Dropping the Gloves, Driving the Play? Reassessing the Role of Fighting in Modern NHL Games

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Abstract. This paper investigates the evolving role of fighting in NHL hockey by analyzing over one million play-by-play events from the 2021–22 to 2023–24 seasons. Using Corsi as a proxy for offensive activity, we find that fights are associated with short-term increases in game intensity—particularly when games are tied or teams are trailing. A logistic regression model further shows that fights are more likely during physically aggressive games and when score differentials are large. These findings suggest that while fighting may no longer drive wins, it continues to shape game momentum and fan experience in subtle, measurable ways.

Keywords: Fighting, Possession, Corsi

1. Introduction

Fighting in hockey has long been a polarizing and enduring topic within the sport. Passionate arguments exist on both sides of the debate. Opponents of fighting often cite the significant health risks—both immediate and long-term—that players face, while also questioning whether fighting influences the outcome or momentum of a game. On the other hand, supporters argue that fighting serves a protective role, particularly for star players who may be targeted by cheap shots and point out that fans appear to respond positively to fights during games.

Historically, research supported the idea that fans enjoy fighting, with several studies showing a positive relationship between the number of fights and game attendance in both the NHL [1]–[4] and minor leagues [5]–[7]. However, more recent findings challenge this perspective. Fortney [8], for example, reported a negative and significant relationship between fighting and NHL attendance, suggesting a potential shift in fan preferences. Yet, public reaction to the highly publicized fights during the 2025 4 Nations Hockey Tournament indicates that fan appreciation for fighting may still be alive and well.

One complicating factor in assessing the relationship between fighting and attendance in the NHL is the use of dynamic ticket pricing, where prices fluctuate based on demand. This can obscure the effect of game-specific factors—such as fighting—on attendance, as the pricing models may already account for these elements. In contrast, minor league hockey, where ticket prices remain static, continues to show a positive relationship between fighting and attendance.

Given the overall decline in fighting, the shift toward smaller and more skilled players, and the growing uncertainty about whether fans are still influenced by fights when deciding to attend games, it is worth reevaluating the role of fighting in modern hockey. Several recent studies—such as those by Goldschmied [9], Leard [10], and Coates et al. [11]—have failed to find any significant link between fighting and positive team outcomes, including winning games or scoring the next goal. These findings suggest that fighting may contribute little to competitive success in today's game.
However, previous research has not examined the effect of fighting on in-game possession metrics. It is possible that fights may indirectly contribute to increased game activity—measured via possession statistics—even if they do not lead directly to goals. With access to detailed play-by-play and possession data, it becomes feasible to test whether fights result in tangible changes in game flow that fans might find exciting.

Using data from the 2021–22 through 2023–24 NHL seasons, this paper investigates the short-term effects of fighting on offensive activity using Corsi (shot attempts) as a proxy for possession and excitement. Our findings show that fighting is followed by an increase (decrease) in offensive activity, particularly for trailing (winning) teams by as much as 16% (-30%). This suggests that fights may act as catalysts for more dynamic and engaging gameplay—an aspect that could help explain continued fan interest.

In addition, we construct a predictive model of fight occurrences based on in-game factors. Our model reveals that fights are more likely to occur when there is a two-goal or greater score differential (by a factor of 1.6), and they tend to happen earlier in games. The likelihood of a fight also increases with the number of hits and penalties in a game.

The remainder of the paper is organized as follows: Section II presents a review of the relevant literature. Section III analyzes changes in Corsi and other variables following fights. Section IV outlines our predictive model of fight occurrence. Section V discusses the implications of our findings, and Section VI concludes the paper.

2. Related Literature

This literature overview synthesizes existing academic work on fighting in the National Hockey League (NHL), with a focus on its ethical implications, impact on attendance, strategic utility, and relevance within the modern context of sport analytics. A particular emphasis is placed on empirical findings and methodological approaches that inform current debates surrounding the role and value of fighting in professional hockey.

