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*Modelling relationships between match events and match outcome in elite football*

This is the Accepted version of the following publication

Liu, H, Hopkins, William and Gómez Ruano, Miguel Ángel (2016) Modelling relationships between match events and match outcome in elite football. *European Journal of Sport Science*, 16 (5). 516 - 525. ISSN 1746-1391

The publisher's official version can be found at  
<http://www.tandfonline.com/doi/full/10.1080/17461391.2015.1042527>  
Note that access to this version may require subscription.

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Table I. Selected match events and variables

Groups	Events and variables: operational definitions
Variables related to goal scoring	<p><b>shot:</b> an attempt to score a goal, made with any (legal) part of the body, either on or off target</p> <p><b>shot on target:</b> an attempt to goal which required intervention to stop it going in or resulted in a goal/shot which would go in without being diverted</p> <p><b>shot blocked:</b> a goal attempt heading roughly on target toward goal which is blocked by a defender, where there are other defenders or a goalkeeper behind the blocker</p>
Variables related to passing and organising	<p><b>ball possession (%):</b> the duration when a team takes over the ball from the opposing team without any clear interruption as a proportion of total duration when the ball was in play</p> <p><b>pass:</b> an intentional played ball from one player to another</p> <p><b>pass accuracy (%):</b> successful passes as a proportion of total passes</p> <p><b>CROSS:</b> any ball sent into the opposition team's area from a wide position</p> <p><b>corner:</b> ball goes out of play for a corner kick</p> <p><b>offside:</b> being caught in an offside position resulting in a free kick to the opposing team</p> <p><b>aerial advantage (%):</b> aerial duels won by a team as a proportion of total duels of the match</p> <p><b>lost ball:</b> a player from the attacking team lost the possession of ball due to a mistake/poor control, including turnovers, dispossesses and unsuccessful passes</p>
Variables related to defending	<p><b>ball recovery:</b> the event given at the start of a team's recovery of ball possession from open play. In order to give a ball recovery the defending team must have full control of the ball and must start a new passage of play.</p> <p><b>tackle:</b> the action of gaining possession from an opposition player who is in possession of the ball</p> <p><b>foul:</b> any infringement that is penalised as foul play by a referee</p> <p><b>yellow card:</b> where a player was shown a yellow card by the referee for reasons of foul, persistent infringement, hand ball, dangerous play, time wasting, etc.</p> <p><b>red card:</b> where a player was sanctioned a red card by the referee, including straight red card and a red card from the second yellow card</p>
Contextual variable	<p><b>match location:</b> playing at home or away</p>

Table II. Means and *s* of match events per match and the estimated within- and between-team SD from the reliability analysis (n = 640 observations, 320 close matches)

Indicator	Mean $\pm$ <i>s</i>	Within-team SD	Between-team SD
shot	13.1 $\pm$ 4.8	4.6	1.4
shot on target	4.6 $\pm$ 2.4	2.4	0.4
shot blocked	2.8 $\pm$ 2.0	1.9	0.4
ball possession (%)	50.0 $\pm$ 11.2	9.6	6.3
pass	402 $\pm$ 58	48	35
pass accuracy (%)	75.2 $\pm$ 7.7	6.3	4.7
cross	21.5 $\pm$ 7.6	6.9	3.5
corner	5.7 $\pm$ 2.8	2.8	0.5
offside	2.7 $\pm$ 2.1	2.1	0.4
aerial advantage (%)	50.0 $\pm$ 6.7	6.2	2.7
lost ball	179 $\pm$ 45	37	27
ball recovery	63.0 $\pm$ 17.6	15.6	8.6
tackle	23.2 $\pm$ 9.4	8.8	3.4
foul	15.5 $\pm$ 6.7	6.0	3.1
yellow card	3.0 $\pm$ 1.9	1.8	0.6
red card	0.20 $\pm$ 0.49	0.48	0.07

Table III. Means and  $s$  of match events in subgroups defined by nine combinations of team and opposition end-of-season rank (high, medium, low)

