Transition to attack in elite soccer

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ABSTRACT

Since the pioneering work of Reep and Benjamin (1968) on regained possessions, there has been a lack of detailed, informative research in the area. The aim of this study was to analyse all elements of transitions to attack in elite football. The influence of turnover zone, turnover type and 'on the ball' player actions upon scoring goals and creating scoring opportunities (S.O.'s) were examined. A total of 3,077 transitions from all 29 games of the 2014-15 Champion's League knockout stages were coded. Multidimensional qualitative data using 11 ordered categorical variables were obtained to characterise each transition. Data were analysed using chi-square analysis. Winning turnovers in offensive areas increased the chance of scoring a goal and creating a S.O. ($p < .001$). Nearly half of all turnovers in the offensive zone, 49.45% (n=45) resulted in a S.O., and 7.69% (n=7) lead to goals. The tackle was the most productive way to turnover the ball ($p < .05$). Teams created significantly more S.O.s and scored more goals when the first and second actions after the turnover were forward ($p < .05$); successful dribbles, runs with the ball and long passes were the optimal player actions. Further analysis revealed that successful teams (top 4) created more S.O.'s from the defensive, defensive midfield and offensive midfield but not the offensive zone ($p < .01$). Finally teams created more S.O.s from turnovers in the offensive half, but not the defensive half, when losing or drawing the tie ($p < .05$). It was concluded that teams should press high to win turnovers and create S.O.'s, supporting the findings of Reep and Benjamin (1968). It was further concluded that the immediate player actions after winning the turnover are critical to the outcome of the transition. **Keywords:** Champion's League, Transitions, Turnover, Soccer.

INTRODUCTION

UEFA's technical report on the 2014-15 Champion's League pronounced transitions as a key feature and suggested that the addition of direct counter attacks to their game was a major factor in Barcelona's winning equation. Goals resulting from transitions accounted for 41.5% (n=34) of all goals scored in the knockout stages. Barcelona scored 5 of those, averaging one per game from the quarter-finals through to the final, emphasising the importance of transition to attack when the opposition was of a higher quality.

The term 'transition to attack' is the contemporary, and often interchangeable, way of describing a counter attack in a football match. Yiannakos and Armatas (2006) defined an attacking transition as "starting when a team first gains possession of the ball and ceases when that same team performs a predetermined outcome (i.e. takes a shot at goal, loses possession, or passes the ball a certain number of times)". Tenga & Sigmundstad (2011) explained counterattacks as "possessions with high degree of offensive directness which tend to approach the opponent's goal directly by using forward passes and dribbles once possession of the ball has been won". James (2006) defined regained possessions as "the occasions when a team regained control of the ball from the opposition's possession".

For the purpose of this research the definition of a team possession used by Pollard & Reep (1997) was adapted: A turnover was observed when a player regained possession from the opposition during play, and a transition was notated when his team performed at least one action (e.g. complete pass or successful dribble). The player must have enough control over the ball to be able to have a deliberate influence on its subsequent direction. The transition ended when the team performed a number of possible outcomes or retained the ball for 6 actions. This was then recorded as build up play.

Ball possession in football
This section aims to investigate ball possession as a performance indicator. Lago-Peñas et al. (2011) analysed 288 matches in the group stages of the Champions League. Winning teams had significantly higher averages for ball possession, data which are supported by Castellano et al. (2012) on 3 world cups: 2002-2010, and Lago-Peñas & Dellal (2010) on the Spanish Primera Liga. In contrast to these findings, Collet (2013) collected data on 6377 matches between 2002 and 2011. Collet showed that when team quality and home advantage were accounted for in domestic league play, the effect of greater possession was consistently negative. However this research, though broad in its sample size, did not factor in evolving match status. Lago & Martin (2007), Lago (2009) and Lago-Peñas & Dellal (2010) found that possession was greater when losing than when winning or drawing leading Lago-Penas & Dellal to conclude that "When ahead, teams decreased their possession, suggesting they preferred to play counterattacking or direct play". Home teams also enjoyed greater possession, and playing against stronger opposition was associated with a reduction in time spent in possession which upheld earlier research by Lago (2009), and more current research on the English Premier League (Bradley et al. 2014).

Number of passes leading to goals scored
Reep & Benjamin (1968) established that 80% of goals resulted from a sequence of 3 passes or less, while Bate (1988) demonstrated that 79% come from moves of 4 passes or less. Hughes & Franks (2005) analysed passing sequences, shots and goals in the 1990 and 1994 World Cups and found similar results. Moreover, Hughes and Franks normalised their data with respect to frequency of the respective lengths of passing sequences; more goals were scored per sequence from longer passing sequences than from more frequent shorter passing sequences and teams produced significantly more shots per possession for longer passing sequences. However, the strike ratio of goals per shot was better for shorter passing sequences, research

supported more recently by Collet (2013). Tenga et al. (2010a ; 2010b) compared counter attacks with "elaborate" attacks when analysing 1703 random possessions in the Norwegian League. Counter attacks resulted in more goals (2010a) and "score box possessions" (2010b) per possession when playing against an imbalanced defence, but not against a balanced defence. Lago-Ballesteros et al. (2012) examined 908 possession from one Primera Liga team over 12 games and revealed that counter attacks were three times more effective than elaborate attacks for producing score box possessions. The evidence suggests that fast transitions to attack, with fewer passes and which don't allow defences to organise, will result in more goals than elaborate attacks when normalised for frequency.

Transition to attack – From what area of the pitch?