Ethical critiques of fighting are central to the discourse. Lewinson [12] evaluates fighting through a universal code of athlete conduct derived from the NHL, the International Olympic Committee (IOC), and the Canadian National Minor Hockey Association (NMHA). He argues that fighting largely contradicts core sporting virtues such as discipline and integrity, even while acknowledging that some defend it under the virtues of courage and loyalty. Drawing on both utilitarian and deontological frameworks, Lewinson concludes that fighting ought to be banned in order to reduce harm and promote a morally consistent code of conduct for athletes.

This ethical framing intersects with ongoing questions about the appeal of fighting from a spectator standpoint. Historically, fighting was believed to drive fan engagement, with several early studies indicating a positive relationship between fighting frequency and game attendance [1]–[4]. However, more recent evidence challenges this assumption. Fortney [8], using data from 2000 to 2020, finds a significant negative correlation between fights per game and average attendance. His results suggest that fans may now prefer high-scoring games over violent ones, signaling a shift in fan preferences that mirrors the league's own emphasis on speed and skill.

Attendance research has also historically considered the role of outcome uncertainty. Rottenberg [13] first proposed the Uncertainty of Outcome Hypothesis (UOH), suggesting that fans are more likely to attend games between evenly matched teams. However, Coates and Humphreys [14] critique the UOH in the NHL context, proposing a behavioral model centered on reference-dependent preferences and loss aversion. Paul et al. [7] found no significant support for outcome uncertainty influencing attendance in junior hockey leagues, and similar inconclusive results have been reported across European leagues, including those in Finland, Sweden, and Russia [15]. These mixed findings indicate that factors such as competitive balance and entertainment value—of which fighting is a debated component—may interact more dynamically with attendance than previously assumed.

The relationship between fighting and attendance appears to differ across league contexts. In Europe, where fighting is strictly penalized or banned, penalty minutes have a limited or inconsistent impact on spectator interest. For instance, in Germany's DEL, penalty minutes were positively associated with attendance, while Finland's SM-Liiga showed no such effect [15]. In Canada, fighting did not significantly impact attendance in the Quebec Major Junior Hockey League, though it did in the broader Canadian Hockey League. In North American minor leagues—such as the American Hockey League (AHL), ECHL, and Southern Professional Hockey League (SPHL)—fighting continues to be positively associated with attendance [5]–[7], suggesting that its draw may be more pronounced in smaller markets or lower-tier professional contexts.

While fighting is often assumed to energize teams or sway game momentum, empirical evidence undermines this belief. Goldschmied [9] and Leard [10] both find no significant correlation between winning a fight and winning the game or scoring the next goal. Coates et al. [11] further demonstrate a negative relationship between fighting and team success, adding strategic doubt to its on-ice utility.

Research by Sirianni [16] supports this by illustrating how the role of the "enforcer" has evolved into a niche function, where players who fight do so in highly structured, often premeditated scenarios—typically against one another in controlled contexts. From a behavioral standpoint, Goldschmied [17] analyzes fight timing and concludes that players are significantly less likely to fight late in games or during the postseason, suggesting that the decision to engage is calculated rather than impulsive.

This calculated nature, however, does not translate to tangible momentum. Studies by Steegar [18] using entropy analysis, and Kniffin [19] in collegiate hockey series, find little evidence for momentum between or within games, even in situations where teams achieve blowout victories or short-term winning streaks. Vesper [20] adds that perceived "hot hands" are not statistically supported in hockey and may, in fact, lead to decreased shot selectivity and efficiency.

The cultural normalization of violence in hockey has also drawn concern from injury prevention researchers. Cusimano [21], through qualitative interviews with youth players, finds that aggressive behavior is socially reinforced by parents, coaches, and teammates, particularly as a demonstration of loyalty or retaliation. Hutchinson [22] connects this culture of contact to concussion rates, reporting that 88% of diagnosed concussions in NHL games involved direct player contact, often occurring along the boards and early in games. Still, Goldschmied [23] reports no significant association between frequent fighting and reduced life expectancy among players from 1957 to 1971, suggesting that the most serious health effects may be short-term or not easily measurable via mortality.

