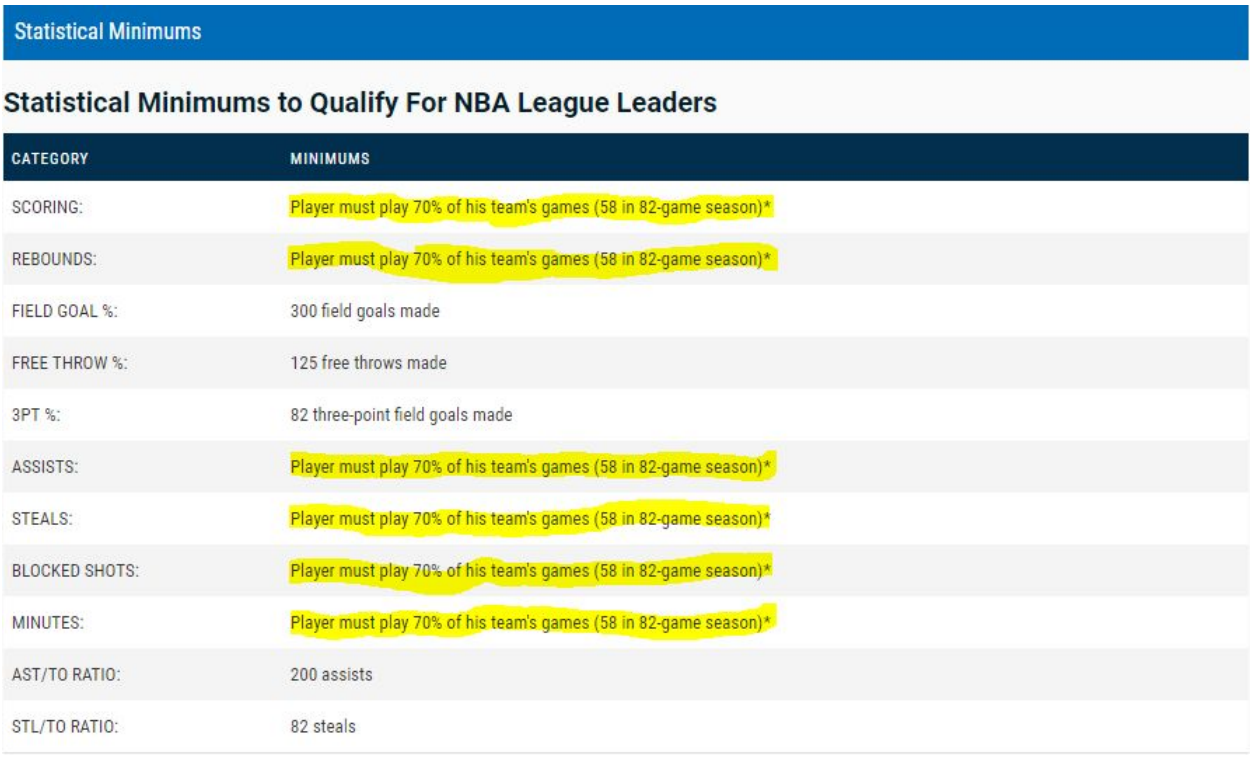
Who Deserved the Most Valuable Player award of the 2016-2017 NBA season? A statistical review

The National Basketball Association Most Valuable Player Award is an annual award presented to the player with the the most impact for his team. The 2016-2017 award went to Russell Westbrook, causing a slew of questions on whether he received the award for his value or because of the storyline of averaging a triple double(10+ points, assists, and rebounds) per game. Westbrook's team The Oklahoma Thunder won just 47 games of 82 making him only the second person to win the MVP award while winning less than 50 games. To answer this question we have to look at:

1) What requirements are usually required to win the award. And
2) How do the players impact compare to one another in terms of "Value"

First we should determine what is commonly required to win the Most Valuable Player Award.

Typically speaking every player that has won this award has won 50 out of 82 games. Team success is important and the most valuable player is expected to lead his team to a 61% win rate at a minimum. That was the easiest requirement to figure out considering that until this years award only one person has won without doing this. But considering what the award is there has to be at least a requirement to play a certain amount of games.This is so that if two players have the same average the one who did it over the longer period of time is awarded. So a games played minimum should is enforced.



