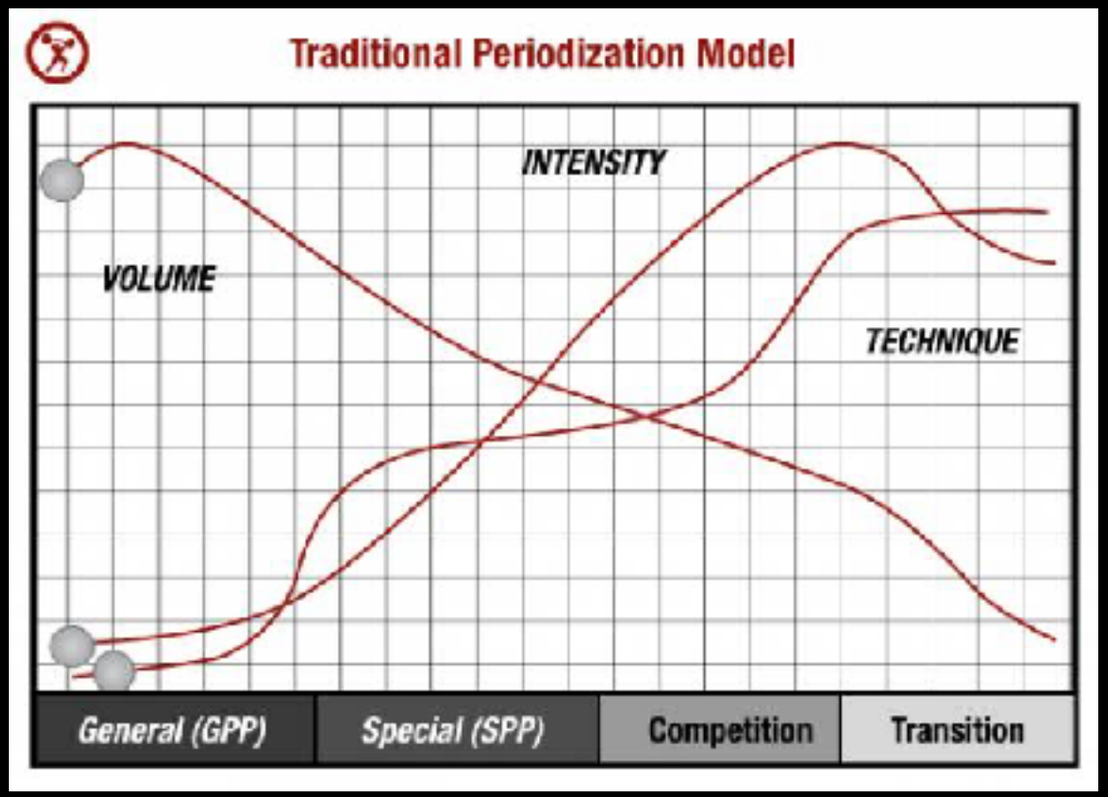
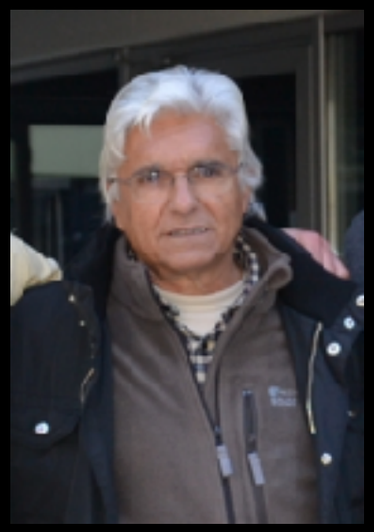
Running-based pre-season



Principle of Specificity

You must do *specific* exercises to improve *specific* components of physical fitness in *specific* body parts.

Football-based pre-season



Prepare the first 2 matches!

SSG in Football

REVIEW ARTICLE

Sports Med 2011; 41 (3): 199-220

Physiology of Small-Sided Games Training in Football

A Systematic Review

Stephen V. Hill-Haas,[1] *Brian Dawson,*[1] *Franco M. Impellizzeri*[2,3] and *Aaron J. Coutts*[4]

1 School of Sports Science, Exercise & Health, University of Western Australia, Perth, Western Australia, Australia
2 Neuromuscular Research Laboratory, Schulthess Clinic, FIFA Centre of Excellence, Zurich, Switzerland
3 Research Centre for Sport, Mountain and Health (CSMS) of Rovereto, University of Verona, Verona Italy
4 School of Leisure, Sport & Tourism, University of Technology, Lindfield, New South Wales, Australia

Journal of Human Kinetics volume 33/2012, 103–113
Section III – Sports Training

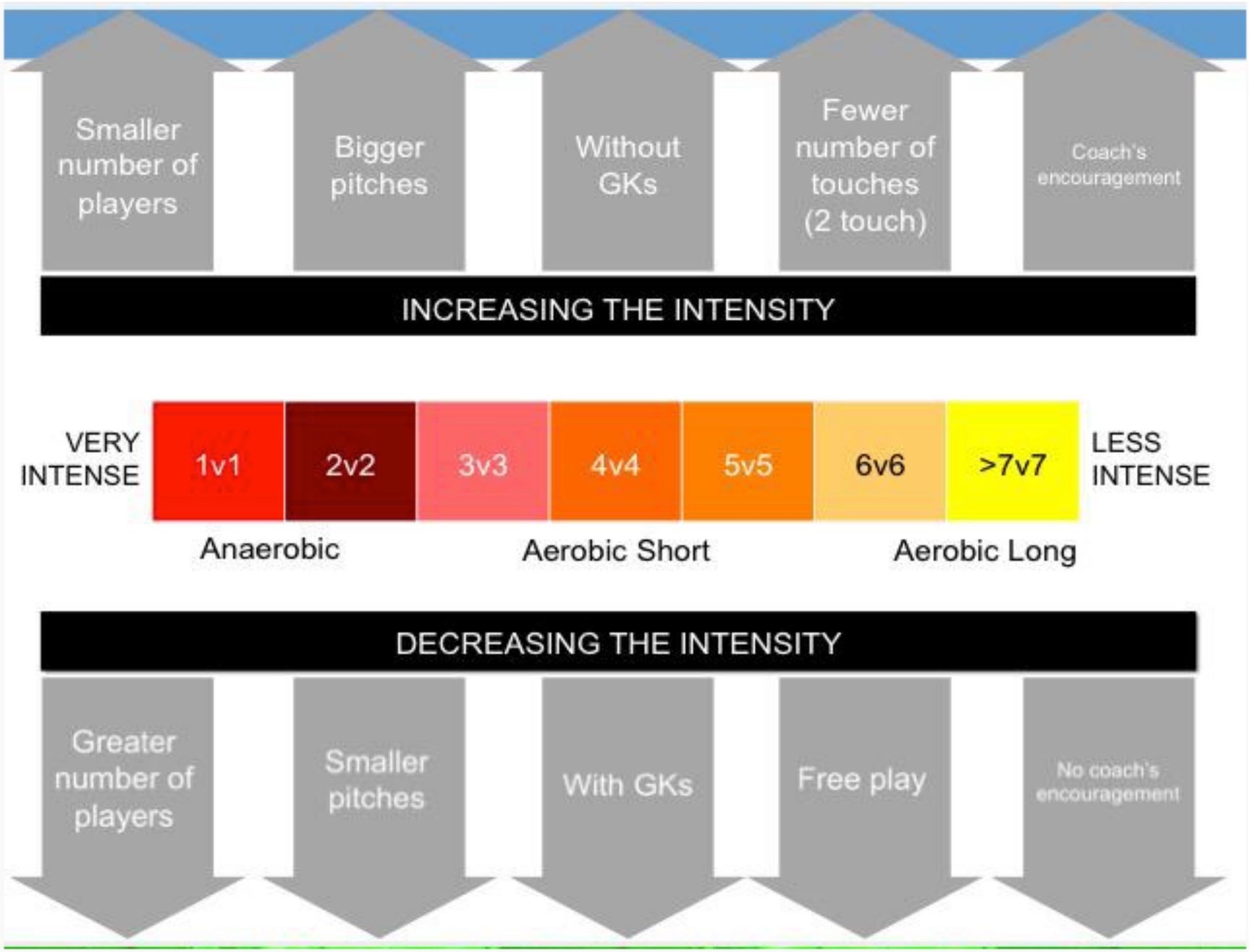
A Review on the Effects of Soccer Small-Sided Games

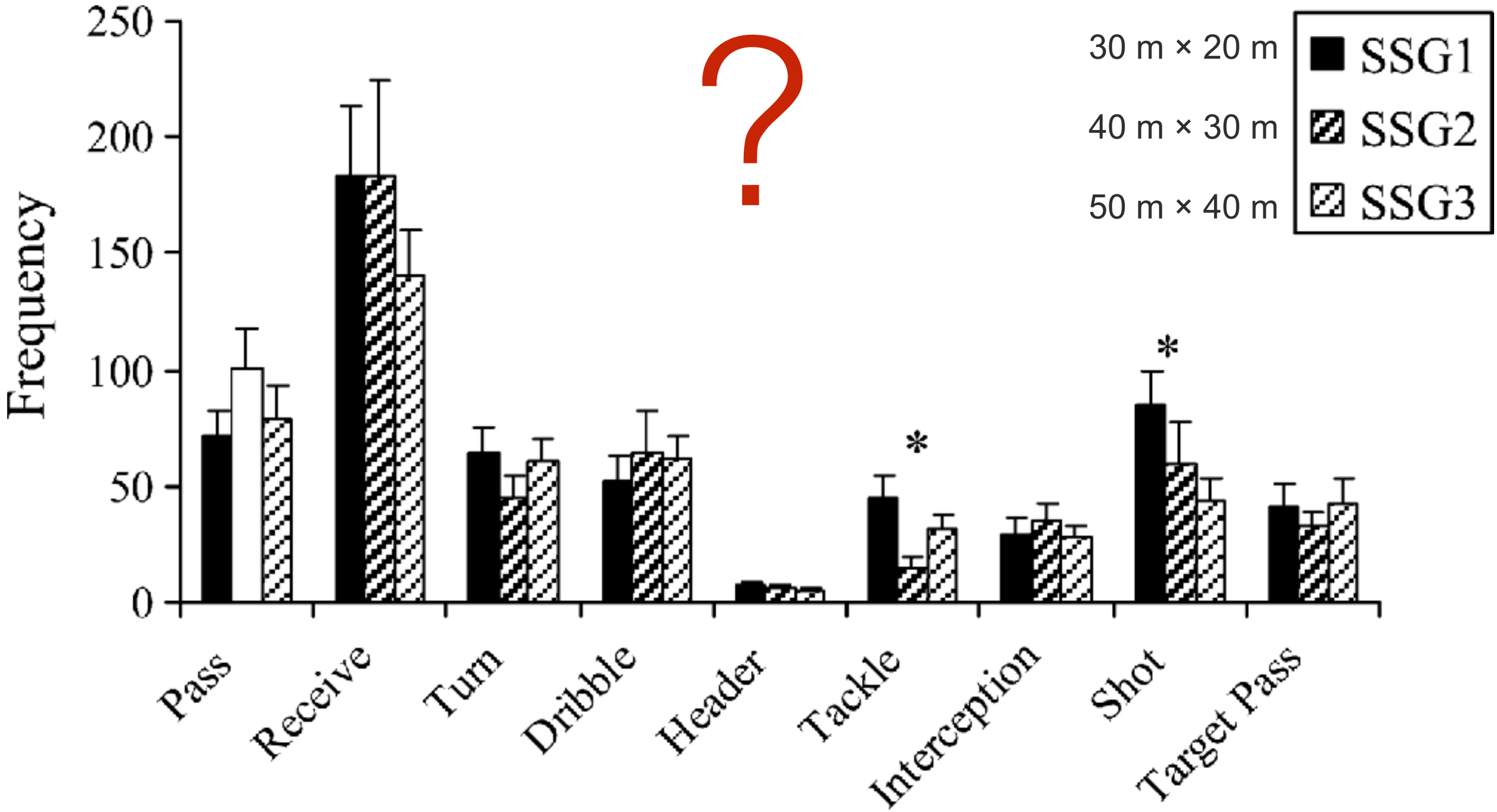
by
Marco Aguiar[2], *Goreti Botelho*[2], *Carlos Lago*[3], *Victor Maças*[2], *Jaime Sampaio*[2]

BRIEF REVIEW

Small-Sided Games in Team Sports Training: A Brief Review

Jamel Halouani,[1] Hamdi Chtourou,[1,2] Tim Gabbett,[3,4] Anis Chaouachi,[1] and Karim Chamari[5]


Smaller number of players
Bigger pitches
Without GKs
Fewer number of touches (2 touch)
Coach's encouragement
INCREASING THE INTENSITY
VERY INTENSE
1v1
2v2
3v3
4v4
5v5
6v6
>7v7
LESS INTENSE
Anaerobic
Aerobic Short
Aerobic Long
DECREASING THE INTENSITY
Greater number of players
Smaller pitches
With GKs
Free play
No coach's encouragement

