

Are Current Match Physical Performance Metrics Fit for Purpose?

Paul Bradley



Introduction

Time Motion Analysis

Valuable tool for quantifying match demands

Data Translational

Instructions to the players and effective translate into applied setting

Integrated Approach

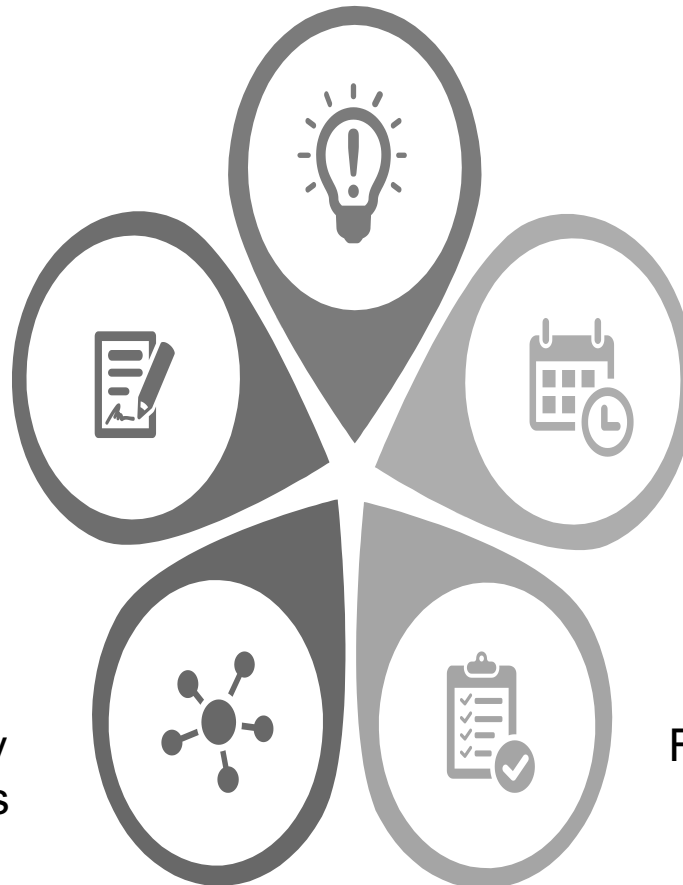
Contextualizes high-intensity runs for key tactical activities

Traditional Approach

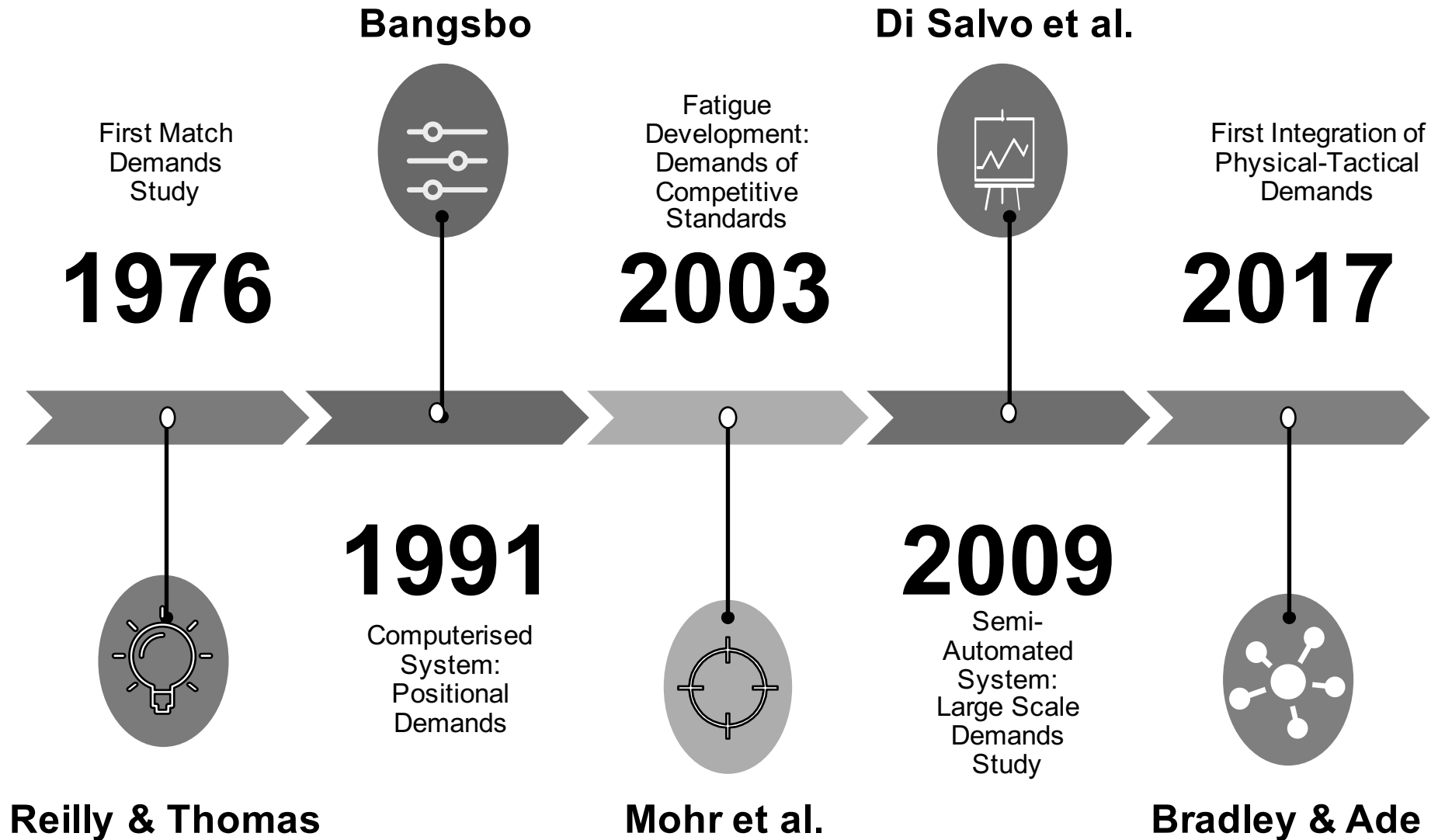
Reports the distance covered along a motion continuum

