

Game location and aggression in rugby league

MARC V. JONES¹, STEVEN R. BRAY², & STEPHEN OLIVIER³

¹*Sport, Health and Exercise, Staffordshire University, Stoke-on-Trent, UK,* ²*Department of Kinesiology, University of Lethbridge, Lethbridge, Alberta, Canada,* and ³*Division of Sport Sciences, Northumbria University, Newcastle upon Tyne, UK*

Abstract

The present study examined the relationship between aggression and game location in rugby league. We videotaped a random sample of 21 professional rugby league games played in the 2000 Super League season. Trained observers recorded the frequency of aggressive behaviours. Consistent with previous research, which used territoriality theories as a basis for prediction, we hypothesized that the home team would behave more aggressively than the away team. The results showed no significant difference in the frequency of aggressive behaviours exhibited by the home and away teams. However, the away teams engaged in substantially more aggressive behaviours in games they lost compared with games they won. No significant differences in the pattern of aggressive behaviours for home and away teams emerged as a function of game time (i.e. first or second half) or game situation (i.e. when teams were winning, losing or drawing). The findings suggest that while home and away teams do not display different levels of aggression, the cost of behaving aggressively (in terms of game outcome) may be greater for the away team.

Keywords: *Home advantage, observational methods, rugby league*

Introduction

In their landmark review, Courneya and Carron (1992) defined home advantage as “the consistent finding that home teams in sport competitions win over 50% of the games played under a balanced home and away schedule” (p. 13). Research over the past 25 years has consistently demonstrated a performance advantage associated with competing at home for teams across a range of sports and levels (Courneya & Carron, 1992; Nevill & Holder, 1999). Courneya and Carron (1992) proposed a conceptual framework designed to capture the major factors that contribute to home advantage. They identified four game location factors (i.e. the crowd, travel, rules and familiarity with the competition arena) that linked to the psychological and behavioural states of the principal actors (i.e. athletes, coaches and officials) and culminated in a hierarchy of performance outcomes (i.e. primary, secondary and tertiary).

Since the publication of their review, Courneya and Carron’s (1992) model has been a stimulus for research investigating potential contributory factors (see Carron *et al.*, this issue). However, despite the proximity of athletes’ behavioural states to the various performance outcomes associated with

home advantage, research on behaviour has been stagnant for over a decade (again, see Carron *et al.*, this issue).

The importance of understanding underlying behavioural mechanisms that contribute to home advantage has been outlined by a number of researchers (e.g. Bray, Jones, & Owen, 2002; Courneya & Carron, 1992; McGuire, Courneya, Widmeyer, & Carron, 1992; Terry, Walrond, & Carron, 1998). Athletes may behave differently when competing at home compared to away for a variety of reasons. For instance, research has shown that coaches adopt a more defensive approach when playing away and directives from coaches may impact on player behaviour (Dennis & Carron, 1999). Data are also consistent with an interpretation that athletes may exert more effort and demonstrate greater persistence at home because of higher levels of confidence (Bray *et al.*, 2002). However, historically the most often studied behaviour among athletes in game location research has been aggression.

The focus on aggression in home advantage research is not entirely surprising, as aggression has been shown to be an important variable related to sport performance (e.g. Sheldon & Aimar, 2001). Territoriality theories suggest that people identify

with places will protect them against attack (Edwards & Archambault, 1989; McGuire *et al.*, 1992). This implies that home teams should display more aggression than away teams. An additional foundation for this hypothesis was provided by Neave and Wolfson (2003), who found that soccer players had higher concentrations of testosterone before playing at home compared to away. In general, research supports a positive, albeit weak, relationship between testosterone concentrations and aggression (Book, Starzyk, & Quinsey, 2001).

