

Goal-scoring patterns in ice hockey: A comparative analysis of the NHL and the Finnish Liiga Playoffs

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Abstract

The study investigated goal-scoring patterns in ice hockey playoff games by comparing the NHL during the 2024–2025 season with the Finnish Liiga during the 2023–2024 season. The analysis included 754 goals scored in 131 games (86 NHL games and 45 Liiga games), which were analyzed through systematic observation of official goal highlight videos. Goals were classified according to game situation, rink zone, type of attack, scoring method and scoring sector. Overall, 64% of goals were scored at even strength, 21% on the 5 vs. 4 power play, and 15% in other situations. Among goals scored in 5 vs. 5 situations, 61% originated in the offensive zone, 30% in the defensive zone, and 10% in the neutral zone. Significant differences were identified between the leagues in the distribution of goals across rink zones ($p < 0.01$), with the largest difference observed in the neutral zone. Most even-strength goals originated from offensive-zone board play (33%) and turnovers (23%), as well as from fast attacks (13%) and counterattacks (13%) initiated from the defensive zone. A z-test indicated a significant difference in offensive-zone goals between the leagues ($p = 0.021$). Goal-scoring methods also differed: Liiga goals were more often created through passes ($p = 0.029$), while NHL goals frequently resulted from deflections ($p < 0.001$). Most goals were scored near the net, with sectors 1–2 accounting for 67% of all goals. These results suggest that effective goal-scoring relies on quick breakout plays from the defensive zone, board play in the offensive zone, and active puck retrieval. Power-play performance also contributes substantially to playoff scoring. The findings provide practical guidance for coaches aiming to improve goal-scoring efficiency through targeted training strategies in playoff games.

Key Words: ice hockey, goal scoring, tactics, goal analysis, scoring patterns, performance analysis

Introduction

Ice hockey is a globally played high-speed team sport (International Ice Hockey Federation [IIHF], 2025). Championships in ice hockey leagues are usually decided in the playoffs following the regular season. Although a team may perform well in the regular season, this does not necessarily guarantee success in the playoffs (Teramoto & Cross, 2010). The different phases of the season vary in character, and this may be reflected in differences in team tactics between the regular season and the playoffs (García et al., 2013).

The purpose of this study was to investigate goal-scoring patterns in ice hockey playoff games and compare the NHL and the Finnish Liiga.

Previous research

Match events in different ball games have often been studied using notation-based performance analysis and systematic observation (Hughes & Franks, 2004; McGarry & Franks, 2005, pp. 265–274). Research has focused, for example, on soccer (Lago, 2007) and basketball (Courel-Ibáñez et al., 2017).

Goal scoring in ice hockey has been relatively little studied (Lignell et al., 2020), and to date, no peer-reviewed study has systematically compared situational goal-scoring patterns between North American and European elite playoff hockey.

A search conducted in the SportDiscus database in April 2026 using the terms ‘ice hockey’ AND ‘goal-scoring’ AND ‘analysis’, restricted to peer-reviewed publications, yielded seven articles. When the search was refined by replacing the term ‘analysis’ with ‘tactics’, the number of results decreased to three. These results illustrate that the scientific literature on ice hockey and goal scoring remains very limited. For this reason, this article also refers, for example, to non-peer-reviewed research findings from the International Ice Hockey Centre of Excellence (International Ice Hockey Centre of Excellence [IIHCE], 2008).

Previous ice hockey studies have examined players’ physical characteristics such as strength (Gerg et al., 2025) and speed (Silvestri et al., 2025). Other studies have analyzed sport-specific skills such as shooting (Robbins et al., 2021) or skating (Upjohn et al., 2008). Although these studies provide valuable insights into aspects such as individual performance, they do not explain how goals are created from the perspective of team cooperation and tactical structure.

Tactics

The style in which ice hockey was originally played in Europe and North America differed significantly. During the last decades of the 20th century, however, playing styles began to converge considerably (Kivinen et al., 2000, pp. 18–19; Valkonen, 1997, pp. 17–26). At the 2006 Olympics, the tactics employed by North American and European teams were very similar. Some stylistic differences remained: the United States and Canada used active forechecking in the offensive zone more frequently than other teams. Overall defensive strategies were largely alike (Luimula, 2013, pp. 144–145).

In the Finnish Liiga, the rink dimensions are slightly larger than those used in the NHL (IIHF, 2023; NHL, 2024). A team's overall tactics are formed by systems designed for different rink zones (Luimula, 2013, pp. 30–31). These systems include, for example, breakouts from the defensive zone, offensive play in the neutral zone, and finishing attacks. Defensive play is divided into defending in the defensive, neutral, and offensive zones (Westerlund, 1997, pp. 527–544). In the defensive and neutral zones, attacks can be categorized as slow attacks, fast attacks, or counterattacks. In slow attacks, the defending team has time to organize with 4–5 players. Fast attacks involve 1–3 players from each team, whereas in counterattacks the attacking team has a numerical advantage—the defending team has at most two players involved (Luimula, 2025a; Westerlund, 1991).

