Projects and strategies for recruitment, identification and worldwide development of talent

Roel Vaeyens

Seminario internazionale
PROGETTO TALENTO:
RICERCA, INDIVIDUAZIONE E SVILUPPO

SEARCHING FOR TALENT: AN IMPOSSIBLE TASK?

????

raw material

end product

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ELITE ATHLETE: A DREAM!?

IMPORTANCE TALENT IDENTIFICATION

- Sportive success ➲ progression from youth to adult elite level
- Evolutions in society
  - search for talent / 'excellence' e.g., Idol tv formats
  - performance-driven ➲ evaluation
  - sport = business
- New world power / Economic crisis / Small countries
  - decreasing competitiveness with financially stronger countries
  - smaller talent pool

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WHAT IS TALENT?

- Definition: no consensus
  - Gagné (1999): Talent = superior mastery of systematically developed abilities (competencies) in any field of human activity to a level that the individual belongs to the top 10% of peers active in that field
- Nature-nurture debate:

  combination of genes and environment
- Complex item ➲ 'potential' to become expert
- Different stages (Russel, 1989; Williams & Reilly, 2000)

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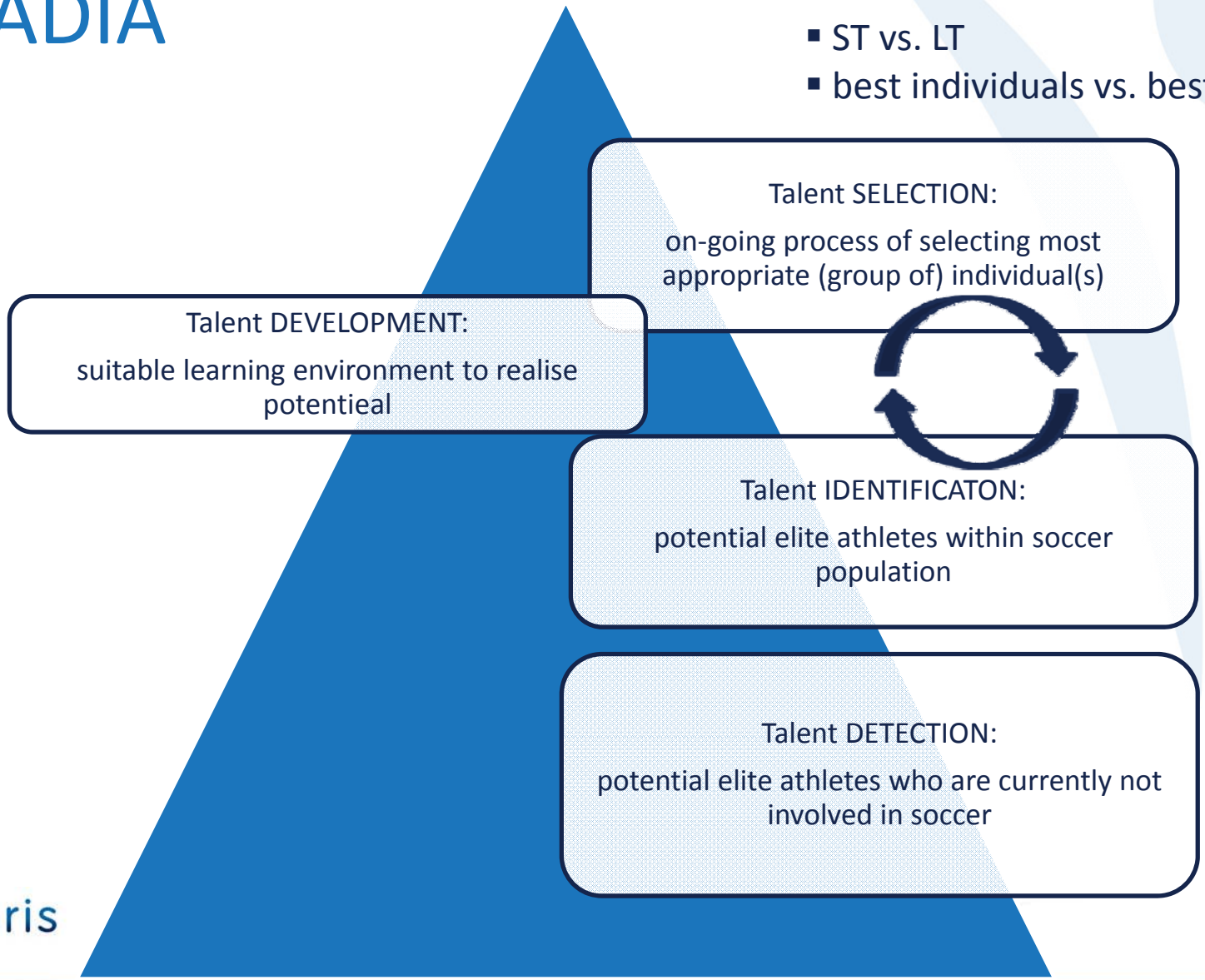
STADIA

- ST vs. LT
- best individuals vs. best team



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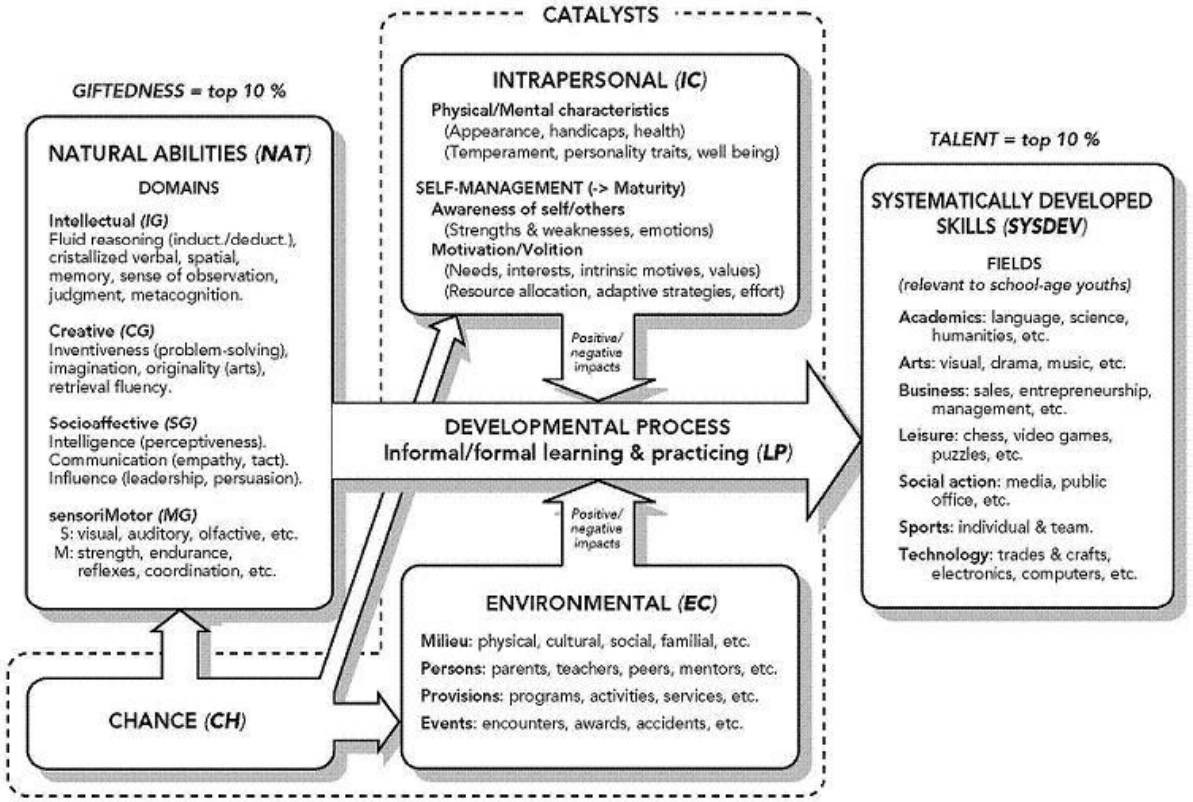
Adapted from Williams & Reilly (2000)

DETERMINANTS & INFLUENCES

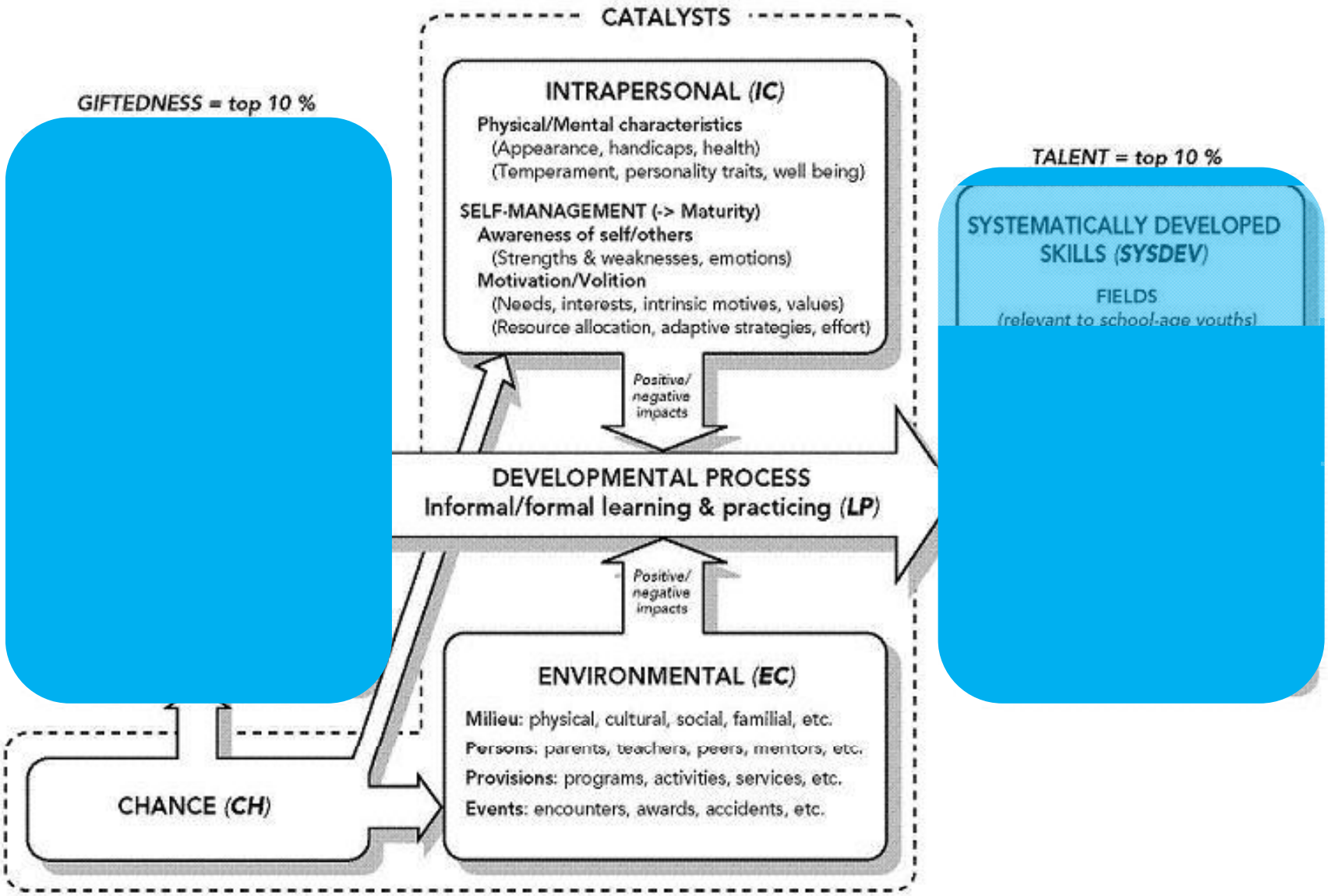
- Differentiated Model of Giftedness and Talent (Gagné):



Gagné (2005)

DETERMINANTS & INFLUENCES

- Differentiated Model of Giftedness and Talent (Gagné):
  natural abilities via developmental process ➲ systematically developed skills
- Clear distinction between
  - ‘giftedeness’ = constituing elements
  - talent = end product of development


CATALYSTS
GIFTEDNESS = top 10 %
INTRAPERSONAL (IC)
Physical/Mental characteristics
(Appearance, handicaps, health)
(Temperament, personality traits, well being)
SELF-MANAGEMENT (-> Maturity)
Awareness of self/others
(Strengths & weaknesses, emotions)
Motivation/Volition
(Needs, interests, intrinsic motives, values)
(Resource allocation, adaptive strategies, effort)
Positive/ negative impacts
TALENT = top 10 %
SYSTEMATICALLY DEVELOPED SKILLS (SYSDEV)
FIELDS
(relevant to school-age youths)
DEVELOPMENTAL PROCESS
Informal/formal learning & practicing (LP)
Positive/ negative impacts
ENVIRONMENTAL (EC)
Milieu: physical, cultural, social, familial, etc.
Persons: parents, teachers, peers, mentors, etc.
Provisions: programs, activities, services, etc.
Events: encounters, awards, accidents, etc.
CHANCE (CH)

Gagné (2005)

DETERMINANTS & INFLUENCES

- Differentiated Model of Giftedness and Talent (Gagné):
  natural abilities via developmental process ➲ systematically developed skills
- Clear distinction between
  - ‘giftedeness’ = constituing elements
  - talent = end product of development
- Trio of catalysts
  - intrapersonal
  - environment
  - chance

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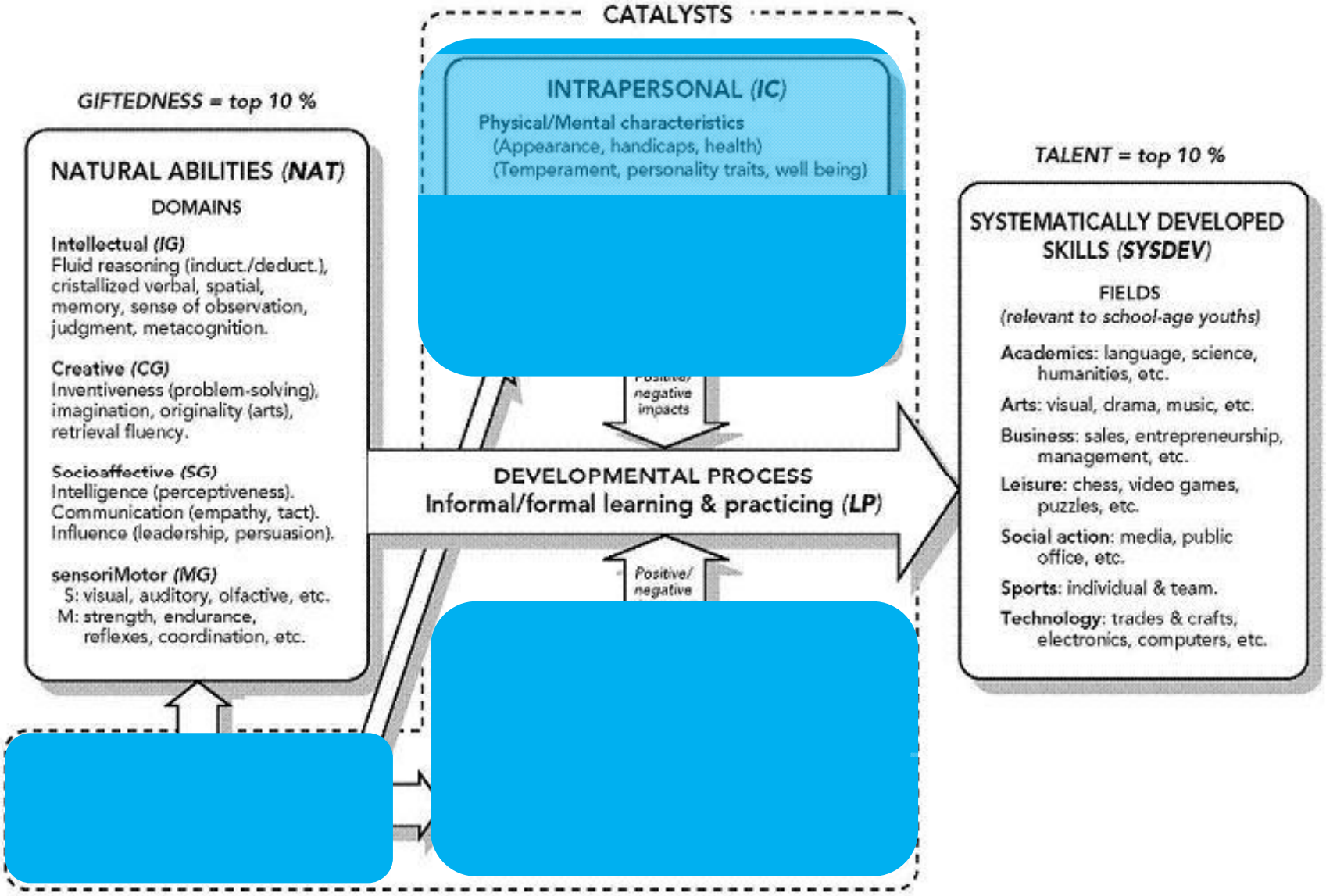

CATALYSTS
GIFTEDNESS = top 10 %
INTRAPERSONAL (IC)
Physical/Mental characteristics
(Appearance, handicaps, health)
(Temperament, personality traits, well being)
NATURAL ABILITIES (NAT)
DOMAINS
Intellectual (IG)
Fluid reasoning (induct./deduct.), cristallized verbal, spatial, memory, sense of observation, judgment, metacognition.
Creative (CG)
Inventiveness (problem-solving), imagination, originality (arts), retrieval fluency.
Socioaffective (SG)
Intelligence (perceptiveness).
Communication (empathy, tact).
Influence (leadership, persuasion).
sensoriMotor (MG)
S: visual, auditory, olfactive, etc.
M: strength, endurance, reflexes, coordination, etc.
negative impacts
DEVELOPMENTAL PROCESS
Informal/formal learning & practicing (LP)
Positive/ negative
TALENT = top 10 %
SYSTEMATICALLY DEVELOPED SKILLS (SYSDEV)
FIELDS
(relevant to school-age youths)
Academics: language, science, humanities, etc.
Arts: visual, drama, music, etc.
Business: sales, entrepreneurship, management, etc.
Leisure: chess, video games, puzzles, etc.
Social action: media, public office, etc.
Sports: individual & team.
Technology: trades & crafts, electronics, computers, etc.

