



Short communication

Examining the home advantage in the National Hockey League: Comparisons among regulation, overtime, and the shootout

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ABSTRACT

Objectives: To investigate the magnitude of the home advantage in the National Hockey League (NHL) as games proceeded from regulation, to overtime, to the shootout, while adjusting for team quality.

Design: Archival.

Method: Binary logistic regression analyses were conducted using data from the 2005–2006 through 2013–2014 NHL seasons ($N = 10,534$ games) to compare home teams' odds of winning in regulation, overtime, and the shootout.

Results: Compared to games decided in regulation, higher quality home teams' odds of winning were slightly lower when games concluded in either overtime or the shootout. Further, regardless of team quality, home teams' odds of winning were moderately lower when games concluded in the shootout rather than overtime.

Conclusions: The shootout may affect home team players' psychological and behavioural states, generally resulting in a decrease in home teams' odds of winning in the shootout relative to overtime.

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The home advantage (HA) can be defined as “the consistent finding that home teams in sport competitions win over 50% of the games played under a balanced home and away schedule” (Courneya & Carron, 1992, p. 13). In fact, Jamieson's (2010) meta-analysis showed a moderate to large effect size ($ES = 0.604$) for overall HA across several major professional sports (e.g., ice hockey, soccer, basketball). Based on this review, it is apparent that there is an advantage to competing at home. In order to guide research on the HA in sport, Carron, Loughead, and Bray (2005) advanced a conceptual framework of the components thought to be influenced by the location of the competition. Within their feed-forward model, Carron et al. suggest that particular game location factors (i.e., crowd, learning, travel, and rule factors) have a differential impact on home versus away teams. These authors propose that such game location factors influence critical psychological, physiological, and behavioural states of both competitors and coaches

that, consequently, have a favourable impact on the performance of home teams.

A number of studies have examined the game location factors within Carron et al.'s (2005) model in relation to the sport of ice hockey (e.g., Agnew & Carron, 1994; Liardi & Carron, 2011; Loughead, Carron, Bray, & Kim, 2003). Of interest to the current study, McEwan, Martin Ginis, and Bray (2012) considered how hockey players' psychological and behavioural states might influence home team performance in National Hockey League (NHL) shootouts (i.e., uncontested shots by individual players against the opposing team's goaltender). Although research generally highlights the existence of a HA in sport (Jamieson, 2010), McEwan et al. drew upon studies that revealed a “home choke” in high-pressure/critical situations (e.g., Baumeister & Steinhilber, 1984), and adopted Wallace, Baumeister, and Vohs's (2005) contention that supportive crowds might induce pressure on athletes (i.e., psychological states) and subsequently overcautious behaviours (i.e., behavioural states). Consequently, McEwan et al. predicted that home players would perform significantly worse than visiting players in outcome-imminent shootout situations. Based on data from the 2006–2007 through 2010–2011 NHL seasons, results of their study revealed home teams enjoyed a HA in shootout situations where scoring a

Abbreviations: HA, home advantage; NHL, National Hockey League; HTQ, home team quality; VTQ, visiting team quality.

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goal would prevent a loss (loss-imminent situations), but experienced a home disadvantage in situations where scoring a goal would result in a win (win-imminent situations).

While the results of McEwan et al. (2012) showed home teams experienced both a HA and home disadvantage depending on the shootout situation, researchers have yet to conclude whether NHL teams playing at home experience a home (dis)advantage in the shootout relative to earlier periods of the game (i.e., regulation and overtime). Since the 2005–2006 NHL season, regular season games have begun and potentially ended in regulation time, which consists of three 20-min periods of 5-on-5 hockey. In games that result in a tie following regulation, a 5-min “sudden death” 4-on-4 overtime period ensues to determine a winner. In games that remain tied after this overtime period, a shootout follows.¹ The shootout consists of a best-of-three format, where each team has three uncontested shots (by three different players) against the opposing team’s goaltender, unless one of the teams wins earlier in the shootout.²

