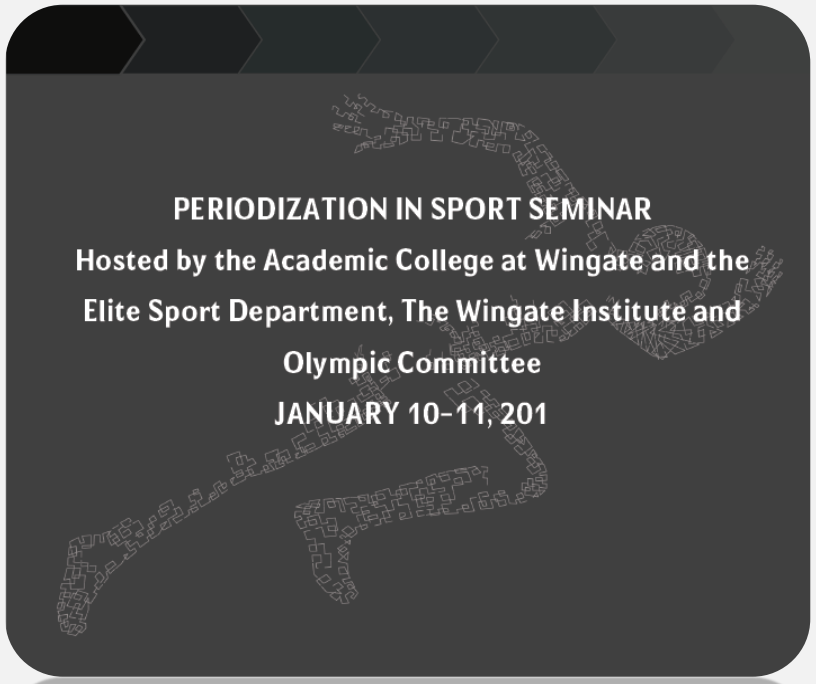


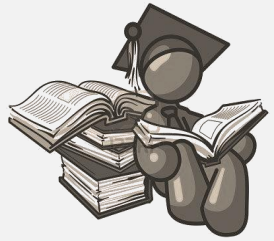
The effects of structural and technical constraints on the profiles of soccer-based passing drill exercises: suggestions for periodization planning and skill development

Antonio Dello Iacono[1,2]

1 The Academic College at Wingate - Israel

2 Sport Science Department - Maccabi Tel Aviv FC - Israel

Professional Approach



Scientific evidence-based
(Science)

Best practice-based
(Field)

Informed Practice

Long term strategies aiming to…

Skills development

Performance improvement

Possible scenarios

As a Scientist I know exactly what happens in your field!
So, you should do…

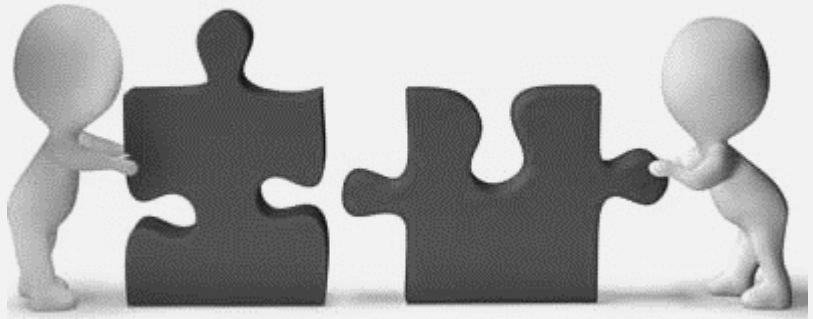
BOOM!!!

