Performance Analysis Coursework

[redacted]

Candidate number: [redacted]

Centre number: [redacted]

Football

Central Midfielder

Total Word count: 1528 excluding references, bibliography and tables of data.

Contents Page

Physiological Coursework

Physiological Demands of a Central Midfielder in Football

It can be argued that the most important components of fitness to a central midfielder's performance would be **cardiovascular endurance**, **muscular endurance** and **power**.

According to Di Salvo et al (2007) central midfield players cover significantly greater distances football matches in comparison to both defender groups and forward groups. This difference in distance coverage is likely because of their linking role within the team (Di Salvo et al, 2007). The submaximal nature of the low-intensity activities involved in football matches means that the aerobic energy system is mainly active (Di Salvo et al, 2009). Bangsbo (2014) also highlights that the aerobic energy system is highly burdened, with average and peak heart rates at around 85% and 98% of maximal values respectively. The average oxygen uptake of 70% of maximal values is also a key reflection of this burden on the aerobic energy system. Midfield players on average have higher VO2 max figures than those of fullbacks, forwards and central defenders (Bangsbo and Michalsik, 2002).

Di Salvo et al (2009) also state that anaerobic energy provisions are used for high intensity efforts that occur in a game. For example, movements to win the ball and actions to go past defenders; with these actions often critical to outcomes of the matches they are performed within. Central Midfielders complete 248m of running at intensities greater than 23km/h (Di Salvo et al, 2007). Many intense actions such as these show that the rate of anaerobic turnover is high during games and that the rate of creatine phosphate usage and lactate build-up is also high (Bangsbo, 2014). During the most intense stages of games the work to rest ratio can increase to 1:2 from a game average of 1:12 (Di Mascio and Bradley, 2013).

Some of these intense actions are completed regularly throughout the course of the game, for example aerial duels. As shown in table 1 by Liu et al (2016) a particularly key area of a central midfielder's game is aerial duels regardless of the teams positioning in the league and assumed style of play. With centre midfielders of top three and bottom three clubs winning an average of 1.4 and 1.5 aerial duel per game respectively.

Table (1) showing descriptive statistics of match performance profiles of players from Top 3 and Bottom 3 teams [in league] (results are counts, except from pass accuracy) (Liu et al, 2016)

