

Unsupervised Playing Style Detection

F9
DATA

David Perdomo Meza (Data Scientist) and Bobby Gardiner (Product Manager)

METHODOLOGY

Our method re-purposes one of the foremost models of Natural Language Processing, LDA, which is concerned with automatically sorting text documents into topic categories. When an LDA model is fit to a set of documents, it will produce a set of 'topics' characterised by key words. After a model is fit, it can be used to process new documents and will classify them as a mixture of the topics: "30% technology, 40% sale ad, etc". It does this by analysing the frequency of different key words appearing in the document. Our method uses an LDA model to analyse the frequency of features of a team in a match, such as 'long ball into opposition half', 'touches', 'interception', etc; and classify it into a mixture of the different styles it learned.

STRENGTHS

LDA is a robust dimensionality reduction technique which, as opposed to other techniques such as PCA, has highly descriptive components. This means that despite being unsupervised, its results are compatible with the knowledge of coaches, analysts and scouts; and its applications are both scalable to large quantities of data and immediately accessible to stakeholders. On top of this, this is all deployed on a relatively simple data set (F9 aggregate data).

TEAM PERSONAS

TEAM MODEL TOPICS

These topics were learned without supervision by the model using the training data.

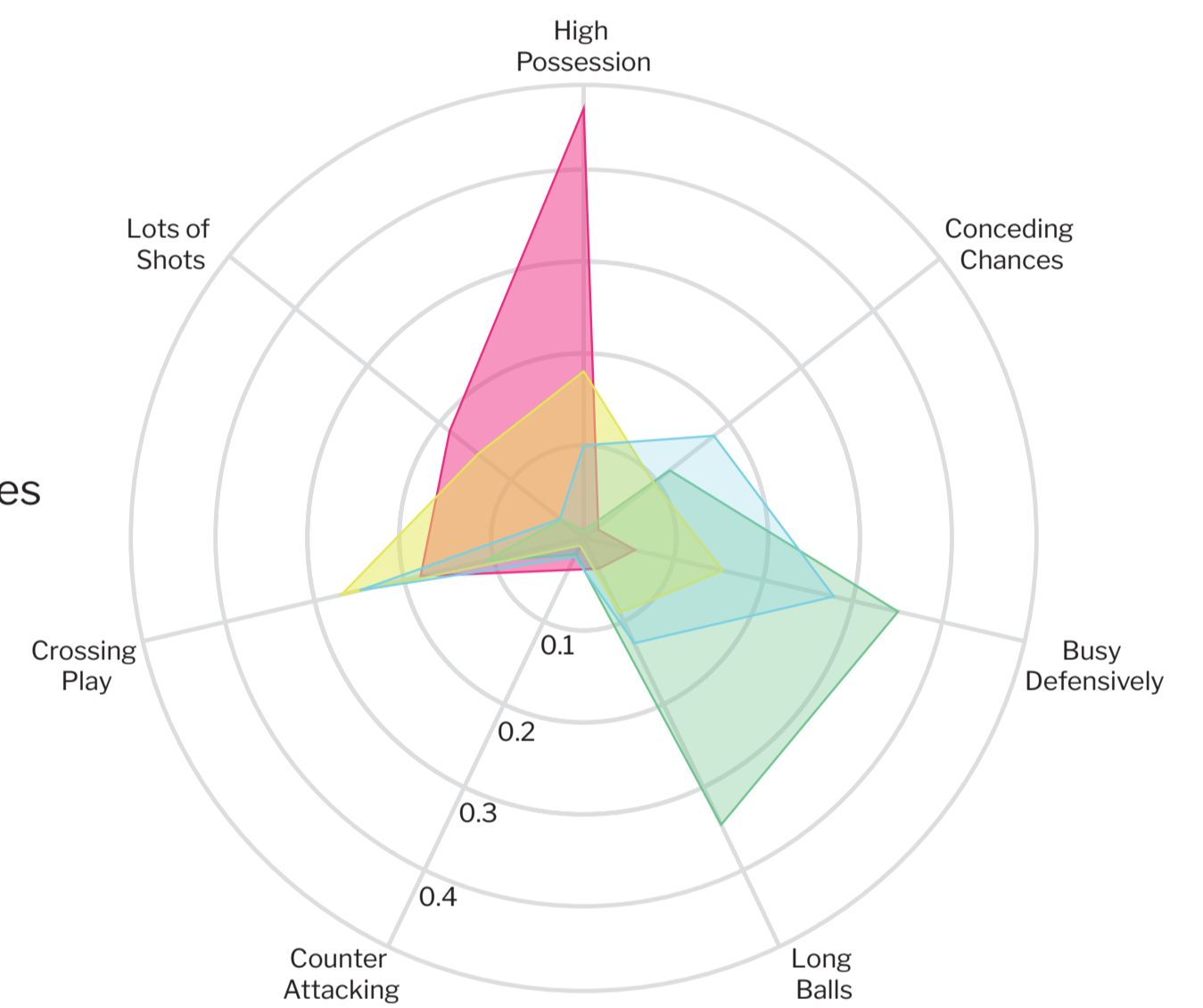
TOPIC	EXPLANATION
High possession	Characterised by dominating possession play: <i>total passes, touches, possession percentage.</i>
Lots of shots	Typified by chance generation: <i>scoring attempts, big chances, through-balls.</i>
Conceding Chances	Defined by chance concession: <i>saves, attempts conceded, yellow cards, blocked shots.</i>
Busy Defensively	Indicating active but successful defensive actions: <i>clearances, possession won in defensive third, blocked crosses.</i>
Crossing Play	Identified by stereotypical crossing features: <i>crosses, headed attempts.</i>
Counter Attacking	This describes fast attacks: <i>fast breaks, one-on-one attempts, accurate through balls.</i>
Long Balls	Exemplifying direct tactics: <i>long balls, accurate launches, accurate flick on.</i>