In the offensive zone, goals are typically created from board play, turnovers, and faceoffs (Luimula, 2025a). Defensive tactics include man-to-man, zone, and hybrid systems in the defensive zone, as well as various formations in the neutral and offensive zones (Luimula, 2013, pp. 87–98).

In several sports, statistics on ball possession during matches have been presented. In soccer, for example, the relationship between possession and match outcome has been widely studied. Some studies have shown that winning teams have greater possession (Bloomfield et al., 2005; Casal Sanjurjo et al., 2017), while others have found that possession does not necessarily correlate with victory (Arkes, 2011; Lago, 2009). In addition to possession, goal scoring is influenced by, for example, the area where the ball is recovered (Wright et al., 2011), the location of the shot (Yiannakos & Armatas, 2006), and the type of attack (Lago-Ballesteros et al., 2012). In ice hockey, both expected goals and the term Corsi have been used to describe team performance. Corsi measures the number of shot attempts, while expected goals also account for shot quality and location (Johansson et al., 2022). However, while both Corsi and expected goals describe team performance, they do not indicate the specific game situations in which goals are scored. Therefore, the main purpose of this study was to describe the types of game situations from which goals are scored.

Goal scoring

In ice hockey games, most goals are scored when teams play at even strength. 63% of goals occur in 5 vs. 5 situations, 21% on a 5 vs. 4 power play, and the remaining 16% in other game situations (Luimula, 2025a). The offensive zone is particularly important from the perspective of goal scoring. Parničan et al. (2021) demonstrated that offensive-zone situations are statistically significant compared to other rink zones. Similar results are presented by Luimula (2013, 2025b), who reported that attacks originating from the offensive zone are the most effective in terms of goal scoring.

In ice hockey, at even strength, most goals are generated from board play and turnovers in the offensive zone, but also from fast attacks and counterattacks starting in the defensive zone (IIHCE, 2008; Luimula, 2025a, 2025b). Offensive efficiency—that is, the attack ending with a shot on goal from sectors 1–3—varies by zone. Offensive efficiency is 4–10% from the defensive zone, 5–6% from the neutral zone, and 19–23% from the offensive zone (IIHCE, 2008; Luimula, 2013, 2025b; Westerlund, 1991). The efficiency of slow attacks is 10–15%, of fast attacks 40%, and of counterattacks as high as 80% (Westerlund, 1991).

5 vs. 4 power play is an important part of team strategy. Previous research has shown that the significance of board play during power plays is particularly pronounced, as it accounted for the second-highest proportion of all goals scored in games (Luimula, 2025a). In general, power-play goals account for about 20–30% of goals in games (Luimula, 2025a; Savolainen, 2016, pp. 566–567). The proportion of power-play goals varies in individual games or series. For example, during the 2022–2024 Stanley Cup Finals, the share of 5 vs. 4 power-play goals was only 9% of all goals scored (Luimula, 2025b).

Goal scoring analysis

In previous ice hockey studies, slightly different shot maps have been used to determine the location of goals. Figure 1 shows a shot map, which is also used in this study.

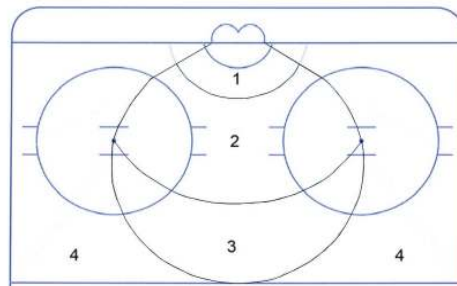


Figure 1. Shot map used in the study (adapted from IIHCE, 2008; Luimula, 2013, 2025a).

In ice hockey games, 30–37% of goals are scored from sector 1. The shares of the other sectors are as follows: sector 2 = 34–35%, sector 3 = 20–25% and sector 4 = 9–11%. Sectors 1–2 together form the so-called scoring area. From this area, a total of 65–75% of goals are scored in games (IIHCE, 2008; Luimula, 2025a, 2025b). Control of the goal-front area is therefore emphasized in scoring. The same has also been noted, for example, in field hockey, where a large share of goals are scored from close range (Sunderland et al., 2006).

Overall, 13.2% of goal-scoring opportunities result in a goal (Lignell et al., 2020). Goal-scoring efficiency, defined as the proportion of shots resulting in goals, was 11.7% across ice hockey games. Goals are scored most efficiently from close range. Goal efficiency is 25% in sector 1, 15% in sector 2, 9% in sector 3, and 4% in sector 4. In efficiency comparisons, sector 1 is statistically significant relative to sector 2–4 (Luimula, 2025b). The ways in which goals are scored also vary. Of the goals scored from the scoring area, 2% result from breakaways, 26% from passes, 53% from direct shots or dekes, and 19% from rebounds or deflections (IIHCE, 2008). In a study covering all goals in games, the breakdown is as follows: 47% from direct shots, 30% from passes, 15% from deflections, and 6% from rebounds (Luimula, 2025a). The championships in both the NHL and the Finnish Liiga are decided in playoffs following the regular season (Liiga, 2024; NHL, 2025). This study analyzes how teams succeed in goal scoring during the decisive moments of the season. In addition, the study examines differences in scoring between the two leagues. The findings of this study can be used to support the development of team performance in both offensive and defensive play.

