Exploring Factors Related to Goal Scoring Opportunities in Professional Football

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Outscoring the opponent is the primary goal in football. In order to optimise scoring opportunities, it is important to understand the physical and tactical performance preceding such events. This observational study explored whether running behaviour prior to goal scoring opportunities (GSOs) in football related to the subsequent outcome (goal or no goal). Furthermore, contextual factors were analysed to potentially explain differences in physical output.

Tracking data was collected from one professional team during its 2016/2017 season. Physical output was analysed for attackers (taking shots) and defenders (trying to prevent shots). The data was differentiated for attacking styles and analysed on the preceding context and subsequent outcome.

Counter attacks were found most effective, as GSO outcome improved with fewer defenders behind the ball ($r=-0.27$; $p=0.03$). Offensively, running behaviour in the minute prior to GSOs explained more variance than the physical output in the preceding 5-min period and increased outputs correlated with success ($r=0.26$; $p=0.04$). Moreover, a significant correlation was found between decreased high-intensity distances covered during the match and favourable outcomes ($r=-0.21$; $p=0.02$). Finally, increased attacking effectiveness was found to relate to greater defensive covered distances ($r=0.51$; $p<0.01$).

Conclusively, running behaviour prior to GSOs was found to relate to the subsequent outcome. Specifically, space ahead of attackers, forcing defenders to cover more ground, was found to relate to GSO effectiveness. The running behaviour of attackers was found to be unrelated to previous activity, highlighting the significance of physical capacity. Similarly, well-timed substitutions appear important once players cannot increase their physical output.

Keywords: Soccer, Match Analysis, Applied Practice, Effectiveness, Success

Introduction

Scoring goals is a game-changing aspect of team sports like association football (soccer). However, with constantly changing constellations of the players and ball, establishing exact pathways to score a goal in any given scenario appears difficult.[1] Factors describing a greater portion of the context of various match sequences may, however, be capable of explaining how the behaviour and strategies of players relates to success.[2] In other words, it would be worthwhile to understand what influences the effectiveness of a team in creating and converting their shooting attempts, or goal scoring opportunities (GSOs).[3] Gathering such information about an opponent will also improve match preparation and increase the chances to successfully defend one's own goal.[4] A first step towards improved understanding has been made, as contextual factors describing playing tactics and situational aspects have been found to affect the ability of a team to be effective in scoring.[5,6]

An example of such contextual variables is inter-team balance, which has previously been found to relate to the success of attacking sequences.[7] This tactical concept describes the organisation of defenders in relation to the opposing attackers, based on positioning and behaviour. It was found that attacks against an imbalanced defensive team led to more ball possessions in the offensive penalty area than attacks against balanced defences.[8] Recently, Goes and colleagues (2020) found changes in the inter- and intra-team balance of subgroups (defenders, midfielders, attackers) during successful attacks.[9] They described disturbances in the synchronous interactions between inter- and intra-team subgroups to allow for the required space for attackers. Other research have demonstrated that attacks which led to goals were preceded by a more pronounced disturbance of defensive balance in comparison with unsuccessful attacks.[10] Moreover, following ball possessions with fewer defenders in between the ball and their goal, as observed during counter attacks, a greater number of successful outcomes was observed.[11] This directly highlights the importance of the style of play when analysing playing effectiveness.[7] And although these findings may sound obvious, they do accentuate a spatial aspect of attacking effectiveness. The presence and positioning of opponents and the location of the ball itself seem to impact the characteristics and outcome of the attack.[11] As such, it may be questioned how attacking players can behave to create such situations or make optimal use of the spaces provided.

