Rating Players: Point Share

I'm as surprised as you are about this: I was listening to the sermon at church. It wasn't a fire-and-brimstone sermon, as I wouldn't go to that type of church. But the sermon is usually a nice little break where I can catch a morning-mini-nap.

The sermon talked about a journey from curiosity to analysis to knowledge, which made me think about the articles I write for Stapled To The Bench (STTB), especially with regards to player rating systems.

Curiosity

Curiosity is a strong desire to know or learn something.

As the sermon went on (and on, and on) I started thinking about statistics. I had just re-read a Bill James article on Win Shares (baseball), and I had just written an article on the "importance" of statistics. Mr. James assessed the impact of player performance in a combination of several statistics on their team's overall performance.

I was curious whether players with high PR-Scores would also be at the top of a properly developed rating system based on the importance of statistics. I mean, they should be, shouldn't they?

Analysis

Analysis is the detailed investigation of the structure of something. In this instance, the "something" is "hockey statistics."

For this new rating system, the analysis was coupled with experimentation. In the development of any rating system, it is necessary to "play with the weights" so that the objective results match subjective expectations. Who is going to believe a rating system is accurate if it identifies Sebastian Aho (F, CAR) as the best player in the league?

Knowledge

Knowledge is information acquired through education, or learning. Using statistics and formulas to categorize hockey players can lead to knowledge. This process could lead to a greater understanding of the contributions of some players.

Let's see what knowledge I can acquire.

Point Share: A New Rating System

Point Share is a new rating system. It's a unit of measurement for a player in standing points. Its value represents how many standing points the player "is responsible for" had he played for a mid-level team.

Point Share uses weighted statistics, and those weights were heavily influenced by an earlier article called *The Importance of Statistics – From Goals to Hits*.

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Most of the statistics STTB has created consist of a specific numeric measurement (a score) and categories which contain groups of players based on their scores. Point Share is no different.

The numeric component is called PtShare, and its specific value will be rounded to the nearest 0.5 points. For example, Adam Fox's specific score of 9.3 was rounded to 9.5.

As with Productivity Rating (PR), Point Share has six categories which use the same suffixes. The Point Share categories are: Pt-Elite, Pt-Star, Pt-First5, Pt-Regular, Pt-Fringe and Pt-CallUp.

The Statistics Being Used: Cost Implications

Almost all of the articles written for Stapled To The Bench (STTB) use data that is freely available. This perfectly fits my personal level of disposable income (I'm a pensioner) and the goal of not monetizing STTB (no advertisements or fees).

The Statistics Being Used: Season Level

A player will be evaluated on what he did in a specific season. Players that miss games will have lower ratings than they would have had, had they played all 82 games.

Jack Hughes (F, N.J) has a PtShare of 7.5, making him Pt-First5. That's pretty good for a guy who played only 62 games. Had he played 82 games he probably would have had a PtShare of 9.5 (Pt-Star). His PtShare accurately reflects the fact that he missed 20 games.

The Statistics Being Used: Counts vs. Percentages

As I see it, counts are measures and percentages are descriptions. When dealing with a large amount of data either is acceptable. At the end of a baseball season, batting average is both an accurate measure and an accurate description of a player who got to bat 500 times. When dealing with small amounts of data only counts are acceptable. After the first game of a baseball season, a player who went 2 for 3 would have a batting average of .667. Two hits is an accurate measure, but .667 is a useless (though accurate) description.

The problem is that rate (percentages, per game) statistics are only meaningful if a player has played a lot of games. Andrew Copp's faceoff winning percentage of 53.5%, while Alex Nylander had a 100% faceoff winning percentage. The true picture comes from counts. Copp won 536 of 1,001 faceoffs, while Nylander won three of three.

The Data Being Used: Frustration #1 – Defensive Statistics

While Productivity Rating is influenced by offense, Point Share is swamped by the offense. Freely available NHL defensive statistics barely exist. Watching a televised game I have heard statistics like "puck battles won" and "zone time": those data are not freely available.

The main defensive statistics I use are defensive zone faceoffs and penalty kill time. If a player has a high count of defensive zone faceoffs and is given a lot of penalty kill time, he is a good defensive player.

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The Data Being Used: Frustration #2 – Defensemen vs. Forwards

As noted in the first frustration, Point Share is swamped with offensive context. As noted in real life, most defensemen don't score very much. Forwards score 85% of the goals and earn 67% of scoring points. 113 forwards had at least 50 points last season, as compared to only 20 defensemen.

To recognize a defenseman's contribution, Point Share rewards defensemen who played over 1,230 minutes in the season. Defensemen who play a lot must be doing something right, so rewarding them for their time on ice is appropriate.

The Point Share Formula, Basically

I would normally explain exactly how players are being evaluated, as it would allow the reader to verify the results by copying the method. To shorten this article by at least a half-dozen pages, I won't be doing that now. I may get around to writing a technical article that precisely defines the formula sometime in the future.