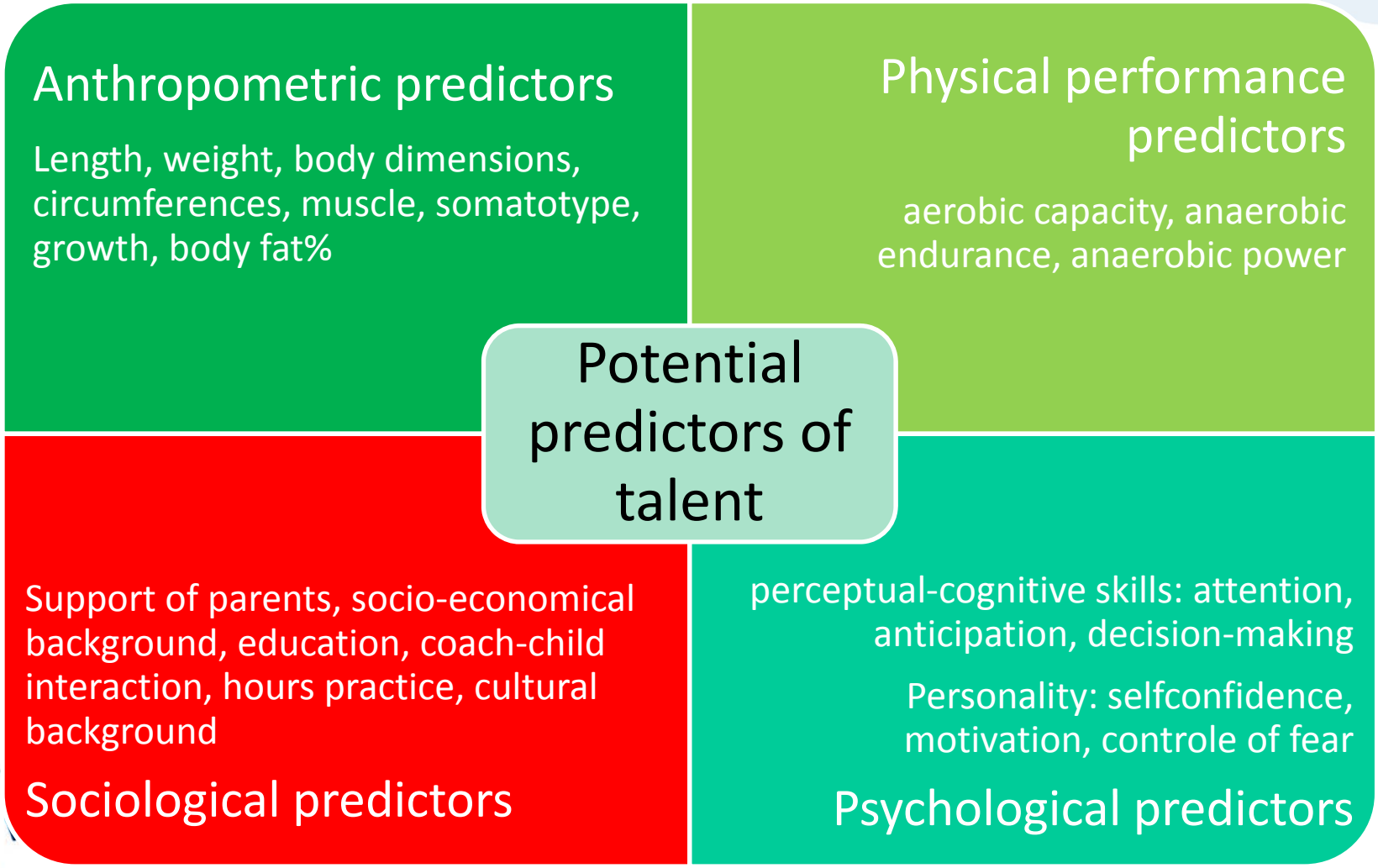
Gagné (2005)

PROBLEMS IN TID & TDE

TALENT = COMPLEX

- Performance ~ great number of factors
  - Expertise = sum of various components

POTENTIAL PREDICTORS OF TALENT



Adapted from Williams & Franks (1998)

TALENT = COMPLEX

- Performance ~ great number of factors
  - Expertise = sum of various components
  - Expertise can be achieved through individual or unique ways through different combinations of skills cf. compensation phenomenon (Bartmus et al., 1987) >< e.g., TIPS

    e.g., discipline, type, playing position

COMPENSATION FOR WEAKNESSES

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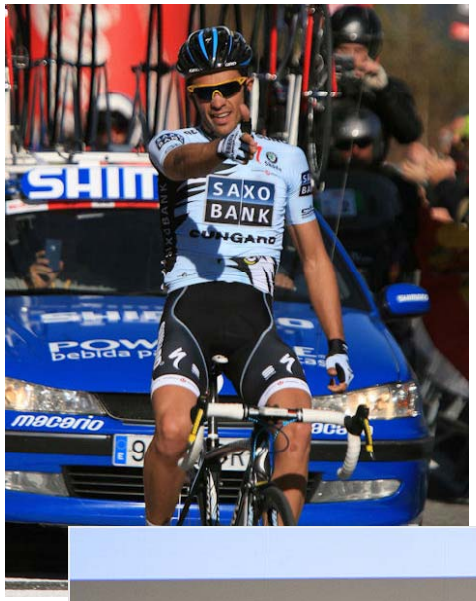
≠ TYPES, DISCIPLINES?



9026

98.48

19.19

58.875

9.58

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TALENT = COMPLEX

- Performance ~ great number of factors
  - Expertise = sum of various components
  - Expertise can be achieved through individual or unique ways through different combinations of skills cf. compensation phenomenon (Bartmus et al., 1987) >< e.g., TIPS

    e.g., discipline, type, playing position
- Abscence of objective performance characteristics e.g., time or distance
- More difficult to evaluate individual performance in team sports

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HOW EVALUATE/IDENTIFY PLAYER?

- Evaluation (identification) based on observation during game (scouting)
- Game is ideal environment to evaluate player

  BUT…

  numerous influences

  - team mates
  - opponents
  - system of play, tactics, playing formation
  - ‘game-to-game variability’
  - practice history
  - …

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Roel Vaeyens CONI Rome 2011

MATURITY ~ PERFORMANCE

- Large inter-individual differences in growth, development and training cause unstable, non-linear development of performance-related capacities (e.g., Malina et al., 2004)

  GHENT YOUTH SOCCER PROJECT (Vaeyens et al., 2006)

  - maturity ~ speed, strength, endurance and technique
  - unique development and evolution of skills in function of timing and tempo of growth spurt

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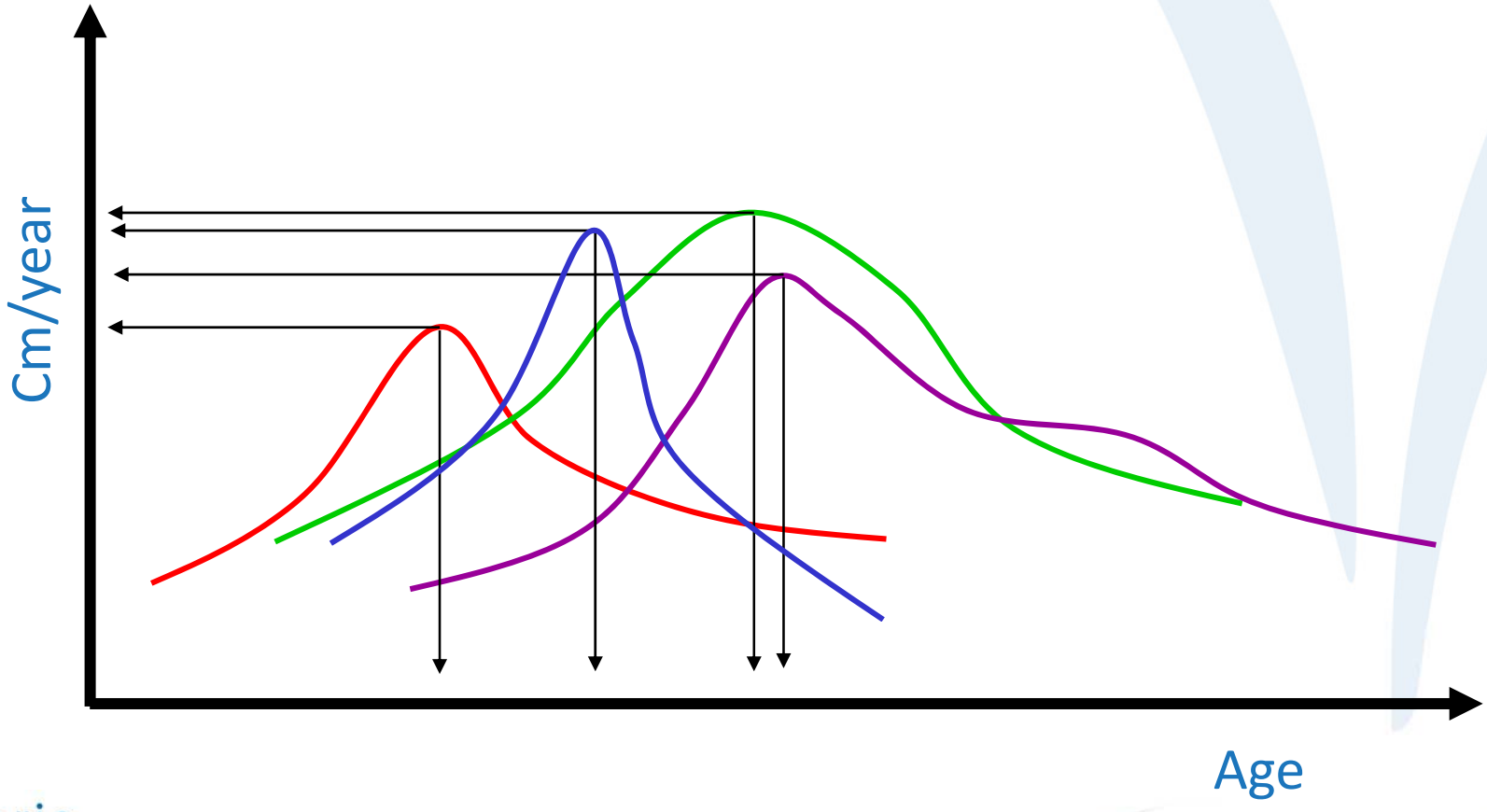
INTER-INDIVIDUAL ≠ IN GROWTH



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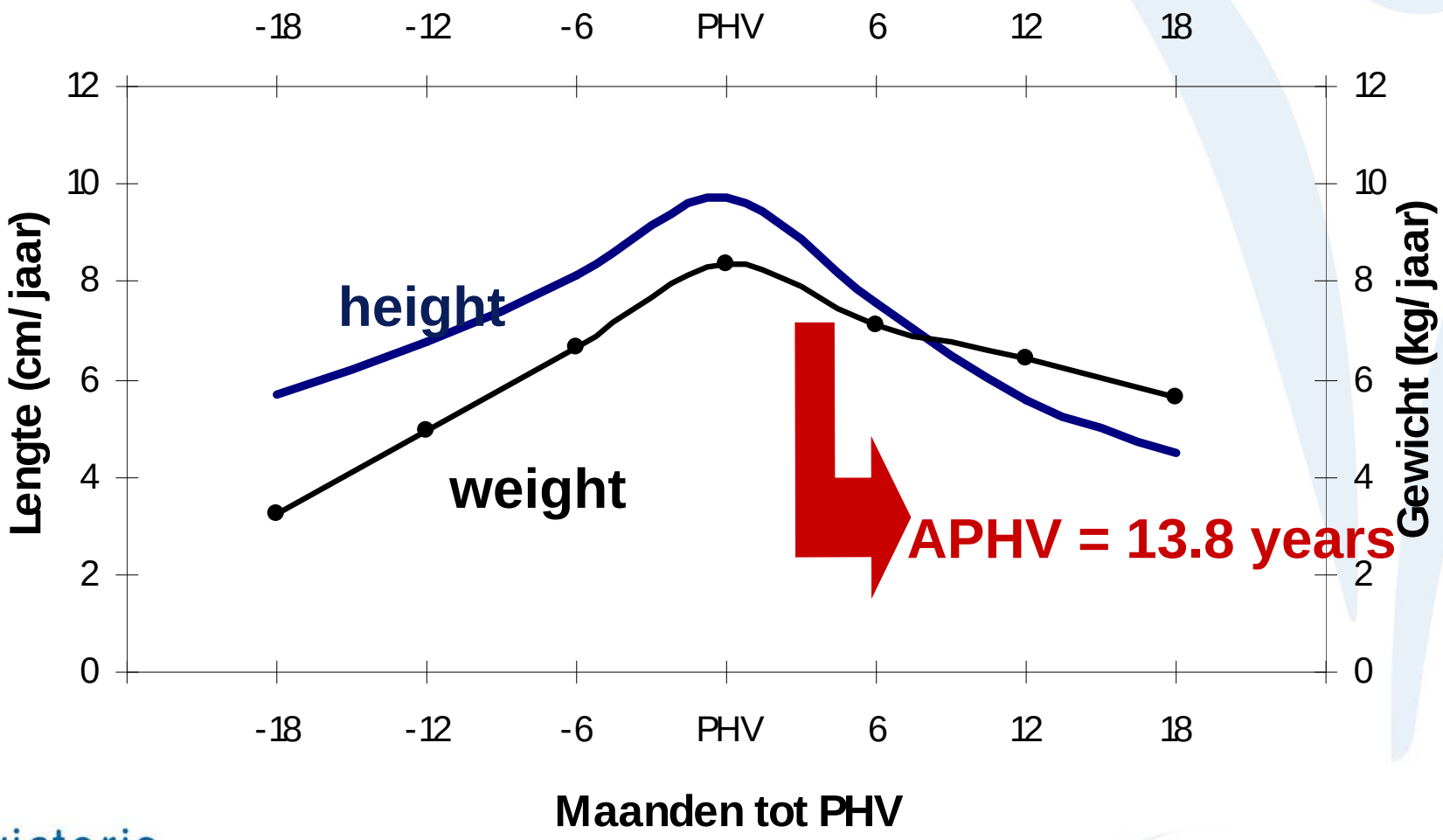
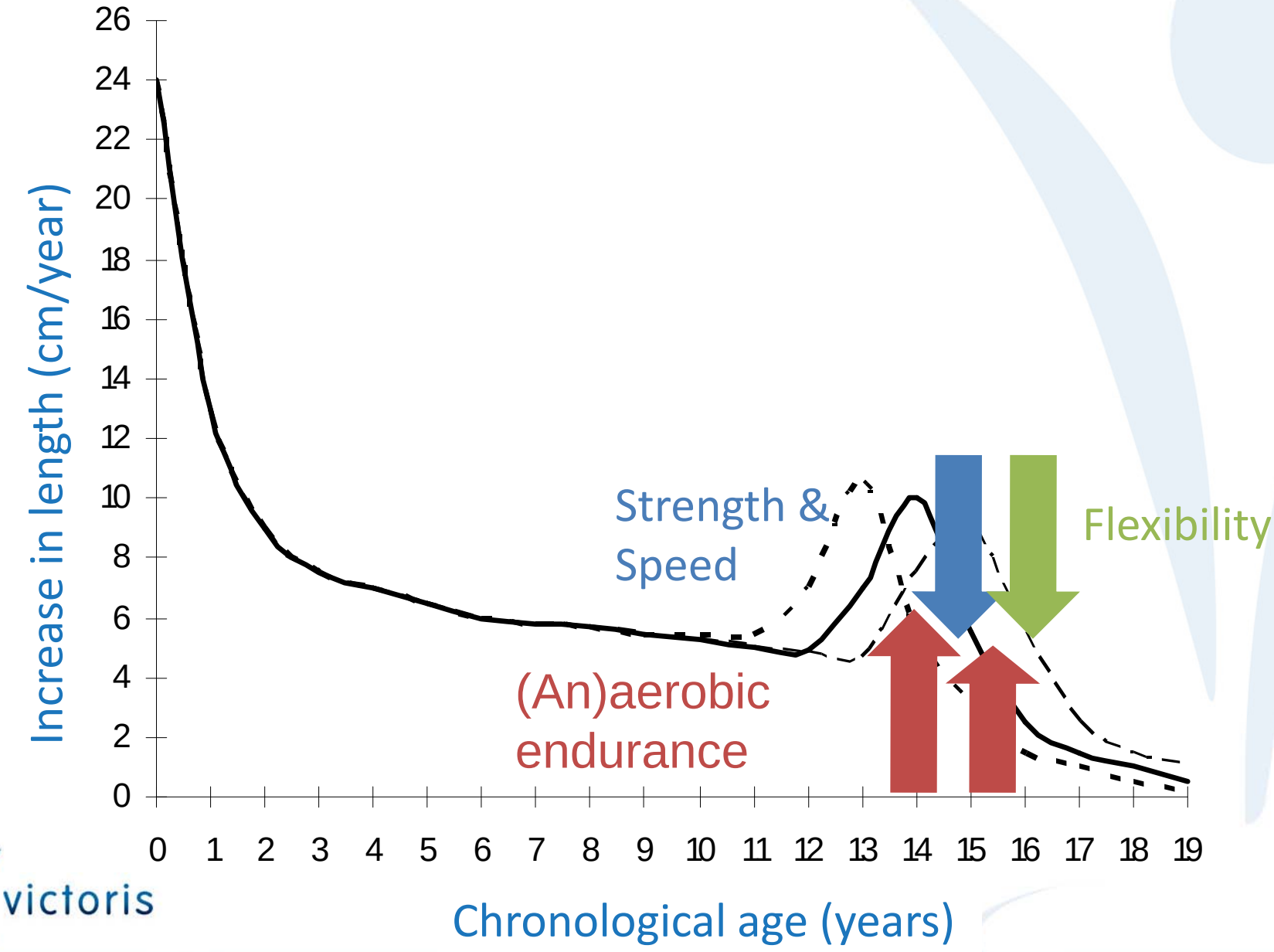
ANTHROPOMETRY



Philippaerts et al. (2006)

DEVELOPMENT RELATED TO GROWTH



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  - unique development and evolution of skills in function of timing and tempo of growth spurt
  - early vs. late mature players

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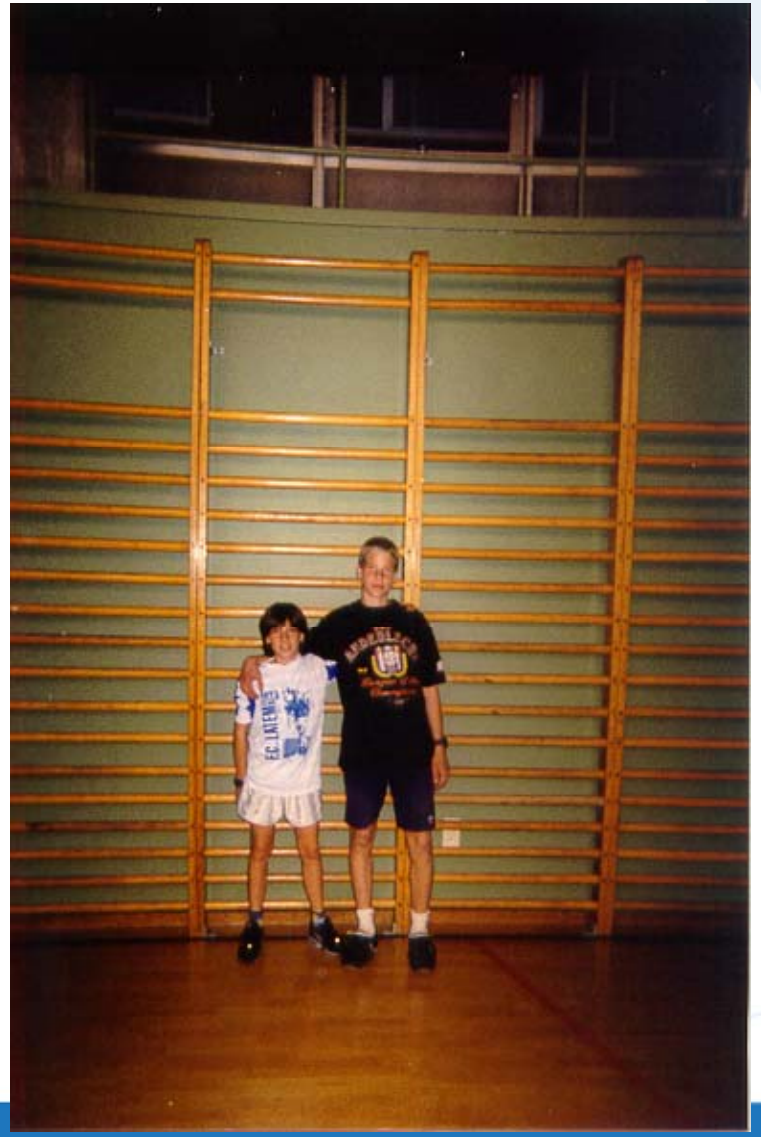
EARLY vs. LATE MATURE