TEAM STYLE COMPARISON

August 2016 – January 2018

This Persona framework can elegantly distinguish differences in playing styles, such as between these 4 Premier League sides.

Swansea Manchester City
Southampton Burnley

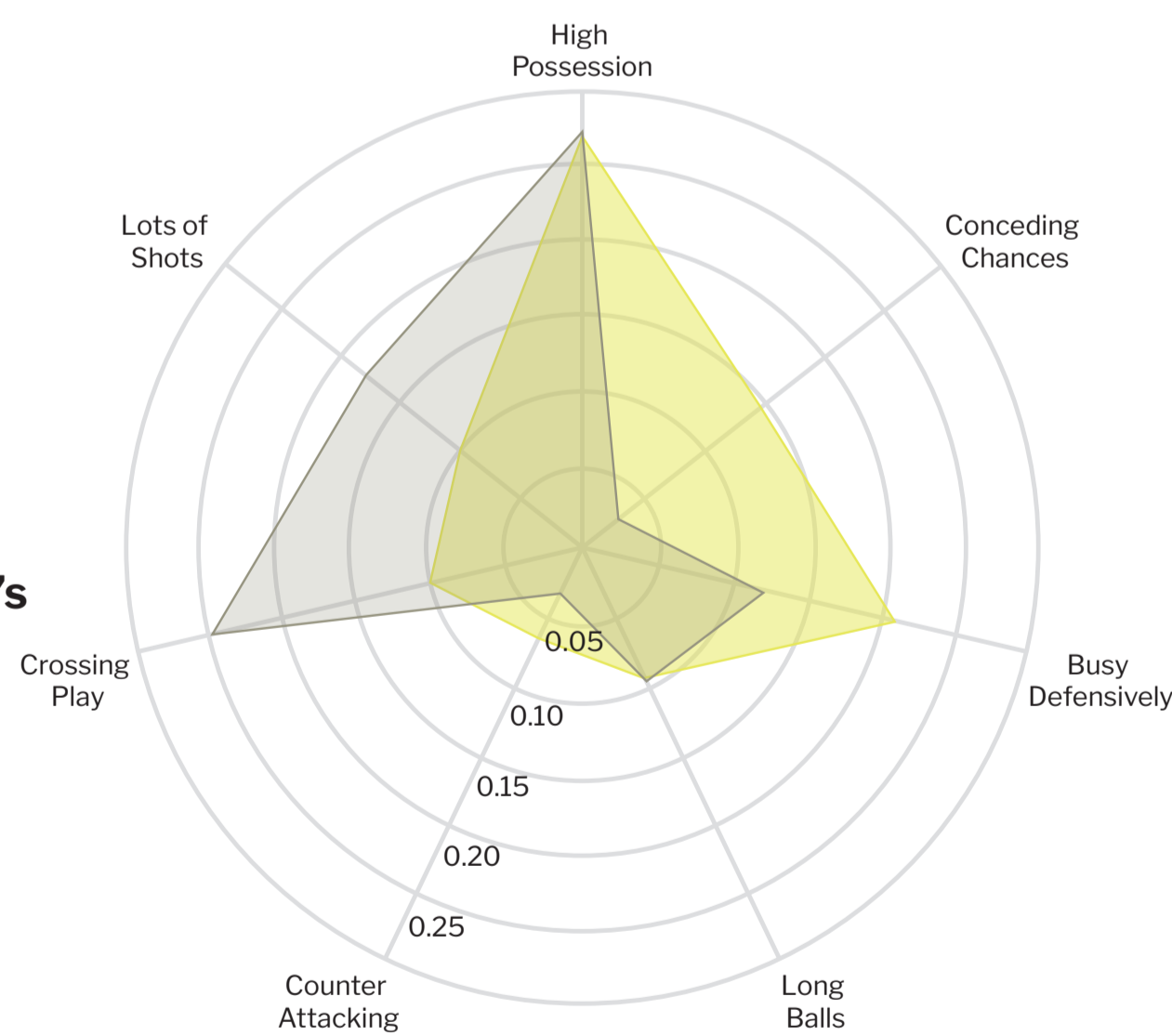


PLAYER EFFECTS ON TEAM PERSONA: PAUL POGBA

August 2016 – January 2018

A uniquely interesting tactical application is isolating the marginal effect of a player on a team's play style, such as Paul Pogba's importance to Manchester United.