The study addressed three research questions:

1. What types of offensive situations lead to goals in the playoff games?
2. How do scoring patterns differ between the NHL and Liiga?
3. What tactical implications can be identified from these scoring patterns?

Material & methods

Material

The research material consisted of official match statistics and goal highlight videos (Hockey-Reference, 2025; Liiga, 2024; NHL, 2025). The analyzed dataset included all 45 playoff games from the 2023–2024 Liiga season and all 86 playoff games from the 2024–2025 NHL season. A total of 754 goals were scored in these games. The dataset included only individual goal events. Therefore, it was not possible to analyze offensive mechanisms in relation to match outcomes.

Method

This study is a quantitative, descriptive, comparative observational study based on systematic notational performance analysis of ice hockey goal-scoring events.

The research method applied was ice hockey goal-scoring analysis, which made it possible to identify the situations leading to individual goals after games by using goal compilations. The method is based on notation-based performance analysis and systematic observation, which have been widely applied in sports research (Hughes & Franks, 2004; McGarry & Franks, 2005, pp. 265–274).

Goal-scoring analysis was used to examine the type of attack, the number of players involved, the scoring method, and the shot sector. The categories applied in the goal-scoring analysis, such as slow attack and fast attack, were grounded in established ice hockey research and related literature (IIHCE, 2008; Luimula, 2013, 2025a, 2025b; Westerlund, 1991, 1997). These operational definitions allowed different game situations to be systematically classified into the appropriate categories. The categories were also designed to ensure that the situations could be consistently identified and analyzed from official goal highlight videos (Luimula, 2025a). Table 1 presents the operational definitions used in the goal-scoring analysis (Luimula, 2025a).

Table 1. Goal-scoring analysis (adapted from Luimula, 2025a).

CATEGORY	SUBCATEGORY
1. Type of attack	<p>Defensive zone (Puck possession in the defensive zone, leading to a direct attack into the offensive zone)</p> <ul style="list-style-type: none"> • Slow attack: The defending team has 4–5 players in the defensive zone. • Fast attack: The defending team has at least as many players as the attacking team (1 vs. 1, 2 vs. 2, 3 vs. 3). The number of defending players is a maximum of three. • Counterattack: The attacking team has more players than the defending team (1 vs. 0, 2 vs. 1, 3 vs. 2). The defending team has no more than two players. <p>Neutral zone</p> <ul style="list-style-type: none"> • Slow attack: The defending team has 4–5 players in the defensive zone. • Fast attack: The defending team has at least as many players as the attacking team (1 vs. 1, 2 vs. 2, 3 vs. 3). The number of defending players is a maximum of three. • Counterattack: The attacking team has more players than the defending team (1 vs. 0, 2 vs. 1, 3 vs. 2). The defending team has no more than two players. <p>Offensive zone</p> <ul style="list-style-type: none"> • Turnover: The defending team gains puck possession from the opponent in the offensive zone and scores within five seconds.

	<ul style="list-style-type: none"> • Face-off win: A goal is scored within five seconds of the face-off. • Board play: The puck is held in the offensive zone for more than five seconds before scoring. Attacks originating in the defensive or neutral zone are also marked as board play if they do not lead to a direct shot (e.g., the puck is carried behind the net or into the corner). Similarly, the “dump and chase” strategy is marked here if the puck has not been lost to the opponent.
2. Game situation	<p>Goals are analyzed based on the type of attack and game situation. Exceptions include a delayed penalty or penalty expiration, in which case the goal is analyzed according to the situation in effect before the player returns to the defensive zone (e.g., if a penalty ends 1 second before a goal, the goal is counted as a power play goal, not an even-strength goal).</p> <ul style="list-style-type: none"> • 5 vs. 5 • 5 vs. 4: Power play • 4 vs. 5: Penalty kill • 5 vs. 3: Two-player power play • 3 vs. 5: Two-player penalty kill • 6 vs. 4: One-player power play, with the goalie pulled • 4 vs. 6: One-player penalty kill, with the opponent's goalie pulled • 4 vs. 4: Both teams missing one player • 4 vs. 3: One-player power play • 3 vs. 3: Overtime • Penalty shot • Shootout
3. Scoring method	<ul style="list-style-type: none"> • Direct shot: Goal from a shot or deke. • Off a pass: One-timer or a goal when the goalie is still moving. • Deflection: A player positions themselves between the shooter and goalie and scores by deflecting the puck. Also includes deflections off a skate or other object. • Rebound: Goal scored after a shot is saved by the goalie. <p>Goals scored against an empty net were additionally identified when the opposing team had pulled its goaltender, while the primary goal-scoring method remained classified as direct shot, off a pass, deflection, or rebound.</p>
4. Scoring sector	<ul style="list-style-type: none"> • Sector 1 • Sector 2 • Sector 3 • Sector 4

