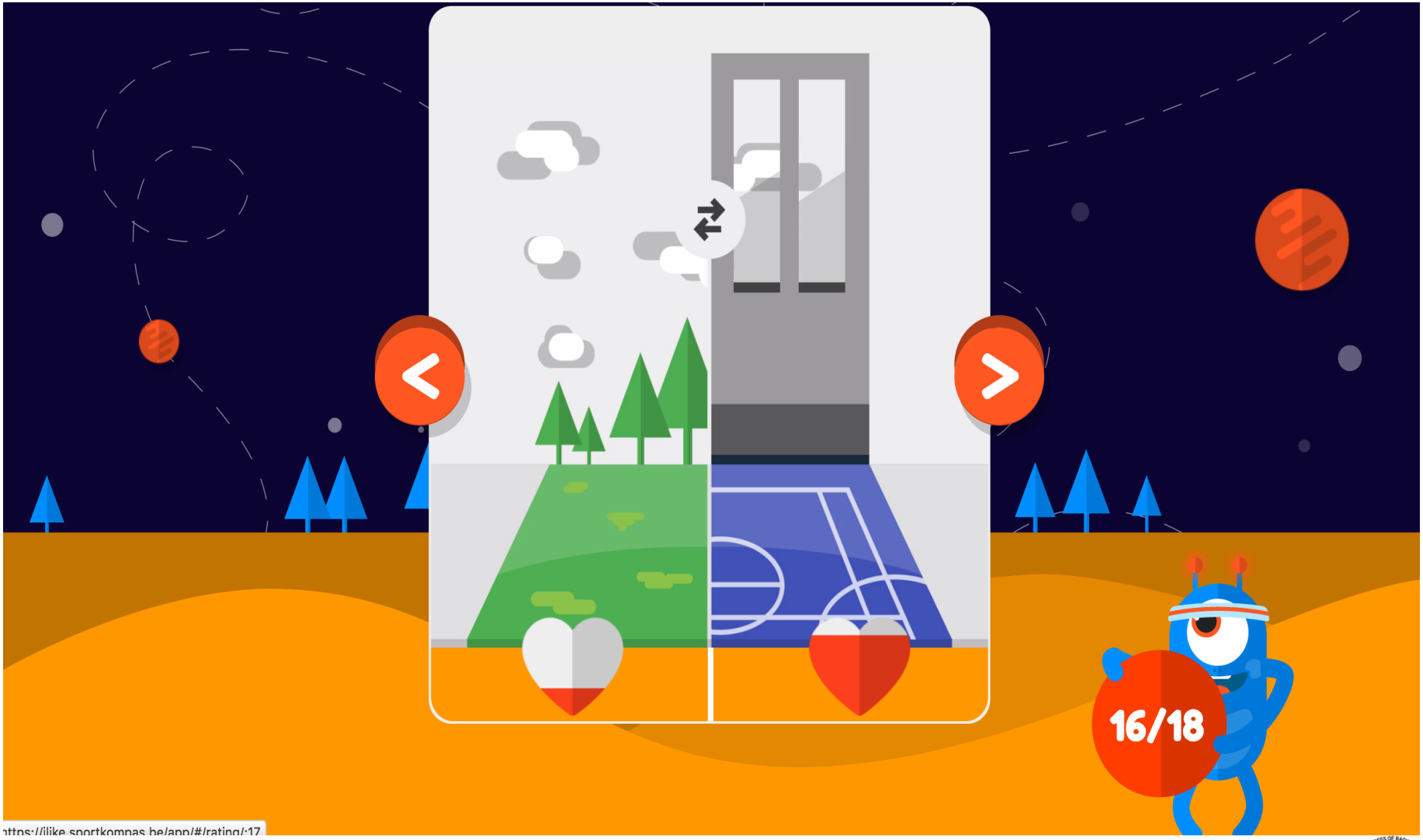
Orienting Sports Potential



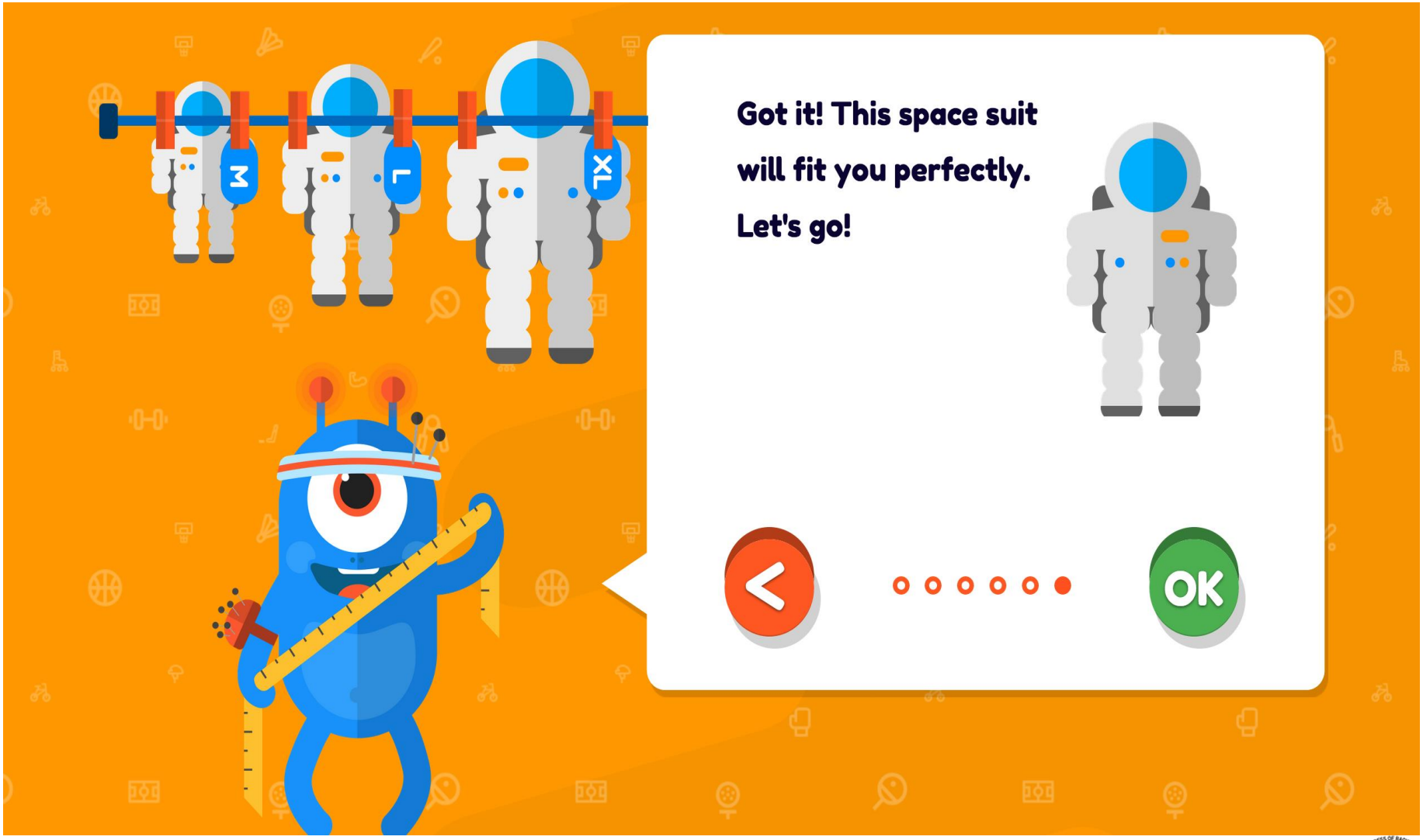
Orienting Sports Potential



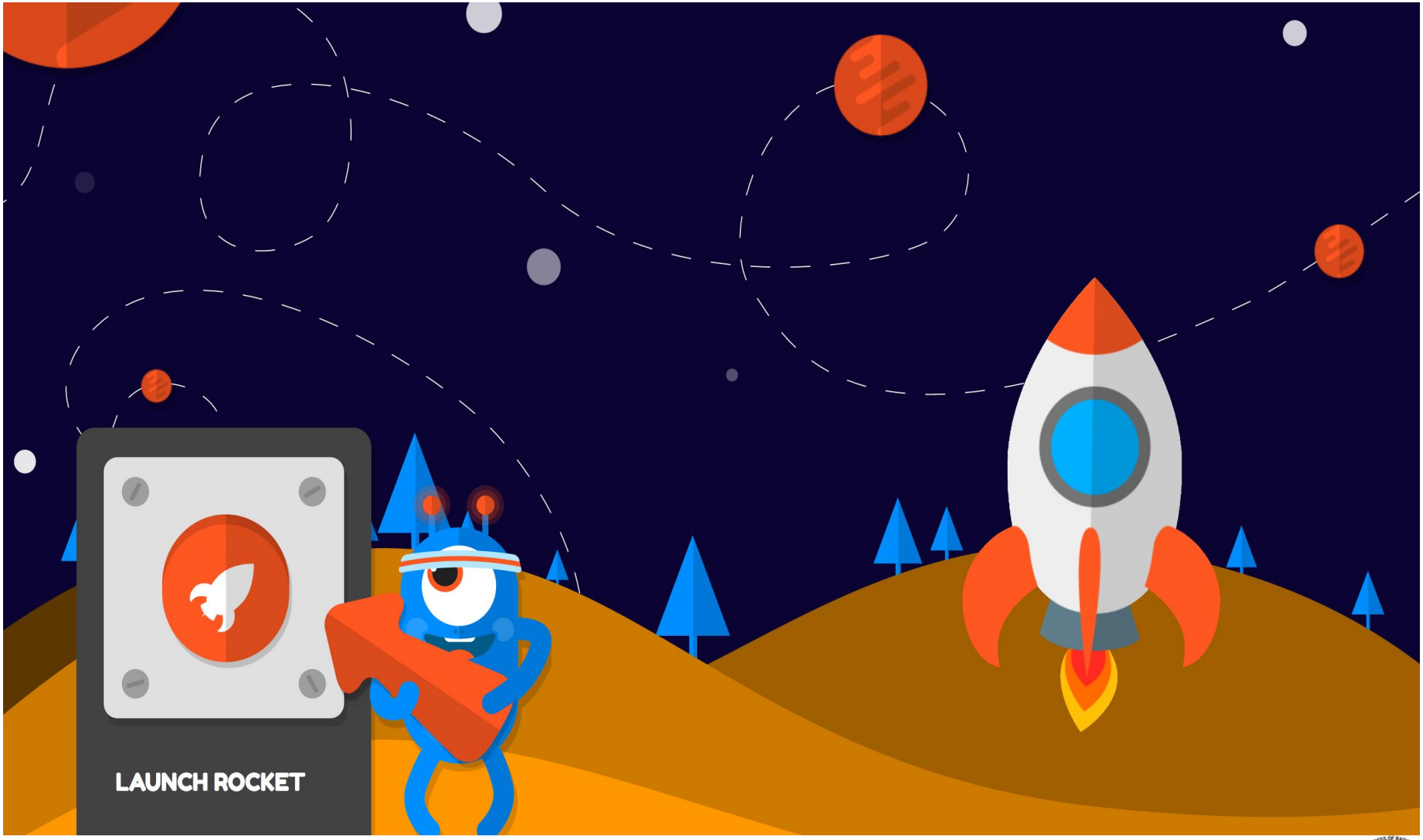
Orienting Sports Potential



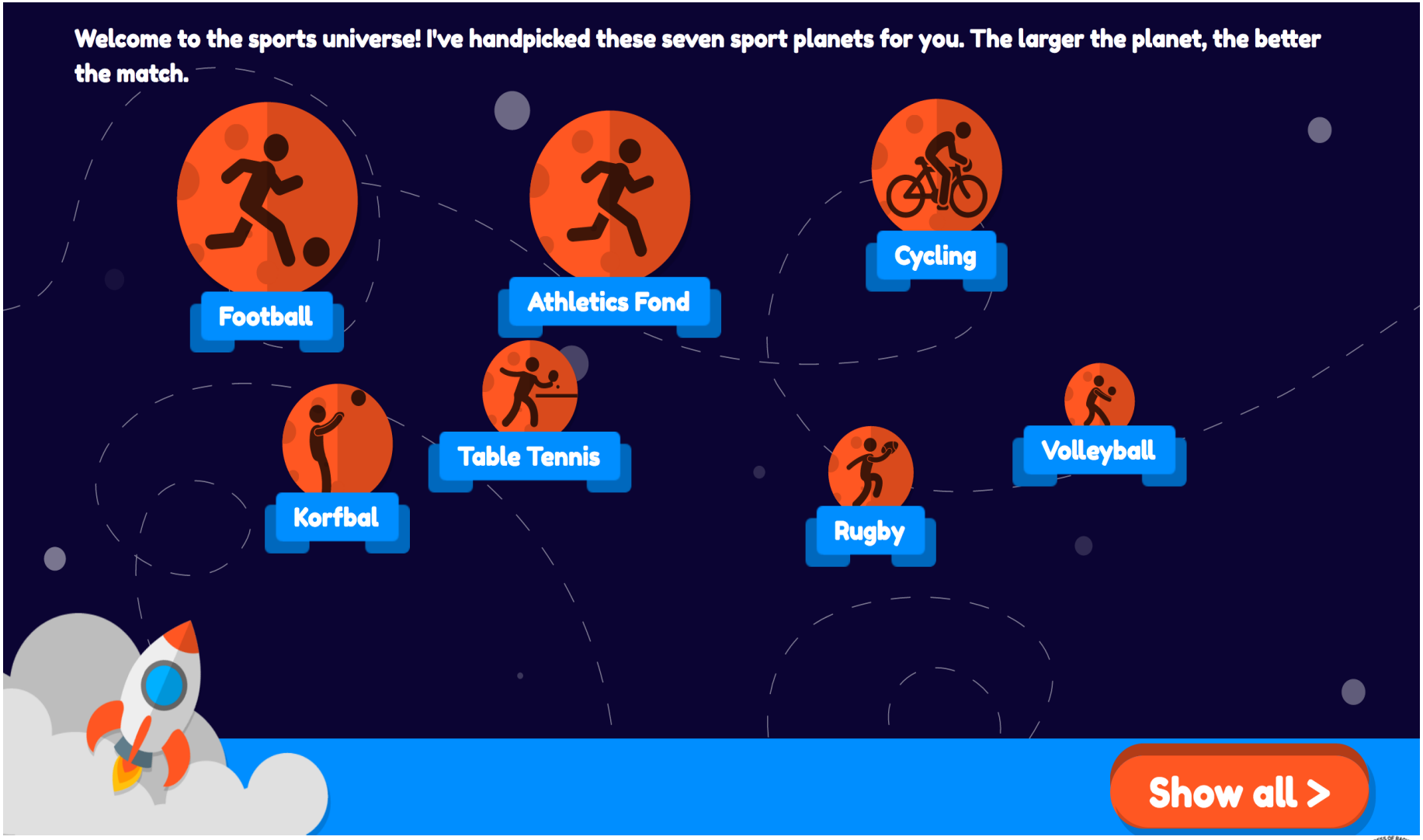
Orienting Sports Potential



Orienting Sports Potential



Orienting Sports Potential



Talent Identification and Development in Badminton

Specialising or Sampling

Specialising or Sampling

SportKompas I NEED (coaches' survey)

Specialising

Sampling

Talent Identification and Development in Badminton

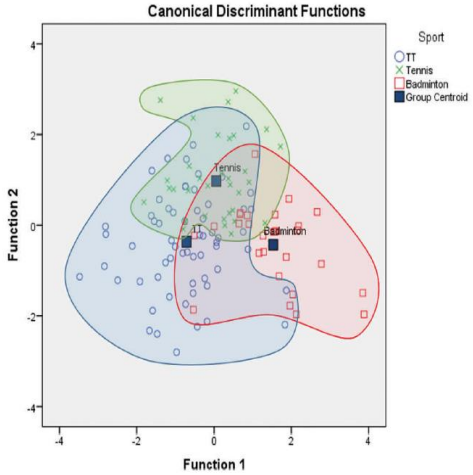
Journal of Sports Sciences

Routledge
Taylor & Francis Group