Faude and colleagues (2012) have shown that straight sprints most often precede a goal.[12] However, as this merely describes one moment during the attack, having all attackers simply sprint towards the goal after receiving or in anticipation of a pass, may become predictable, diminish spaces and not lead to many more goals. As previously described, context seems to dictate the effectiveness, which has been considered for general running metrics. For example, a situational aspect of context, like the venue or the quality of opposition, was found to lead to differences in running output.[13] From a more tactical perspective, the playing formation of the opponent has also been found to affect distances covered by teams and outfield players.[14,15] Furthermore, when opponents were playing more defensively (defined as a closer positioning to one's own goal), attackers were found to reach lower top speeds.[16]

Whilst the previously introduced results show how the overall playing effectiveness (creating and converting more GSOs) and physical characteristics (distance covered or top speed reached) depend on context, the question remains whether it is possible to combine these aspects.[17] In order to disturb the balance between and within the opponent's organisation, attackers should constantly alter their running behaviour (for example speed and direction) to become unpredictable for defenders. As previously found, a sprint may

finally cause such disturbances and precede a goal more often. Consequently, it would be of interest to know what influences this running behaviour. Exploring whether previous physical output or contextual factors are related to such acute running strategies and allow for more (effective) GSOs, may potentially strengthen future analyses. In other words, practitioners may be informed on their team's or the opponent's effectiveness in creating, converting or preventing match-deciding sequences like GSOs.

Therefore, the present study aimed to investigate the running behaviour leading up to GSOs. First, it was determined whether physical output was related to the success of the attempt. This involved analyses from an offensive (creating the GSO) and defensive (preventing the GSO) standpoint. Subsequently, tactical and situational factors were studied to potentially explain the observed differences in running behaviour.

Methods

Design

The observational design of the current study aimed to investigate the running behaviour of outfield players leading up to goal scoring opportunities during football matches. Tracking data of a professional team was collected over one complete season, using GPS monitoring. The physical output prior to scoring attempts was analysed from an offensive and defensive perspective, to explore its relation with outcome and contextual factors.

Subjects

Match data was collected from all outfield players of a German professional male football team during the 2016/2017 Regionalliga season (4th national league; age: 26.3±4.3 yrs.; height: 180.7±5.9 cm; weight: 77.8±5.1 kg). Every player provided consent to the anonymous use of their match data. The study was ethically approved by the local Human Research Ethics Committee and performed according to the Declaration of Helsinki.

Data Collection

During the season, all outfield players wore an individually assigned Global Positioning System (GPS) tracker during 33 league matches (TT01, Tracktics GmbH, Hofheim, Germany; firmware version 1.7). The system was tested prior to the current investigation.[18] With a standard error of the estimate, describing validity, of 3.1% and 3.4% for distance and velocity and coefficients of variation, indicating the reliability of the system, of 2.0% and 4.7% for distance and velocity, the system has been previously deemed valid and reliable for tracking running behaviour in football.[18] The quality of the GPS signal during the matches was deemed appropriate; on average 11.4 satellites were connected with a horizontal dilution of precision of 0.89, describing an appropriate spread of the satellites in the sky.[19]

Tactical match footage, showing all players at all time, was provided by the participating team for every match. In the end, 427 individual match observations were collected from 23 different players, involving starting players and substitutes. The GSOs created and conceded by the participating team were selected based on two criteria: 1) the attack had to originate from open play, which means the attacking team could not have had a set piece (goal kick, throw in, free kick or corner kick) in the 20s prior to the shot[3,20]; and 2) the attacking team should have had at least 5s of uninterrupted possession, in order to determine the type of attack.[5] After the application of these criteria, 220 GSOs (145 created and 75 conceded by the participating team) were selected for further analysis.

Parameters

In order to describe the running behaviour of the player taking the shot (described as *the attacker*), or the defender trying to prevent the shot (described as *the final defender*), three parameters were collected: the maximal running velocity reached during the attacking sequence leading to the GSO, as well as the total and high-intensity distance (HID) covered in the 1 and 5 minutes prior to the attempt. The short time frame of 1 minute was selected to potentially involve high-intensity actions, as close to the attempt as possible.[19] The larger window of 5 minutes was selected as it most certainly contains a change in ball possession, however was still found to relate to the physical output at the end of the time frame.[21,22] On the team level, the maximal running velocity described the highest velocity recorded within