Statistical Minimums

Statistical Minimums to Qualify For NBA League Leaders

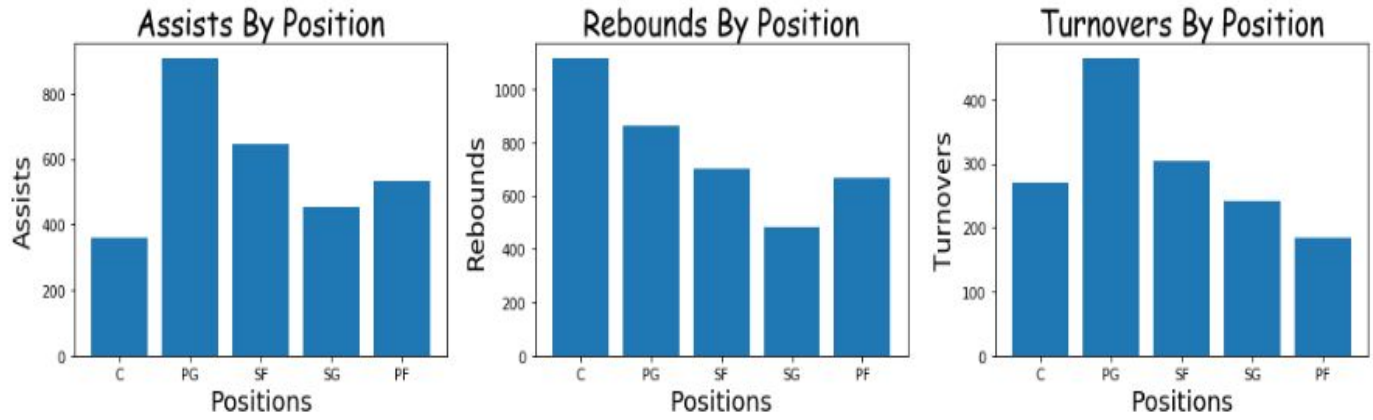
CATEGORY	MINIMUMS
SCORING:	Player must play 70% of his team's games (58 in 82-game season)*
REBOUNDS:	Player must play 70% of his team's games (58 in 82-game season)*
FIELD GOAL %:	300 field goals made
FREE THROW %:	125 free throws made
3PT %:	82 three-point field goals made
ASSISTS:	Player must play 70% of his team's games (58 in 82-game season)*
STEALS:	Player must play 70% of his team's games (58 in 82-game season)*
BLOCKED SHOTS:	Player must play 70% of his team's games (58 in 82-game season)*
MINUTES:	Player must play 70% of his team's games (58 in 82-game season)*
AST/TO RATIO:	200 assists
STL/TO RATIO:	82 steals

https://stats.nba.com/help/statminimums/

Here we can see that for awards with game minimums that the NBA has enforced a 70% participation minimum, meaning 58 games played out of 82. For our analysis we will adopt this same minimum.

How many potential Star Players are in the league?

Simply put, the player who has more than above average individual stats, team related stats, and meets the requirements of 50 wins and 70% of games played. What isn't simple is that although it is becoming a positionless league, different positions still specialize in different areas.



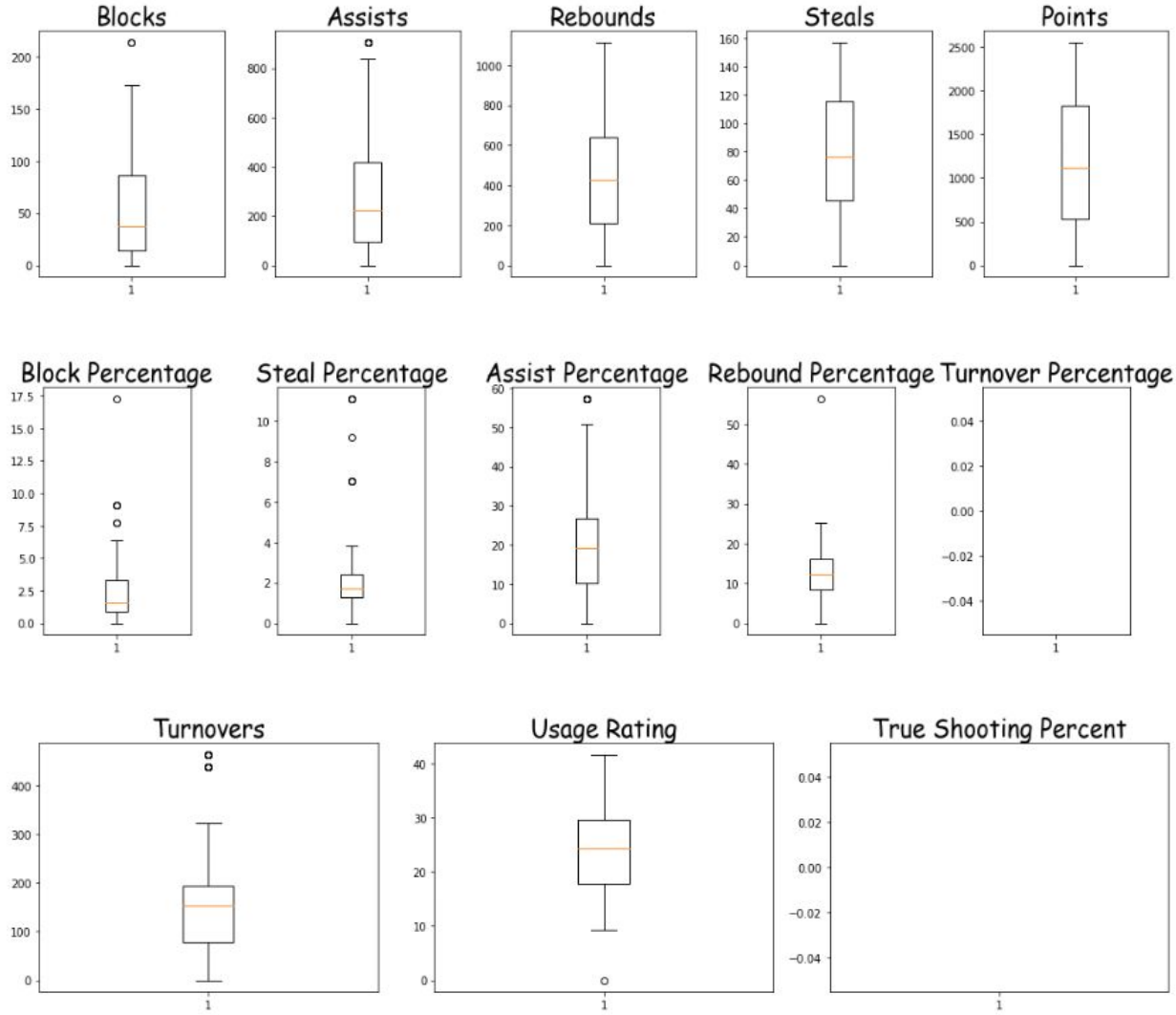
Using three stats as an example in the above bar graphs, it shows point guards handle the ball more leading to more assists and turnovers, while the taller centers will have more rebounds. To be fair we will start by comparing players of the same position in a variety of team and individual stats. We'll look at assist, rebounds, steals, blocks and turnovers on an individual level as well as the percent that player accounted for while on the floor of the teams total. For rebounds it will be total rebounds which is a combination of offensive and defensive rebounds. True shooting percentage is a formula of: Points/ [2*(Field Goals Attempted+0.44*Free Throws Attempted)] and Usage Percentage is the number of team plays used by a player and is calculated by: (FGA + Possession Ending FTA + TO) / POSS. The star potential players will consist of players who are two standard deviations above the mean in these categories.