ISSN: 0264-0414 (Print) 1466-447X (Online) Journal homepage: http://www.tandfonline.com/loi/rjsp20

A coaches' perspective on the contribution of anthropometry, physical performance, and motor coordination in racquet sports

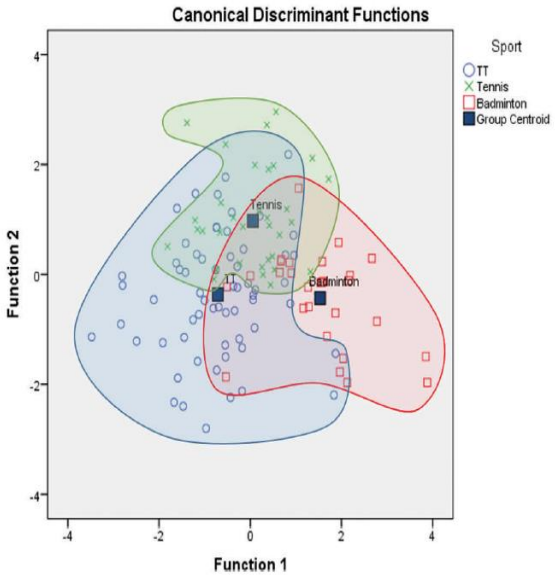
Kamasha Robertson, Johan Pion, Mireille Mostaert, Mohd Rozilee Wazir Norjali Wazir, Tamara Kramer, Irene Renate Faber, Pieter Vansteenkiste & Matthieu Lenoir




FREE YOUR MIND.
THE MATRIX

Talent Identification and Development in Badminton

Talent Identification and Development in Badminton



Balance

Flexibility

Core Stability

Climbing

Pull Strength

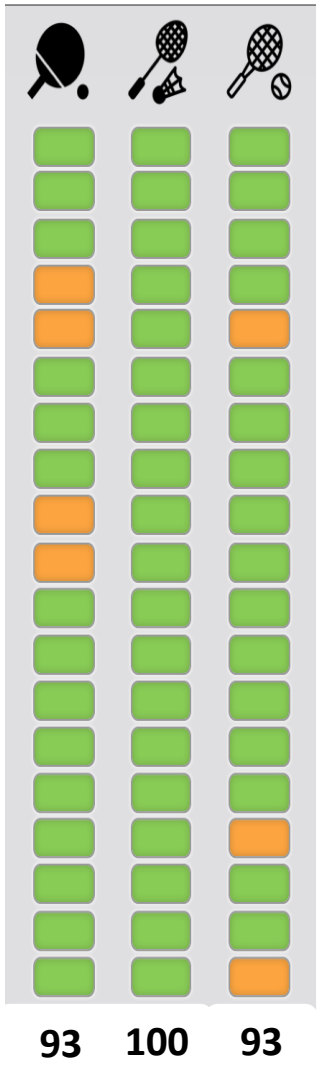
Catching

Rythm

Hitting

Individual / Team

Small / Tall



Velocity (Speed)