Early research on game location and aggression produced conflicting findings (see Courneya & Carron, 1992; McGuire *et al.*, 1992). However, there are also difficulties in interpreting past findings due to the inconsistent definitions of aggression used in those studies. As McGuire *et al.* (1992) adeptly pointed out, aggression had been operationalized as behaviours more accurately defined as assertive, or a combination of aggression and assertion, rather than aggression *per se*.

This limitation was addressed by McGuire *et al.* (1992) when they examined the frequency of aggressive penalties awarded to home and away teams during the National Hockey League's 1987–1988 season. Their findings showed no differences in aggressive penalties between home and visiting teams. However, there was a significant interaction between game location and game outcome, with home teams being more aggressive in games they won and away teams being more aggressive in games they lost.

McGuire *et al.* (1992) concluded that games with high levels of aggression favoured the home team, as it enticed the crowd to become more actively involved in the contest, which in turn energized and motivated the home players. However, this conclusion should be tempered somewhat, since recent findings indicate that games with higher levels of aggression may favour the home team because officials are more likely to penalize the away team (Nevill, Balmer, & Williams 2002). That is, the cost of behaving aggressively may be greater to the away team (because they are more likely to be penalized) than the home team.

Despite the efforts of McGuire *et al.* (1992) to provide more insight into the relationship between game location and player aggression, questions remain about the actual aggressive behaviours committed by players when playing at home and away. Specifically, McGuire *et al.* used archival data that reflected only the number of penalties assessed by the referee and not the number of aggressive behaviours that actually took place during the games. Because it has been demonstrated empirically that National Hockey League officials aim for consistency in their assessment of

penalties rather than penalizing every aggressive act (Rains, 1984), there are likely to have been inconsistencies between the number of penalties recorded and the number of aggressive acts carried out in their sample.

The purpose of the present study was to examine differences in player aggression as a function of game location in rugby league. The study was intended to extend the work of McGuire *et al.* (1992) by using an observational methodology to assess aggressive acts committed by players during competition as opposed to examining archival data of penalties assessed by referees. The strength of using an observational method to assess aggression has been outlined by Kirker, Tenenbaum and Mattson (2000): "The observation of game behavior in real time and the context in which it occurs provides the best opportunities to understand the complex dynamics of aggressive behavior in sport" (p. 376). Indeed, observational methods have been used increasingly in recent studies of aggression in sport (e.g. Coulomb & Pfister, 1998; Kirker *et al.*, 2000; Sheldon & Aimar, 2001).

Rugby league matches were chosen for the present study because it is a collision sport in which aggressive incidents occur. Also, the rules of rugby league make it more likely that there will be an equal distribution of possession between home and away teams. This is an important consideration, as one difficulty in assessing the impact of a game location on aggression in many sports such as soccer, hockey and rugby union is that the home team may be more offensive in their tactics (Dennis & Carron, 1999) and retain possession of the ball or puck longer. In rugby league, possession of the ball is controlled. That is, each team is given six tackles or chances to score. If they have not scored within those six tackles, then possession is awarded to the opposing team. Typically, if teams have not scored by the fifth or sixth tackle, they pre-empt this changeover and punt the ball downfield, thereby handing possession of the ball over to the opposition, but gaining territory.

Due to the equivocality of previous findings on player aggression as it relates to game location, hypotheses were necessarily conservative. However, in line with previous studies that have examined aggression in this context, we drew upon territoriality theories as a basis for prediction. Accordingly, we hypothesized that home teams would display greater aggression than away teams. In line with recommendations by McGuire *et al.* (1992), a micro-analytic research strategy was employed whereby the relationships between critical game variables (game outcome, time of game, current state of game) were also considered to better understand how game location may impact aggression.

Methods

Sampling of games

We videotaped a random sample of 21 professional rugby league games from the 2000 Super League season (Super League V). Ten of the 12 teams in the league were included in the study. One team was involved in one sampled game (Huddersfield-Sheffield), one team was involved in two sampled games (Hull), three teams were involved in three sampled games (Bradford, Halifax, London), one team was involved in four sampled games (Castleford), one team was involved in five sampled games (Leeds), one team was involved in six sampled games (Warrington) one team was involved in seven sampled games (St Helens) and one was involved in eight sampled games (Wigan).