Problems

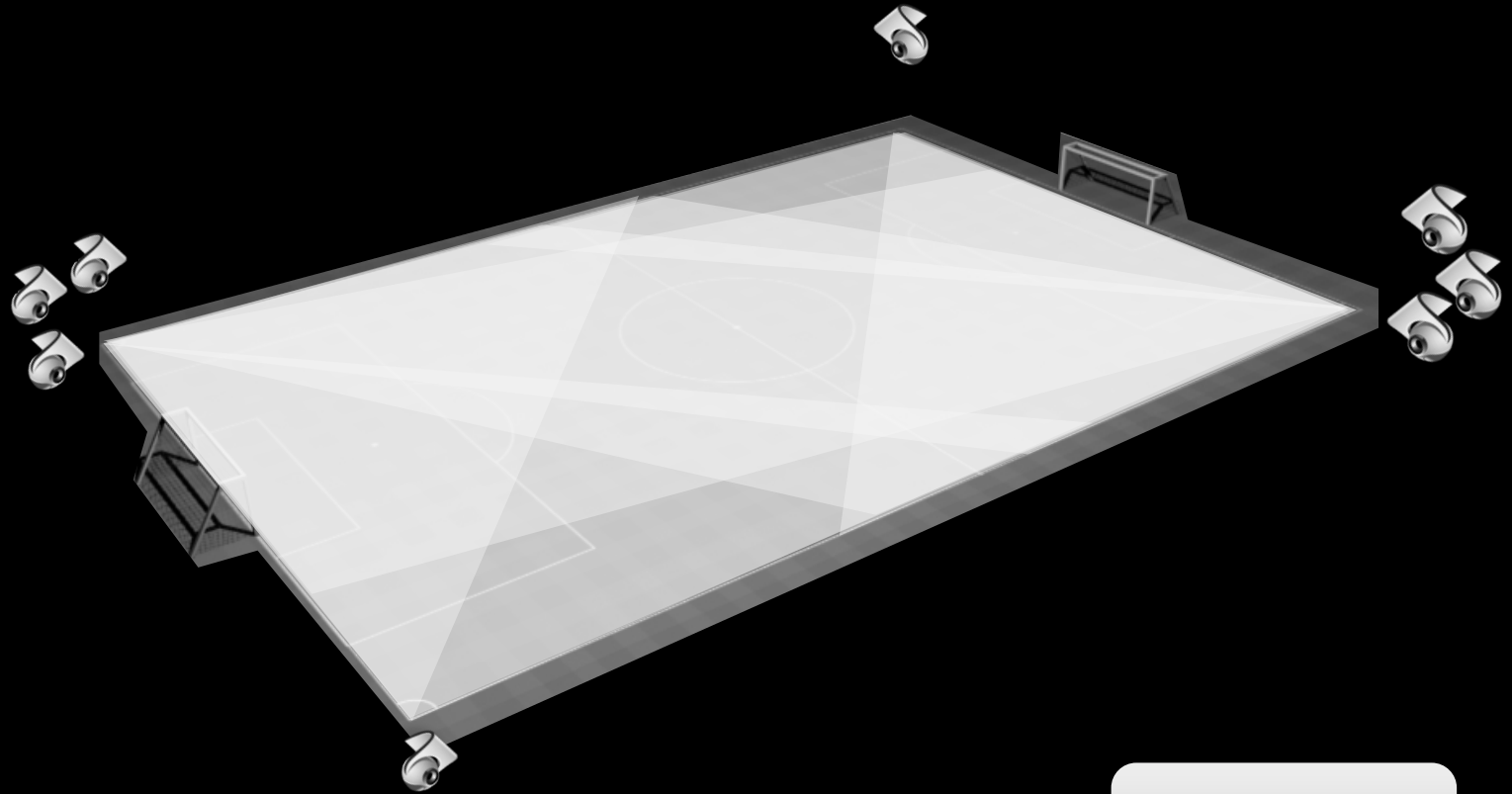
Fails to assimilate other factors leading to one-dimensional insight