In determining the shooting sector, the statistical services of both leagues were utilized. These services provide information on individual goals, such as the scorer, game time, and shooting location. The identification of the shooting location is based on tracking data transmitted by the smart puck (Bitwise, 2024; NHL, 2024). The placement of the shooting location in relation to the sectors was analyzed by overlaying a transparent plastic sheet on the computer screen. The sheet contained a shot map with the designated sectors.

The study was conducted by analyzing goal highlight videos with an iPad tablet, while observations were simultaneously recorded in an Excel spreadsheet. All games were analyzed by the same observer. The goal compilations, together with the official match statistics of the leagues that included shooting location data, enabled repeated reviews of individual situations when necessary. Of the 754 goals analyzed in this study, 9 were considered ambiguous and therefore only partially analyzed. For example, in the case of own goals ($n = 3$), the number of players involved in the attack was recorded, whereas the scoring method was not. In addition, the scoring method and scoring sector were missing for a small number of goals. Consequently, the partial analysis of these nine goals accounted for 1% of all goals scored in the playoffs.

The reliability of the study can be assessed by comparing the researcher's observations to either repeated measurements or to the observations made by another researcher (Alkula et al., 1994, pp. 83–84; Siedentop & Tannehill, 2000, pp. 72–74). No separate retest was conducted for the present dataset. The present study was designed as a direct continuation of the earlier investigation and therefore employed identical coding procedures and operational definitions. Furthermore, the coding procedure had previously demonstrated high inter-observer reliability (92.5%) in the author's earlier study, and the present study employed the same observational framework, operational definitions, and coding procedure.

Statistical analysis

In the first stage, the number of goals scored in each category of the goal scoring analysis was calculated using Microsoft Excel. Next, the proportions of each subcategory and main category relative to the total number of goals were determined. Finally, potential differences between the Liiga and the NHL in different game situations were analyzed using the chi-square test. Standardized residuals (z-values) were calculated to identify which cells contributed most to the chi-square test results.

In addition, the proportions of goals scored in the different leagues were compared using the two-proportion z-test. The level of statistical significance was set at $p < 0.05$.

In addition to statistical significance, effect sizes were also reported. Cohen's h was used as the effect size measure for the two-proportion z-tests, and Cramér's V for the chi-square tests. Cohen's h values of 0.20, 0.50, and 0.80, and Cramér's V values of 0.10, 0.30, and 0.50 were interpreted as small, medium, and large effects, respectively.

Match-level variables such as win-loss outcomes were not included in the dataset, and therefore statistical models requiring these variables—such as decision-tree analyses—could not be applied.

Ethics

Ethical approval was not required because the study was based exclusively on publicly available match statistics and official goal highlight videos and did not involve human participants or personal data.

Results

Percentages are rounded to the nearest whole number, so totals may not sum to exactly 100%. A total of 754 goals were analyzed in the study, of which 220 (= 29%) were scored in the Finnish Liiga and 534 (= 71%) in the NHL. The total number of games was 131, comprising 45 games from the Liiga and 86 games from the NHL. Table 2 presents the distribution of goals across different game situations and in 5 vs. 5 play.

Table 2. Distribution of goals by game situation and, in 5 vs. 5 play, by playing area and attacking method ($n = 754$), with results of statistical tests.

CATEGORY	SUBCATEGORY	Total % (N)	Liiga % (n)	NHL % (n)	Statistical test / Std residuals
Game situation	5 vs. 5	64 (481)	66 (146)	63 (335)	$\chi^2(2) = 0.89$, ns.
	5 vs. 4	21 (162)	20 (44)	22 (118)	ns.
	Other	15 (111)	14 (30)	15 (81)	ns.
5 vs. 5 – Playing area	Defensive zone	30 (142)	27 (40)	30 (102)	-0.47 (Liiga), +0.31 (NHL)
	Neutral zone	10 (47)	4 (6)	12 (41)	-2.19 (Liiga), +1.44 (NHL)
	Offensive zone	61 (292)	68 (100)	57 (192)	+1.21 (Liiga), -0.80 (NHL)
	5 vs. 5 overall	-	-	-	$\chi^2(2) = 9.29$, $p < 0.01$, $V = 0.110$
5 vs. 5 – Type of attack	Offensive zone board play	33 (158)	38 (55)	31 (103)	ns.
	Offensive zone turnover	23 (111)	25 (36)	22 (75)	ns.
	Defensive zone fast attack	13 (64)	14 (20)	13 (44)	ns.
	Defensive zone counterattack	13 (62)	11 (16)	14 (46)	ns.
	Offensive zone face-off	5 (23)	6 (9)	4 (14)	ns.
	Neutral zone fast attack	5 (24)	3 (4)	6 (20)	ns.
	Neutral zone counterattack	4 (18)	1 (2)	5 (16)	ns.
	Defensive zone slow attack	3 (16)	3 (4)	4 (12)	ns.
	Neutral zone slow attack	1 (5)	0 (0)	1 (5)	ns.
	Summary (Offensive zone vs. other)	-	68 (100)	57 (192)	z-test: $p = 0.021$, Cohen's $h = 0.232$
	Note:				
	1) Standardized residuals for Liiga and NHL are shown in Test statistics-column				
	2) ns. = not significant				

