What effects can a rule change have in the NBA?

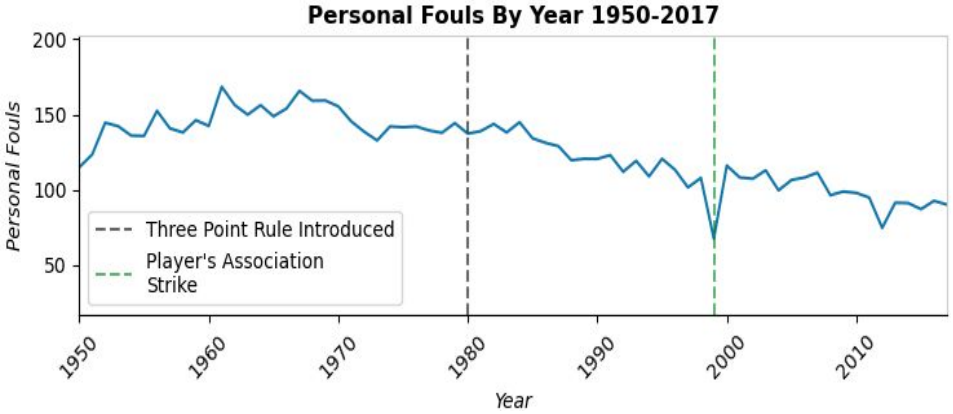
By Jordan Fairbanks

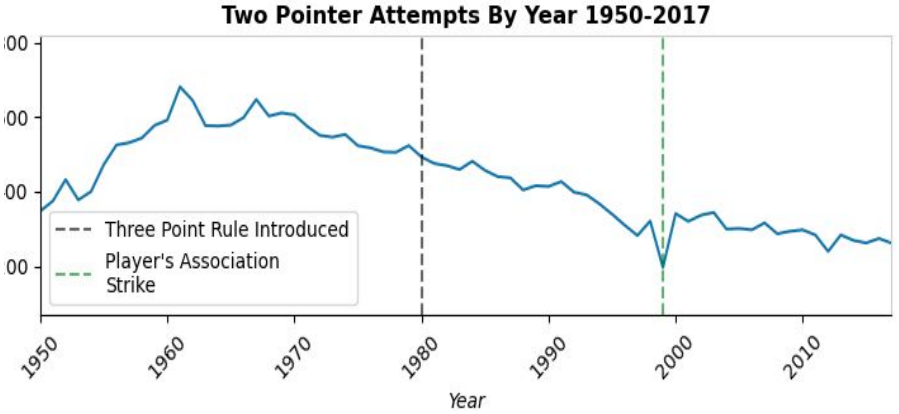
First, let’s ask ‘What makes basketball fun to watch?’

I want to see:

- Fancy ball handling
- Dunks
- Fouls
- Blocks
- Lots of points

What was basketball like in the beginning?





- Taller/bigger players had an advantage
- Lots of trying to score layups
- Lots of fouling