- CA = 12.0 yrs
- SA = 9.0 yrs
- Ht = 143.1 cm

- CA = 12.6 yrs
- SA = 13.5 yrs
- Ht = 165 cm

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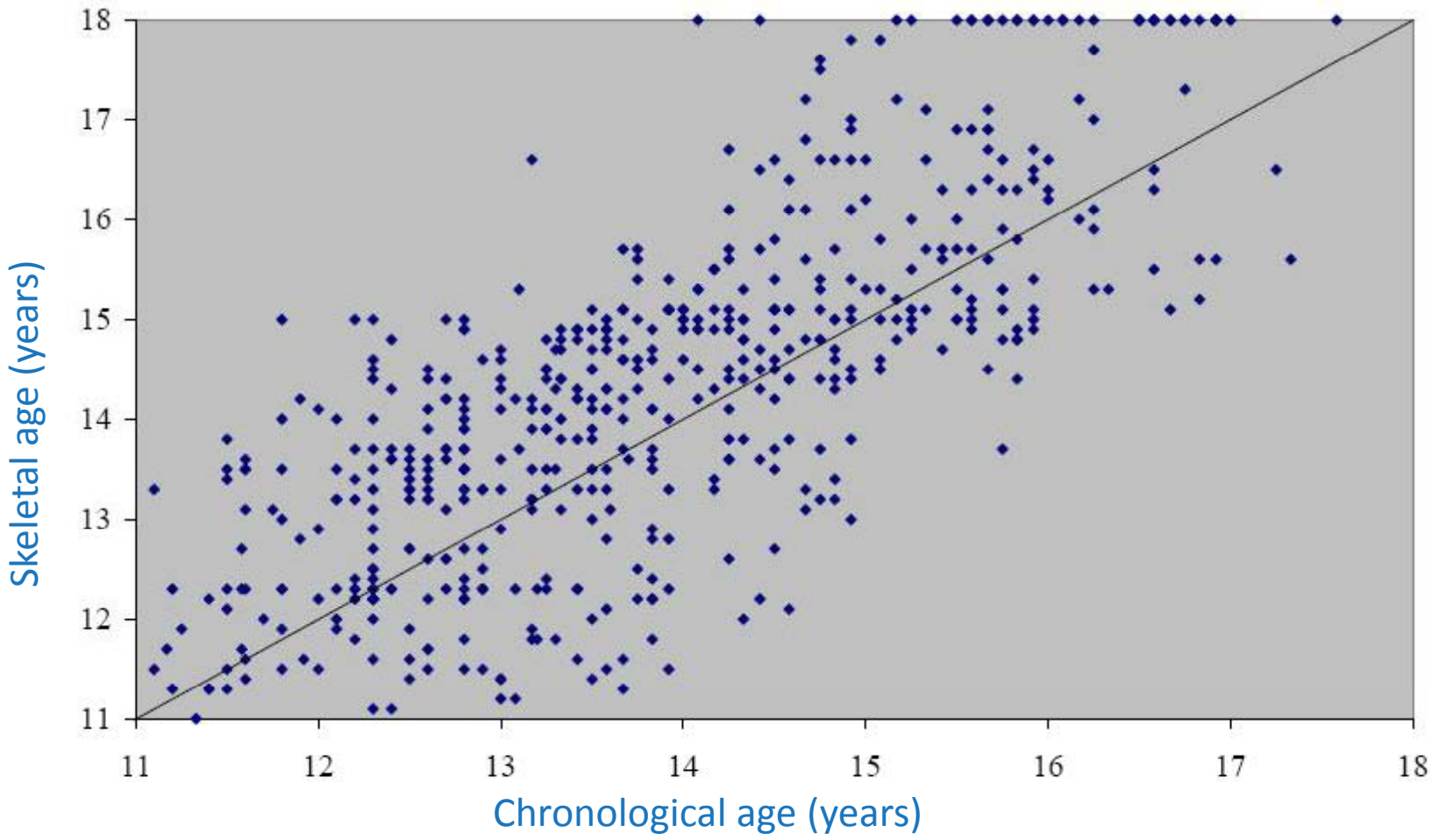
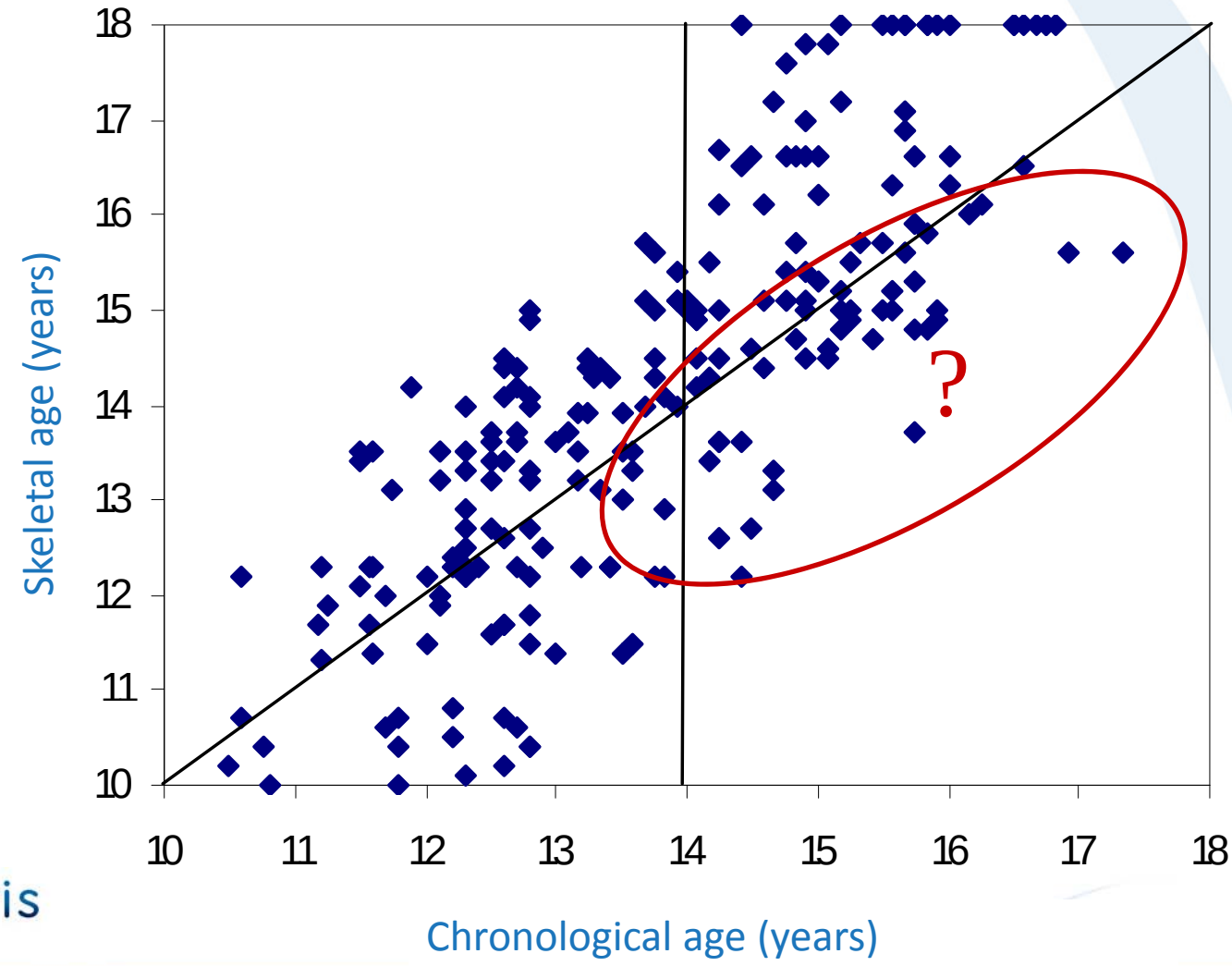
EARLY vs. LATE MATURE



62% skeletal age > chronological age

Philippaerts et al. (2004)

NATIONAL LEVEL



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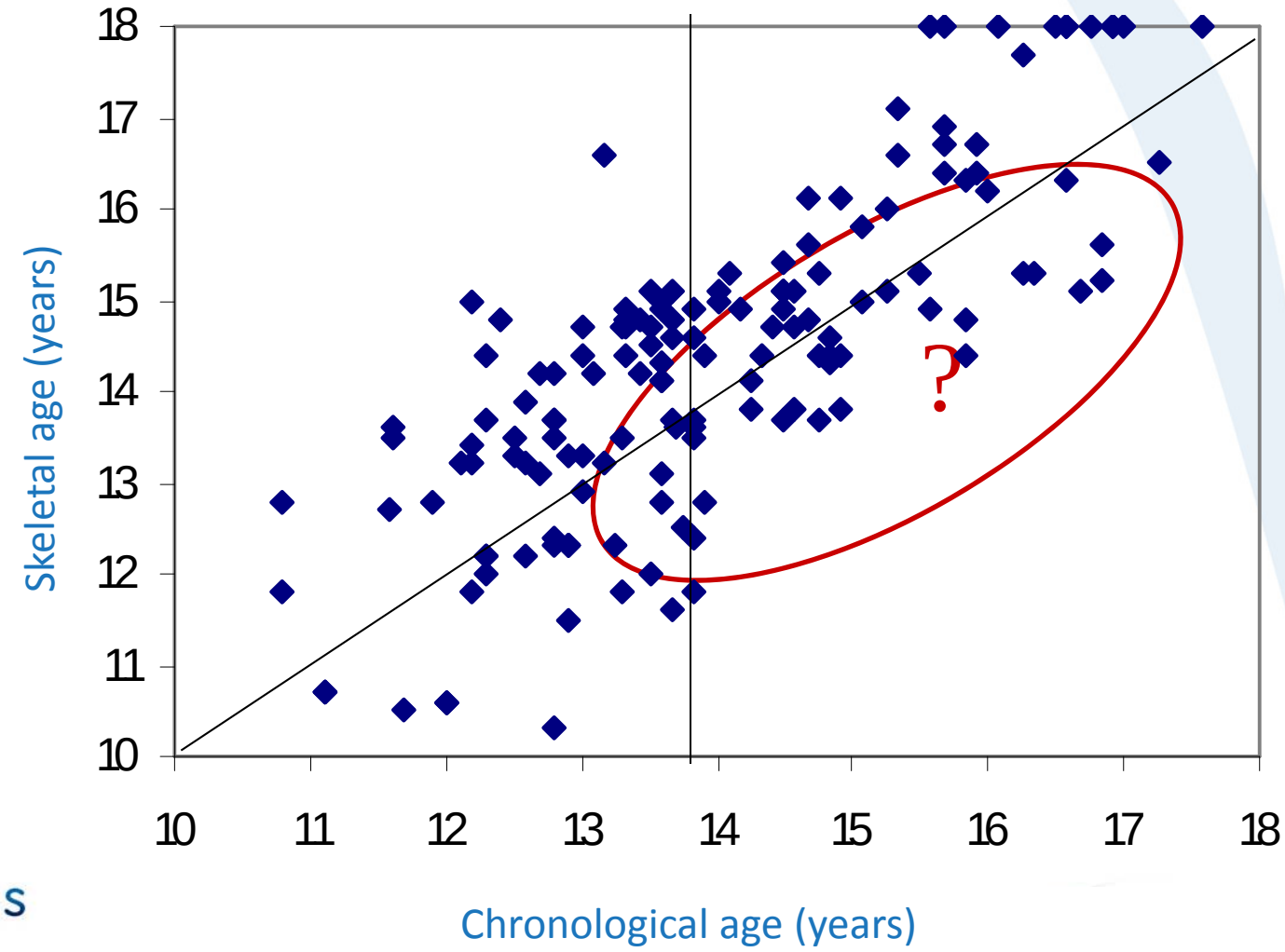
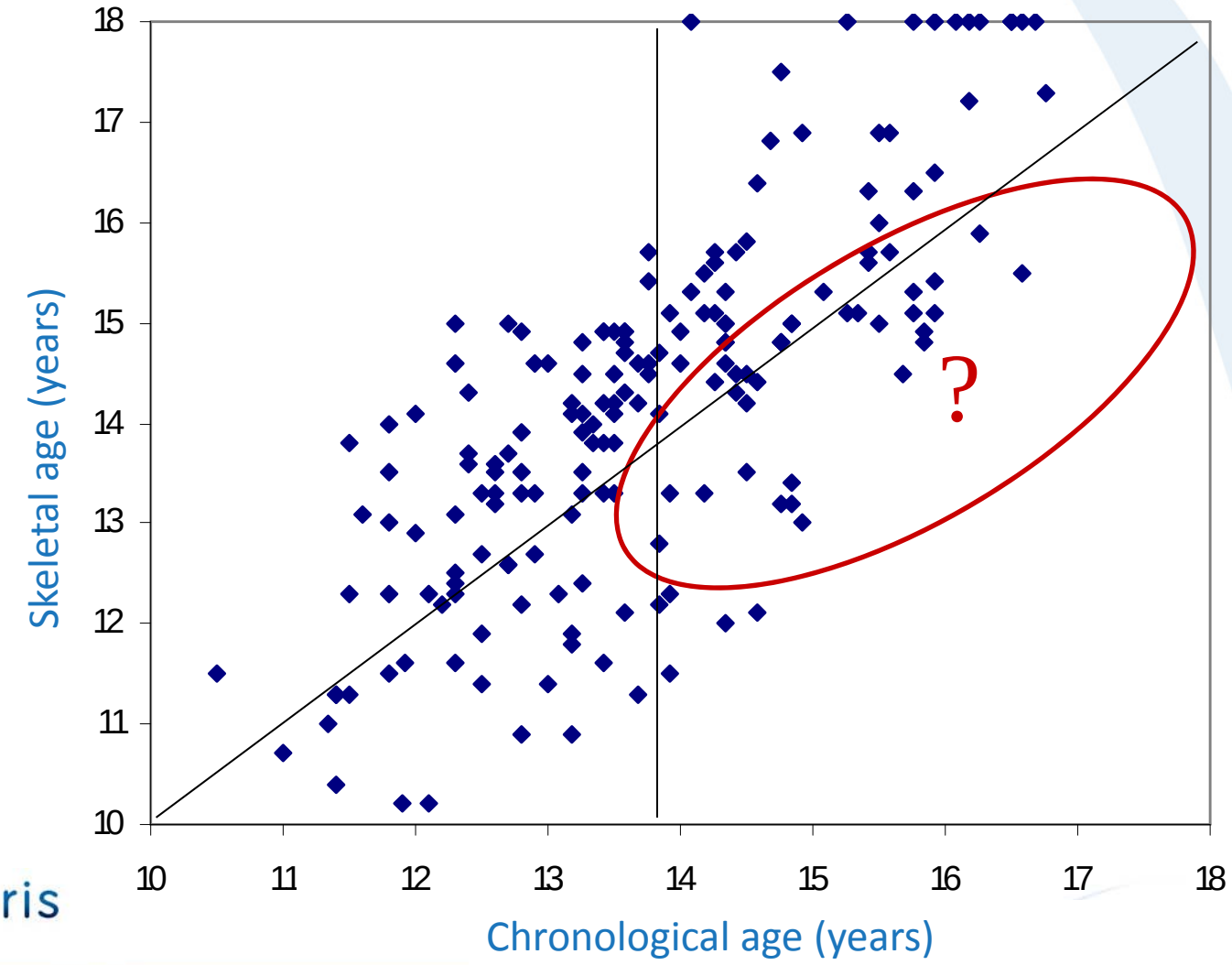
Philippaerts et al. (2004)

PROVINCIAL LEVEL



Philippaerts et al. (2004)

REGIONAL LEVEL



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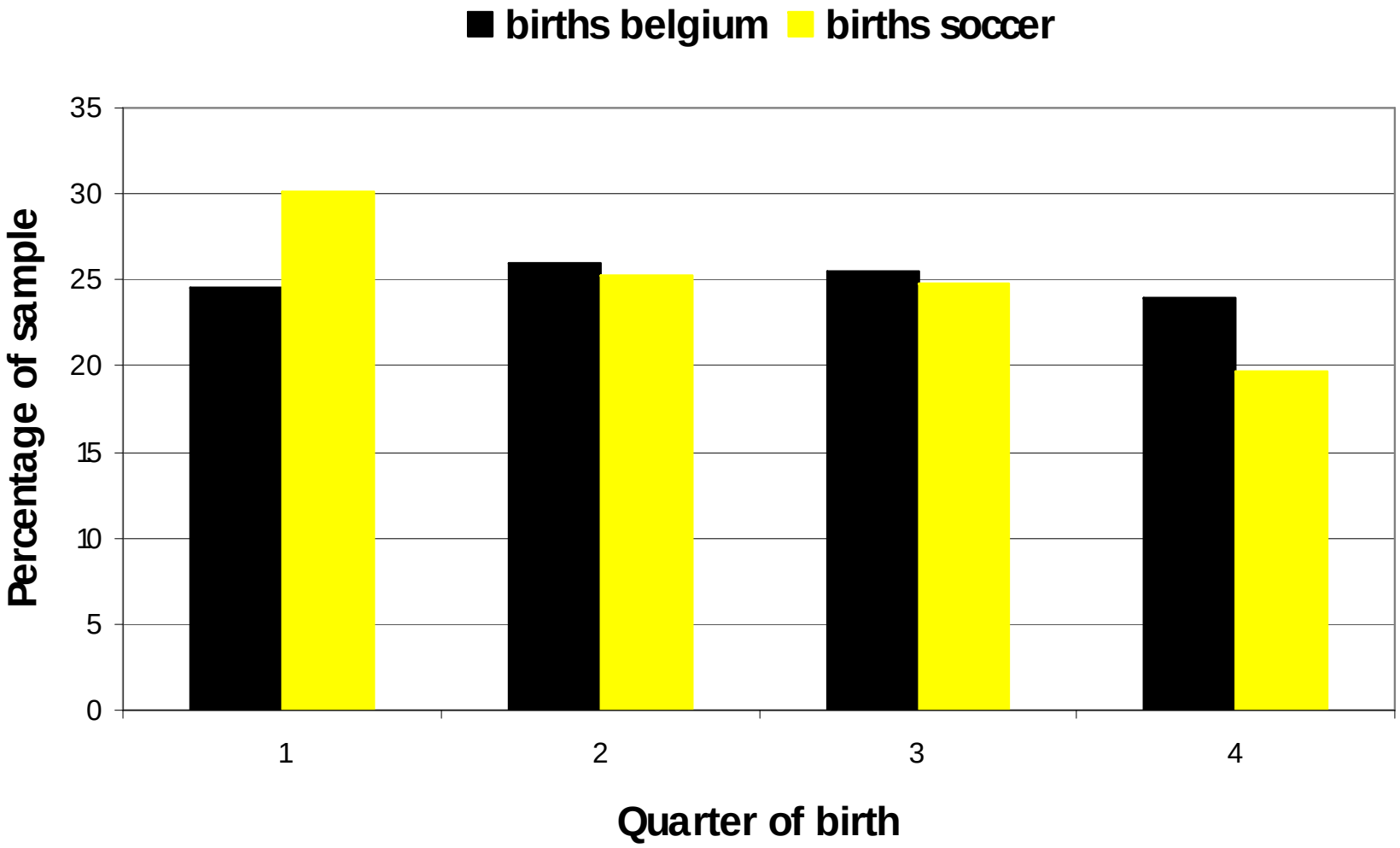
  GHENT YOUTH SOCCER PROJECT (Vaeyens et al., 2006)

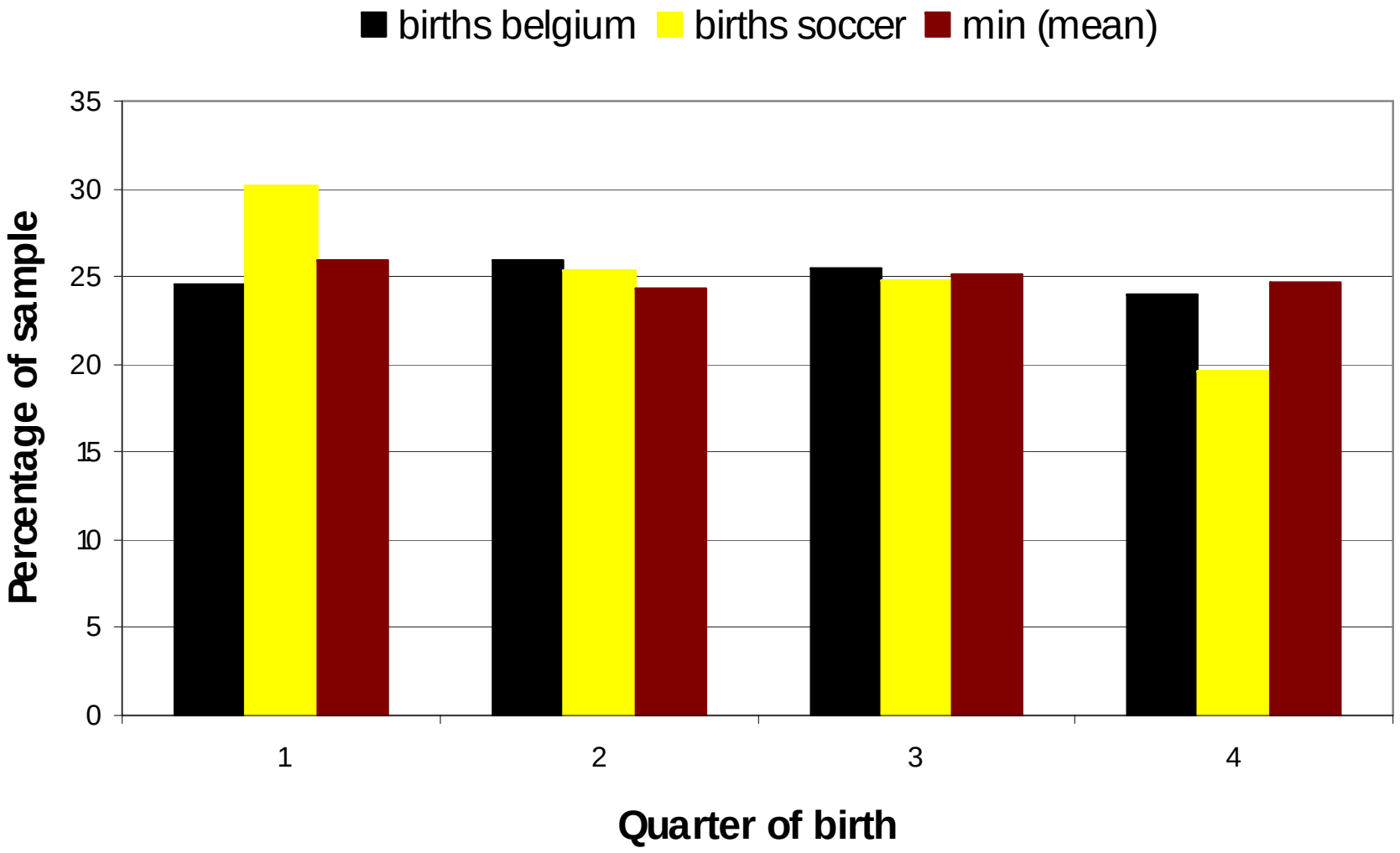
  - maturity ~ speed, strength, endurance and technique
  - unique development and evolution of skills in function of timing and tempo of growth spurt
  - early vs. late mature players
  - relative age effect