At the elite level is every statistical category important?

After narrowing it down to 25% of the league using a variety of stats it's time to see how these players compare to each other, and not just relative to their position. With a group of players so far above the average all of these stats may not be relevant anymore for comparison. For instance if the range of the values is small that would mean players provided the same value for the most part, it is however to see if there are any major outliers that are significantly above the range of the rest of the group as that would help

their MVP case more with the exception of turnovers. While players at this level will have more turnovers because they handle the ball more, having too many turnovers hurts your team in the long run.

Statistical Columns:



These boxplots show that there are columns that the range is too small to be significant, and that there are some where only the top outliers should be considered and the rest are within a small range.

Which player deserves the award?

WIth this list of elite players who have provided incredible value to their respective teams it's time to crown one of them as the most valuable. The requirements that I adopted for the award is a 50 win record and 58 games played. During the 2016 season there were 8 teams who won 50 plus games.

Eastern Conference	W	L	W/L%	GB	PS/G	PA/G	SRS
Boston Celtics* (1)	53	29	.646	—	108.0	105.4	2.25
Cleveland Cavaliers* (2)	51	31	.622	2.0	110.3	107.2	2.87
Toronto Raptors* (3)	51	31	.622	2.0	106.9	102.6	3.65
Washington Wizards* (4)	49	33	.598	4.0	109.2	107.4	1.36
Atlanta Hawks* (5)	43	39	.524	10.0	103.2	104.0	-1.23

Western Conference	W	L	W/L%	GB	PS/G	PA/G	SRS
Golden State Warriors* (1)	67	15	.817	—	115.9	104.3	11.35
San Antonio Spurs* (2)	61	21	.744	6.0	105.3	98.1	7.13
Houston Rockets* (3)	55	27	.671	12.0	115.3	109.6	5.84
Los Angeles Clippers* (4)	51	31	.622	16.0	108.7	104.4	4.42
Utah Jazz* (5)	51	31	.622	16.0	100.7	96.8	4.00

https://www.basketball-reference.com/leagues/NBA_2017_standings.html

	PlayerName	#
0	Giannis Antetokounmpo	6
1	Russell Westbrook	5
2	John Wall	5
3	James Harden	5
4	Jimmy Butler	4
5	Draymond Green	4
6	DeMarcus Cousins	4

This list shows 7 players who led in the most statistical categories(6). Giannis(Milwaukee Bucks) won 42 games, 8 games under the 50 game minimum. Out of the three players tied with 5 leading categories only James Harden(Houston Rockets) won more than 50 games at 55. He also played 81 out of 82 possible games. With the requirements fulfilled and an elite group of players for 4 categories **James Harden** deserved the MVP award for the 2016 season.

Future Research

Machine learning algorithm that can take in all of these stats and tell us who the current MVP is. Should be able to update and recalculate after every game. Should also be able to predict the remaining season based on current stats(for instance after 22 games using that's players averages to predict over a 82 game span), resting pattern, and team stats(for example should be able to predict the outcome of future games based on the stats) and use all of that to predict who the projected MVP will be at any given moment.