From a theoretical perspective, it is plausible that NHL players might experience pressure to excel in shootouts, particularly when playing at home and attempting to “satisfy” their fans. Based on Baumeister’s (1997) assertion that choking occurs because of an ego-threatening situation (i.e., perception that an audience’s current favourable view of oneself could be jeopardized), Jordet (2011) suggested athletes may experience emotional distress (i.e., pressure to perform), and thus behave in debilitating manners (i.e., poor self-regulation strategies resulting in a missed shot) during shootouts. In line with this suggestion, there is empirical research showing that supportive audiences are associated with poor performance on individual skill-based tasks (e.g., Butler & Baumeister, 1998). Consequently, a home team’s odds of winning in the NHL should be significantly lower for games decided in shootouts compared to earlier periods of the game, where home competitors do not have the heightened pressure of performing independently before a supportive audience. Liardi and Carron (2011) found partial support for this hypothesis when they reported that home teams won 56% of games decided in regulation/overtime, yet only 47.1% of games that prolonged into the shootout during the 2006–2007 NHL season. While providing preliminary evidence of a home disadvantage in the shootout, readers should exercise caution when interpreting the results of their study for several reasons. First, given that descriptive statistics were used for their analysis, the authors were unable to compare whether playing during regulation/overtime versus the shootout had a significant effect on home teams’ odds of winning. As a result, it was not possible to deduce whether the decrease in home winning percentage from regulation/overtime to the shootout was statistically meaningful. Second, given that these researchers collapsed games that terminated in regulation or overtime into one category, it was not possible to infer whether concluding a game in regulation or overtime predicted whether home teams won or lost. Third, Liardi and Carron analyzed only one season of play. Consequently, the authors noted that a larger data set encompassing several seasons would likely lead to more conclusive findings. Therefore, the current study sought to examine the magnitude of the HA in the NHL as games proceeded from regulation, to overtime, to the shootout, using an extensive sample of games and a statistical technique (i.e., logistic

regression analysis) that yields both practical and statistically meaningful results.

There is also one important factor that recent research examining the HA in the NHL has failed to consider. Specifically, Liardi and Carron (2011) and McEwan et al. (2012) did not account for team quality in their analyses. Schwartz and Barsky (1977) were among the first scholars to note that the magnitude of the HA was affected by the relative quality of the home team and its visiting counterpart, and several studies have since highlighted the importance of adjusting for this moderating variable (e.g., Allen & Jones, 2014). Different methods of adjusting for team quality have been employed over the years, with common approaches including using a team’s end of season winning percentage (e.g., Gómez & Pollard, 2011) or ranking (e.g., Allen & Jones, 2014). In the present study, we adjusted for team quality using Cochran and Blackstock’s (2009) version of the Pythagorean Method (see the Method section for a full description), which allowed us to account for the quality of both the home and visiting team during *each* game contained in our sample.

To summarize, the purpose of the present study was to examine the magnitude of the HA in the NHL as games progressed from regulation, to overtime, to the shootout, while adjusting for team quality. As the structural format in regulation and overtime is similar (i.e., 5-on-5 compared to 4-on-4), it was hypothesized that home teams’ odds of winning would not differ significantly when games were decided in overtime compared to regulation. However, given supportive audiences may induce psychological pressure (Wallace et al., 2005) and have a detrimental effect on *individual* performance (Butler & Baumeister, 1998), it was hypothesized that home teams’ odds of winning would be significantly lower when games prolonged into the shootout compared to when they were decided in either regulation or overtime.

1. Method

1.1. Sample

Archival data were collected for every NHL regular season game that occurred from the 2005–2006 through 2013–2014 seasons from an online statistical hockey database (<http://hockey-reference.com>). Each of the 30 teams in the NHL competed in 82 games per season in eight of the nine seasons, and in 48 games during the lockout-shortened 2012–2013 season, resulting in a total sample size of 10,560 games. Upon review of the data, we elected to omit 26 neutral site games (e.g., Helsinki, Prague), since neither team was competing in front of its home audience.³ Thus, the final sample consisted of 10,534 games.

1.2. Team quality

According to Cochran and Blackstock (2009), sabermetrician Bill James advanced the Pythagorean Method in 1980 that predicted the winning percentage of a baseball team based upon the number of runs it scored and allowed. Cochran and Blackstock revised this formula to approximate a NHL team’s winning percentage based on goals scored and goals allowed. Consequently, we quantified team quality in the present study as predicted team winning percentage.

¹ The shootout rule applies to regular season games only (playoff games employ one or more “sudden death” overtime periods, as is necessary).

² If the score remains tied following the best-of-three format, coaches select additional players to participate in a “sudden death” shootout.

³ On occasion, the NHL has teams compete in regular season games in non-NHL cities to gauge interest in expansion/relocation and/or to promote the NHL brand.

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