the team (potentially, however not necessarily, the player taking the shot or final defender). The total and high-intensity distance covered in the 1 and 5 minutes prior to the GSO was the calculated as the average of all outfield players. The total and high-intensity match distance was computed by averaging the distances of those players completing the entire match. For both the individual and team parameters, two high-intensity thresholds were used. First, an arbitrary speed zone for HID was used (14.4 $km*h^{-1}$).[23] Second, an individualised threshold was applied, since the data was collected from a single team, thereby allowing for a more sensitive approach.[24] This threshold was based on the lactate threshold speed, which averaged at 14.5 $km*h^{-1}$ for all individual players.[25] These values, describing aerobic fitness, were calculated after performing incremental step tests during pre-season and in the winter break. The average of both tests was used for each player.

The tactical side of the contextual factors were described by several parameters. First, the type of attack was identified. In line with previous research, attacks were categorised as 1) a counter attack, when the defensive team was unorganised and passes were mainly directed forwards; 2) direct, when the defensive team was organised and passes were mainly directed forwards; or 3) elaborate, when the defensive team was organised and passes were directed forwards, sideways and backwards.[6,11,26] Second, the number of defenders behind the ball was determined for several moments during the attack: when possession was won, at 10 as well as 5 seconds before the GSO, and at the moment of the attempt.[10] Third, the zone of ball possession at the same moments during the attack was recorded. For this parameter, twelve different zones on the field were used, as previously suggested by Sarmento and colleagues (2018, see Figure 1).[11] The outcome of an attack was categorised as "goal", "save" (where the goalkeeper or final defender between the ball and the goal cleared the attempt), and finally "off target" (when the attempt went wide of the target or hit the post or crossbar). Finally, the playing position of the player taking the shot was recorded to individualise context. Due to the applied nature of the study, players were separated into three subgroups: defenders, midfielders and attackers.

The situational aspects of match context were the venue (home or away), the time point the GSO took place during the match, and the opponent's level (long term quality) as well as their form (short term quality). For team level, the ranking during the specific half of the season and the final standing in the league table were used as separate measures.[27] For team form, the percentage of points gathered during the five league matches prior to the current match was calculated.

Statistical Analysis

Values were displayed as Mean ± Standard Deviation (SD) or with 95% Confidence Limits [CL] when deemed appropriate. Factor analyses, using a principal component analysis (PCA), were performed to discover which combinations of physical or contextual parameters explained most variance within the data.[28] Several criteria had to be met: first, Bartlett's test of sphericity was used to indicate sufficient inter-variable correlation; second, the minimal eigenvalue to separate factors was set at 1; and third, factor loadings of 0.7 or higher were required for further analysis.[28] The collections of factors determined through the PCA were tested through multiple regression analyses. Linear regressions were also calculated for each separate factor. The magnitude of correlation (r) was assessed using the following thresholds: <0.1, trivial; 0.1 to 0.3, small; 0.3 to 0.5, moderate; 0.5 to 0.7, large; 0.7 to 0.9, very large; and 0.9 to 1.0, almost perfect.[29] SPSS Statistics was used for all statistical tests (version 24; IBM, Chicago, IL, USA).

Results

The characteristics of the analysed GSOs can be seen in Table 1. Counter attacks recorded most goals scored from the least attempts, with 24.6% of all counter attacks leading to goals, compared with 12.4% and 11.4% for elaborate and direct attacks, respectively. Furthermore, counter attacks were characterised by fewest defenders behind the ball during the final 10 s of the attack (3.0±1.4, compared with 4.6±1.6 and 5.5±2.8 during direct and elaborate attacks, respectively). Consequently, the outcome of the GSO was found to correlate significantly with the number of defenders behind the ball at the time of the shot (r=0.27 [0.11, 0.42]; small; p=0.03). When taking playing position into consideration, although most shots were taken by midfielders, attackers were found to be more effective, independent of attacking style (25.5% compared with 15.3% and 11.1% for midfielders and defenders, respectively).