Reep and Benjamin (1968) studied regained possessions and showed that 30% of all regained possessions lead to shots on goal and 25% of all goals came from regained possessions in the attacking quarter. Hughes & Churchill (2005) reported very similar results to Reep and Benjamin - 50% of all goals came from possession gained in the attacking quarter. Grant et al. (1998) concluded that although there were more shots from regained possessions in the attacking quarter there were less goals, leading them to suggest that "the quality of the scoring opportunity is better from possession regained further away from goal, possibly because of the greater amount of space than can be exploited". More recently, Almeida et al. (2014) also analysed regained possessions, this time in the knockout stages of the 2011-2012 Champion's League; just 2.8% of turnovers take place in the attacking quarter and only 16% in the attacking midfield quarter. Almost half (48%) of regained possessions took place in the defensive quarter of the pitch. It demonstrates a momentous shift in the way the game is played from the earlier research with most teams dropping off defensively to some defined point on the pitch while reorganizing their attacking, midfield and defensive units. Barreira et al. (2014) researched the attacks (n=1619) of the semi-finalist teams at the 2010 FIFA World Cup; the ball was rarely recovered in the attacking quarter and ball recoveries in midfield defensive central zones increased attacking efficacy. Similarly, Gómez et al (2012) investigated 1900 Primera Liga matches over 5 seasons, and winning teams were discriminated from losing and drawing teams by their ability to recover the ball in zone 2 (in the defensive half between the centre circle and the 18 yard box semi-circle). Liu et al (2015) examined the 2014 FIFA World Cup in Brazil and disclosed that 'Shot from Counter Attack' resulting from a turnover in the defensive half had a clearly positive effect on the probability of winning.

The research is divided on the best area of the pitch to win turnovers and it is one of the aims of this inquiry to answer the question. The more recent studies suggest that turnovers in the defensive half are the key to creating chances and winning games. Conversely, the older studies point to winning turnovers in the attacking half as the best way to create chances and score goals.

The type of turnover that leads to a transition to attack

Wright et al. (2011) examined 1788 shots and 169 goals during an English Premier League season and concluded that transitions in play accounted for 65% of all goals and 56 % of all shots. They categorised the transition into 3 types: interception, successful tackle and other (all turnovers that were not tackles or interceptions e.g. rebound or deflection). Interceptions contributed 19% of all goals; successful tackles 10% and other 36%. Barreira et al (2014) explored ball recovery patterns as a performance indicator. Ball recovery by a tackle, and by a defensive behaviour followed by a pass, increased attacking play effectiveness related to goal scoring and shots on target, respectively. Almeida et al. (2014) evaluated the 28 knockout games of the 2011-2012 Champion's League season and showed 5457 ball recoveries which provides a basis for comparison with this research: - 36.9% were interception, 15.6% were tackles, 2.5% goalkeeper saves, 24.6% set plays and 20.4% turnovers.

The composition of an effective transition to attack

Olsen & Larsen (1997) stated that for a team to counterattack successfully: "the first pass is especially important after the breakdown. It should go forward and be combined with great mobility". Gonzalez-Rodenas et al. (2015) reinforced this statement in finding that performing a penetrative action during the first 3 seconds after the ball recovery increased the chance of creating a scoring opportunity. Fleig & Hughes (2004) analysed counter attacks at the 2002 World Cup and demonstrated that successful counter attacks lasted between 10 and 15 seconds and consisted of 4-8 actions. They also suggested that long passes from the defensive third were unlikely to succeed and that teams should adopt controlled attacks with quick interchanges of passing. Armatas et al. (2005) discovered that 35% of counter attacks in the Champion's League involve 2 players, and 33% involved 3 players. Turner & Sayers (2010) exposed significant differences between transition speed and pass sequence length, and the number of players involved. They proposed that for a team to conduct fast transitions they need to minimize the amount of players and passes involved to three or less. The research in this area is extremely limited, and is one of the driving forces behind this study.

PROBLEM DEFINITION

Leicester has just won the English Premier League with the third lowest average possession statistics in the division (43.7% source www.premierleague.com). And Atletico Madrid reached the 2016 Champion's League Final having knocked out Bayern Munich and Barcelona averaging less than 31% possession over the 4 games (source www.uefa.com), making this research extremely relevant and current. With defences in football becoming more and more organised, the ability to create chances and score goals on the counter attack has become increasingly important. Famously, Reep and Benjamin (1968) advocated a high pressure game in the attacking quarter to regain possession and score goals, but there is a lack of current research on what areas of the pitch teams should look to regain possession and start transitions or counter attacks. There is also an absence of research on the composition of successful transitions and the findings will have significance for coaches and analysts alike. This study aims to analyse all the turnovers in possession from open play in the knockout stages of the 2014-15 Champion's League to investigate a number of outstanding details regarding transition to attack in modern football:

- (A) What zone (or quarter) of the pitch is the most productive for creating goal scoring opportunities and scoring goals?
- (B) What type of turnover is most effective in setting up successful transitions?
- (C) What is the composition of successful transitions from each zone of the pitch – is there a pattern to efficient transitions at this elite level of the game?

RESEARCH DESIGN

Experimental design process

The experimental design process had 3 distinct phases:

1. Design of a hand notation system to measure transitions to attack in the Champion's League, and carry out reliability on a group stage Champion's League match: Arsenal V Anderlecht 04-11-2014 (Reliability 1).
2. Introduce the "opposition touch" action, redraft some operational definitions, convert the system into a functional computerized system for use with Sportscode Game Breaker plus (V10.3.17), and carry

out reliability on a second group stage Champion's League match: Manchester City V Bayern Munich 25-11-2014 (Reliability 2).

3. Fine-tune some operational definitions, reorganize the attacking passes into short, medium and long, and carry out final reliability on a third group stage Champion's League match: Real Madrid V Liverpool 04-11-2014 (Final Reliability)

Two experienced coaches (1 UEFA "A" and 1 UEFA Pro License), and one full time football performance analyst assisted with the design of the system. Data collection was carried out by one trained observer and experienced analyst. The coded data were exported into Microsoft Excel as an edit list, formatted for analysis using the indirect function and analysed using both Excel and SPSS statistical software.

Variables and procedures
The turnovers were analysed with regard to the type of turnover and the transverse zone in which it took place. Four types of turnover were considered, which where adapted and formulated from a review of the research and through the experimental design process: save, interception, tackle and other (See Table 3.53 for operational definitions). The turnover zones were demarcated by dividing the pitch into 4 equal transverse zones: defensive, defensive midfield, offensive midfield and offensive.

Penalty kicks, corner kicks, and free kicks in the offensive quarter were included as successful outcomes (arising from the first reliability study where Arsenal scored 2 goals from a penalty and a free kick won because of a transition to attack). The team, venue of the match (home / away) and status of the tie (winning, drawing, losing) taking into account the UEFA away goals rule, were notated for each transition.