Research Timeline



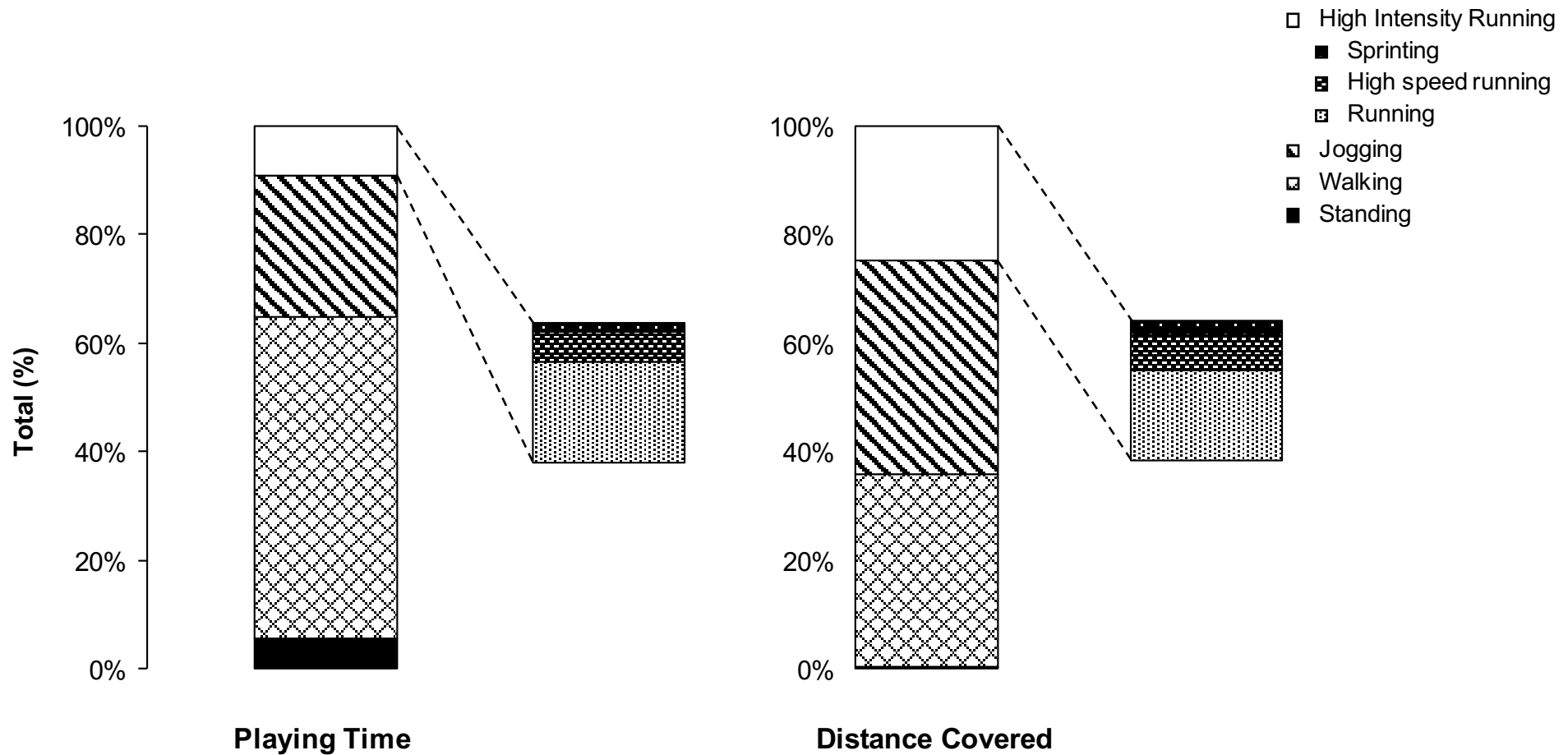
prozone



Remote Capture Suite
Controlled from PZ HQ

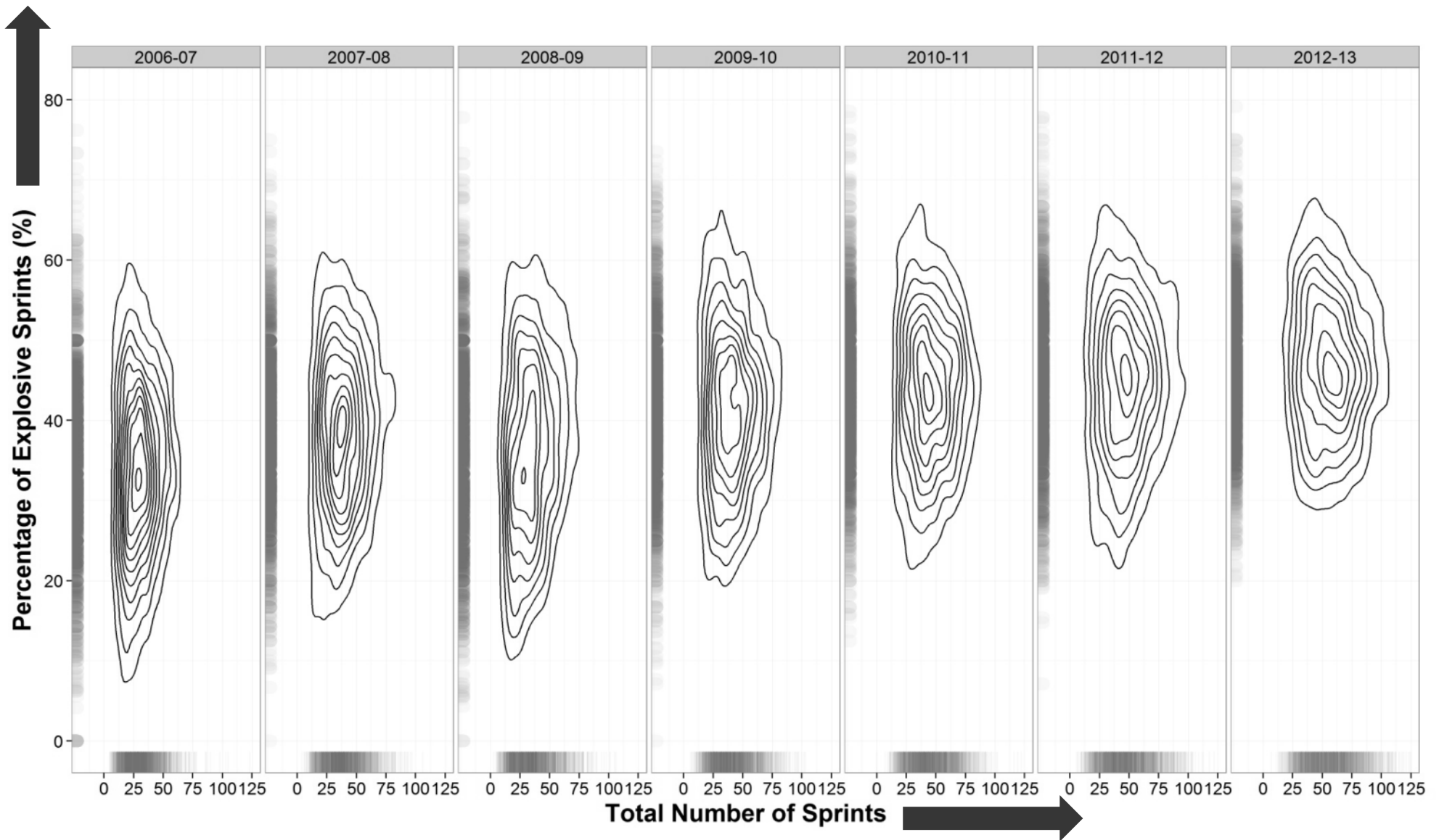


The Traditional Approach