Classification of behaviours

In a pilot project, an approach based on research by Widmeyer and Birch (1984) to classify aggressive penalties in ice hockey was used to determine aggressive behaviours in rugby league. A sample of current rugby players, coaches and officials was asked to identify specific behaviours that they considered to be aggressive play. The definition of aggression provided by Baron and Richardson (1994 p. 7) – “any form of behaviour directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment” – was used as a basis for their determination of aggressive behaviour.

The sample comprised seven current rugby league players who each had approximately 10 years playing experience and who had played at county standard or above. One player was currently part of the emerging Scotland student rugby league team, two were qualified club coaches and one was a qualified rugby league referee with two years experience. The players took part in a focus group and were asked to outline aggressive behaviours that could be exhibited by teams defending (Defensive Aggression) and attacking (Offensive Aggression). These behaviours were combined to give an overall index of aggressive behaviours. The list of behaviours generated were: high tackle, flop, punch/forearm, head butt, facial (rubbing the face of the attacking player by either using their hand or pushing the face into the ground after a tackle), late tackle, gouge/bite, stamp, off-the-ball aggression, forearm/elbow, and kick out (done by an attacking player when the tackler is lying on him preventing him from getting up).

Procedure

Two research assistants were trained in the use of the coding scheme. When recording aggressive beha-

viours, the researchers coded the time the incident occurred and whether the player who exhibited the behaviour was in a team that at that time was winning, losing or level. The two research assistants watched and coded two games together to familiarize themselves with the scoring system. The research assistants then coded a separate set of three games independently (i.e. the same three games were coded by both assistants). Inter-rater reliability was 86% for those three games, which is comparable to other sport psychology research that has utilized observational data (e.g. Coulomb & Pfister, 1998; Krane, 1993; Sheldon & Aimar, 2001). The remaining 16 games were then coded independently by the researchers, each researcher coding eight games.

Results

Because all data were nominal levels of measurement (frequency counts), we considered the chi-square test to be most appropriate for the analysis. With an alpha level of 0.05, each test had sufficient power (> 0.8) to detect a small to medium effect size (Cohen, 1988).

The data were analysed in five stages. First, we examined the impact of game location on the frequency of aggressive behaviours in the entire sample of 21 games. Second, to control for the possible confounding effect of unbalanced team quality, we examined the impact of game location on the frequency of aggressive behaviours in a sample of 10 games with evenly matched teams. In line with recommendations by McGuire *et al.* (1992), the remaining analyses explored how critical game variables impacted the relationship between game location and aggression. Separate analyses were conducted to explore the relationship between aggression and game location as a function of game outcome, aggression and game location as a function of time of game, and aggression and game location as a function of the current state (i.e. winning, losing, tied) of the game.

Data from the complete sample of 21 games

The game outcome results from the sample of 21 games were evenly balanced, comprising 10 games which ended in a victory to the home side, 10 games which ended in a victory to the away side, and one game tied. Overall, there was no significant difference [$\chi^2 (1, n = 632) = 0.63, P > 0.05$] in the number of aggressive behaviours exhibited by the home ($n = 306$) and away ($n = 326$) teams.

Data from evenly matched teams

End-of-season position in the table was used to classify the contests as evenly or unevenly matched.

Games were considered evenly matched if they involved two teams that qualified for the end-of-season play-offs (positions 1–5) or involved two teams that finished out of the play-offs (positions 6–12). Using these criteria, the data set yielded a total of 10 games involving evenly matched opponents. In those 10 games, the home team won six games, the away team won three games, and one game was drawn. There was no significant difference [χ^2 (1, $n = 326$) = 0.60, $P > 0.05$] in the number of aggressive behaviours exhibited by the home ($n = 156$) and away ($n = 170$) teams in this analysis either.