For each selected statistic I determined the total value for all players. As an example, the total expected goals for (xGF) in the NHL was 40,286. I then chose a multiplier for the statistic so that the product (xGF * $xGF_{MULTIPLIER}$) would be close to 10,000. Using a multiplier of 0.250 made the product 10,073. The reason I chose "close to" rather than "exactly" is that the total of xGF will be different in different seasons. I don't want to calculate season-specific multipliers, even though it would be easy ($xGF_{MULTIPLIER}$ = 10,000/xGF).

Each player would get a weighted xGF value using $xGF_{MULTIPLIER}$ and his actual xGF, creating a datum called w.xGF. Ryan O'Reilly (F, NSH) had xGF = 111.16 and w.xGF = 27.8.

Gathering all of the weighted values for a player, I then developed a formula that weighted each item with respect to its importance and worked with those weights until the sum of the weighted values gave the best players a PtShare value in the 10.0+ range. I think the process is a little easier than it sounds.

You may wonder why Point Share was designed so that the top players in the league would get a PtShare of 10.0 or a little more. One has to consider how many points a single player could be responsible for, and also consider that a team dresses eighteen players and two goalies for a game.

When I looked at that question, I was considering a team that had 95 standing points in a season. If I said that one player was worth 50 points, that means the other seventeen players would be worth a total of 45 points. That just makes no sense at all: McDavid is worth 50 points and Draisaitl is worth 5 points? They should be close to equal. If an extremely good player is worth 12 points (McDavid's PtShare is 12.0), that leaves room for his teammates to get fair evaluations as well (Draisaitl's PtShare is 11.5).

In his best seasons, Wayne Gretzky wasn't worth 50 standing points to his team.

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Selected Statistics

Datum	Description
w.PTS	Scoring points: goals plus assists
w.TKA	Takeaways
w.HIT	Hits delivered
w.BLK	Blocked shots
w.FOT	Total faceoffs taken
w.xGF	Expected Goals For
w.DZ%	Defensive Zone Faceoffs
w.PKT	Penalty Kill Time-On-Ice
w.TRC	Team-Relative Corsi
w.DOI	Defenseman Time-On-Ice

To be clear, blocked shots mean the number of shots a player blocked and not the number of times a player's shot was blocked.

Defensive zone faceoffs used a percentage, but if a player was involved in fewer than 600 faceoffs he would be assigned a value of 0.

For traded players, team-relative Corsi was calculated for each team he played for and the total across all teams was used.

Defenseman Time-On-Ice (DOI) was used to get a better balance of defensemen in the top 100 players. Without this balancing factor, the top 100 players consisted of 89 forwards and 11 defensemen. With the balancing factor, there were 63 forwards and 37 defensemen in the top 100. Gimmicky? Absolutely. Was it the right thing to do? Absolutely.

PtShare – League Level Counts by Category

Insofar as how the players fell into categories, PtShare seems accurate. About 2% of players fell into the Elite category, and each subsequent category had more players. This describes the talent pool of players in any league and agrees with the distribution of talent as seen by Productivity Rating (PR-Score).

Pt-Ctgry	Count	PR-Ctgry	Count
Pt-Elite	17	PR-Elite	22
Pt-Star	45	PR-Star	61
Pt-First5	99	PR-First5	125
Pt-Regular	174	PR-Regular	205
Pt-Fringe	259	PR-Fringe	206
Pt-CallUp	330	PR-CallUp	305

If anything, Pt-Share is a little stricter in its ratings. It has fewer Elites, Stars and First5s.

The next table shows the counts of players by their PR and Pt categories. More than 70% of players are in the same category (counts presented in bold). The yellow-shaded boxes indicate where players are two categories apart in the rating systems.

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	Pt Elite	Pt Star	Pt First5	Pt Rglr	Pt Fringe	Pt CallUp
PR-Elite	**16**	6				
PR-Star	1	**32**	26	2		
PR-First5		7	**66**	51	1	
PR-Rglr			7	**112**	86	
PR-Fringe				9	**154**	43
PR-CallUp					18	**287**

Trevor Moore (PR-Score 8.12, Pt-Score 5.7) and Mario Ferraro (PR-Score 8.07, Pt-Score 5.6) are both at the bottom of the PR-Star category and the top of the Pt-Regular category. I view their two-category separation as nothing more than coincidental: a minor change in either formula could have them only one category apart.

Radko Gudas (PR-Score 6.32, Pt-Score 3.1) is a little above the bottom of the PR-First5 category and in the middle of the Pt-Fringe category. I view this two-category separation as bad luck for Gudas. His Pt-Score is lower because he is a low-scoring defenseman who didn't get a lot of ice time (66 games played). Both PR-Score and Pt-Score give defensemen a bonus for their ice time, but the Pt-Score bonus is stingier.

I was very surprised there were only three "two-category" differences.

The Top Players in Pt-Share (2023-24)

The following table shows the top 30 players in Pt-Share in the 2023-24 season. The Pt-Elite players are Nathan MacKinnon through John Carlson.