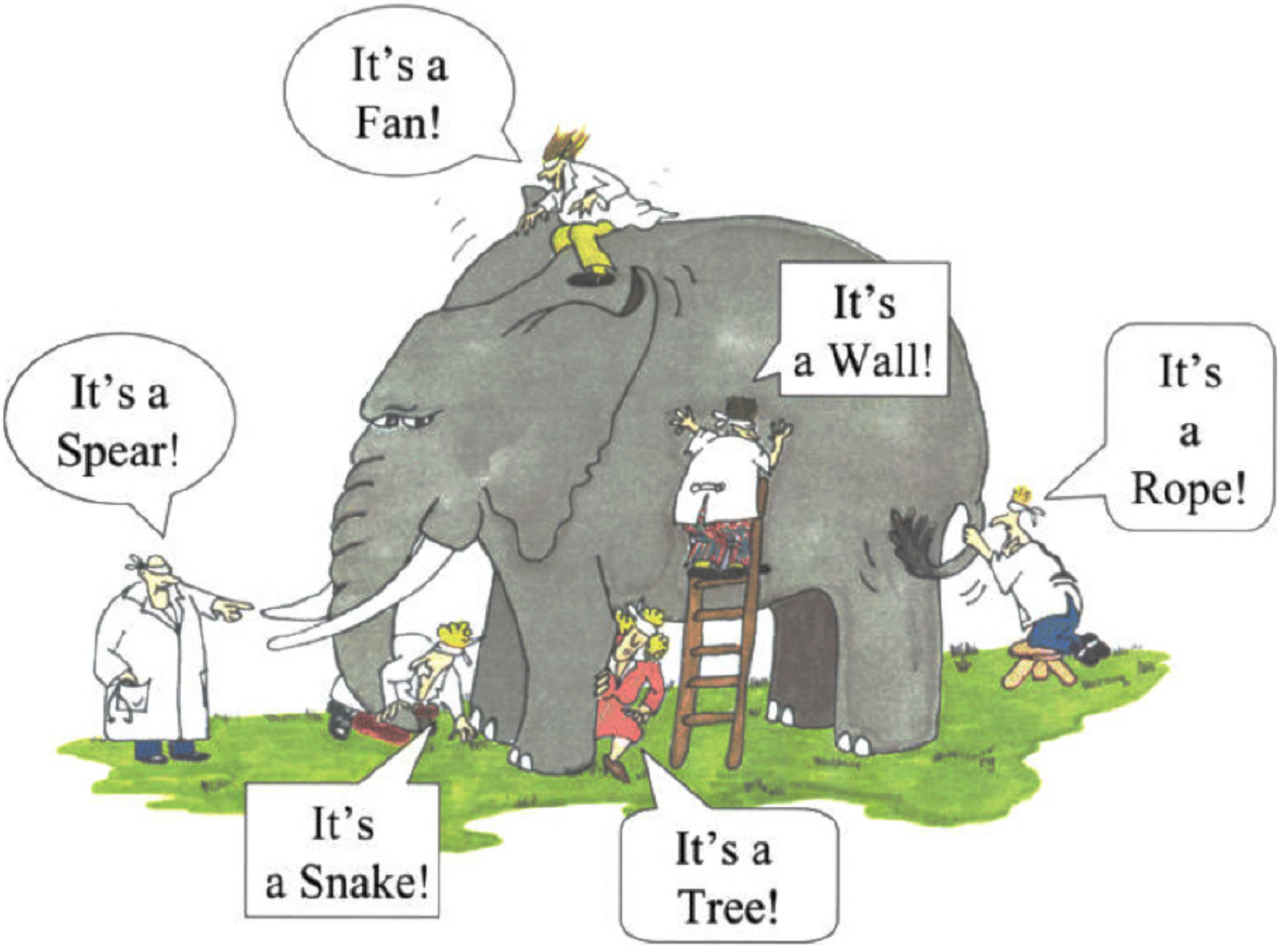

?
30 m × 20 m
40 m × 30 m
50 m × 40 m
SSG1
SSG2
SSG3
Frequency
250
200
150
100
50
0
*
*
Pass
Receive
Turn
Dribble
Header
Tackle
Interception
Shot
Target Pass
Technical Actions

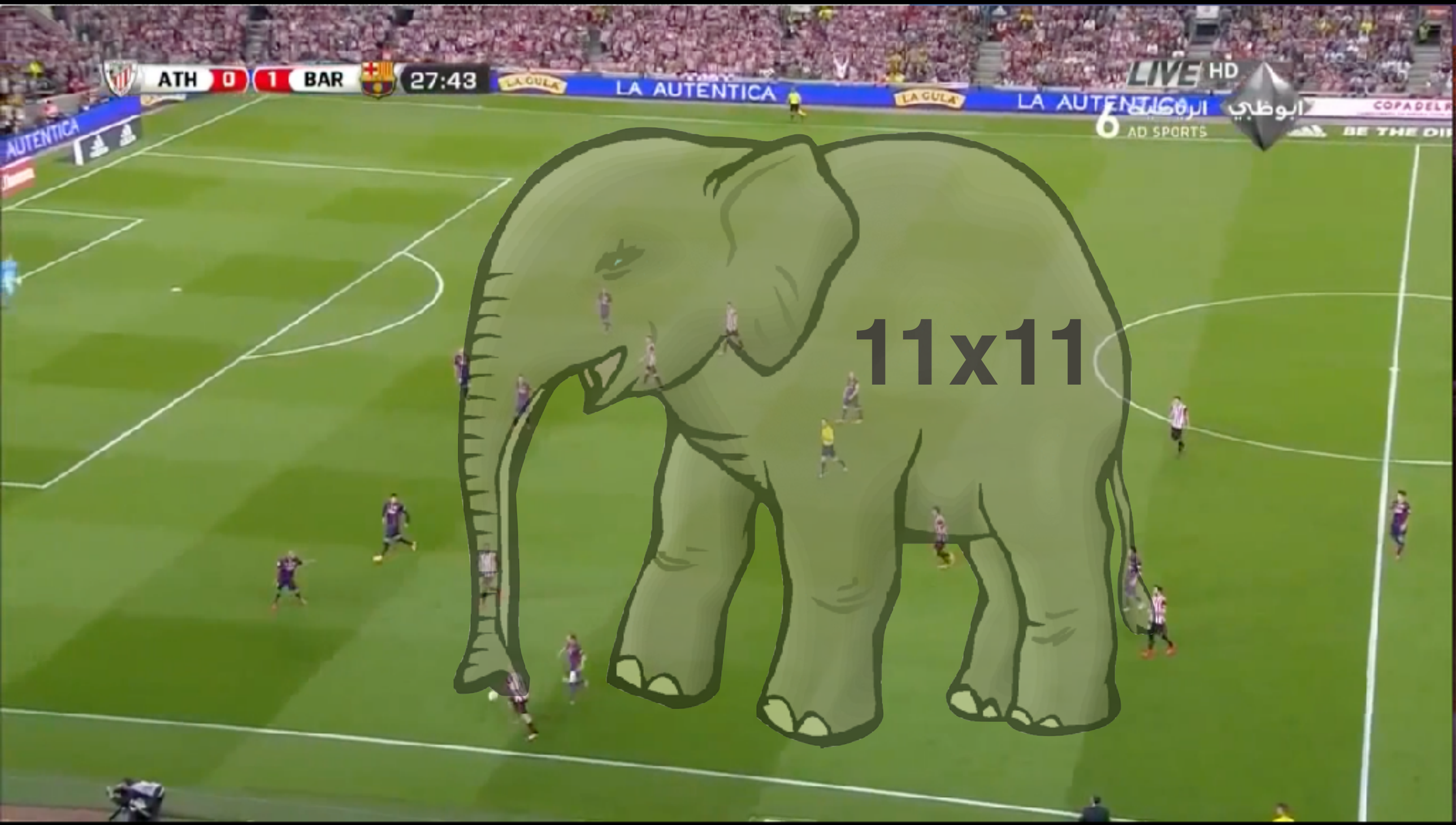
4 x 4

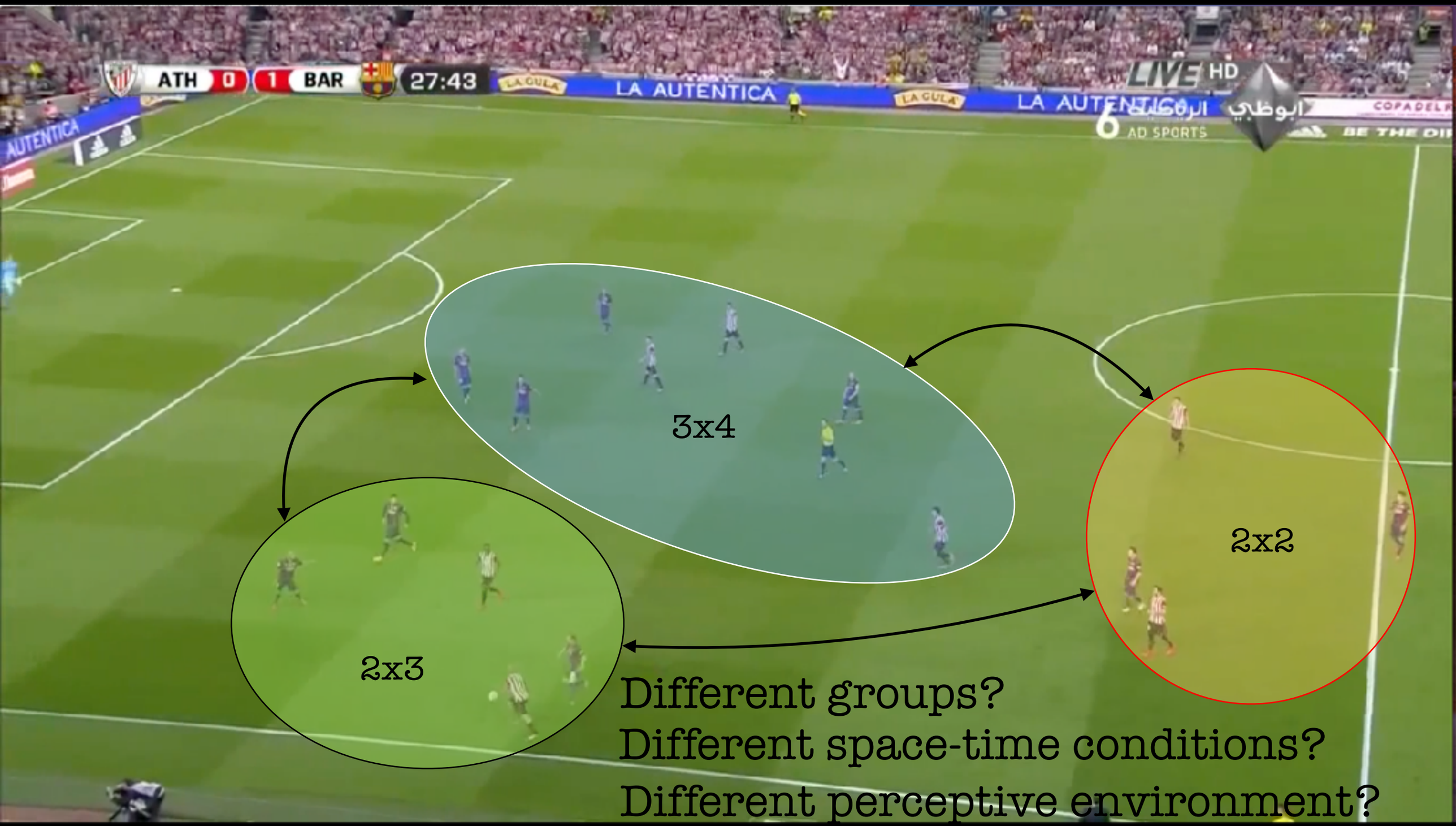
Tactical dependency

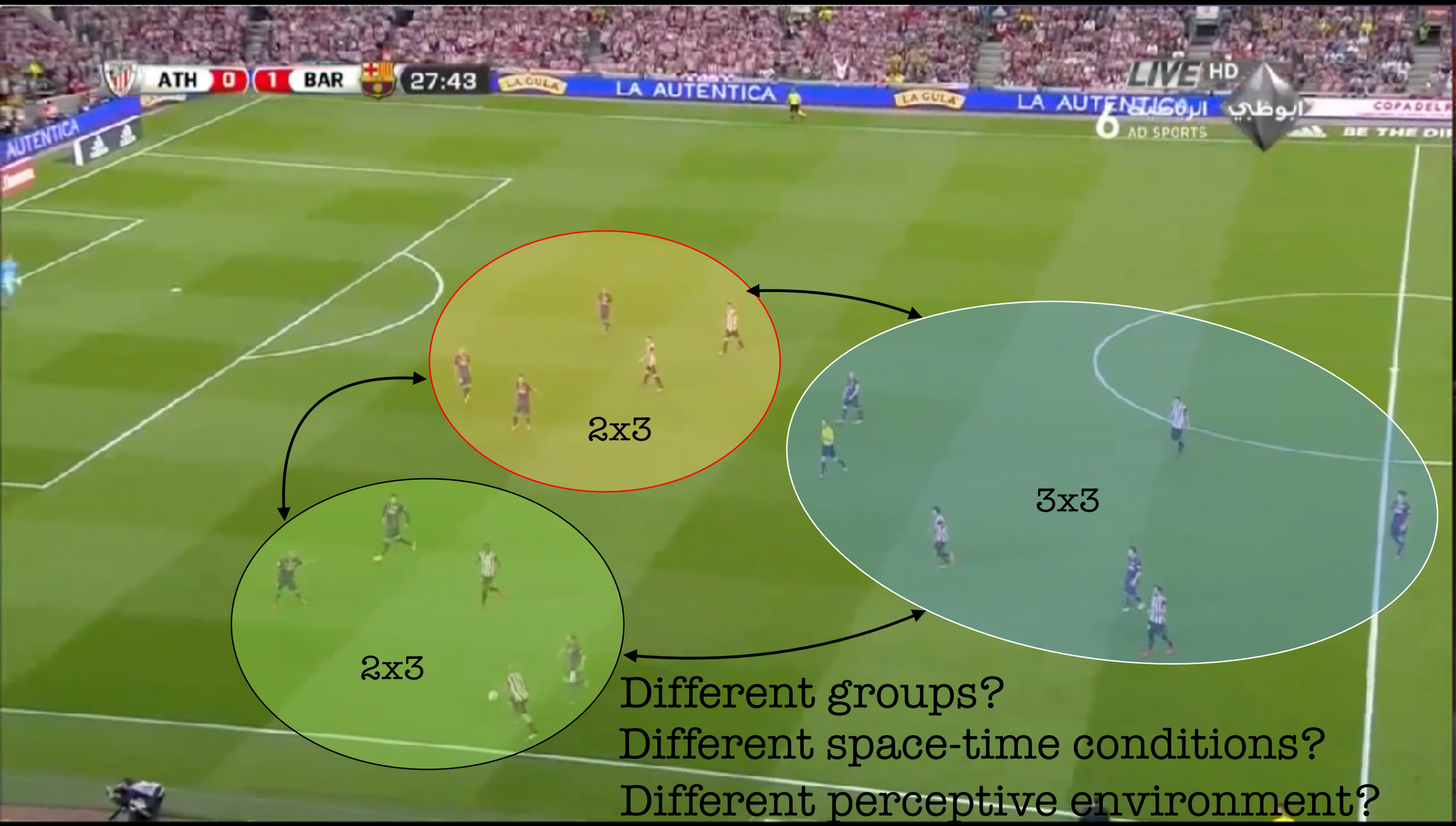
Can the small-sided games also be used to improve tactical performance?

