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An investigation of home advantage and other factors affecting outcomes in English one-day cricket matches

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Abstract

We examined the factors affecting the outcome of cricket matches played in the English one-day county cricket league. In particular, we focused on the home-field effect and the importance of winning the pre-match toss of a coin to determine a team's strategic decision to bat first or second. A home-field effect appeared to be confirmed in that home teams won 57% of all matches with a win/loss result. A logistical regression model was used, with the outcome variable defined in terms of a home team win/loss. We found that while winning the toss is an important aspect of a one-day cricket match, other factors tend to dominate in determining the result, especially team quality and match importance for the home and away teams in the overall league context. Our results also indicate, not surprisingly given the nature of cricket attendance and spectating, that the crowd effect is largely insignificant. The results of our study do not support any rule changes requiring the abandonment of the coin toss to determine batting order.

Keywords: *Cricket, home advantage, team sports, tournament rules*

Introduction

Home-field advantage in team sports refers to the phenomenon that teams playing at home win significantly more often than chance would dictate. For competitions in which all matches involve a win/loss result, home-field advantage may be defined as “the consistent finding that home teams in sports competitions win over 50% of the matches played under a balanced home and away schedule” (Courneya & Carron, 1992, p. 13), with the implied home advantage being higher the greater the percentage point excess above 50%. Following the seminal work of Schwartz and Barsky (1977) and Edwards (1979), considerable descriptive evidence of significant home-field advantage has emerged for a range of team sports (for reviews, see Courneya & Carron, 1992; Nevill & Holder, 1999). While much of this research is US-based, and mainly covers American football, baseball, basketball and ice hockey, there are also studies relating to English and Scottish association football (soccer) (Clarke & Norman, 1995; Nevill, Newell, & Gale, 1996; Pollard, 1986) and Australian Rules football (Stefani & Clarke, 1992). In general, the evidence indicates clear and histori-

cally stable home-field advantage, although its magnitude varies between sports and, to an extent, between different competitions and levels within a sport (e.g. professional and college football in the USA, English league soccer and European soccer competitions). Courneya and Carron (1992) presented composite home advantage figures, involving a quantitative synthesis of studies that have examined home advantage in major team sports in terms of the win percentage of decided matches (i.e. baseball 53.5%, football 57.3%, ice hockey 61.1%, basketball 64.4%, soccer 69%).

Basic explanations for the causes of home-field advantage and its effects have mainly approached the issue from the viewpoint of social psychology (e.g. Edwards, 1979; Edwards & Archambault, 1989; Schwartz & Barsky, 1977). Accepting that different sports possess varying mixes of home advantage factors, which themselves interact, the major causal factors can be viewed as falling within four categories:

1. *Learning/familiarity* associated with home and visiting teams” differing levels of intimacy with arena/ground facilities (e.g. Barnett & Hilditch, 1993; Moore & Brylinski, 1995; Pollard, 2002).

2. *Travel factors* based on the assumption that visiting teams experience greater fatigue and disruptions in preparation and routines, which contribute to an adverse effect on match performance (e.g. Pace & Carron, 1992).
3. *Rule factors* that may extend special privileges explicitly favouring the home team, such as the home team in baseball and softball always having the last "bat" (Courneya & Carron, 1990).
4. *Crowd effects* in terms of size and/or density, based on the assumption that there are differences in psychological support extended to home and visiting teams, which are affected both directly and indirectly by decisions by match officials (e.g. Agnew & Carron, 1994; Harville & Smith, 1994; Nevill *et al.*, 1996; Pollard, 1986).

In addition, differing tactical approaches adopted by home and away teams during a match, which are themselves not unrelated to other factors, may be important (e.g. Carmichael & Thomas, *in press*; Dennis & Carron, 1999).

