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Goals Galore vs. Bounteous Blood: What Do Hockey Fans Want to See?

Abstract – NHL attendance has been growing throughout the past decade. In this note we attempt to disentangle the rationale behind this phenomenon. We examine the rule changes that have increased scoring while also testing for the effect of violence on attendance. We hypothesize that fans enjoy both the goal scoring nature of the game as well as the brutish, violent facets of it. However, it seems that a team's success measured by their points and goals scored have a significant effect on attendance whereas violence does not. Interestingly enough, the sign for violence is negative, giving evidence to the refutation of previous studies' claims.

Introduction

"I went to a fight the other night, and a hockey game broke out."

-Rodney Dangerfield

"High sticking, tripping, slashing, spearing, charging, hooking, fighting, unsportsmanlike conduct, interference, roughing...everything else is just figure skating."

-Author Unknown

The National Hockey League comprises one of the four major sports in the United States along with the National Football League, Major League Baseball, and the National Basketball Association. Of these four sports, the NHL possesses perhaps the most unique mix between violence and finesse, where padded gladiators exchange haymakers one moment and only seconds later involve themselves in a beautiful display of skating prowess and hand-eye coordination. Many studies cite hockey as the only sport which tolerates fighting as "part of the game".

It is conceivably for this reason that fans of the NHL tend to be some of the most crazed and passionate fans in America. In order to maximize revenue and profits, NHL club owners must attempt to estimate the rationale for attending a hockey game. Factors including city market size and team success are of course prevalent but more primal are the dichotomy between fast-paced, open scoring vs. grit-your-teeth bloody battles via fists and sticks. Do fans come to see shooters tear up the twine or to see their favorite “enforcers” beat the snot out of the division rivals? It is this intriguing question that is imperative in increasing ticket sales and attendance in the NHL.

To begin with a simple assumption, one can distinguish between three types of hockey fans; ones who prefer violence, ones who prefer, cleaner, more pure games, and ones who prefer a mixture of both. Throughout the history of the NHL there have been myriad of civilian groups and small government efforts to curtail the pervasive violent nature of the sport (4). However, owners and even players rejected these calls for reform and fighting remains part of the game today, even though it is penalized much harsher in every other league of ice hockey in the world. Without branding NHL owners as blood-lustful moguls we again assume that NHL owners hope to maximize profits, therefore we should hope to find a positive correlation between violence and attendance throughout the league.

On the other side of the spectrum, hockey “purists” advocate for finesse-filled skill-based endeavors on the ice. These proponents point to the prevalence of “cleaner” hockey in the international arena, with many European countries adopting a larger rink with harsher restrictions on contact, therefore minimizing violence in the sport (2). The league responded to some of the purist’s desires in the 2004-05 lockout period where rule changes were adopted to “speed-up” the game and increase scoring, which is thought to enhance fan interest. Since this lockout period, the overall health of the league has grown as scoring, and attendance have increased. What explains the strong attendance figures, fights, goals, or both?

The salience of this study becomes more apparent when viewing the current 2011-2012 season with violence continuing to dominate the game today. Arguably the game’s best player, Sidney Crosby of the Pittsburgh Penguins, was sidelined nearly half of the season due to a concussion suffered from a violent elbow that was not even deemed a

penalty by the officials. In addition, three “enforcers”, or players notorious for fighting and their toughness, passed away in the spring of 2011. “Derek Boogaard, a fearsome 6'8", 265-pound heavyweight for the Rangers, died in May of an accidental overdose of alcohol and the painkiller oxycodone. On Aug. 15, Jets forward Rick Rypien committed suicide; the 27-year-old, it was revealed by Winnipeg's assistant G.M. Craig Heisinger, had battled depression for 10 years. Two weeks later, Predators tough guy Wade Belak was found dead in a Toronto condo. Belak, who retired last March after 14 NHL seasons, had hanged himself” (Sports Illustrated). Critics have argued that these deaths are attributable to the pounding that the body takes, especially the brain. A recent playoff game on April 13, 2012 between rivals Philadelphia Flyers and Pittsburgh Penguins featured 13 goals and over 170 combined penalty minutes between the teams. It was one of the most covered and highly rated game of the playoffs. It featured huge hits, high-sticking, slashing, sucker-punching, and even hair pulling. The crowd was going wild for the duration of the game for over two hours.