The blind men and the elephant

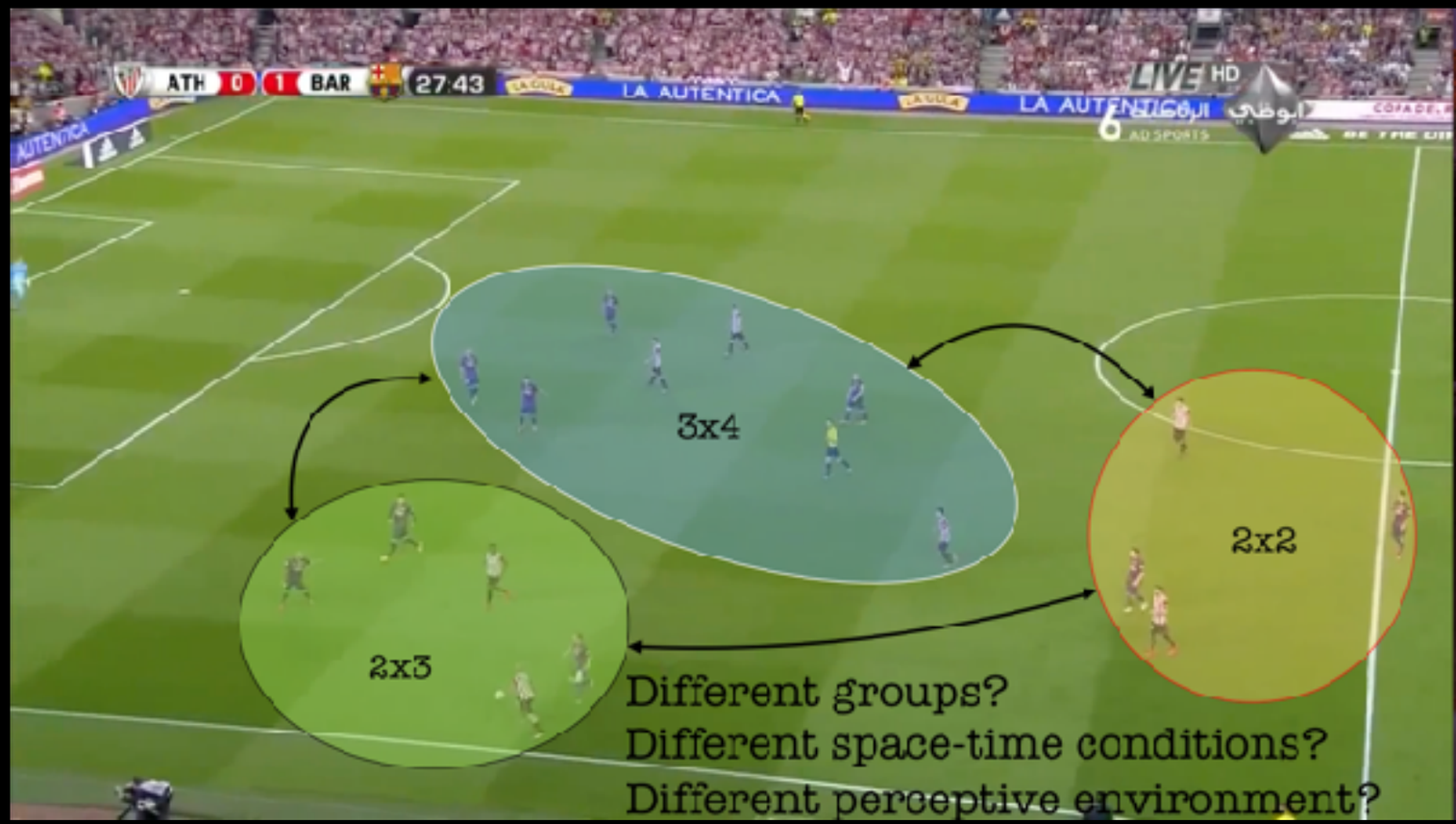


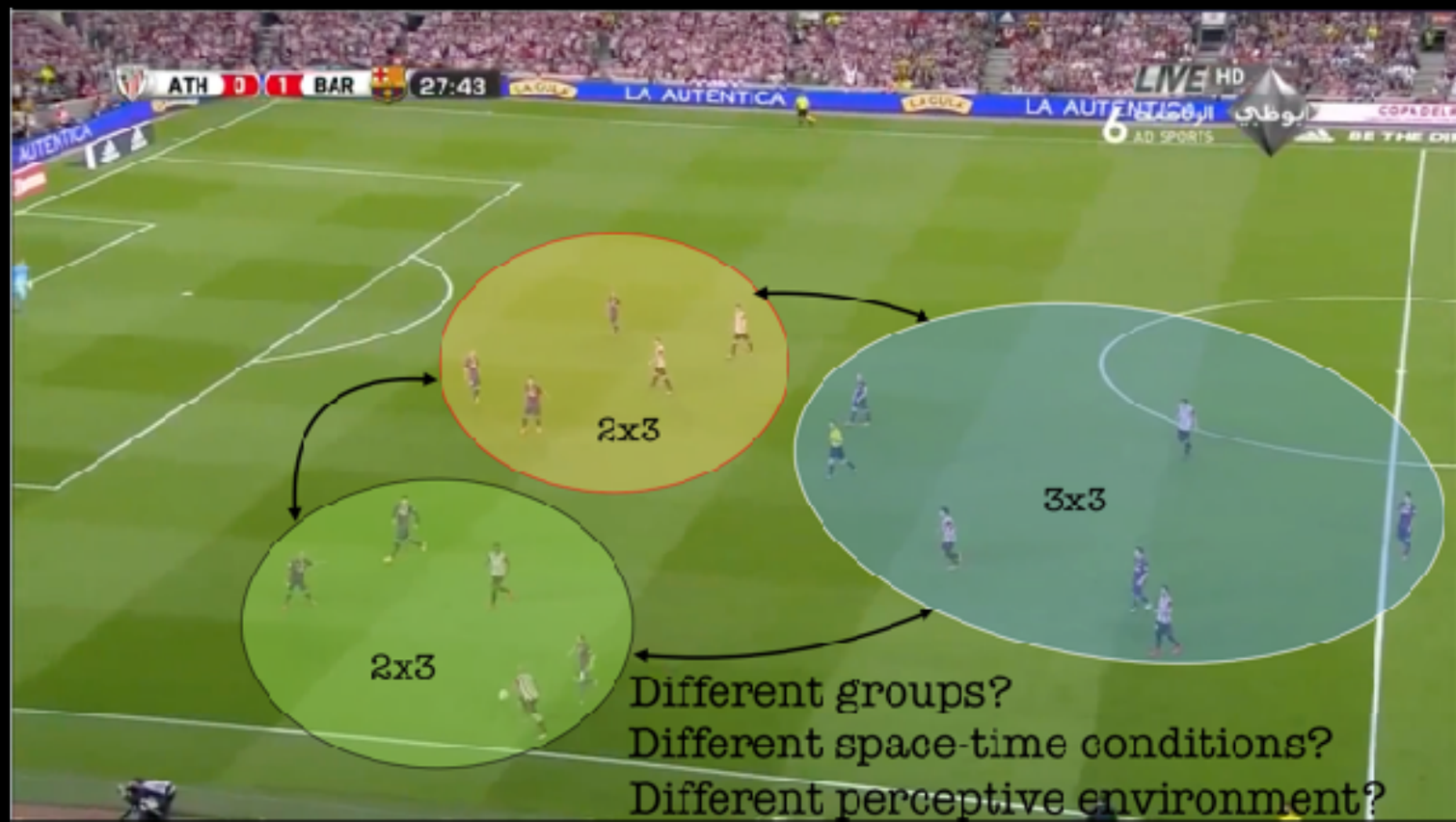

ATH 0 1 BAR
27:43
LA AUTENTICA
LA GULA
LIVE HD
AD SPORTS
11x11


ATH 0 1 BAR 27:43
LA AUTENTICA
LIVE HD
3x4
2x3
2x2
Different groups?
Different space-time conditions?
Different perceptive environment?


ATH 0 1 BAR 27:43
LA AUTENTICA
LIVE HD
AD SPORTS
2x3
3x3
2x3
Different groups?
Different space-time conditions?
Different perceptive environment?