While the existence of home-field advantage has become increasingly well documented and interpreted, the systematic and empirical research of its nature and causes has been more limited. Due to the difficulties in controlling many home advantage variables, and several potential interactive effects, some work has been speculative. In addition to the problems of quantifying perceived psychological factors that contribute to home-field advantage, other factors include the relative quality and strengths of the two teams – in terms of abilities and skills of individual players – team cohesion and morale, the coaching/management input, as well as the significance and/or position of a match in a league or tournament programme. In general, the empirical evidence suggests that effects of travel fatigue are minimal, the familiarity aspect is unsubstantiated, and the effects of rule factors and tactical issues have largely been ignored (e.g. Courneya & Carron, 1992; Pollard, 1986). While most research has tended to focus on the specific – and interactive – aspects of crowd effects, the results have been varied, failing to establish the precise nature of any relationship between crowd support and home advantage (e.g. Agnew & Carron, 1994). Such research has generally had two strands. First, it has contrasted outdoor sports (e.g. American Football and baseball) with indoor sports (e.g. basketball and ice hockey), the latter of which display closer crowd–player interrelations in more compressed and intense atmospheres. Second, it has examined the importance of home advantage in sports for which facilities and playing conditions are less variable and more uniform.

Despite a wealth of data, covering both individual and team performance, the sport of cricket is relatively under-researched. The earliest academic research on cricket matches and scores goes back to Elderton (1945) and Wood (1945), with more recent statistical studies by Clarke (1988), Kimber and Hansford (1993), and Preston and Thomas (2000). Schofield (1982) provided an economic analysis of the development of first-class county cricket in England. Analyses of attendance demand functions were provided by Schofield (1983) for limited-overs county cricket in England, and by Hynds and Smith (1994) for international test match cricket. Although production function studies have been undertaken by Schofield (1988) for English cricket and Bairam, Howells and Turner (1990a, b) for Australia and New Zealand cricket, there has been no explicit treatment of the home-field effect in contributing to match results.

Methods

The English one-day cricket league

During the study period, 18 county teams competed in a single one-day cricket league, scheduled to play each other once during a season, weather permitting on the fixture date, stretching from the end of April/early May to mid-September. The league championship was won by the team accumulating the highest number of points over the fixture programme. The league positions of two or more teams equal on points were determined by the greatest number of match wins over the season or, if equal, by the highest net run rate throughout the season.

A match of limited-overs cricket is played between two teams of 11 players, directly refereed by two "umpires". Each team comprises a balance of specialist "batsmen" and "bowlers", with some players combining the two roles as "all-rounders", together with a specialist "wicket-keeper" when "fielding". As played during the study seasons of 1996 and 1997, each side is allocated a maximum of 40 overs, of six balls each over, in which to "bat" for a single "innings" while the other side bowls and fields, with each bowler allocated a maximum number of overs. The order of batting is determined by a team captain's choice following his successful call on a toss of a coin before the match. Apart from wicket length, the overall playing area dimensions and arena/stadium facilities are potentially more variable than those in other outdoor but especially indoor sports. However, a potentially more critical aspect of a cricket pitch refers to the state of the playing area, particularly when affected by recent and prevailing weather conditions, which can dramati-

cally affect results by favouring batsmen or bowlers, of different kinds.

The win/loss result of a match is determined by a side scoring the most runs, whether losing all ten of its “wickets” (to various forms of dismissals) or not and regardless of the number of batsmen used, during its over allocation. There is also the possibility of a “tied” result where the two teams end the match having scored the same number of runs, regardless of the number of wickets lost. Four points are awarded to a winning team and no points to the loser, with the teams obtaining two points each in the rare event of a tie. When matches are curtailed due to poor weather conditions, before the start or at any stage of either innings, results can still be achieved in contrived form following modification of the rules. For the 1997 season, a specially designed method of determining results in weather-affected matches was introduced in the form of the Duckworth-Lewis system (Duckworth & Lewis, 1998). This was presented as a fairer method of producing a result when a match is forcibly shortened at any time after it has commenced. In the event of no – or insufficient and abandoned – play, a “no result” is declared (with no postponement or replay allowed), with each team receiving two points.