Aggression, game location and game outcome

The number of aggressive behaviours exhibited by the home and away teams in games that ended in a victory for one or the other (10 for the away team and 10 for the home team) are shown in Figure 1. A 2×2 (team \times game outcome) chi-square analysis was conducted. In line with recommendations by Thomas and Nelson (1996), the Yates' correction for continuity was included. In this case, results showed there was a significant difference [χ^2 (1, $n = 581$) = 5.84, $P < 0.05$] in the pattern of aggressive behaviours exhibited by the home and away teams. Inspection of Figure 1 shows that there was little difference in the frequency of aggressive behaviours in games won or lost by the home team. However, it is clear that the away team engaged in more aggressive behaviours in games they lost compared with games they won.

Aggression, game location and time of game

Separate 2×2 (home and visiting team \times first and second half) chi-square analyses were conducted for

games won by the home and away teams and games lost by the home and away teams. In line with recommendations by Thomas and Nelson (1996), the Yates' correction for continuity was included. The frequencies of aggressive behaviours in each half for games won by home and away teams are shown in Figure 2. There was no significant difference [χ^2 (1, $n = 256$) = 1.21, $P > 0.05$] in the pattern of aggressive behaviour between home and away teams. The frequencies of aggressive behaviours in each half for games lost by home and away teams are shown in Figure 3. Again, there was no significant difference [χ^2 (1, $n = 325$) = 0.01, $P > 0.05$] in the pattern of aggressive behaviour between home and away teams. In both instances (Figure 2 and 3), aggressive behaviours were higher in the first half than the second half.

Aggression, game location and game situation

The numbers of aggressive behaviours displayed by the home and away teams as a function of game situation (winning, losing, tying) are displayed in Figure 4. A 2×3 (team \times game situation) chi-square analysis showed no significant difference [χ^2 (2, $n = 632$) = 0.82, $P > 0.05$] in the pattern of aggressive behaviours exhibited by the home and away teams in relation to game situation.

Discussion

The purpose of the present study was to examine differences in player aggression as a function of game location in rugby league. Overall findings showed there was no difference in the levels of aggression exhibited by the home and away teams. Nor did the pattern of aggressive behaviour exhibited by home and away teams differ significantly as a function of

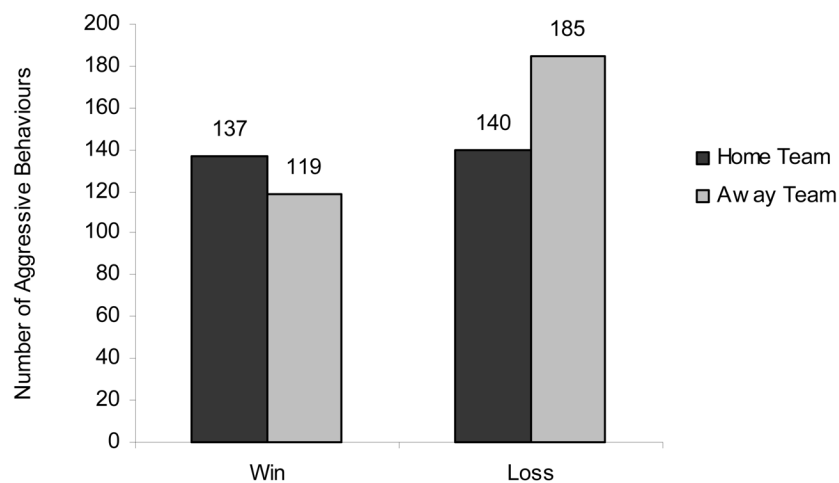


Figure 1. The number of aggressive behaviours exhibited by home and away teams as a function of game outcome.

