

Repeated high-speed activities during youth soccer games in relation to changes in maximal sprinting and aerobic speeds

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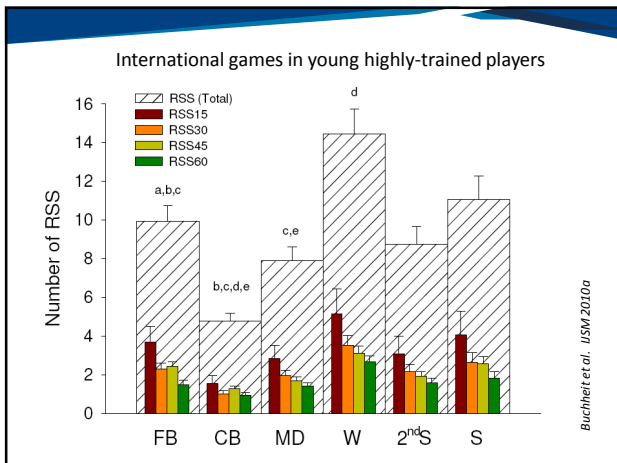
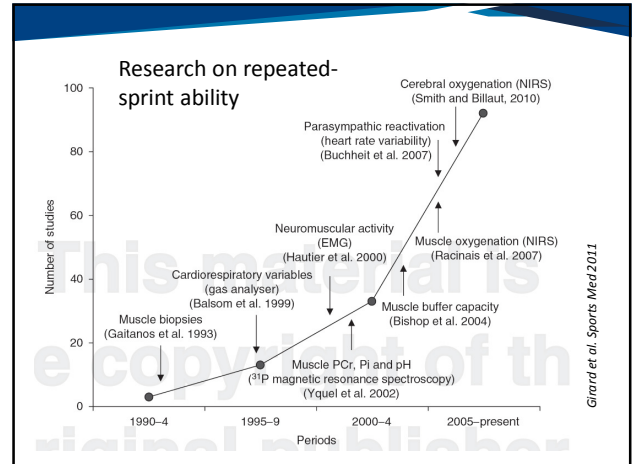
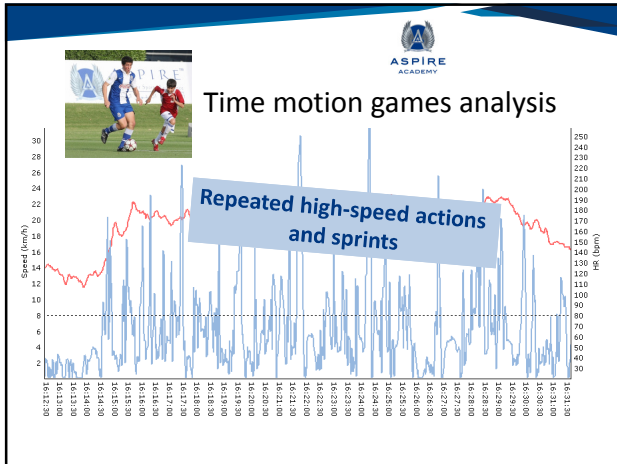


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Sport science support - Training process in an academy