Attacking Effectiveness

The PCA analyses revealed that the attacker's physical output in the minute prior to a goal explained 44.5% of the variance within the physical parameters, whereas the running behaviour in the preceding five minutes explained 34.4%. For a non-successful attempt, 38.2% of the variance was explained by the 5 min output, compared with 34.7% by the 1 min output. The combined 1 min factors showed a significant correlation with outcome (r=0.26 [0.10, 0.41]; small; p=0.04). In contrast, no significant correlation was found for the 5 min physical output.

On a team level, no differences in factors between the PCA analyses for successful and non-successful attempts were found for the offensive team. However, a significant correlation was observed between match HID and outcome (r=0.21 [0.05, 0.36]; small; p=0.02, see Table 2).

The PCA analyses of the final defender's physical output revealed no specific factor combinations for attacks that led to a conceded goal. However, for attacks that were defended successfully, 1 min physical output explained 38.0% of the variance within factors and 5 min running behaviour 32.6%. The multiple regression analyses of these components showed significant correlations between outcome and the running behaviour in the minute leading up to the attempt and in the 5-min period prior to the attempt (r=0.51 [0.38, 0.62]; large; p<0.01 and r=0.42 [0.28, 0.55]; moderate; p=0.01, respectively). All physical parameters were found higher when the attempt led to a goal in comparison with a non-successful attempt (see Table 2).

For the defensive team, the PCA analysis revealed that the physical output of the team prior to an attempt explained 46.1% of the variance and the running behaviour during the match 26.8%. Multiple regression analyses then showed significant correlations between outcome and the 5 min output, as well as the physical output during the match (r=0.49 [0.35, 0.61]; moderate; p<0.01 and r=0.29 [0.13, 0.44]; small; p=0.04, respectively). For the team's physical output in the minute leading up to the conceded attempt, a significant correlation between 1 min HID and outcome was found (r=0.24 [0.07, 0.39]; small; p=0.04, see Table 2).

Contextual Factors

First, tactical parameters were added to the analyses between outcome and the preceding physical output. Merely for elaborate attacks, a difference in the PCA analysis was found, with 46.0% of the variance within factors explained by the running behaviour in the

five minutes prior to the attempt, in comparison with 30.1% for the 1 min output. The multiple regression analyses revealed a significant correlation between outcome and the overall physical output of the attacker, described by total distance and HID, in the five minutes prior to an attempt following an elaborate attack (r=0.35 [0.21, 0.50]; moderate; p=0.02). For the output in the minute leading up to the attempt, significant correlations were observed between outcome and the 1 min total distance covered following an elaborate attack by the attacker and offensive team (r=0.31 [0.15, 0.46]; moderate; p=0.02 and r=0.28 [0.11, 0.43]; small; p=0.03, respectively). For the other tactical parameters, no significant correlations with outcome were found.

The comparison of the physical characteristics between different tactical contexts revealed several differences. First, a significant correlation between attacking style and the maximal speed reached leading up to the GSO was found for the attacker (counter: 22.6±4.2, direct: 21.1±3.7, elaborate 19.7±4.3 $km*h^{-1}$; r=0.28 [0.12, 0.42]; small; p<0.01) and the offensive team (counter: 26.2±2.8, direct: 25.4±2.6, elaborate 24.8±2.3 $km*h^{-1}$; r=0.22 [0.06, 0.37]; small; p<0.01). Also, the HID covered by the attacker in the 5-minute period prior to the GSO was found to correlate with attacking style (counter: 15.9±8.9, direct: 20.9±11.1, elaborate: 21.6±13.3 $m*min^{-1}$; r=0.20 [0.04, 0.35]; small; p=0.02). These differences in HID were based on individualised thresholds, with a non-significant correlation found using arbitrary thresholds (r=0.15 [-0.02, 0.30]; p=0.07). The inclusion of the playing position (of the player taking the shot) revealed a significant correlation with the distance covered in the minute leading up to the attempt, independent of outcome (defender: 124.7±30.2, midfielder: 115.8±32.8, attacker: 101.0±28.8 m; r=0.24 [0.10, 0.39]; small; p<0.01). No significant correlations were found between attacking styles and defensive running behaviour. Furthermore, physical parameters of the attacker or final defender were not found to correlate with the zones of ball possession before the attempt. However, the fewer opponents behind the ball at 10 seconds before the GSO, the higher speeds were reached within the offensive team (r=-0.22 [-0.37, -0.06]; small; p=0.01).