Players 1 to 10	Pt Share	Players 11 to 20	Pt Share	Players 21 to 30	Pt Share
Nathan MacKinnon	13.0	J.T. Miller	11.0	Drew Doughty	9.5
Connor McDavid	12.0	Robert Thomas	10.5	Aleksander Barkov	9.5
Quinn Hughes	12.0	Victor Hedman	10.0	Erik Karlsson	9.5
Auston Matthews	11.5	Mike Matheson	10.0	Sam Reinhart	9.5
Leon Draisaitl	11.5	Rasmus Dahlin	10.0	Sebastian Aho	9.5
Sidney Crosby	11.0	Artemi Panarin	10.0	Adam Fox	9.5
Cale Makar	11.0	John Carlson	10.0	Mikko Rantanen	9.0
Nikita Kucherov	11.0	Josh Morrissey	9.5	David Pastrnak	9.0
Roman Josi	11.0	Vincent Trocheck	9.5	Nick Suzuki	9.0
Evan Bouchard	11.0	Noah Dobson	9.5	Elias Pettersson	9.0

Would any rating system be seen as reasonable if it didn't have MacKinnon, McDavid and Matthews near the very top?

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Canadian Corner – Top Three Players in Pt-Share for the Canadian Franchises

eam	PtShare #1	Pt Share	PtShare #2	Pt Share	PtShare #3	Pt Share	Total PtShare
EDM	Connor McDavid	12.0	Leon Draisaitl	11.5	Evan Bouchard	11.0	34.5
VAN	Quinn Hughes	12.0	J.T. Miller	11.0	Elias Pettersson	9.0	32.0
TOR	Auston Matthews	11.5	William Nylander	8.5	John Tavares	8.0	28.0
MTL	Mike Matheson	10.0	Nick Suzuki	9.0	Cole Caufield	6.0	25.0
CGY	Nazem Kadri	8.5	MacKenzie Weegar	8.5	Mikael Backlund	7.5	24.5
WPG	Josh Morrissey	9.5	Mark Scheifele	8.0	Adam Lowry	6.5	24.0
OTT	Claude Giroux	8.0	Brady Tkachuk	7.5	Jake Sanderson	7.5	23.0

Edmonton and Vancouver had three excellent players having excellent seasons.

It might surprise you to see Toronto being third on this list, well behind the second-place Vancouver Canucks. Marner missed 13 games and would have been second on the Maple Leafs had he played 80 games. Even in the healthy-Marner scenario, Toronto still would have been third. Toronto is the only team on the list without a defenseman in their top three. Morgan Rielly was fifth on Toronto in PtShare, behind John Tavares.

Montreal had two really good players and one good young player. Calgary's best player wasn't as good as Montreal's, but their second and third players were better than Montreal's.

Winnipeg had two good players and one marvellous goalie. Hence their great season.

Ottawa had one Pt-Star player (Giroux) and five Pt-First5 players, but they did not have a marvellous goalie. Hence their season.

Highest and Lowest Rated Players Based on Games Played

On the left side of the table below are the highest-rated players who played no more than 50 games, the wounded warriors if you will. Two Senators are on that list, causing hope to leap up in the hearts of Senator fans.

Highest Pt-Share, No More Than 50 GP		Lowest Pt-Share, At Least 70 GP	
Players	Pt Share	Players	Pt Share
Shea Theodore	4.0	Mattias Janmark	2.0
Josh Norris	4.0	Jacob Bernard-Docker	2.0
Patrick Kane	4.0	Dominik Kubalik	2.0
Artturi Lehkonen	4.0	Andreas Englund	2.0
Shane Pinto	4.0	Ryan Lomberg	2.0

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On the right side of the table above are the lowest-rated players who played at least 70 games. Again, there are two Senators on the list, including the frequently benched in 2024 Jacob Bernard-Docker. Could it be that benching him is appropriate?

Points Above Replacement

Another way to use Point Share is to state how a player compares to a replacement-level player, a player who is good in the AHL and who would be called up to replace a failing or injured player. This is called "Points Above Replacement": PtAR.

A replacement player will be represented by the PtShare score of 2.5, which is the bottom of the Pt-Fringe category. This reflects the truth of a fringe NHL player: if he doesn't improve, the team will give a minor leaguer a chance to take his roster spot.

For a couple of examples, Auston Matthews (F, TOR, PtShare 11.5) would be +9.0 PtAR, which is 9.0 points above a replacement-level player. Ryan Reaves (F, TOR, PtShare 1.5) would be -1.0 PtAR, which is 1.0 points below a replacement level player.

Summary

Having been tempted to follow a path from curiosity to analysis to knowledge, a rating system called Point Share was created. Has this led to an increase in my knowledge? Yes.

#1) Any reasonable rating system will put players in roughly the same order. The best players in the league will rise to the top, the call-ups will drop to the bottom.

#2) Given that most statistics measure offense, it is hard to rate forwards and defensemen evenly on the same scale without doing something extra for defensemen. In both Productivity Rating and Point Share, defensemen get a bonus for their time on the ice.

#3) I expected that players who are used a lot for defensive zone faceoffs would have their expected goal data impacted. I was surprised to learn that the impact is far more offensive than defensive. Their expected goals against (xGA) are a little higher, but their expected goals for (xGF) are a lot lower. I'm guessing that most good defensive players are also not good offensive players, and vice versa.

Related Articles

Introduction to Productivity Rating

The Importance of Statistics – From Goals to Hits