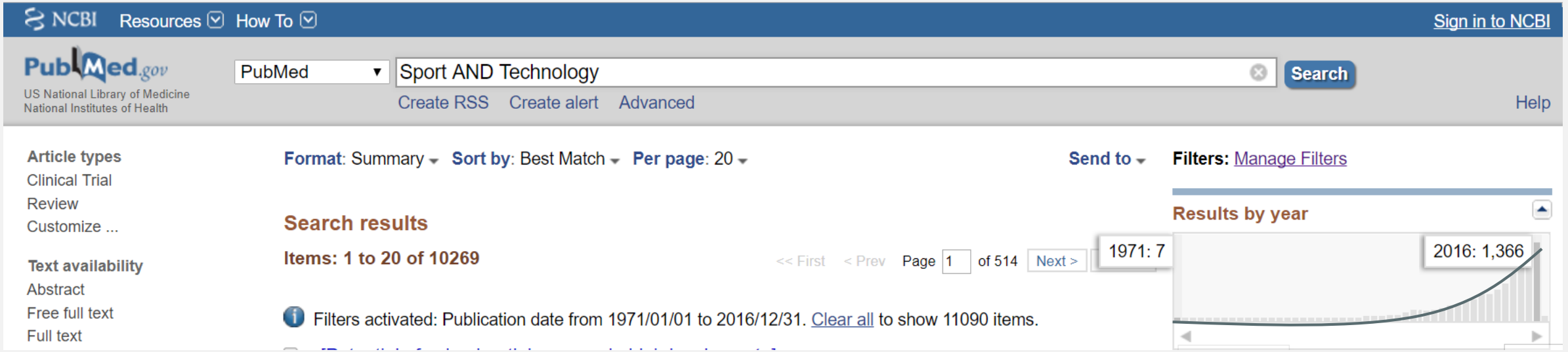
My dear, have you ever been out of your lab?
So, let me do my job!

Technology – a possible mediator

Advanced technology provides me valid, reliable and unbiased data!!!

Technological tools offer me attractive, useful and user-friendly information





Exponential increase of technology use into sport settings

- Extensive information to effectively quantify and profile individual players and/or team performances
- Methodological decisions leading to positive impacts of sporting performances

The “Eye” of technology

- Provides a comprehensive overview of the performance of interest – *what the human eye is unable to provide*

- Leads to decision making processes which rely on solid data rather than subjective judgements – *unbiased data supplier*

Systematic Approach – Football Applications



Evidences → **Observation** → **Interpretation** → **Scientific Approach** → **Practical Applications**





What the “Science” states about football?

from a scientific standpoint…..

- Impulsive efforts such as accelerations, sprints and repeated sprints are movement patterns prerequisites for successful participation at elite level (Faude et al., 2012)

- Mastery of technical skills like dribbling, passing and kicking, discriminate top players from less-talented counterparts (Lago & Martin, 2007)

- For an effective transfer, technical-based football-specific drills, should be performed in similar conditions to those of occurring during match play (Williams & Hodges, 2005)

What is the common practice in “Football”?

from a professional viewpoint…..

- Technical skills are addressed and developed separately from the physical and physiological capabilities

- Coaches are unaware of the fitness load associated with the technical-skills drills and neglect the adaptations that are likely to occur

- Coaches are unaware of the effects induced by the specific constraints (structural and rule) commonly used in football practice

Do specific structural and technical rule constraints affect the performance profile of technical-drills exercises?

Aim of the study:

To investigate the effects of structural (8 vs. 6 players involved) or technical (single pass vs. double pass) constraints on the physiological, time-motion and technical responses of football-based technical drills

Experimental design:

A randomized, post-only crossover study design to analyze the differences between the experimental drills` protocols

MEETING 1	Warm-up (15 min)	⟷	8-players format + single pass
MEETING 2	Warm-up (15 min)	⟷	8-players format + double pass
MEETING 3	Warm-up (15 min)	⟷	6-players format + single pass
MEETING 4	Warm-up (15 min)	⟷	6-players format + double pass

Experimental protocols:

5 sets of 3 min of either triangle-shape or Y-shape passing drills featured by the different structural and technical constraints.

Triangle-shape

Y-shape

Passing **Sprinting** **Ball carrying**

Dependent variables:

- Internal load data: percentage of maximal Heart rate (% HRmax) and rating of perceived exertion (RPE, arbitrary unit (AU)); (Foster et al., 2001)

- External load data: relative distance per minute (RD, m/min,), high-speed distance per minute (HSD, m/min), sprint distance per minute (SD, m/min), high-intensity (+/- 2 m/sec^{-2}) accelerations and decelerations per minute (HAD, nr./min); (Abade et al., 2014; Dwyer & Gabbett, 2012)