Table 2.12. Operational definitions

Turnover Type	
Interception (I)	When the defender prevents a ball passed by an opponent from reaching its intended receiver by contacting the ball and keeping his own team in possession of the ball (Taylor et al., 2008; Rowlinson and O'Donoghue, 2009).
Tackle (T)	When the defender dispossesses the opponent of the ball through a physical challenge or defensive pressure (Taylor et al., 2008; Rowlinson and O'Donoghue, 2009). If the ball ricochets less than 10m to a teammate as the result of a tackle, it is not classified as a pass. If the rebound is over 10m then it is classified as a pass.
Save (S)	When the goalkeeper prevents the opposing team from scoring a goal after any kind of shot, i.e. a kick, a header or any intended deflection of the ball toward a goal (Almeida et al., 2014), and starts a transition within 5 seconds of coming under control of the ball. If the ball ricochets less than 10m to a teammate as the result of a save, it is not classified as a pass. If the rebound is over 10m then it is classified as a pass.
Other (O)	When the defender collects a ball lost by the opposing team as the result of a rebound, blocked shot, missed control or a contested header second ball. If the ball ricochets less than 10m to a teammate as the result of the turnover, it is not classified as a pass. If the rebound is over 10m then it is classified as a pass.
Turnover Zone	
Defensive (D1)	Determined by dividing the pitch into 4 transverse zones with the same size. (Almeida et al., 2014) From the end line to the midpoint in the half.
Defensive Midfield (D2)	From the midpoint in the half to the halfway line.

Offensive Midfield (A2)	From the halfway line to the midpoint in the half.
Offensive (A1)	From the midpoint in the half to the end line.
Player Actions	
Run (R)	Player in possession of the ball, runs with or without a change of pace but without attempting to dribble past an opponent, for 20m or more. (adapted from Hughes & Reed, 2005).
Dribble (D)	Player in possession of the ball dribbles past an opposing player using skill, or change of pace. (adapted from Hughes & Reed, 2005).
Attacking Pass (Ps, Pm, Pl)	Player in possession of the ball makes a deliberate attempt to transfer ball to another player using any part of the body. (Hughes & Reed, 2005). The pass must be played forward. Alternatively, the pass may be played sideways or backwards (a) into space for a player to run onto or (b) weighted to allow the team mate to play forward first time (a set-up pass) or (c) Any pass in the offensive quarter. Three lengths of pass were considered:- Short (Ps) 0-10m, Medium (Pm) 10-25m and Long (Pl) over 25m.
Possession Pass (Pm)	Player in possession of the ball plays any length pass backwards or square, excluding the 3 exceptions noted above.
Cross (Cc) (Coc)	Player in possession of the ball directs a cross longer than 10m, towards the opposition's penalty box from a wide area (the by-line to 4 m inside the penalty box). (adapted from Ensum et al., 2005) (Cc) Delivered to critical scoring area (as defined by James, 2006) (Coc) Delivered to penalty area, but outside critical area.
Shot (Son) (Soff) (Sb)	Player in possession of the ball makes an attempt to score a goal for his team with any part of the body (adapted from Rowlinson & Donoghue, 2009). 3 categories:- shot on target (Son) but saved by the goalkeeper, shot off target (Soff) including hitting the post or crossbar, and shot blocked (Sb) by an opposition defender.
Goal (G)	Player in possession of the ball scores a goal.
Free Kick Scored (FKs)	Player in possession of the ball wins a free kick in the attacking quarter from which the attacking team subsequently scores. Note that the goal must be scored within 3 touches after the free kick is delivered.
Free Kick Missed (FKm)	Player in possession of the ball wins a free kick in the attacking quarter from which the team fails to score, within three touches of the set-piece.
Penalty Scored (Ps)	Player in possession of the ball wins a penalty kick from which the attacking team subsequently scores.
Penalty Missed (Pm)	Player in possession of the ball wins a penalty kick from which the team fails to score.
Corner Scored (Cs)	Player in possession of the ball wins a corner kick from which the attacking team subsequently scores. Note that the goal must be scored within 3 touches after the corner kick is delivered.

Corner Missed (Cm)	Player in possession of the ball wins a corner kick from which the team fails to score, within three touches of the corner.
(S.O.) Scoring Opportunity	All goals, shots, crosses and set pieces outcomes were grouped together and classified as an SO for further analysis.
Foul (Fw) (F2)	Player in possession of the ball is fouled by the opposition. Player in possession of the ball commits a foul himself.
Ball out of play (BO)	Either the player in possession or a defending player puts the ball out of play (not including corner kicks).
Build Up Play (BU)	If the team on transition to attack maintains possession of the ball for 6 actions without a positive attacking outcome, then it becomes classified as build up play.
Turnover (TO)	The player in possession of the ball turns the ball over to the defending team.
Offside (OS)	A player from the attacking team is ruled offside by the match officials.
Opposition Touch (OT)	A player from the defending team gets a touch on the ball which significantly deflects the direction of the ball, but which does not stop the transition to attack.

Outcome Hierarchy: As some transitions might produce two outcomes and only one is notated for each transition, a hierarchy of outcomes was organised: 1. Goal, 2. Team scores from a penalty, free kick or corner, 3.Shot on Target but saved by the keeper, 4. Shot off target, 5. Shot Blocked, 5. Cross to critical scoring area, 6. Cross Outside CSA, 7. Attacking team fails to score from a penalty, free kick or corner

Match sample

This study examined transition to attack in the knockout stages of the 2014-2015 Champion's League. All twenty-nine matches were analysed and 3154 transitions recorded. A total of 77 transitions were void due to action replays and teams putting the ball out of play for treatment to injured players leaving a total of 3077 transitions for analysis. Extra-time was excluded from the sample to ensure homogeneity of the 29 matches. All matches were downloaded off www.wyscout.com and were originally recorded off terrestrial TV with Sky Calcio providing most of the matches.

Reliability

Intra-observer reliability was assessed on three different games as the experimental design evolved and followed the guidelines recommended by Hughes et al. (2002). The matches were coded first (R1), and then recoded (R2) after a minimum of 21 days to minimize any learning effect. Percentage error was calculated using the following equation recommended by Hughes et al. (2002):

$$\text{Percentage error} = [\textstyle\sum(\text{Mod}(R1-R2))/ \ RTOT\text{mean}] *100$$

Where 'mod' is the modulus and '$\sum$' indicates the 'sum of' and RTOTmean is the mean of the total variables measured.