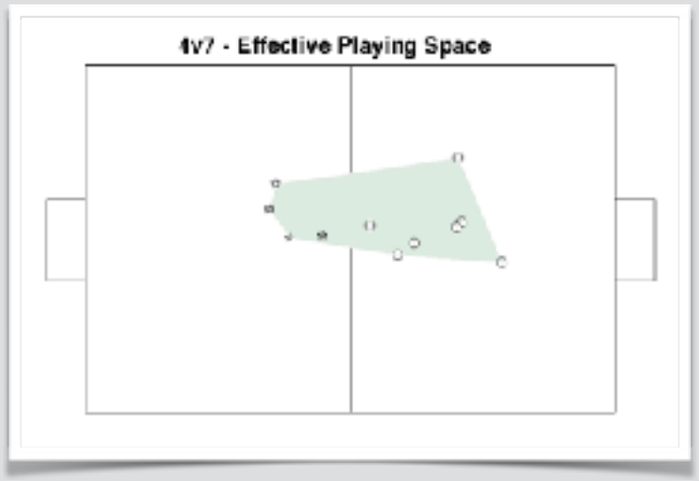
Several perspectives



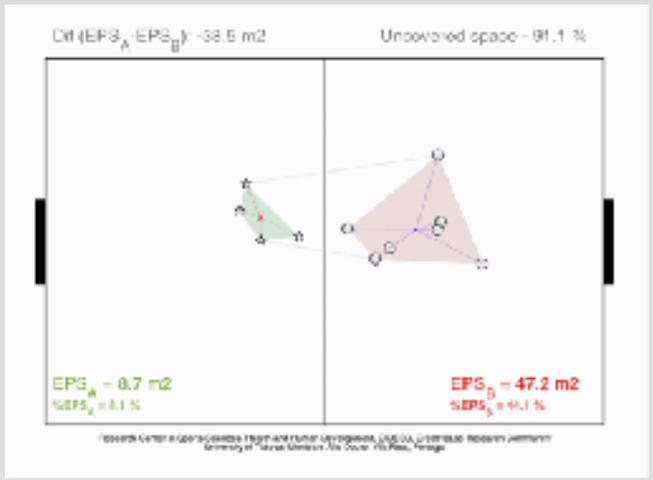


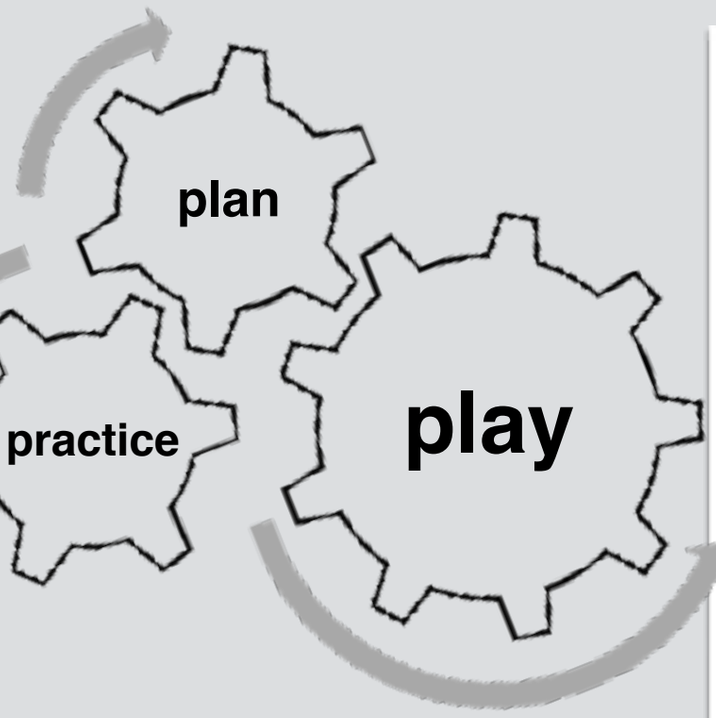
MESO TASKS

AGENTS AS UNIT

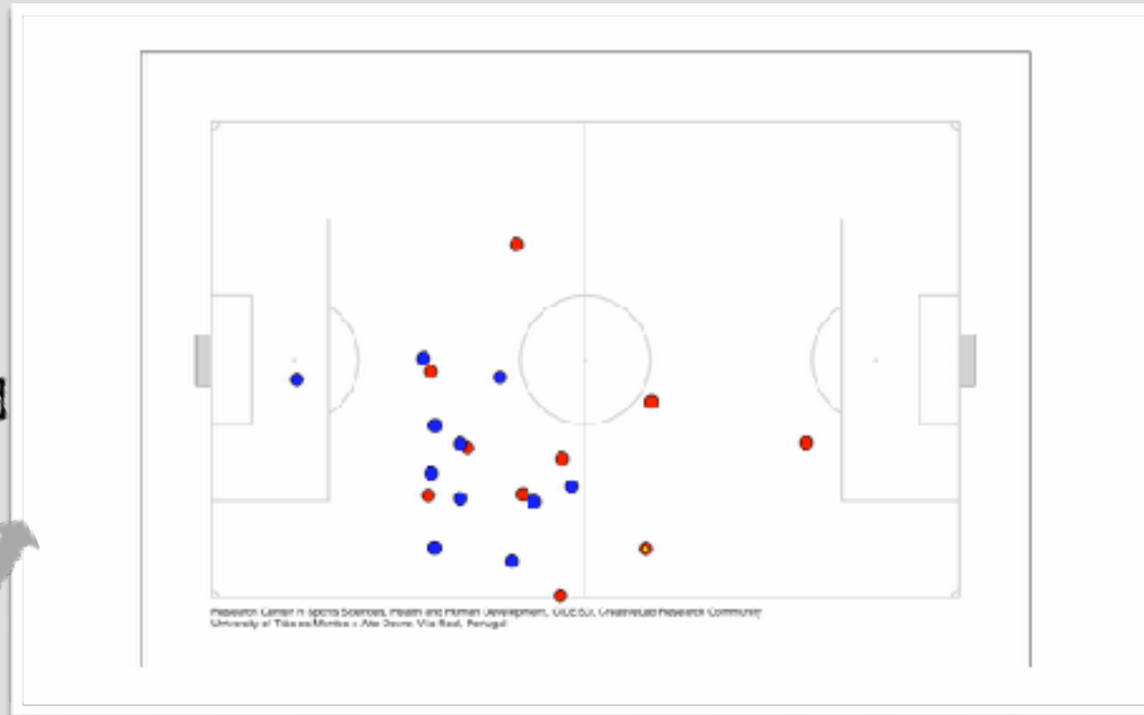


CONFRONTATIONS

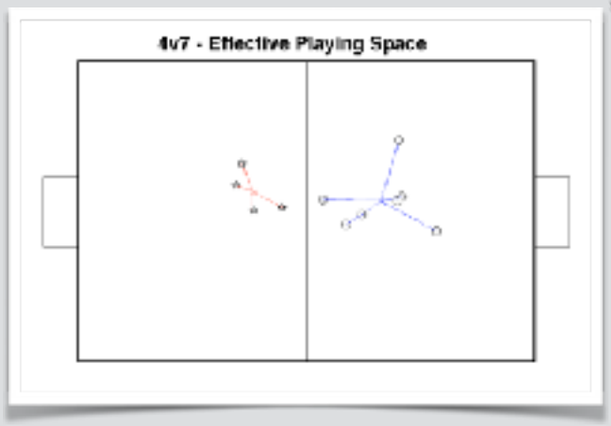




COMPETITION 11X11 MACRO TASK



INDIVIDUAL CONTRIBUTIONS



MICRO TASKS

REPRESENTATIVENESS

Tactical Representativeness

Running

More controlled physiological responses

Technical Drills

More technical actions executed

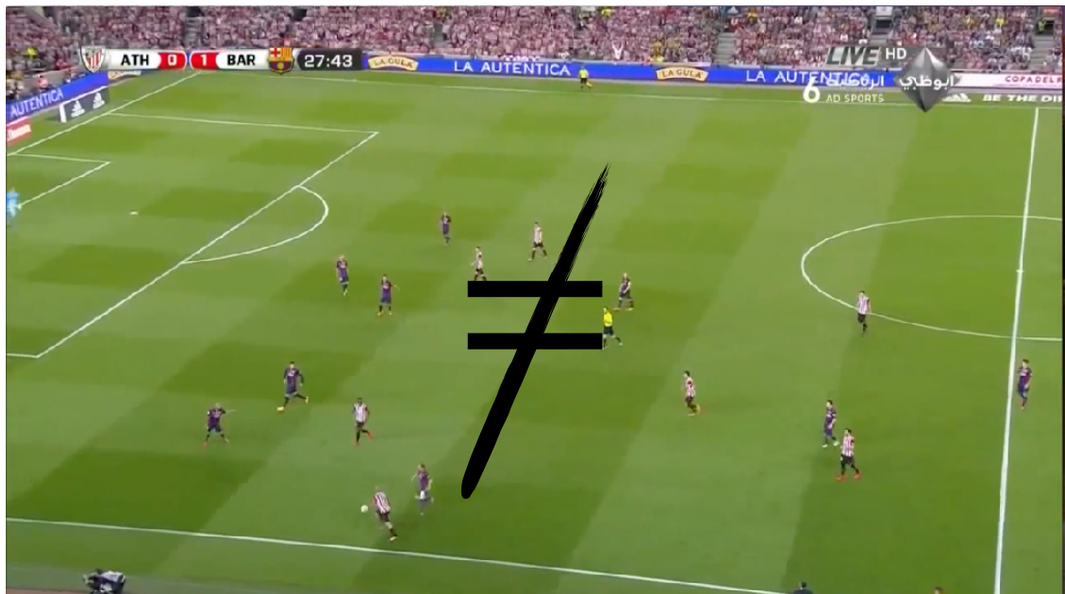
SSG

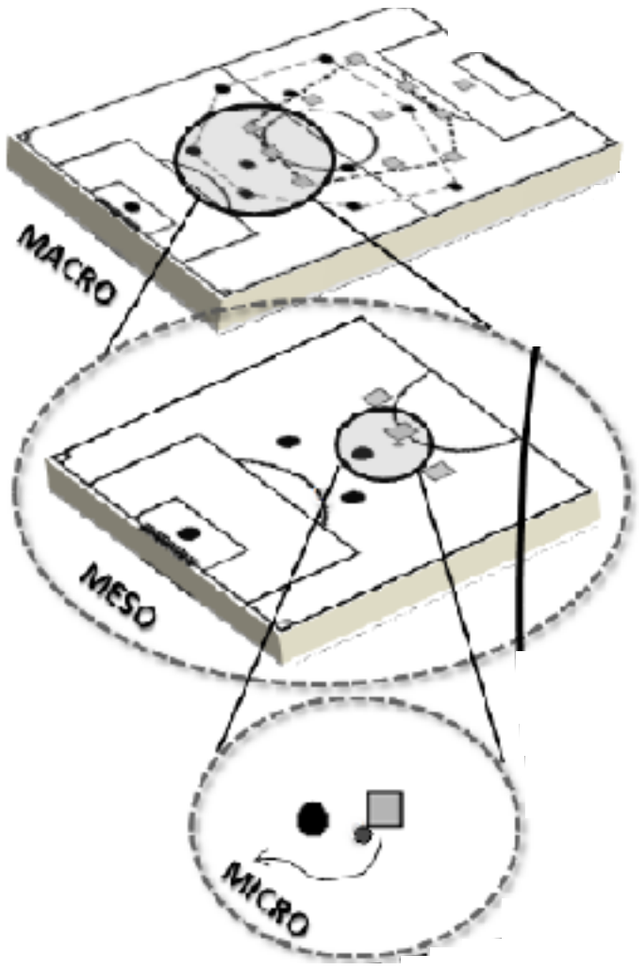
ncrease the quantity/specificity of environment information

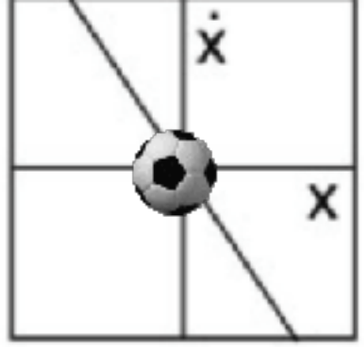
Organizational Drills

Fine-tune how environmental information is perceived

11x11







behavioral dynamics

emerge

capture

information

$i = \lambda(e)$

Environment

$\dot{e} = \phi(e,F)$

Agent

$\dot{a} = \psi(a,i)$

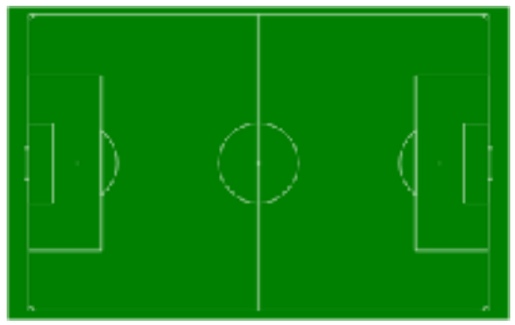
action

$F = \beta(a)$

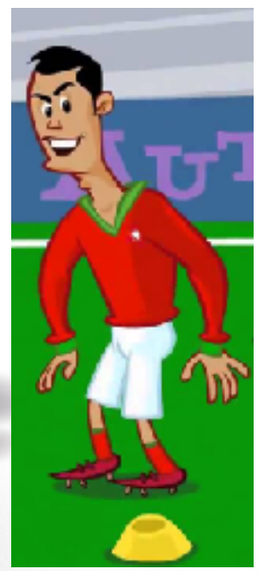
Number
Size
….

Number
Size
Weight
….

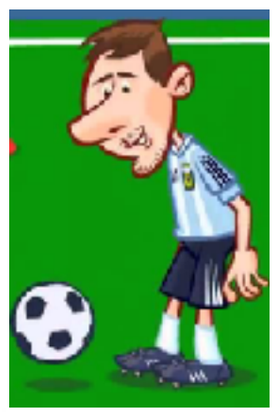
Allow
Forbid
….



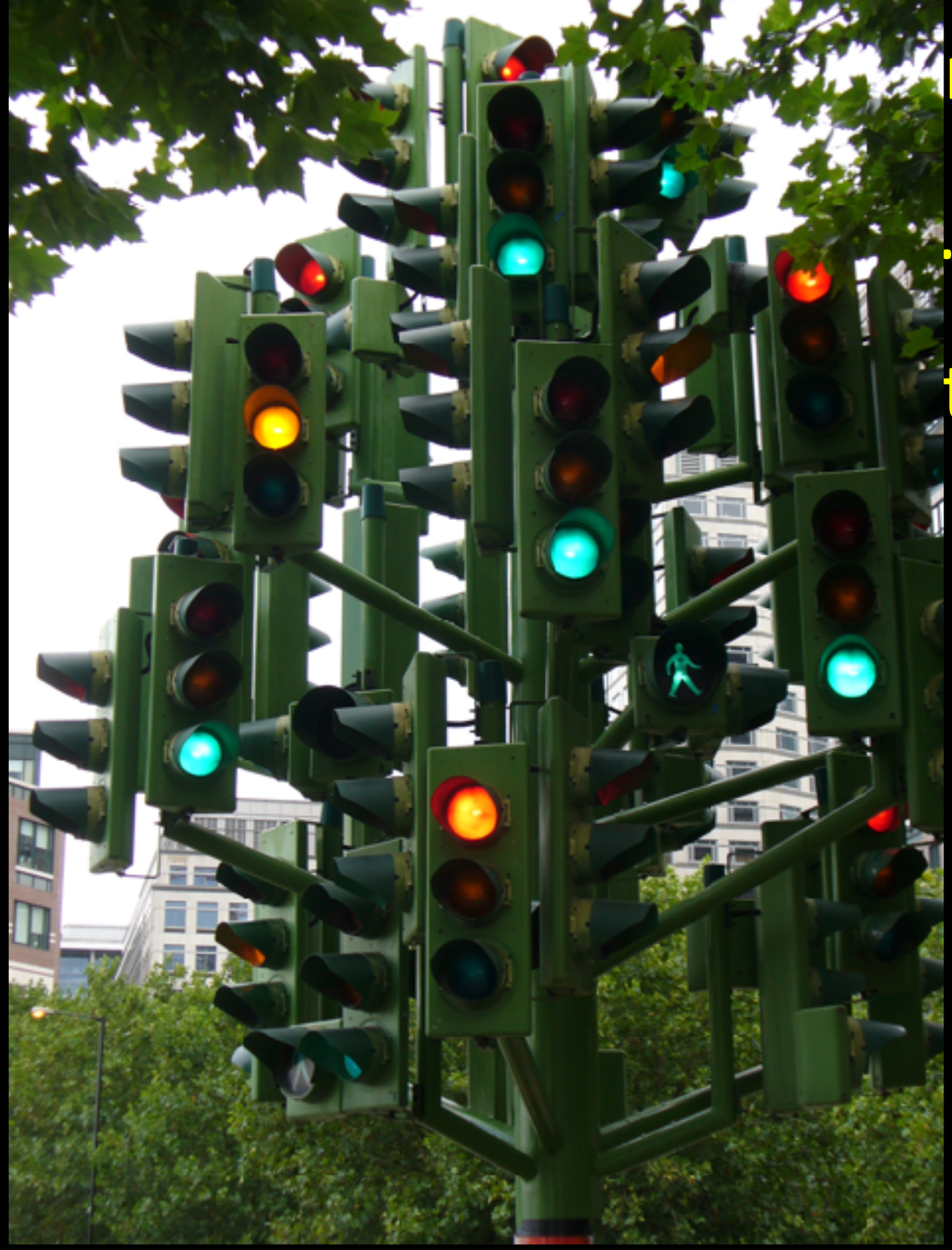
Size
Shape
….



Number
Opposition
….



Unpredictable?