Endurance

Jumping

Agility Run

Throwing

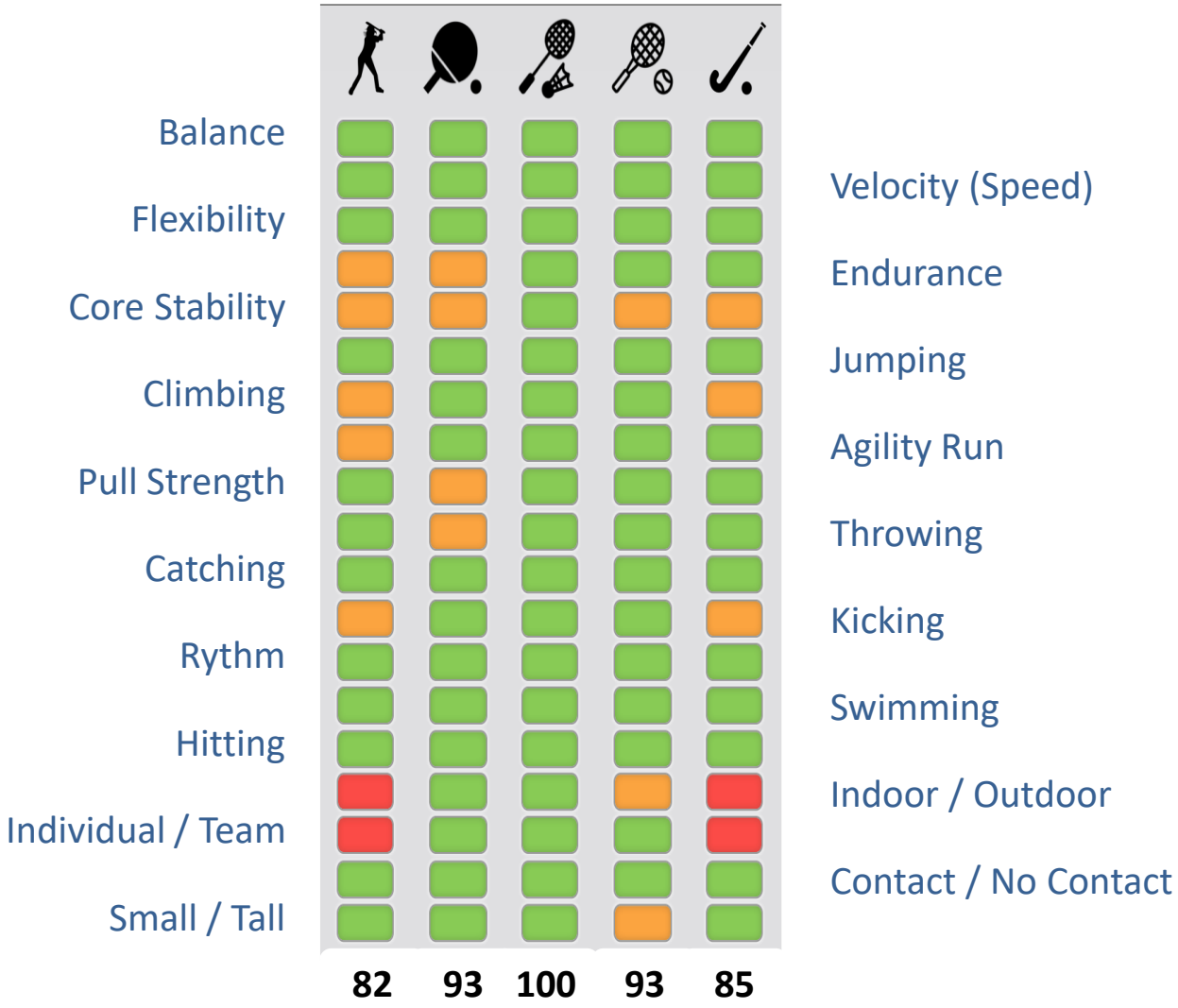
Kicking

Swimming

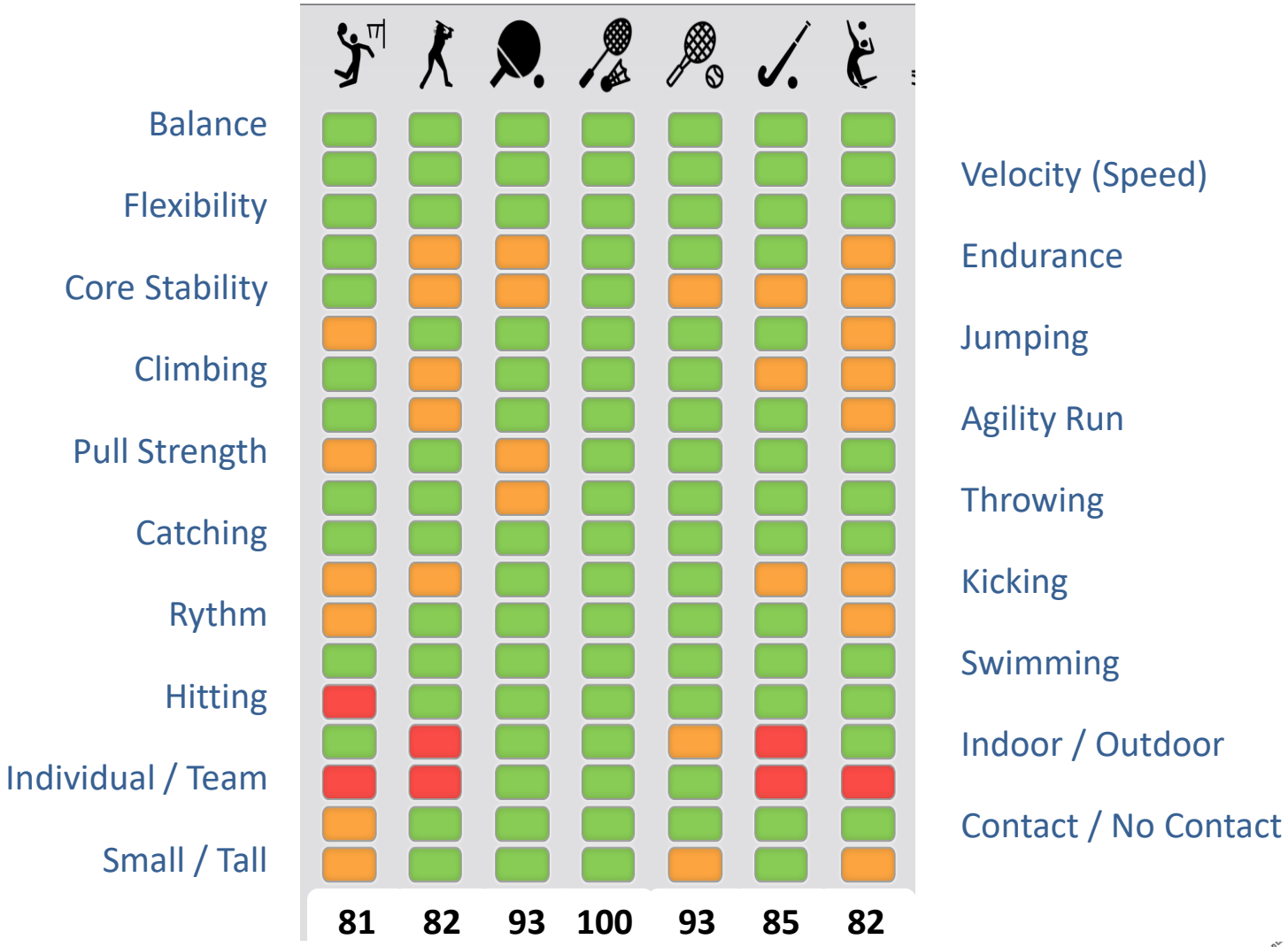
Indoor / Outdoor

Contact / No Contact

Talent Identification and Development in Badminton



Talent Identification and Development in Badminton



Talent Identification and Development in Badminton

Talent Identification and Development in Badminton

Specialising

Broader Specialisation

Directed Sampling

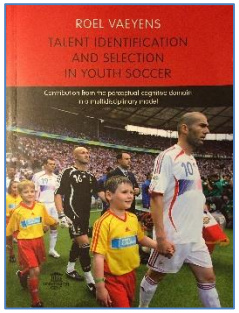
Sampling

Identifying Sports Potential

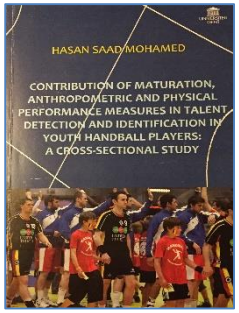
SPORT
TALENT

Sports specific talent identification tool for children at sports clubs

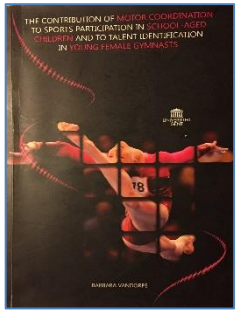
Talent Identification and Development in Badminton



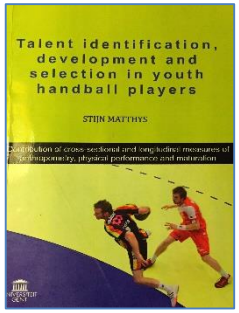
R. Vaeyens



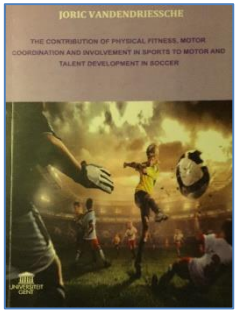
H. Mohammed



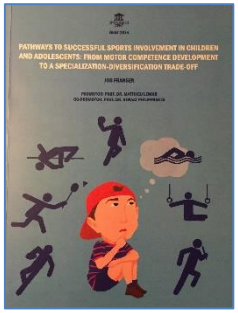
B. Vandorpe



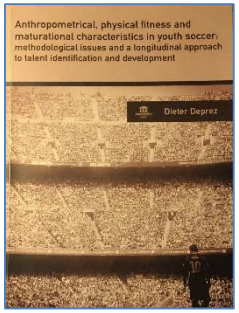
S. Matthys



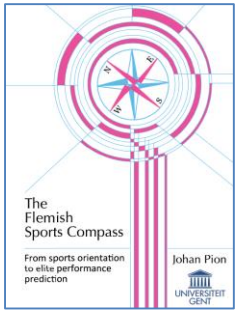
J. Vandendriessche



J. Fransen



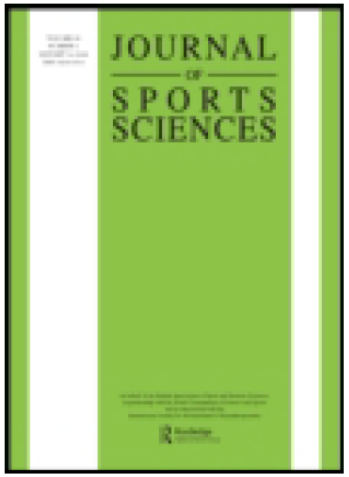
D. Deprez



J. Pion

Identifying Sports Potential

Predicting Sporting Elite



Journal of Sports Sciences
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rjsp20

The value of a non-sport-specific motor test battery in predicting performance in young female gymnasts

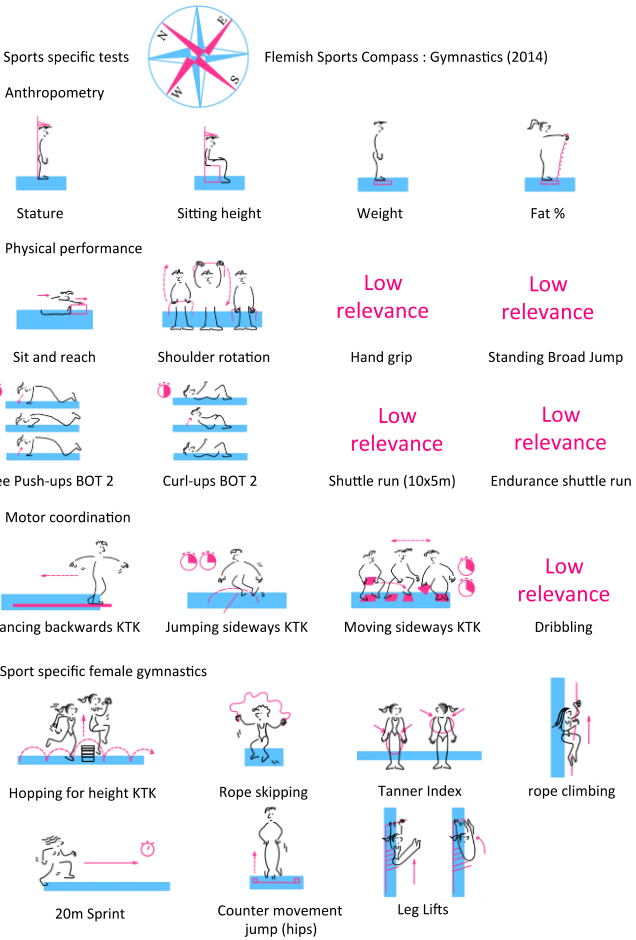
Barbara Vandorpe [a] , Joric B. Vandendriessche [a] , Roel Vaeyens [a] , Johan Pion [a] , Johan Lefevre [b] , Renaat M. Philippaerts [a] & Matthieu Lenoir [a]

[a] Department of Movement and Sport Sciences, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

[b] Department of Biomedical Kinesiology, Faculty of Kinesiology and Rehabilitation Sciences, KU Leuven, Leuven, Belgium