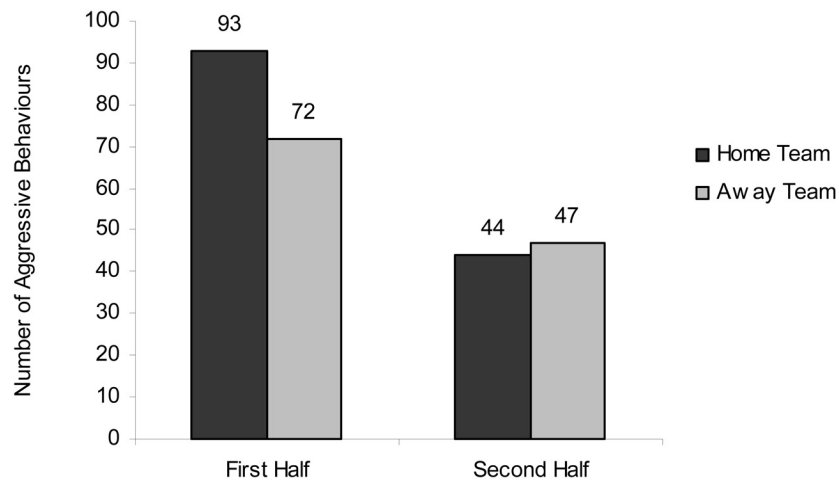


Figure 2. The number of aggressive behaviours per half exhibited by home and away teams for games which they won.

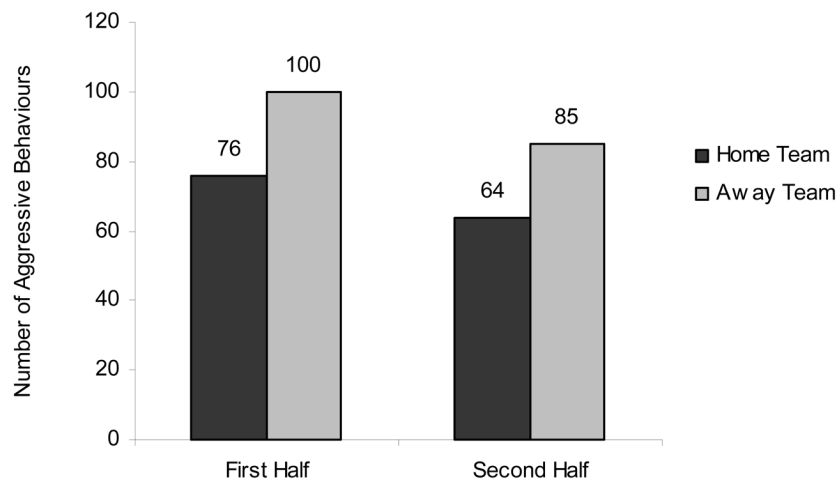


Figure 3. The number of aggressive behaviours per half exhibited by home and away teams for games which they lost.

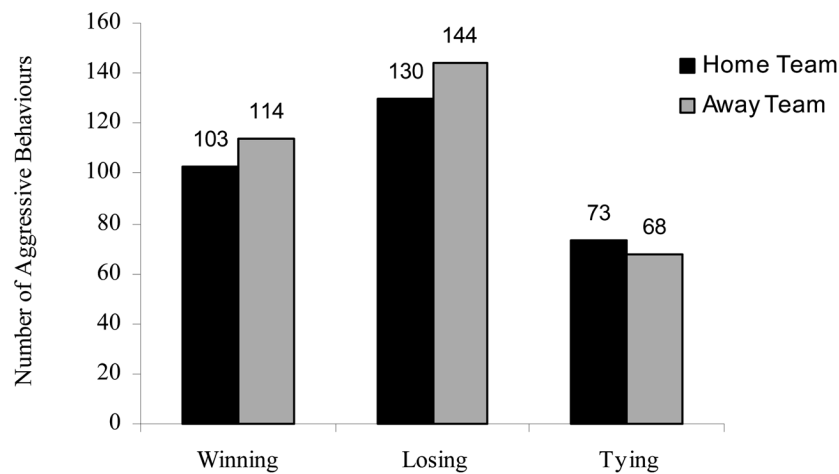


Figure 4. The number of aggressive behaviours exhibited by home and away teams as a function of game outcome