The PCA analysis of the situational context revealed that opponent quality and form explained 37.1% of the variance within all factors. The regression analyses of these parameters showed a significant correlation between the final league standing of the opponent and the HID covered by the final defender and defensive team in the five minutes prior to conceding a GSO (r=-0.24 [-0.43, -0.04]; small; p=0.02 and r=-0.41 [-0.59, -0.20]; moderate; p<0.01, respectively). No significant correlations were found between the physical output leading up to created or conceded GSOs and venue or time played in the match.

Discussion

Tracking data, as well as tactical and situational context were collected over one season to explore whether running behaviour was related to the effectiveness of GSOs in football. Contextual factors were subsequently studied to potentially explain these differences in physical output leading to created and conceded GSOs. Several physical parameters were found to relate to the outcome of the attack. It was found that the attacker's running behaviour directly leading up to the attempt (1 min prior), was of more importance than the output over a longer period (5 min prior). Furthermore, an increased total distance as well as HID covered in the minute before the attempt was found to positively relate to success. In contrast, an increased activity of the defender was found to be related to a higher likelihood of conceding a goal. On a team level, lower physical outputs during the match were related to more successful attacks, and increased outputs over a longer period of time were found to be related to the chances of conceding. The inclusion of tactical context revealed different success rates and physical characteristics of attacking styles, with more goals and higher offensive speeds recorded during counter attacks. However, when ball possession was closer to the opponent's goal, as during elaborate attacks, greater physical output of the attacker and offensive team was found to relate to increased success. Finally, the situational context was studied, which was only able to explain differences in running behaviour leading up to GSOs due to opposition quality. With stronger opponents, increased physical outputs during defensive sequences were found. Taken together, although the magnitude of most correlations were small or moderate, effective attempts were found to be related to an increase in distance covered during the attack and a lower match HID, potentially indicating the ability to create more space.

In line with previous studies, counter attacks were found to be the most effective style of play for scoring goals.[6,11] Although the fewest attacks were classified as a counter attack, they resulted in the greatest number of goals scored (see Table 1). This playing style was also characterised by fewer defenders in between the ball and the goal. These spaces, which attackers can utilise, have previously been described as indicators of an imbalanced defensive organisation.[8] Another important aspect of team balance are the movements of both teams, as previously concluded by Moura and colleagues (2016) and more recently by Goes and colleagues (2020).[9,30] The current study found a significant correlation between attacking effectiveness and increasing distance covered by attackers (looking for space) and defenders (covering their opponents) in the minute prior to an attempt. As it becomes more difficult to maintain intra- and inter-team balance when players are moving quicker, these results seem to confirm the importance of this concept.[3,9] It does not appear that defenders simply increase their physical output when they realise that the opponent is about to create a threatening GSO. This is explained by the data, demonstrating that regardless of changes in ball possession, an increased physical output of defenders in the 5-minute period prior to a GSO was related to the subsequent outcome.