All data were checked item against item in the first 2 reliability studies, and consequently operational definitions were refined for the final reliability study. The data were examined as thoroughly as all the games in the subsequent analysis. The final reliability results showed that the system used in this research was both repeatable and accurate (see Fig 3.1).

Statistical analysis

The Chi-square test of significance was the statistical method (both the goodness-of-fit test and the test of independence) used to analyse the results as recommended for categorical data in performance analysis by Nevill et al., (2002). Scoring Opportunities was the main outcome with sufficient data across all of the analysis fields to satisfy Chi-square test assumptions. Some categories were either combined or omitted for goal analysis due to low frequencies; the offensive zone and the offensive midfield zone were joined for zone comparisons, and the actions long pass, dribble and run with the ball were left out for action investigation. Tenga et al. (2010c) did find that scoring opportunities could be used as a proxy for goals scored when comparing the effectiveness of different playing tactics in soccer.

DATA ANALYSIS AND DISCUSSION

Reliability

Final reliability results showed percentage error values of 0 - 5.26% for the variables with sufficient data for reliability analysis (See fig. 3.1). These results indicate a strong level of agreement between the trials and an acceptable level of error for this study. There were a number of variables with error values over 5% - turnover other (13.33%), long pass (6.45%) and run with ball (8.7%). This was attributed to the low frequency of instances and an actual error of one between the 2 analyses.
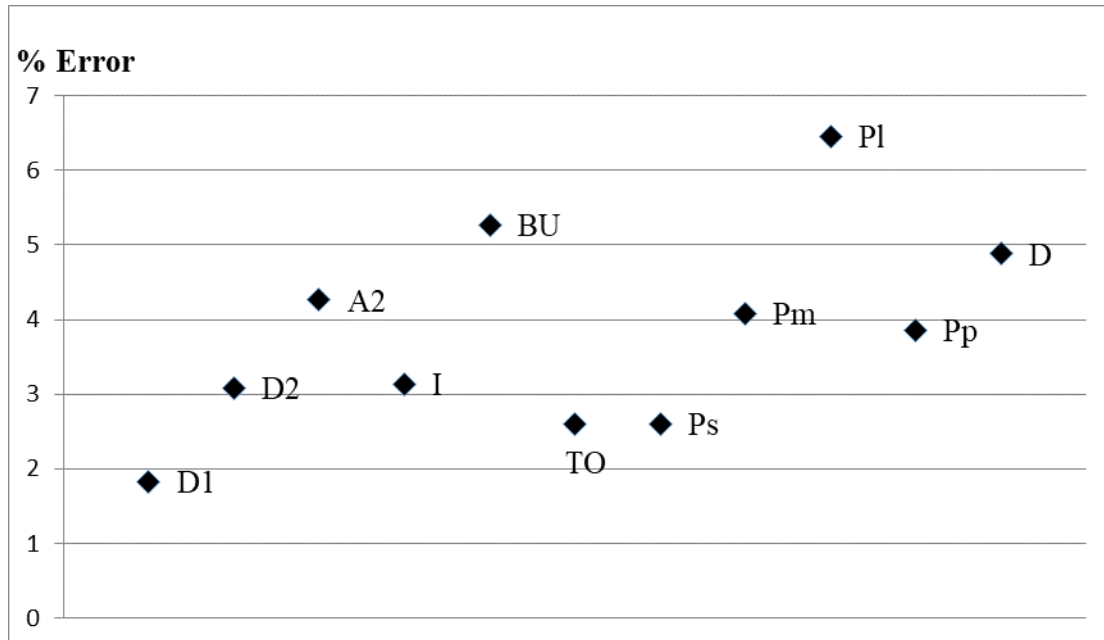

Fig. 3.1. The data from the final reliability study, the intra-operator test, presented as a function of the accuracy of each variable

Turnover zone analysis

A total of 3077 turnovers and subsequent transitions to attack were analysed. Of all transitions, 1.10% (n=34) resulted in goals, and 12.64% (n=389) produced S.O.'s. The TO zone data significantly indicated that the higher up the pitch a team wins turnovers, the more likely it is to score goals, and create S.O.s, in accordance with previous work by Gonzalez-Rodenas et al. (2015) (see table 3.2). The offensive zone was the most prolific for winning turnovers with 49.45% (n=45) yielding a S.O., and 7.69% (n=7) finishing in goals. Teams were almost 7 times more likely to create a S.O. from transitions initiated in the offensive zone than the defensive zone, and over 11 times more likely to score a goal, contradicting the earlier work of Grant et al. (1998). The data confirm the main reason that the high press, or Jurgen Klopp's "gegen" press (counter press) is currently back in vogue in the football world, with Germany winning the world cup in 2014 adopting this style of play. Reep and Benjamin (1968) showed that 30% of all regained possessions lead to shots on goal and 25% of all goals came from regained possessions in the offensive quarter leading them to pioneer direct playing tactics with high pressing in the opposition half. The current research found that just 5.95% of turnovers lead to shots on goal, 8.5% of goals (n=7) came from turnovers won in the offensive quarter and 20.73% of goals (n=17) came from turnovers won in the attacking half. The main difference between this research and that of Reep and Benjamin lies in the number of turnovers won in the offensive half and quarter. Just 2.81% of turnovers took place in the offensive quarter in this research, supporting earlier work by Almeida et al. (2014).