	All Players (n = 1583)		Full Back (n = 382)		Central Defender (n = 415)		Wide Midfielder (n = 183)		Central Midfielder (n = 402)		Forward (n = 201)	
Variable	Top3	Bottom3	Top3	Bottom3	Top3	Bottom3	Top3	Bottom3	Top3	Bottom3	Top3	Bottom3
Assist	0.2 ± 0.4	0.1 ± 0.2	0.1 ± 0.3	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.1	0.3 ± 0.5	0.1 ± 0.3	0.2 ± 0.4	0.1 ± 0.3	0.3 ± 0.6	0.1 ± 0.4
Shot	1.4 ± 1.9	1.1 ± 1.4	0.6 ± 0.9	0.4 ± 0.7	0.6 ± 0.8	0.4 ± 0.7	4.0 ± 3.2	2.0 ± 1.4	0.9 ± 1.1	1.2 ± 1.3	3.3 ± 2.0	3.1 ± 2.0
Shot on target	0.5 ± 1.0	0.4 ± 0.7	0.2 ± 0.4	0.1 ± 0.3	0.2 ± 0.4	0.2 ± 0.4	1.5 ± 1.6	0.7 ± 0.8	0.3 ± 0.6	0.3 ± 0.6	1.5 ± 1.3	1.1 ± 1.0
Ball touch	71 ± 27	53 ± 16	79 ± 24	59 ± 15	58 ± 21	48 ± 15	63 ± 18	53 ± 13	86 ± 30	59 ± 18	61 ± 24	41 ± 10
Passes	52 ± 26	34 ± 15	50 ± 22	30 ± 12	44 ± 21	32 ± 14	41 ± 15	31 ± 10	70 ± 30	45 ± 18	44 ± 23	26 ± 8
Pass Accuracy (%)	82 ± 11	75 ± 12	83 ± 10	73 ± 12	81 ± 14	75 ± 13	78 ± 9	78 ± 10	85 ± 9	77 ± 11	82 ± 9	70 ± 11
Through ball	0.5 ± 1.0	0.1 ± 0.4	0.2 ± 0.5	0.0 ± 0.1	0.1 ± 0.3	0.1 ± 0.3	0.9 ± 1.1	0.1 ± 0.4	0.8 ± 1.2	0.2 ± 0.5	0.9 ± 1.2	0.2 ± 0.5
Key pass	1.0 ± 1.3	0.9 ± 1.2	0.9 ± 1.0	0.6 ± 0.8	0.2 ± 0.5	0.2 ± 0.4	2.1 ± 2.0	1.6 ± 1.4	1.3 ± 1.3	1.2 ± 1.4	1.4 ± 1.1	1.4 ± 1.6
Crosses	1.8 ± 2.6	2.1 ± 3.2	2.9 ± 2.7	2.5 ± 2.3	0.1 ± 0.4	0.1 ± 0.3	4.5 ± 4.4	6.3 ± 4.4	1.8 ± 2.4	1.6 ± 2.9	1.3 ± 1.5	1.7 ± 2.5
Successful dribble	0.9 ± 1.4	0.6 ± 0.9	0.8 ± 1.1	0.4 ± 0.8	0.3 ± 0.5	0.1 ± 0.4	1.5 ± 1.6	1.2 ± 1.2	0.9 ± 1.2	0.6 ± 0.9	2.0 ± 2.0	1.0 ± 1.2
Foul drawn	1.2 ± 1.3	1.2 ± 1.3	1.2 ± 1.1	0.8 ± 1.0	0.6 ± 0.9	0.5 ± 0.8	1.9 ± 1.6	1.9 ± 1.5	1.3 ± 1.2	1.5 ± 1.3	1.9 ± 1.7	2.1 ± 1.4
Aerial duel Won	1.5 ± 1.7	1.7 ± 1.8	1.2 ± 1.4	1.3 ± 1.2	2.2 ± 1.9	2.0 ± 1.6	1.2 ± 1.7	0.7 ± 1.0	1.4 ± 1.6	1.5 ± 1.8	0.9 ± 1.3	3.5 ± 2.7
Dispossessed	1.1 ± 1.3	0.9 ± 1.2	1.0 ± 1.0	0.5 ± 0.7	0.2 ± 0.5	0.2 ± 0.4	1.6 ± 1.4	1.6 ± 1.3	1.0 ± 1.2	1.1 ± 1.1	2.3 ± 1.7	2.2 ± 1.4
Turnover	0.9 ± 1.2	0.7 ± 1.0	0.8 ± 0.9	0.6 ± 0.7	0.3 ± 0.5	0.2 ± 0.5	1.8 ± 1.5	1.4 ± 1.2	0.9 ± 1.0	0.7 ± 0.8	1.9 ± 1.6	1.7 ± 1.5
Offside	0.3 ± 0.7	0.2 ± 0.6	0.1 ± 0.4	0.1 ± 0.3	0.1 ± 0.3	0.0 ± 0.2	0.6 ± 1.0	0.4 ± 0.7	0.1 ± 0.4	0.1 ± 0.3	0.9 ± 1.1	1.2 ± 1.2
Tackle	2.1 ± 1.8	2.1 ± 1.7	2.7 ± 2.0	2.8 ± 1.8	2.0 ± 1.5	2.0 ± 1.6	1.7 ± 1.7	1.3 ± 1.2	2.7 ± 2.1	2.5 ± 1.9	0.9 ± 1.0	0.6 ± 0.9
Interception	1.7 ± 1.6	1.7 ± 1.7	2.2 ± 1.7	2.1 ± 1.7	2.1 ± 1.5	2.5 ± 1.9	0.6 ± 0.8	0.8 ± 1.0	1.9 ± 1.7	1.7 ± 1.5	0.5 ± 0.8	0.3 ± 0.6
Clearance	2.7 ± 3.3	3.7 ± 3.9	2.5 ± 2.0	4.0 ± 2.6	6.3 ± 3.7	8.0 ± 4.2	0.6 ± 1.0	0.7 ± 0.9	1.5 ± 1.8	1.5 ± 1.7	0.3 ± 0.8	0.9 ± 1.5
Shot block	0.3 ± 0.6	0.3 ± 0.6	0.3 ± 0.5	0.3 ± 0.5	0.5 ± 0.8	0.6 ± 0.9	0.1 ± 0.2	0.1 ± 0.3	0.3 ± 0.6	0.3 ± 0.6	0.1 ± 0.3	0.1 ± 0.3
Foul committed	1.3 ± 1.3	1.3 ± 1.3	1.3 ± 1.4	1.2 ± 1.1	1.0 ± 1.1	1.2 ± 1.1	1.1 ± 1.2	1.0 ± 1.0	1.6 ± 1.4	1.7 ± 1.6	1.2 ± 1.3	1.7 ± 1.5
Yellow card	0.2 ± 0.4	0.3 ± 0.4	0.1 ± 0.4	0.3 ± 0.5	0.2 ± 0.4	0.3 ± 0.4	0.2 ± 0.4	0.1 ± 0.3	0.3 ± 0.4	0.3 ± 0.5	0.2 ± 0.4	0.2 ± 0.4

The argument that central midfielders compete at varying degrees of intensity is supported by Jozak et al (2001) use of table 7 we can see that central defensive midfielders on average spend less time (50.51 minutes) completing low intensity activity than any other position. They are also shown in table 8 to spend the most time on average in medium intensity activity with 6.20 minutes. They spend the second most time in high intensity activity with 6.27 minutes as shown in table 9.