Goals by game situation

The analyzed goals were divided into three game-situation categories: 5 vs. 5, 5 vs. 4 power play, and other situations. In the overall dataset, 64% of goals were scored during 5 vs. 5 play, 21% on the power play, and 15% in other situations.

Based on the chi-square test, no statistically significant difference was found between the Liiga and the NHL in the distribution of goals across game situations. In both leagues, the majority of goals were scored at

even strength (Liiga 66%, NHL 63%), followed by 5 vs. 4 power play (Liiga 20%, NHL 22%), and the remainder in other situations (Liiga 14%, NHL 15%).

Goals at even strength (5 vs. 5)

A total of 481 goals were scored at even strength, 146 in the Liiga and 335 in the NHL (see Table 2). Combined results showed the following distribution by zone: defensive zone 30%, neutral zone 10%, and offensive zone 61%. The most common offensive plays leading to goals were board play (33%) and turnovers in the offensive zone (23%), as well as fast attacks (13%) and counterattacks (13%) initiated from the defensive zone.

Statistically significant differences were observed between the leagues. In the Liiga, the distribution across zones was: defensive zone 27%, neutral zone 4%, and offensive zone 68%. In the NHL, the respective shares were 30%, 12%, and 57%. The chi-square test showed that the difference in zone distribution was significant ($\chi^2(2) = 9.29$, $p < 0.01$, Cramér's $V = 0.110$). The largest difference was in the neutral zone, where the Liiga produced fewer goals than expected (standardized residual $z = -2.19$), while the NHL produced more ($z = +1.44$). In the offensive zone, the Liiga produced slightly more goals than expected ($z = +1.21$), while the NHL produced fewer ($z = -0.80$). No significant differences were found in the defensive zone.

Analysis of offensive plays showed that board play accounted for the highest proportion of goals in both leagues (Liiga 38%, NHL 31%). This was followed by turnovers in the offensive zone (Liiga 25%, NHL 22%), fast attacks (Liiga 14%, NHL 13%), and counterattacks from the defensive zone (Liiga 11%, NHL 14%). A two-proportion z-test showed a statistically significant difference between the leagues in the overall share of goals scored from the offensive zone ($p = 0.021$, Cohen's $h = 0.232$).

Goals on the power play (5 vs. 4)

Table 3 summarizes the distribution of goals by power play.

Table 3. Distribution of goals by power play ($n = 162$), with results of statistical tests.

CATEGORY	SUBCATEGORY	Total % (N)	Liiga % (n)	NHL % (n)	Test statistics
5 vs. 4 – Playing area	Defensive zone	7 (11)	9 (4)	7 (7)	ns.
	Neutral zone	3 (5)	2 (1)	3 (4)	ns.
	Offensive zone	90 (146)	89 (39)	90 (107)	ns.
5 vs. 4 – Type of attack	Offensive zone board play	76 (123)	73 (32)	77 (91)	ns.
	Other (e.g. face-off, turnover, slow attack)	24 (39)	27 (12)	23 (27)	ns.
	- offensive zone turnover	8 (13)	11 (5)	7 (8)	ns.
	- offensive zone face-off	6 (9)	5 (2)	6 (7)	ns.
	- defensive zone slow attack	5 (8)	2 (1)	6 (7)	ns.
Note: ns. = not significant					

A total of 162 goals were scored on the power play, 44 in the Liiga and 118 in the NHL. Combined results showed the following distribution: defensive zone 7%, neutral zone 3%, and offensive zone 90%. The majority of power play goals originated from board play in the offensive zone (76%). Additional goals were scored, for example, from turnovers (8%) and face-offs (6%) in the offensive zone, and slow attacks (5%) initiated from the defensive zone.

Differences between the leagues were minimal. In the Liiga, the distribution was: defensive zone 9%, neutral zone 2%, and offensive zone 89%. In the NHL, the respective shares were 7%, 3%, and 90%. Board play accounted for 73% of power-play goals in the Liiga and 77% in the NHL.

Other situations

Table 4 presents the proportion of goals scored from other situations relative to the total number of goals.

Table 4. Proportions of goals from other situations ($n = 111$) relative to all goals, with results of statistical tests.