Predicting Sporting Elite

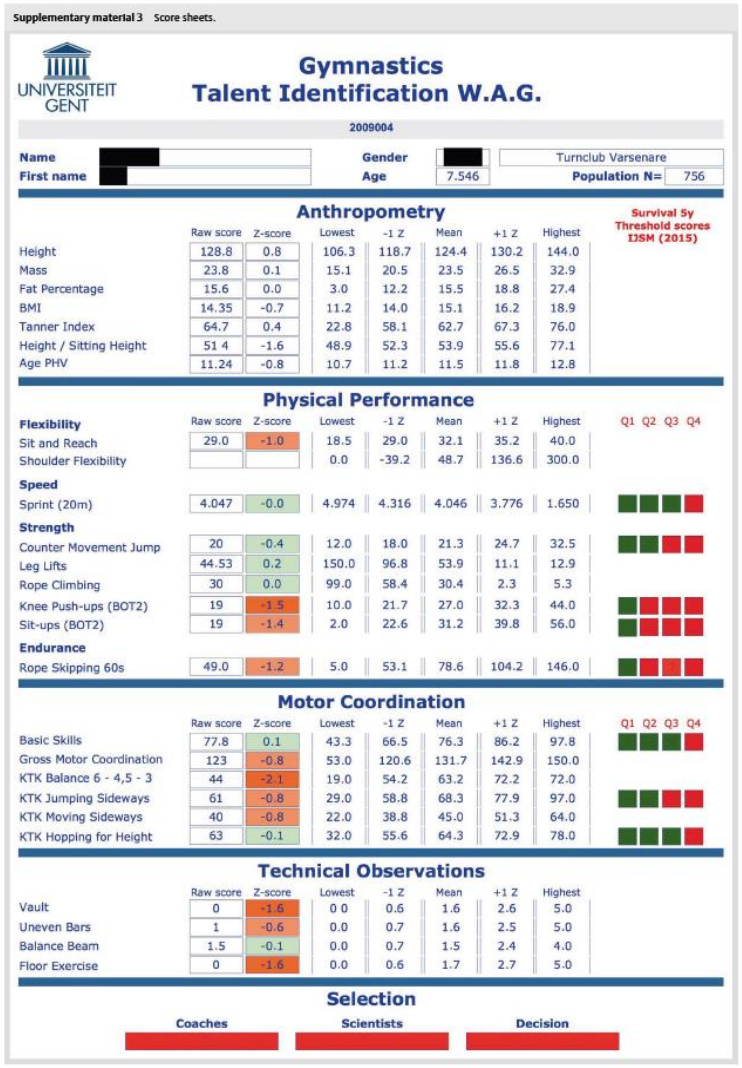
Gymnastics



SPORT KOMPAS

I DO

Predicting Sporting Elite



Supplementary material 3 Score sheets.

UNIVERSITEIT GENT

Gymnastics
Talent Identification W.A.G.

2009004

Name [redacted] Gender [redacted] Turnclub Varsenare
First name [redacted] Age 7.546 Population N= 756

Anthropometry

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Survival 5y Threshold scores IJSM (2015)
Height	128.8	0.8	106.3	118.7	124.4	130.2	144.0	
Mass	23.8	0.1	15.1	20.5	23.5	26.5	32.9	
Fat Percentage	15.6	0.0	3.0	12.2	15.5	18.8	27.4	
BMI	14.35	-0.7	11.2	14.0	15.1	16.2	18.9	
Tanner Index	64.7	0.4	22.8	58.1	62.7	67.3	76.0	
Height / Sitting Height	51 4	-1.6	48.9	52.3	53.9	55.6	77.1	
Age PHV	11.24	-0.8	10.7	11.2	11.5	11.8	12.8	

Physical Performance

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Flexibility								
Sit and Reach	29.0	-1.0	18.5	29.0	32.1	35.2	40.0	
Shoulder Flexibility			0.0	-39.2	48.7	136.6	300.0	
Speed								
Sprint (20m)	4.047	-0.0	4.974	4.316	4.046	3.776	1.650	
Strength								
Counter Movement Jump	20	-0.4	12.0	18.0	21.3	24.7	32.5	
Leg Lifts	44.53	0.2	150.0	96.8	53.9	11.1	12.9	
Rope Climbing	30	0.0	99.0	58.4	30.4	2.3	5.3	
Knee Push-ups (BOT2)	19	-1.5	10.0	21.7	27.0	32.3	44.0	
Sit-ups (BOT2)	19	-1.4	2.0	22.6	31.2	39.8	56.0	
Endurance								
Rope Skipping 60s	49.0	-1.2	5.0	53.1	78.6	104.2	146.0	

Motor Coordination

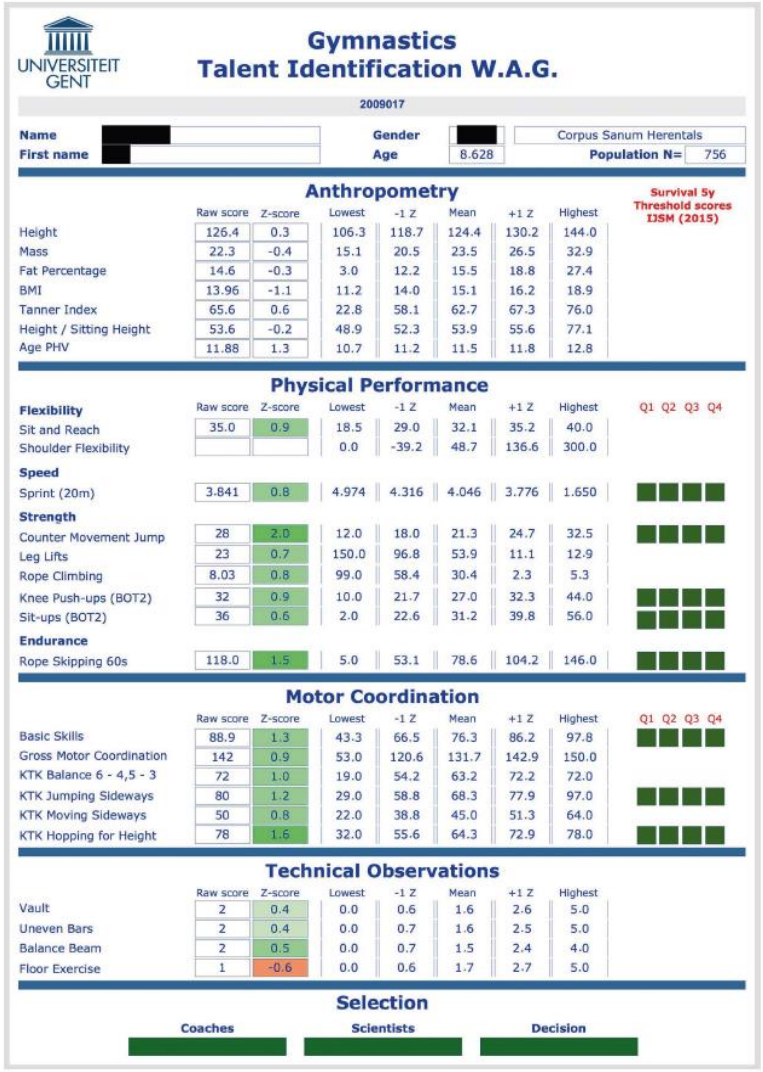
	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Basic Skills	77.8	0.1	43.3	66.5	76.3	86.2	97.8	
Gross Motor Coordination	123	-0.8	53.0	120.6	131.7	142.9	150.0	
KTK Balance 6 - 4,5 - 3	44	-2.1	19.0	54.2	63.2	72.2	72.0	
KTK Jumping Sideways	61	-0.8	29.0	58.8	68.3	77.9	97.0	
KTK Moving Sideways	40	-0.8	22.0	38.8	45.0	51.3	64.0	
KTK Hopping for Height	63	-0.1	32.0	55.6	64.3	72.9	78.0	

Technical Observations

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest
Vault	0	-1.6	0 0	0.6	1.6	2.6	5.0
Uneven Bars	1	-0.6	0.0	0.7	1.6	2.5	5.0
Balance Beam	1.5	-0.1	0.0	0.7	1.5	2.4	4.0
Floor Exercise	0	-1.6	0.0	0.6	1.7	2.7	5.0

Selection

Coaches | Scientists | Decision



UNIVERSITEIT GENT

Gymnastics
Talent Identification W.A.G.

2009017

Name [redacted] Gender [redacted] Corpus Sanum Herentals
First name [redacted] Age 8.628 Population N= 756

Anthropometry

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Survival 5y Threshold scores IJSM (2015)
Height	126.4	0.3	106.3	118.7	124.4	130.2	144.0	
Mass	22.3	-0.4	15.1	20.5	23.5	26.5	32.9	
Fat Percentage	14.6	-0.3	3.0	12.2	15.5	18.8	27.4	
BMI	13.96	-1.1	11.2	14.0	15.1	16.2	18.9	
Tanner Index	65.6	0.6	22.8	58.1	62.7	67.3	76.0	
Height / Sitting Height	53.6	-0.2	48.9	52.3	53.9	55.6	77.1	
Age PHV	11.88	1.3	10.7	11.2	11.5	11.8	12.8	

Physical Performance

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Flexibility								
Sit and Reach	35.0	0.9	18.5	29.0	32.1	35.2	40.0	
Shoulder Flexibility			0.0	-39.2	48.7	136.6	300.0	
Speed								
Sprint (20m)	3.841	0.8	4.974	4.316	4.046	3.776	1.650	
Strength								
Counter Movement Jump	28	2.0	12.0	18.0	21.3	24.7	32.5	
Leg Lifts	23	0.7	150.0	96.8	53.9	11.1	12.9	
Rope Climbing	8.03	0.8	99.0	58.4	30.4	2.3	5.3	
Knee Push-ups (BOT2)	32	0.9	10.0	21.7	27.0	32.3	44.0	
Sit-ups (BOT2)	36	0.6	2.0	22.6	31.2	39.8	56.0	
Endurance								
Rope Skipping 60s	118.0	1.5	5.0	53.1	78.6	104.2	146.0	

Motor Coordination

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Basic Skills	88.9	1.3	43.3	66.5	76.3	86.2	97.8	
Gross Motor Coordination	142	0.9	53.0	120.6	131.7	142.9	150.0	
KTK Balance 6 - 4,5 - 3	72	1.0	19.0	54.2	63.2	72.2	72.0	
KTK Jumping Sideways	80	1.2	29.0	58.8	68.3	77.9	97.0	
KTK Moving Sideways	50	0.8	22.0	38.8	45.0	51.3	64.0	
KTK Hopping for Height	78	1.6	32.0	55.6	64.3	72.9	78.0	

Technical Observations

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest
Vault	2	0.4	0.0	0.6	1.6	2.6	5.0
Uneven Bars	2	0.4	0.0	0.7	1.6	2.5	5.0
Balance Beam	2	0.5	0.0	0.7	1.5	2.4	4.0
Floor Exercise	1	-0.6	0.0	0.6	1.7	2.7	5.0

Selection

Coaches | Scientists | Decision

Predicting Sporting Elite

Talent in Female Gymnastics: a Survival Analysis Based upon Performance Characteristics