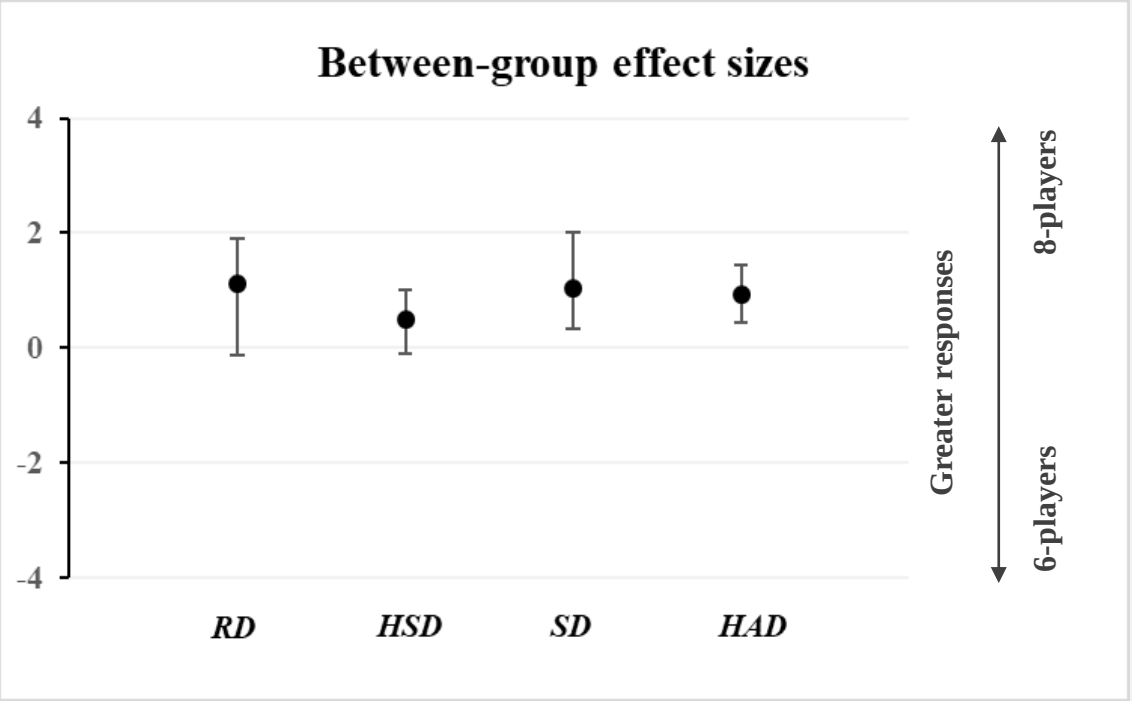
- Technical performance data: ball speed (m/sec) and pass accuracy (%) (Dellal et al., 2011)

Statistical analysis:

- Test-retest and intra-day reliability assessed by the Intra-Class Correlation Coefficient (ICC) and Coefficient of Variability (%), respectively.

- Differences between the experimental protocols by Effect size (ES) and the Magnitude-based Inference method (Hopkins, 2000; Hopkins et al., 2009)

Findings – External Load:



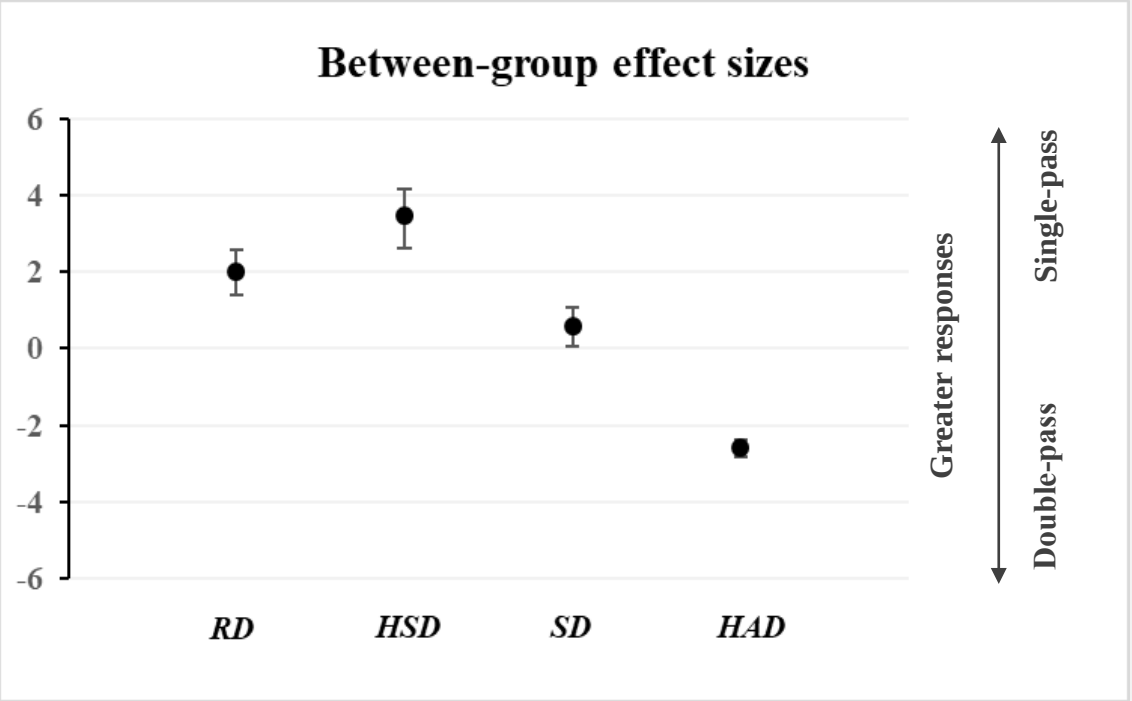
The greater external load responses for the 8-players formats may be the consequence of a specific "pacing effect"