Table (7) showing results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: Offensive midfielder, defensive midfielder, central defender, side back and forward in the variable low intensity activity (Jozak et al, 2001)

Low intensity activity (min)	F= 7.82; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	51.44				
Defensive midfielder	50.51	0.79			
Central defender	53.71	0.09	0.00		
Side back	51.79	1.00	0.58	0.18	
Forward	54.01	0.03	0.00	1.00	0.08

Table (8) showing results of the Kruskal-Wallisov's test of differences between players who primarily play the positions of: Offensive midfielder, defensive midfielder, central defender, side back and forward in the variable medium intensity activity (Jozak et al, 2001)

Medium intensity activity (min)	F= 16.19; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	5.75				
Defensive midfielder	6.20	0.54			
Central defender	4.65	0.00	0.00		
Side back	5.22	0.24	0.00	0.22	
Forward	4.73	0.00	0.00	1.00	0.35

Table (9) showing the results of the Kruskal-Wallisov's test of differences between players who primarily play the positions of: Offensive midfielder, defensive midfielder, central defender, side back and forward in the variable high intensity activity (Jozak et al, 2001)

High intensity activity (min)	F= 16.86; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	6.51				
Defensive midfielder	6.27	0.90			
Central defender	4.51	0.00	0.00		
Side back	5.77	0.09	0.50	0.00	
Forward	5.45	0.00	0.05	0.02	0.84

Tests and Measurements

Component 1:

Cardiovascular Endurance

Test

Multi Stage Fitness Test

Validity

The multi stage fitness test would be used for sports which have a high aerobic demand such as football (Walker, 2016)

Protocol

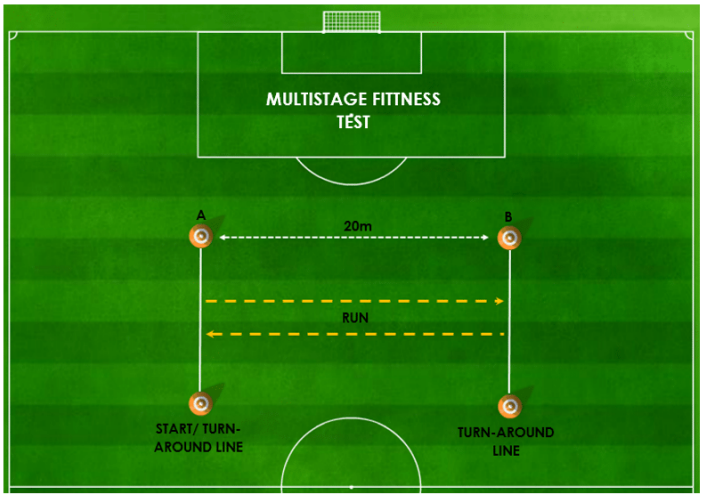


Figure 1. Multistage Fitness Test configuration.

(Walker, 2016)

Multi Stage Fitness Test Protocol Video - https://www.youtube.com/watch?v=ngkneNAbqos

Reliability

- Distance of 20m is measured out using tape measure and with an assistant
- Assistant ensures that participant reaches the lines either end and doesn't continue if two or more consecutive bleeps are not kept up with, and to record the number of shuttles completed
- Test should be done alone as factors relating to competition and distraction may alter the accuracy of the test
- Test must be performed maximally

Normative Data

A table showing Male Norms in MSFT for ages 14-20 from Bizley et al (2010, cited in Mac, 2018 (a))

Age	Excellent	Above Average	Average	Below Average	Poor
14 - 16	L12 S7	L11 S2	L8 S9	L7 S1	< L6 S6
17 - 20	L12 S12	L11 S6	L9 S2	L7 S6	< L7 S3

Component 2:

Power

Test:

Vertical Jump

Validity:

Vertical jumps are a measure of lower-body power and an essential motor skill of team sports such as football (Dear, 2018).