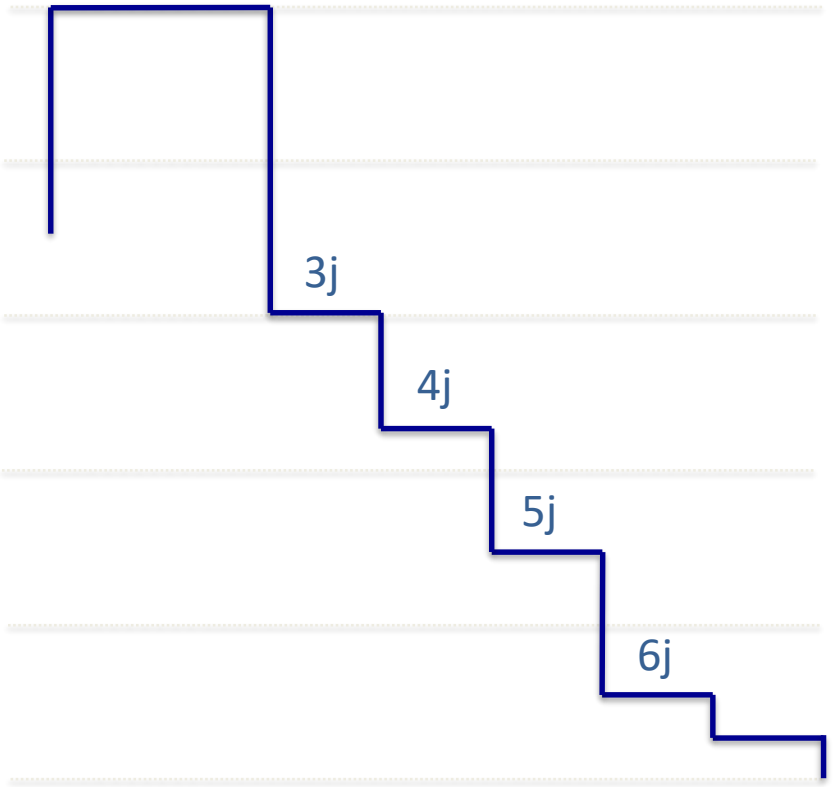
DOI 10.1055/s-0035-1548887
Int J Sports Med 2015; 36: 935–940

Authors J. Pion, M. Lenoir, B. Vandorpe, V. Segers

Affiliation Ghent University, Movement and Sports Sciences, Ghent, Belgium

Predicting Sporting Elite

Gymnastics (WAG)

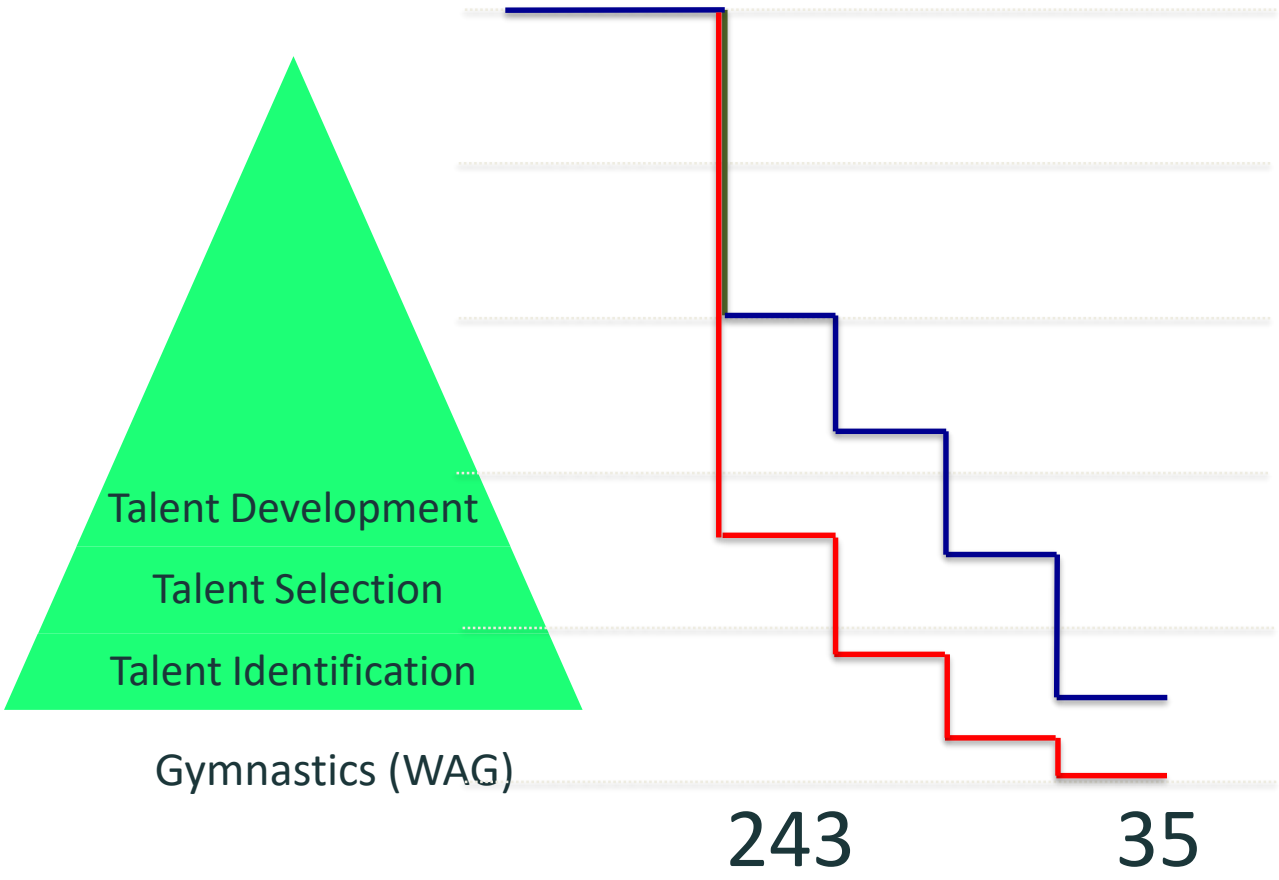


Baseline → 5y later

243 → 35

Talent in female gymnastics: a survival analysis based upon performance characteristics
Pion J, Lenoir M, Vandorpe B, Segers V
International Journal of Sports Medicine 2015; 36(11): 935-940

Predicting Sporting Elite



Sprint 20m
Drop Out Ratio
67.6%

< 3.90 s.
> 4.28 s.

Talent in female gymnastics: a survival analysis based upon performance characteristics
Pion J, Lenoir M, Vandorpe B, Segers V
International Journal of Sports Medicine 2015; 36(11): 935-940

Predicting Sporting Elite

Journal of Sports Sciences

Routledge
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Predictive models reduce talent development costs in female gymnastics

Johan Pion, Andreas Hohmann, Tianbiao Liu, Matthieu Lenoir & Veerle Segers

Predicting Sporting Elite

UNIVERSITEIT GENT

Gymnastics
Talent Identification W.A.G.

2009017

Name	[redacted]	**Gender**	[redacted]	Corpus Sanum Herentals	
First name	[redacted]	**Age**	8.628	**Population N=**	756

Anthropometry

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Survival 5y Threshold scores IJSM (2015)
Height	126.4	0.3	106.3	118.7	124.4	130.2	144.0	
Mass	22.3	-0.4	15.1	20.5	23.5	26.5	32.9	
Fat Percentage	14.6	-0.3	3.0	12.2	15.5	18.8	27.4	
BMI	13.96	-1.1	11.2	14.0	15.1	16.2	18.9	
Tanner Index	65.6	0.6	22.8	58.1	62.7	67.3	76.0	
Height / Sitting Height	53.6	-0.2	48.9	52.3	53.9	55.6	77.1	
Age PHV	11.88	1.3	10.7	11.2	11.5	11.8	12.8	

Physical Performance

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Flexibility								
Sit and Reach	35.0	0.9	18.5	29.0	32.1	35.2	40.0	
Shoulder Flexibility			0.0	-39.2	48.7	136.6	300.0	
Speed								
Sprint (20m)	3.841	0.8	4.974	4.316	4.046	3.776	1.650	
Strength								
Counter Movement Jump	28	2.0	12.0	18.0	21.3	24.7	32.5	
Leg Lifts	23	0.7	150.0	96.8	53.9	11.1	12.9	
Rope Climbing	8.03	0.8	99.0	58.4	30.4	2.3	5.3	
Knee Push-ups (BOT2)	32	0.9	10.0	21.7	27.0	32.3	44.0	
Sit-ups (BOT2)	36	0.6	2.0	22.6	31.2	39.8	56.0	
Endurance								
Rope Skipping 60s	118.0	1.5	5.0	53.1	78.6	104.2	146.0	

Motor Coordination

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest	Q1 Q2 Q3 Q4
Basic Skills	88.9	1.3	43.3	66.5	76.3	86.2	97.8	
Gross Motor Coordination	142	0.9	53.0	120.6	131.7	142.9	150.0	
KTK Balance 6 - 4,5 - 3	72	1.0	19.0	54.2	63.2	72.2	72.0	
KTK Jumping Sideways	80	1.2	29.0	58.8	68.3	77.9	97.0	
KTK Moving Sideways	50	0.8	22.0	38.8	45.0	51.3	64.0	
KTK Hopping for Height	78	1.6	32.0	55.6	64.3	72.9	78.0	

Technical Observations

	Raw score	Z-score	Lowest	-1 Z	Mean	+1 Z	Highest
Vault	2	0.4	0.0	0.6	1.6	2.6	5.0
Uneven Bars	2	0.4	0.0	0.7	1.6	2.5	5.0
Balance Beam	2	0.5	0.0	0.7	1.5	2.4	4.0
Floor Exercise	1	-0.6	0.0	0.6	1.7	2.7	5.0

Selection

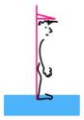
Coaches	Scientists	Decision

Talent Identification and Development in Badminton

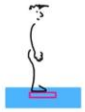
Generic tests

Flemish Sports Compass (2015)

Anthropometry


Stature

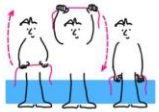

Sitting height


Weight


Fat %

Physical performance

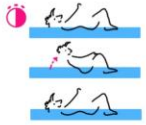

Sit and reach

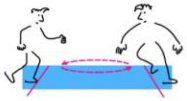

Shoulder rotation


Hand grip


Standing Broad Jump


Knee Push-ups BOT 2


Curl-ups BOT 2

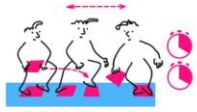

Shuttle run (10x5m)