The importance of the toss

Given the nature of a cricket match, a team captain assumes considerable responsibility for tactics, particularly when his team is bowling and fielding. The captain chooses and permutes his bowlers in response to the type and form of the batsman at the wicket and the stage and state of the match, and similarly arranges fielding positions which can be changed on a ball-by-ball basis. Some teams are better equipped to bat first and set a target to defend, while others prefer to chase targets depending – all other things being equal – on their relative batting/bowling/fielding strengths in comparison with their opponents. As such, winning the toss to determine match batting order would appear to confer an advantage on a team given its known strengths and strategic preference, the nature of the opposition, and its perception of the cricket pitch and weather conditions. However, while the winning of the toss involves a 50–50 probability for each team, it may be assumed that the advantage conferred by the choice of batting order is potentially greater for the home team captain. A home team’s choice of batting order is likely to be better informed than that made by the away team captain, given the home team’s familiarity with the cricket pitch and view regarding anticipated weather and atmospheric changes during the course of the match. It is also possible that home team selection ahead of the match has been influenced by

local and current knowledge of the venue, enabling an appropriate mix of specialist batsmen and different bowling styles. Given these possibilities, it would appear that winning the toss assumes greater significance in potentially determining a result than in sports where the toss simply decides initial direction of play as, for example, for the first half of an association football or rugby football match. This, of course, is in direct contrast with the game of baseball, which, although played sequentially through nine innings with each team alternating their half-innings, does not involve choice of batting order determined by the toss. In baseball, the rules stipulate that the visiting team always bats first with the home team having the opportunity to bat last.

Data

The limited-overs league was chosen as the study context in preference to other forms of cricket for two reasons. First, far more win/loss results are seen than in the first-class county championship format, which involves two innings a side with unlimited overs; this format has a high propensity for drawn or no result matches. Second, the league provides a more balanced and fuller schedule of regular fixtures and a greater number of observations than the other premier one-day competitions involving the first-class cricketing counties, which are organized on a randomly drawn, knockout basis. Although the league structure in our study period did not generate a precise balance of scheduled home and away matches during a single season (with nine matches at home and eight away, or vice versa, for any one team), this was achieved in aggregate over the two seasons. With the second season programme involving a reversal of the previous season’s fixture list, all 18 teams were scheduled to play the same number of home and away matches (17 each) although, because of the abandonment of a few matches due to weather conditions, not all matches produced a result. For many teams, not all home matches were played at the same venue.

Our data set contains 270 observations relating to all those scheduled matches during the 1996 and 1997 league seasons which generated a win/loss result, and excludes four tied results. Of these matches, 45 were curtailed in some form or another and involved a contrived result. Apart from attendance and membership data supplied by the England and Wales Cricket Board, all match information was obtained from the *Wisden Cricketers Almanack*. There are no ethical issues involved in analysing or interpreting the data used, which were obtained in secondary form and not generated by experimentation. Full definitions of all variables employed in our study are given in Table I.

Table I. Definitions of variables

Variable	Definition
RESULT	1 for home win, 0 for away win
TOSS	1 for home team winning toss, 0 otherwise
VENUE	1 for occasionally used home venue, 0 otherwise
CURTMATCH	1 if match curtailed by weather conditions, 0 otherwise
HJENN	Jennett measure of match importance for home team in overall league championship context
AJENN	Jennett measure of match importance for away team in overall league championship context
H%POINTS	Accumulated seasonal points total of home team from all matches prior to observed fixture as a percentage of maximum aggregated match points possible from those matches
A%POINTS	Accumulated seasonal points total of away team from all matches prior to observed fixture as a percentage of maximum aggregated match points possible from those matches
MEM%	Percentage of spectators at match who are home team members
ATTEN	Total attendance at match
DERBY	1 if derby match, 0 otherwise
HOLIDAY	1 if match played on bank holiday, 0 otherwise