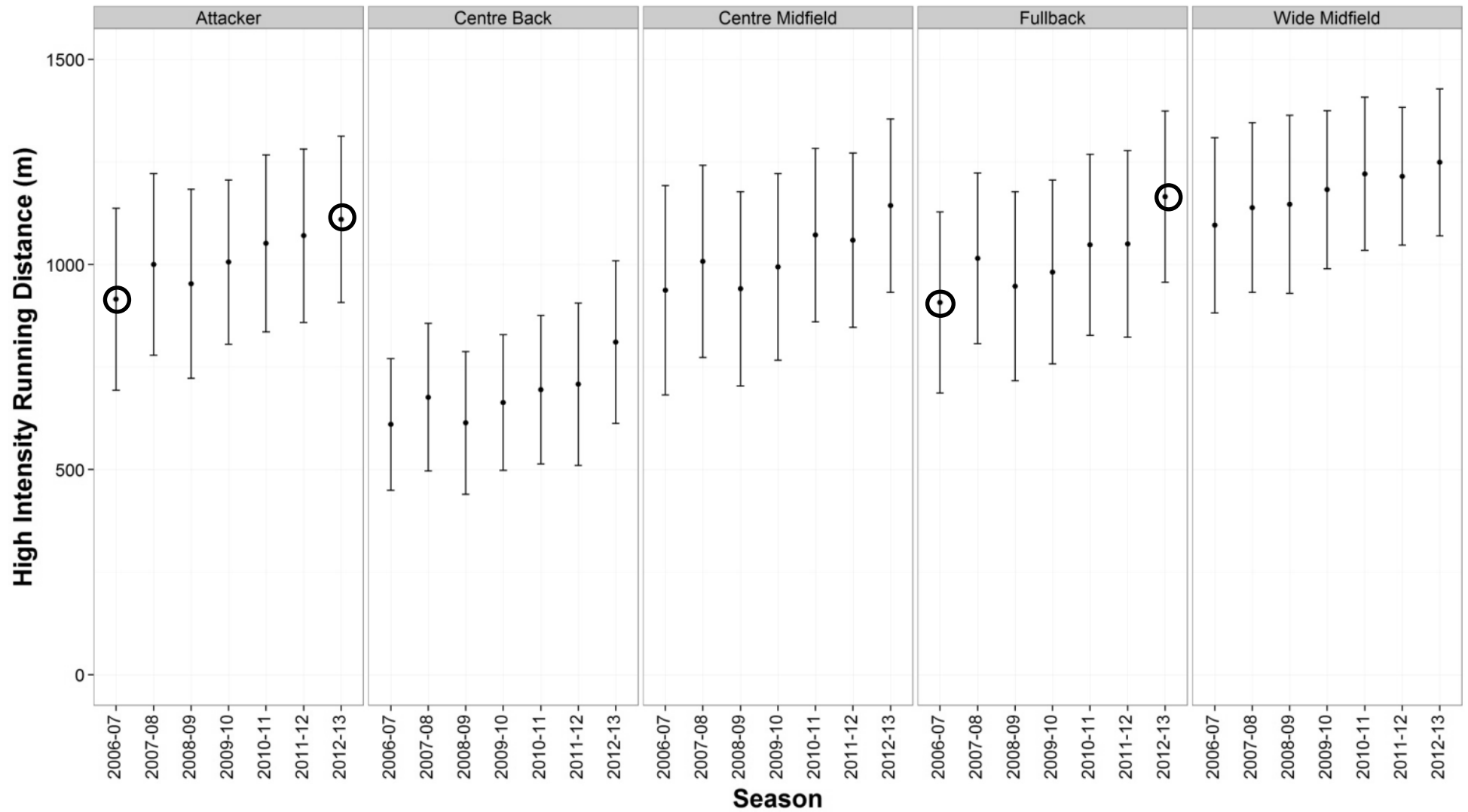
Bradley et al. (2009) *J Sports Sci*

Evolution of the Physical Demands



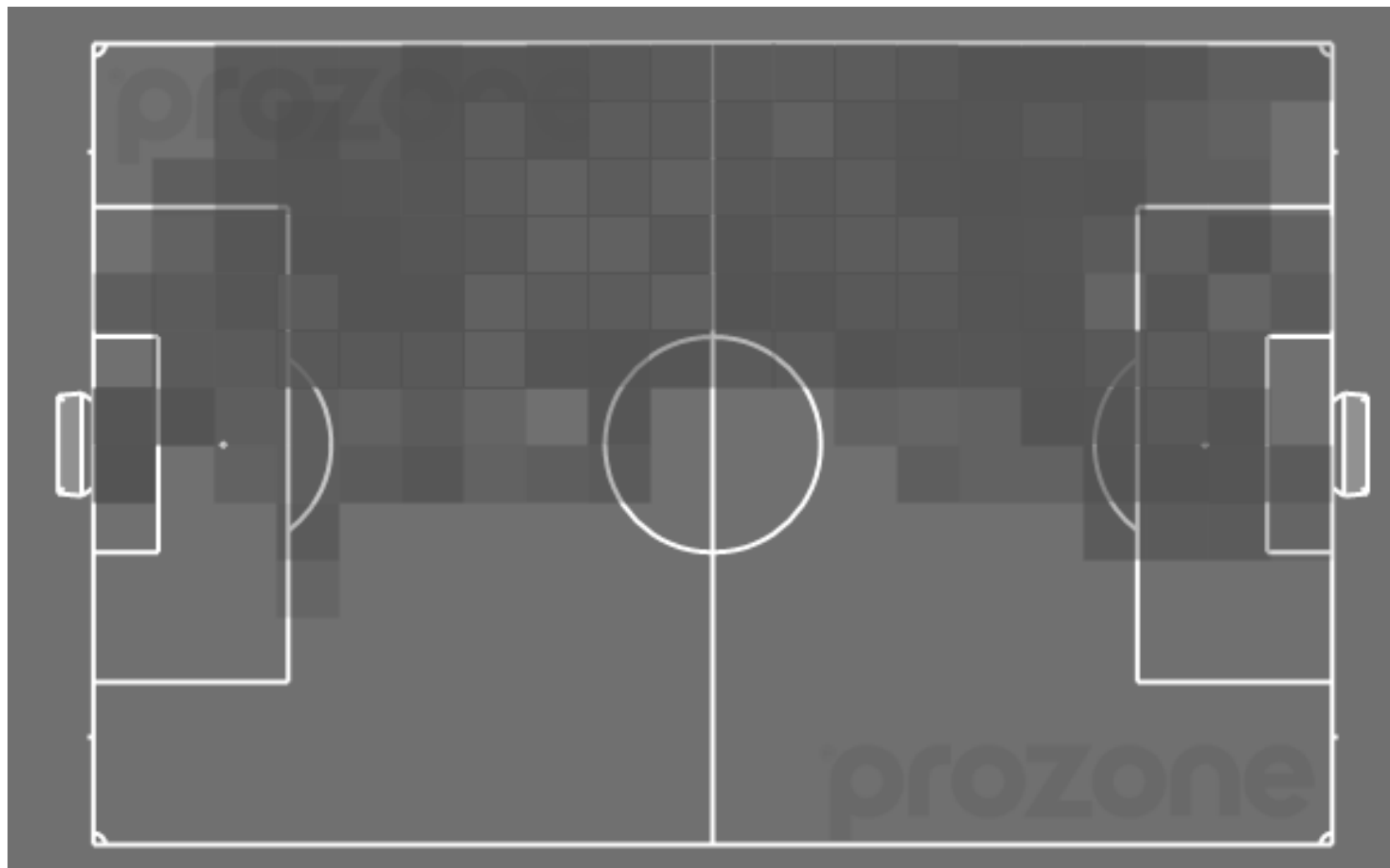
Barnes et al. (2014) *Int J Sports Med*