RELATIVE AGE EFFECT



Vaeyens et al. (2005)

RELATIVE AGE EFFECT



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RELATIVE AGE EFFECT

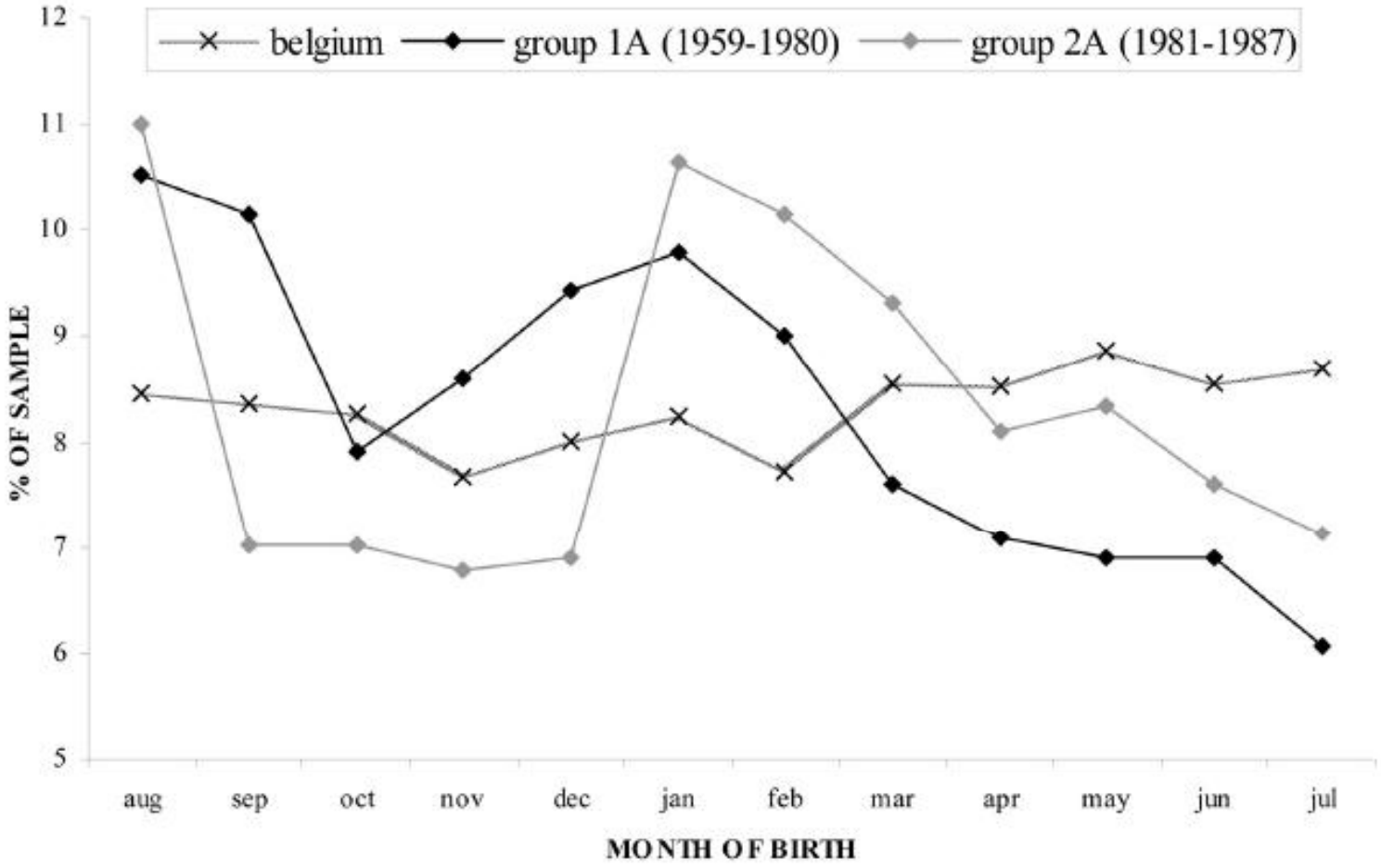
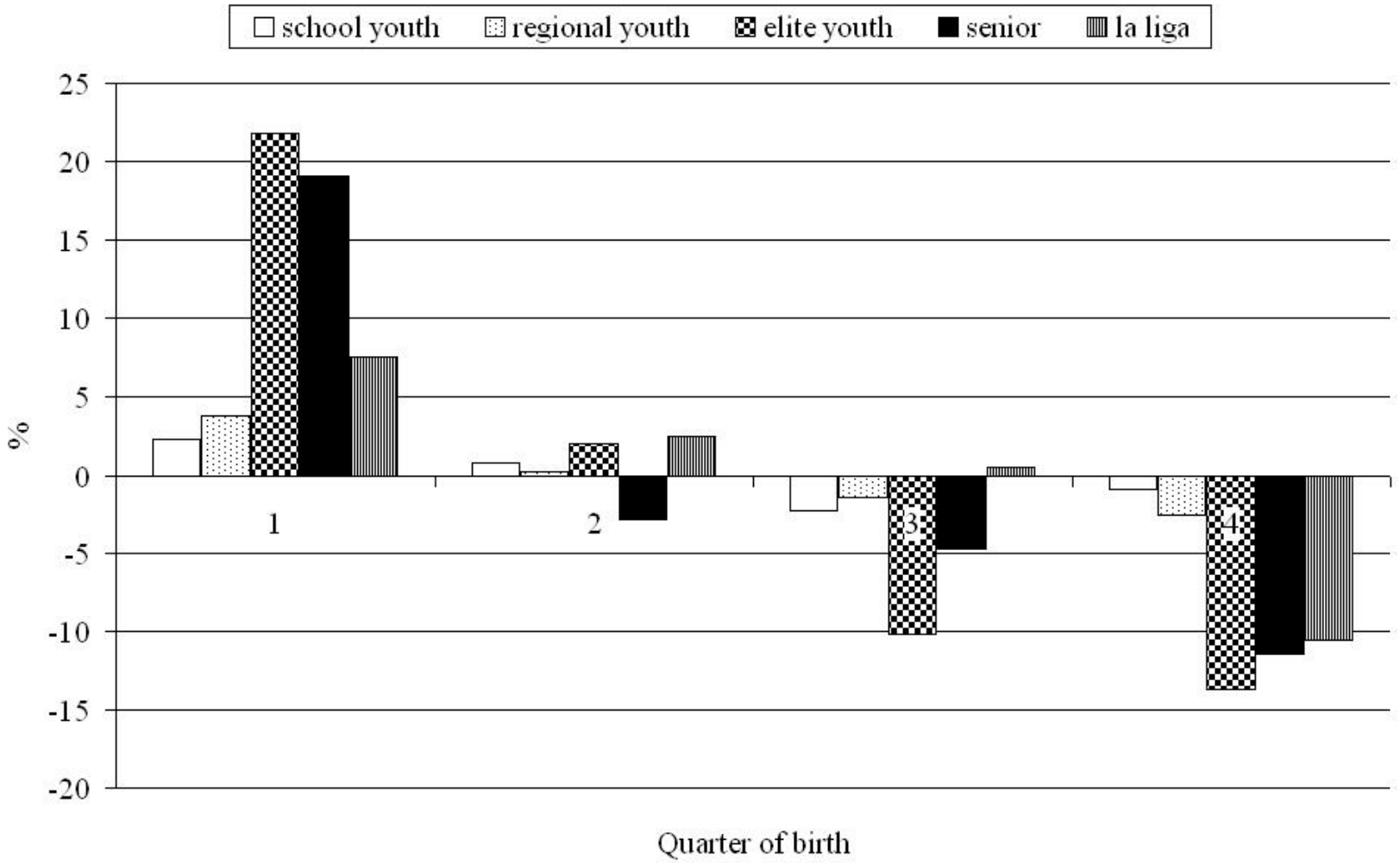


Figure 1. Birth date distributions (%) by age group with comparative data for the Belgian population.

Vaeyens et al. (2005)

RELATIVE AGE EFFECT



Mujika et al. (2009)

TALENT IS DYNAMIC ISSUE

- Talent ID = prediction on LONG TERM

  BUT… mainly based on CURRENT performances

  ➲ assumptions

  - youth sport = adult sport ???
  - retainment of characteristics through puberty (e.g., growth, training)??? cf. eternal promising players
  - physical advantage disappears
  - shifts in task demands e.g., rule changes (judo, gymnastics) or game characteristics (increased game demands)

TALENT IS DYNAMIC ISSUE

- GYSP: discriminating (elite vs. sub-elite) characteristics: age-specific
  - 10-14 years: anthropometry (Ht, Wt, body fat%) cf. maturity
  - U13-U14: technique & speed
  - U15-U16: endurance

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SUCCESS RATE OF TID PROGRAMMES

- Few scientific studies have examined the efficiency & efficacy of TID programmes
  - Schumacher et al. (2001): ca. 30% successful
  - Menaspa et al. (2010): physiological variables do not predict professional career of young cyclists

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SUCCESS RATE OF TID PROGRAMMES

- Low to moderate success ratios in German and Russian TID & TDE programmes (e.g., Riecken et al., 1993; Güllich et al. 2005, 2008)
  - Majority of early recruited and supported children never become successful senior athletes
  - Many international successful senior athletes have not been supported in institutional TDE programmes at young age

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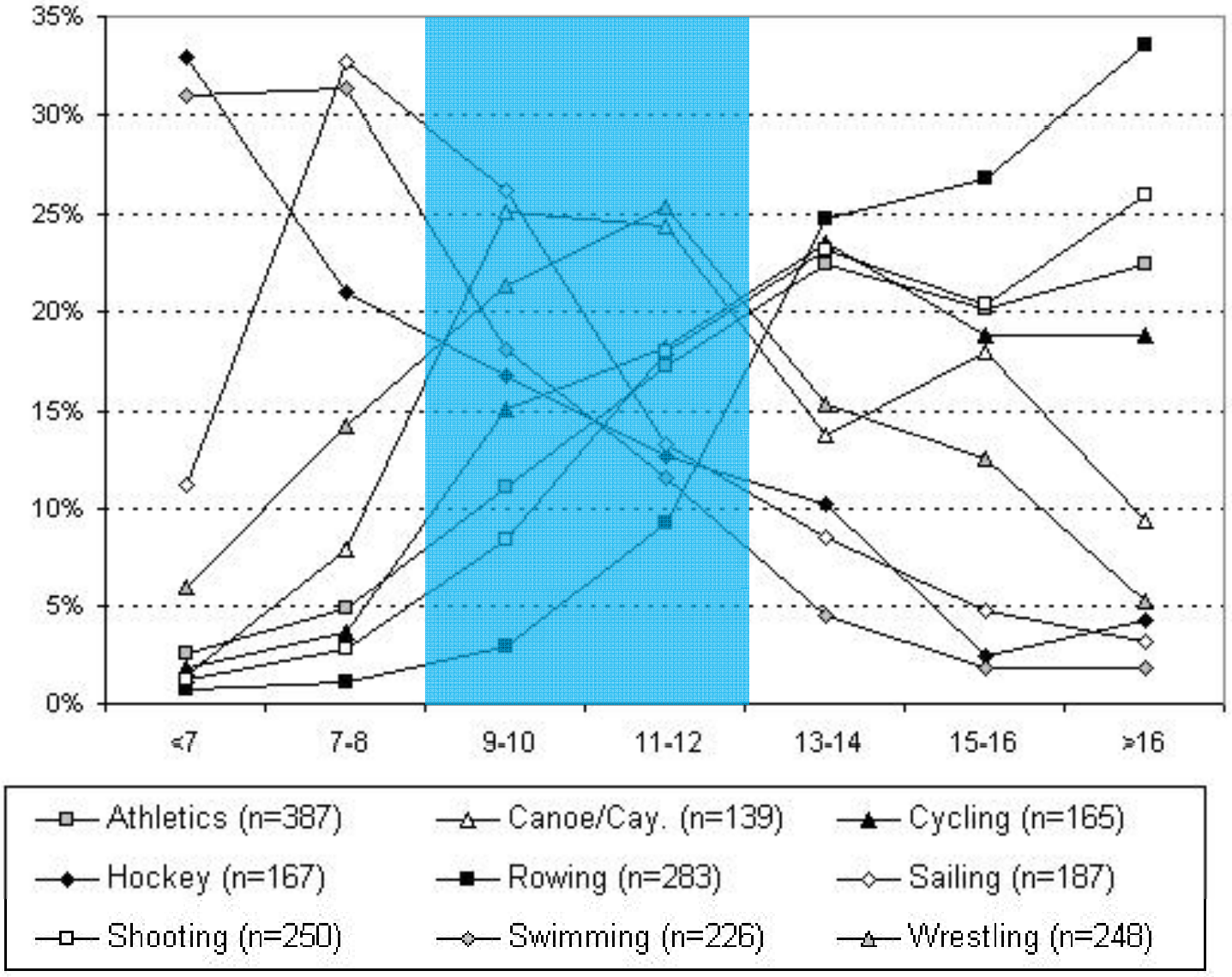
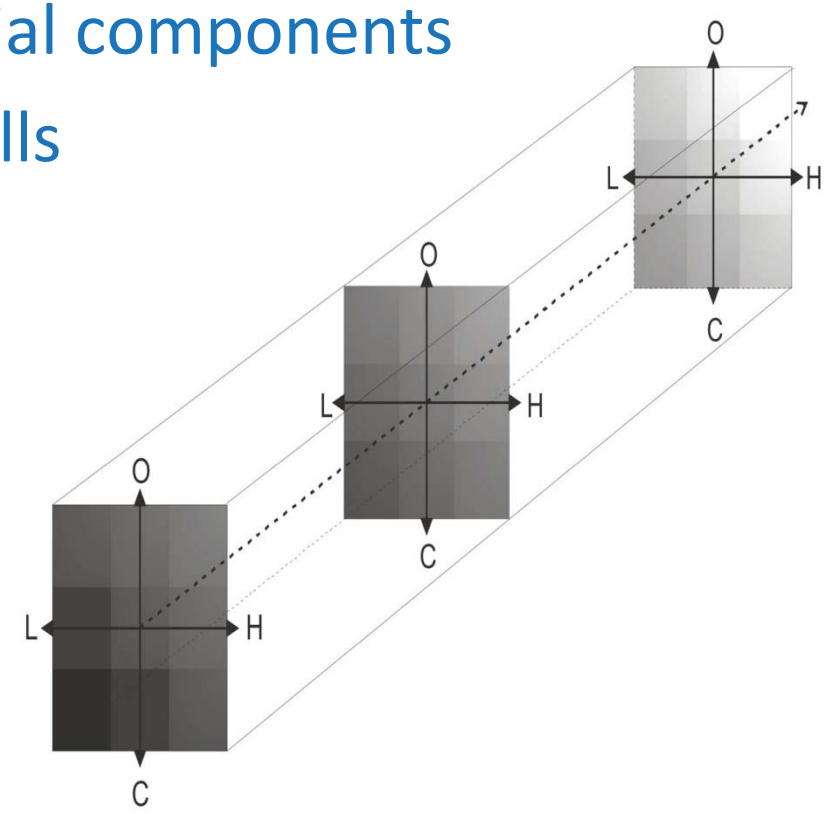
STARTING AGE OF OLYMPIC ATHLETES



PREDICTION ACCURACY

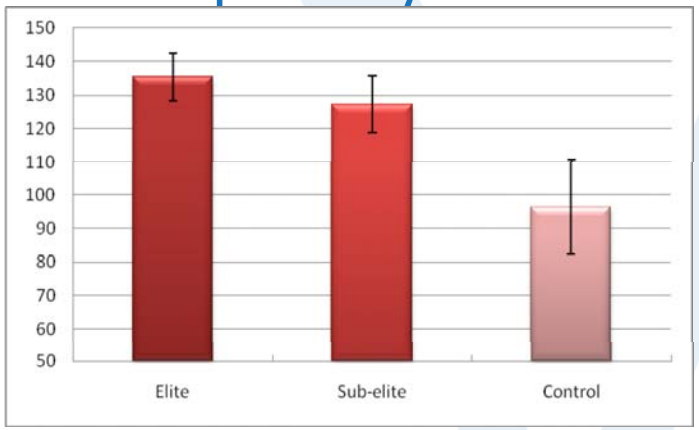
- Time
- Number of essential components
- Open vs closed skills



Vaeyens et al. (2008)

NEED FOR LONGITUDINAL APPROACH

- Vandorpe et al. (2010): two-year follow-up of 7-year-old female gymnasts
  - 35 selected: elite
  - 27 not selected: sub-elite



- MQKTK (Kiphard & Shilling, 1974)
  - Elite (135) > Sub-elite (127) > Control (98)
- Retrospective regression analysis: 29% of total variance of competition result is explained by MQ score of -2 years

Physical + Motor profile

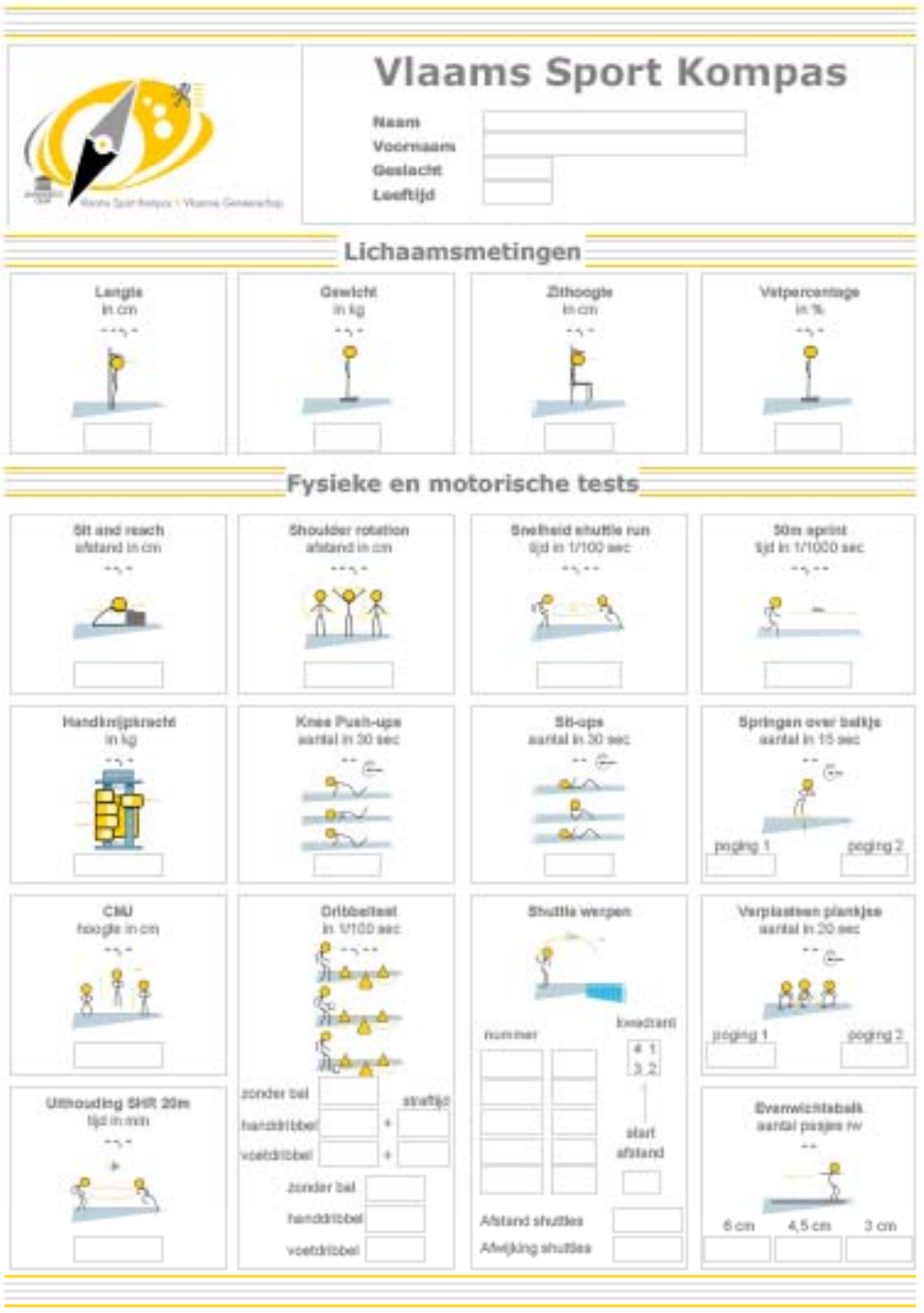
Elementary school
6 to 11 years

2008-2010 (n= 5613)