With Pogba Without Pogba

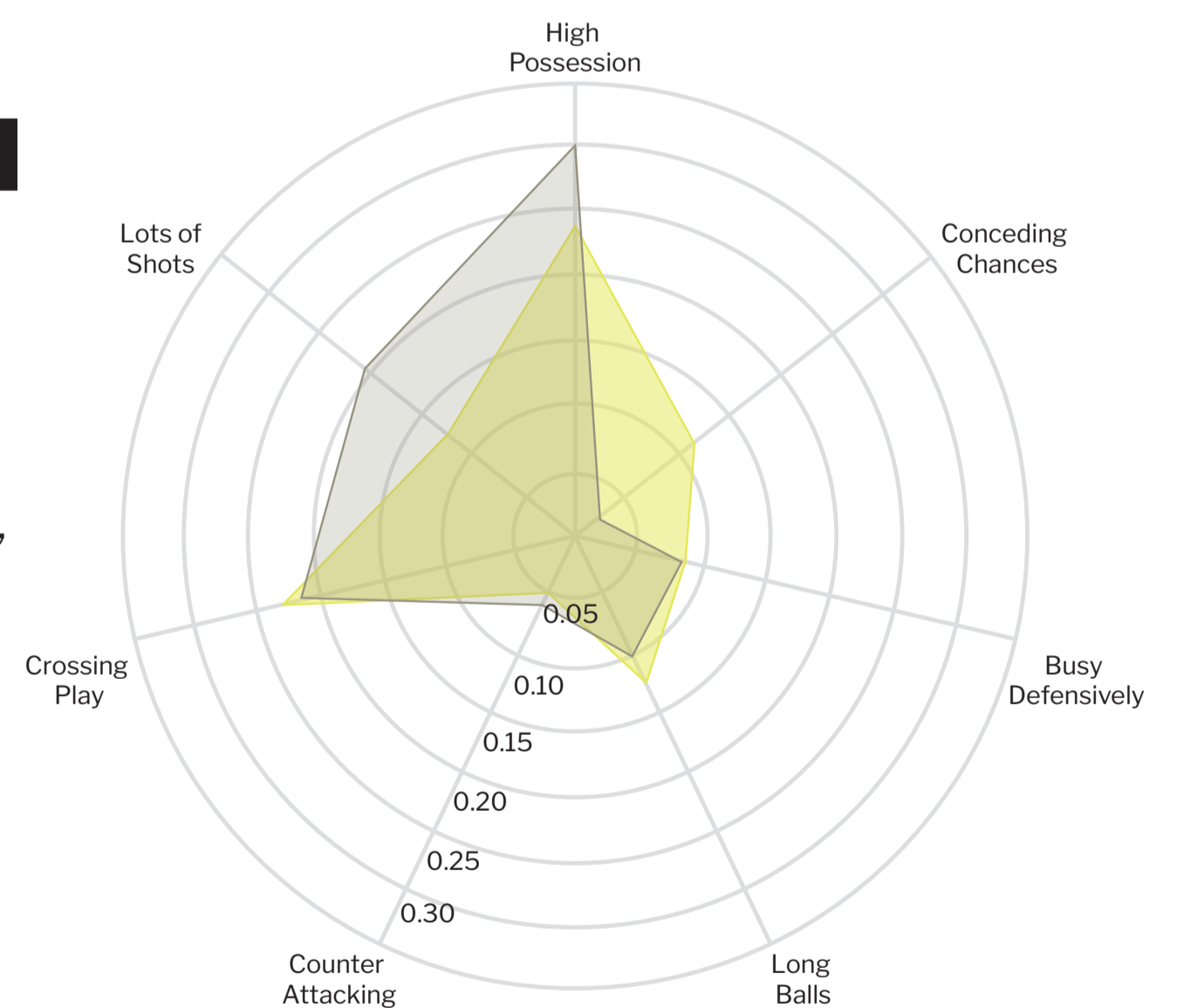


PLAYER EFFECTS ON TEAM PERSONA: BEN DAVIES

August 2016 – January 2018

In situations of line-up choices, e.g. between Ben Davies and Danny Rose, these Personas can provide insight that might be valuable to a manager.