the time of game or the current state of game. However, the pattern of aggressive behaviours

exhibited by home and away teams did differ significantly as a function of game outcome. That

is, away teams engaged in significantly more aggressive behaviours in games that they lost compared with games they won, while there was little difference in the frequency of aggressive behaviours exhibited by home teams across games as a function of game outcome.

There are several possible reasons why the home teams did not display higher levels of aggression than the away teams. First, there are some concerns about applying territoriality theories to humans in sport settings; defence of these territories for athletes is not a matter of life or death as it may be for animals (Edwards & Archambault, 1989). Even if performing at home is associated with a greater likelihood of responding aggressively, because athletes have a desire to defend their territory, this does not necessarily mean that athletes playing at home will *actually* display higher levels of aggression. Athletes may choose not to aggress because such behaviour is likely to be penalized by officials, which may have a substantial impact on chances of success (Widmeyer, Dorsch, Bray, & McGuire, 2002).

Second, while research has indicated that athletes competing at home have higher concentrations of testosterone (Neave & Wolfson, 2003), this does not necessarily mean that they will behave in a more aggressive manner. Although positive, the relationship between testosterone and aggression is not thought to be strong (Book *et al.*, 2001). Instead, increased testosterone may contribute to the home advantage by influencing other factors that lead to increased likelihood of success in sport. Neave and Wolfson (2003) reported that increased concentrations of testosterone may result in increased dominance in face-to-face encounters (behaviours more akin to assertion), a greater willingness to take risks, improved reaction time, improved aspects of spatial ability and increased metabolic rate of muscles.

The suggestion that athletes may display greater aggression at home is also at odds with one study that assessed the psychological state of rugby players before home and away games. Terry *et al.* (1998) found that players reported higher levels of anger when competing away from home than when competing at home. Given that levels of anger are typically associated with levels of aggression (Berkowitz, 1993), this would suggest that away teams will behave more aggressively.

Similar to McGuire *et al.* (1992), the results of the present study indicate that time of game and game situation do not appear to influence the relationship between game location and aggression. The finding that there is a different pattern of aggression levels between home and away teams as a function of game outcome is also partially consistent with the findings of McGuire *et al.* Contrary to McGuire *et al.*,

however, our results showed no difference in the aggression displayed by the home team between games they won and lost. However, we found away teams engaged more frequently in aggressive acts in games which they lost compared to games they won. This is in line with the findings of McGuire *et al.*, who found that teams playing away from home were called for more aggressive penalties in games which they lost.

In their study, McGuire *et al.* (1992) concluded that games with high levels of aggression favoured the home team, as it enticed the crowd to offer more active involvement in the contest, and in turn energized and motivated the home players. However, the findings of the present study are more in line with the suggestion that games with higher levels of aggression do not so much favour the home team as hinder the away team, as the away teams displayed higher levels of aggression in games which they lost. Because recent research has outlined that officials are more likely to penalize the away team (Nevill *et al.*, 2002), the cost of behaving aggressively may be greater to the away team than the home team because they are more likely to be penalized.

Using an observational method to assess aggression, the present study was an attempt to explore the relationship between game location and aggression. It supports earlier findings (McGuire *et al.*, 1992) that game outcome is a factor in the game location–aggression relationship. Future research into aggression and game location may wish to build on the findings of this study and those of McGuire *et al.* and explore whether games with higher levels of aggression favour the home team because it energizes the crowd to become more actively involved in the contest, or whether behaving aggressively is more detrimental to the away team because of the increased likelihood of being penalized.

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