Literature Review

There have been several studies attempting to connect violence to attendance. Regressions in the early 1980s were run demonstrating the link to attendance and violence stating, “hockey is show biz, hockey is a blood sport”, presenting evidence in favor of the violence hypothesis (2). In a more recent adaptation concerning a season in the late 1990s, it was found that teams who fight more draw bigger crowds (1). This study also yielded some other interesting results. The author concluded that regional rivalries drew bigger fans, especially in Canada, but more importantly that scoring seemed to decrease attendance, which seems shocking. This result must be contrasted with the prior study where an additional finding expressed a defining difference between American and Canadian viewers. It seemed that Canadian fans enjoyed higher scoring affairs while Americans desired more fights rather than goals (1). When aggregated, the league total may then show a negative correlation between fighting and attendance.

Another study aids in painting a clear picture about the reality of employment in the NHL. Teams must select the perfect combination of skill players and “enforcers”, (3). In addition to battling other enforcers, these players try to limit the success of

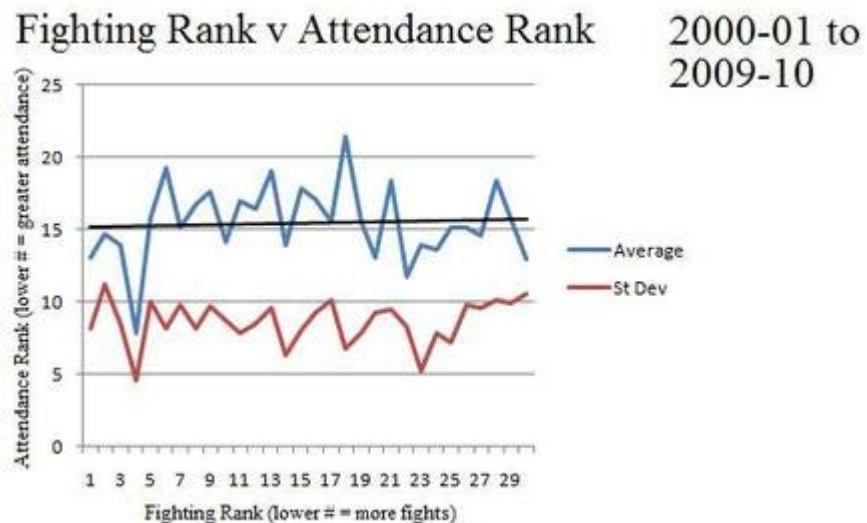
opposing skill players, and the study suggests that the rougher and more violent a player is, the higher his salary, thus incentivizing violence in the game of hockey. Thus a culture of violence is embraced, rather than discouraged.

Additional studies focused on the negative externalities with allowing graphic violence into mainstream culture (7). This violence trickles from the ice to the crowds and to younger generations in amateur leagues (4). Fortunately this paper only tackles the issue of violence and its effect on attendance among others rather than the intense moral symposium that would ensue.

In an analysis that reflected on the culture of the NHL, the author contended that the extraordinary amount of emphasis on winning helps, either directly or indirectly, in promoting a violent culture in the game. He added that the NHL “is perhaps the only league, professional or otherwise, that encourages the use of physical intimidation outside the rules as a legitimate tactic; and the attempt to sell hockey to a wide audience in the U.S. is more easily undertaken because understanding a hockey brawl is easier than learning the intricacies and finesse of the game (12).

The final study of some noteworthiness was a simple study done by a fan, in which he tested the significance of fighting as it relates to attendance. The chart below shows a team’s fighting rank in regards to its attendance. Please note that the lower numbers dictate a higher number of fights for a team and a higher attendance rate, therefore, teams placed closer to the origin fought more and had higher attendance. The results dictate the first five or so teams, in order of fighting ranks saw greater than average attendance figures but after these first, several teams the results seem to be inconclusive,

showing that fighting is not strongly correlated to attendance in any direction (11). My study will delve into this matter more deeply.