With Davies Without Davies

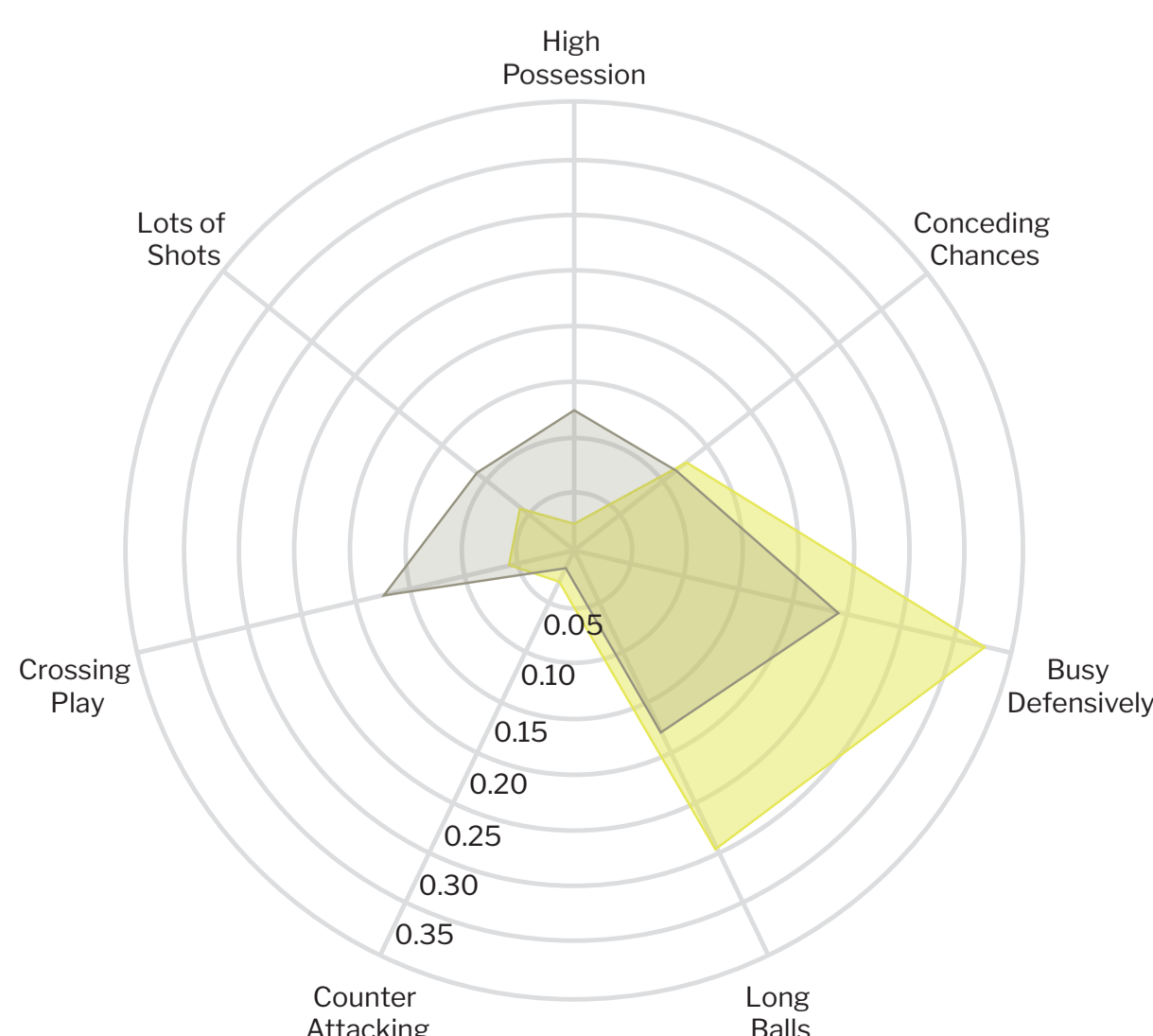


MANAGER EFFECTS ON TEAM PERSONA: SAM ALLARDYCE

August 2016 – January 2018

Decision makers may wish to isolate the effect of a manager on play-style to see if they are fulfilling the club's philosophy. Sam Allardyce, for example, has had a significant impact on Everton's tactics.