Physical + Motor profile

Topsport school
12 to 18 years

2008-2010 (n= 1592)



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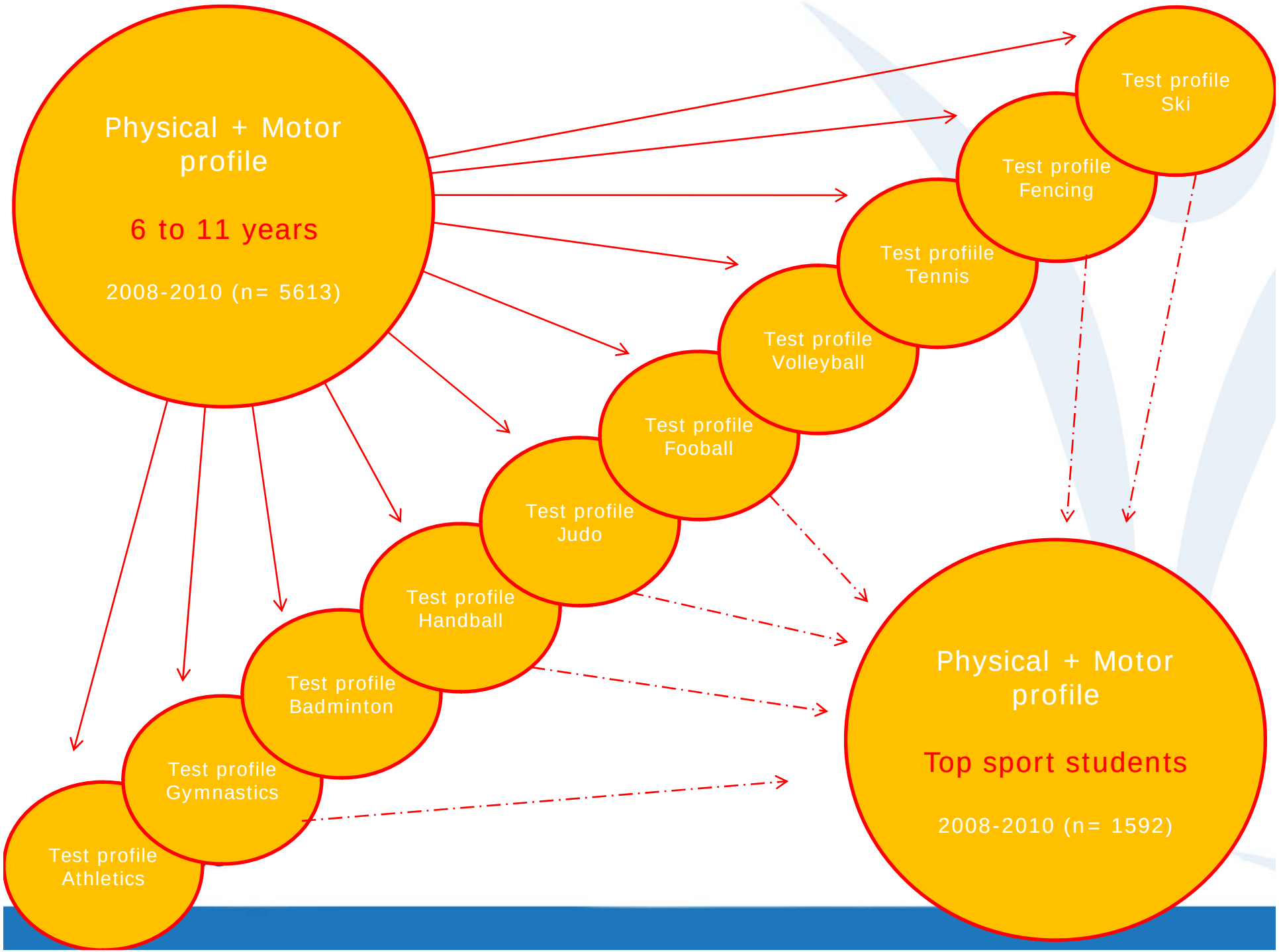
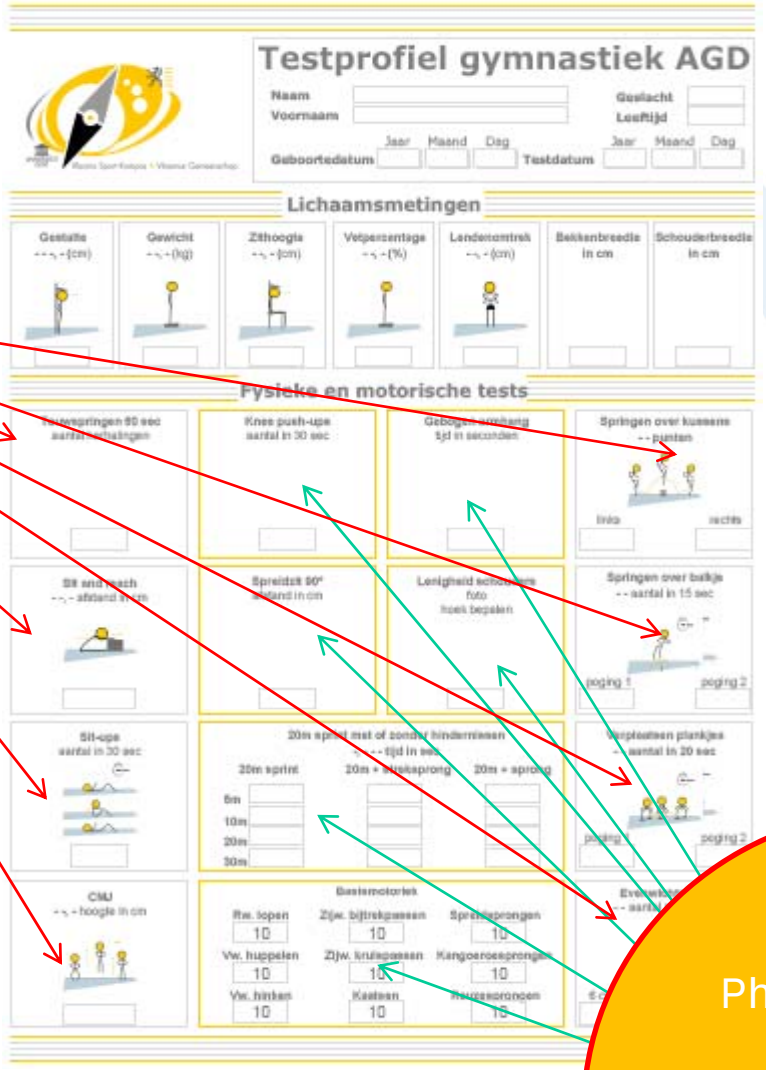

Physical + Motor profile
6 to 11 years
2008-2010 (n= 5613)
Test profile Ski
Test profile Fencing
Test profiile Tennis
Test profile Volleyball
Test profile Fooball
Test profile Judo
Test profile Handball
Test profile Badminton
Test profile Gymnastics
Test profile Athletics
Physical + Motor profile
Top sport students
2008-2010 (n= 1592)

Physical + Motor profile

6 to 11 years

2008-2010 (n= 5613)



Test profile Gymnastcs

Physical + Motor profile

Top sport students

2008-2010 (n= 1592)

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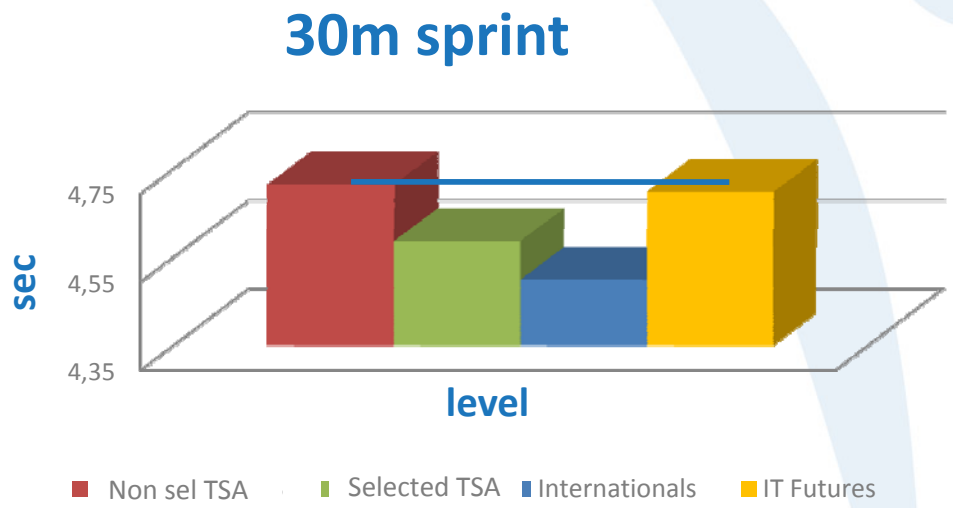
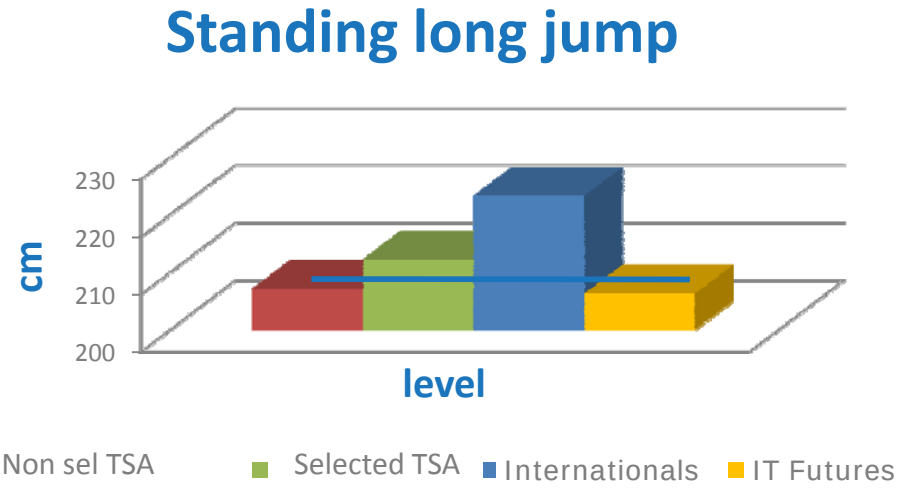
RECOMMENDATIONS

- TID test battery: useful complementary advice
  - Primarily anthropometric, physical & physiological measures → inclusion of other parameters e.g., technical & tactical skills
  - Development of game-based approach

LATE MATURING PLAYERS: U16 FUTURES

Physical profile





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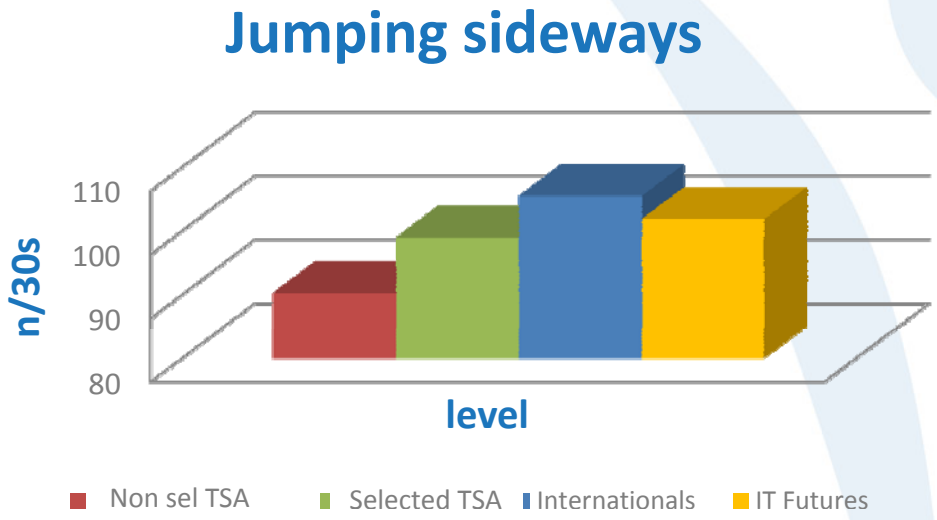
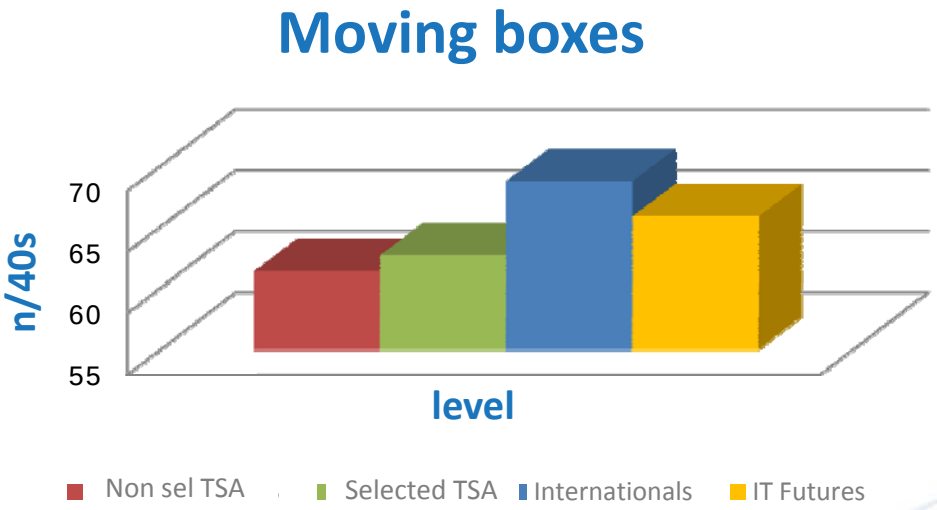
Vandendriessche et al. (2010)

LATE MATURING PLAYERS: U16 FUTURES

Coordination profile





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Vandendriessche et al. (2010)

RECOMMENDATIONS

- TID test battery: useful complementary advice
  - Inclusion of other parameters e.g., technical & tactical skills
  - Development of game-based approach
- Individualized approach taking into account (biological) maturity & training history profile
- Repetitive profiling of young athletes is essential
  - Identification vs reference values
  - Identification strengths & weaknesses
  - Monitoring progression & development

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Naam	[redacted]
Ploeg	[redacted]
Geboortedatum	[redacted]
Spelpositie	hoek
Werphand	R
Club	DBG

Aandachtspunten: uithouding, lenigheid

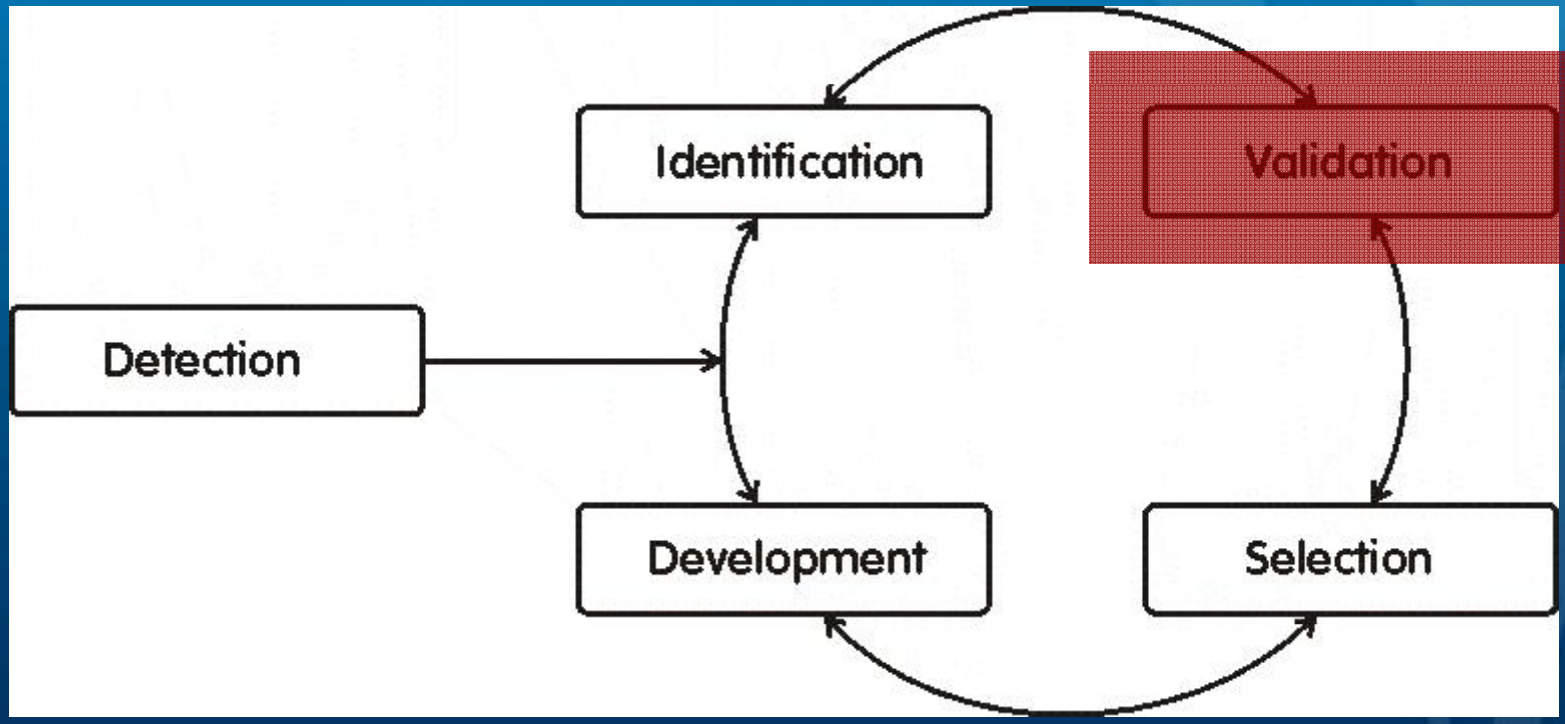
Opmerkingen:

goed | gemiddeld | zwak

	11-05-2009	27-08-2009
LICHAAMSAFMETINGEN		
Lichaamslengte (cm)	177,5	179,1
Lichaamsgewicht (kg)	66,1	66,4
Lichaamsvet (%)	10	10,7
LENIGHEID		
Sit and Reach (cm)	17,5	25
Schouderlenigheid (cm)	100	100
KRACHT		
CMJ armzwaai (cm)	42,5	42,4
CMJ zonder armzwaai (cm)	31,1	32
Bosco Index (%)	92,0	92,5
5 meervoudige sprongen (m)	13,12	13
Handknijpkracht links (kg)	56	52
Handknijpkracht rechts (kg)	68	52
SNELHEID EN BEHENDIGHEID		
Shuttle sprint (s)	11,988	11,799
Driehoeksschuiftest (s)	10,78	10,53
Slalom dribbeltest (s)	8,44	8,21
Sprint 5 m (s)	1,081	1,142
Sprint 10 m (s)	1,836	1,907
Sprint 20 m (s)	3,157	3,24
Sprint 30 m (s)	4,426	4,544
Verval sprint 5 m (%)	8,4	2,5
Verval sprint 10 m (%)	5,6	2,0
Verval sprint 20 m (%)	4,0	2,0
Verval sprint 30 m (%)	3,4	1,9
UITHOUDING		
Yo-Yo IR1 afstand (m)	1680	1560

Styn.Matthys@UGent.be

REPETITIVE PROFILING



Vaeyens et al. (2008)

It's not the strongest of the species that survives, nor the most intelligent or skilled, but the one most responsive to the environment"

(Charles Darwin, 1859)

ACKNOWLEDGEMENT

- TID research group Dept Movement & Sports Sciences
  - Matthieu Lenoir
  - Renaat Philippaerts
  - Dieter Deprez
  - Job Fransen
  - Stijn Matthys
  - Johan Pion
  - Joric Vandendriessche
  - Barbara Vandorpe

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TID PROGRAM IN THE FIELD: SOME EXAMPLES