Data and Methodology

Before we test the preferences of NHL fans towards violence and goal scoring we must understand first who NHL fans are. NHL fans are both old and young, with slightly more than 50% being under the age of 45. Slightly over 15% of Americans identify themselves as fans of the National Hockey League, which is lower than the other 3 major sports but this number has been rising through the last couple of decades. Interestingly enough, the study suggests that the average NHL fan is more educated than the non-hockey fan where NHL fans are upwards of 20% more likely to have attended college. In addition to this finding, the study reports that NHL fans are also wealthier than the non-fan (5). By analyzing these results a possible psychological debate can occur where the paramount question would be whether better-educated Americans are more or less accepting of violence in sports.

For this study, many variables were recorded over a period from the 2000-2001 season to the present season. Sources included NHL.com, ESPN.com, and a series of other hockey databases. Average attendance per year for each team was collected as well as points, goals, penalty minutes, majors, fighting penalties, hits, and playoff appearances. Let's examine why each of these variables were selected as possible determinants of game attendance.

Every hockey season has 82 games, half of which are home and half on the road. The attendance rate is the dependent variable for this study. Since each stadium has a different capacity ranging from about 15,000 to 21,000, a utilization of the percentage of the stadium filled would provide a better estimate rather than raw attendance numbers. Points (a win rewards a team with two points while making it to overtime guarantees both teams at least 1 point) are one of the first variables being tested (8). The hypothesis is that the greater the number of points, the higher the attendance in a given stadium. Fans should appreciate watching their team win, so the coefficient should be positive. Points are simply a measure of rankings and standings within any given season. I argue that the greater the number of points a team possesses in a given season should correspond to a higher attendance rate for the selected club.

Goals are another variable that should impact attendance. Fans are arguably entertained when their team scores goals, goals also may lead to wins, therefore goals

scored should have a positive impact on attendance. Playoff appearances in the season prior should be considered as well. Making the playoffs denotes success, as only 16 of the 30 NHL teams qualify for the playoffs in a season. The depth of the playoff run should also matter, meaning that getting knocked out in the first round of the playoffs won't have nearly as strong of an effect on attendance as winning the Stanley Cup. For the study, I selected dummy variables for the playoffs. I coded failure to make the playoffs with a 0 and for each additional round advanced (there are four total) another dummy was created.

After dealing with the wins and scoring variables, the "bloodier" variables need to be tested. These take the form of penalty minutes, major penalties, fighting, and hits. Penalties can be given to a player for over a dozen reasons, but a majority of the offenses involve physical or illegal "violent" acts, therefore penalty minutes can serve as a viable proxy for violence. Major penalties are usually the more violent majors, such as boarding or spearing, and may serve as a proxy for violence. Fighting is a specific subset of major penalties and is broadly recognized as the true flag for violence in the NHL. Last but not least is the variable hits. Hits are legal body-checks made during the normal course of play in a hockey game. Since these are legal, the results won't be found in the penalty variables. A simple model appears below. The model dictates that each variable should in some way affect attendance for every team.

$$\mathbf{Attendance} = \alpha_0 + \alpha_1\mathbf{points} + \alpha_2\mathbf{goals} + \alpha_3\mathbf{penalty} + \alpha_4\mathbf{fighting} + \alpha_5\mathbf{playoffs} + \varepsilon$$

The model leaves room for some variations meaning that more variables like hits and majors can be added but since they are a subset of particular groups mentioned in the model we can test the separately. To recap my hypothesis into a simpler frame, I believe every variable should have a positive effect on attendance, meaning fans want to see their teams win, score, fight, be physical, and make the playoffs year after year.