Referee behavior further complicates the picture. Schuckers [24] finds that referees are less likely to call penalties in close or late-game situations, and that visiting teams are penalized more frequently than home teams. Guerette [25] expands on this by studying games without fans during the COVID-19 pandemic, showing that the typical home-ice advantage in penalty calls disappeared in empty arenas, indicating the influence of crowd pressure on officiating.

From a methodological standpoint, these studies draw on a wide range of tools. Researchers have used logistic regression [24], survival analysis [23], entropy modeling [18], exponential graph networks [16], and time series forecasting [26, 27] to explore fighting's place in the game. Metrics such as Fenwick% and xG are increasingly applied to study game flow and momentum, though their predictive power on short-term outcomes remains limited. The broader takeaway is that while fighting may be calculated and deeply entrenched in hockey's cultural history, it has little effect on outcomes, waning influence on attendance, and is increasingly at odds with the ethical and safety priorities of modern sport.

Despite the volume and diversity of existing research, several gaps remain. For instance, few studies have incorporated real-time player tracking or high-resolution event data to evaluate the immediate tactical implications of fights. Moreover, while fan sentiment is often implied through attendance data, qualitative or survey-based studies on contemporary fan attitudes toward fighting are sparse. As the NHL and other leagues move toward data-driven player evaluation and league governance, there remains substantial room for new research that integrates ethics, fan behavior, and advanced analytics to better understand fighting's evolving role in the sport.

3. Data and Methodology

We scraped play-by-play data for every game played over the last three completed NHL seasons (2021-22, 2022-23, 2023-24) from api-web.nhle.com. Play-by-play data contain timestamped events throughout a game with additional game details and event descriptors. Each event contains details such as the score of the game at the time of the event, the number of skaters on the ice and whether the goalie is on the ice for both teams, and x- and y-coordinates for where the event took place (if applicable). The different events that get recorded throughout a game include starts and ends of periods, ends of shootouts, faceoffs, hits, stoppages, takeaways, giveaways, penalties, delayed penalties, shots, failed shot attempts, and goals. Shots are broken up into three categories: blocked, missed, and on-goal. Additionally, there are details given as to what type of penalty is committed. Across the three seasons of data and all games, there are 1,324,038 total events.

The Effect of Fighting on Offensive Production

We first conduct an exploratory analysis of the impact that fighting has on team offensive production post-fight. Since goals are infrequent events in hockey (~2% of all recorded events), measuring offensive production in terms of goals scored paints an incomplete picture. Instead, goal scoring opportunities, measured by shot attempts, can be a better proxy for how well a team is performing. We use Corsi, which sums all shot attempts taken by a team, to measure offensive production for each team in a game.

Table 1: Summary of Fights Per Game Across Seasons

Games with:	2021-2022	2022-2023	2023-2024
0 Fights	1,037 (79%)	1,037 (79%)	1,047 (80%)
1 Fight	228 (17%)	233 (18%)	227 (17%)
2+ Fights	47 (4%)	42 (3%)	38 (3%)

To analyze the impact of fighting on offensive production, we create post-fight windows of time and compare offensive production within these windows to offensive production from the start of the game to the time of the fight. The post-fight windows include: two minutes post-fight, five minutes post-fight, 10-minutes post-fight, and the duration of time from the fight occurring and the end of the period. For each occurrence of a fight, we compare the offensive production of both teams during the windows after the event to their offensive production before the event occurred. The pre-fight window that is compared to all post-fight windows encompasses all events from the start of the game to the time of the fight.

We restrict the sample to regular season games and regulation periods as overtime periods are played differently. Initially, our sample includes 972 fights. To allow for enough time to pass, we only analyze fights that occur at least two minutes into the game and at least two minutes before the end of the game, reducing the sample to 877 fights. Additionally, we only analyze fight occurrences which resume play at even strength immediately post-fight to avoid entangling results with the impact of a team having a power play, which further reduces the sample size to 630 (~65% of all fights).