The dependent outcome variable (RESULT) is dichotomously defined as 1 for a home win and 0 for an away win, with the related odds ratio interpreted as the ratio of the probability of a home win to the probability of an away win. Those matches curtailed by weather conditions are dummied by a CURTMATCH variable. The rule aspects of a limited-overs match are examined by specifying TOSS as a dichotomous variable coded 1 and 0, respectively, depending on whether the home side won the toss or not to determine batting order. As discussed previously, the expected influence of winning the toss on the match result may be assumed to be positive, as far as it relates to the home team. Attempts to capture the crowd effect associated with home advantage, in terms of overall size and density of home support, involve the employment of a variable measuring total attendance at a match (ATTEN) together with another reflecting the tendency for match attendance to be dominated by home season ticket-holding members (MEM%), calculated as the proportion of total attendance comprising of home team members. Both of these may, on the basis of the earlier discussion, be hypothesized to have a positive relationship with a home win result, although their importance may be assumed to be limited given the traditional nature and (somewhat restrained) behaviour of cricket spectators. The possibility that crowd atmosphere is more intensive, and the pressure on players is greater, in those matches which are more significant for championship determination, particularly as the end of season approaches, is allowed for by employing the well-established Jennett measures (Jennett, 1984), HJENN and AJENN, which proxy the importance of a match for the home and away team, respectively, in the overall league championship context. Any particular crowd effect arising from a bank holiday fixture is dummied by a HOLIDAY

variable, while that potentially associated with a "derby" match is allowed for by a dummy variable (DERBY) defined in terms of matches between counties whose traditional boundaries are contiguous. The DERBY dummy may also indirectly, and inversely, capture any travel distance factors potentially disadvantaging an away team.

While anticipating positive and negative relationships, respectively, between the match result and home team match importance and between match result and away team match importance, neither Jennett measure of match importance in a championship context can be unambiguously assumed to have a particular directional effect on match result. This is due to the variable effects of pressure on either or both teams, and the same can be similarly argued for any anticipated derby or holiday match effects. The occurrence of occasionally used home venues (defined as two or less over the study period) is dichotomously defined by a VENUE variable in an attempt to capture any particular unfamiliarity of the away team with the nature and dimensions of the pitch and outfield and surrounding facilities, which may be assumed to positively favour a home win result. Finally, to allow for other factors which may impinge on match results, in addition to the home-field effect, the quality, strengths and overall form of the teams involved are incorporated in our model. These factors are proxied by variables relating to the accumulated seasonal points totals of the home and away teams, respectively, before a fixture expressed as a percentage of the maximum aggregated match points attainable: H%POINTS for the home team and A%POINTS for the away team. The directional effect of the former on the match result is assumed to be positive and that of the latter negative.

Processing the data shows that the home-field effect is confirmed by the fact that 57% of all

matches resulting in a definite result are won by the home team, with the percentage increasing slightly to 58% when the results of curtailed matches are excluded. This would seem to accord with the (incidental) reporting of a home advantage figure of 56% for English county championship (unlimited-overs) cricket in Pollard's (1986) study of association football. Although overall the team winning the toss was victorious in 51% of cases, the statistics show that the home team went on to win in 56% of those matches where it won the toss to choose batting order, while in contrast the away team only won 43% of those matches in which it won the toss. This suggests that (as previously explained) winning the toss appears to confer a greater advantage to the home team than the away team in terms of being able to make a better informed and potentially more successful choice regarding batting order as a means of achieving a win. The average attendance at all matches in our data set was 2937, which is small when compared with the average attendance of 3354 in the bottom division of the English Football League during the 1996–1997 season (and 28,434 for the English Premier League), while the average figure for the home members component of match attendance was 66.5%.

Model

Our model may be viewed in three stages. The first stage specification investigates the strategic effect of the importance of winning the toss on the likelihood of a home team victory, in combination with the familiarity aspects associated with venue location, with curtailed matches dummied. The next formulation additionally contains all those variables that attempt to capture the home-field effect in terms of crowd size and intensity, and match importance, together with the quality of the two teams involved. Our final specification is the most parsimonious, containing only significant variables as generated by a stepwise backward elimination procedure. All the specifications were estimated using a logistic model in which the dependent variable is *RESULT*, which has a value of 1 for a home win and 0 for a home loss. The three estimated equations are as follows:

- 1) $RESULT = f_1$ (TOSS, VENUE, CURT-MATCH)
- 2) $RESULT = f_2$ (TOSS, VENUE, CURT-MATCH, HJENN, AJENN, H%POINTS, A%POINTS, MEM%, ATTEN, DERBY, HOLIDAY)
- 3) $RESULT = f_3$ (HJENN, AJENN, H%POINTS)

Various interactions were also considered, including those relating to winning the toss and batting order, but none were found to be significant. In addition, the construction of a correlation matrix (not reported) for the explanatory variables displayed no evidence of any high correlations, which might imply serious multicollinearity problems, with only the variables measuring match attendance and home team match significance showing any sign of correlation with a coefficient of 0.36.