Results

Table 1 – Winning, Scoring, and Fighting’s Effect on Attendance

Points	.00148 (2.65)***
Goals	.07074 (2.79)***
Penalties	-.00149 (-1.95)*
Major Penalties	.00016 (.87)
Fighting	-.03438 (-1.44)
Hits	.000005 (.02)
Playoffs	.01 (2.50) ***

Since this study involved both time-series and cross-sectional data, a panel regression was in order. Lag variables for attendance were utilized with conservative estimates that attempt to limit autocorrelation. There were over 90 observations so a z-score was utilized to determine significance. Table 1 displays the primary findings of the study. The coefficient is the first value in the chart. The z-score is given in the parentheses. The *** symbol signifies significance at the 99% level, * at the 90% level. As you can see the regression had highly significant results coupled with some interesting findings. To begin, points and wins were considered strong determinants for a team’s attendance level. For each additional point a team earns, attendance rises .148%, which might not seem like an extensive total, but remember that attendance is in the tens of thousands so a .148% increase could signify between 30 to 100 more fans for each game. Fans are compelled to come to games to see their team win. The playoff variable was significant as well, where teams that go further in the playoffs consistently have higher fan turnout than do teams without such success.

What effect does scoring on the attendance? Some scholars have argued that violence affects attendance at a greater magnitude than scoring. However these results provides evidence in refuting this claim. Goal scoring appears to be highly correlated to fan turnout. In fact, for every goal per game higher that a team scores, an increase of

over 7% in fan attendance is generated. Therefore, it seems that defensive, low scoring teams possess a smaller fan base than the flashier, higher-scoring clubs.

Now that it has been demonstrated that fans do love their goal scoring, what about the “violent” characteristics of the game? Surprisingly, none of the variables for violence affected attendance in a positive manner at any significant level. In fact, penalties were actually statistically significant at a negative manner, implying that a team that takes more penalties may actually suffer in attendance for doing so. To explain these somewhat peculiar findings, we must look at what the repercussions of penalties are. In a game, after a team takes a penalty, that team loses that player for at least two minutes and they must play with one fewer person on the ice for the duration of the penalty. This “power play” for the other team yields much higher chances of scoring in comparison to regular 5 vs. 5 hockey. It may be that these penalties enhance that team’s chance of losing because of the power plays given to the opposition. The second strongest (either positive or negative) of the four physical characteristics, fighting also had a negative effect on attendance. Referring back to the original hypothesis that fans prefer violence we are again stumped by the findings. Each characteristic involving violence, although not statistically significant, had a negative effect on attendance. How could this be? Perhaps more violent teams are penalized by their brutish style of play and give the opposition more chances and motivation to beat them. It could also be very well true that the better teams use less violent tactics to achieve victory, meaning that they employ many more skill players than enforcers to get victories for their fan base. One answer may lie with the lack of recent studies concerning violence in the game as it relates to fan attendance. The ones cited above took place before the turn of the millennium. There is a possibility that the gap between American and Canadian desires (fighting vs. skill, respectively) is quite large and that the Canadian core may triumph over the Americans, especially considering that every Canadian team has nearly 100% and over attendance ratings compared to their southern American counterparts. Maybe public opinion over violence in hockey has changed. Specific incidents like Marty McSorley’s intentional slash to the head of Donald Brashear in the 2000 season highlight just how brutish the sport could be.

Discussion

The most astonishing find in this study appears to be that violence has a weak but negative effect on attendance. This finding goes against my earlier hypothesis and also the findings of other authors. As noted in prior studies, Canadian fans, which comprise nearly 20% of the attendance market, have shown a reluctance to adopt a love for violence. When distinguishing between American and Canadian fans, the results may become stronger and possibly more positive for Americans. However, in this note an aggregation of all of the NHL took place, possibly diminishing likely effects. The time frame studied may cover almost a generation of fans. Therefore, there is ample time for the cultural and societal attitudes towards hockey and violence to change greatly. But as of present there seems to be no conclusive evidence linking violence to increased attendance.