Longer within-set phases of passive recovery + lower work-to rest ratio

↕

Quantitatively and qualitative better time-motion performances

Findings – External Load:

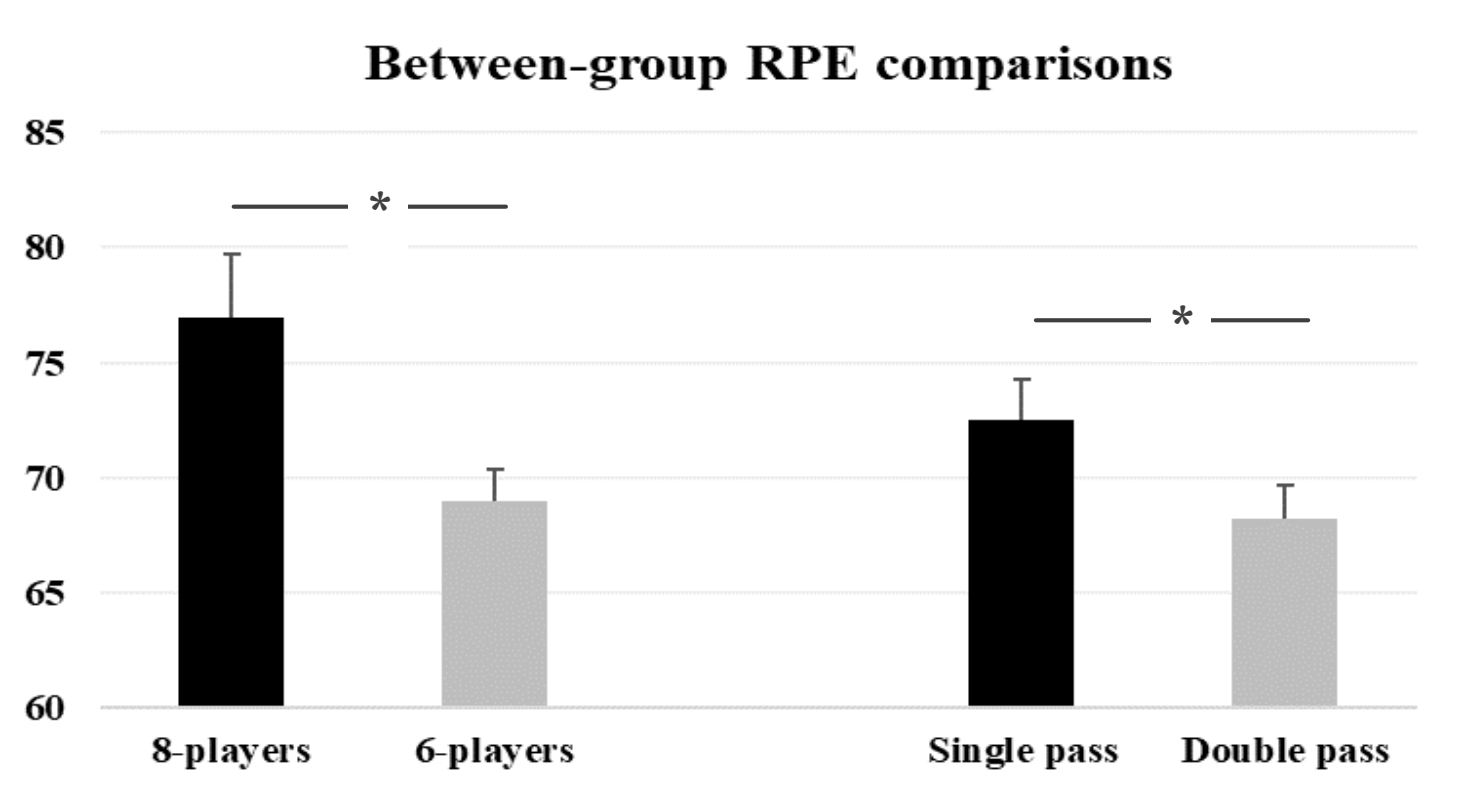


Specific and different profiles

Single-pass ↔ higher paces and intensity

Double-pass ↔ higher accelerations and decelerations demands

Findings – Internal Load:



*** Meaningful difference**

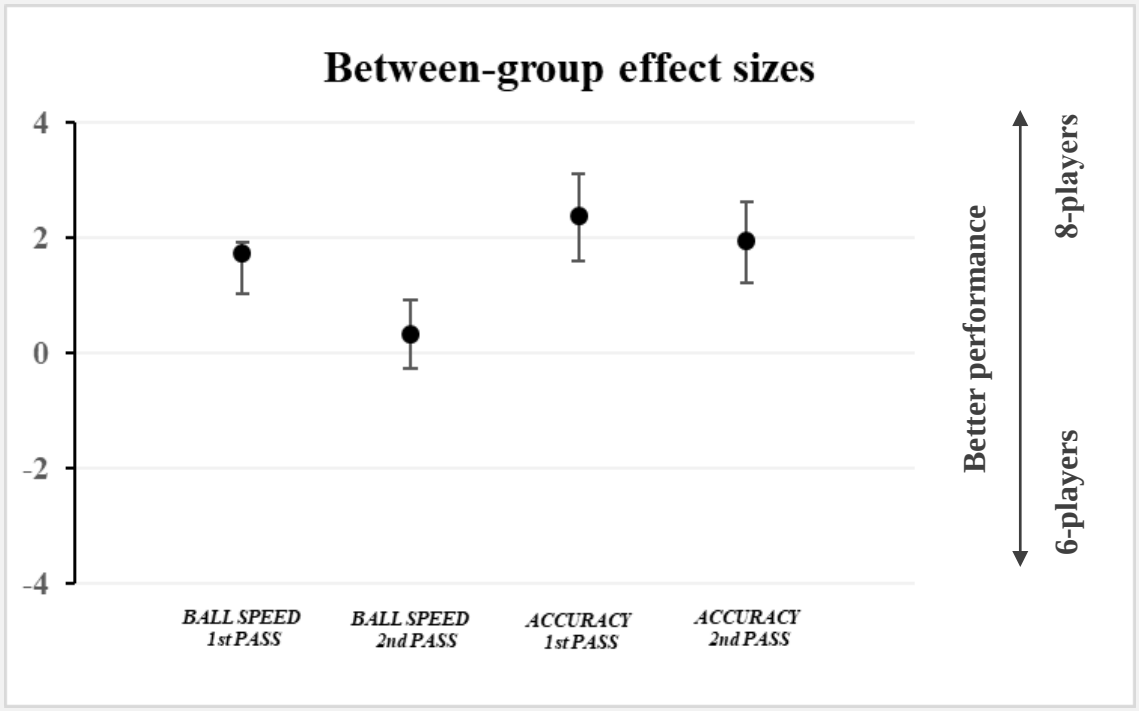
The greater internal load responses for the 8-players formats vs. 6-players formats and single-pass formats vs. double-pass formats, confirm the relationships between RPE scores and high intensity efforts