Although the potential existence of a full set of paired and reversed venue fixtures offers a further and more direct opportunity to examine home advantage, we did not explicitly investigate this for two reasons. First, the data are incomplete and unbalanced, with 32 of the 270 win/loss observations having no pairing due to a "no result" in one of the reverse fixtures (due to abandonment) and 45 paired fixtures displaying an unevenness due to match curtailment (requiring a "contrived" result) in one of the fixtures. Second, the informational content of reverse fixture comparisons when paired matches are played in separate seasons (rather than in the same season) is necessarily limited, as considerable changes may have occurred in team compositions over the period. These problems are obviated or reduced in the case of, for example, a full schedule of English Premier League football matches played on a home and away basis during a single season.

Results

The results of our three logistic estimations are reported in columns 1, 2 and 3 of Table II, and include log-likelihoods and pseudo- R^2 values indicating the percentage of correctly predicted outcomes.

In the first regression estimation (column 1), a home team win of the toss is shown to be positively significant at the 5% level with the variables indicating occasional venues and curtailed matches both non-significant. In the second set of results (column 2), all variables are incorporated into the model, with only that indicating away team match importance, in a league context, being (negatively) significant at the 5% level. The non-significance of most variables, including that indicating a home team win of the toss, required the estimation of our most parsimonious model (column 3) as generated by backward elimination. This model consists of three significant variables explaining a home win match result. The importance of a match in a league championship context is shown to be significant for both the home team (positively at 10%) and the away team (negatively at 5%), with the variable measuring quality/strength and form of the home team positively significant (at the 5% level).

Table II. Logistic results for home advantage in limited-overs cricket (dependent variable is RESULT)

Variable	1	2	3
TOSS	0.380** (1.982)	-0.168 (0.634)	
VENUE	-0.260 (0.844)	-0.299 (0.864)	
CURTMATCH	0.046 (0.144)	-0.693 (0.187)	
HJENN		1.693 (1.206)	2.403* (1.711)
AJENN		-3.090** (2.181)	-3.596** (2.730)
H%POINTS		0.436 (0.754)	0.691** (2.065)
A%POINTS		-0.760 (1.338)	
MEM%		0.485 (0.855)	
ATTEN		0.116 (1.189)	
DERBY		0.367 (1.058)	
HOLIDAY		-0.473 (1.022)	
<i>LL</i>	-184.790	-161.214	-164.572
<i>R</i> ²	53%	62%	63%

Notes:

t-statistics are in parentheses; *significant at 10%, ** significant at 5%.

LL is the log likelihood function. *R*² is the percentage of correctly predicted outcomes, sometimes termed the pseudo-*R*².

n = 270 for estimation 1 and *n* = 250 for estimations 2 and 3 due to the absence of observations for H%POINTS and A%POINTS for the first seasonal match for a team.

Discussion

Our study of matches played in the English one-day county cricket league during the 1996 and 1997 seasons provides further evidence for the existence of a home-field effect in professional team sports, in that home teams won 57% of all matches with a win/loss result. While it initially appears that the toss has a significant effect on the result of a match, to the extent that it confers a particular advantage to the home team when it wins the toss to decide match batting order, our specified regression model does not allow us to demonstrate its explicit contribution. The effect of winning the toss is nullified when team quality and match importance in the overall league championship context are added to the specification, indicating that these factors are most important for determining match outcomes. In particular, our results show that the likelihood of a home win is higher the greater the quality and form of the home team and the greater the importance of the match to the home team in a league context, while the likelihood is lower the greater the similar importance of the match to the away team. The non-significance in our model of the strength/quality and form of the away team may be explained by the subsumption of these factors into the home-field effect.

