

Does individual regular season consistency translate to individual playoff success?

Introduction:

This project explores the relationship between individual regular season consistency and playoff success in the NHL, aiming to help teams understand player performance under pressure. While the regular season assesses a player's abilities across various scenarios, the playoffs introduce higher stakes and tougher competition. Understanding whether consistent regular season performance translates to playoff success is crucial for informing team strategies, coaching decisions, and player evaluations. Teams that identify players who maintain or elevate their performance in the playoffs can more effectively construct their rosters, positioning themselves for a greater chance of Stanley Cup Playoff success.

Metrics chosen to measure consistency:

For purposes of simplicity, three common, well measured and critical player statistics were chosen to be the input variables for this project. These three variables are Goals (“G”), Assists (“A”), and Takeaways (“TKA”). These metrics combined provide a crucial understanding of both a players offensive and defensive abilities - reflecting their overall impact on a game.

Data Scraping:

Python was used to scrape data from StatMuse.com, compiling G, A, and TKA statistics for the top 3 players in terms of point totals from each NHL team over the past 9 seasons (2015-2024). This dataset, which distinguishes between regular season and playoff performance, provides insights into the impact of key players on their teams.

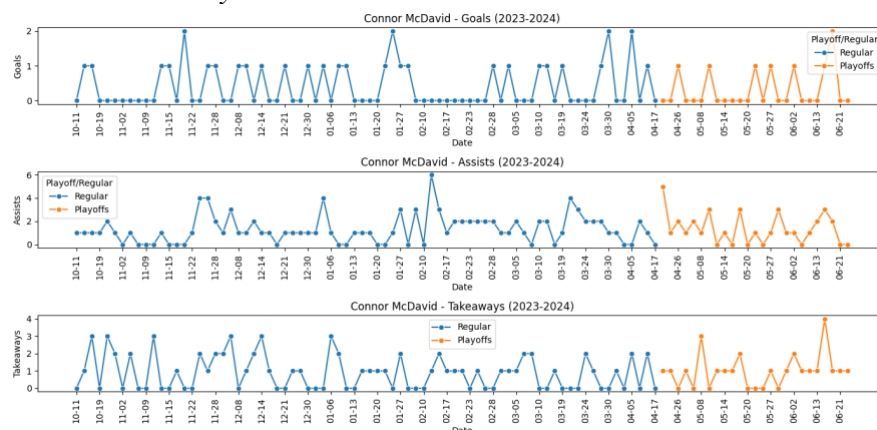
Consistency:

In the NHL, consistency means a player performs reliably in key metrics like goals, assists, and takeaways across games and seasons. A consistent player delivers steady results, making them dependable and impactful for their team. A consistent player delivers similar results in key performance metrics—such as goals, assists, and takeaways—without significant fluctuations, regardless of the context or opponent.

Pre-Analysis:

Before completing any analysis, a player in the dataset from this past season (2023-2024) was chosen to help showcase what consistency versus inconsistency looks like for a player in these categories.

Connor McDavid Consistency Chart:



The line charts display Connor McDavid's 2023-2024 performance in goals, assists, and takeaways, comparing regular season and playoff performance. McDavid was consistent in assists and remained a key offensive contributor, though his goal-scoring varied. Defensively, his takeaways were inconsistent in the regular season but became more reliable in the playoffs. Overall, McDavid maintained his role as a crucial playmaker, though he faced greater challenges in goal-scoring during the playoffs.

Analysis:

Consistency Table - measure of consistency: A Consistency Table was created to measure NHL players' consistency by comparing the normalized standard deviation of their performance metrics (Goals, Assists, Takeaways) between the regular season and playoffs over nine seasons. A lower normalized standard deviation indicates consistent performance, while higher values suggest variability. This table helps determine if regular-season consistency translates to playoff performance.

Key Bias (adjusted for): The consistency analysis initially presented an important bias that was considered. The consistency metric tended to favour players who produce fewer stats, as consistently low or zero outputs result in a lower standard deviation, making them appear more consistent. Conversely, elite players who score in bunches seemed inconsistent due to higher variability in their performance—scoring, for example, 1 goal one night and 4 the next. To adjust for this, a weighting system to account for the volume of stats a player produces was created. The standard deviation for each statistic was normalized by dividing by the average number of goals, assists, or takeaways a player generates. This reduces the bias against players with higher stat totals.