Table 3.2. Goals scored and scoring opportunities created analysed by TO. zone and type

Variable	Turnovers	Goals Scored			Scoring Opportunity (S.O.)		
	N	N	%	P*	N	%	P*
TO Zone							
Defensive	1360	9	0.66	< .001	97	7.13	< .001
Def. MF	1026	8	0.78		103	10.04	
Off. MF	600	10	1.67		144	24.0	
Offensive	91	7	7.69		45	49.45	
Total	3077	34	1.10		389	12.64	
TO Type							
Save	155	0	0		12	7.74	0.06
Interception	2063	17	0.82		250	12.12	
Tackle	785	16	2.03		119	15.16	
Other	74	1	1.35		8	10.81	
Total	3077	34	1.10		389	12.64	

*P = Pearson's chi-square, % = Number of outcomes as a percentage of the number of T.O.'s

Turnover type analysis

There was a strong, but not significant (p = .06), relationship between the turnover types for S.O.'s created (see table 3.2). No goals were observed from transitions started with a save, and just 7.69% of saves lead to a scoring chance created, upholding earlier work by Barreira et al. (2014), but in contrast to Horn et al. (2000), who highlighted the role of the goalkeeper in starting transitions. Interceptions contributed 20.73% (n=17) and tackles 19.51% (n=16) of all goals scored, figures higher than previously reported. Wright et al (2011) examined 1788 shots and 169 goals during an English Premier League season and found that interceptions contributed 19% of the goals and successful tackles 10%. A further analysis of interceptions and tackles by turnover zone revealed significant and noteworthy results (see fig. 3.3). The tackle was marginally more productive than the interception from each zone, except the defensive zone, for S.O.s created. But for goals

scored the tackle proved close to twice as effective in the 3 most advanced zones with over 10% of tackles in the offensive zone leading to goals, thus providing further vindication for supporters of the high press. Barreira et al. (2014) also demonstrated that ball recovery by tackle induced the scoring of goals. Hughes et al. (2001) identified 12 perturbations that occur before a shot can take place. The tackle was one of the most effective perturbations in producing goals per shots at just under 6 shots per goal. Results from this research showed that the tackle was even more efficient at 4 shots per goal. The interception was slightly less prolific at 6 shots per goal, but lower than the 8.89 shots per goal that UEFA reported for all games in the 2014-15 Champion's League (UEFA Champion's League Season Review 2014-2015) emphasising once again the importance of transition to attack. It is of interest to note that Sasaki et al. (2011) learned that 10% of tries in the first tier of Japanese rugby union were scored on counter attacks from a tackle turnover won mainly in the offensive half. The results suggest a similarity between the sports with the high press in soccer comparable to the rush defence in rugby.
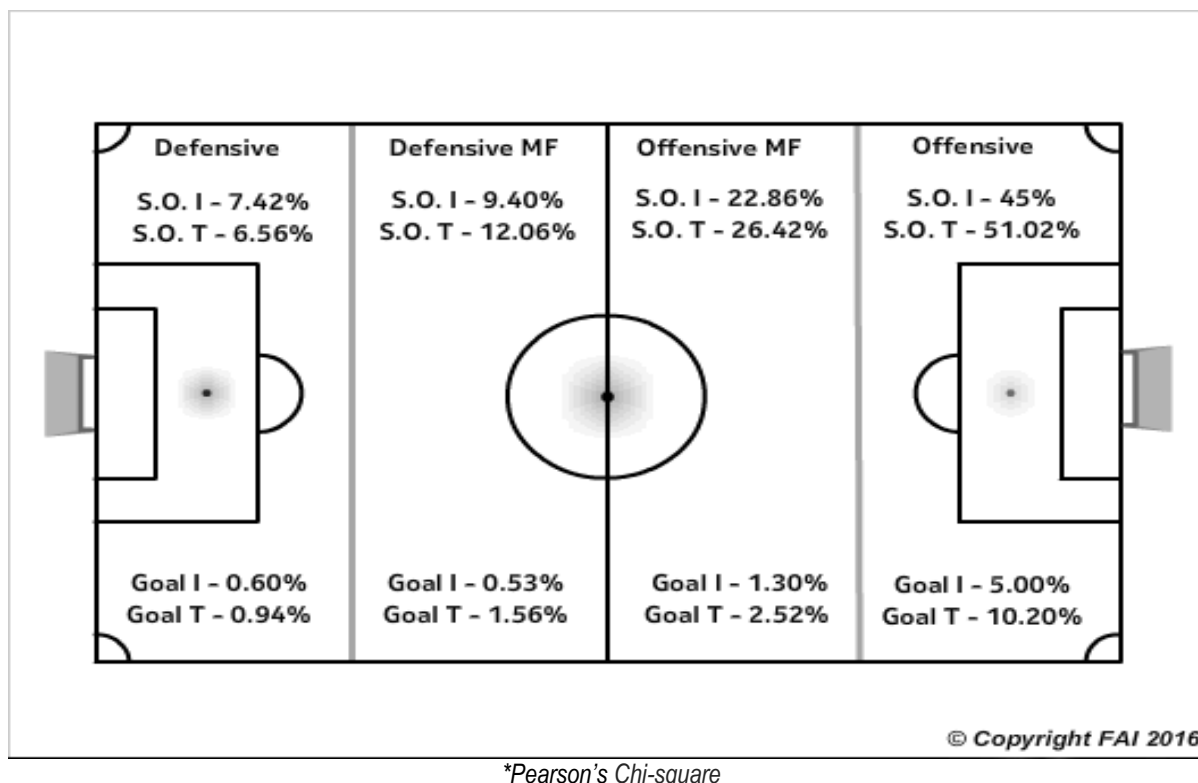

*Pearson's Chi-square

Fig. 3.3. Differences in strike rate between transitions initiated by interceptions (I) and tackles (T) from each zone, for creating S.O.'s ($p < .001*$) and scoring goals ($p = .03*$)