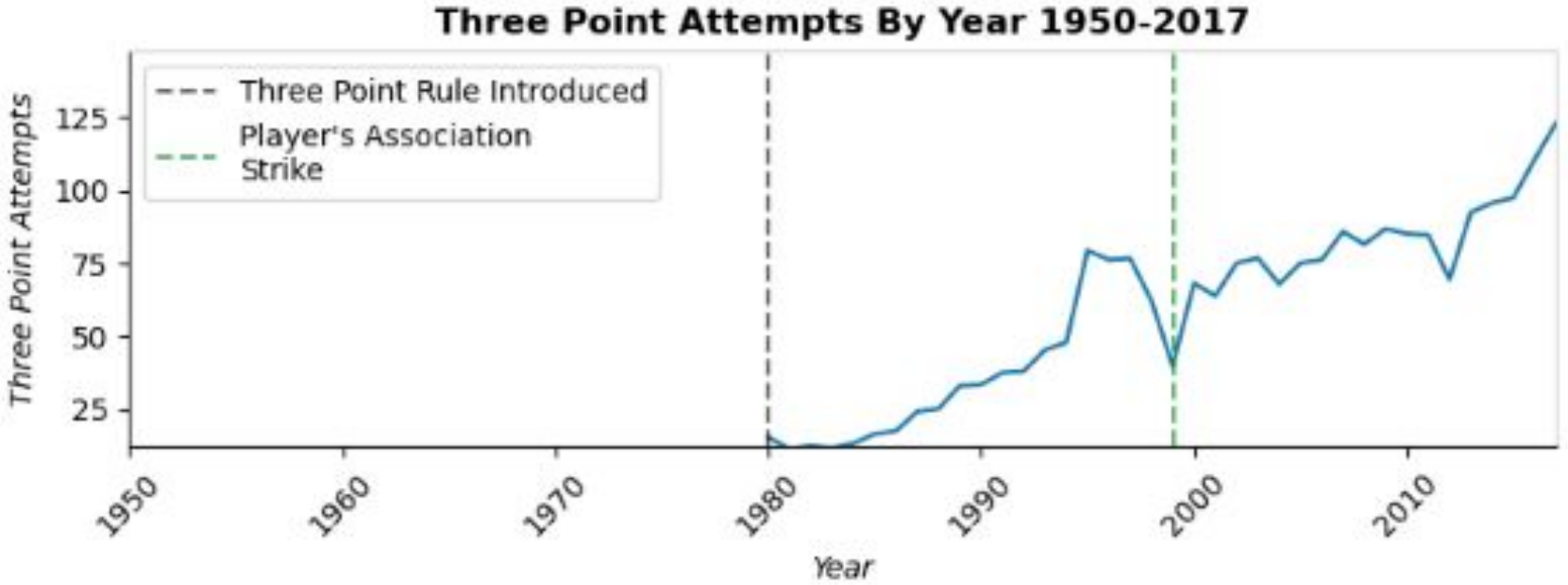
From the 1950's to the 1970's, they tried a lot of different rule changes to handle the amount of fouls

In the 1978 pre-season, the NBA tried out the three pointer, later implementing a full rule change in the 1979-80 season.

In 1999 there was a players association strike, they only played about 60% of the season which corresponds to the green dotted line (and the dip in both graphs.)

It took a few years to show significant change as college and high school athletes started to train to better shooters.

In 1980, the Three Pointer was introduced.



How did this affect the stats of the average player over time?

Why is a three pointer so much better than a two pointer?

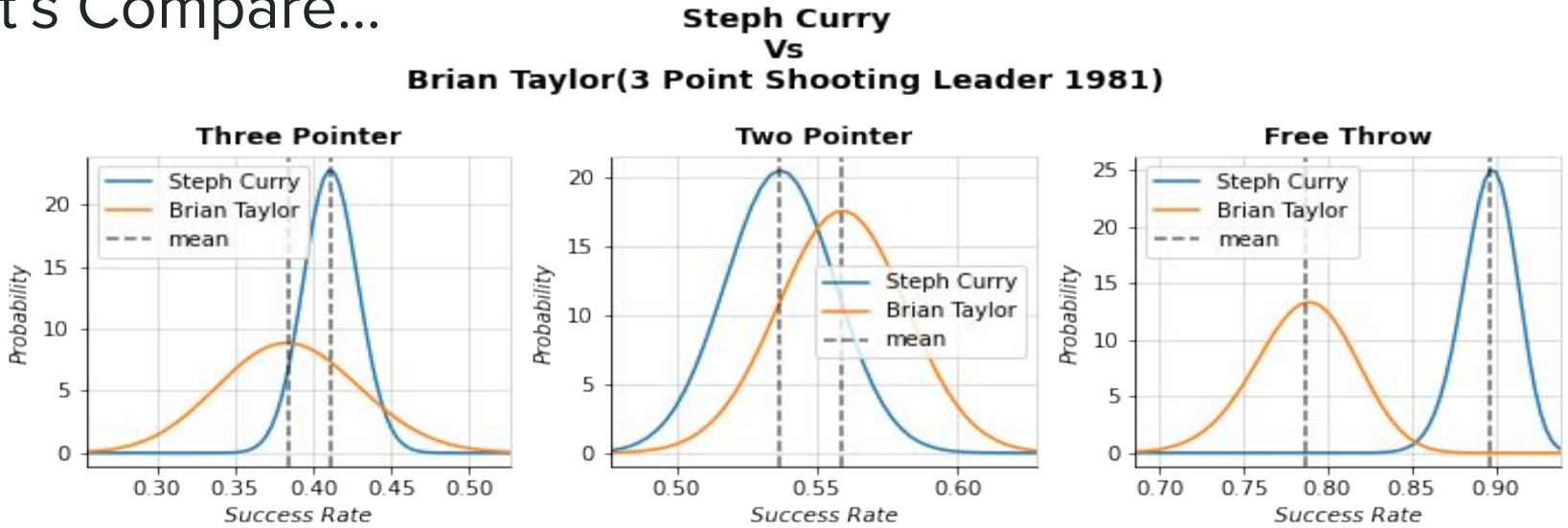
Let’s take a look at Steph Curry, one of the best shooters in the NBA today.