In the before and after windows, we calculate Corsi rate by summing shot attempts during the window and dividing by the duration of the window in seconds. If there was not enough time after the event occurring until the end of the game to cover the calculated duration range (e.g., a fight happening with three minutes left in the game would not have a complete five minute post-fight window), we divide the Corsi sum by the actual time elapsed. Equation one displays Corsi rate where t is the duration of the window in seconds (e.g., 120 seconds for the two-minute window for a fight that occurs before the last two minutes of a game):

$$CorsiRate = \frac{Goals+Shots\ on\ Goal+Missed\ Shots+Blocked\ Shots}{t} \qquad (1)$$

Table 2 provides an array of paired Welch's t-test results comparing the post-fight Corsi rates to the pre-fight rates for fights. We do not assume equal variance across the compared post-fight and pre-fight windows, hence the choice of Welch's t-tests. Since each fight has post-fight windows that correspond to a pre-fight window, we use paired tests. The rates were multiplied by 60 before conducting the tests for interpretability, and the rates represent Corsi per minute. Eight t-tests were specified for fights that occur during each of the following game score scenarios: all scenarios, tie games, home team losing by one goal, home team winning by one goal, home team losing by two or more goals, and home team winning by two or more goals. The eight t-tests include four for both the home and away teams for their rates in the four post-fight windows. For each test, the mean difference in Corsi rate is reported with t-statistics in parentheses.

Table 2: Paired Welch's T-Test Statistics Comparing Post-Fight Periods to Pre-Fight Corsi Rates

		n	After 2	After 5	After 10	Until EOP
All scores		630				
	Home		-0.010	0.019	0.020	0.017
			(-0.296)	(0.869)	(1.115)	(0.789)
	Away		-0.027	-0.031	-0.029	-0.017
			(-0.892)	(-1.390)	(-1.611)	(-0.753)
Tie game		197				
	Home		0.033	0.058	0.054	0.042

			(0.514)	(1.324)	(1.470)	(1.056)
	Away		0.035	-0.016	-0.028	0.009
			(0.660)	(-0.416)	(-0.826)	(0.225)
Home losing by 1		101				
	Home		0.117	0.158	0.099	0.108
			(1.459)	(2.722)***	(2.251)**	(1.899)*
	Away		-0.180	-0.192	-0.088	-0.073
			(-2.380)**	(-3.804)***	(-2.269)**	(-1.547)
Home winning by 1		111				
	Home		-0.079	-0.041	0.000	0.019
			(-1.007)	(-0.798)	(0.001)	(0.322)
	Away		0.146	0.136	0.129	0.091
			(2.069)**	(2.952)***	(3.511)***	(1.916)*
Home losing >= 2		99				
	Home		-0.001	0.042	0.079	0.036
			(-0.014)	(0.842)	(1.949)*	(0.795)
	Away		-0.283	-0.234	-0.208	-0.260
			(-4.440)***	(-4.210)***	(-4.600)***	(-5.455)***
Home winning >= 2		122				
	Home		-0.127	-0.121	-0.129	-0.115
			(-1.803)*	(-2.782)***	(-3.561)***	(-2.357)**
	Away		0.052	0.093	0.022	0.090
			(0.750)	(1.748)*	(0.556)	(1.463)

*-notation notes statistical significance of t-test at 1% (***), 5% (**) and 10% (*) levels.

Results of the t-tests suggest that teams might benefit from fighting. In scenarios where the game is not tied, there appears to be evidence the losing team at the time of the fight benefits from either or both an increase in offensive production themselves or a decrease in offensive production for the winning team. These results might suggest that it can be strategic to fight in certain game scenarios. While the reported mean differences might appear miniscule, mean Corsi rates per minute in the dataset are roughly 0.98 and 0.95 for home and away teams, respectively. Therefore, a result such as the 0.158 increase for the home team and -0.192 decrease for the away team in the five minutes post-fight window when the home team is losing by one goal is rather substantial. For this example, approximate percentage changes of Corsi rate in the post-fight window are +16% for the home team and -20% for the away team. Coupling these results suggest a major post-fight advantage for the home team.