Transition composition – Number of actions, descriptive analysis

The average number of actions required from all zones to score a goal or create a scoring opportunity was almost exactly 4 (see fig. 3.4). Transitions from the defensive quarter comprised mostly of 3-6 actions. This is slightly less than earlier reported by Fleig and Hughes (2004) who showed successful counter attacks from the defensive third took 4-7 actions indicating an increase in the pace of the game between the 2 studies. Over 82% of S.O.'s created from the offensive zone occurred within 3 actions indicating the need for directness against a defence possibly less imbalanced than from turnovers won in other zones.
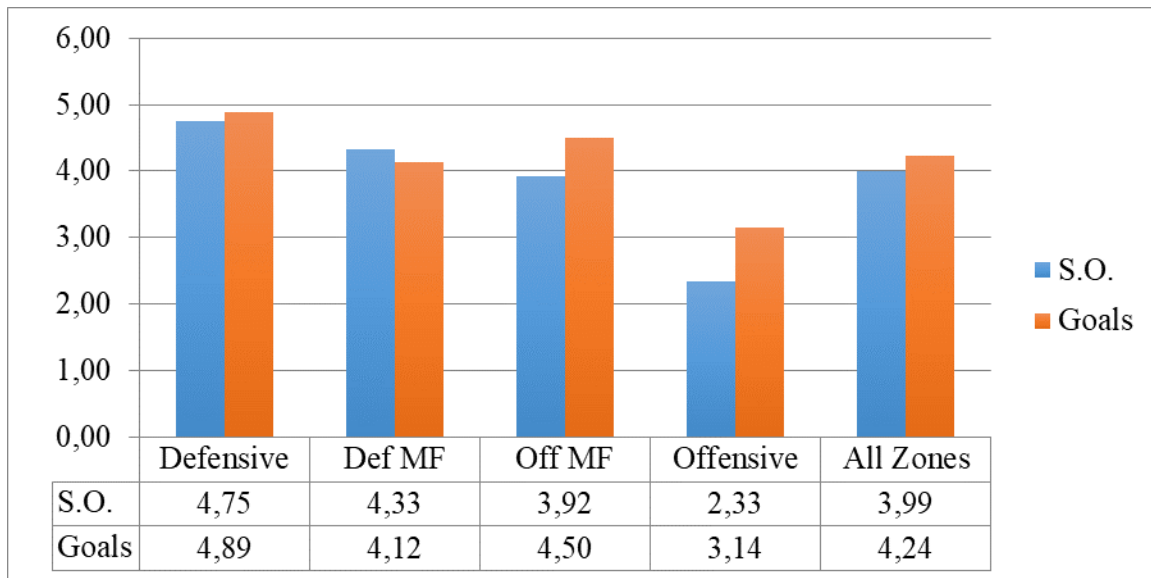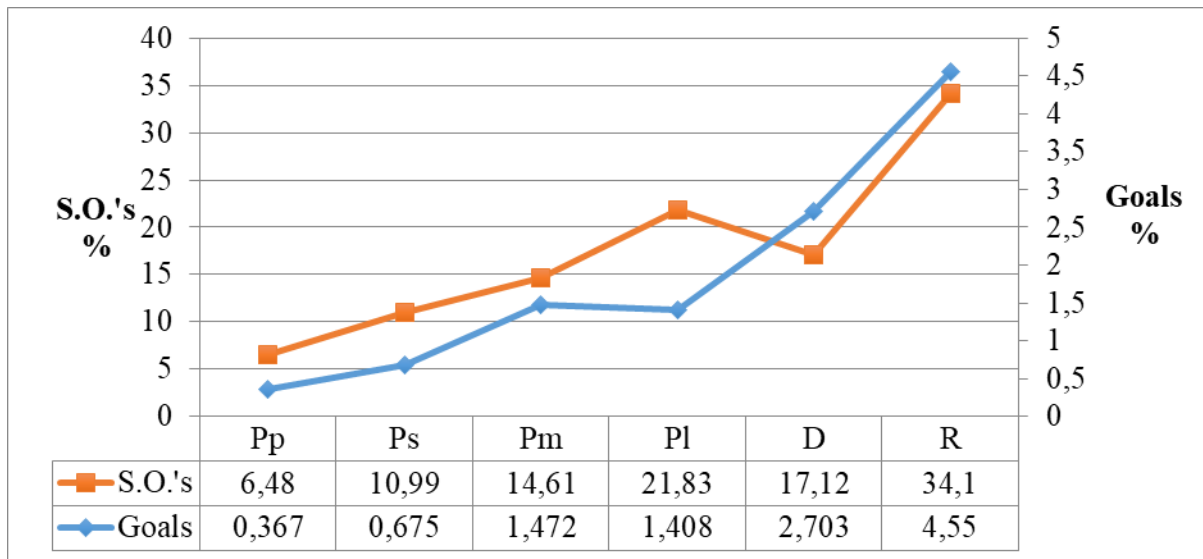
	Defensive	Def MF	Off MF	Offensive	All Zones
S.O.	4,75	4,33	3,92	2,33	3,99
Goals	4,89	4,12	4,50	3,14	4,24

Fig. 3.4. Average number of actions required to create a S.O. and score a goal from each zone

Transition composition - First action
The first action after the turnover significantly influenced the number of scoring opportunities created ($p <$ .001) and goals scored ($p = .04$). The results elucidate the need for playing the ball forward as soon as the turnover is won (see fig. 3.1). A paltry 6.48% (n=53) of transitions that begin with a possession pass resulted in a S.O. and just 0.37% (n=3) finished with goals. In other words, 183.5 transitions were needed to score one goal if the first pass was played backwards or sideways. Olsen & Larsen (1997) stated that for a team to counterattack successfully: "the first pass is especially important after the breakdown. It should go forward and be combined with great mobility". It is clear from the figures that the first pass, or action, is indeed critical to the outcome of the transition. At the top end of the scale, 34.10% (n=15) of transitions that started with a player running with the ball culminated in a S.O. and 4.55% (n=2) finished with a goal. The importance of this information cannot be understated for coaches who can implement strategies to maximise their chances of creating opportunities and scoring goals. Bradley and O'Donoghue (2011) also affirmed that the first action after the turnover was 'crucial' for counter-attacking success in elite Gaelic Football. However, they found that the shorter hand pass was a better option than a long kick pass highlighting fundamental differences between the two sports.
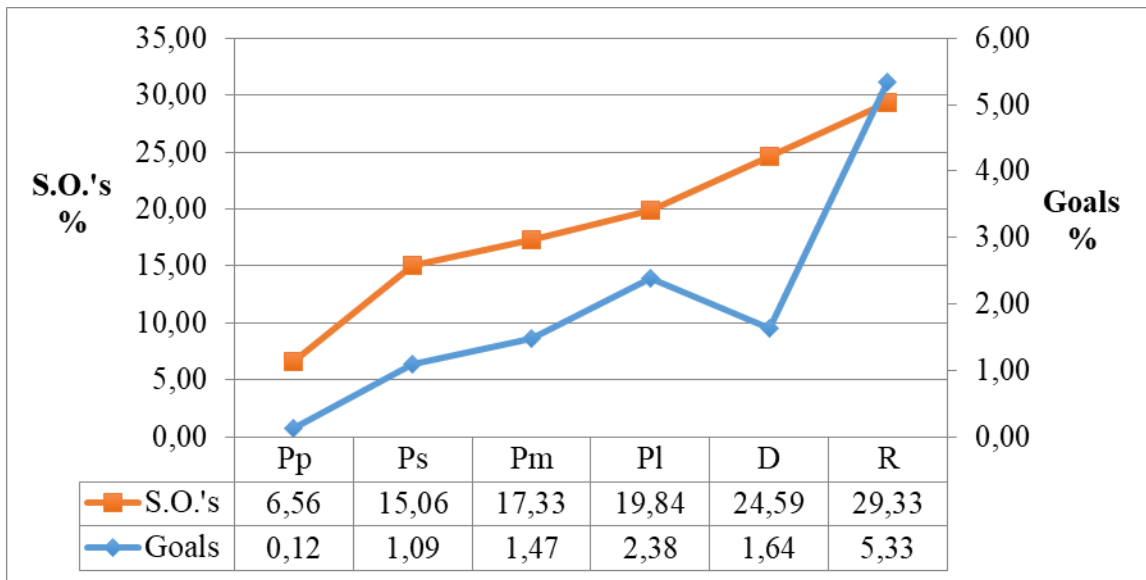
	Pp	Ps	Pm	Pl	D	R
S.O.'s	6,48	10,99	14,61	21,83	17,12	34,1
Goals	0,367	0,675	1,472	1,408	2,703	4,55