Player	Year	3PA	3P%	2PA	2P%
Stephen Curry	2015.0	646.0	0.443	695.0	0.528

	Percentage	Attempts	Expected points
2 Pointers	52.8	695	733.92
3 Pointers	43.3	646	858.534

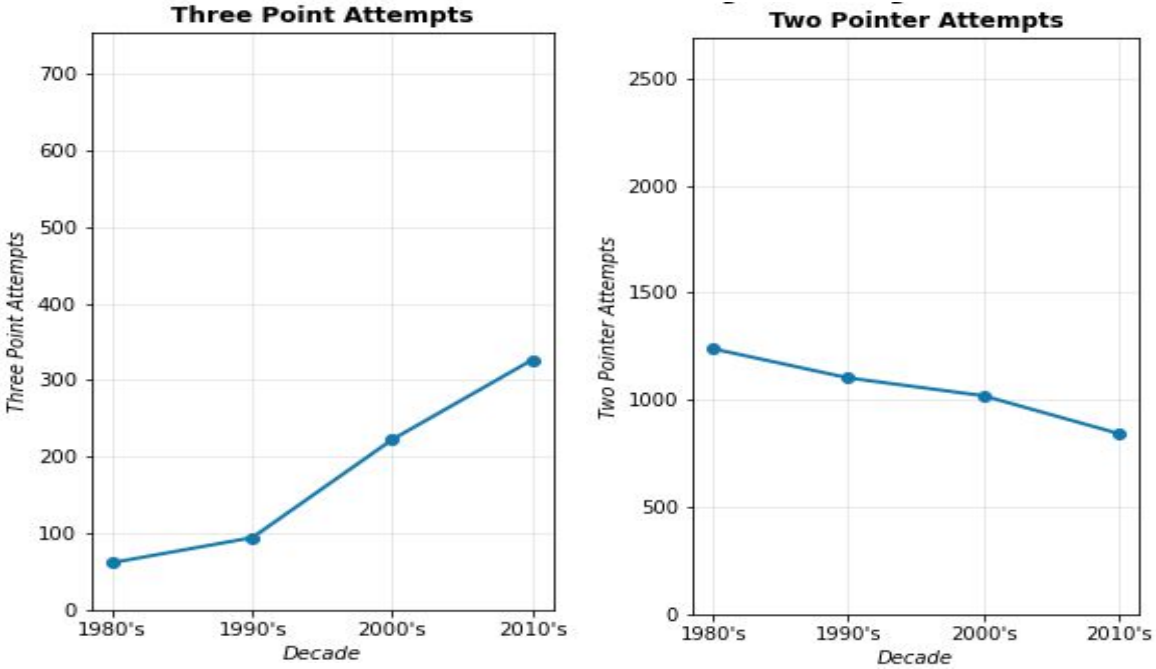
- Even though Steph Curry attempted (and made) more two pointers, he scored more points from three’s.

Let’s Compare...