Key findings:

- **Assists:** Playoffs average normalized STD is 1.738, slightly lower than the regular season's 1.823.
- **Goals:** Playoffs average normalized STD is 1.39, with regular season slightly higher at 1.443.
- **Takeaways:** Higher variability in the playoffs with a 1.437 normalized STD compared to the regular season of 1.362.

Table 1: Consistent/Inconsistent Overall Normalized STD:

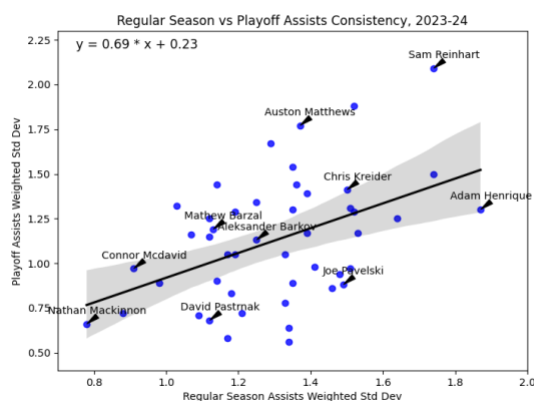
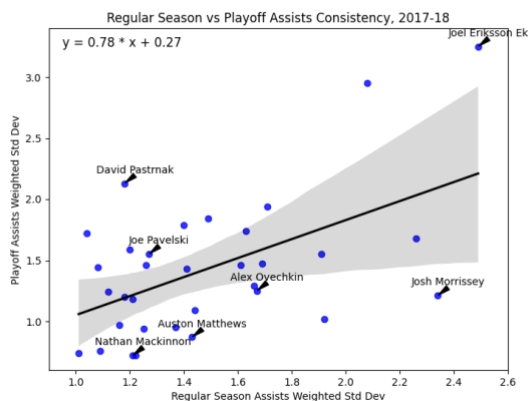
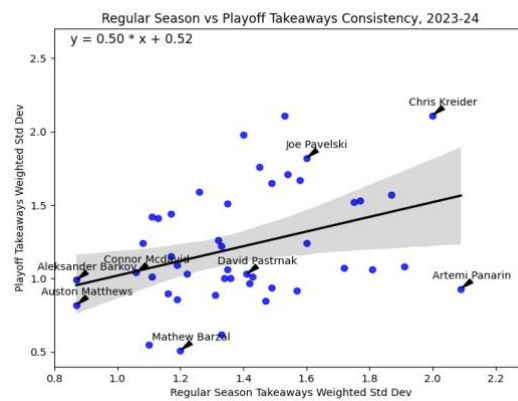
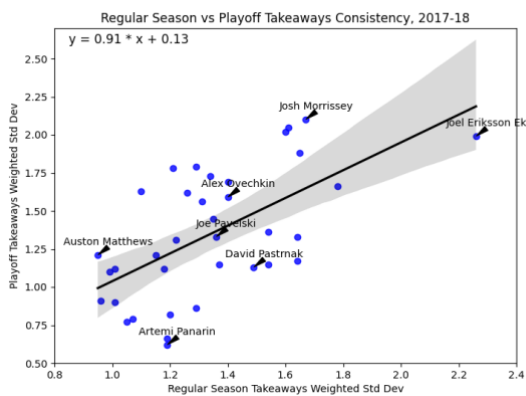
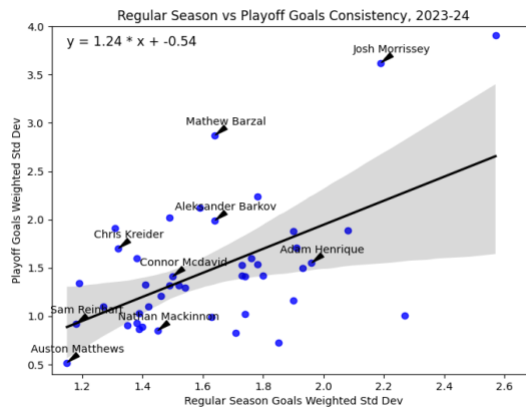
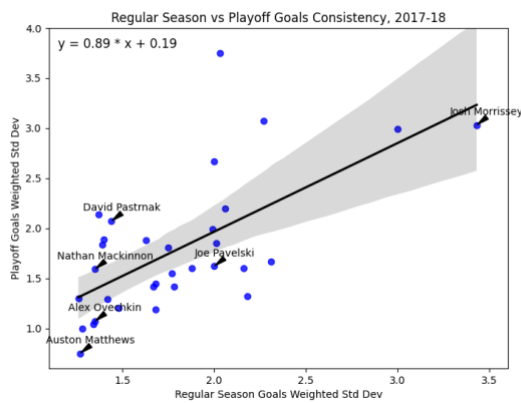
Player Average Normalized STD						
Player	Assists_Playoffs	Assists_Regular	Goals_Regular	Goals_Playoffs	Takeaways_Regular	Takeaways_Playoffs
Connor McDavid	0.983	0.945	1.345	1.317	1.068	1.052
Jack Hughes	0.99	1.14	1.38	1.24	1.21	0.92
Josh Morrissey	1.383	1.807	2.983	3.727	1.74	1.65
Mike Matheson	3.61	1.54	2.66	2.55	1.37	1.61