During counter attacks, where open spaces were largest, both attackers and defenders have been found to cover as much ground as quickly as possible.[16] This is partially confirmed by the present results, stating that both the player taking the final shot, as well as the overall team in attack, reached higher speeds during counter attacks. Interestingly, no correlations between physical output and attacking styles were found for defenders. This accentuates generally different positional requirements, also for given playing styles. Furthermore, the present study found a correlation between the covered HID, based on individualised thresholds, in the 5-min period prior to a GSO and attacking style, with the attacker covering less HID before a counter attack. This decrease in HID potentially allows for the increased

offensive output and may even implicate that offensive teams choose when to place a counter attack, depending on the activity prior to retaining ball possession and the acute status of their physical resources. This decrease in HID was not found for the minute prior to the GSO. This may be explained by the increased output during the attack itself or that teams have to cover more distance in defence, what usually precedes a counter attack.[31] Interestingly, the significant correlation between attacking style and covered HID was, as mentioned, merely present for the distances calculated through individualised thresholds. Although the average thresholds differ only marginally (14.4 vs 14.5 $km*h^{-1}$ for the arbitrary and individualised thresholds, respectively), substantial effects on an individual level may become apparent, as the spread in the individual threshold increases sensitivity, leading to statistically significant changes in the results. This shows the added benefit of sensitising data describing intensity when working with a single team.[25,32]

With the current study confirming that counter attacks are the most effective style of play for scoring goals, it would be a logical assumption that the found increase in physical output prior to successful attempts is merely due to attacking style. Counter attacks were indeed found to start deeper in the own half, consequently requiring a higher physical output to reach the opponent's goal. However, the attacker's as well as the offensive team's physical output was also found to correlate with success during elaborate attacks, where the opponent is organised and found standing closer to their own goal. This indicates that the found increases in running behaviour prior to a successful attack do not merely relate to attacking style. This is also confirmed by the analyses of the playing position of the player taking the shot. A significant correlation was found for the total distance covered in the minute leading up to an attempt, with defenders covering more ground, as they usually start an attack further away from the opponent's goal. However, no significant correlations were found between playing position and physical output prior to successful attempts, indicating the increased running behaviour to be independent of player positioning.

Apart from the differences in running behaviour during specific attacks, it was also found that the overall output during sequences leading to GSOs did not relate to the time played during the match, from both an offensive as well as a defensive point of view. This is an interesting finding, considering that physical output has been previously found to decrease during a match.[33] This possibly indicates that players, regardless of playing position, are able to deliver the required physical output when it is most needed. As a result, this means they need to appropriately pace and recover during the match.[34] Three more findings seem to confirm the importance of endurance capacity and well-timed substitutions, in case a player or opponent is no longer able to reach the required output.[35] First, the outcome of conceded GSOs was negatively correlated with the preceding HID covered by the defender, describing higher values prior to conceded goals. Second, attacking outcome correlated with the HID covered during a match, indicating higher effectiveness for lower match outputs. Finally, an increased physical output in the minute leading up to the GSO was positively correlated with outcome. All of this seems to support the importance of a great physical capacity of the players and intelligent pacing, in order to be sufficiently recovered to increase one's activity when required.[36,37]

A further aspect where the physical output during attacking sequences showed contrasting patterns to that during the complete match, was that for match location. Castellano and colleagues (2011) described that teams playing at home covered more distance than teams playing away,[31] whereas the current study found no significant correlations between the physical output during attacks leading to created or conceded GSOs

and playing venue. This indicates that the physical output whilst creating or defending GSOs is independent of playing at home or away. As such, the previously found differences in match distance may relate to the increased activity during sequences that did not lead to GSOs or the number of attacks, as home teams were found to play more offensive.[38]

Due to the applied nature of the current study, certain limitations were apparent. Since one team was supplied with tracking devices and no opponent data was externally available, the exact positioning of the opposing players was unknown. Such data would have been advantageous and this provides incentive for future studies to improve the understanding whether inter-player distances are affected by previous physical output and whether they play a role in the effectiveness of attacks.[9,30] Furthermore, since the current data is collected from a single team, the results may not be fully transferrable to other teams or generalisable for a larger population. The results also mostly showed small correlations, potentially due to the relatively small sample size. Similarly, insufficient events were available to utilise individual player data as a potential factor. In the current study, merely shooting effectiveness and total distance covered, independent of outcome, presented differences between subgroups of players, based on general playing position. This leaves future studies to include a wider range of teams, include more advanced positional metrics as well as contextual factors and study individual player characteristics more intensively.[9] However, the current study and results do show how practitioners may approach analysing their team's or an opponent's running behaviour leading up to GSOs. Where it is difficult to perform intervention studies directly impacting tactics in professional sports, the current study aimed to provide insights to directly impact training and match preparation. Additionally, the current findings accentuate that the meaningfulness of analyses could be enhanced when incorporating contextual data.[39] With increasingly more information on the effect of context gathered, it may eventually become possible to perform highly-specific intervention studies relating to match analysis in (sub) elite football. Such studies, altering behaviour during isolated events, hold more scientific as well as practical power, making them extremely valuable to the field.