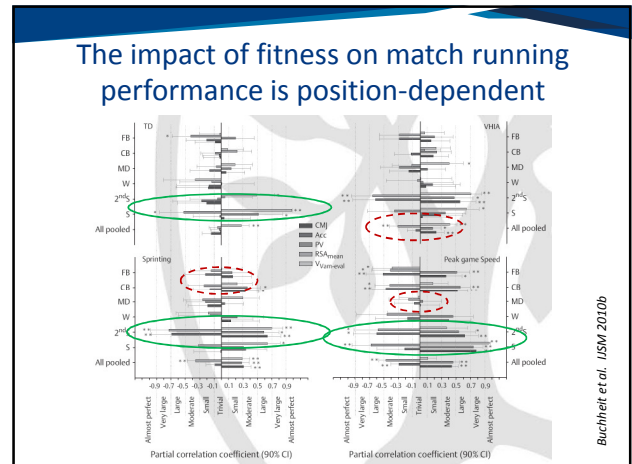
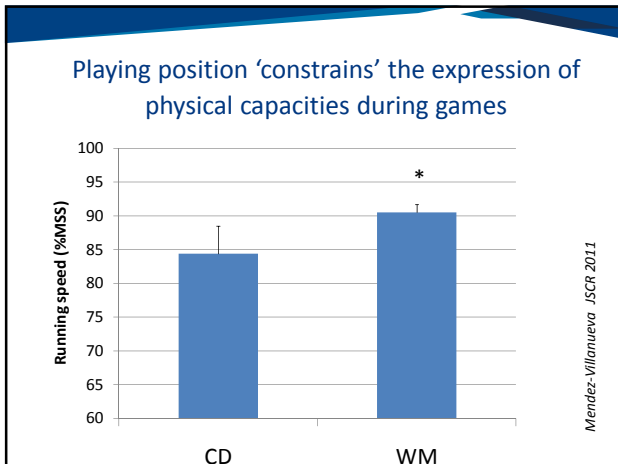
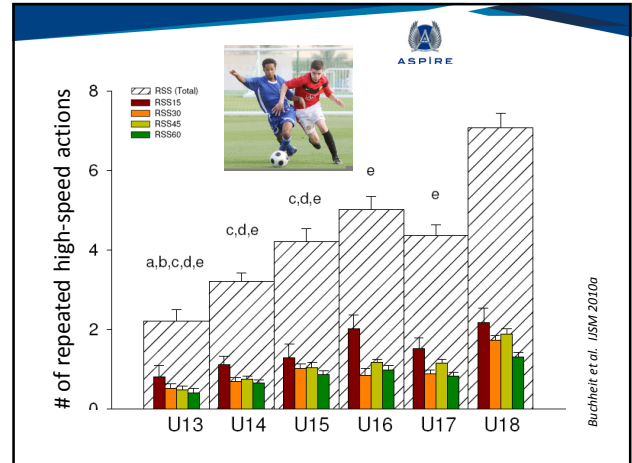
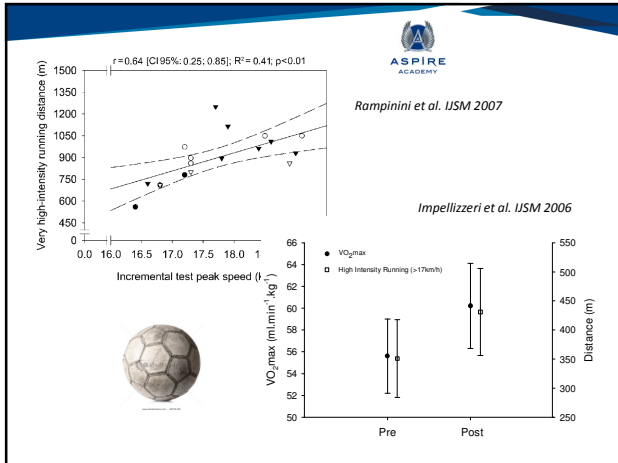
- Football is first a **tactical / technical** game
- Understanding the physical demands of a game is determinant for the **implementation of physical training strategies**

- What should we train?
- How much should be train?



Q: Do/how speed and fitness influence high-intensity running performance and repeated-sprint activity during game ?





Game running activities vs. physical capacities

- Most of the available data limited to cross-sectional analyses or correlations
- No data on repeated high-speed actions or sprints
- Impact of playing positions on these relationships is unclear
- **Q:** which physical capacities can impact high-intensity running performance and repeated-sprint activity during game ?
- **Q:** can all playing positions benefit from the same 'transfer' ?