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A TOOL TO DETECT, ORIENT AND IDENTIFY TALENT

UNIVERSITEIT GENT

Vlaams Sport Kompas • Vlaamse Gemeenschap

MISSION

- Approximately 50% of the Flemish 6-12 year-old children engages in organised sport activities. The ‘Flemisch Sports Kompas’ wants to help these children in their choice for a sport / sport clusters for which it is best suited
- A profile is made based on
  - Body composition
  - Physical characteristics
  - Motor characteristics
  - Preference for sporting activities

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TARGET GROUP: ALL CHILDREN

- Design of an orienting sporting advice with a threefold aim
  - Low scores: orientation towards a healthy development
  - High scores: orientation towards organised/competitive sport
  - Very high scores: orientation towards top sport
- Features
  - Long-term vision
  - Cross-federational approach
  - Based on uniform and objective measures

Vlaams Sport Kompas

Naam	[redacted]	**Geslacht**	Man	Ascanusinstituut Asse	
Voornaam	[redacted]	**Leeftijd**	8,304	200701006	
		Voorkeurshand	Rechts		
		Voorkeursvoet	Rechts	**Aantal leeftijdsgenoten**	14

Lichaamsmetingen

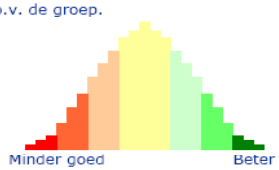
	Meting	Z-score	Laagste	-1 Z	Gemiddelde	+1 Z	Hoogste
Lichaamslengte	131,0	0,0	119,9	125,6	130,9	136,2	138,8
Lichaamsgewicht	26,4	-0,1	20,2	21,9	26,7	31,6	35,3
Vetpercentage	15,0	-0,3	11,1	11,4	16,2	21,1	30,3
Lendenomtrek	59,0	0,7	51,0	53,0	56,5	60,0	64,0
BMI	15,38	-0,1	14,0	13,7	15,5	17,3	19,2

Fysieke en motorische tests

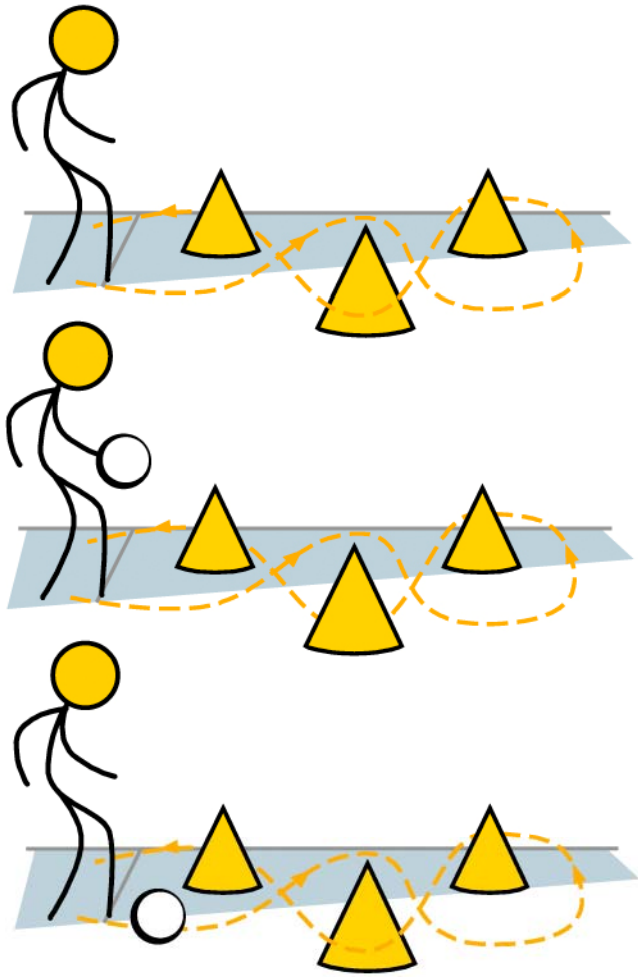
	Meting	Z-score	Laagste	-1 Z	Gemiddelde	+1 Z	Hoogste
Evenwicht							
Evenwichtbalk 6 - 4,5 - 3	43	0,9	12,0	20,4	32,1	43,9	50,0
Lenigheid							
Sit and Reach	23,0	1,0	10,0	15,0	19,0	23,1	23,0
Schouderlenigheid	100	0,9	73,0	80,4	90,5	100,6	110,0
Snelheid en behendigheid							
Shuttle Run (10x5m)	21,53	-1,2	21,5	21,8	23,7	25,6	28,6
Springen over balkje	61	1,8	27,0	36,5	45,2	53,9	61,0
Verplaatsen Plankjes	42	1,2	23,0	26,5	33,5	40,4	45,0
Kracht							
Hoogspringen uit stand (CMJ)	18,3	0,5	9,3	12,8	16,6	20,3	21,8
Verspringen uit stand	126	0,1	87,0	104,9	124,1	143,4	155,0
Springen over kussens	67	2,4	33,0	39,5	47,7	55,9	67,0
Knee Push-ups (BOT2)	22	-0,0	13,0	17,5	22,2	27,0	29,0
Sit-ups (BOT2)	20	0,7	4,0	7,9	15,1	22,4	29,0
Handknijpkracht	14	-0,3	11,0	11,7	15,1	18,5	21,0
Uithouding							
Uithouding Shuttle Run (20m)	6,0	0,7	2,0	3,5	5,0	6,5	6,5
Motoriek							
Fijne motoriek	30	0,8	13,0	19,0	25,0	31,0	33,0
Grove motoriek	444	1,7	278,0	318,0	363,9	409,9	444,0

De resultaten kunnen als volgt geïnterpreteerd worden:

De persoonlijke scores staan in de eerste kolom 'Meting'
De Z-score geeft aan hoe ver de eigen score van de gemiddelde score van de groep ligt.
De Z-scores staan ingekleurd en geven aan waar de leerling zich situeert t.o.v. de groep.
Groen geeft een zeer goede score weer en rood staat voor een minder goede score t.o.v. de groep.
Er zijn nog geen algemeen geldende referentiegegevens beschikbaar,
daarom worden de resultaten weergegeven per school en per leeftijdsgroep en
geven ze slechts een voorlopige indicatie van het resultaat van elk individu.



- Analyse van de componenten van “talent”
- Unieke combinatie van scores is richtinggevend voor een cluster van sporten
- Eerste grootschalige oriëntatie op Topdagen voorjaar 2009



Physical + Motor profile

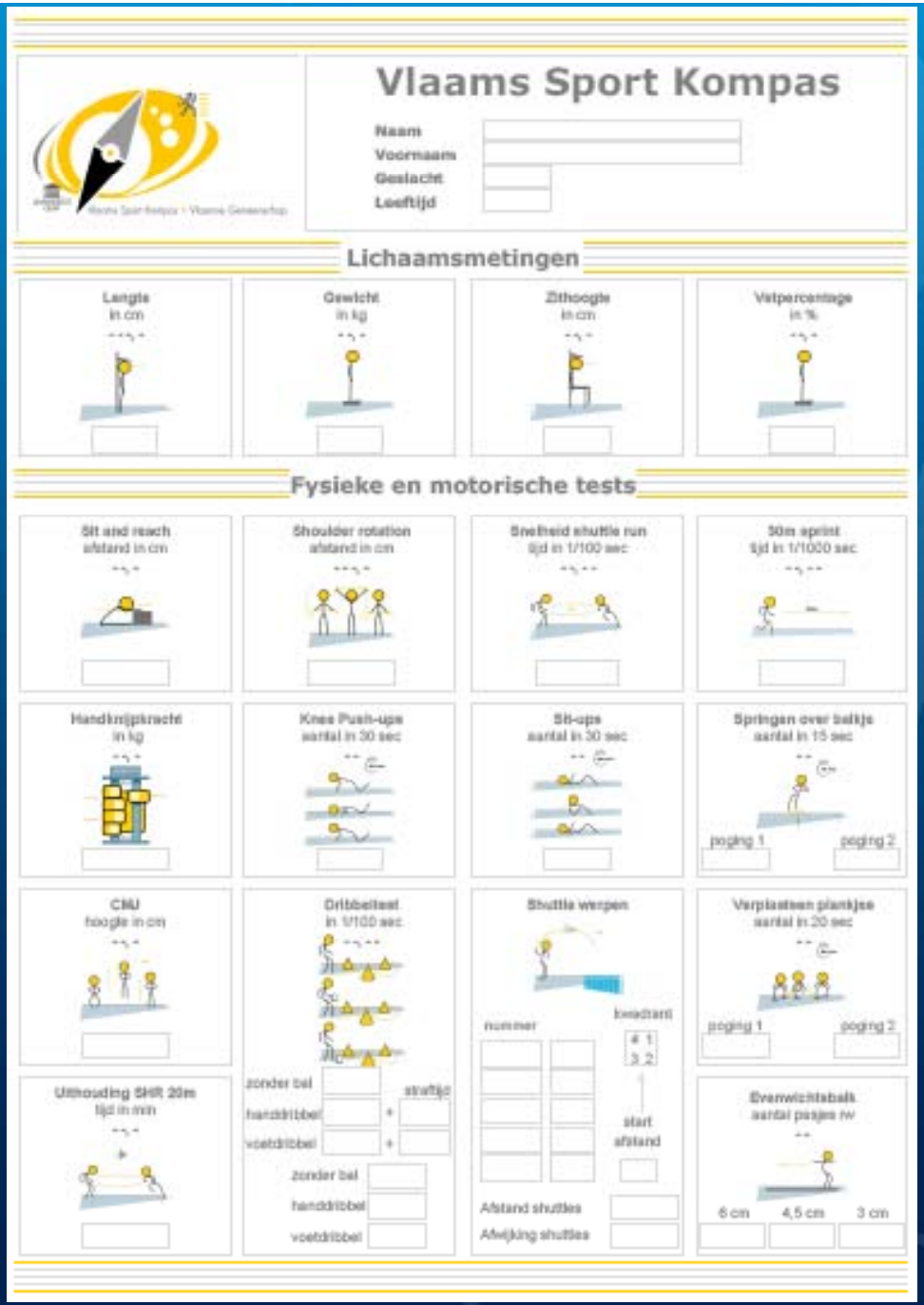
Elementary school
6 to 11 years

2008-2010 (n= 5613)

Physical + Motor profile

Topsport school
12 to 18 years

2008-2010 (n= 1592)



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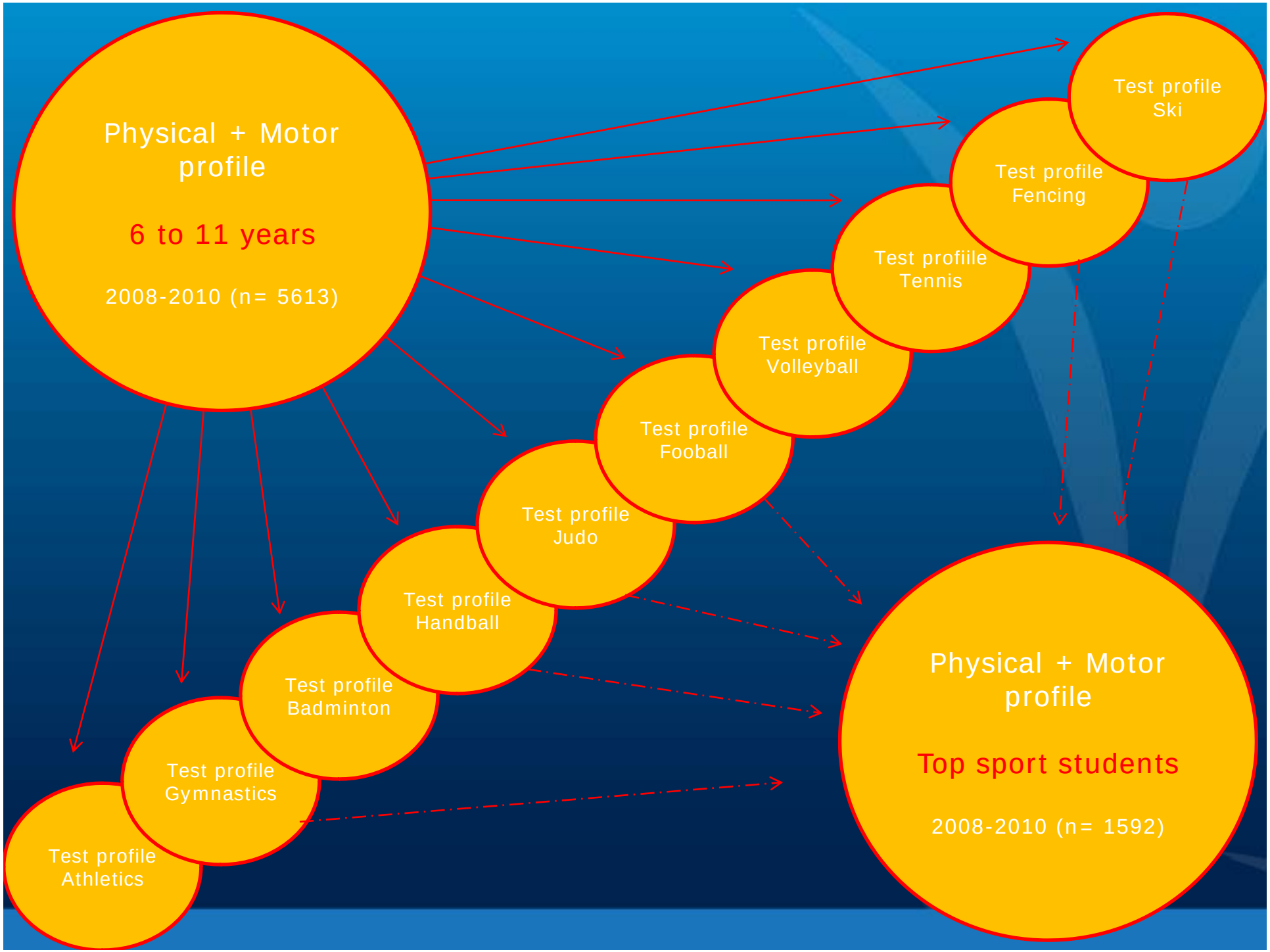
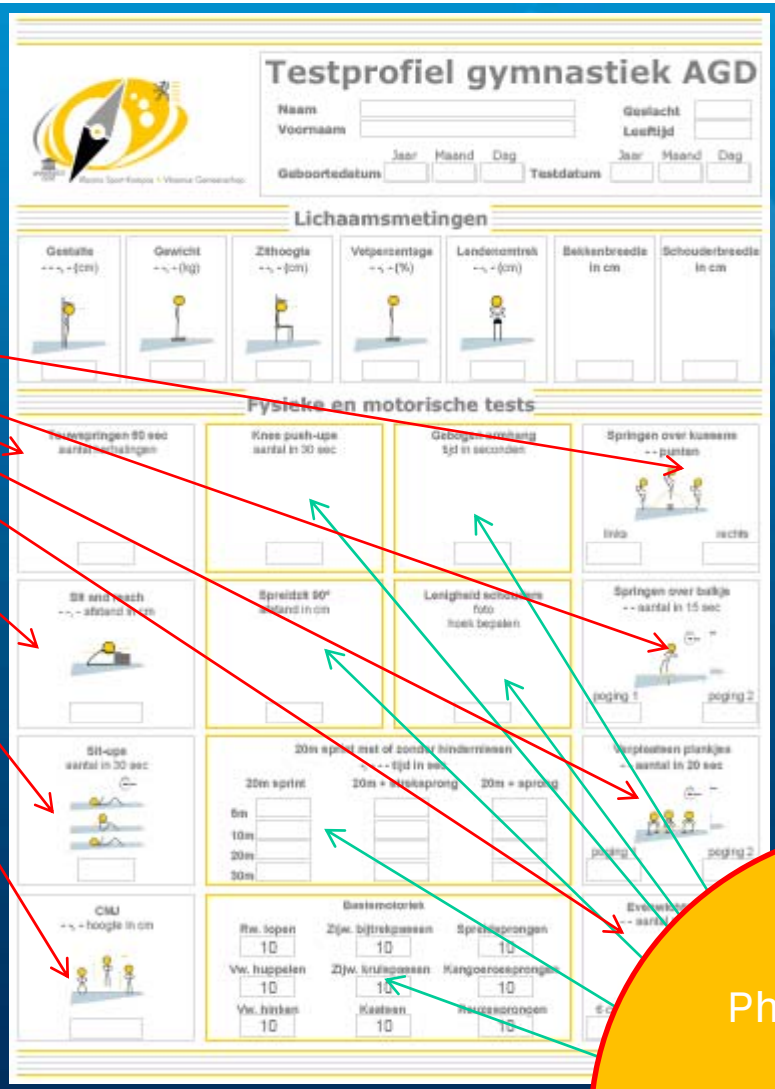

Physical + Motor profile
6 to 11 years
2008-2010 (n= 5613)
Test profile Ski
Test profile Fencing
Test profiile Tennis
Test profile Volleyball
Test profile Fooball
Test profile Judo
Test profile Handball
Test profile Badminton
Test profile Gymnastics
Test profile Athletics
Physical + Motor profile
Top sport students
2008-2010 (n= 1592)

Physical + Motor profile

6 to 11 years

2008-2010 (n= 5613)



Talent detection

Test profile Gymnastcs

‘New’ Talent

Physical + Motor profile

Top sport students

2008-2010 (n= 1592)

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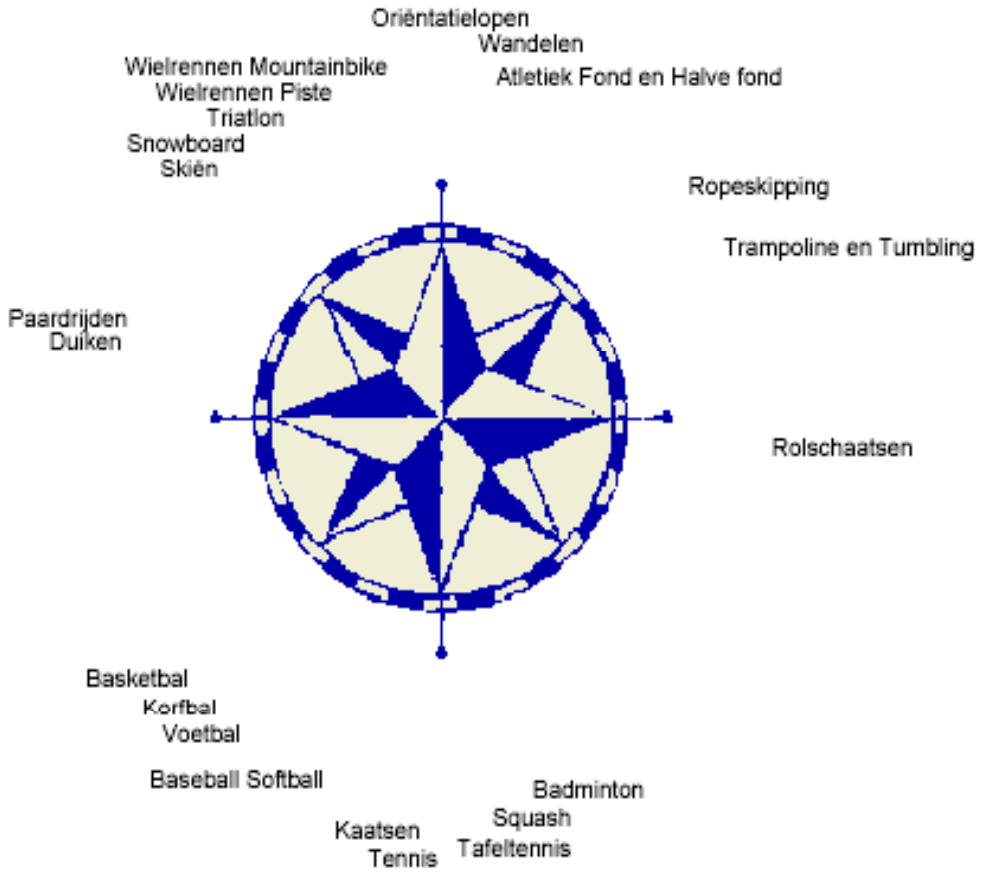
Globaal lichaamsevenwicht
Snelheid ledematen
Lenigheid
Explosieve kracht
Statische kracht
Rompkracht
Functionele kracht
Loopsnelheid en wendbaarheid
Cardio respiratoire uithouding
Trekken
Heffen
Zwaaien
Klimmen
Dragen
Steunen
Duwen
Vangen
Werpen
Stoten
Slaan
Trappen
Dribbelen
Ritmisch bewegen
Zwemmen
Glijden

Eerste Hypothetisch model van het sportkompas



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Vlaams Sport Kompas • Vlaamse Gemeenschap