4. Fighting Probability Model

We model the occurrence of a fight in an NHL game based on game characteristics. Namely, whether the score differential, time remaining in the game and period number, Corsi differential, and hit and penalty running totals impact the probability of a fight breaking out. We specify logistic regression models with a dependent variable of a game event being a fight ($y = 1$). Regressors include score differential (Home – Away), time remaining, period number, Corsi differential (Home – Away), Hit count, and Penalty count. Corsi differential is measured using the cumulative sum of Corsi for each team at the time of the event while hit and penalty counts are the cumulative sum of these events across both teams.

Without any transformations, the functional form of the models shows issues with heteroskedasticity and autocorrelation. We correct for these issues in two ways. First, in Model I, we present results using clustered standard errors, clustered by the individual game. In Model II, results are presented using heteroskedasticity-consistent standard errors. We attempted using heteroskedasticity- and autocorrelation- consistent standard errors, but alas, the methods utilized in R were computationally costly and did not converge due to the sample size and complexity of the regressors.

Models I and II are presented in Table 3. The robust standard errors calculated for Model II are consistently smaller compared to those for Model I, increasing the significance of the explanatory variables across the board. The

lack of correction for autocorrelation in Model II is likely leading to a misspecification of the model. However, the only difference between the two models is $ScoreDiff_1$ is significant in Model II but not in Model I. The results of Model I suggest that fights are more likely to occur when the score differential in a game is two goals or greater in either direction. The time remaining and period number variables suggest that fights are more likely to occur earlier in the game. Lastly, the number of hits and penalties increases the likelihood of a fight occurring, which is to be expected, as these variables control for overall aggression.

Table 3: Results of Models I and II

Variable	I	Odds Ratio	II	Odds Ratio
Intercept	-8.009***		-8.009***	
	(0.361)		(0.273)	
$ScoreDiff_{-1}$	0.022		0.022	
	(0.112)		(0.076)	
$ScoreDiff_1$	0.117		0.117*	1.124
	(0.101)		(0.070)	
$ScoreDiff_{-2}$	0.404***	1.498	0.404***	1.498
	(0.108)		(0.077)	
$ScoreDiff_2$	0.470***	1.600	0.470**	1.600
	(0.101)		(0.070)	
Time Remaining	0.001***	1.001	0.001***	1.001
	(0.0001)		(0.0001)	
Corsi Differential	0.030		0.030	
	(0.035)		(0.021)	
Second Period	-0.955***	0.385	-0.955***	0.385
	(0.118)		(0.077)	
Third Period	-2.427***	0.088	-2.427***	0.088
	(0.201)		(0.126)	
Hit Count	0.015***	1.015	0.015***	1.015
	(0.005)		(0.003)	
Penalty Count	0.220***	1.246	0.220***	1.246
	(0.015)		(0.005)	
Home Team Fixed Effects	Yes		Yes	
Away Team Fixed Effects	Yes		Yes	

*-notation notes statistical significance of t-test at 1% (***), 5% (**) and 10% (*) levels.

Table 4 presents the results of models using score differential as a continuous variable and its squared term. Again, Model III uses clustered standard errors and Model IV uses heteroskedasticity-consistent standard errors. Operationalizing score differential as a continuous variable with its squared term in Model III-IV provides the same suggestions as Models I-II: fights are more likely to occur as the score differential grows, regardless of whether the home team is winning or losing.

Table 4: Results of Models III and IV

Variable	I	Odds Ratio	II	Odds Ratio
Intercept	-7.979***		-7.979***	
	(0.362)		(0.274)	
Score Differential	0.006		0.006	
	(0.020)		(0.013)	
Score Differential^2	0.024***	1.024	0.024**	1.024
	(0.005)		(0.003)	
Time Remaining	0.001***	1.001	0.001***	1.001
	(0.0001)		(0.0001)	
Corsi Differential	0.040		0.040*	1.041
	(0.036)		(0.021)	
Second Period	-0.868***	0.420	-0.868***	0.420
	(0.115)		(0.075)	
Third Period	-2.343***	0.096	-2.343***	0.096

	(0.197)		(0.125)	
Hit Count	0.014***	1.014	0.014***	1.014
	(0.005)		(0.003)	
Penalty Count	0.215***	1.240	0.215***	1.240
	(0.015)		(0.005)	
Home Team Fixed Effects	Yes		Yes	
Away Team Fixed Effects	Yes		Yes	

*-notation notes statistical significance of t-test at 1% (***), 5% (**) and 10% (*) levels.