*Pearson's Chi-square

Fig. 3.5. The association between the first action of the transition on the strike rate for creating S.O.'s ($p <$ .001*) and scoring goals (p = .04*)

Transition composition – Second action

Gonzalez-Rodenas et al. (2015) demonstrated that performing a penetrative action during the first 3 seconds after the ball recovery increased the chance of creating a scoring opportunity. The results shown here substantiate that but go one step further (see figs. 3.5, 3.6). The strike rate for creating scoring opportunities ($p < .001$) and goal scoring ($p = .02$) increases almost linearly with the second action that the player on the ball performs. Fleig and Hughes (2004) suggested that long passes were unlikely to produce successful counter attacks but the data presented here indicated that long passes had a better strike rate than short or medium passes for both S.O's created and goals scored. Dribbles and runs with the ball were the most proficient on the ball actions.

	Pp	Ps	Pm	Pl	D	R
S.O.'s	6,56	15,06	17,33	19,84	24,59	29,33
Goals	0,12	1,09	1,47	2,38	1,64	5,33

Pearson's Chi-square

Fig 3.6. The association between the second action of the transition on the strike rate for creating S.O.'s (p < .001*) and scoring goals (p = .02*)

Successful (top 4 teams) v unsuccessful teams (5-16)

Successful teams had significantly more shots on and off target and scoring opportunities (p < .01) supporting earlier work (Lago-Ballesteros & Lago-Peñas, (2010); Lago-Peñas et al., 2010). When the S.O.'s were sub grouped by zone there was a less obvious message (see fig. 3.7). Successful teams created more S.O.'s (p < .001) from all zones except the offensive zone opposing the findings of Winter & Pfeiffer (2016) who showed that successful teams at the individual match level of Euro 2012 do not differ regarding transition play after a ball recovery. A closer look at turnovers from the defensive half revealed that successful teams were twice as likely to create a S.O. from the defensive zone, and 1.5 times more likely from the defensive midfield zone upholding previous work (Gomez et al., 2012; Barreira et al., 2014). As over 80% of S.O. transitions from the offensive zone took 1-3 actions, and over 70% of S.O. transitions from the other 3 zones took 4-6 actions, the results indicate successful teams were better at building longer transitions. Grant et al. (1998) discovered that successful teams were better at moving the ball forward for longer sequences of play and the data presented here corroborates that finding.
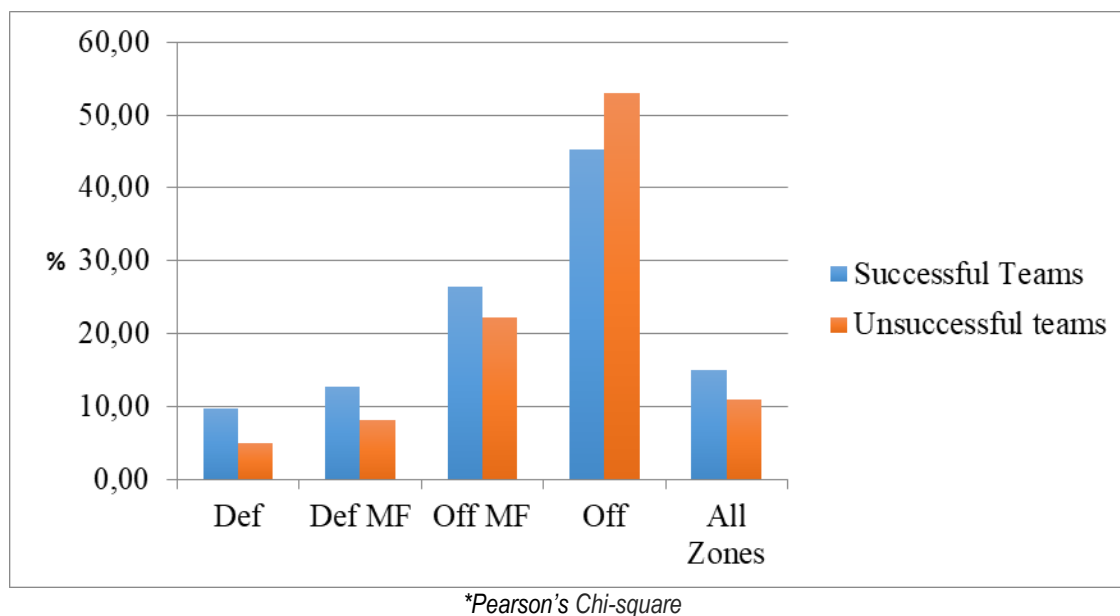
Pearson's Chi-square

Fig 3.7. Differences between successful and unsuccessful teams for creating S.O.'s from transitions initiated in each zone ($p < .001*$)