What may not be surprising but is noteworthy is the powerful effects that winning and goal scoring have on attendance. Both values were significant at the 99% level. It appears that the “better” (more wins, more goals) a team is correlates greatly with increasing attendance. Therefore, teams should strive to score as much as possible to fill up the stands, just so long as they win.

It is important to note the time period in which this study took place. Throughout the early years of the new millennium the league was in distress. Operating incomes were either stagnant or falling on average while only a few teams made enough revenue to cover some of the expenses of the loss generating teams. This lack of financial stability coupled with owner dissatisfaction over what they saw as high player wages led to a lockout for the entirety of the 2004-2005 season (9). Debates occurred between owners and players over whether or not a salary cap should be implemented and if players' salaries be tied to the financial strength of the league. An important sidebar to this discussion is the momentous impact of game attendance for the financial viability of the NHL. At the time of the lockout, the NHL generated more than half of its revenue from gate receipts (attendance). Compared to the three other major sports league, this proportion dominated the proportions of revenue related to game attendance for the other leagues by over 10% (5). This note further highlights the importance of maximizing attendance for the health of the league. When the lockout ended, NHL Commissioner

Gary Bettman unveiled a slew of changes that were intended to enhance scoring. Some of these changes included eliminating the two-line pass that would “open up” the game more, inventing a system for a shootout to eliminate ties, and restricting goaltender movement to give attacking players another advantage. After these changes or augmentations as many now call them, scoring jumped over 30% in the next season alone. Assuming the NHL is profit-maximizing, one could argue that Commissioner Bettman believed that increasing goals in the game would bring greater attendance, and indeed it has as the health of the league is still growing.

Referring back to the results, it is important to note some limitations with the findings. Goals, although having a statistically significant effect on attendance, are also in some fashion related to wins; because the more goals a team scores theoretically their chance of winning each game rises. To account for this, statistical measures including adding lag variables and correcting for autocorrelation were adopted to keep the results relatively conservative. Another limitation was the lack of fighting information available. It was only used in the three latest seasons and further studies could utilize a larger dataset on fighting majors to test whether or not my results hold true in the long run. The time period in question involved a significant transformation in the form of the lockout that had a significant effect on several variables, most notably goal scoring so it may behoove further researchers to break down the time periods into pre-lockout and post-lockout periods rather than aggregating them together in order to test for stronger effects. An additional drawback of the study is that it examines solely regular season attendance rather than the postseason, but this was done so for a reason. The rationale is that attendance is already much greater at playoff games, therefore little variation would take place season to season for playoff teams.

Perhaps the most profound limitation in the study is the data on attendance itself. Attendance rate is a bound variable anywhere from .6 to 1.2. This means that no team ever had less than 60% of their stadium filled during a season while some had more than 100% (due to the availability of standing room tickets). Although this range allows for some variability of attendance rate from year to year, since it is so stringently bounded between these parameters, it is difficult to explain the relatively minor fluctuations in attendance. There are few statistical measures that can be used to account for the

bounded attendance variable many of which are fairly complex and may take away from the primary findings of this note. Despite these noted considerations, we must view this study for what it has highlighted when it comes to what drives hockey attendance.

Conclusion

The fans have voiced their opinion via game attendance on the matter of scoring vs. violence. Overwhelmingly we have found that fans go to games to see goals and to see their teams succeed rather than watching bullies beat each other up. The results for violence were surprising, where penalties actually diminished attendance. It may be true that many fans enjoy watching fights but that these fans seem to be overshadowed by fans who enjoy viewing their team dominate their opponents via the scoreboard rather than their fists.

Fortunately for the league it appears that attendance is holding strong or increasing in the present period. Are the league's good fortunes attributable to smart business practices on behalf of the league in order to raise scoring or does it stem from a multitude of other innumerable factors? The truth is that the reasons behind attending a hockey game are hard to quantify. Maybe you would like to watch your favorite player or perhaps you want to see players get the snot kicked out of them, every person is different. It is these differences, which define the ever-growing fan base of the NHL. What we have gathered today is but a tiny piece of the puzzle of explaining the rationale behind attending a hockey game.

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