5. Discussion

The findings of this study contribute new dimensions to our understanding of fighting in hockey, particularly in terms of its on-ice effects and contextual likelihood. While earlier research has questioned the strategic value of fighting—often concluding that it does not lead to improved outcomes such as winning a game or scoring the next goal—our analysis suggests that fights can serve as a catalyst for increased offensive activity, at least in the short term. Specifically, when games are tied or one team is trailing, fights appear to boost Corsi rates (i.e., shot attempts), particularly for the team behind on the scoreboard. These increases in offensive zone activity may not always translate into goals, but they do indicate a measurable shift in game tempo that could enhance the excitement and momentum perceived by players and fans alike.

This potential for fights to energize gameplay may partially explain the lingering fan interest in fighting, even as its frequency declines and its role as a performance tool diminishes. The results align with the hypothesis that fighting can be situationally beneficial—less as a deterministic event, and more as a psychological or momentum-shifting mechanism, particularly for teams attempting to disrupt an opponent's control or revive their own effort.

This insight complicates the narrative that fighting is purely detrimental or antiquated, suggesting that its role is more nuanced and possibly adaptive to specific game states. The predictive modeling further enriches this perspective by identifying the conditions under which fights are more likely to occur. Score differential—particularly when it reaches two goals or more—emerges as a key driver, suggesting that fights often occur as responses to perceived imbalance rather than in tightly contested games. The timing of fights also matters: they are more likely to happen earlier in games, likely due to teams' hesitancy to incur penalties or lose players during decisive moments. In addition, higher counts of hits and penalties are strongly associated with fight occurrence, reinforcing the idea that fights emerge from escalations in physicality and game intensity.

Importantly, the relationship between fighting and Corsi metrics complicates earlier conclusions from studies such as Goldschmied [9], Leard [10], and Coates et al. [11], which focused largely on scoring and winning. Our study highlights that there may be more subtle, immediate effects on gameplay that are not captured by goals alone. This underscores the importance of incorporating advanced possession metrics and high-resolution event data when assessing the tactical or entertainment value of fighting in contemporary hockey.

From a policy standpoint, these findings walk a middle line. They neither fully vindicate fighting as an essential tool nor entirely discredit its relevance. Instead, they suggest that fighting continues to exert situational effects on game dynamics that may hold residual value for teams, players, and spectators—particularly in terms of psychological tone and energy on the ice.

6. Conclusion

This paper revisits the complex and controversial role of fighting in hockey through the lens of modern sport analytics. Drawing on play-by-play data from three NHL seasons (2021–22 to 2023–24), we examined both the in-game effects of fighting on offensive production and the contextual conditions under which fights are most likely to occur. Our analysis shows that fighting is associated with short-term increases in offensive activity, especially for trailing teams or in tied games—suggesting that fights can act as momentum shifts even if they do not translate directly into scoring outcomes.

Furthermore, our predictive modeling indicates that fights are more likely when games are physically intense, involve higher penalty counts, or feature a notable score differential. These insights reinforce the idea that fighting often emerges not randomly, but as a strategic or emotional response to in-game dynamics.

Together, these results point to a more nuanced understanding of fighting's place in modern hockey. While fighting may no longer be central to winning games or building rosters, it retains the ability to influence gameplay intensity and spectator experience. Future research should continue to explore these short-term effects using additional tracking data, fan sentiment surveys, and cross-league comparisons. As the NHL and other leagues continue evolving toward faster, more skilled styles of play, understanding how legacy elements like fighting affect the game's rhythm and perception will remain essential to informed policymaking and fan engagement.

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