Protocol:

(Mac, 2018 (b))

Vertical Jump Protocol Video - https://www.youtube.com/watch?v=l3PDmnz8dgc

Reliability:

- The environment conditions and equipment will be standardised for all 3 repeats
- Assistant calculates mean of 3 repeats and ensures all factors are kept constant (e.g. shoes on or off) and that the arm is fully extended in the initial reach
- Technique must be to spring off maximally, and reach as high as possible on the board

Normative Data:

National norms for 16 to 19 year olds (Davis, 2000, cited in Mac, 2018 (b))

Gender	Excellent	Above average	Average	Below average	Poor
Male	>65cm	50 - 65cm	40 - 49cm	30 - 39cm	<30cm

Component 3:

Muscular Endurance

Test:

Wall Squat test

Validity:

Analysis of this test result indicates the participant's quadricep strength endurance Mac (2018 (c)). The quadriceps are a muscle that is crucial to the active running nature of a football game.

Protocol:

(Mac (2018 (c))

Wall Squat Protocol Video - https://www.youtube.com/watch?v=yjmKNvFi4Gk

Reliability:

- An assistant will record the time using a stopwatch and monitor the participant ensuring conditions of test are met, e.g. knees bent at 90 degrees.
- Floor and wall surfaces will remain the same

Normative Data:

The following table (Arnot and Gaines, 1984, cited in Mac, 2018 (c)) is the national norms for 16 to 19 year olds.

Gender	Excellent	Above Average	Average	Below Average	Poor
Male	>102 secs	102 - 76 secs	75 - 58 secs	57 - 30 secs	<30 secs

Individual Fitness Profile

Physiological Strengths and Weaknesses

Introduction

I am comparing my scores to participants of a similar age, same gender, same sport and where possible comparison with participants who play the same position as me. Therefore, they are 16/17 years old, male, football players who play central midfield. The data comes from tests undertaken in bootcamps across numerous years, using Year 12 students each time. They were undertaken using the same areas each time (eg. Sports hall).

Certain tests may have been affected by the environment they were in and the equipment being used, for example the Margaria Kalamen test was done in college corridor using a light gate and using steps that were a slightly different height.

Other tests such as cardiovascular endurance tests rely on participant putting in maximum effort in order for the data to be realistic and reliable.

***Table 1**. My fitness test results compared to other College & Club male footballers results of similar age.*

KEY:

Red - the worst score
Yellow - my score
Green - the best score
Orange – average score

						Speed	Repeated Anaerobic Sprint test					
Year	Surname	Forename	Sport	Group	Position	20m	1	2	3	4	5	6
2011	Goddard	Liam	Football	C2		2.6	4.51	4.51	4.75	5.06	4.84	5.09
2011	Luddington	Timothy	Football	C2		2.45	3.96	4.3	4.14	4.52	4.38	4.6
2012	Greenstock	Joe	Football	A1		2.59	4.53	4.56	4.65	4.71	4.64	4.71
2012	Ankers	Dominic	Football	E4		2.72	4.9	4.58	4.78	4.83	4.96	4.96
2013	Clark	Tom	Football	D4		3.27	4.52	4.79	4.87	4.91	5.08	5.21
2013	Padmore	Richard	Football	A1		3.44	4.58	4.63	4.93	5.02	5.34	5.21
2014	Harrop	Samuel	Football	B1	CM	3.28	4.61	4.7	4.83	4.88	5.06	5.04
2014	Harrow	Ryan	Football	D2	CM	3.26	4.53	4.48	4.64	4.69	4.88	4.93
2015	Bellis	Samuel	Football	ADC	CM	3.34	4.69	4.77	5.06	4.97	5.23	5.23
2017	Vinil	Joseph	Football	A01	CM	3.27	4.69	4.80	5.14	5.18	5.02	5.12
2017	Kourbaj	Sami	Football	A01	CM	3.32	4.84	4.82	4.88	4.95	5.62	6.02
2018	Pulley	Jordan	Football	B01	CM	3.21	5.00	4.92	5.27	5.40	5.65	5.60
2018	Compton	Josh	Football	D02	CM	3.40	5.38	5.49	5.58	5.82	5.77	5.92
2018	Rogers	Jaden	Football	D02	CM	3.37						
	Average					**3.11**	**4.67**	**4.72**	**4.89**	**5.00**	**5.11**	**5.20**