The two most consistent players based on an average of their normalized STD values across goals, assists, and takeaways are: Connor McDavid with an overall consistency score of 1.118 and Jack Hughes with an overall consistency score of 1.147.

The two most inconsistent players are: Josh Morrissey with an overall consistency score of 2.215 and Mike Matheson with an overall consistency score of 2.223.

The above selection focuses on players with playoff experience and highlights both their reliability and variability in performance.

Regression Analysis:



Overall Comparison Summary:

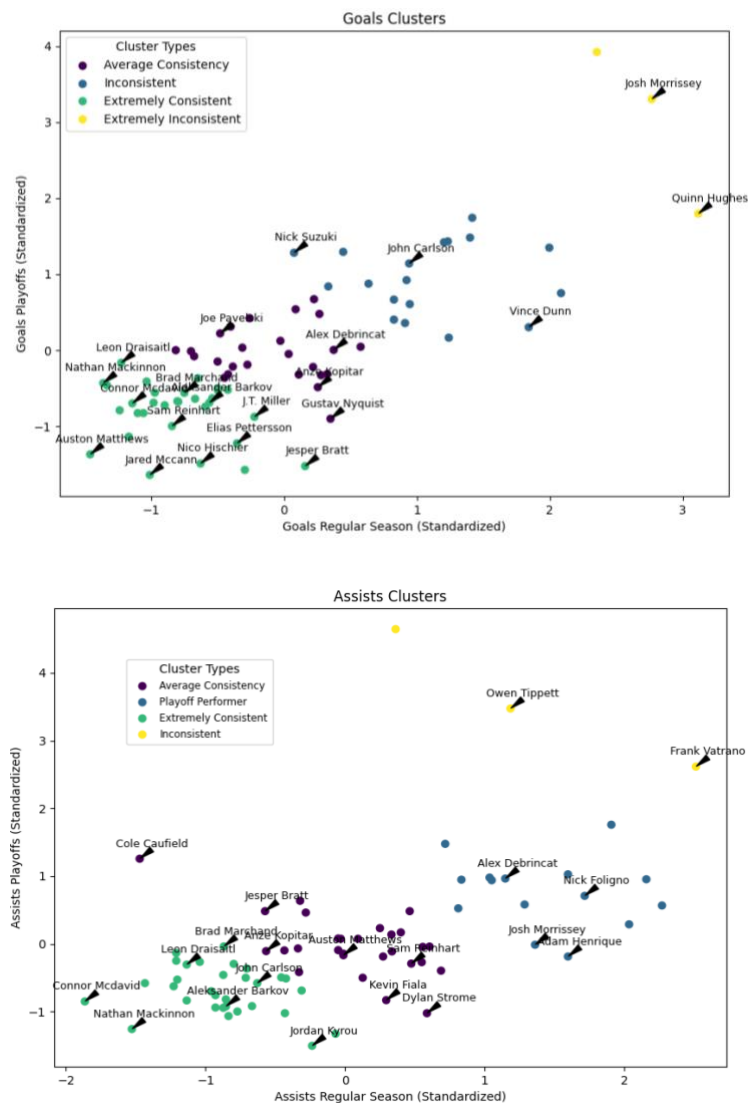
The analysis of regular season versus playoff consistency for Goals, Assists, and Takeaways from the 2017-18 and 2023-24 NHL seasons reveals a strong positive correlation across both years, though the strength of this relationship varies by category and season. In 2017-18, consistency in takeaways showed the strongest correlation between the regular season and playoffs, while in 2023-24, the relationship weakened, particularly for takeaways. Overall, players like Josh Morrissey and Joel Eriksson Ek displayed high variability in playoff performance, whereas Auston Matthews and Connor McDavid maintained steadier consistency. The evolving slopes between these two seasons suggest that the link between regular season and playoff performance may be shifting, with some players adapting more to the playoff environment over time. Nonetheless, the predictive power of regular season