Endurance shuttle run

Motor coordination


Balancing backwards KTK


Jumping sideways KTK

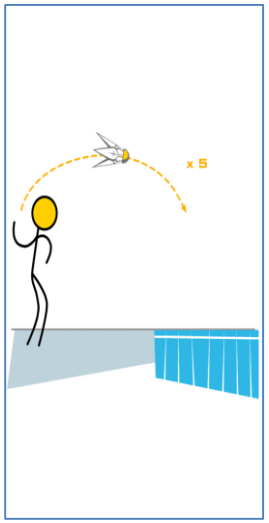

Moving sideways KTK


Dribbling

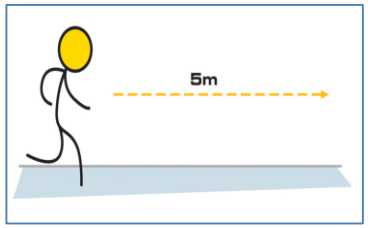
SPORT KOMPAS

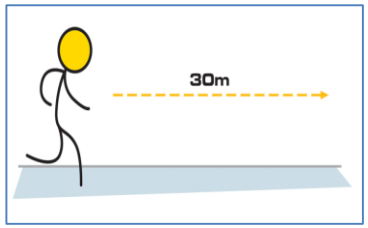
I DO

Talent Identification and Development in Badminton

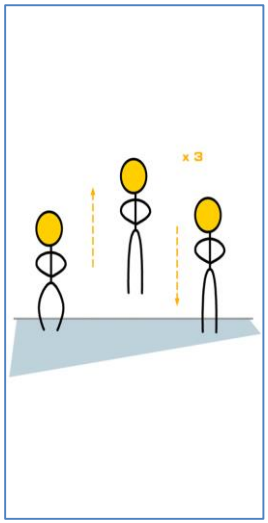


Shuttle Throw





Sprint 5m / 30m



CM Jump

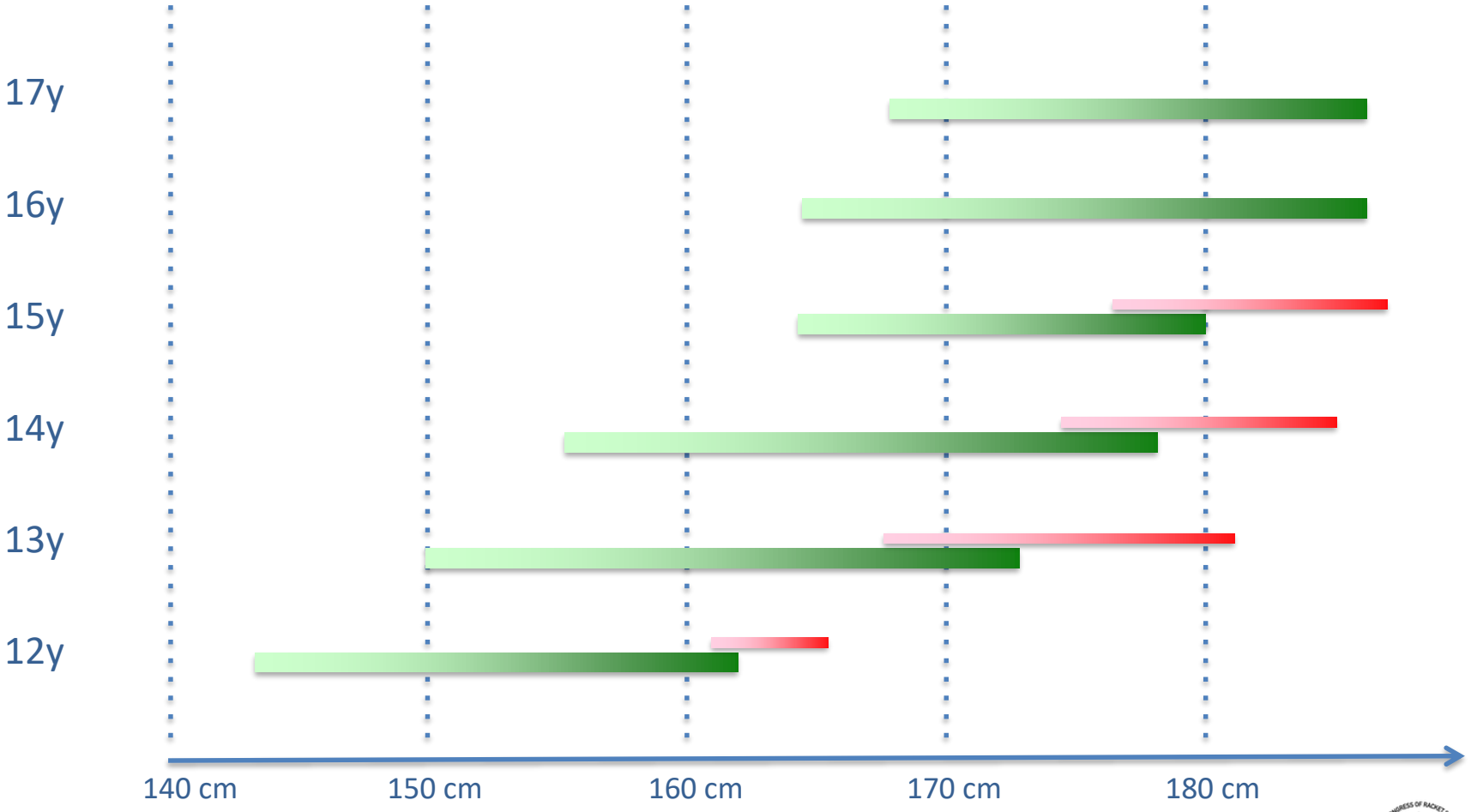
SPORT KOMPAS

I DO

Growth and Maturation

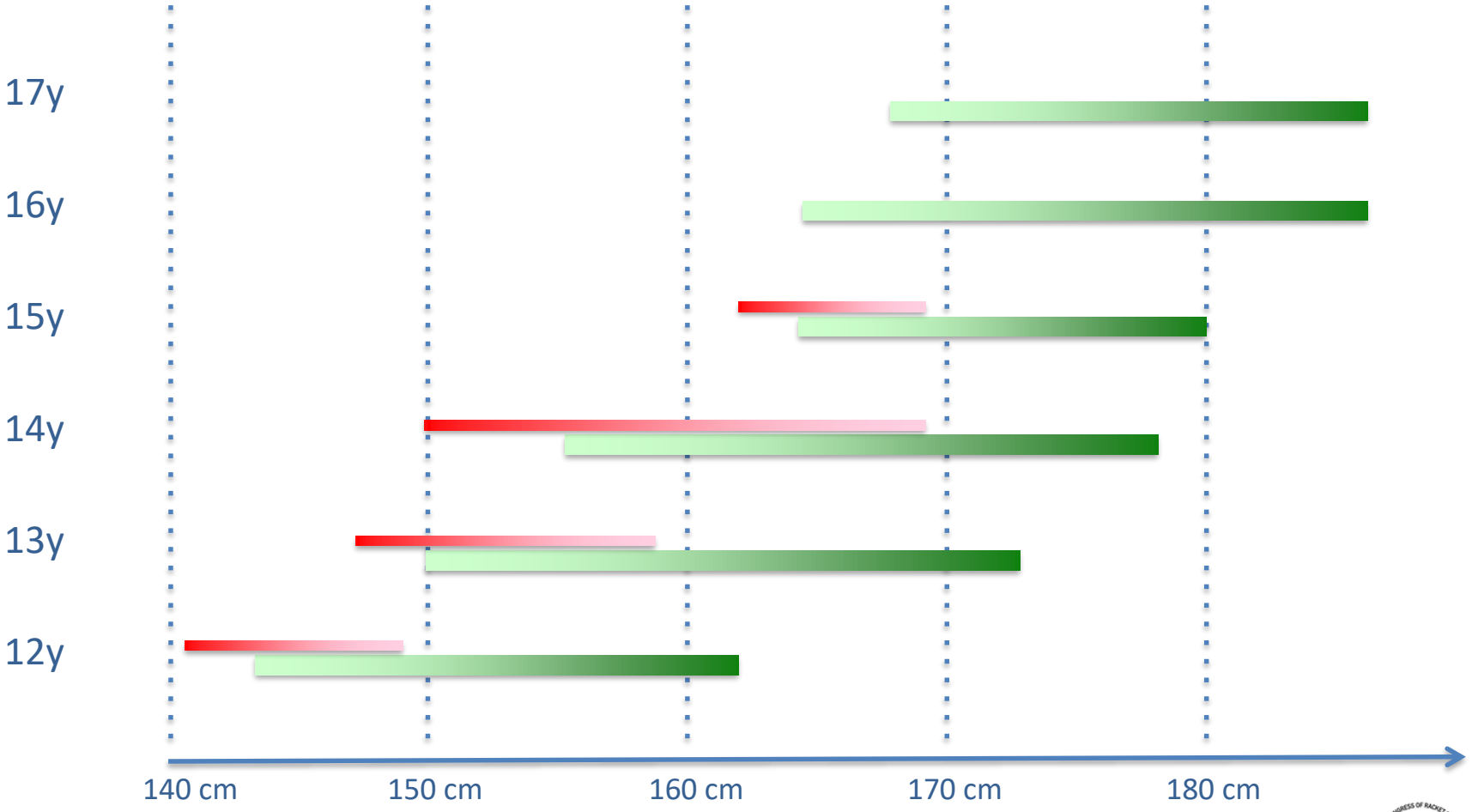
Talent Identification and Development in Badminton

Stature (APHV 6 months earlier)