					Flexibility	Power							
Surname	Forename	Sport	Group	Position	S&R	SLJ	STJ	2h, st, j	2h, 2st, j	2h,2st, 2j	5 spring	Margaria Kalaman	Sargent jump
Goddard	Liam	Football	C2		31	2.26	5.92	7.97	10.11	12.95	10.46		
Luddington	Timothy	Football	C2		24	2.19	6.16	8.32	10.65	13.24	10.09		
Greenstock	Joe	Football	A1			2.16	6.05	8.84	11.74	14.24	11.26		
Ankers	Dominic	Football	E4		14	2.04	5.49	7.78	9.77	11.52	10.12		
Clark	Tom	Football	D4		20	1.93	5.85			12.45	10.1		
Padmore	Richard	Football	A1		5	1.84	5.7			11.8	9.33		
Harrop	Samuel	Football	B1	CM	20	2.31	6	9.39	11.76	14.24	10.72		
Harrow	Ryan	Football	D2	CM	15	2.12	8.85	8.85	11.11	12.98	11.34		
Bellis	Samuel	Football	ADC	CM	31	2.44	6.7	9.1	11.22	13.5	11		
Vinil	Joseph	Football	A01	CM	32.0	2.00	5.70	8.02	10.13	12.88	10.20	2124	
Kourbaj	Sami	Football	A01	CM	21.0	1.94	5.47	6.83	9.55	12.05	10.89	1845	
Pulley	Jordan	Football	B01	CM	4	2.12		8.78	9.85	11.62	10.80	2597	60
Compton	Josh	Football	D02	CM	31	2.49	6.33	8.80	11.42	13.32	11.32	2975.82	45
Rogers	Jaden	Football	D02	CM	33	2.21	6.54	8.75	11.12	14.13	11.40	3650.5	
Average					**21.62**	**2.15**	**6.21**	**8.45**	**10.70**	**12.92**	**10.65**	**2638.46**	**52.50**

						Agility	Core			Aerobic		Aero+D:AUbic
Year	Surname	Forename	Sport	Group	Position	Illinois	Plank	L	R	MSFT	V02 max	Cooper test
2011	Goddard	Liam	Football	C2		15.3	2.36	1.17	1.21	13.1		
2011	Luddington	Timothy	Football	C2		16.03	3.13	1.07	1.35	9.5		
2012	Greenstock	Joe	Football	A1		16.45	2.12	1.11	1.17	12		
2012	Ankers	Dominic	Football	E4		16.88	2.01	1.17	1.21	10.1		
2013	Clark	Tom	Football	D4		13.46	1.45	0.48	0.53	9.2		
2013	Padmore	Richard	Football	A1		14.84	0.51	1.18	1.01	10.2		
2014	Harrop	Samuel	Football	B1	CM	15.4	1.45	1.23	1.55	11.9		
2014	Harrow	Ryan	Football	D2	CM	16.21	2.10	1.02	0.4	11.4		
2015	Bellis	Samuel	Football	ADC	CM	15.64	0.5	0.3	0.5	9.9		
2017	Vinil	Joseph	Football	A01	CM	16.70	2.58	1.22	1.40	11.20		2700
2017	Kourbaj	Sami	Football	A01	CM	16.96	3.04	1.04	1.40	14.10		2666
2018	Pulley	Jordan	Football	B01	CM	15.95	4.23	1.18	0.44	12.80	46.4	2580
2018	Compton	Josh	Football	D02	CM	16.50	2.30	1.17	1.05	10.20	56.00	3010
2018	Rogers	Jaden	Football	D02	CM	15.96	2.24	1.00	0.57	11.30	56.50	3032
	Average					**15.88**	**2.14**	**1.02**	**0.99**	**11.21**	**52.97**	**2797.6**

						Muscular Endurance					Muscular Strength	
Year	Surname	Forename	Sport	Group	Position	PU max	PU 1min	SU max	SU 1min	ST max	Leg Press	Bench Press
2011	Goddard	Liam	Football	C2		0	20	50	33	45	155	54
2011	Luddington	Timothy	Football	C2		42	39	48	35	25	120	61
2012	Greenstock	Joe	Football	A1		50	52	34	40	41	200	68
2012	Ankers	Dominic	Football	E4		23	20	23	26	35	170	47
2013	Clark	Tom	Football	D4		33	42	50	60	24	167.5	61
2013	Padmore	Richard	Football	A1		9	11	24	54	21	140	61
2014	Harrop	Samuel	Football	B1	CM	38	36	44	37	14	195	61
2014	Harrow	Ryan	Football	D2	CM	22	39	41	24	23	195	52
2015	Bellis	Samuel	Football	ADC	CM	38	20	27	26	25	195	75
2017	Vinil	Joseph	Football	A01	CM	35	42	53	49	47	195	89
2017	Kourbaj	Sami	Football	A01	CM	43	53	28	69	26	195	47
2018	Pulley	Jordan	Football	B01	CM	35	42	82	44	57	195	89
2018	Compton	Josh	Football	D02	CM	10	20	42	32	39	195	40
2018	Rogers	Jaden	Football	D02	CM	34	41	54	32	45	195	75
	Average					**31.69**	**34.07**	**42.86**	**40.07**	**33.36**	**179.46**	**62.86**

Evaluation of Strengths and Weaknesses

Coaches Report

Player Name: Joshua Compton
Position- Centre Midfield

Joshua has been an integral part of the college team this season. He has been very committed and has led by example during both training and matches. He demonstrates good tactical understanding and sound positional sense.