Positional Demands

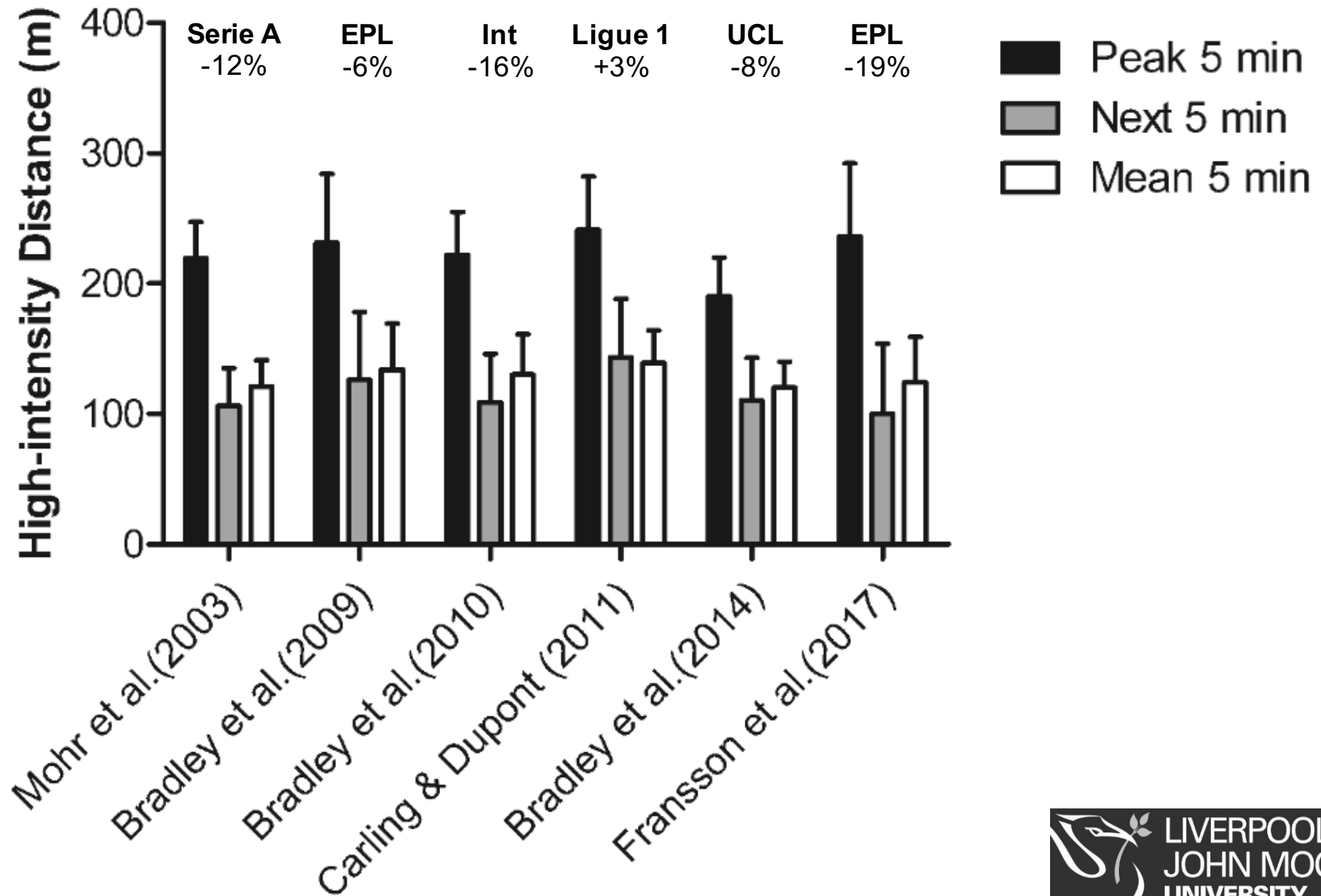


Bush et al. (2015) *Hum Mov Sci*

Heat Map of EPL Left Back



Transient Performance Decrements



SO WHAT?