Purpose

Examine in highly-trained young players the effect of **longitudinal** changes in

- Maximal sprint speed (MSS)
- estimated maximal aerobic speed (MAS)

on

- Repeated high-speed actions
- Repeated sprints sequences

during international games with respect to **playing positions**

2 locomotor entities (Bundle JAP 2003)

Methods




- 124 young soccer players
 - 14.3 ± 0.8 yrs,
 - 0.3 ± 0.9 yrs from/to peak height velocity
 - 163.0 ± 9.4 cm and 49.1 ± 7.8 kg
- 14 hours of combined soccer-specific training and competitive play per week
- Tested 3 x / year (i.e., October, January and May)

Physical Performance field tests

- Time-motion analysis during international friendly games









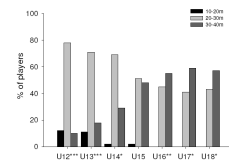



Physical performance tests

- Anthropometry → Maturity status = age from peak height velocity (Mirwald MSS 2002)
- Incremental track test (Vam-eval) → esti. **MAS**
- 40-m sprint with 10-m split times


→ Acceleration (1st 10 m) / **MSS** (best split)
(Buchheit USPP 2012)

Reliability of the performance measures (CV):

(n = 65 players)

- **MSS: 1.4%** (90% CL: 1.2;1.6)
- **MAS: 3.5%** (90% CL: 3.0;4.1)


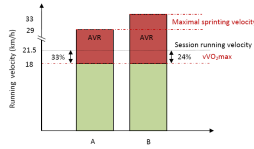


Match analyses




- GPS, SPI Elite, GPSport, 1Hz
- 109 games → 736 player-matches
 - full-backs (FB, n = 36 different players played at this position)
 - centre-backs (CB, n = 26)
 - midfielders and second strikers (MD, n = 48)
 - wide midfielders (wingers, W, n = 43)
 - strikers (S, n = 19).


Match analyses

- Absolute **and** relative speed thresholds (Buchheit USM 2010)
- **Absolute** speed threshold
 - in relation to opponents
 - to compare players
 - Repeated high-speed actions : > 2 actions >19 km.h⁻¹ within 60s
- **Relative** speed threshold
 - Relative demand for each player
 - Repeated sprint sequences : > 2 actions >61% of MSS within 60s


124 players tested 3 x / years
 • October to January
 • January to May
 • May to October