Whilst playing centre midfield he has been highly effective in both defence and attack. Defensively he is tenacious, reads the game well and uses his physical attributes to good effect when attempting to win possession of the ball. He has suffered from a recurring injury during the season and subsequently his fitness and strength have suffered slightly. He would benefit from increased leg power and stamina, particularly during the latter stages of the game. Explosive power would be beneficial for acceleration into tackles, tracking back and for increasing his jumping/heading ability.

In attack Joshua has showed excellent finishing when arriving into the penalty box. He should attempt to find such goal scoring positions more frequently as technically he finishes extremely well. This again would be helped by increasing his leg strength and stamina as the midfield role requires substantial fitness and strength if box to box play is to be achieved.

His recovery rate is good. A quality that is essential to his chosen position. He has no trouble in completing a 90 minute match and continues to show a good level of work rate up until the final whistle.

It has been an absolute pleasure being Joshua's coach this year.

Neil O'Donohue
BA (Hons) Physical Education QTS
UEFA B Football Coach
neil.odonohue1@gmail.com

Strengths

1. Cardiovascular Endurance
2. Flexibility

Weaknesses

1. Muscular Endurance
2. Power

Power is an area that I need to work on so I can win more aerial duels and be more of a threat from corners by having more explosive leaps to get higher than my opponents. I believe it will have the most positive impact on my game as it should help reduce the amount of times that I need to recover as a result of not winning the aerial duel and should hopefully increase the chances of my team being in possession of the ball at key times.

Future PDP

Power

Total Word count: 879 excluding references, bibliography and tables of data.

Physiological Bibliography

Bangsbo J, Michalsik L. Assessment and physiological capacity of elite soccer players. In: Spinks W, Reilly T, Murphy A (eds). Science and Football IV. London: Routledge, 2002: 53–62

Bangsbo.J (2014) Physiological Demands of Football, *Sports Science Exchange,* 27(125), 1-6

Dear, A. (2018). *Vertec Jump Test.* Available: https://www.scienceforsport.com/vertec-jump-test/. Last accessed 13th Sept 2018.

Di Mascio.M, Bradley.P.S (2013) Evaluation of the Most Intense High-Intensity Running Period in English FA Premier League Soccer Matches. *Journal of Strength and Conditioning Research,* 27(4), 909-915

Di Salvo.V, Baron.R, Tschan.H, Calderon Montero.F.J, Bachl.N, Pigozzi.F (2007). Performance Characteristics According to Playing Position in Elite Soccer. *International Journal of Sports Medicine,* 28, 222-227

Di Salvo.V, Gregson.W, Atkinson.G, Tordoff. P, Brust.B (2009), Analysis of High Intensity Activity in Premier League Soccer. *International Journal of Sports Medicine,* 30, 205-212

Jozak.R, Perić.A, Bradić.A, Dizdar.D (2011) Position-related differences in the amount, intensity and speed of movement in elite football players. *Homo Sporticus,* 13(2), 16-22

Liu.H, Gómez.MA, Gonçalves.B, Sampaio.J (2016) Technical performance and match-to-match variation in elite football teams. *Journal of Sports Sciences,* 34(6), 509-518

Mac, B. (2018 (a)). *Multi-Stage Fitness Test*. Available: https://www.brianmac.co.uk/beep.htm. Last accessed 24th September 2018

Mac, B. (2018 (b)). *Sargent Jump Test.* Available: https://www.brianmac.co.uk/sgtjump.htm. Last accessed 13rd September 2018

Mac, B. (2018 (c)). *Wall Squat Test.* Available: https://www.brianmac.co.uk/wallsquat.htm. Last accessed 13rd September 2018.

Walker, O. (2016). *Multistage Fitness (Beep) Test.* Available: https://www.scienceforsport.com/multistage-fitness-beep-test/ Last accessed 24th September 2018.

Performance Analysis Coursework

Football

Technical: Defensive Heading

Slow Motion: http://www.hudl.com/technique/video/view/eFkIWrfM?e=17457585

Real Time: http://www.hudl.com/technique/video/view/NwNI1Olt?e=17457588

(649 words, excluding references, bibliography and tables of data)