CATEGORY	SUBCATEGORY	Total % (N)	Liiga % (n)	NHL % (n)	Test statistics
Other situations	5 vs. 6	8 (61)	8 (18)	8 (43)	ns.
	6 vs. 5	2 (15)	2 (5)	2 (10)	ns.
	Other (e.g. 5 vs. 3, 4 vs. 4, 4 vs. 5)	5 (35)	3 (7)	5 (28)	ns.
Note: ns. = not significant					

Other game situations accounted for 15% of all goals. No differences were observed between the leagues (Liiga 14%, NHL 15%).

The majority of these goals were scored when the opposing goaltender had been pulled for an extra player in 5 vs. 6 play (see Table 4). Empty-net goals represented 8% of all goals in both leagues. The second

most common situation was 6 vs. 5 power play (2% in both leagues). In the NHL, approximately 2% of goals were scored during 5 vs. 3 power plays, 2% during 4 vs. 4 situations, and 2% during 4 vs. 5 penalty kills.

Goal scoring methods

Table 5 presents the proportions of all goals scored, broken down by method of scoring and by shooting sector.

Table 5. Distribution of goals by scoring method ($n = 745$) and scoring sector ($n = 752$), with results of statistical tests.

CATEGORY	SUBCATEGORY	Total % (N)	Liiga % (n)	NHL % (n)	Statistical test
Scoring method	Direct shot	48 (359)	51 (112)	47 (247)	ns.
	Off a pass	26 (195)	32 (69)	24 (126)	z-test: $p = 0.029$, Cohen's $h = 0.173$
	Deflection	14 (101)	6 (14)	17 (87)	z-test: $p < 0.001$, Cohen's $h = 0.324$
	Rebound	12 (90)	11 (23)	13 (67)	ns.
Scoring sector	Sector 1	24 (180)	26 (57)	23 (123)	ns.
	Sector 2	43 (325)	38 (84)	45 (241)	ns.
	Sector 3	21 (159)	22 (49)	21 (110)	ns.
	Sector 4	12 (88)	14 (30)	11 (58)	ns.
Note:		ns. = not significant			

Goal-scoring methods were categorized into four types (see Table 5). In the combined results, direct shots accounted for 48%, passes for 26%, deflections for 14%, and rebounds for 12%.

A direct shot was the most common method in both leagues (Liiga 51%, NHL 47%). Rebounds accounted for 11% of goals in the Liiga and 13% in the NHL. Differences were observed in the other two methods: goals scored from passes were more frequent in the Liiga (32%) than in the NHL (24%) (two-proportion z-test, $p = 0.029$, Cohen's $h = 0.173$). Deflections were significantly more common in the NHL (17%) than in the Liiga (6%) ($p < 0.001$, Cohen's $h = 0.324$).

Goal scoring sectors

The majority of goals were scored close to the net (see Table 5). Based on the combined dataset, the distribution across sectors was: sector 1 = 24%, sector 2 = 43%, sector 3 = 21%, and sector 4 = 12%. Together, sectors 1–2 (the so-called scoring area) accounted for 67% of all goals.

No statistically significant difference was observed between the leagues. In the Liiga, 64% of goals were scored from the scoring area, while the corresponding share in the NHL was 68%.

Discussion

This study addresses a clear gap in the existing literature on ice hockey performance analysis. Although previous work has examined individual aspects of goal scoring—such as shot locations, scoring efficiency, or tactical elements—these findings have largely originated from non-peer-reviewed reports produced by organizations such as the IIHCE. Only a limited number of peer-reviewed studies have focused specifically on goal scoring, and none have systematically described the situational origins of goals in professional playoff hockey or compared these mechanisms between two major leagues. By analyzing the contexts in which goals are scored in the NHL and the Finnish Liiga playoffs, this study provides new empirical evidence on how scoring opportunities emerge under the highest competitive pressure.

Key findings

Goals by game situation

Goals scored in the playoffs were distributed as follows by game situation: even strength (5 vs. 5) 64%, power play (5 vs. 4) 21%, and other situations 15%. The shares in the NHL and the Liiga were nearly identical. Similar results were reported in a previous study on the Finnish Liiga 2023–2024 regular season, where the corresponding figures were 63%, 21%, and 16% (Luimula, 2025a).

Goals by zone in 5 vs. 5 play

Zone-specific analysis indicated that most goals were scored from the offensive zone. Overall distribution was: offensive zone 61%, defensive zone 30%, and neutral zone 10%. These results were consistent with previous studies examining the Finnish Liiga regular season and games of the Finnish national team (IIHCE, 2008; Luimula, 2025a).

However, differences were observed between the NHL and the Liiga: in the NHL, the defensive zone accounted for 30% and the neutral zone for 12%, whereas in the Liiga these figures were 27% and 4%. The offensive zone accounted for 57% in the NHL and 68% in the Liiga. Chi-square testing indicated that the overall difference between leagues in zone-specific goal distribution was statistically significant ($p < 0.01$). A closer analysis revealed that the difference was mainly related to goals scored from the neutral zone: more than expected in the NHL and less than expected in the Liiga.