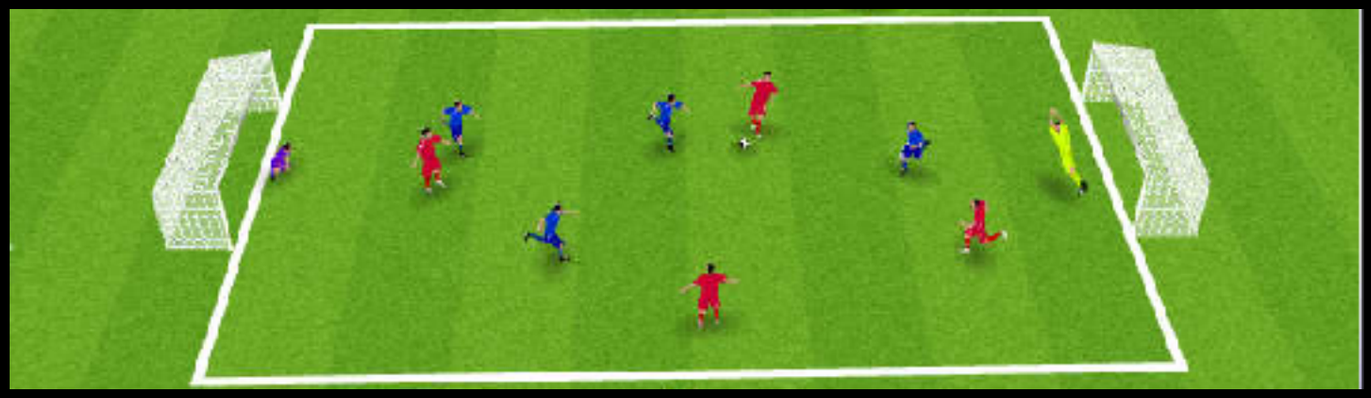


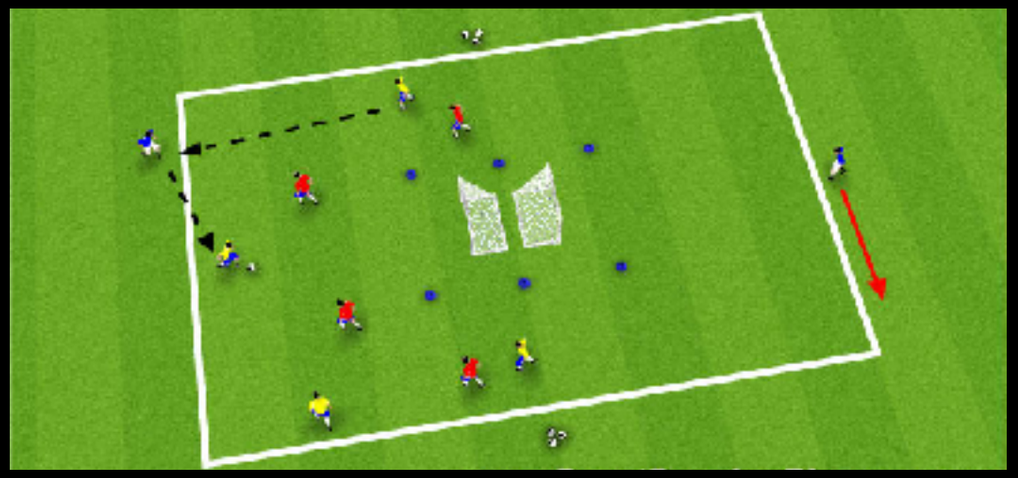
roving the adaptation to

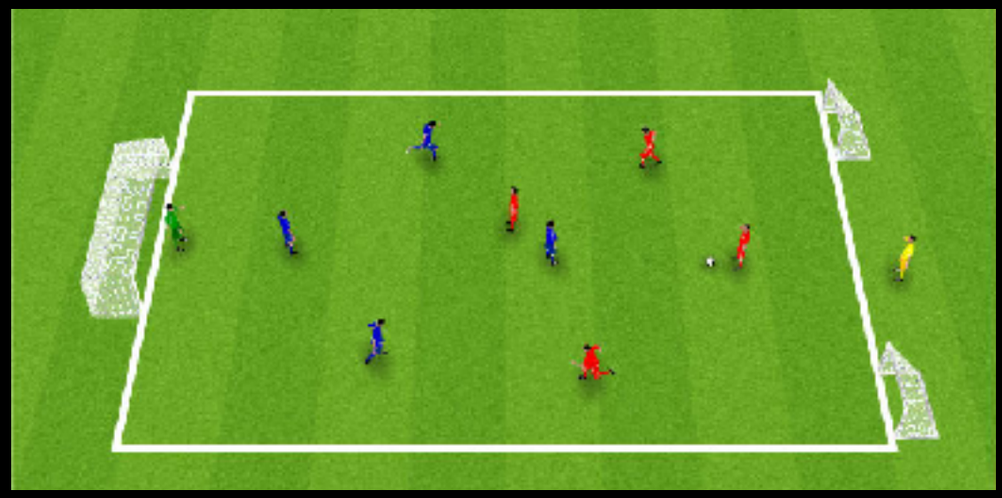
..probably not by repeating

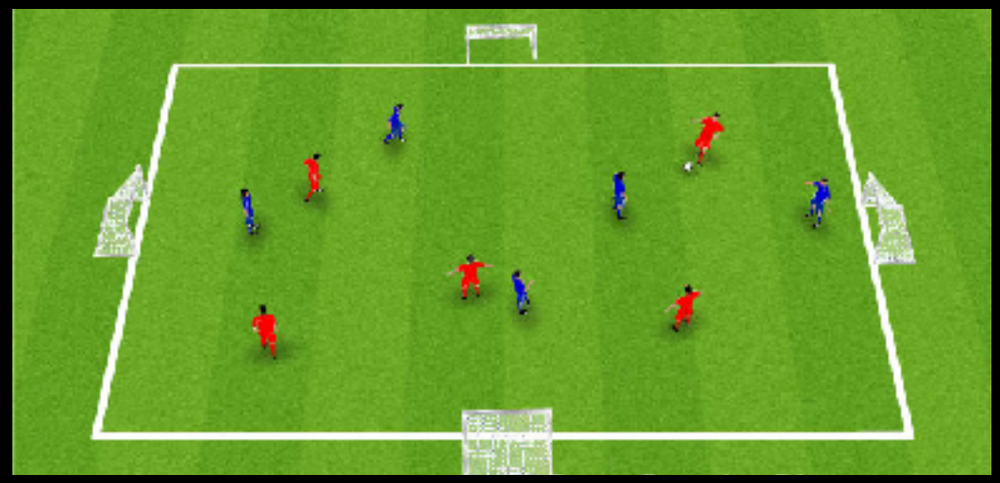
ted behaviours

Small-sided games









Complex, dynamic, non-linear, non-specific constraints…quite open tasks and possibilities

Order (low entropy)

Work Mode

Secondary Work Mode (Talent)

Dependable

Competent

Responsible

Persevering

Toil

Constrained

Lock

Key

Erratic

Serendipitous

Frivolous

Easy

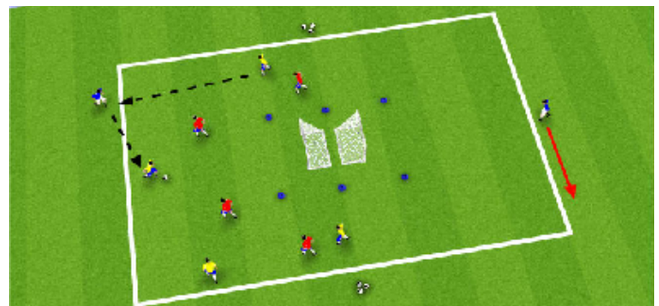
Free

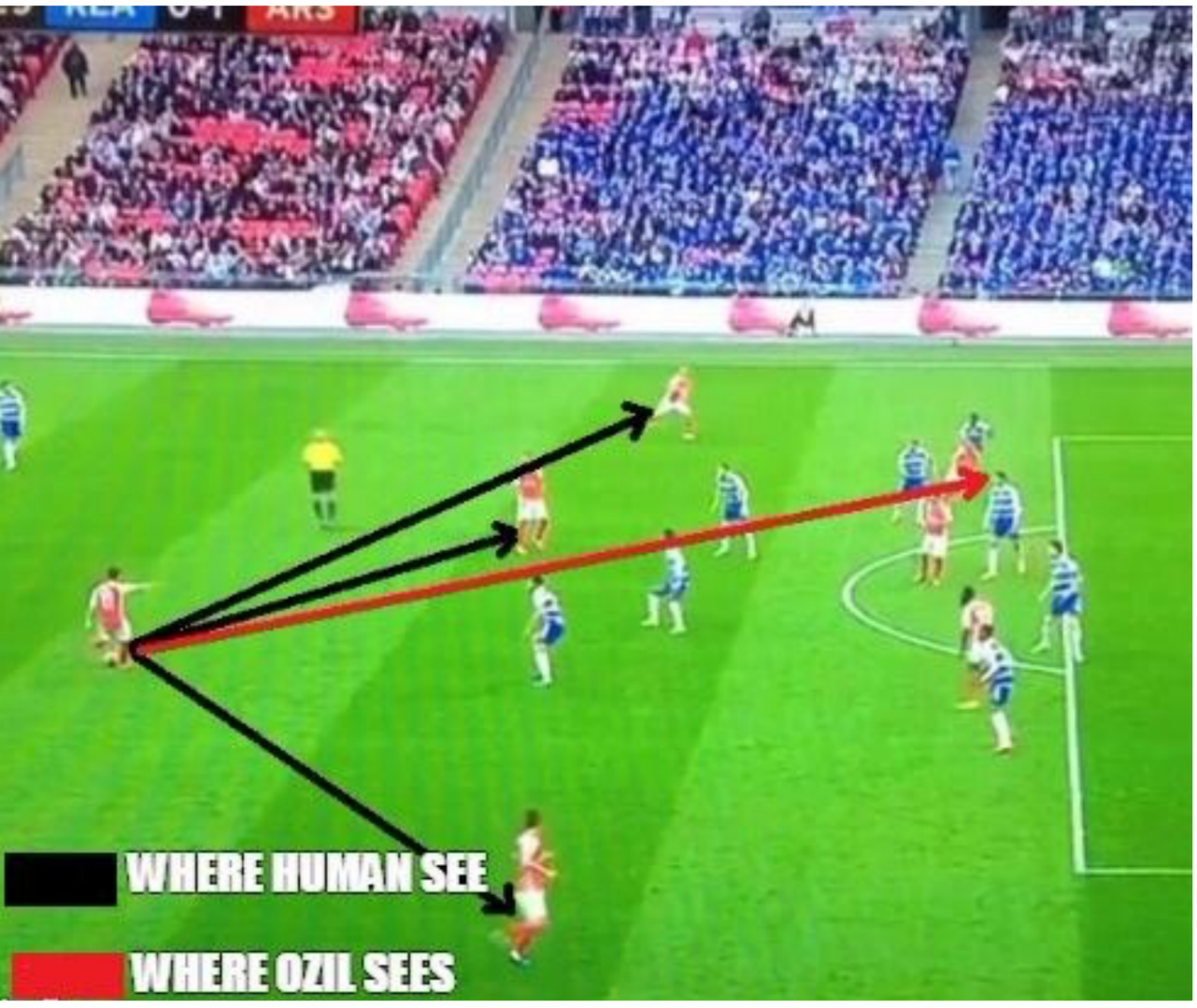
Preferred Conscious Mode

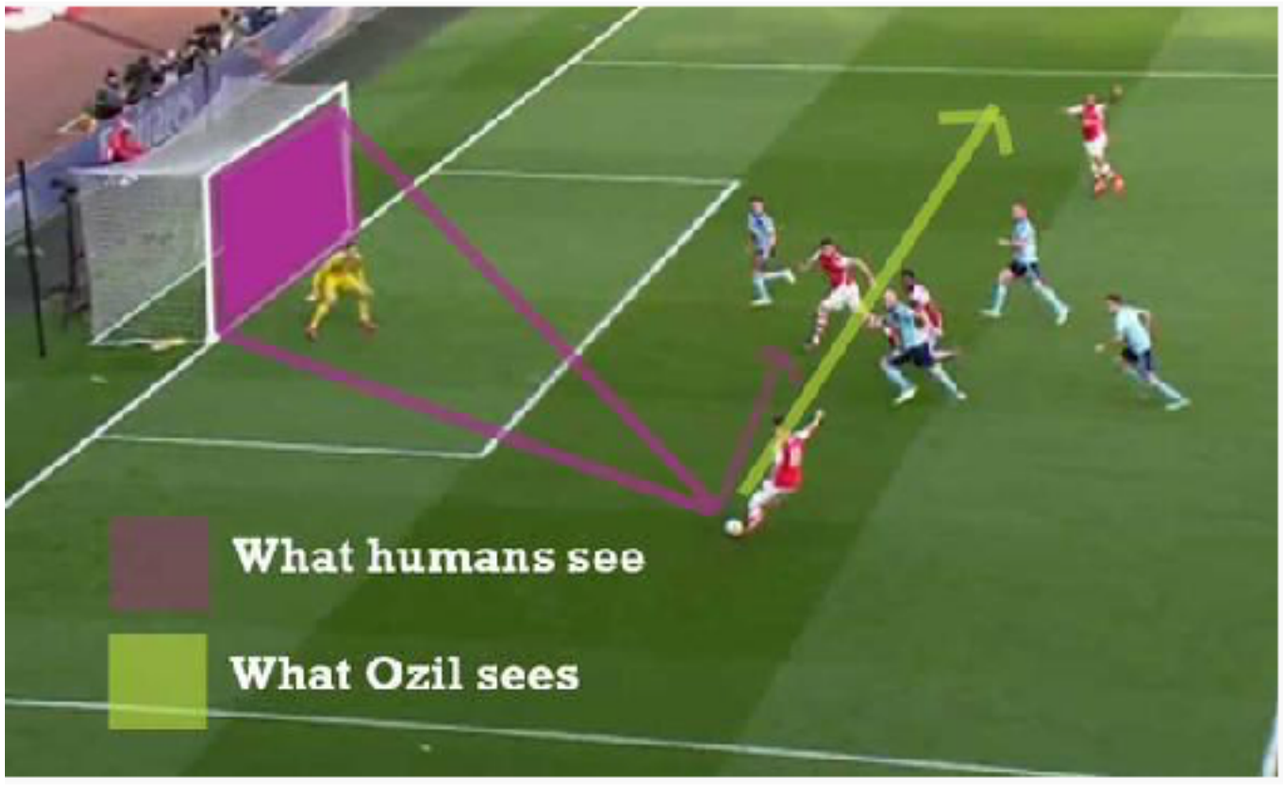
Challenge Mode

Creative Mode

Disorder (high entropy)