The Integrated Approach

Technical Activities with Tactical Purpose
Technical events during Set Pieces
Technical events during Others/Phases of Play
Technical events during Set Pieces

Tactical
Playing Style
Phase of Play
Formation
Coaching Philosophy
Positional Role
Tactical

Technical
Passes
Tackles
Shots
Headers
Dribbling
Crosses
Technical

Full Integration

Physical

Physical

Total Distance

High-Intensity Running Distance

Sprinting Distance

Accelerations/Decelerations

Physical Activities with Tactical Purpose
Recovery Run
Covering
Overlapping
Closing Down/Interception
Push up Pitch
Run in Behind
Break into Box

Physical Activities with Technical Purpose
Dribbling Ball
Run to Cross Ball/Tackle
Jumping to Head Ball

High-intensity efforts in elite soccer matches and associated movement patterns, technical skills and tactical actions. Information for position-specific training drills

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ABSTRACT

This study aimed to translate movement patterns, technical skills and tactical actions associated with high-intensity efforts into metrics that could potentially be used to construct position-specific conditioning drills. A total of 20 individual English Premier League players' high-intensity running profiles were observed multiple times ($n = 100$) using a computerised tracking system. Data were analysed using a novel high-intensity movement programme across five positions (centre back [CB], full-back [FB], central midfielder [CM], wide midfielder [WM] and centre forward [CF]). High-intensity efforts in contact with the ball and the average speed of efforts were greater in WMs than CBs, CMs and CFs (effect sizes [ES]: 0.9–2.1, $P < 0.05$). WMs produced more repeated efforts than CBs and CMs (ES: 0.6–1.3, $P < 0.05$). In possession, WMs executed more tricks post effort than CBs and CMs (ES: 1.2–1.3, $P < 0.01$). FBs and WMs performed more crosses post effort than other positions (ES: 1.1–2.0, $P < 0.01$). Out of possession, CFs completed more efforts closing down the opposition (ES: 1.4–5.0, $P < 0.01$) but less tracking opposition runners than other positions (ES: 1.5–1.8, $P < 0.01$). CFs performed more arc runs before efforts compared to CBs, FBs and WMs (ES: 0.9–1.4, $P < 0.05$), however, CBs completed more 0–90° turns compared to FBs, CMs and WMs (ES: 0.9–1.1, $P < 0.01$). The data demonstrate unique high-intensity trends in and out of possession that could assist practitioners when devising position-specific drills.

ARTICLE HISTORY

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KEYWORDS

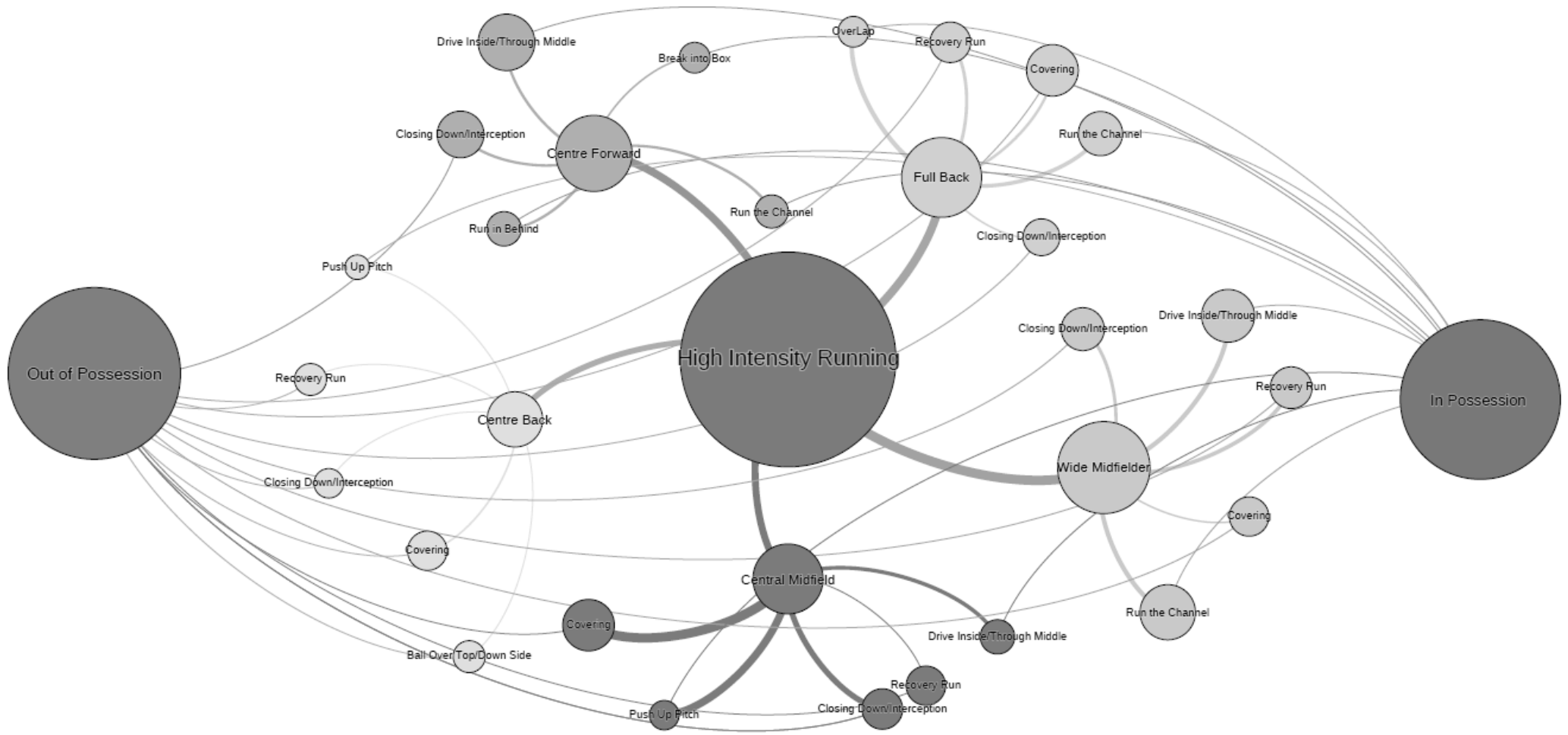
Football; time-motion analysis; training prescription

Integrating Physical-Technical-Tactical Variables

Table 1. High-intensity movement programme (HIMP).