With respect to those variables which proxy direct and indirect crowd effects, both aggregate match attendance and home member presence are found to be non-significant. This appears to reflect the nature of crowds at English cricket matches, where the atmosphere is more muted and the crowd effect generally less compressed and intensive than that found in other professional team sports, particularly

those played in more enclosed and confined indoor stadiums. The lack of a crowd effect seems to be further confirmed by the non-significance of variables indicating popular derby and holiday matches. However, the significance of the two variables measuring match importance for the home and away teams in a league championship context indicates the possibility of indirect crowd atmosphere effects, particularly when associated with matches that have a greater bearing on championship outcomes. In addition, it should be noted that although crowd effects may be limited in various forms of English domestic cricket, this may not be the case in international test match cricket, which is often, though not always, played in vast arenas with large, vociferous and intimidating crowds. The associated pressure on umpires in such circumstances (see Sumner & Mobley, 1981) has led to the relatively recent introduction of “neutral” country umpires. A fuller study of pressure on officials could involve a detailed investigation of match-play statistics focusing on dismissals requiring an explicit umpiring decision, in particular the contentious issue of “leg before wicket” (LBW). However, while all batting dismissals are recorded for each match, there is no record of “not out” decisions given in favour of the batsmen in response to appeals, whether reasonable or unreasonable, from the fielding side.

Our results provide no support for a simple, but often mooted, rule change involving the abandonment of the toss in one-day cricket matches. It would appear that allowing the visiting team to automatically choose order of batting, to reduce any familiarity advantage to the home team, would not affect the outcome in terms of reduced

probability of the home team winning. However, while this conclusion may apply to the limited-overs form of cricket examined in this study, further research is required of the implications of the toss and choice of batting order for other forms of cricket. This applies to other variants of one-day, limited-overs cricket of both domestic knock-out form and at international level, where matches often are of longer duration with early morning batting the norm, as well as for "first-class" county cricket and test match cricket, of two-innings a side and unlimited overs, played on a number of consecutive days. In the latter case, the importance of the home team winning the toss may be great with the possibility of pitch preparation (or "doctoring") "sympathetic" to the home team being a regular source of controversy and debate. Finally, the implications of winning the toss in determining the order of batting may be especially relevant in limited-overs matches played on a day-night basis, where the side batting second under artificial lighting may be disadvantaged. While this was a particularly controversial issue during the 2003 Cricket World Cup in South Africa, a meaningful empirical investigation of the day-night issue awaits an appropriate accumulation of such matches (e.g. "India demand semi switch", *Guardian Unlimited*, 6 March 2003).

While our model results do not provide conclusive evidence about isolating and explaining any home-advantage effect in English one-day cricket, the fact that the data clearly indicate its existence may suggest that, as noted by Pollard (1986), the explanation lies in the operation of complex psychological factors. These include the possibility of a self-fulfilling effect that "the very acceptance of the existence of home advantage may itself create a vicious circle which contributes to its cause" with respect to both the home team and the away team (Pollard, 1986, p. 247). As such, and despite the proliferating research on home-field advantage in team sports, it would appear that much still remains to be learned regarding the complex mechanisms that contribute to its relevance in determining a match result.