Event	High-level teams ( $n = 6$ )			Medium-level teams ( $n = 7$ )			Low-level teams ( $n = 7$ )		
	vs high $N = 44$	vs medium $N = 65$	vs low $N = 69$	vs high $N = 65$	vs medium $N = 74$	vs low $N = 87$	vs high $N = 69$	vs medium $N = 87$	vs low $N = 80$
shot	12.6 ± 6.2	13.8 ± 4.5	12.6 ± 4.6	12.5 ± 4.5	13.8 ± 4.7	12.7 ± 4.2	14.1 ± 5.7	13.7 ± 5.1	12.3 ± 4.1
shot on target	4.2 ± 2.6	5.2 ± 2.4	4.7 ± 2.6	4.2 ± 2.3	4.9 ± 2.4	4.1 ± 2.3	5.0 ± 2.8	4.6 ± 2.3	4.2 ± 2.1
shot blocked	2.6 ± 1.9	3.2 ± 1.8	2.7 ± 1.7	2.2 ± 1.7	3.0 ± 2.3	2.5 ± 1.9	3.5 ± 2.5	2.9 ± 1.8	2.6 ± 1.8
ball possession (%)	50.0 ± 11.6	54.4 ± 11.2	57.7 ± 10.1	45.6 ± 11.2	50.0 ± 10.7	51.4 ± 11.0	42.3 ± 10.1	48.6 ± 11.0	50.0 ± 7.7
pass	447 ± 70	405 ± 55	429 ± 70	404 ± 50	378 ± 32	390 ± 46	421 ± 65	388 ± 48	386 ± 53
pass accuracy (%)	79.4 ± 6.4	78.8 ± 6.6	80.4 ± 7.6	73.9 ± 6.9	73.3 ± 6.5	73.9 ± 8.5	73.2 ± 7.3	73.3 ± 7.5	73.8 ± 7.1
cross	20.4 ± 9.9	21.1 ± 7.7	20.7 ± 8.1	20.7 ± 5.9	19.1 ± 6.6	21.0 ± 6.7	23.3 ± 8.0	23.3 ± 7.9	22.9 ± 7.6
corner	5.4 ± 2.7	6.0 ± 2.6	5.7 ± 2.8	5.5 ± 2.7	5.7 ± 2.8	5.4 ± 2.6	6.2 ± 3.0	5.5 ± 3.0	5.6 ± 3.0
offside	2.3 ± 2.2	2.6 ± 2.1	3.3 ± 2.3	2.6 ± 2.6	2.2 ± 1.9	2.9 ± 1.9	2.3 ± 2.4	2.4 ± 1.6	3.2 ± 2.1
aerial advantage (%)	50.0 ± 6.9	53.8 ± 5.3	52.6 ± 7.8	46.2 ± 5.3	50.0 ± 5.1	48.3 ± 6.2	47.4 ± 7.8	51.7 ± 6.2	50.0 ± 6.2
lost ball	165 ± 42	160 ± 36	150 ± 40	192 ± 47	179 ± 40	180 ± 47	204 ± 49	189 ± 45	182 ± 36
ball recovery	61 ± 15	58 ± 14	55 ± 13	73 ± 24	64 ± 17	61 ± 18	72 ± 21	64 ± 15	60 ± 17
tackle	22.3 ± 8.5	21.7 ± 8.0	19.0 ± 6.3	28.3 ± 13.9	23.5 ± 8.3	22.4 ± 8.6	27.8 ± 10.9	23.8 ± 8.7	20.4 ± 5.8
foul	16.6 ± 7.1	13.2 ± 6.0	11.0 ± 4.9	17.9 ± 6.0	17.1 ± 7.0	14.9 ± 6.0	18.6 ± 7.3	16.5 ± 7.3	14.2 ± 5.2
yellow card	3.1 ± 1.7	2.5 ± 1.7	2.1 ± 1.4	3.8 ± 2.1	3.4 ± 1.7	3.2 ± 2.1	3.5 ± 2.1	2.8 ± 1.9	2.8 ± 1.6
red card	0.10 ± 0.29	0.10 ± 0.32	0.16 ± 0.39	0.29 ± 0.58	0.26 ± 0.50	0.24 ± 0.54	0.23 ± 0.58	0.23 ± 0.56	0.17 ± 0.41

Note:  $n$  denotes the number of teams,  $N$  denotes the number of matches