HIMP categories	Description
<i>Movement pattern</i>	
Turn 0–90°	Player turns $\leq \frac{1}{4}$ circle
Turn 90–180°	Player turns $\geq \frac{1}{4}$ circle but $\leq \frac{1}{2}$ circle
Swerve	Player changes direction at speed without rotating the body
Arc run	Player (often leaning to one side) moving in a semi-circular direction
<i>Technical skill</i>	
Long pass	Player attempts to pass the ball to a team mate over a distance greater than 30 yards
Trick	Player performs ball skill before, during or after dribbling /running with the ball
Cross	Player attempts to cross the ball into the opposition penalty box from either flank in the attacking third of the pitch
Shot	Player attempts to kick the ball into the opposition goal
Header	Player makes contact with the soccer ball with the head
Tackle	Player dispossess the soccer ball from the opponent
<i>Tactical outcome (in possession)</i>	
Break into the opposition penalty box	Player enters the opposition penalty box
Run with the ball	Player moves with the ball either dribbling with small touches or running with the ball with bigger touches
Overlapping run	On the external channel, player runs from behind to in front of, or parallel to the player on the ball
Push up the pitch	Player moves up the pitch to support the play or play offside (defensive and middle third of the pitch only)
Drive through the middle of the pitch	Player runs with or without the ball through the middle of the pitch
Drive inside the pitch	Player runs from external flank with or without the ball into the central area
Run the channel of the pitch	Player runs with or without the ball down one of the external areas of the pitch
Run in behind the opposition defence	Player aims to beat the opposition offside trap to run through onto the opposition goal
<i>Tactical outcome (out of possession)</i>	
Close down opposition player	Player runs directly towards opposition player on the ball
Interception of opposition pass	Player cuts out pass from opposition player
Covering	Player moves to cover space or a player on the pitch whilst remaining goal side
Track runner	Player runs alongside opposition player with or without the ball
Ball passed over the top of player	Opposition plays a long pass over the defence through the centre of the pitch
Ball passed down the side of pitch	Opposition plays a ball over the top or down the side of the flank
Recovery run	Player runs back towards own goal when out of position to be goal side

Positional Integration



Bradley & Ade (In Review) *IJSP*

In Possession: Break into Box



Video by Atle Rosseland LJMU



In Possession: Overlapping



Video by Atle Rosseland LJMU



In Possession: Run in Behind



Video by Atle Rosseland LJMU



Out of Possession: Ball Over Top/Down Side



Video by Atle Rosseland LJMU



Out of Possession: Recovery Run



Video by Atle Rosseland LJM U



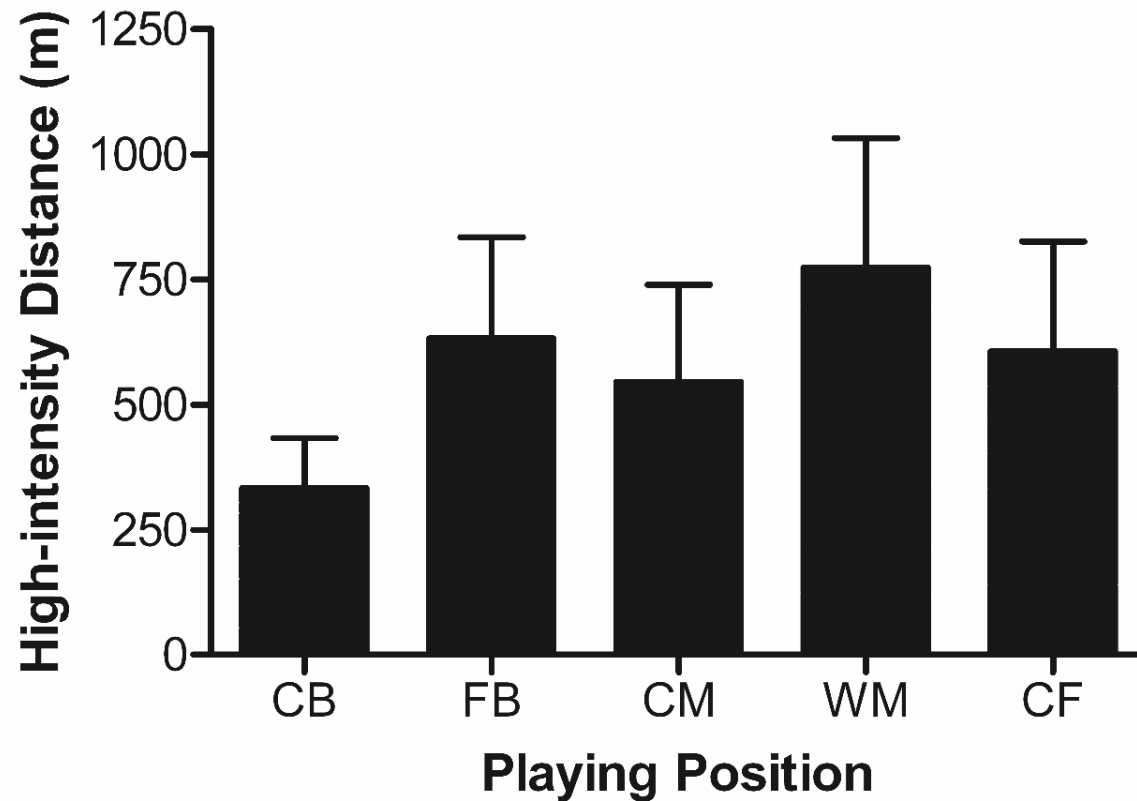
Out of Possession: Closing Down/Intercepting