Het Vlaamse model van algemene screening-sportidentificatie- talentdetectie- talentidentificatie-talentontwikkeling-talentbehoud en carrierebegeleiding

Talentbehoud en carrierebegeleiding

Talentontwikkeling (fase 2) in topsportcentra van federatie of in topclubs

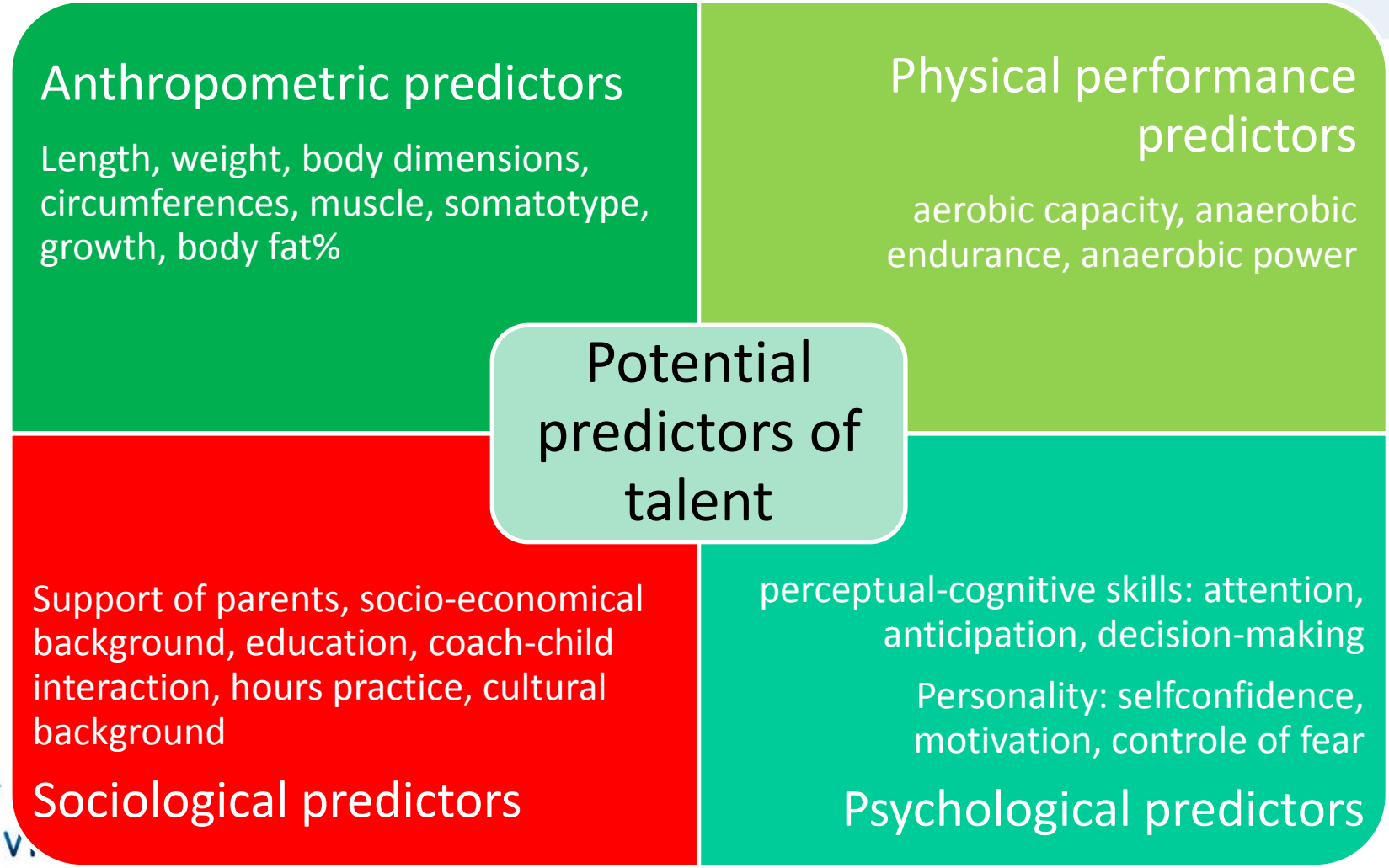
Talentontwikkeling (fase 1) in topsportscholen of topclubs

Sportspecifieke talentdetectie en identificatie (Federatieniveau)

Sportidentificatie (2008-2009: 5 topdagen met telkens 1000 kinderen)

Algemene screening id scholen (2008-2009: 800 scholen)

POTENTIAL PREDICTORS OF SOCCER TALENT



Adapted from Williams & Franks (1998)

SCIENCE IN THE FIELD?

- Williams & Reilly (2000):

  "Professional soccer clubs are now more aware of the importance of identifying and developing their own talented players with the ability to play in the first team…"

  "…However, many existing TID programmes have a relatively flimsy scientific foundation."

A JOINT APPROACH

- Selection for top sport academy:
  - Talent identification test procedure (objective)
  - Games 2vs2, 5vs5, 8vs8, 11vs11 (experts)

  - May 2009 (325 players, 14-18 years)
  - Internationals youth teams

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UNIVERSITEIT GENT Vlaams Sport Kompas • Vlaamse Gemeenschap

Anthropometric predictors

Potential predictors of talent

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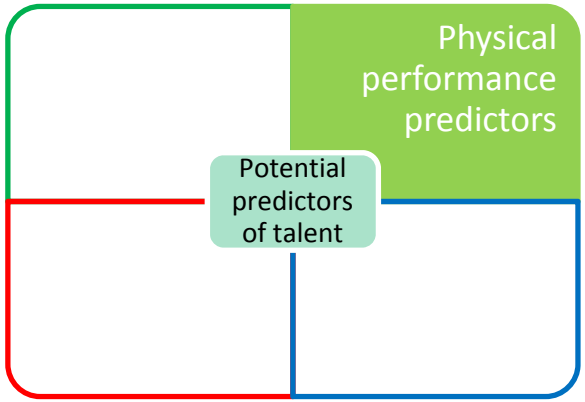
Physical performance predictors
Potential predictors of talent

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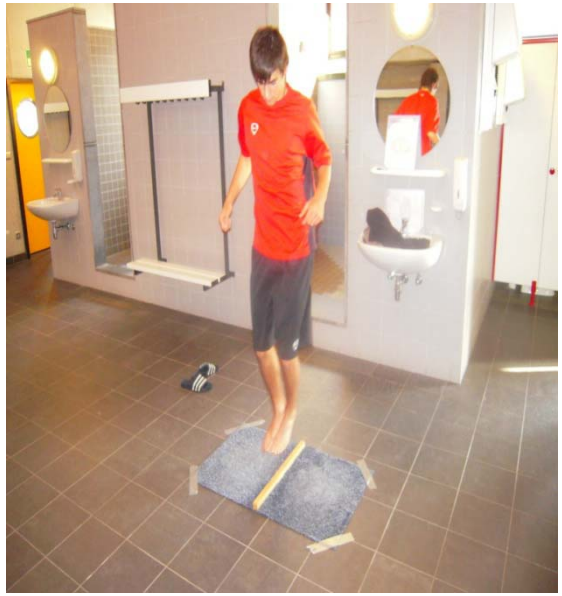
Potential predictors of talent

Psychological predictors



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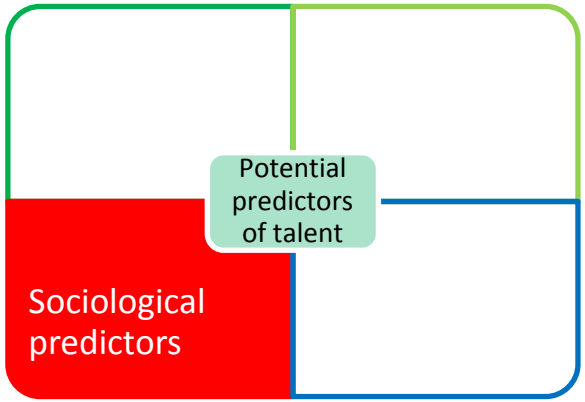

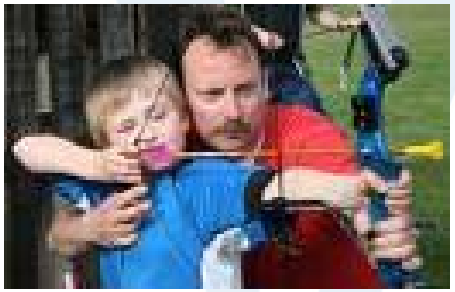

- Ego-Task questionnaire
- Training profiles

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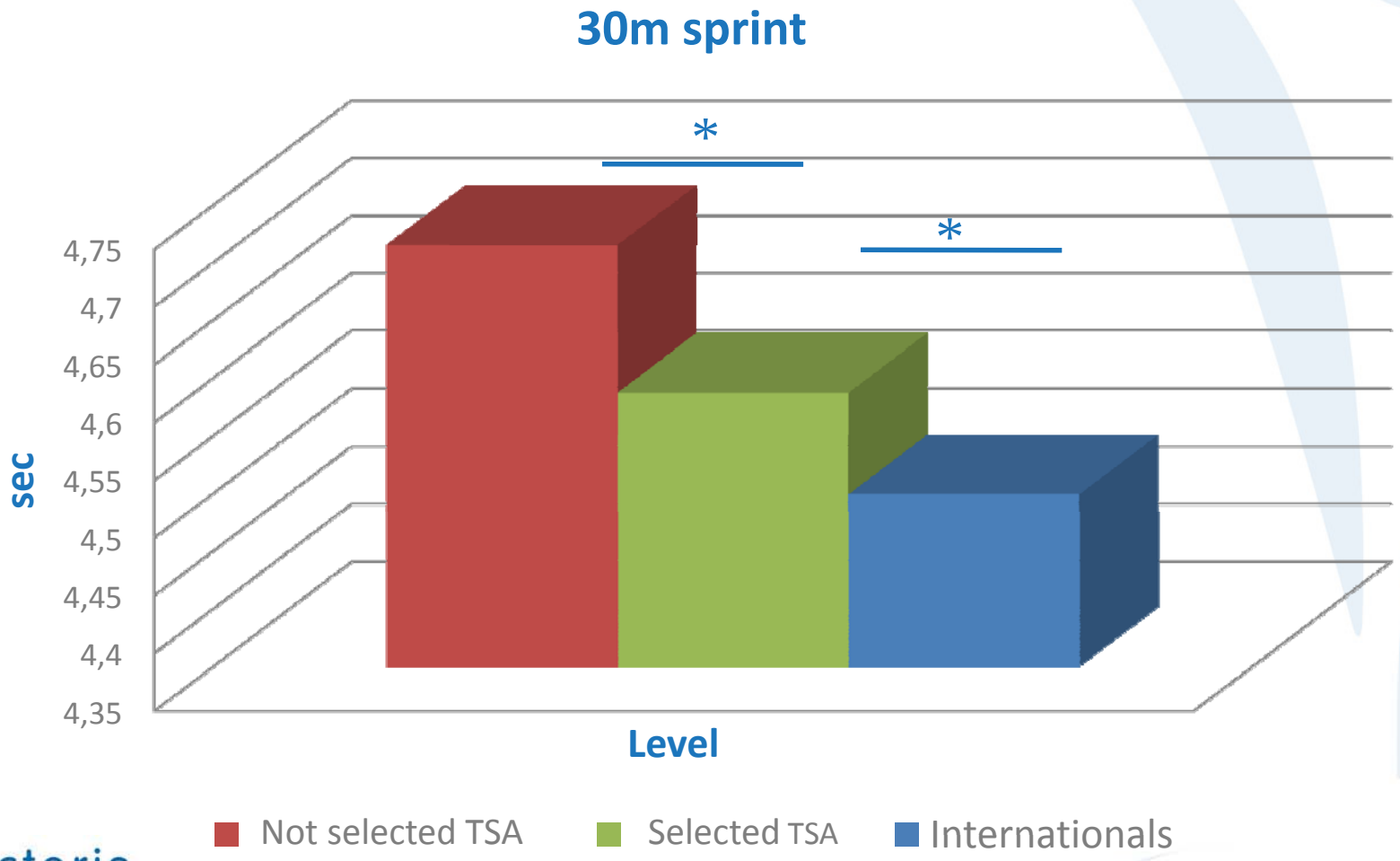
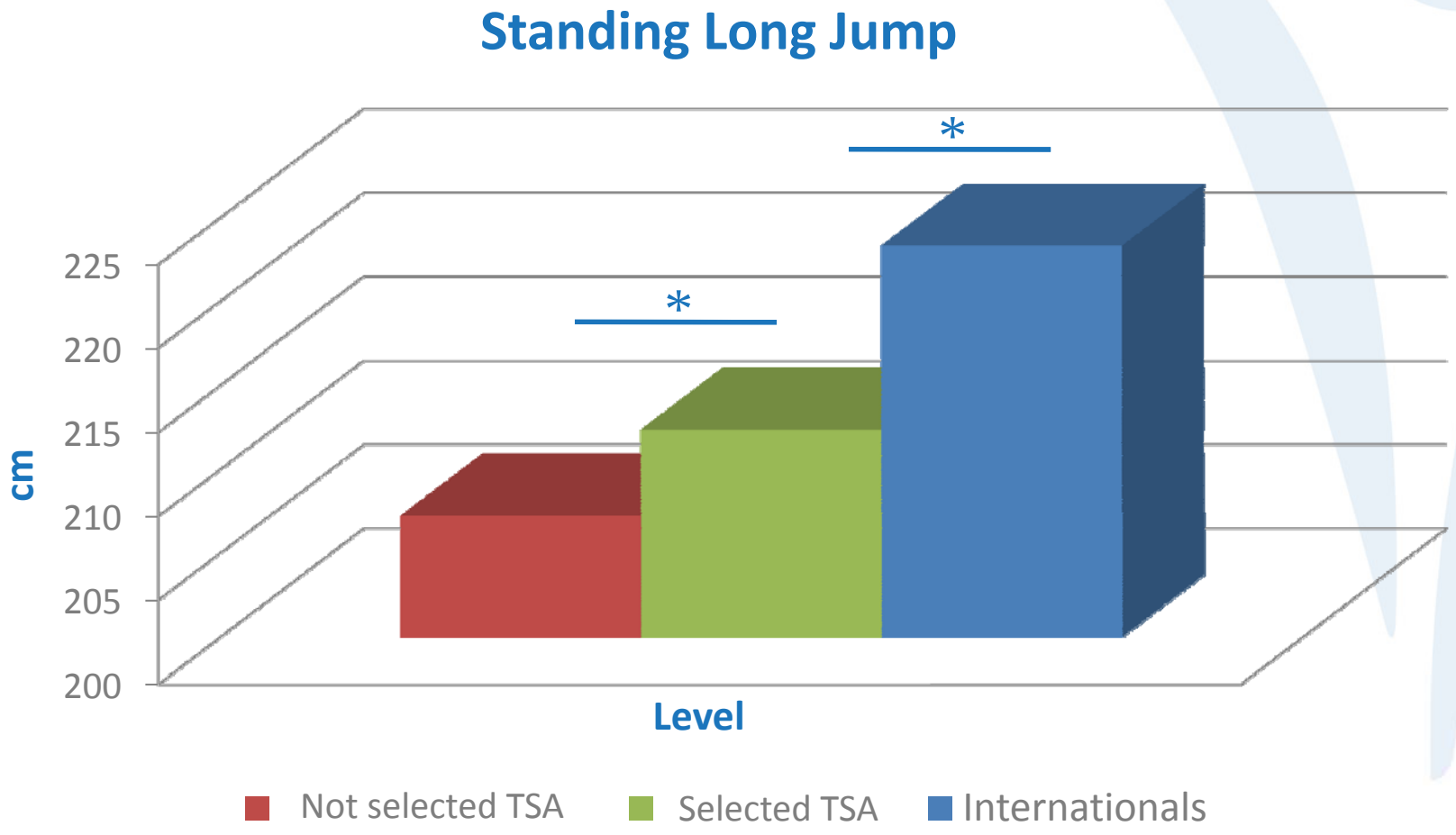
DISCRIMINATIVE POWER PHYSICAL TESTS – U16



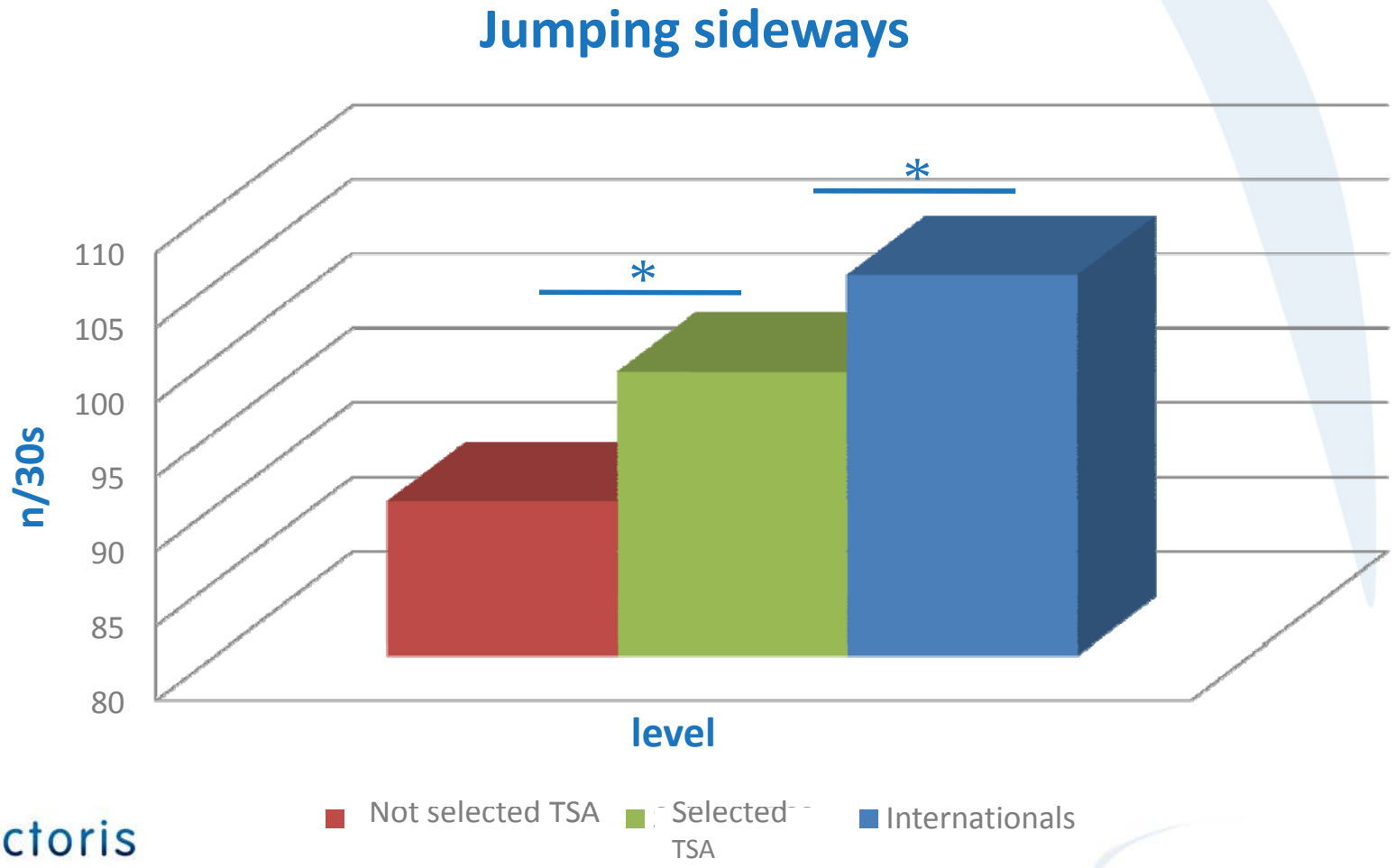
Vandendriessche et al. (2010)