Practical Applications

By finding that effective attacks are related to an increased distance covered and fewer defenders behind the ball, the current study seems to highlight the importance of finding and utilising space and the capacity to increase one's physical output when required. As attacking effectiveness was also found to relate to less HID covered during the match, the importance of a great physical capacity is indicated. In general, attackers need to be capable of increasing their physical output to disturb the balance within the opponent's organisation and find space to take a shot. Similarly, defenders need to be capable to cover more ground to remain balanced with their teammates and close down their opponents. A team's tactical as well as individual pacing strategies should be thoroughly prepared and trained. Since the physical output during attacks was found to be mostly unrelated to situational context, the importance of being sufficiently recovered for upcoming attacks or well-timed substitutions of players who are unable to increase their physical output anymore, is also emphasised.

Conclusions

The current observational study found relations between running behaviour and the outcome of scoring attempts. Increased distances covered during the attacks by both the attacker, looking to move away from his opponent, and the defender, having to track his opponent, were found to be related to a higher attacking effectiveness. Counter attacks, characterised by fewer defenders behind the ball, were found to be more physically demanding in comparison with direct play and elaborate attacks and lead to most goals scored. Since a decreased physical output during the match and in the 5-min period leading up to an attempt was found to relate to success, the importance of a great physical capacity is demonstrated. Consequently, tactical as well as pacing strategies are shown to be of significance, in order to increase one's physical output when required. Furthermore, space, available during counter attacks or created by attackers through increased running output, may be a decisive factor during GSOs from open play. Future, large-scale, studies may confirm these results from applied data and analyses.

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Figure Captions

Figure 1. Distribution of the pitch, used to describe the zone of ball possession at the various moments during an attacking sequence.

Tables

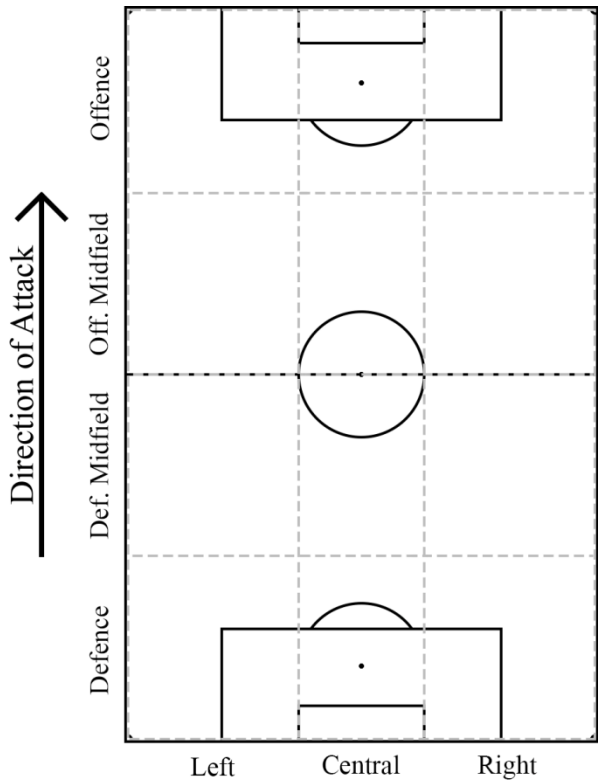
Offensive	N	Goal	Save	On T	Post	Wide	Off T
Total	145	27	65	92	5	48	53
Home	77	17	29	46	5	26	31
Away	68	10	36	46	0	22	22
Elaborate	62	8	28	36	2	24	26
Direct	43	7	22	29	2	12	14
Counter	40	12	15	27	1	12	13
Defensive							
Total	75	7	34	41	2	32	34
Home	34	3	17	20	1	13	14
Away	41	4	17	21	1	19	20
Elaborate	27	3	11	14	1	12	13
Direct	27	1	14	15	0	12	12
Counter	21	3	9	12	1	8	9