Core Skill: Standing Header

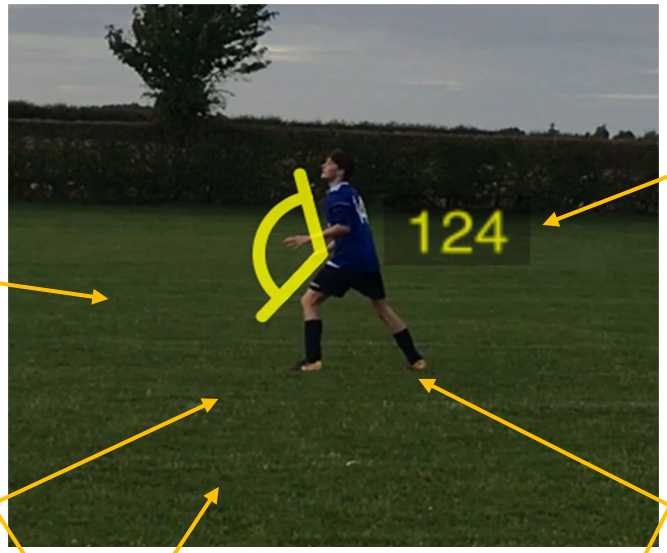
Initial Preparation

Flexion of knees for both me and James: there is an isotonic eccentric contraction in the quadricep muscle during the downward phase, which becomes an isotonic concentric muscle contraction in the quadriceps once you push off the ground.

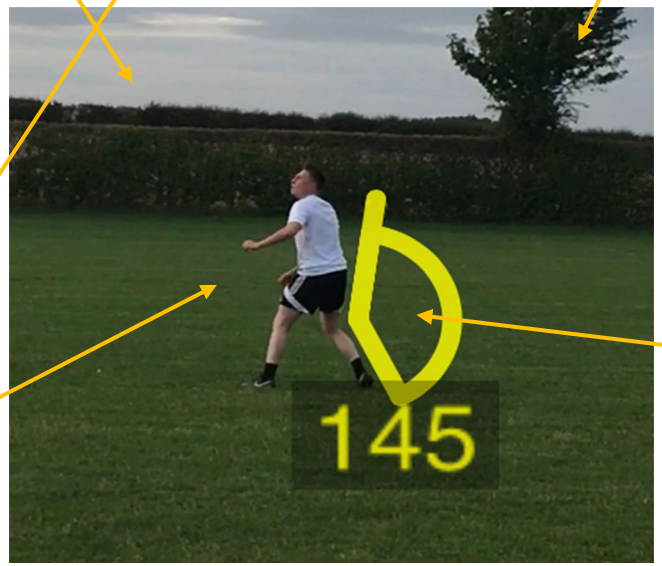
Flexion left hip: I show flexion at an angle of 124°. The movement occurs in the sagittal plane. This allows the movement to explode upwards to achieve the greatest height possible. It also allows for a greater base of support.

Flexion of elbow: Both of us have an isometric contraction in the biceps brachii muscles which is the agonist, prior to the elbow being extended to generate more power.

ME



JAMES



Both me and James have our trunks still in the anatomical position. This limits the heading performance as according to Kirkendell et al (2001, cited in Williams, 2012) if the trunk is greatly extended it can generate a great forward velocity and will exert a greater impact on the ball.

Extension at right hip: This provides a solid base of support which Hargreaves and Bates (2010, cited in Williams, 2012) says is crucial for a defensive standing jump. This also allows for a side-on stance to be assumed as advised by Carr (2019).

James right knee has greater flexion than mine. Also, his right ankle is plantar flexed. This provides the chance for a greater isotonic concentric contraction and explosive upwards movement.

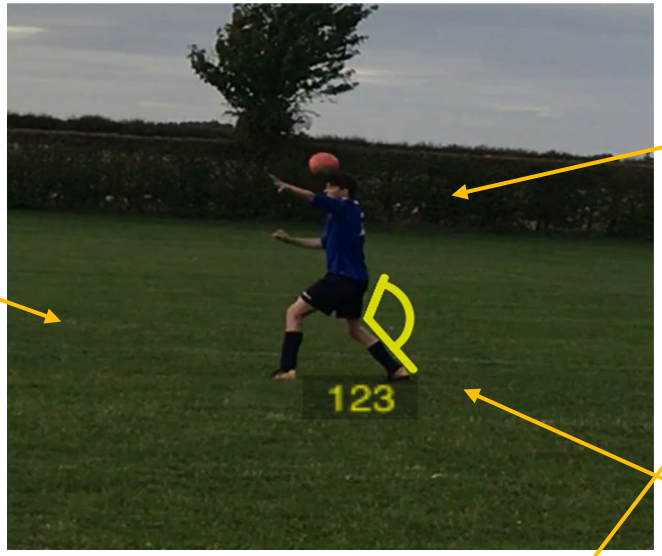
Execution

Elbow Extension: Both my elbows are extended with an isotonic concentric contraction of triceps brachii. This is prior to extension at the shoulder to gain momentum to increase power generated.