736 player-matches



Substantial (>1/2 CV) increase in MSS or MAS

No change in MSS or MAS




Substantial (>1/2 CV) decrease in MSS or MAS

At least 2 games played during a given testing period

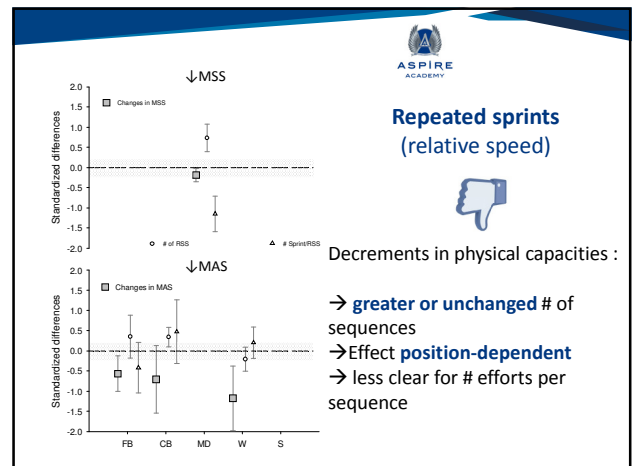
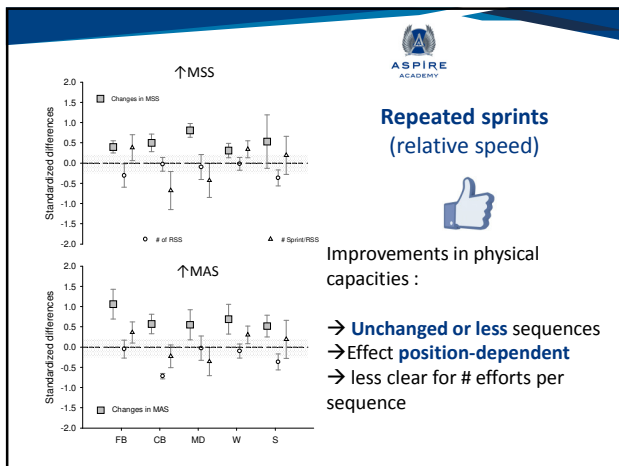
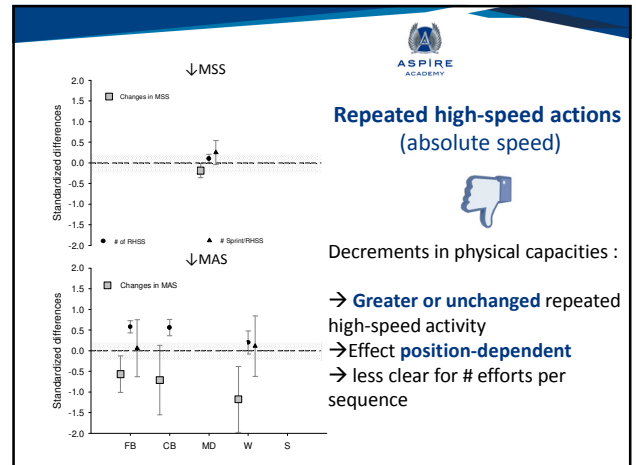
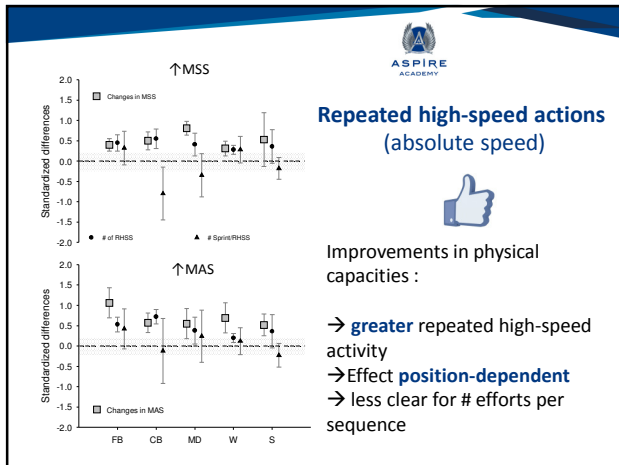
33 different players, 207 games
 Pairs of Δ : 41 for MSS and 28 for MAS

Changes in repeated high-speed actions and repeated sprint sequences ?




10 different players, 73 games
 Pairs of Δ : 9 for MSS and 12 for MAS

Changes in repeated high-speed actions and repeated sprint sequences ?

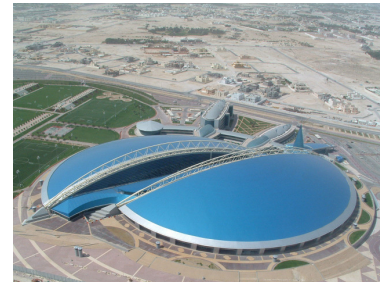


- Getting faster and/or fitter
 - Enables **greater repeated high-speed activities**
 - but does **not translate** into greater repeated-**sprint** activity during games
 - ↓ the occurrence of **sprints** (↓ load)
 - Large **position differences**
 - **Game** constrains **limit** the expression of fitness
- Losing speed and/or fitness
 - Does **not compromise** the actual match running activity → **fitness was not limiting** before
 - But **↑ relative** running **load** during games

- Physical fitness
 - ✓ **is not THE first determinant of repeated high speed actions during games** → actual game demands are likely more important
- 
- ✓ May modulate **relative physical load**
 - Injury risk, fatigue
 - Passing ability, decision making, etc...

How much should we train physical capacities?

- Who can do more, can do less !
- Thresholds ? ‘Minimum required’ to play...
- Cost/benefits in relation to player’s
 - Physical profile
 - Playing style
 - Playing position
 - Playing standard



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