Evolving tie status and S.O.'s

The status of the tie was notated for each turnover and transition, but any results have to be tempered by the nature of two leg matches where a team could be losing the first leg 2-1 but be quite happy with the result. When the turnovers were sub-grouped by zone and evolving tie status, there were no significant differences for the number of turnovers won but there were for S.O.'s created ($p = .04$) – see fig. 3.8. Drawing and losing teams were more efficient in the offensive half indicating a greater urgency to create a S.O.
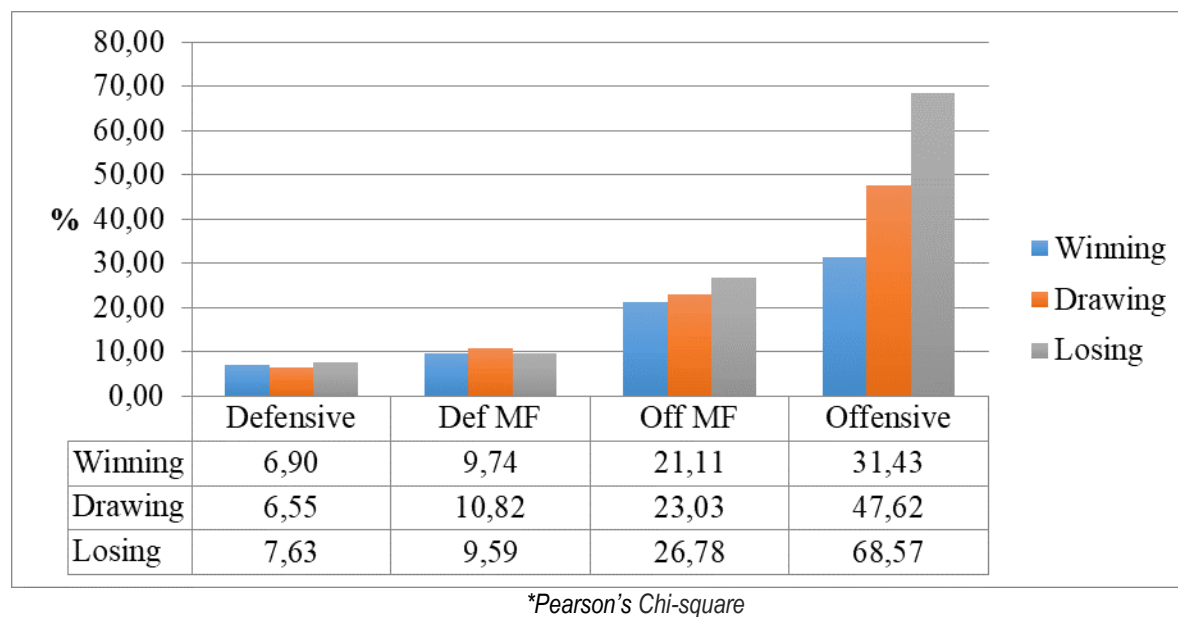

	Defensive	Def MF	Off MF	Offensive
Winning	6,90	9,74	21,11	31,43
Drawing	6,55	10,82	23,03	47,62
Losing	7,63	9,59	26,78	68,57

Pearson's Chi-square

Fig 3.8. The association between evolving tie status on the strike rate for creating S.O.'s from transitions initiated in each zone ($p = .04*$)

CONCLUSION

The data presented here break new ground on turnovers and transition to attack in the modern game. The main research findings were:

- There were significantly more goals scored, and scoring opportunities created per transition from turnovers in the offensive and offensive midfield zone than there were from turnovers in the defensive and defensive midfield zone.
- The type of turnover that starts a transition is important with a tackle most prolific for creating S.O.'s and scoring goals.
- The first and second actions after the turnover are critical, and significant. The ball should go forward immediately with a player running with the ball the optimal first action. Longer passes provide a higher chance of creating a S.O. than short or medium passes.

From a coaches' standpoint there is a very strong argument presented here to adopt strategies that focus on pressing high, with the emphasis on winning tackle turnovers. There's also a clear case for starting transitions to attack with forward passes and actions. Finally, coaches should consider that the benefits of starting a transition from the defensive half with a long pass are two fold; (1) the prospect of scoring increases and (2) the chance of conceding a goal from an opposition turnover decreases, which upholds the original philosophy of Charles Reep (Reep and Benjamin, 1968).

Strengths

The analysis system that was constructed for this research was comprehensive - covering all elements of a transition, accurate – producing reliable, detailed non-parametric data and valid – answering the questions posed in the problem statement. A full game was coded, exported into excel and formatted for analysis in 80-100 minutes (depending on the number of transitions). The analysis technique produced information, which heretofore was only anecdotal, for coaches to ingest and base training and game strategies around. One of the drawbacks was the low frequency of some variables, in particular goals, for statistical analysis but Tenga et al. (2010c) did show that scoring opportunities could be used as a proxy for goals scored when comparing the effectiveness of different playing tactics in soccer.

Limitations

All the games used for the study were downloaded from www.wyscout.com and were recorded from terrestrial television (Sky Calcio mainly). They have a significant amount of replays resulting in some turnovers and transitions being missed. Also some of the camera angles (particularly the close up pitch-side angles) used can make it difficult to identify the area of the pitch where the turnovers take place.

Delimitations

The operational definitions that are used in the study have been developed from a review of the literature, and through the experimental design process and may not be universally agreed in either the performance analysis or football spheres. The software chosen is the one that the researcher is familiar with and has chosen to use. Other software would have given more functionality to the system if the operator had the time and money to invest.

RECOMMENDATIONS FOR FUTURE RESEARCH

There are a number of recommendations that could be made to the experimental design for further research:

- Outcomes: Add a through ball to 18 yard box outcome, as there were a number of dangerous through balls that did not register as a successful transition outcome.
- Outcomes: Introduce a score box possession outcome as used by previous scholars (Tenga et al. 2010a; 2010b; 2010c; Lago-Ballesteros et al. 2012) to allow direct comparisons with their research, but also to have consistency of terms in the research area.
- Opposition Interaction: The same researchers included a measure of the opposing team's defence and this could also be incorporated to provide a more valid analysis of transition to attack.
- Turnovers: All turnovers need to be recorded (not just the turnovers that were followed by at least one complete action) to provide a complete analysis of a team's transition to attack strategy.
- Pre turnover opposition possession type: In this the age of the "counter press", the type of possession that the opposition had prior to the turnover should be notated to establish did the transition start from opposition build up play, set-piece or has the ball been won back from a counter press.

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