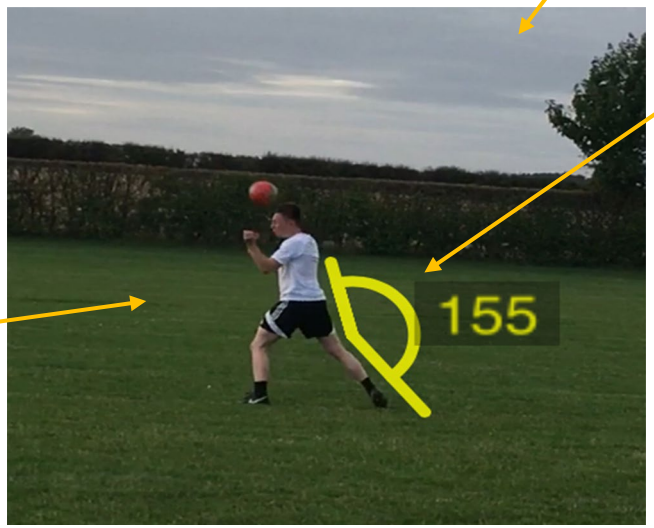
Neither me nor James significantly jump for the ball, perhaps this is because it is an unchallenged jump. However, Carr (2019) advises that a header from a standing jump should have a one footed take-off. Furthermore, University of Manitoba (2019) recommends heading the ball just before the apex of the jump in order to increase the velocity that is transferred from head to ball.

Elbow Flexion: Both James elbows are flexed with isotonic concentric contraction in the biceps brachii. Hargreaves and Bates (2010, cited in Williams, 2012) suggests that this helps more power be exerted in the header.

ME



JAMES



Neck Extension: This action is done by both me and James, it is prior to the later movement of flexion and allows the performer to keep track of the ball as it moves through the air. According to BBC Sport Academy (2019) contact should be made with the lower half of the ball. Contact should be with the middle zone of the forehead (University of Manitoba, 2019).

James right knee is extended however my right knee is still flexed at 123°. This helps build momentum and maintain balance (Complete Soccer Guide, 2010). Arguably in this particular component of the skill, my technique is better than James'.

Neck extensors and flexors should contract isometrically at the point of contact with the ball in order to generate force (Kirkendell et al, 2001, cited in Williams, 2012). Kirkendell et al (2001, cited in Williams, 2012) states not isometrically contracting these muscles means the head may be accelerated backwards and injury may occur.

Follow Through

Flexion of Trunk: Both me and James perform this action. Although I perform it to greater degree of 133°, neither of us perform it as well as shown in Williams (2012) figure 1.1(a). This movement represents countermovement and helps produce a catapult effect (Ekblom, 1994, cited in Williams, 2012). Therefore, both me and James could improve by increasing flexion of the trunk as well as flexion of the hips.

Neck flexors and extensors should be isometrically contracted in order to aid deceleration of the head and reduce risk of injury (University of Manitoba, 2019). This also allow the eyes to remain focused on the ball (University of Manitoba, 2019).

James' left quadricep is doing an isotonic eccentric contraction to act as a brake in controlling and absorbing the forces during his landing.

ME

JAMES

Extension of shoulders and extension of elbows: My movement reflects advice from Kristensen et al (2004) that swinging of arms helps propel performer upwards and achieve greater jump height by raising the centre of mass.

James' right hip is extended in the sagittal plane and abducted in the frontal plane. Whereas my right hip is only slightly extended at 170°. This means that neither of us are landing on two feet as advised by Carr (2019) and this is therefore something that must be improved.

Total Word count: 649 excluding references, bibliography and tables of data.

Technical Bibliography

BBC Sports Academy (2019). *Defensive Heading,* Available: http://news.bbc.co.uk/sportacademy/hi/sa/football/skills/newsid_2071000/2071610.stm

Carr, T (2019). *Power Heading*, Available: https://www.soccercoachweekly.net/practice-plans/power-heading/ Last Accessed: 26th February 2019

Complete Soccer Guide (2010), *How to Head a Soccer Ball,* Available: https://www.completesoccerguide.com/soccer-heading/ Last Accessed: 25th February 2019

Kristensen, L.B , Andersen, T.B , Srensen, H, (2004). Soccer, *Sports Biomechanics,* 3(2), 195-208, Last Accessed: 24th February 2019

University of Manitoba (2019), *Soccer Heading Checklist,* Available: https://umanitoba.ca/faculties/kinrec/hlhpri/media/soccer_heading_checklist.pdf Last Accessed: 27th February 2019

Williams, J, (2012) Influence of Leg Dominance on Heading Performance in Association Football, BSc Thesis, Cardiff Metropolitan University, Cardiff, viewed 24th February 2019, https://repository.cardiffmet.ac.uk/handle/10369/3898