Ability to explore, perceive and act with ordered and disordered environments

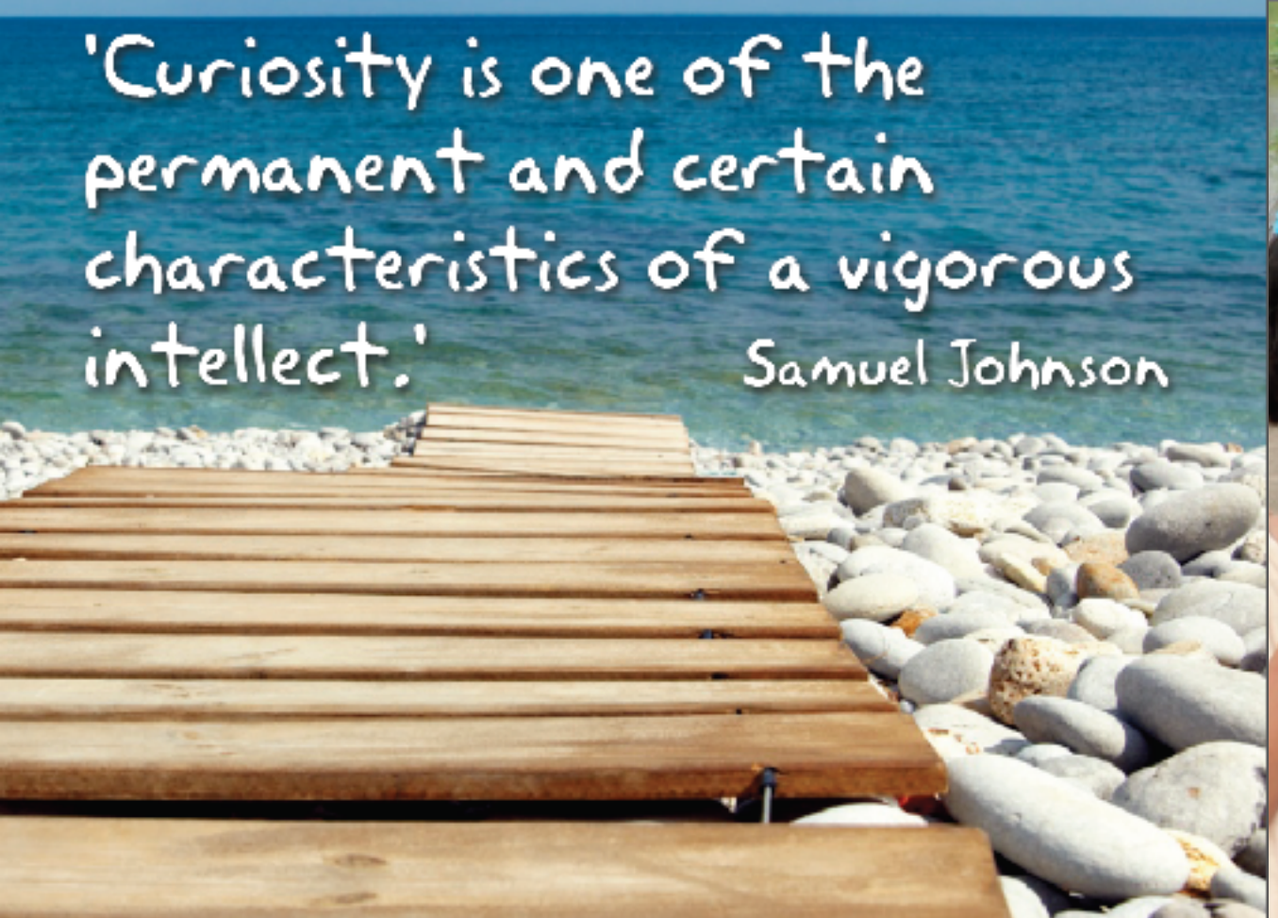
John Cleese

Creativity

…is not a talent it's a way of operating.

Practice….
Practice….
Practice….
Practice….
Practice….
Practice….
Practice….
Practice….

Step 1: Be Curious


'Curiosity is one of the permanent and certain characteristics of a vigorous intellect.'
Samuel Johnson

be curious:
Play

be curious:
Suspend Judgement

be curious:
Ask (lots of) Questions

Step 2:

Make Connections

'Creativity is the power to connect the seemingly unconnected.'

William Plomer

make connections:

Talk to People in Different Fields

Try Something (Anything) New

make connections:

Step Sideways & See Another Angle

make connections:

Step 3:

Challenge Yourself

challenge yourself:

Take Risks

challenge yourself:

Accept Failures

" Freedom is not worth if it does not include the freedom to make mistakes."
Mahatma Gandhi

challenge yourself:

Question Assumptions

Step 4: Cultivate Your Ideas

'Courage does not always roar. Sometimes, it is the quiet voice at the end of the day saying, I will try again tomorrow.' Unknown

cultivate:

Give Ideas time to Grow

cultivate:

Daydream

cultivate:

Consider all the Possibilities

More traditional training approaches also kill creativity!

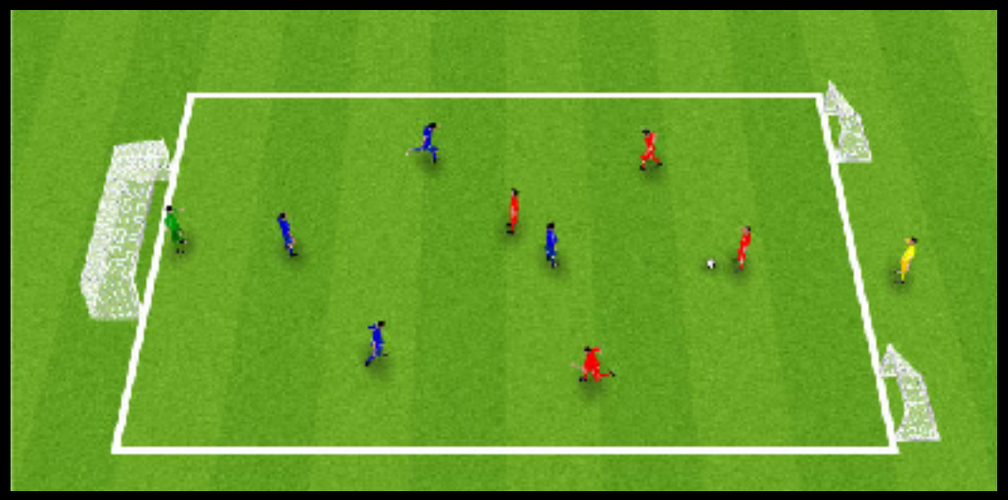
Eliminate errors…no risks…

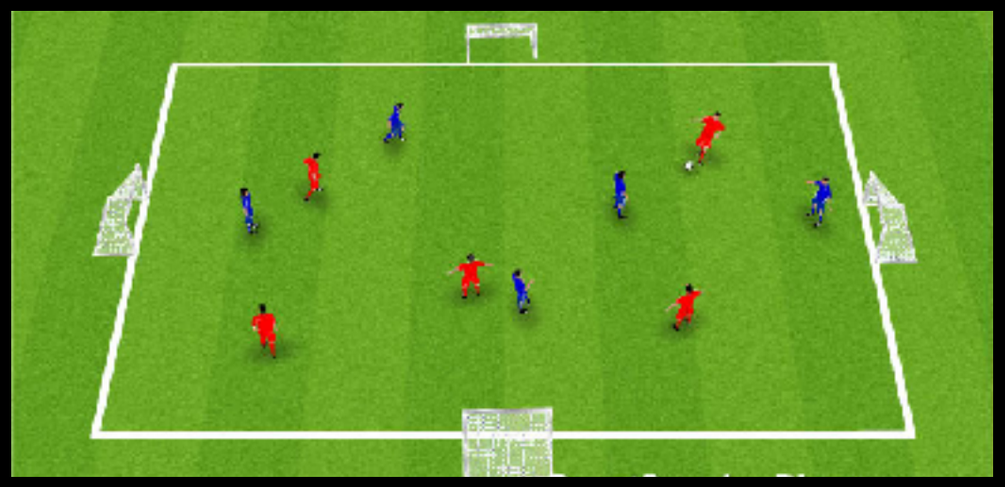
Low variability…low adaptation…

Too much specificity…

Too much predictability…

Small-sided games





Some research-based considerations…

Journal of Sports Sciences, 2015
Vol. 33, No. 12, 1259–1266, http://dx.doi.org/10.1080/02640414.2015.1022571

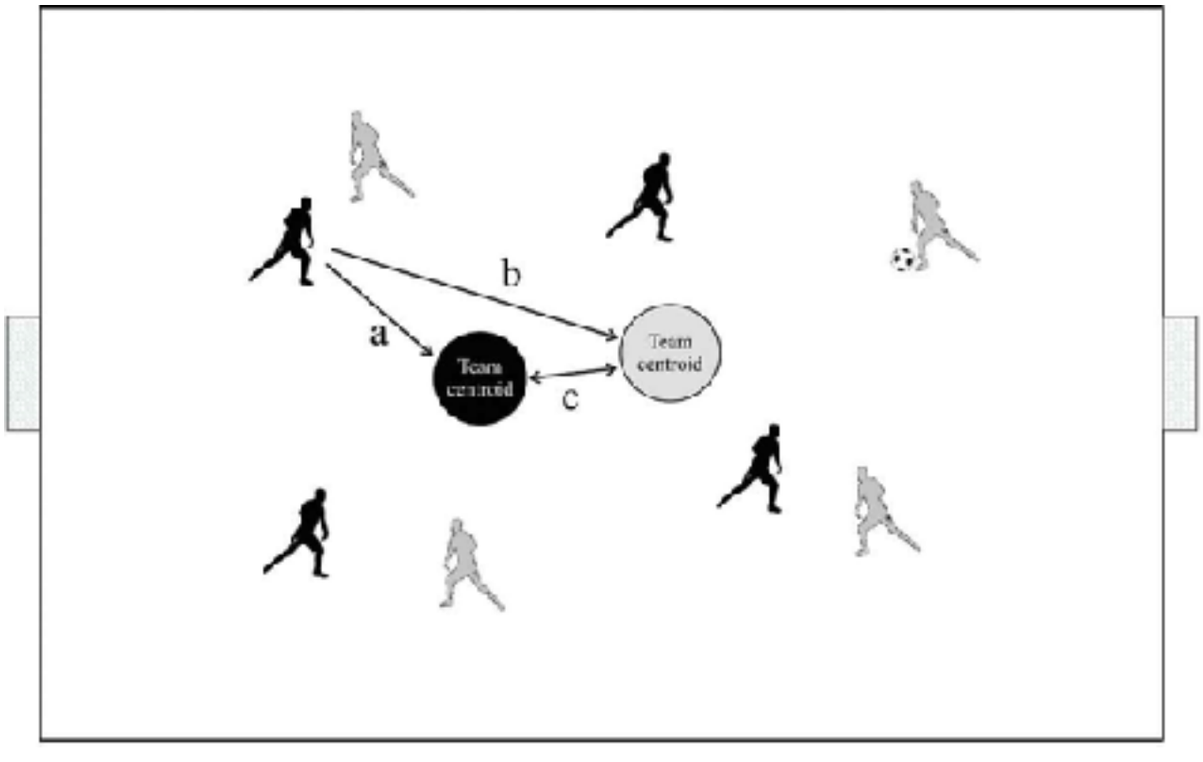
Routledge

Footballers' movement behaviour during 2-, 3-, 4- and 5-a-side small-sided games

MARCO AGUIAR[1], BRUNO GONÇALVES[1], GORETI BOTELHO[2], KOEN LEMMINK[3] & JAIME SAMPAIO[1]

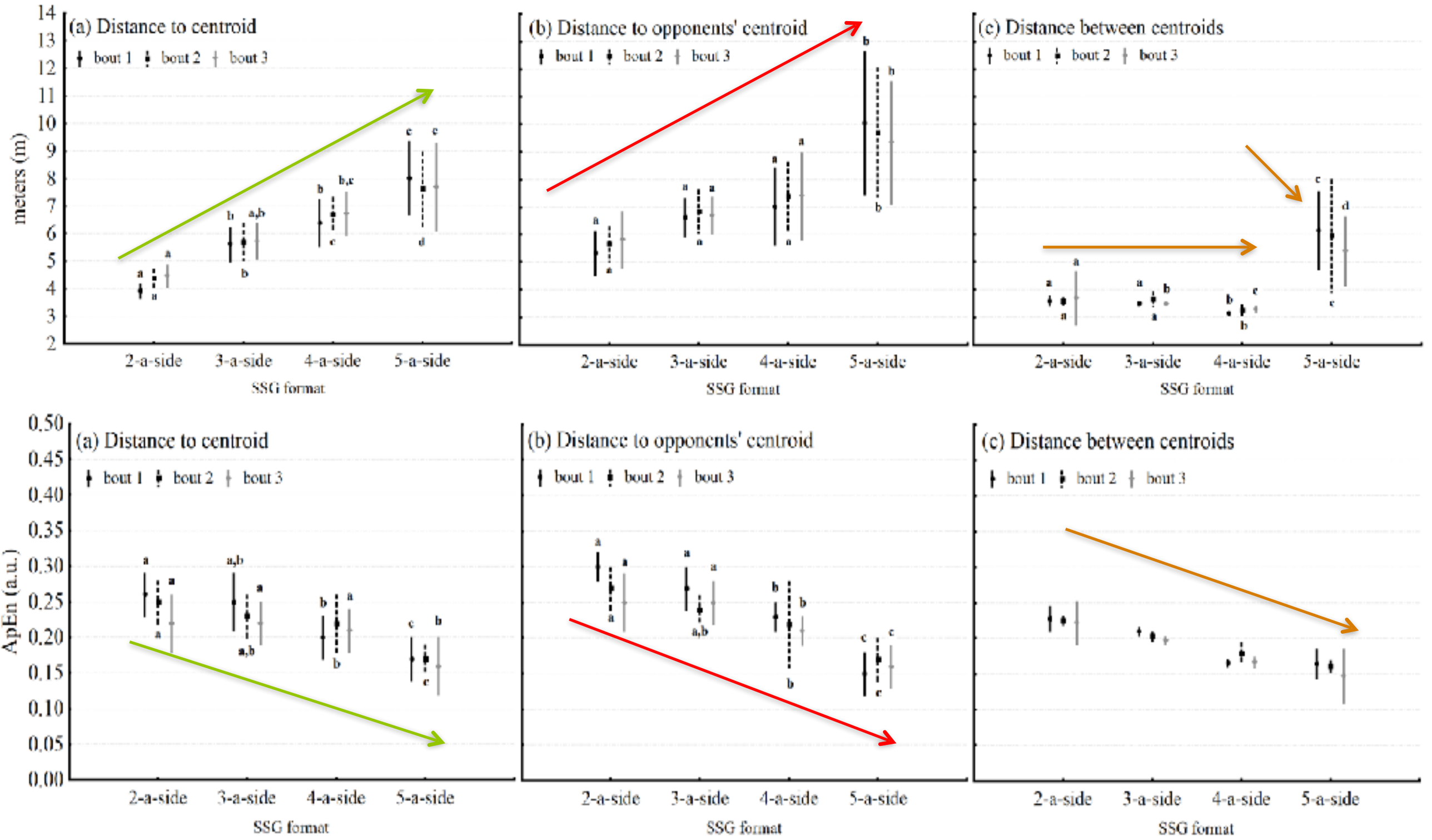
[1]*Centre for Lab, Research Centre in Sports, Health Sciences and Human Development, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal,* [2]*CERNAS Research Unit, Coimbra College of Agriculture, Polytechnic Institute of Coimbra, Bencanta, Coimbra, Portugal and* [3]*Center for Human Movement Sciences, University of Groningen, Groningen, Netherlands*

area/player = 150 m²



2-a-side, 28 × 21 m
3-a-side, 35 × 26 m
4-a-side, 40 × 30 m
5-a-side, 44 × 34 m

Results


(a) Distance to centroid
(b) Distance to opponents' centroid
(c) Distance between centroids
bout 1
bout 2
bout 3
meters (m)
ApEn (a.u.)
2-a-side
3-a-side
4-a-side
5-a-side
SSG format

Results

Distance to centroid

4 to 8 meters...