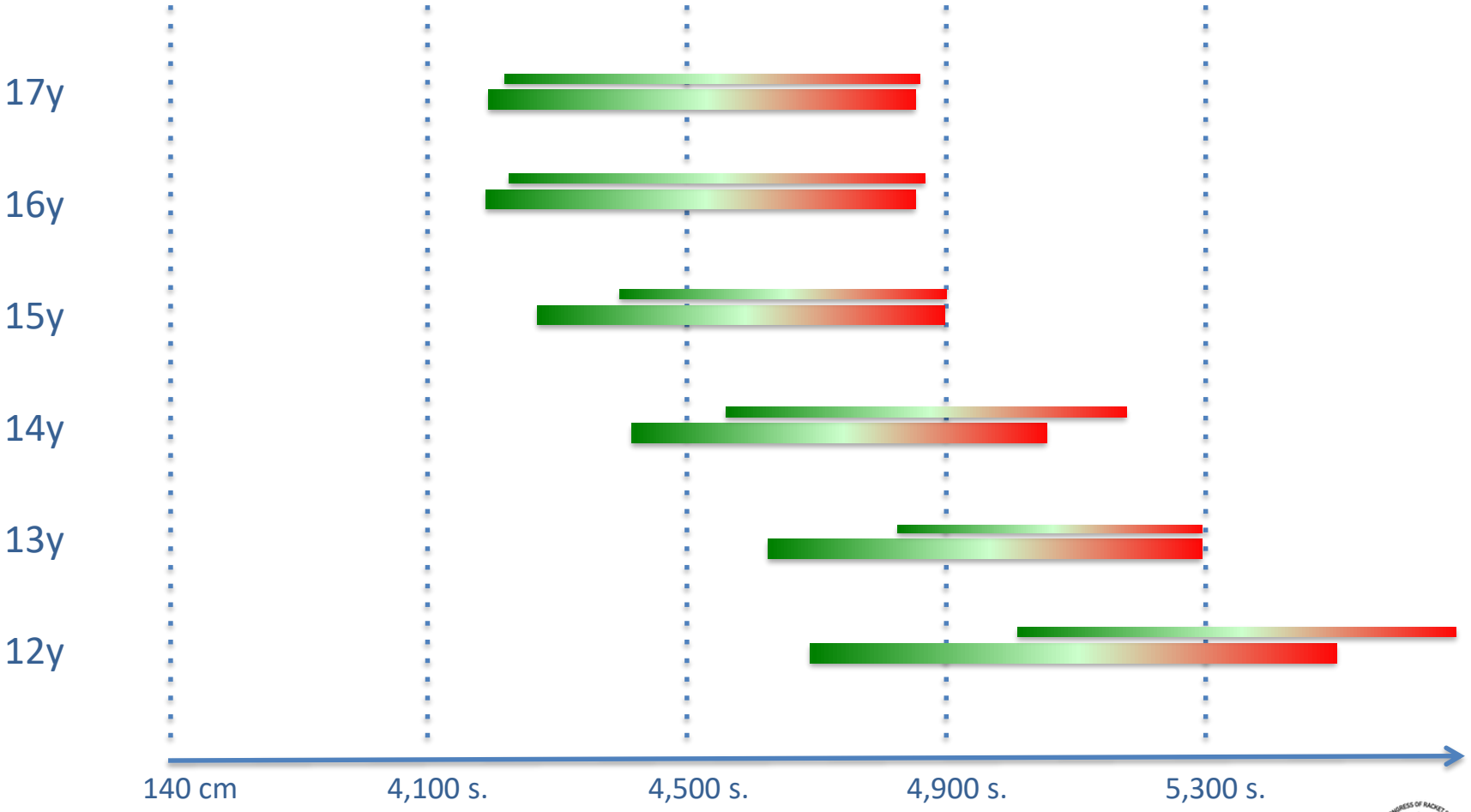
Talent Identification and Development in Badminton

Stature (APHV 6 months later)

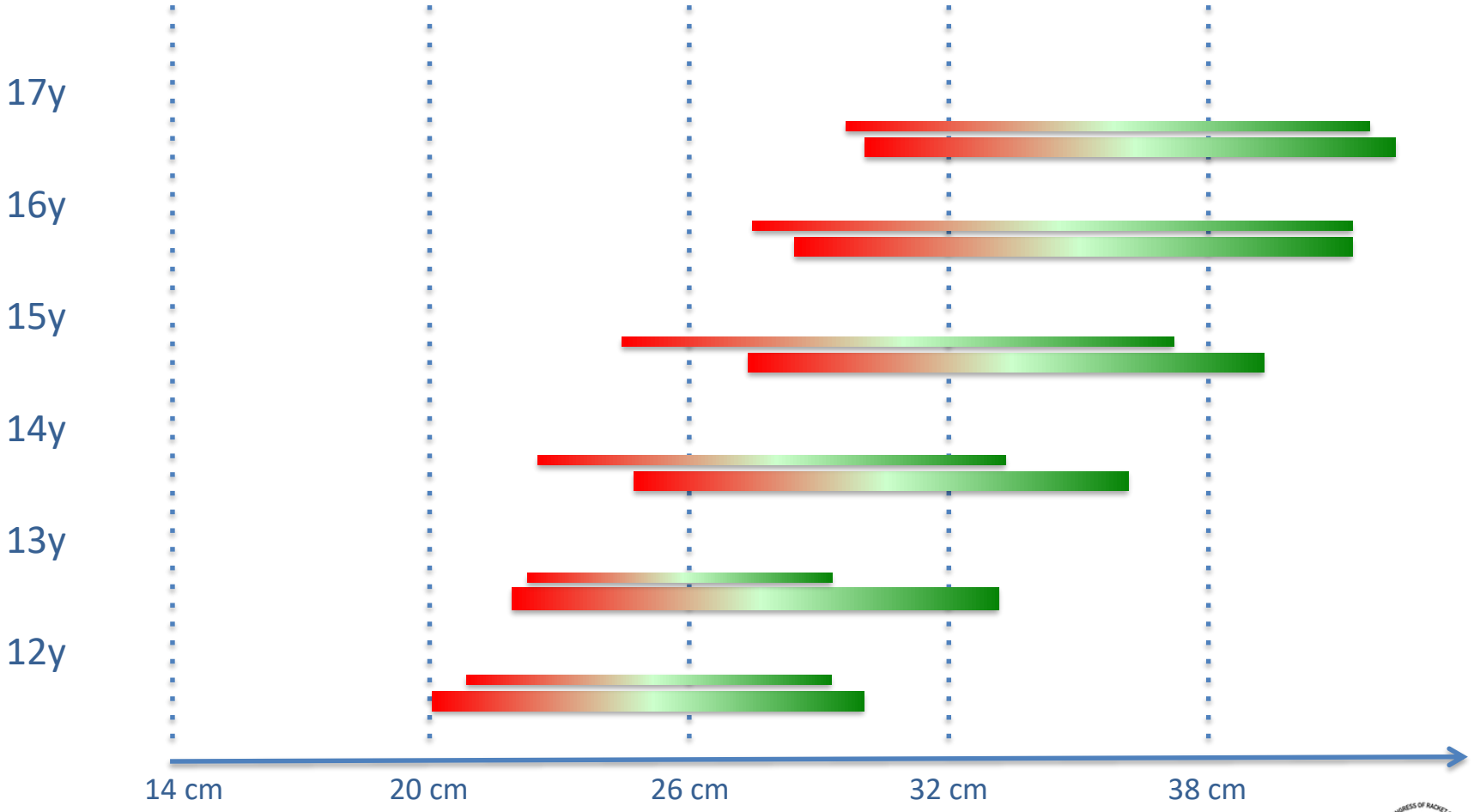


Talent Identification and Development in Badminton

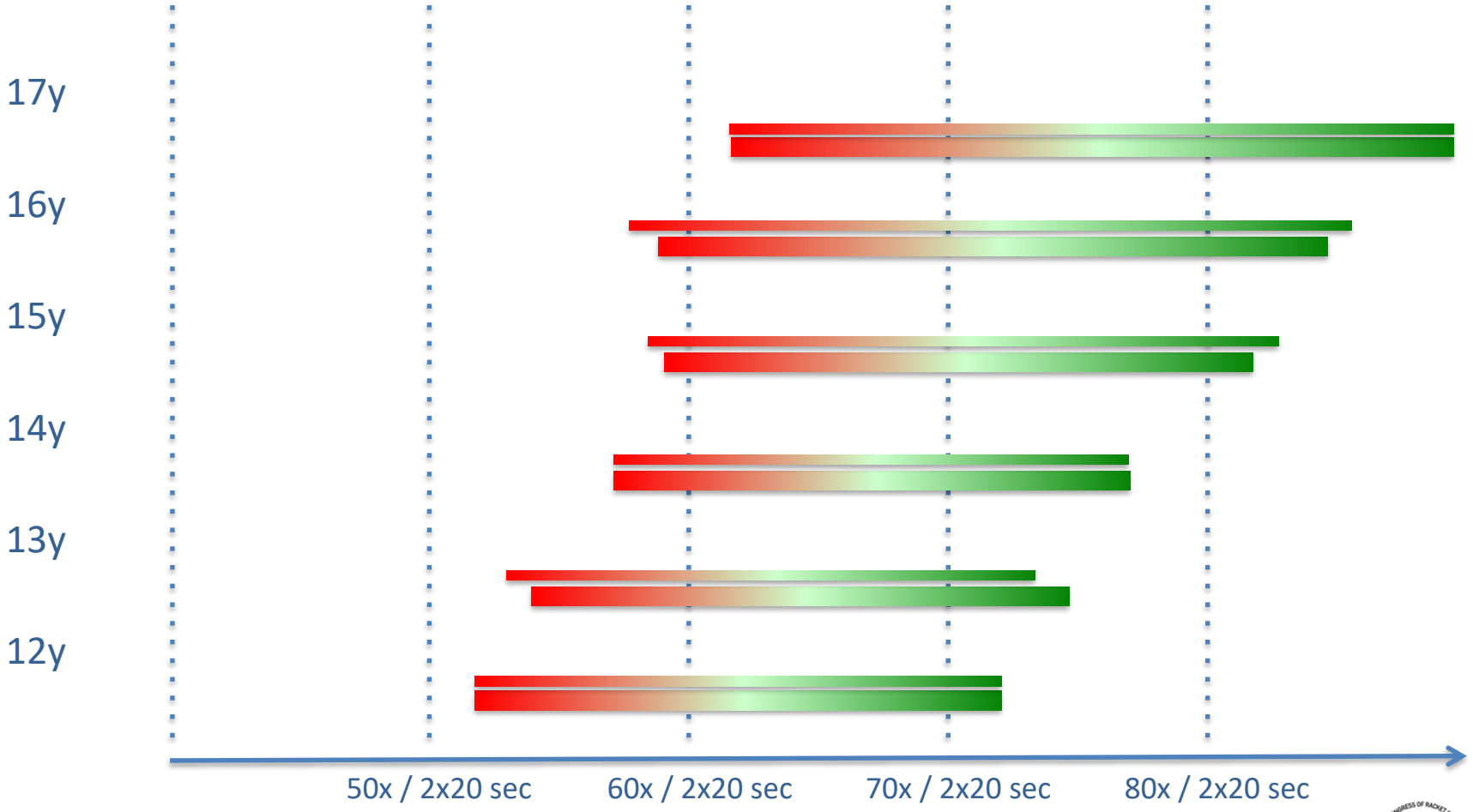
Sprint 30m (APHV 6 months later)