Video by Atle Rosseland LJMU

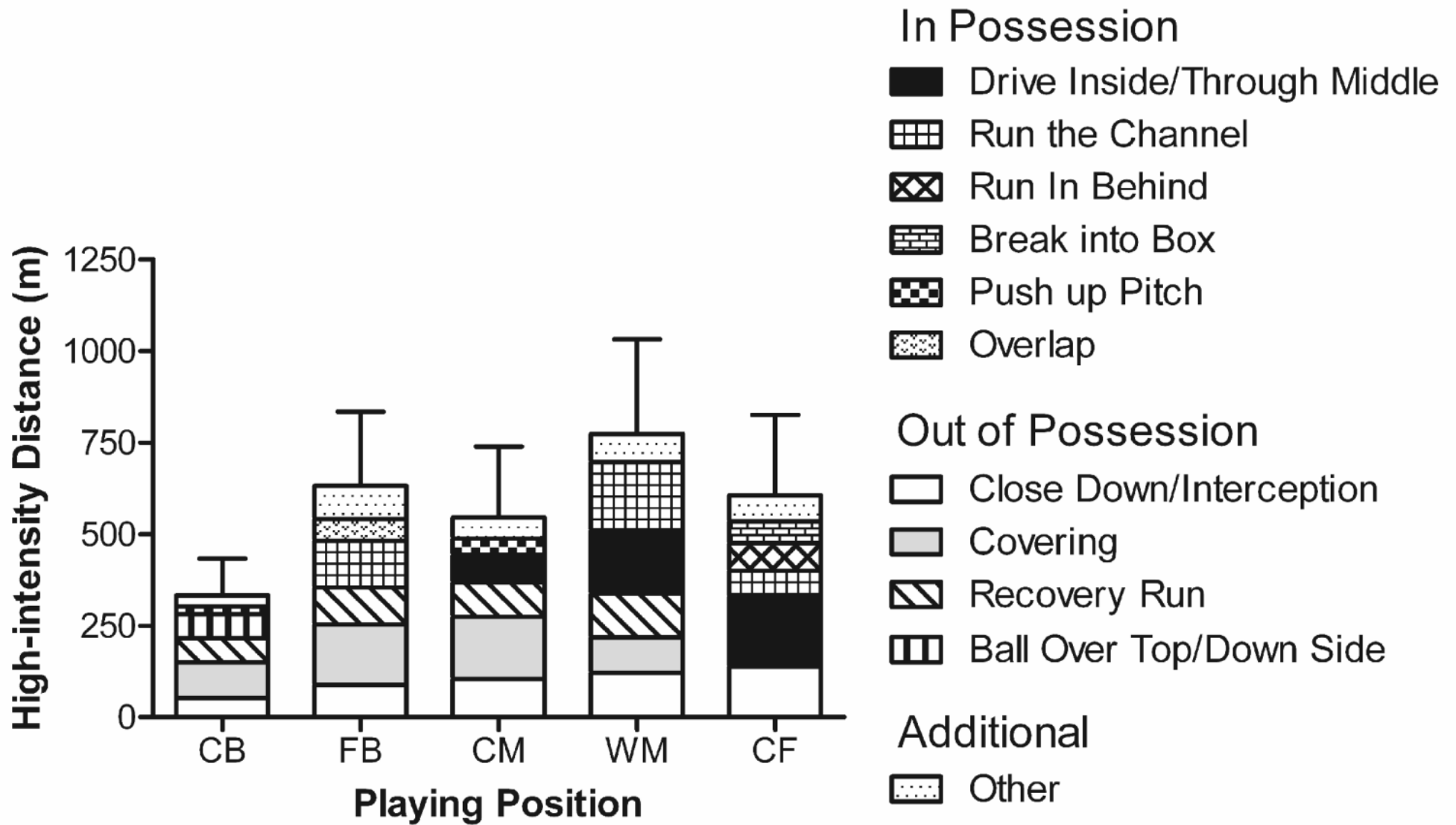


Traditional Approach or 'Blind Distance'



Bradley & Ade (In Review) *IJSP*

Integrated Approach or 'Purposeful Distance'



Bradley & Ade (In Review) *IJSPP*

Application: Position-Specific Training



Ade & Bradley, (in preparation)

Application: Isolated Full Back



Ade & Bradley, (in preparation)

Application: Isolated Central Midfielder



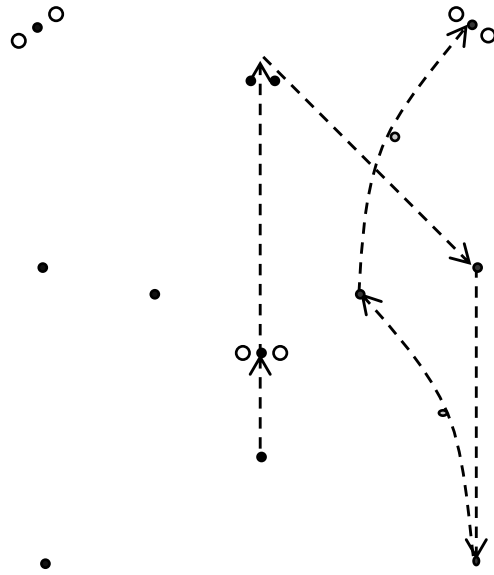
Ade & Bradley, (in preparation)

Application: Isolated Centre Forward






Ade & Bradley, (in preparation)

Application: Repeated Sprint Testing



Di Mascio et al. (2015). *Eur J Appl Physiol*

Conclusions

- 1 Contextualized**
Amalgamates physical and tactical match metrics 
- 2 Intuitive**
Aids the translation of such information to applied staff 
- 3 Progress**
Only for research purposes at present (needs automation) 

Thanks to

STATS



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