Different perception demands...

Different skill execution...passing to an open player at 5m or at 8 m...

Distance to opponents' centroid

5 to 10 meters...

Different perception demands...

Anticipating a pass performed at 6 m or at 9 m...

Randomness

More players...decreased randomness...

Effects of pacing, status and unbalance in time motion variables, heart rate and tactical behaviour when playing 5-a-side football small-sided games

Journal ofScience and Medicinein Sport 17 (2014) 229–233

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Journal of Science and Medicine in Sport

journal homepage: www.elsevier.com/locate/jsams

Original research

Effects of pacing, status and unbalance in time motion variables, heart rate and tactical behaviour when playing 5-a-side football small-sided games

Jaime E. Sampaio[a,b,*], Carlos Lago[c], Bruno Gonçalves[a,b], Victor M. Maçãs[a,b], Nuno Leite[a,b]

[a] Research Center for Sports Sciences, Health and Human Development, Vila Real, Portugal
[b] Department of Sports Sciences, Exercise and Health, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal
[c] Faculty of Educational Sciences and Sports, University of Vigo, Pontevedra, Spain

Game pace

...compare time-motion variables, heart rate and players' tactical behaviour according to game pace in 5-a-side games.

Slow → Normal → Fast

…to identify the most discriminating variables in classifying performances according to these constraints.

5-a-side
60 m × 40 m pitch size
5 min duration

In fast pacing...higher randomness for the same distances!

Distance covered at several speeds, total distance covered, time spent in heart rate zones and collective positional variables according to game pace.

Variable	Slow paced	Normal paced	Fast paced	
Distance covered between 0-6.9 Km h^{-1}*	254.0±36.9	205.2±31.0	201.8±44.0	a,b
Distance covered between 7-9.9 Km h^{-1}	154.7±44.9	177.4±35.7	146.6±34.8	c
Distance covered between 10-12.9 Km h^{-1}*	114.5±42.1	172.5±51.0	171.0±36.9	a,b
Distance covered between 13-15.9 Km h^{-1}*	55.2±27.6	111.3±40.2	136.0±62.9	a,b
Distance covered between 16-17.9 Km h^{-1}*	14.8±11.3	44.9±23.7	65.4±35.2	a,b,c
Distance covered above 17.9 Km h^{-1}*	10.2±9.4	59.6±39.0	74.4±58.5	a,b
Total distance covered (m)	604.5±100.2	771.4±124.4	795.3±156.5	a,b
Time spent below 75% HR_{max} (min)	1.9±2.1	1.6±1.5	0.5±0.3	b
Time spent between 75-84.9% HR_{max} (min)	1.8±1.4	2.1±1.4	1.2±1.5	-
Time spent between 85-89.9% HR_{max} (min)	1.1±0.9	1.1±1.2	1.5±1.4	-
Time spent above 90% HR_{max} (min)	0.9±1.5	0.7±1.1	2.3±2.1	b
Randomness in distance to team centroid*	0.99±0.08	1.15±0.06	1.22±0.09	a,b,c
Distance to team centroid (m)	10.6±3.3	10.6±2.9	11.1±2.3	-

Post-hoc differences are: (a) between slow and normal paced games; (b) between slow and fast paced games and (c) between normal and fast paced games.* Discriminant structure coefficient above |0.30| in function one (85.8 % of the variance).

Numerical unbalance and status

Superiority (5x4) → Winning

Superiority (5x4) → Losing

Inferiority (4x5) → Winning

Inferiority (4x5) → Losing

Distance covered at several speeds, time spent in heart rate zones, total distance covered and collective positional variables according to game status and team unbalance constraints.

	Inferiority		Superiority		
Variable	Losing	Wining	Losing	Wining	
Distance covered between 0-6.9 Km h-1*†	200.5±22.1	250.7±27.7	254.3±16.9	203.5±13.5	c
Distance covered between 7-9.9 Km h-1	141.5±10.2	176.9±12.8	150.9±38.5	120.7±30.8	b,c
Distance covered between 10-12.9 Km h-1	143.4±34.0	179.3±42.6	157.4±31.3	125.9±25.1	c
Distance covered between 13-15.9 Km h-1†	89.4±37.7	111.8±47.1	104.5±21.4	83.6±17.1	c
Distance covered between 16-17.9 Km h-1†	40.0±17.4	50.0±21.8	35.9±15.3	28.7±12.2	b
Distance covered above 17.9 Km h-1	37.5±28.0	46.8±35.0	64.1±30.5	51.3±24.4	
Total distance covered (m)†	652.3±67.7	815.4±84.6	767.1±87.0	613.7±69.6	c
Time spent below 75% HRmax†	0.5±0.2	0.6±0.2	0.9±0.6	0.7±0.5	b
Time spent between 75-84.9% HRmax†	0.9±0.9	1.2±1.1	2.9±1.3	2.3±1.0	b
Time spent between 85-89.9% HRmax†	1.3±1.0	1.7±1.2	1.7±1.0	1.3±0.8	
Time spent above 90% HRmax†	2.2±1.6	2.8±2.0	0.8±1.1	0.6±0.9	b
Randomness in distance to team centroid*	1.11±0.05	1.13±0.04	1.14±0.03	1.17±0.06	a,b
Distance to team centroid (m)*	9.5±2.6	10.5±2.2	10.7±2.9	11.5±2.4	a,b

a-significant single effect of match status; b-significant single effect of team inequity; c-significant match status × team inequity interaction; * Discriminant structure coefficient above |0.30| in function one (96.7 % of the variance). † Discriminant structure coefficient above |0.30| in function two (3.3 % of the variance)

Have to cover more distance to win when in inferiority, but have to cover less distance to win when in superiority!

Higher randomness when wining and when in superiority!

Higher distance to centroid when wining and when in superiority!

Targets

Contents lists available at ScienceDirect
Human Movement Science
journal homepage: www.elsevier.com/locate/humov

How perceiving additional targets modifies teams' tactical behavior during football small-sided games

Bruno Travassos [a,b,*], Bruno Gonçalves [b,c], Rui Marcelino [b,c]
Ricardo Monteiro [a], Jaime Sampaio [b,c]
[a] Department of Sport Sciences, University of Beira Interior, Portugal
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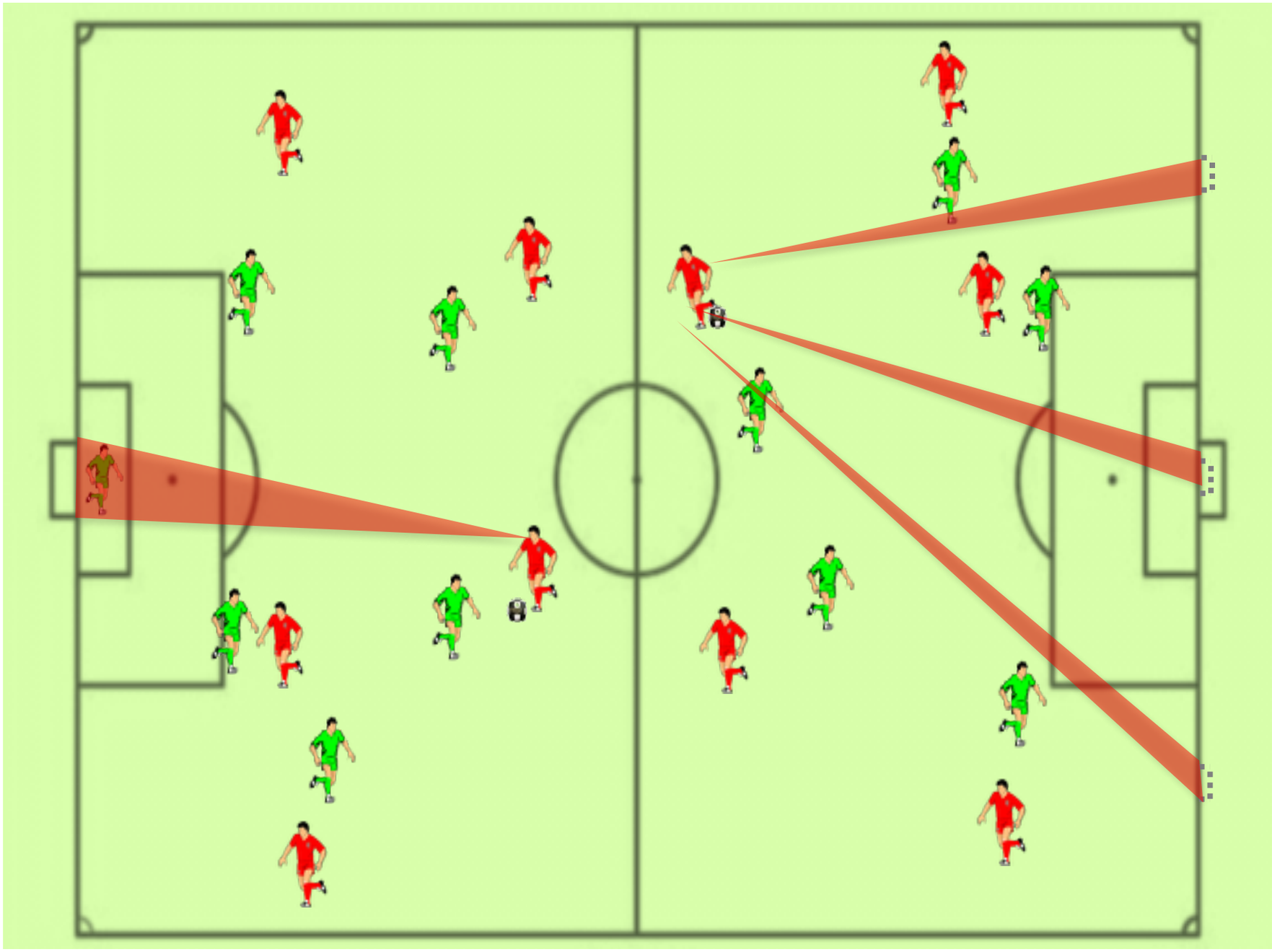
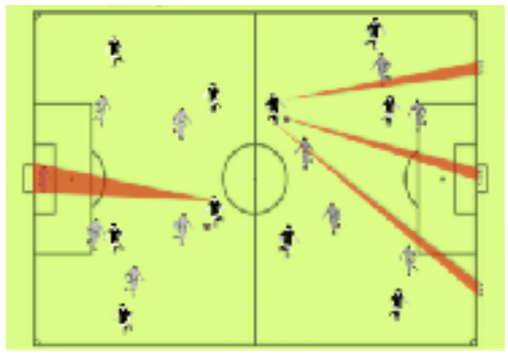
SSG with 2 targets and goalkeeper

SSG with 6 targets



Distance between the CG of each team (DistCG)
Relative stretch index (RelSTI) (i.e., the difference between the stretch index of each team)