Before Allardyce After Allardyce

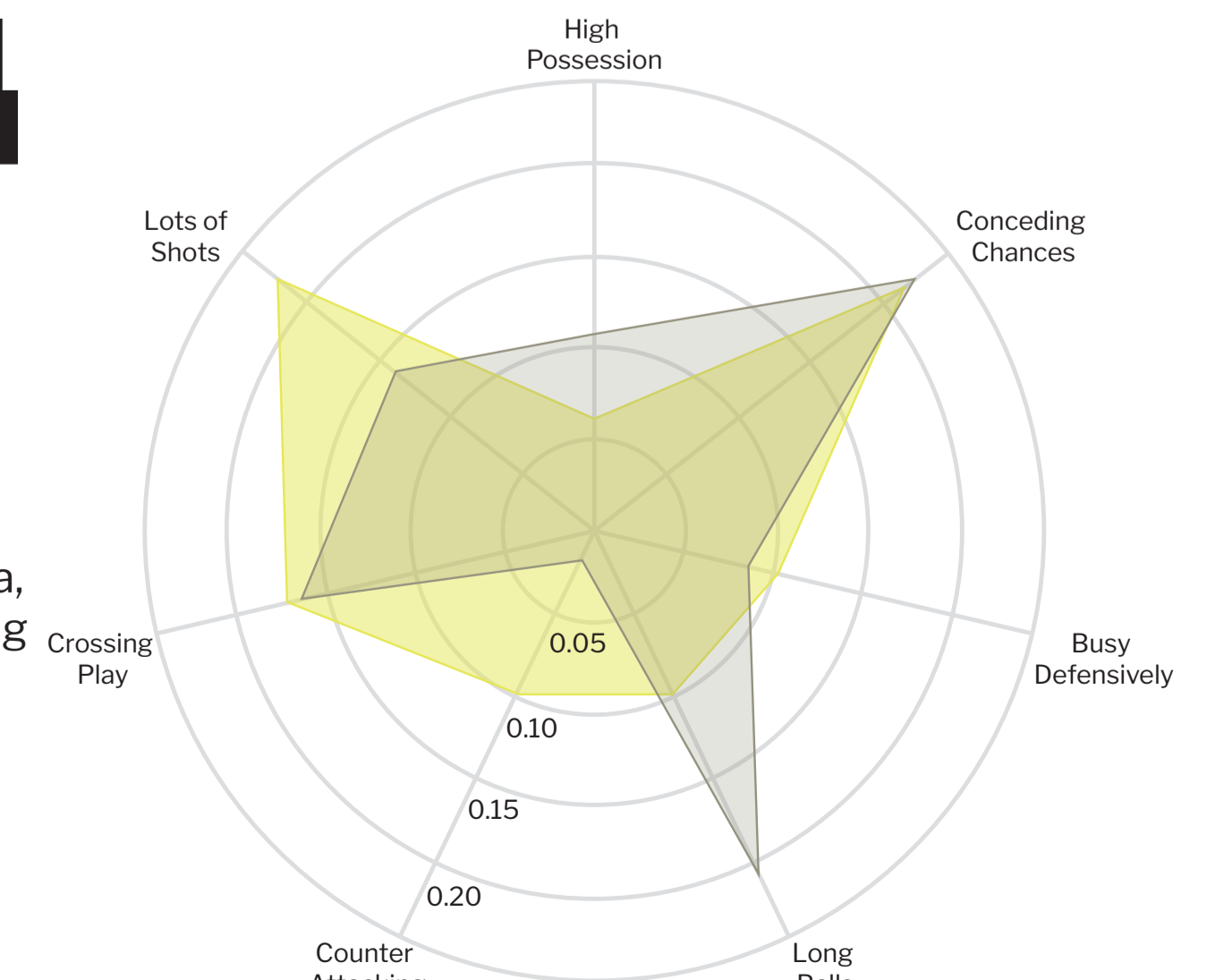


MANAGER EFFECTS ON TEAM PERSONA: VALENCIA WITH MARCELINO

August 2016 – January 2018

Marcelino's impact on Valencia, meanwhile, has been in creating more offensive opportunities and counter-attacking, while their defence is still busy and concedes chances.

Before Marcelino After Marcelino



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PLAYER PERSONAS

MIDFIELDER MODEL TOPICS

These topics were learned without supervision by the model using the training data.

TOPIC	EXPLANATION
Shots	Characterised by shot attempts: <i>scoring attempts, shot off target, blocked out of box attempt.</i>
Defending	Typified by defensive actions: <i>total tackles, interception, possession won middle third.</i>
Proficient Passing	Defined by passing actions: <i>accurate pass, accurate forward zone pass, touches, accurate chipped pass.</i>
Aerial Game	Indicating aerial actions: <i>accurate flick ons, head pass, effective head clearance.</i>
High Risk / Reward	Identified by high risk actions: <i>unsuccessful touch, won contest, put through.</i>
Chance Creation	This describes chance creation: <i>accurate layoffs, attempts assisted open play, successful final third passes.</i>
Crossing	Exemplifying crossing play: <i>total crosses, accurate crosses, crosses behind 18 yards.</i>

MIDFIELDER PLAYING STYLES

August 2016 – January 2018

This Persona framework can elegantly distinguish differences in player playing styles, such as between these 5 midfielders.

- Sergio Busquets
- Radja Nainggolan
- Marouane Fellaini
- Mesut Özil
- Naby Keita



DEFENDER MODEL TOPICS

These topics were learned without supervision by the model using the training data.