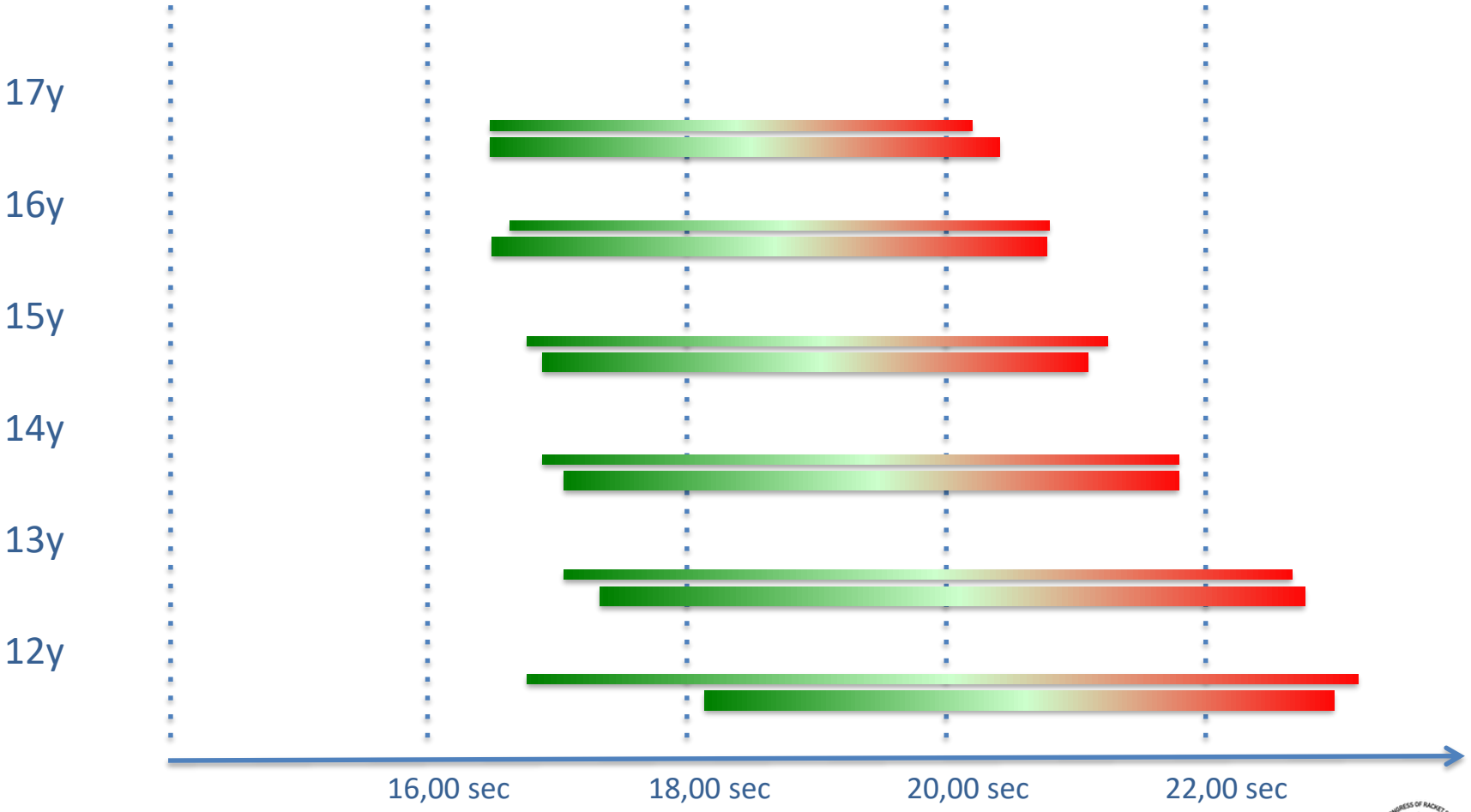
Counter movement jump (APHV 6 months later)



KTK Moving Sideways (APHV 6 months later)



Dribble feet (APHV 6 months later)



NSCA CEU QUIZ

Available at: http://www.nsca.com/Certification/Continuing-Education/CEU-Quizzes/

Bio-banding in Sport: Applications to Competition, Talent Identification, and Strength and Conditioning of Youth Athletes

Sean P. Cumming, PhD,[1] Rhodri S. Lloyd, PhD,[2,3] Jon L. Oliver, PhD,[2,3] Joey C. Eisenmann, PhD,[4] and Robert M. Malina, PhD[5,6]

[1]Department for Health, University of Bath, Bath, United Kingdom; [2]Youth Physical Development Centre, Cardiff Metropolitan University, Cardiff, United Kingdom; [3]Sports Performance Research Institute New Zealand, Auckland University of Technology, Auckland, New Zealand; [4]College of Osteopathic Medicine, Michigan State University, East Lansing, Michigan; [5]Department of Kinesiology and Health Education, University of Texas, Austin, Texas; and [6]Tarleton State University, Stephenville, Texas

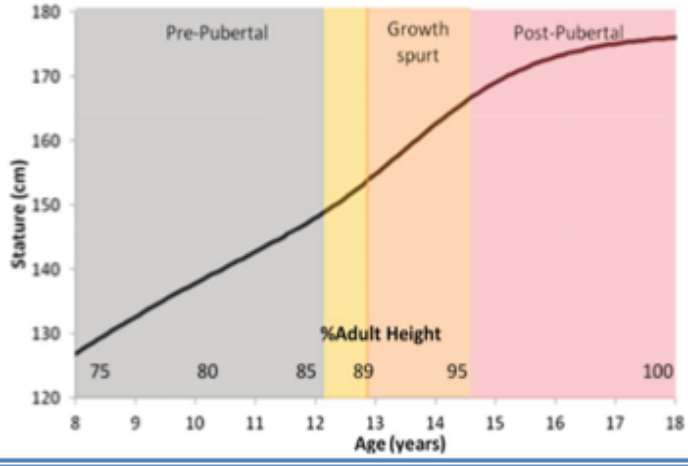
Talent Identification and Development in Badminton

Anthropometry

		Lowest	-1 Z	mean	+1 Z	highest
Stature	155,3	155,3	155,2	165,9	176,7	176,8
Body weight	38,4	38,4	38,2	48,3	58,5	58,7
Sitting height	78,4	78,4	77,7	84,8	91,9	92,4
BMI	15,92	15,9	16,0	17,4	18,8	18,8

Growth prediction

Maturity offset (Mirwald et al, 2002)	-1,6
APHV (Mirwald et al, 2002)	14,1
Growth prediction (Sherar et al 2005)	166,9
Growth prediction (curve)	178,4
Grow potential (curve)	23,1
% adult height (curve)	



Bio-bands of maturity for an individual male based on cumulative growth and percentage of adult height (Cumming et al 2017).

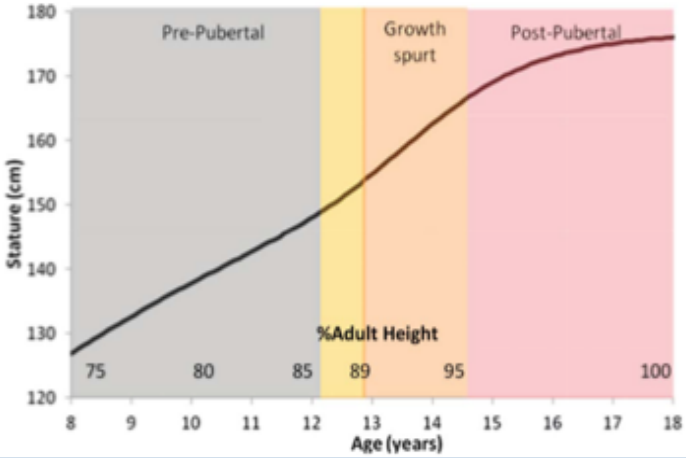
Talent Identification and Development in Badminton

Anthropometry

		Lowest	-1 Z	mean	+1 Z	highest
Stature	165,7	155,3	155,2	165,9	176,7	176,8
Body weight	47,9	38,4	38,2	48,3	58,5	58,7
Sitting height	83,6	78,4	77,7	84,8	91,9	92,4
BMI	17,45	15,9	16,0	17,4	18,8	18,8

Growth prediction

Maturity offset (Mirwald et al, 2002)	-0,4
APHV (Mirwald et al, 2002)	13,9
Growth prediction (Sherar et al 2005)	173,9
Growth prediction (curve)	182,0
Grow potential (curve)	16,3
% adult height (curve)	



Bio-bands of maturity for an individual male based on cumulative growth and percentage of adult height (Cumming et al 2017).

Talent Identification and Development in Badminton

Name	Pint	**Ranking Score**	782		
First Name	Lander			Year	Month	Day
Gender (M /F)	M	**Date of birth**	1997	9	11
Age	12,51	**Test date**	2010	3	16

Anthropometry

		Lowest	-1 Z	mean	+1 Z	highest
Stature	155,3	155,3	155,2	165,9	176,7	176,8
Body weight	38,4	38,4	38,2	48,3	58,5	58,7
Sitting height	78,4	78,4	77,7	84,8	91,9	92,4
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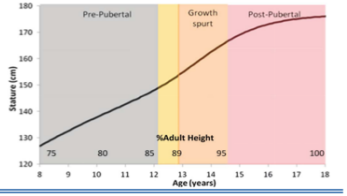

Physical performance tests

		Lowest	-1 Z	mean	+1 Z	highest
Sit and reach (cm)	26	26	26	27	28	29
Sprint 5m (s)	1,161	1,207	1,215	1,148	1,081	1,075
Sprint 30m (s)	4,88	5,04	5,11	4,763	4,41	4,37
Counter Movement Jump (cm)	24,5	24,5	24,7	31,4	38,2	38,0
Standing Broad Jump (cm)	172	172	169	196	223	226
Endurance Shuttle Run (min)	11	11	11	12	13	13

Coordination tests

		Lowest	-1 Z	mean	+1 Z	highest
Balance beam KTK 6 - 4,5 - 3	59	59	58	62	66	67
Jumping sideways KTK	98	97	97	98	98	98
Moving sideways KTK	63	63	63	68	73	73

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Name	Pint	**Ranking Score**	782		
First Name	Lander			Year	Month	Day
Gender (M /F)	M	**Date of birth**	1997	9	11
Age	13,526	**Test date**	2011	3	22

Anthropometry

		Lowest	-1 Z	mean	+1 Z	highest
Stature	165,7	155,3	155,2	165,9	176,7	176,8
Body weight	47,9	38,4	38,2	48,3	58,5	58,7
Sitting height	83,6	78,4	77,7	84,8	91,9	92,4
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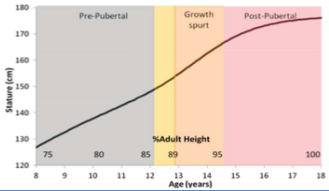

Physical performance tests

		Lowest	-1 Z	mean	+1 Z	highest
Sit and reach (cm)	27	26	26	27	28	29
Sprint 5m (s)	1,207	1,207	1,215	1,148	1,081	1,075
Sprint 30m (s)	5,039	5,04	5,11	4,763	4,41	4,37
Counter Movement Jump (cm)	31,76	24,5	24,7	31,4	38,2	38,0
Standing Broad Jump (cm)	190	172	169	196	223	226
Endurance Shuttle Run (min)	11	11	11	12	13	13

Coordination tests

		Lowest	-1 Z	mean	+1 Z	highest
Balance beam KTK 6 - 4,5 - 3	61	59	58	62	66	67
Jumping sideways KTK	98	97	97	98	98	98
Moving sideways KTK	67	63	63	68	73	73

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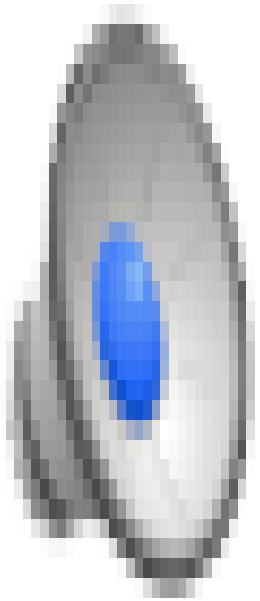
Talent Identification and Development in Badminton



Future Projects


eTALENT Lab
Hogeschool van Arnhem en Nijmegen
HAN University of Applied Sciences

Talent Identification and Development in Badminton

Thank you