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References

- Agnew, G. A., & Carron, A. V. (1994). Crowd effects and the home advantage. *International Journal of Sports Psychology*, 25, 53–62.
- Bairam, E. I., Howells, J. M., & Turner, G. M. (1990a). Production functions in cricket: The Australian and New Zealand experience. *Applied Economics*, 22, 871–879.
- Bairam, E. I., Howells, J. M., & Turner, G. M. (1990b). Production functions in cricket: One day and three day matches in New Zealand. *Journal of the Australian Society of Sports History*, 6, 203–217.
- Barnett, V., & Hilditch, S. (1993). The effect of an artificial pitch surface on home team performance in football (soccer). *Journal of the Royal Statistical Society, Series A*, 156, 39–50.
- Carmichael, F., & Thomas, D. (in press). Home-field effect and team performance: evidence from English Premiership football. *Journal of Sports Economics*.
- Clarke, S. R. (1988). Dynamic programming in one-day cricket: Optimal scoring rate. *Journal of the Operational Research Society*, 39, 331–337.
- Clarke, S. R., & Norman, J. M. (1995). Home ground advantage of individual clubs in English soccer. *The Statistician*, 44, 509–521.
- Courneya, K. S., & Carron, A. V. (1990). Batting first versus last: Implications for the home advantage. *Journal of Sport and Exercise Psychology*, 12, 312–316.
- Courneya, K. S., & Carron, A. V. (1992). The home advantage in sport competitions: A literature review. *Journal of Sport and Exercise Psychology*, 14, 13–27.
- Dennis, P. W., & Carron, A. V. (1999). Strategic decisions of ice hockey coaches as a function of match location. *Journal of Sports Sciences*, 17, 263–268.
- Duckworth, F. C., & Lewis, A. J. (1998). A fair method of resetting the target in interrupted one-day cricket matches. *Journal of the Operational Research Society*, 49, 220–227.
- Edwards, J. (1979). The home field advantage. In J. H. Goldstein (Ed.), *Sports, matches, and play: Social and psychological viewpoints* (pp. 409–438). Hillsdale, NJ: Erlbaum.
- Edwards, J., & Archambault, D. (1989). The home field advantage. In J. H. Goldstein (Ed.), *Sports, matches, and play: Social and psychological viewpoints* (2nd edn., pp. 330–370). Hillsdale, NJ: Erlbaum.
- Elderton, W. (1945). Cricket scores and some skew correlation distributions. *Journal of the Royal Statistical Society, Series A*, 108, 1–11.
- Harville, D., & Smith, M. (1994). The home court advantage: How large is it, and does it vary from team to team? *American Statistician*, 48, 22–28.
- Hynds, M., & Smith, I. (1994). The demand for Test Match cricket. *Applied Economics Letters*, 1, 103–106.
- Jennett, N. (1984). Attendances, uncertainty of outcome and policy in Scottish league football. *Scottish Journal of Political Economy*, 31, 176–198.
- Kimber, A. C., & Hansford, A. R. (1993). A statistical analysis of batting in cricket. *Journal of the Royal Statistical Society, Series A*, 156, 443–455.
- Moore, J. C., & Brylinski, J. (1995). Facility and familiarity and the home advantage. *Journal of Sport Behaviour*, 18, 302–311.
- Nevill, A. M., & Holder, R. L. (1999). Home advantage in sport: An overview of studies on the advantage of playing at home. *Sports Medicine*, 28, 221–236.
- Nevill, A. M., Newell, S. M., & Gale, S. (1996). Factors associated with home advantage in English and Scottish soccer matches. *Journal of Sports Sciences*, 14, 181–186.
- Pace, A., & Carron, A. V. (1992). Travel and the home advantage. *Canadian Journal of Sports Sciences*, 17, 60–64.

- Pollard, R. (1986). Home advantage in soccer: A retrospective analysis. *Journal of Sports Sciences*, 4, 237–248.
- Pollard, R. (2002). Evidence of a reduced home advantage when a team moves to a new stadium. *Journal of Sports Sciences*, 20, 969–973.
- Preston, I., & Thomas, J. (2000). Batting strategy in limited overs cricket. *The Statistician*, 49, 95–106.
- Schofield, J. A. (1982). The development of first-class cricket in England: An economic analysis. *Journal of Industrial Economics*, 30, 337–360.
- Schofield, J. A. (1983). The demand for cricket: The case of the John Player League. *Applied Economics*, 15, 283–296.
- Schofield, J. A. (1988). Production functions in the sports industry: An empirical analysis of professional cricket. *Applied Economics*, 20, 177–193.
- Schwartz, B., & Barsky, S. F. (1977). The home advantage. *Social Forces*, 55, 641–661.
- Stefani, R. T., & Clarke, S. (1992). Predictions and home advantage for Australian Rules Football. *Applied Statistics*, 19, 251–261.
- Sumner, J., & Mobley, M. (1981). Are cricket umpires biased? *New Scientist*, 91, 29–31.
- Wood, G. H. (1945). Cricket scores and geometrical progression. *Journal of the Royal Statistical Society, Series A*, 108, 12–22.