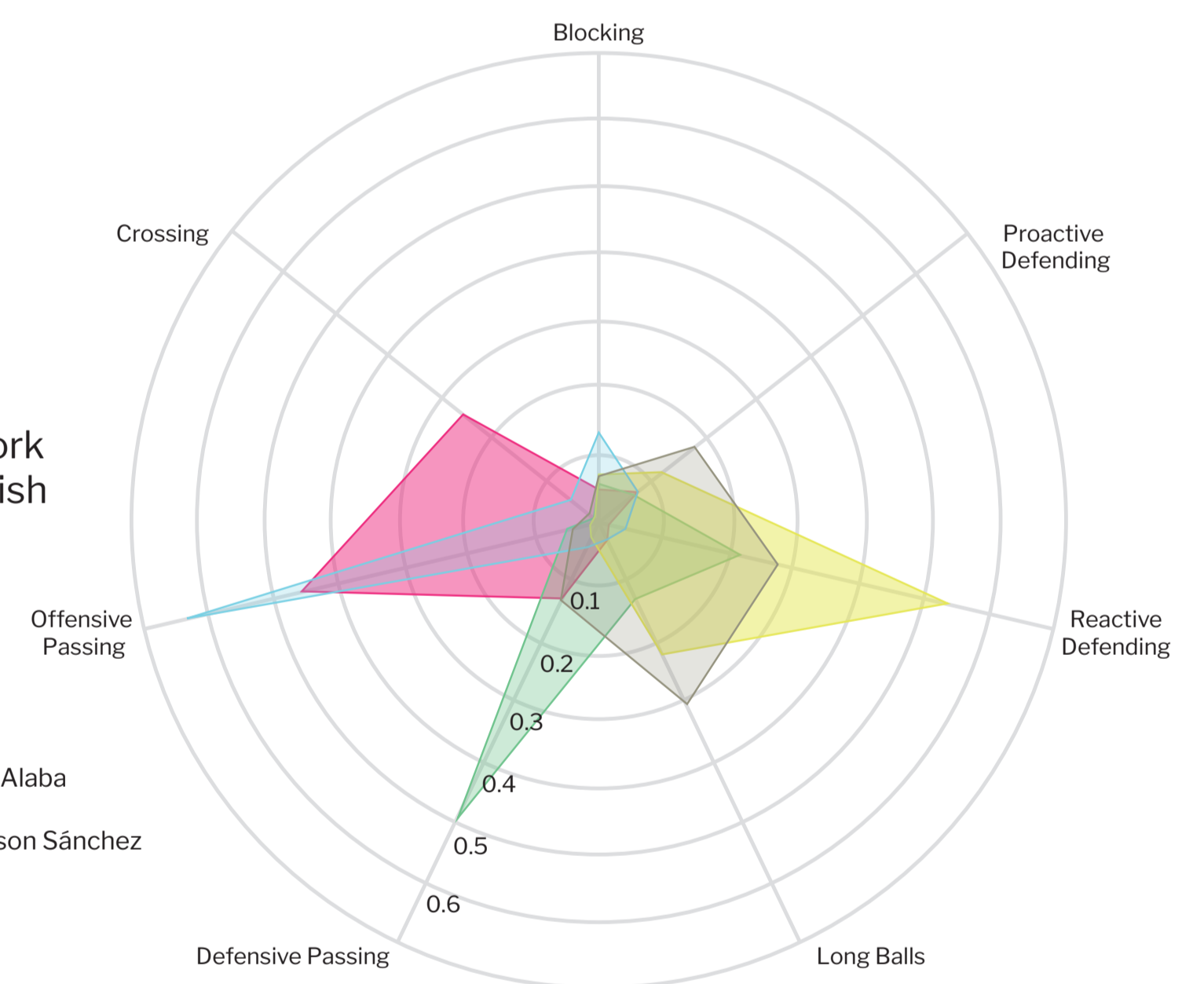
TOPIC	EXPLANATION
Offensive Passing	Characterised by passing in opposition half: <i>accurate forward zone pass, successful final third passes, total forward passes.</i>
Defensive Passing	Typified by passing in own half: <i>accurate back zone pass, total back zone pass, successful long passes from own half into opposition's.</i>
Proactive Defending	Defined by proactive defensive actions: <i>interceptions, offside provoked, total tackle, possession won defensive third.</i>
Reactive Defending	Indicating reactive defensive actions: <i>effective clearance, aerial won, duel won.</i>
Blocking	Identified by blocking defensive actions: <i>blocked cross, blocked pass, attempted tackle foul.</i>
Crossing	This describes crossing features: <i>crosses after 18 yards, total crosses not from corners, crosses behind 18 yards.</i>
Long Balls	Exemplifying direct play: <i>long pass from own half into opposition's, accurate chipped pass, accurate long balls.</i>

DEFENDER PLAYING STYLES

August 2016 – January 2018

This Persona framework can elegantly distinguish differences in player playing styles, such as between these 5 defenders.