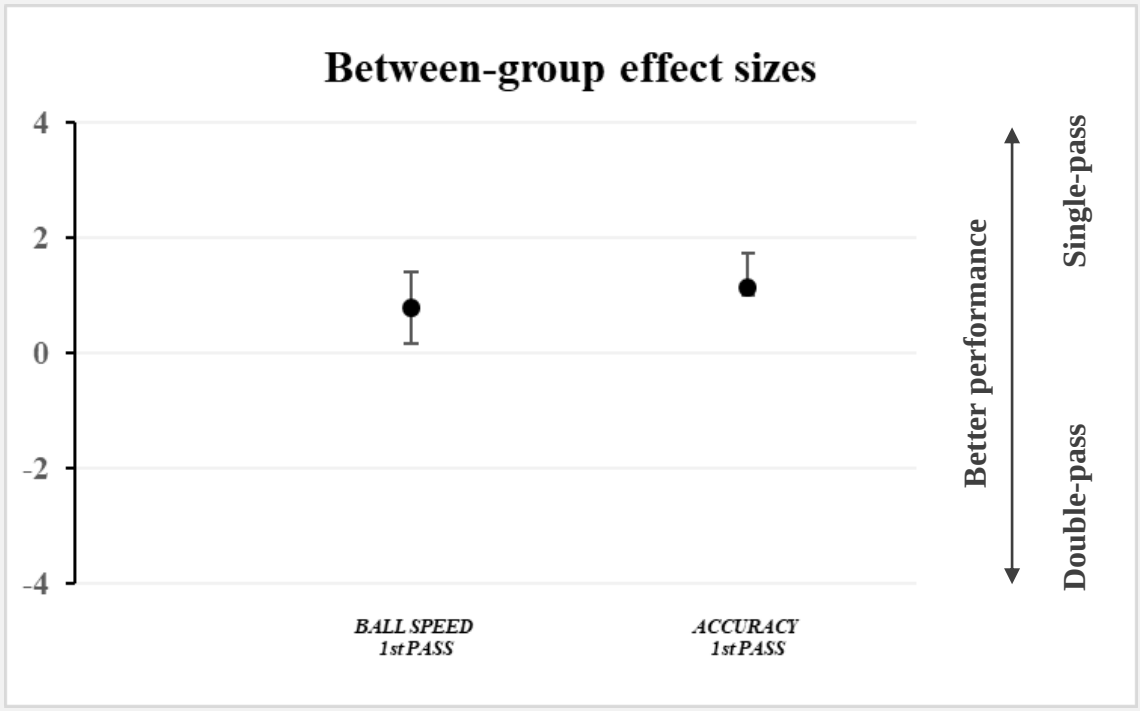
Greater amount high intensity efforts

↕

Higher subjective RPE

Findings – Technical Performance:





The greater pass accuracy for the single-pass formats compared to the double-pass formats may be the consequence of the higher complexity of the latter experimental protocol

Single-pass format ↔ less information and decision making process to be performed

↕

Quantitatively better technical performances

Practical Applications:

- Selective selection of the different drills` format according to the periodization plan and the main training aims

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
TACTICAL CONTENT	**DAY OFF**	**Line-Position Training**	**Transition Attack to defense**	**Build-up**	**Transition Defense to attack**	**Attack**	**MATCH**
DRILL FORMAT		**6-playes + Single-pass**	**6-playes + Double-pass**	**Combinations**	**8-playes + Double-pass**	**8-playes + Single-pass**	

- Sequential order for complex football-related skills acquisition (e.g. young players development)

Skill complexity

→

8-playes + Single-pass | **8-playes + Double-pass** | **6-playes + Single-pass** | **6-playes + Double-pass**

←

Physical demands

References:

1. **Faude O, Koch T, Meyer T.** Straight sprinting is the most frequent action in goal situations in football. J Sports Sci.2012;30:625-31.
2. **Lago C, Martin R.** Determinants of possession of the ball in soccer. J Sports Sci.2007;25:969-74.
3. **Williams AM, Hodges NJ.** Practice, instruction and skill acquisition in soccer: challenging tradition. J Sports Sci.2005;23:637-50.
4. **Foster C, Florhaug JA, Franklin J, Gottschall L, Hrovatin LA, Parker S et al.** A new approach to monitoring exercise training. J Strength Cond Res.2001;15:109-15.
5. **Abade EA, Goncalves BV, Leite NM, Sampaio JE.** Time-motion and physiological profile of football training sessions performed by under-15, under-17 and under-19 elite Portuguese players. Int J Sports Physiol Perform.2014;9:463-70.
6. **Dwyer DB, Gabbett TJ.** Global positioning system data analysis: velocity ranges and a new definition of sprinting for field sport athletes. J Strength Cond Res.2012;26:818-24.
7. **Dellal A, Lago-Penas C, Wong dP, Chamari K.** Effect of the number of ball contacts within bouts of 4 vs. 4 small-sided soccer games. Int J Sports Physiol Perform.2011;6:322-33.
8. **Hopkins WG.** Measures of reliability in sports medicine and science. Sports Med.2000;30:1-15.
9. **Hopkins WG, Marshall SW, Batterham AM, Hanin J.** Progressive statistics for studies in sports medicine and exercise science. Med Sci Sports Exerc.2009;41:3-13.

Thank you
for the attention

antdelloiacono@Virgilio.it

antoniod@mtafc.com

@DelloAntonio