Targets

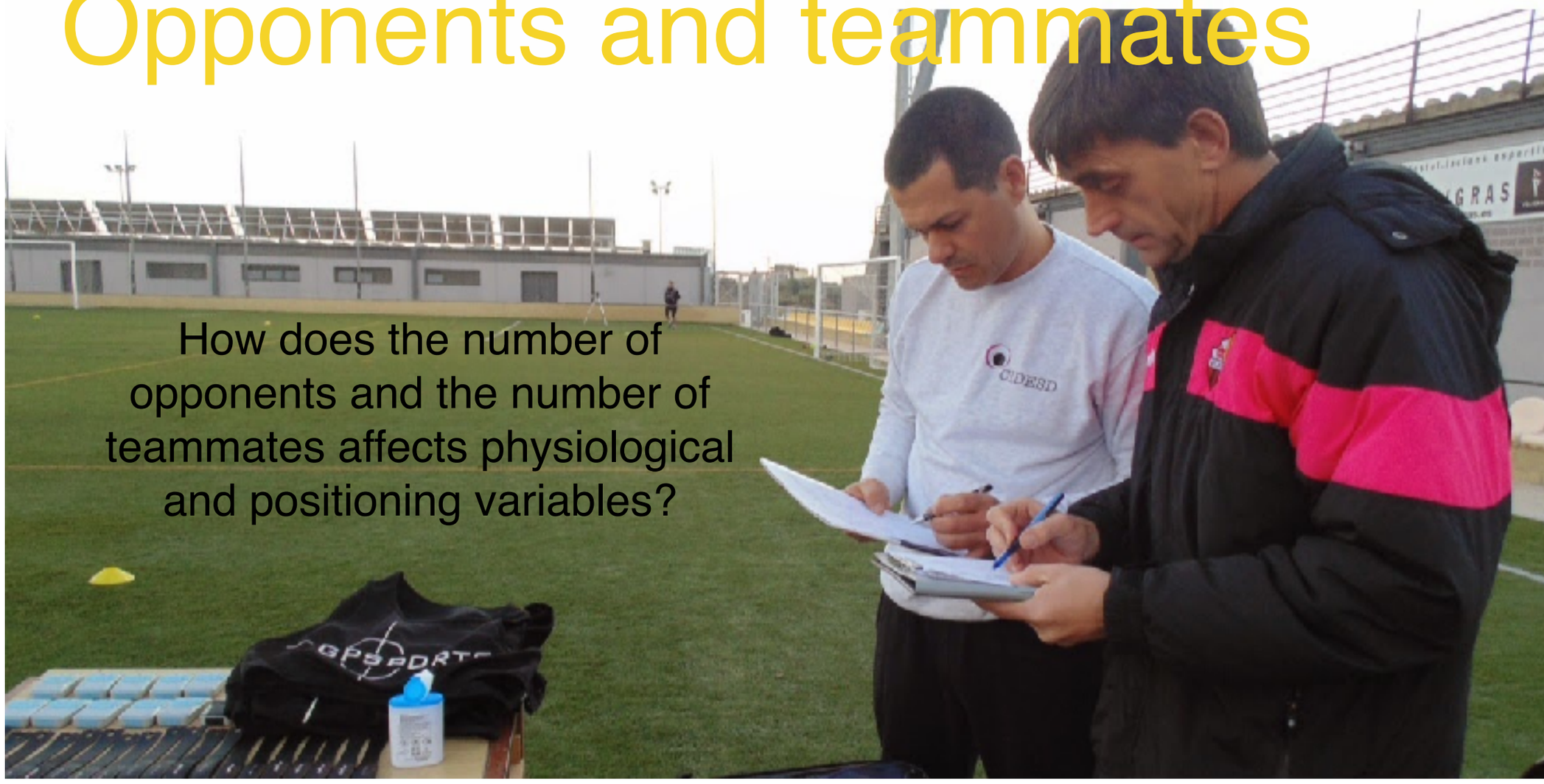


Defensive pressure … one goal (reducing the number of opportunities for attacking, allow defending team to rise on the field and to play closer to attacking team).

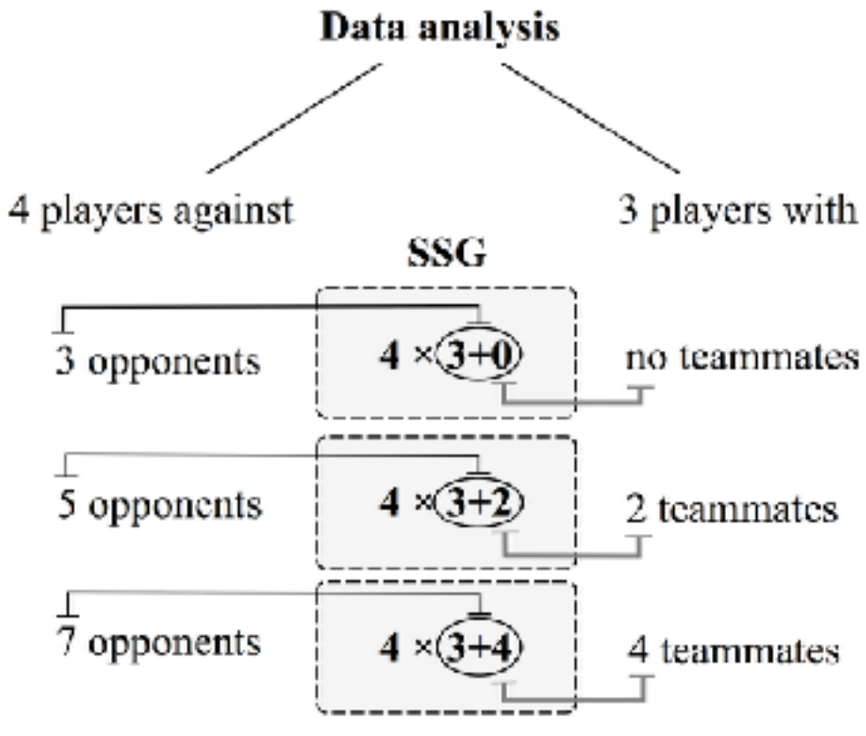
Security ball possession … six small goals (increasing the number of opportunities for attacking, constraints defending team to retreat on the pitch and to increase the distance between teams).

Travassos et al (2014)

Opponents and teammates



How does the number of opponents and the number of teammates affects physiological and positioning variables?



4x3

4x5

4x7

Professionals and Amateurs!

Heart Rate, Time-Motion, and Body Impacts When Changing the Number of Teammates and Opponents in Soccer Small-Sided Games

Lorena Torres-Ronda,[1] Bruno Gonçalves,[2] Rui Marcelino,[2] Carlota Torrents,[1] Emili Vicente,[1] and Jaime Sampaio[2,3]

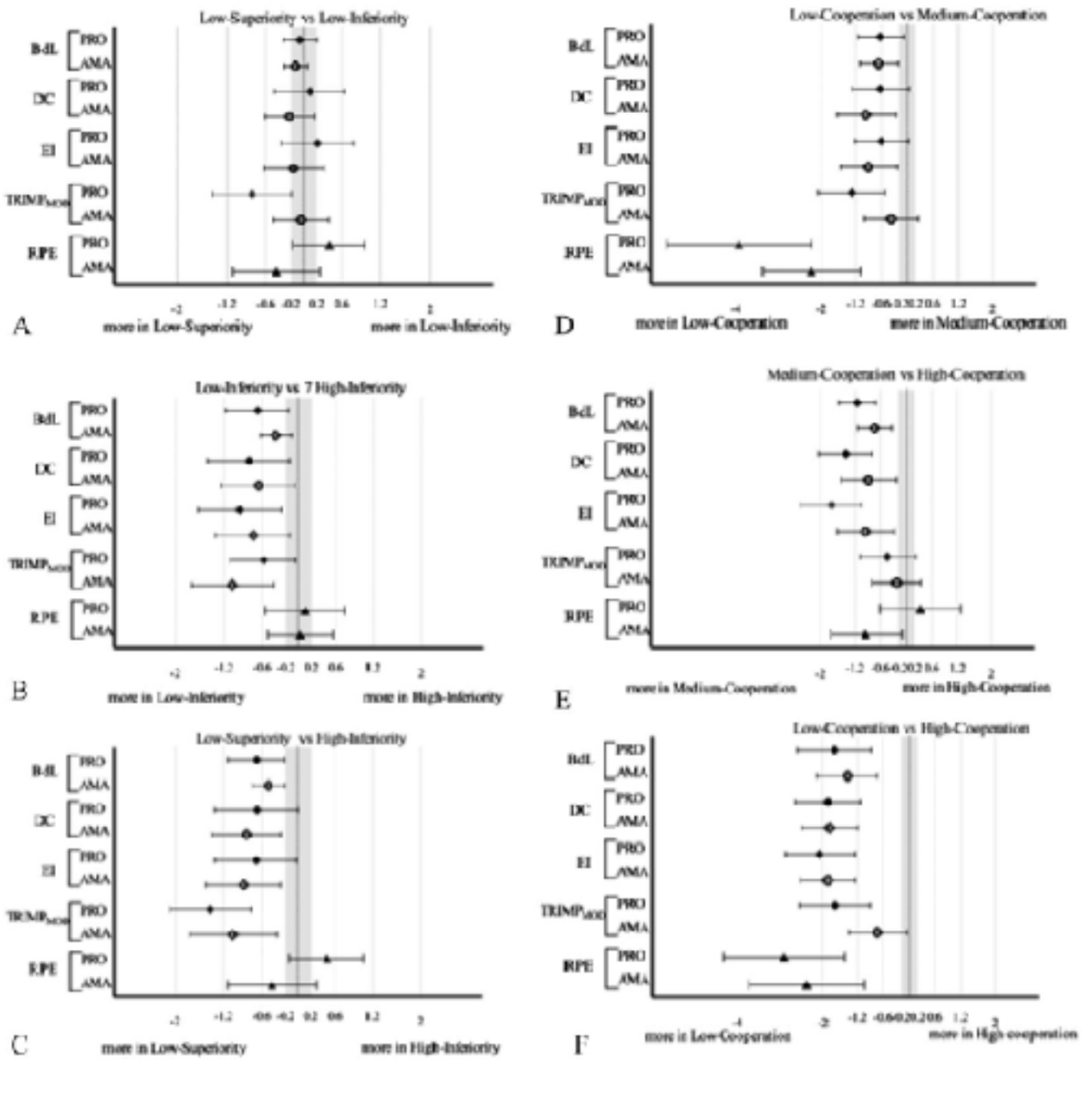
[1]National Institute of Physical Education of Catalonia (INEFC), University of Lleida, Lleida, Spain; [2]Research Center in Sports Sciences, Health Sciences and Human Development (CIDESD), Vila Real, Portugal; and [3]CreativeLab Research Community, Trás-Os-Montes e Alto Douro University, Vila Real, Portugal

Effects of emphasising opposition and cooperation on collective movement behaviour during football small-sided games

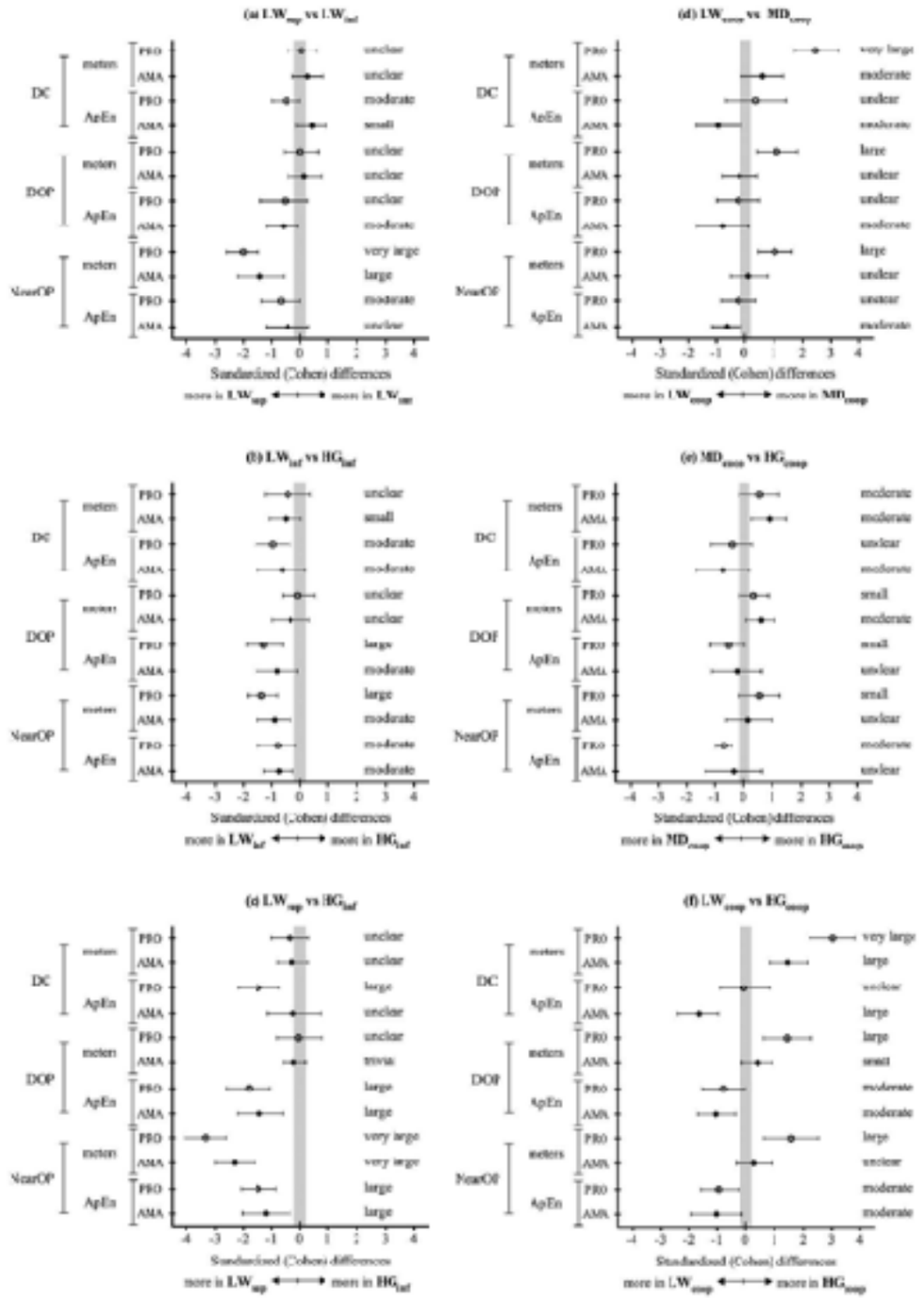
B. Gonçalves [A,D], R. Marcelino [A,D], L. Torres-Ronda [C,E], C. Torrents [C] and J. Sampaio [A,B]

[A]Research Center in Sports Sciences, Health Sciences and Human Development, CIDESD, CreativeLab Research Community, Vila Real, Portugal; [B]Sport Sciences Department, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal; [C]National Institute of Physical Education of Catalonia (INEFC), University of Lleida, Lleida, Spain; [D]Department of Health and Kinesiology, Exercise and Sport Nutrition Lab, Texas A&M University, College Station, TX, USA

Biological



Behavioural



Take home message?

1. Organised disorder, just general principles of play. Reach your goals with open tasks
2. Impose variability (adaptation)
3. No error…no learning
4. Limit instruction, be a designer

SSG tactical?

Creativity?

At least 5-a-side?

Unbalance?

Several targets?

Change the teammates?