performance on playoff consistency is overall strong and therefore a useful tool in predicting individual player playoff success.

K-means clustering algorithm:

This method partitions players into clusters based on metrics like goals, assists, and takeaways, allowing analysts to discern which players are consistent, which excel in specific areas, and which might show variability between regular season and playoff performance.

Offence Metrics:



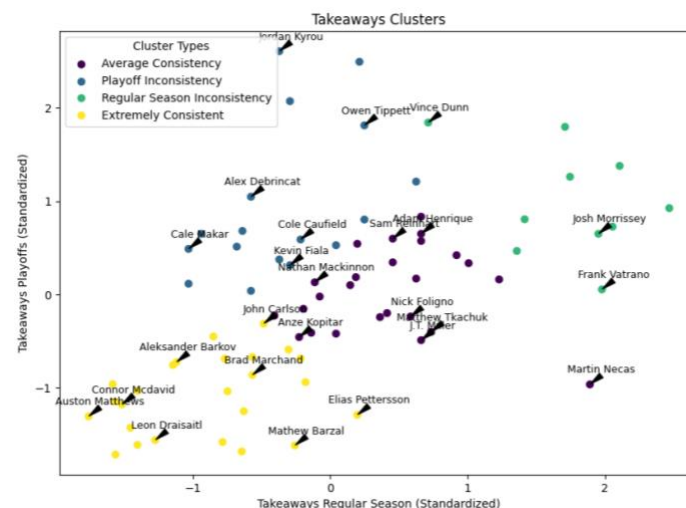
Extremely Consistent: Players such as Connor McDavid, Nathan Mackinnon, and Aleksander Barkov consistently excel in their offensive performance (G and A) during both the regular season and playoffs. These are elite players.

Inconsistency: Josh Morrissey shows extreme inconsistent performance in both the playoffs and regular season in goal-scoring, while Frank Vatrano shows extreme inconsistency in assists for both.

Playoff (Only) Performers: Players such as Josh Morrissey and Adam Henrique showcase consistent playmaking abilities in the playoffs through their consistent assist production. These players elevate their play in the playoffs.

Average Consistency: Anze Kopitar maintains steady offensive performance in both the regular season and playoffs. Joe Pavelski and Gustav Nyquist maintain steady goal-scoring across both seasons, while Sam Reinhart and Auston Matthews produce an average level of assists.

Defensive Metric:



Extremely Consistent: Players such as Connor McDavid and Leon Draisaitl, maintain a very consistent level of performance in takeaways during both the regular season and playoffs, showcasing their defensive reliability.

Inconsistent: Players such as Josh Morrissey and Frank Vatrano struggle in the regular season in their takeaway consistency but improve in the playoffs.

Playoff Inconsistency: Players such as Jordan Kyrou, Owen Tippett struggle to replicate regular season takeaway consistency in the playoffs.

Average Consistency: Players such as Matthew Tkachuk and Anze Kopitar manage to maintain a consistent level of production in playoff takeaways.

Conclusion: This project demonstrates that regular season consistency is a strong predictor of playoff success. K-means clustering indicates that elite players like Connor McDavid and Nathan Mackinnon consistently and steadily perform in both the regular season and playoffs, making them key and economically productive assets. In contrast, players with more variable performances such as Frank Vatrano require strategic consideration as to their roles and allocated ice time in regular season versus playoff settings. By integrating regression and clustering insights, teams can better understand how regular season consistency translates to playoff performance, informing roster construction and strategy to enable and promote greater postseason success.

All code utilized in this project: https://github.com/jolin33/Olin_Joshua_UtahAnalyticsProject