DISCRIMINATIVE POWER PHYSICAL TESTS – U16



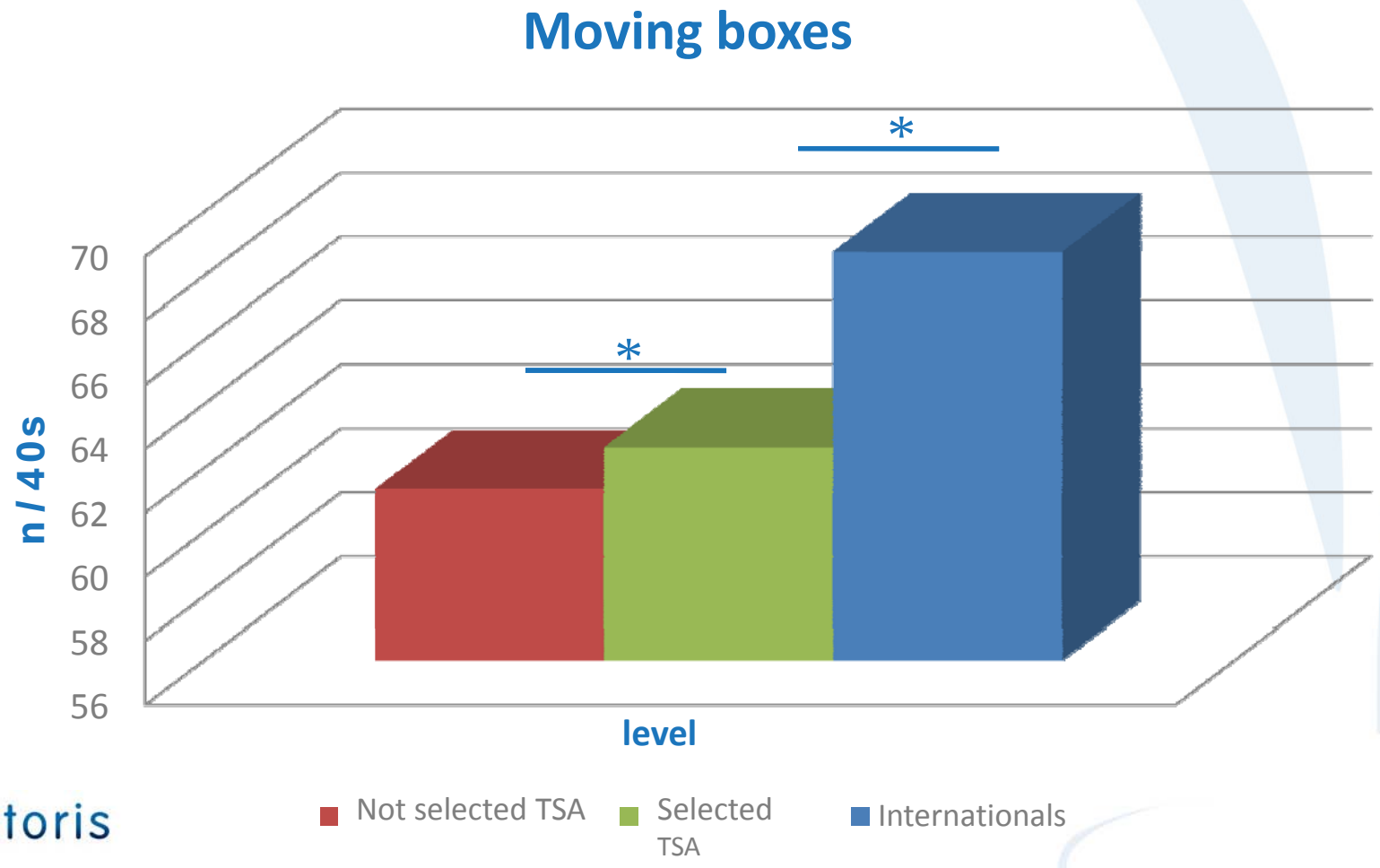
Vandendriessche et al. (2010)

DISCRIMINATIVE POWER COORDINATION TESTS – U16



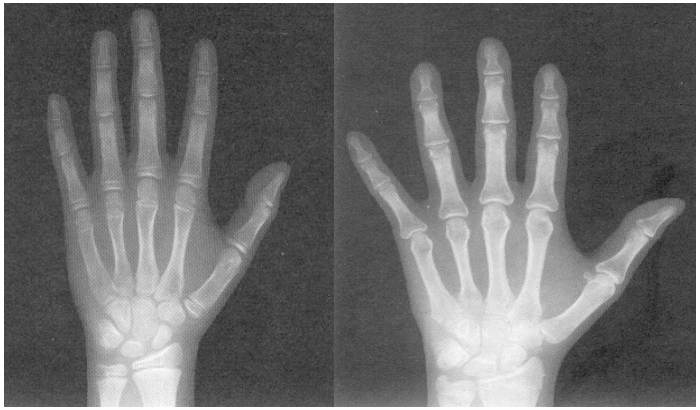
Vandendriessche et al. (2010)

DISCRIMINATIVE POWER COORDINATION TESTS – U16



Vandendriessche et al. (2010)

MEASUREMENT OF MATURITY



10.5 yrs 17.5 yrs

- Field tests
- Age at peak height velocity (Mirwald et al., 2005)
  - Indication of timing of peak growth spurt

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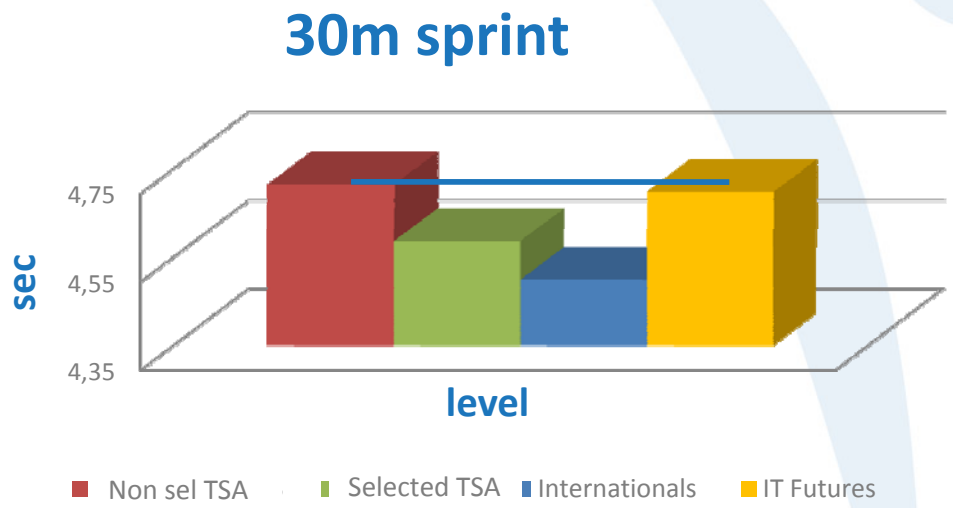
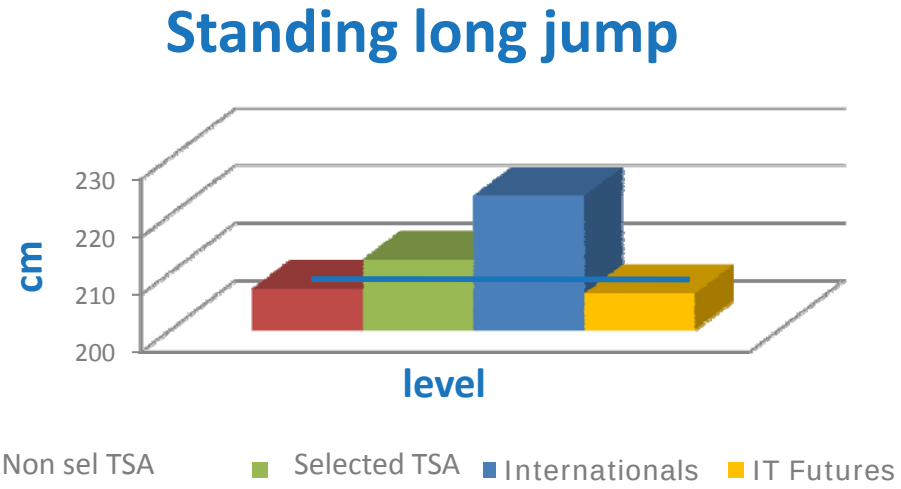
LATE MATURING PLAYERS: U16 FUTURES

Physical profile





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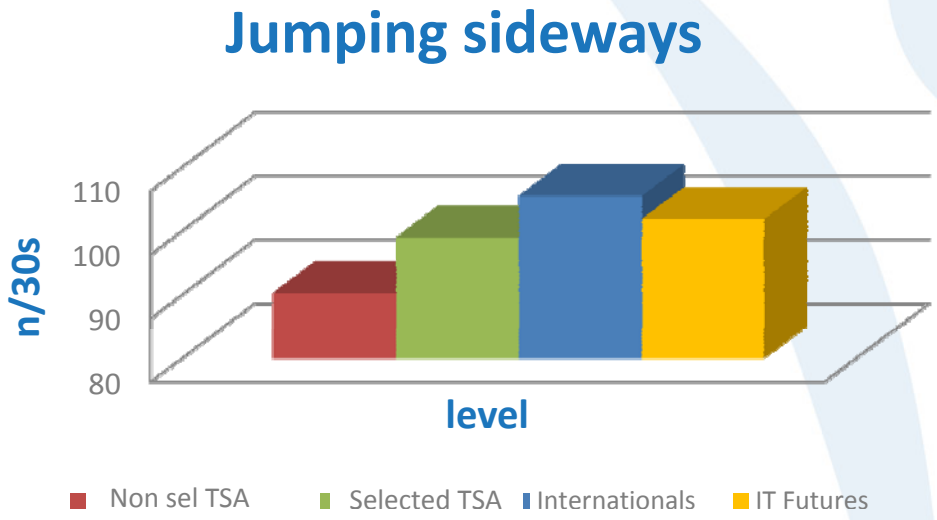
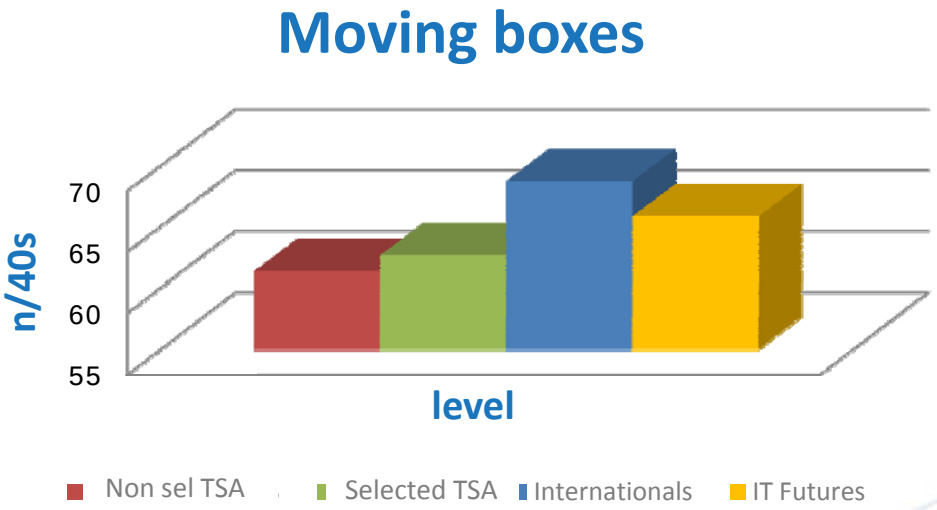
Vandendriessche et al. (2010)

LATE MATURING PLAYERS: U16 FUTURES

Coordination profile





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Vandendriessche et al. (2010)

TID TESTS: ADDED VALUE

- Discriminative power
  - Selected vs non-selected players
  - Benchmarks of different levels per age group
- Take into account maturity-level!
  - Physical characteristics: differences
  - General motor coordination: no differences

RECOMMENDATIONS

- TID test battery: useful complementary advice
  - Inclusion of other parameters e.g., technical & tactical skills
  - Development of game-based approach
- Individualized approach taking into account (biological) maturity & training history profile
- Repetitive profiling of young athletes is essential
  - Identification vs reference values
  - Identification strengths & weaknesses
  - Monitoring progression & development

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TALENT DEVELOPMENT

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EARLY VS LATE SPECIALIZATION

- Early specialization
  - Negative impact on development of general abilities (Wiersma, 2000)
  - Increased risk for burn-out (Henschen, 1998) or drop-out (Wiersma, 2000)
  - Not essential to reach elite level (Côté, 1999)
  - No exposure to benefits of other sports (Wolstencroft, 2002)

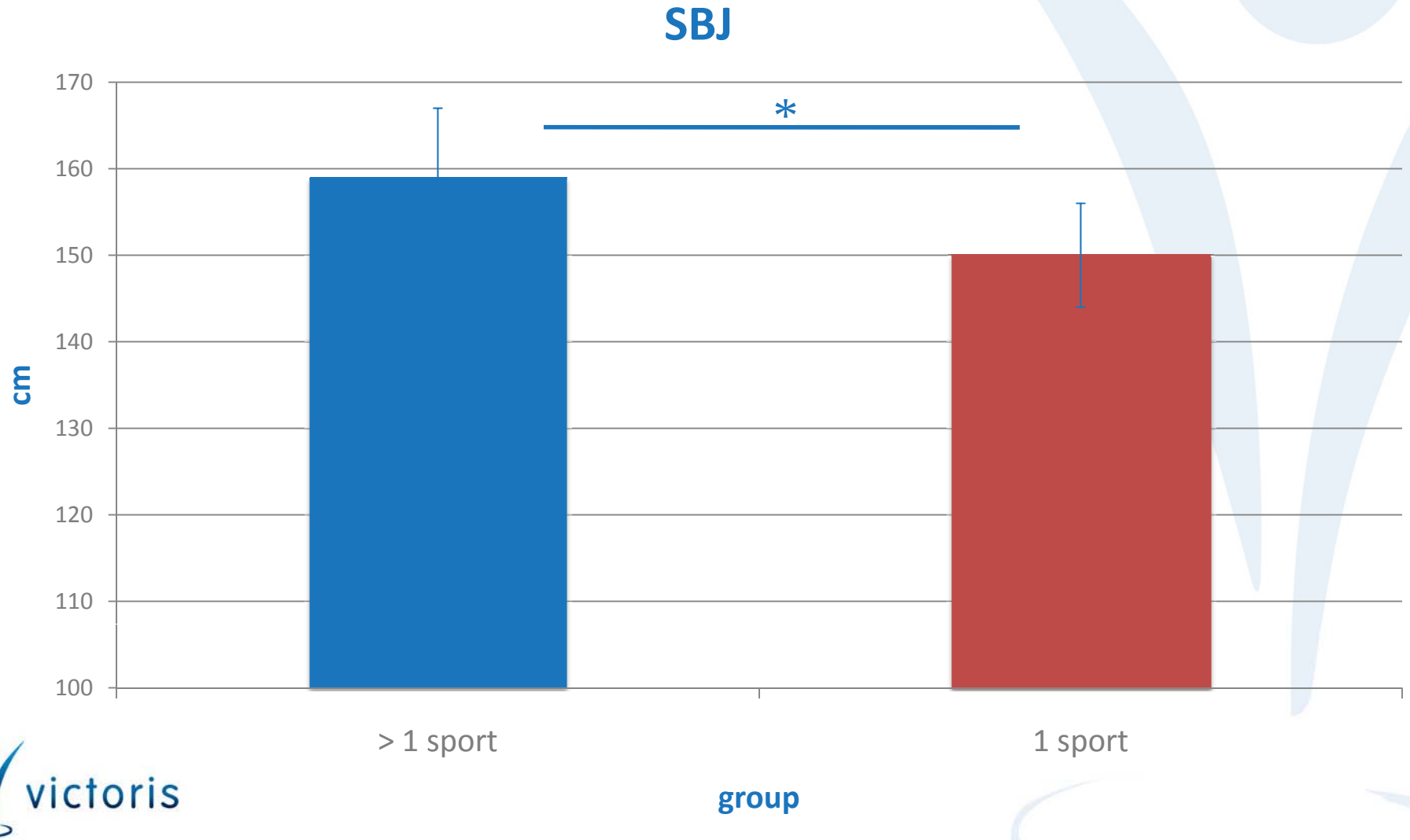
MULTIPLE SPORTS BACKGROUND

- Baker et al. (2003)
  - Beneficial for general and sport-specific development
  - More consistent performances, less injuries and drop-out

MULTIPLE SPORTS BACKGROUND

- Sportakus project
  - Handball – Volleyball – Basketball – Soccer – Dance – Atletics – Tennis
  - 6-12 years (n=288)

SPORTAKUS – GENERAL ABILITIES



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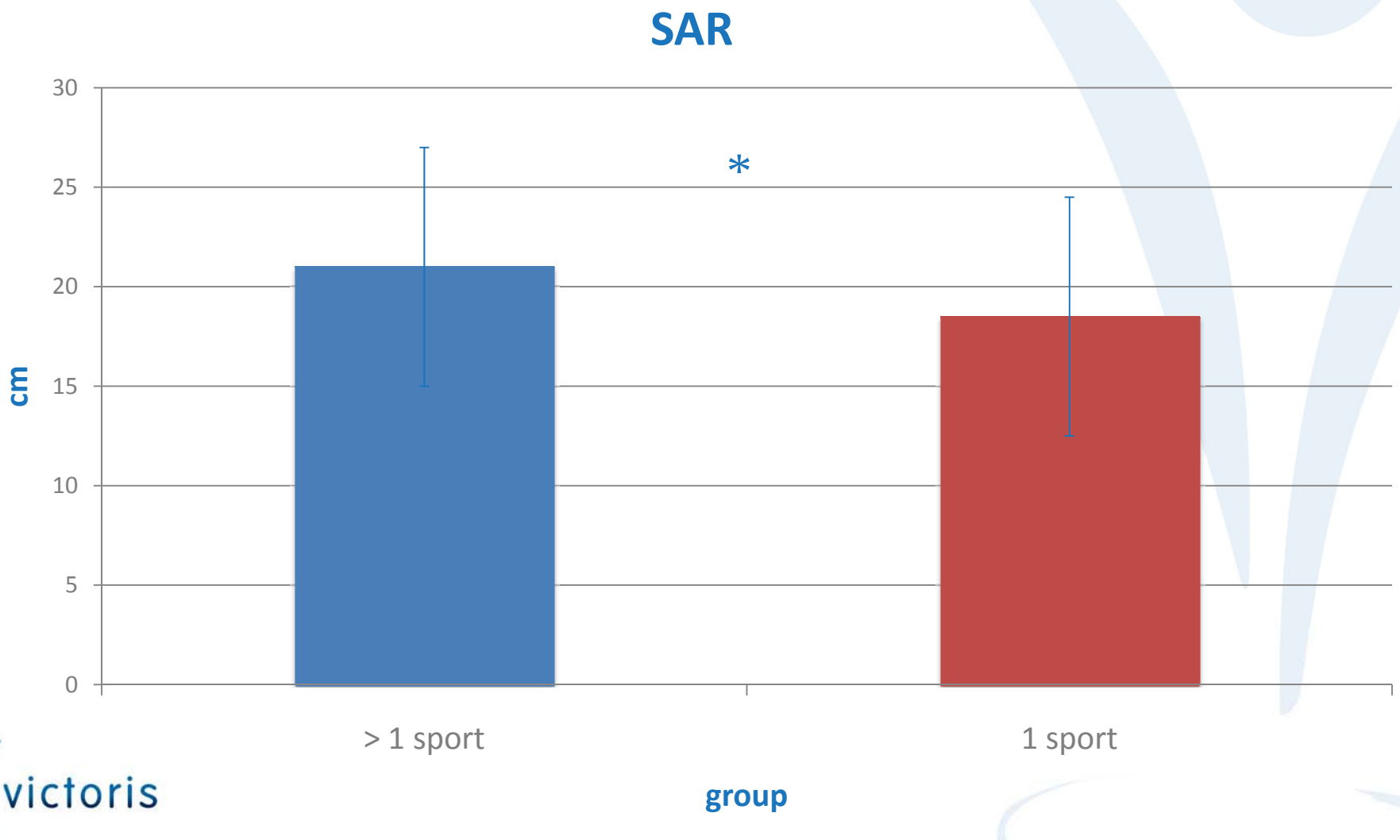
Fransen et al. (unpublished)

SPORTAKUS – GENERAL ABILITIES



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Fransen et al. (unpublished)

SPORTAKUS – SPORTSPECIFIC SKILLS

- Soccer dribble test
  - Significant differences between soccer group and other sports from 7 yrs

EARLY VS LATE SPECIALIZATION

- Multiple sports background is beneficial for complete development cf. Developmental Model of Sport Participation (Côté and Fraser-Thomas, 2007)

- Early involvement in some sports may be essential to reach elite level

OPTIMAL DEV OPPORTUNITIES

- Individualised approach cf. maturity
- Targets and methods: long term
- Identification & development of skills
  - essential at adult age
  - increase opportunities to learn and successfully develop (youth: LT plan vs. adults: ST)
  - tid test battery: useful support in decision-making process
- Repetitive profiling: progression rather than performance!

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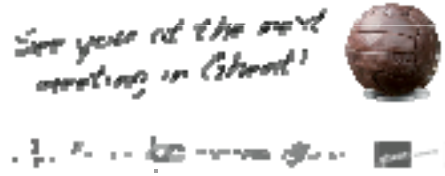

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