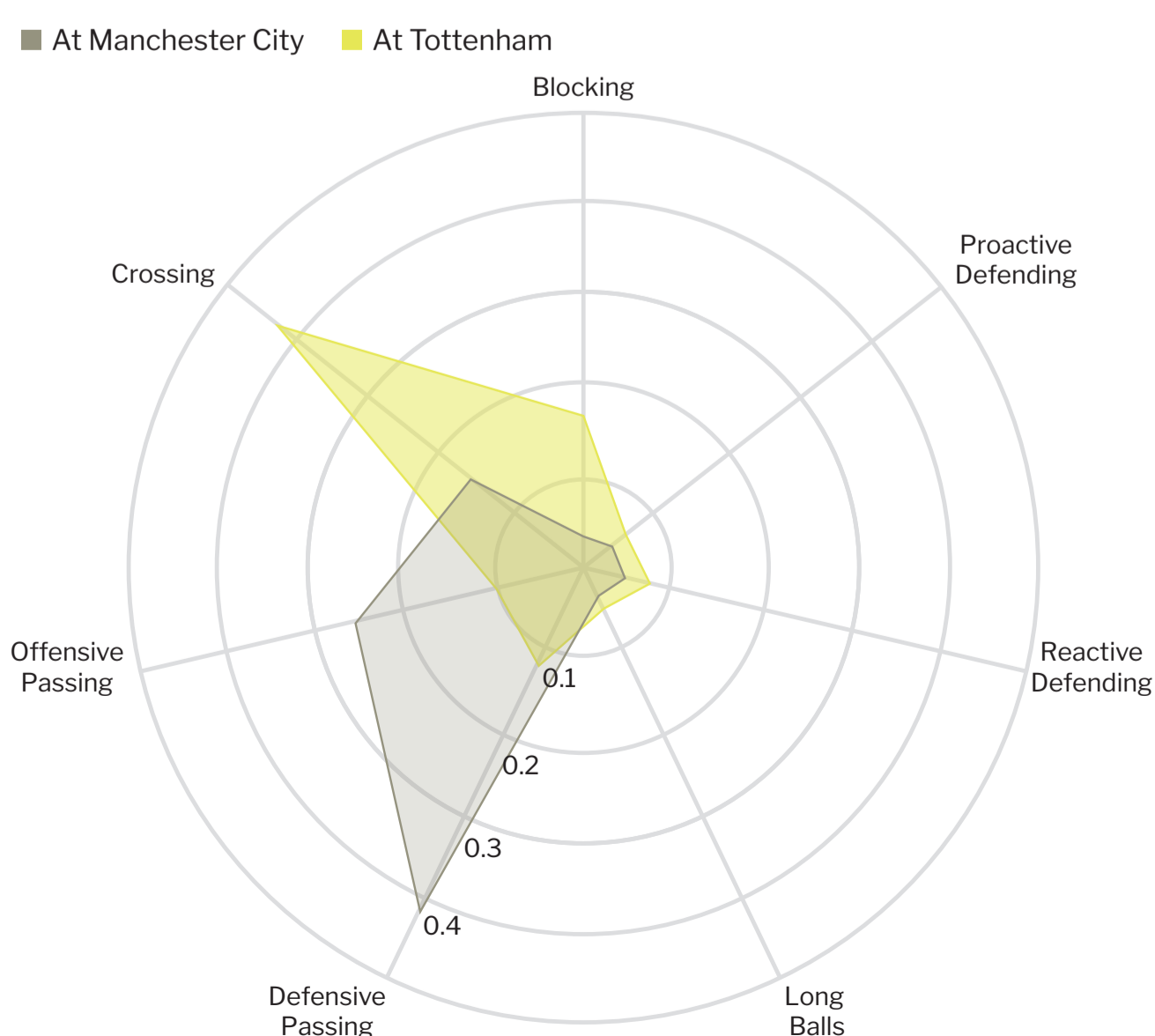
- Jordi Alba
- David Alaba
- Ben Mee
- Davinson Sánchez
- Diego Godin



TEAM EFFECTS ON DEFENDER PLAYING STYLES

August 2016 – January 2018

Another tactical application is isolating the effect of a team change on a player's play style, such as **Kyle Walker's** move to Manchester City.



PLAYER SIMILARITY

MIXING PERFORMANCE AND STYLISTIC SIMILARITY

August 2016 – January 2018

Using Football Whisper's Performance Ratings, also built on Opta F9, we can evaluate player similarity on two axes: persona, and performance.

Who is like Lionel Messi?

Name	Persona Similarity	Performance Similarity	Performance Difference	Total Similarity
Lorenzo Insigne	93.21	97.29	0.80	190.50
Neymar	92.58	97.79	0.65	190.37
Mohamed Salah	92.43	92.45	-2.22	184.88
Paulo Dybala	95.62	89.08	-3.22	184.70
Kylian Mbappe	84.43	95.22	-1.41	179.65
Dries Mertens	87.38	91.89	-2.39	179.27
Sergio Agüero	81.33	96.77	0.95	178.10
Luis Suárez	85.46	91.78	2.42	177.24
Alexis Sánchez	95.28	81.81	-5.36	177.10
Iago Aspas	93.56	81.45	-5.46	175.01