This difference may be explained by tactical factors, influenced by playing traditions, rink size, and playing philosophy. North American playing style has been described as more direct, whereas European hockey emphasizes skill and skating (Kivinen et al., 2000, pp. 18–19; Valkonen, 1997, pp. 17–26).

The higher proportion of neutral zone goals in the NHL may reflect a faster transition style typical of North American hockey, whereas teams in the Liiga may favor controlled puck possession, leading to fewer neutral zone goals. This difference in playing style is illustrated by observations from the 2006 Turin Olympic Games. When a defenseman first gained puck possession in the neutral zone, for example after an opponent's dump-out, Finland typically initiated attacks more slowly through multiple passes between defensemen. In contrast, Canada transitioned more directly and rapidly toward the offensive zone (Luimula, 2013, p. 81).

The proportion of goals from the offensive zone differed between the leagues by 11 percentage points. The effect size, however, was small, suggesting that while the difference is statistically robust, its practical magnitude should be interpreted with some caution. Analyses using the two-proportion z-test also supported the observations of league differences. The two-proportion z-test indicated a statistically significant difference between the leagues in the overall proportion of goals originating from offensive-zone situations ($p = 0.021$). The effect size was small (Cohen's $h = 0.232$), suggesting limited practical significance despite the statistical significance. One possible explanation for the Liiga's higher share is rink size: the European rink, being wider than an NHL rink, allows more effective use of board play in the offensive zone. However, because rink dimensions were not directly examined in this study, this explanation remains speculative.

Goals by type of attack

Examination of attack types showed that most even-strength goals originated from offensive zone board play (33%) and turnovers (23%). A significant proportion of goals also came from defensive zone fast attacks (13%) and counterattacks (13%). The results were otherwise similar between the NHL and the Liiga, but the Liiga had a slightly higher share of board play goals (38% vs. 31%).

These findings align with previous studies showing a statistically significant difference between offensive zone attacks and those originating from the defensive or neutral zones (Luimula, 2013, 2025a; Parničan et al., 2021). However, the results differ somewhat from a study on the Stanley Cup Finals (Luimula, 2025b), where most goals came from offensive zone turnovers (30%) and board play (20%). Overall offensive zone contribution was similar, but the shares of turnovers and board play were reversed. The share of defensive zone fast attacks was comparable, but in the Finals, the proportion of counterattacks was higher than in the current study (23% vs. 13%). This suggests that, particularly in critical playoff moments such as the Finals, goals are more likely to arise from fast turnovers in both defensive and offensive zones.

Goals on 5 vs. 4 power play

Power play goals accounted for 21% of all goals. Most 5 vs. 4 goals were scored from the offensive zone (90%), particularly from board play (76%). Goals from the defensive zone (7%) and neutral zone (3%) were less common but indicate that breakout plays and controlled progression can also create direct scoring opportunities.

No significant differences were found between the NHL and Liiga in 5 vs. 4 goals. In both leagues, power play goals accounted for approximately 20% of goals (NHL 22%, Liiga 20%). The results were consistent with a previous study (Luimula, 2025a). In contrast, a study focusing on the Stanley Cup Finals reported a lower share of power play goals (9%), with a more even distribution between defensive and offensive zones (Luimula, 2025b). This difference may be due to the small sample size in the Finals ($n = 12$) and the low number of power play goals ($n = 7$), as well as successful penalty killing by the opponents.

Goals from other situations

Other situations accounted for 15% of all goals. Most of these occurred in 5 vs. 6 situations, where the opposing team played without a goalie (8% of all goals). The next most common were 6 vs. 5 goals (2%). No major differences were observed between the NHL and Liiga. However, results partly differed from previous regular season studies, in which a significant share of goals also occurred in 3 vs. 3 overtime situations (Luimula, 2025a). In this study, overtime was played at even strength, explaining the discrepancy.

Goal scoring methods

In the playoffs, most goals were scored by direct shots (48%). Next were goals from passes (26%), deflections (14%), and rebounds (12%). These results differed only slightly from a previous Liiga regular season study, in which the respective shares were as follows: direct shot 47%, pass 30%, deflection 15%, and rebound 6% (Luimula, 2025a).

Statistically significant differences were found between the NHL and Liiga in goals from passes ($p < 0.05$) and deflection goals ($p < 0.001$), with passes being more common in the Liiga (32% vs. 24%) and deflections more frequent in the NHL (17% vs. 6%). However, the effect sizes were small (Cohen's $h = 0.173$ and 0.324), indicating that the differences between the leagues were relatively modest in practical terms. One possible explanation for the differences may be rink size: the wider offensive zone in the Liiga provides more space for off-puck players to move into open positions, facilitating scoring from passes.