Table 1. Description of the included created (offensive) and conceded (defensive) goal scoring opportunities, separated for venue and attacking style. "On T" describes the number of attempts ending on target, the summation of goals and saves. "Off T" describes the number of attempts ending off target, the summation of attempts hitting the post (or crossbar) and those wide of the goal.

Player/Team	Variable	Goal	No Goal	Correlation
Attacker	**1 min distance**	115.9 (29.0)	104.0 (31.7)	**0.27 (p=0.03)**
	1 min HID	24.2 (28.9)	22.5 (20.3)	
	Max velocity	21.7 (4.4)	20.8 (4.2)	0.09 (p=0.29)
	5 min distance	95.9 (36.7)	103.0 (27.5)	0.09 (p=0.26)
	5 min HID	19.2 (14.5)	20.0 (11.1)	0.18 (p=0.10)
Offensive team	**1 min distance**	108.5 (26.1)	105.2 (28.9)	0.05 (p=0.59)
	1 min HID	19.6 (11.3)	17.4 (10.4)	0.08 (p=0.31)
	Max velocity	25.3 (2.5)	25.4 (2.6)	0.13 (p=0.88)
	5 min distance	96.3 (26.3)	100.8 (24.6)	0.12 (p=0.15)
	5 min HID	15.7 (7.1)	16.0 (5.4)	0.03 (p=0.69)
	Match distance	104.2 (5.0)	106.0 (4.5)	0.15 (p=0.07)
	Match HID	15.7 (1.8)	16.9 (2.7)	**0.20 (p=0.02)**
Final defender	**1 min distance**	143.9 (49.1)	105.8 (29.9)	**0.51 (p<0.01)**
	1 min HID	42.0 (54.3)	15.9 (18.2)	
	Max velocity	16.5 (4.3)	19.2 (4.0)	0.19 (p=0.09)
	5 min distance	118.7 (44.8)	100.7 (17.6)	**0.42 (p=0.01)**
	5 min HID	31.8 (44.5)	15.6 (8.3)	
Defensive team	**1 min distance**	93.1 (22.9)	84.1 (20.4)	0.13 (p=0.27)
	1 min HID	16.9 (11.6)	13.9 (9.0)	**0.24 (p=0.04)**
	Max velocity	23.7 (2.0)	24.7 (2.6)	0.12 (p=0.32)
	5 min distance	88.9 (14.5)	81.7 (12.2)	**0.49 (p<0.01)**
	5 min HID	18.4 (5.7)	14.2 (3.7)	
	Match distance	83.9 (6.4)	81.2 (8.7)	**0.29 (p=0.04)**
	Match HID	17.3 (1.5)	14.5 (2.2)	

Table 2. Description of physical parameters for the attacker (the player taking the shot), the offensive team, the final defender (trying to prevent the shot) and the defensive team. The

data is presented as mean (standard deviation) in $m*min^{-1}$ for distances and $km*h^{-1}$ for velocity and separated for those attempts that led to a goal and those that did not. The correlation coefficients are presented with the level of significance in brackets. Significant correlations ($p<0.05$) are marked in bold and a vertical border symbolises the data it applies to (single or multiple regression). *HID*: high-intensity distance based on individualised thresholds.


Direction of Attack
Offence
Off. Midfield
Def. Midfield
Defence
Left
Central
Right