Goal scoring sectors

Goals were distributed across sectors as follows: sector 1 = 24%, sector 2 = 43%, sector 3 = 21%, and sector 4 = 12%. Therefore, the primary scoring area (sectors 1–2) accounted for 67% of all goals. No differences

were observed between leagues. In previous studies, sector 1 accounted for 30–37% and sector 2 for 34–35% (IIHCE, 2008; Luimula, 2025a, 2025b). Compared to previous studies, the results of this study showed a smaller share for sector 1 and a larger share for sector 2.

Previous research has shown that scoring efficiency increases with proximity to the goal (Lignell et al., 2020; Luimula, 2025b). This study focused solely on actual goals, not all scoring attempts. While this does not present new sector-specific efficiency results, it emphasizes the importance of defending the area in front of the goal.

Limitations

The method used in this study was goal scoring analysis, based on notation-based game analysis and systematic observation (Luimula, 2025a). Similar methods have been widely applied in sports research (Hughes & Franks, 2004; McGarry & Franks, 2005, pp. 265–274).

Reliability can be assessed by comparing observations with repeated measurements or with observations made by another researcher (Alkula et al., 1994, pp. 83–84; Siedentop & Tannehill, 2000, pp. 72–74). No separate inter-observer reliability assessment was conducted for the present dataset. However, the coding procedure had previously demonstrated high inter-observer reliability (92.5%) in the author's earlier study using the same observational framework and coding categories. The present study employed the same coding protocol and operational definitions throughout the analysis.

The use of official goal highlight videos allowed repeated examination of individual game situations and reduced the need to rely on a single viewing of each event.

A limitation was that the analysis was based on game summaries, meaning the researcher could not control camera angles, potentially complicating the interpretation of, for example, the starting area of an attack. Due to limitations caused by the goal highlight compilation, nine out of 754 playoff goals could not be fully analyzed because of unclear situations or recording errors (e.g., own goals or missing scoring method), representing 1% of the sample. Nevertheless, the absence of an inter-observer reliability assessment for the current dataset should be considered a limitation.

A further limitation is that the dataset contained only individual goal events and did not include match-level variables such as win–loss outcomes. As a result, it was not possible to examine how scoring mechanisms relate to match results, nor to apply statistical models that require these variables (e.g., decision-tree analyses).

Future research

This study focused on realized goals. Future research could investigate goal types at the team level by combining game analysis with coach interviews to better understand intended strategies and their execution. Comparative analyses could also be conducted between championship-winning and lower-performing teams. Moreover, future studies could benefit from integrating modern technologies, such as player tracking systems and artificial intelligence, to facilitate large-scale analyses of game datasets and uncover scoring patterns that may remain undetected through traditional observational methods.

Practical implications

Goal-scoring methods remain consistent between the regular season and playoffs. The main difference between the NHL and the Liiga was in goals from neutral zone attacks and offensive zone board play. Detailed analysis may offer teams new tactical insights.

The results can inform coaching in team tactical planning, highlighting key tactical components for scoring. Offensive aspects of particular importance include defensive zone breakout plays and offensive zone board play, both at even strength and on the power play. From a defensive perspective, the results emphasize defending the area in front of one's goal, turnovers in the offensive zone, and puck control, which together ensure strong defensive readiness and limit opponents' ability to execute fast attacks or counterattacks. For coaches, these findings highlight specific offensive and defensive mechanisms that can be systematically trained and monitored. Integrating these situational patterns into video-analysis workflows may help teams better anticipate scoring opportunities and refine both offensive and defensive structures.

Conclusions

Although several differences between the leagues reached statistical significance, the effect sizes were small (Cohen's $h = 0.17$ – 0.32 ; Cramér's $V = 0.11$), indicating that these differences were modest in magnitude and should be interpreted with caution. One of the differences between the leagues was in the neutral zone, where relatively more goals were scored in the NHL as a result of quick transitions, while in the Liiga, goals were more often the product of offensive zone control and board play. This distinction may reflect differences in rink size and playing philosophies. This suggests that structural characteristics of the playing environment, such as rink dimensions, may influence tactical choices and scoring patterns.

The study demonstrated that goal-scoring patterns in the playoffs are largely similar to those in the regular season: the majority of goals were scored at even strength (64%), particularly from offensive zone board play and turnovers. The findings also highlight the importance of quick defensive zone breakout play and active forechecking to regain puck possession in the offensive zone.

Most goals were scored from close range. 67% of goals originated from sectors 1 and 2, underscoring the importance of defending the slot area and the movement of off-puck players in offensive play. Nearly half of the goals resulted from direct shots, but deflections and rebounds also provided significant additional means of scoring.

Overall, the study reinforces that playoff goal-scoring is built on structured offensive-zone play, rapid exploitation of turnovers, and effective special-teams performance. These mechanisms appear to be central components of playoff offensive performance and offer concrete focal points for developing both offensive and defensive team tactics.

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