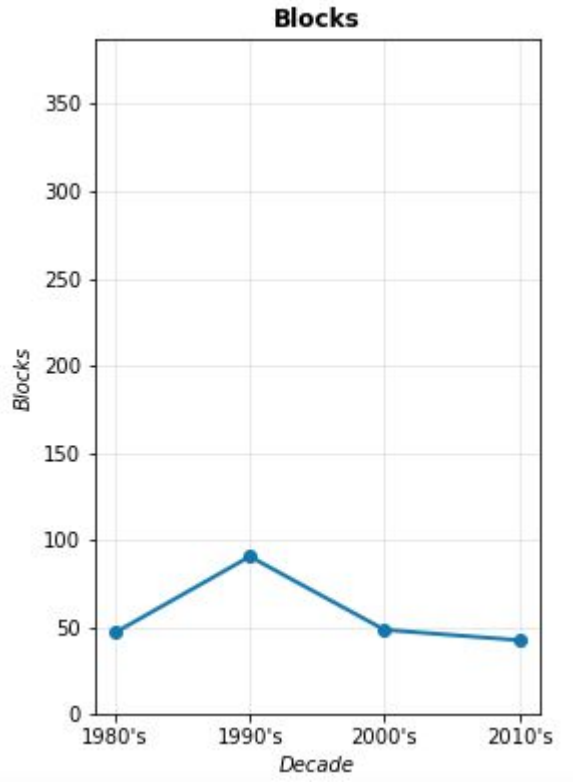


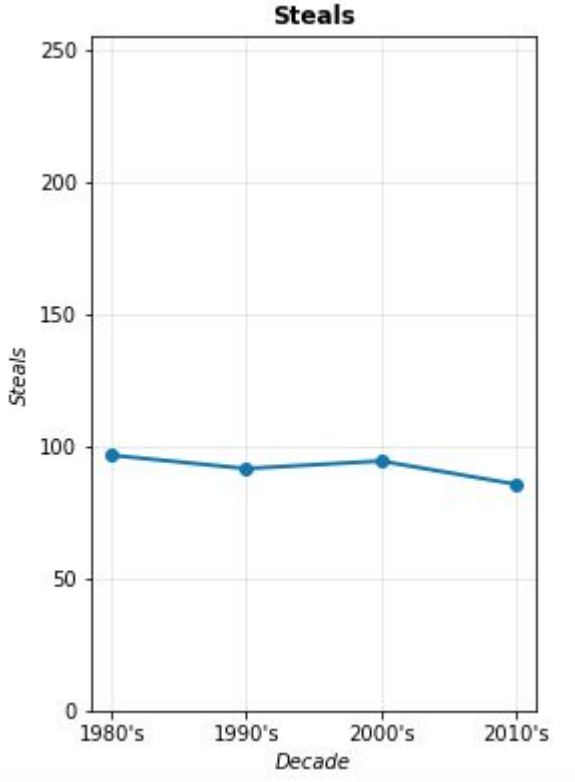
- These graphs represent the shooting percentages of Steph curry in 2017 and Brian Taylor in 1981
- You can see how much more consistent of a three point shooter Steph Curry is by looking at the variance of the three point graph, and we can infer that Steph Curry spent more time and energy developing his shooting.

Even the top scorers show the trend of favoring three pointers.



As the top scorers in the league start to favor three pointers, they attempt less layups and shots from inside the key.





We also see:

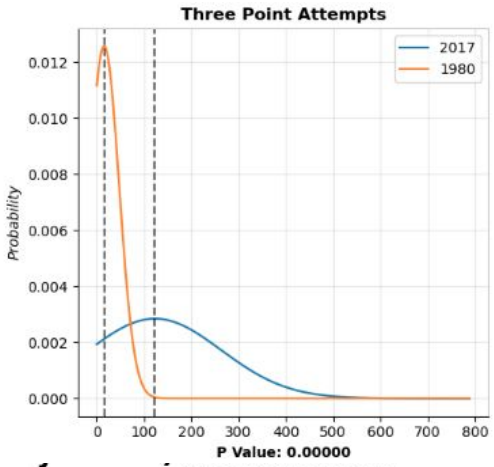
-less blocking

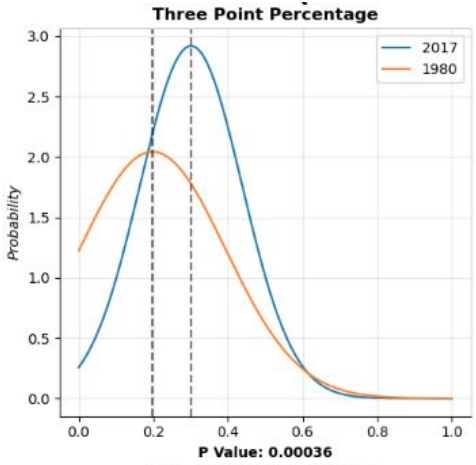
-less stealing

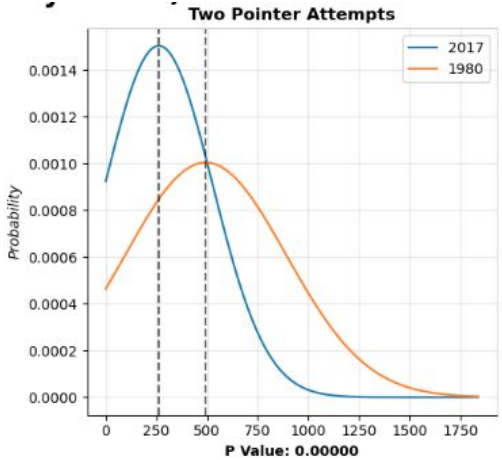
Which means:

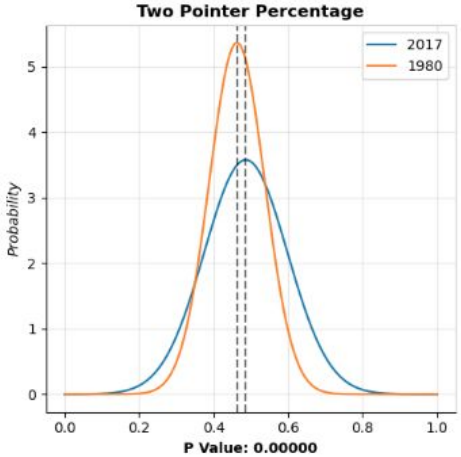
-less ball handling

-less exciting games







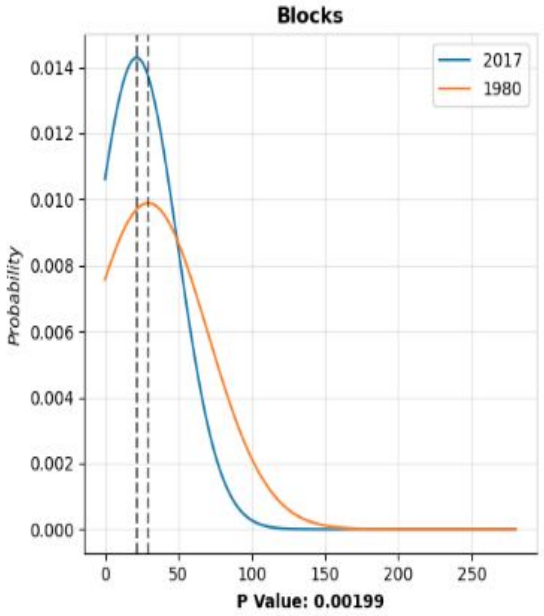


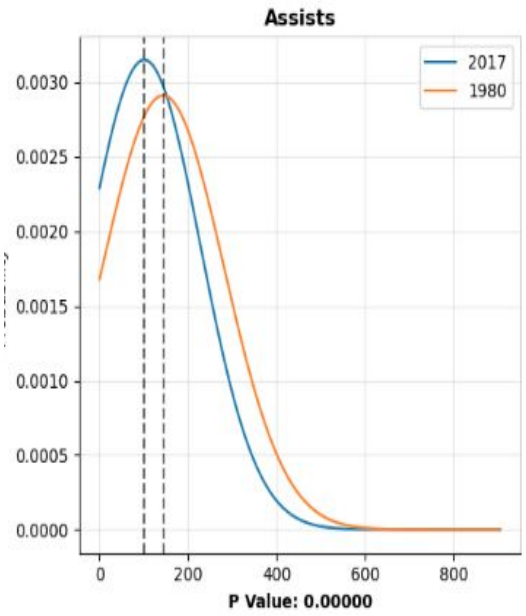
To test if the league statistics would differ between 1980 and 2017, I used the Mann Whitney U test to see if the underlying distributions for each statistic differ.

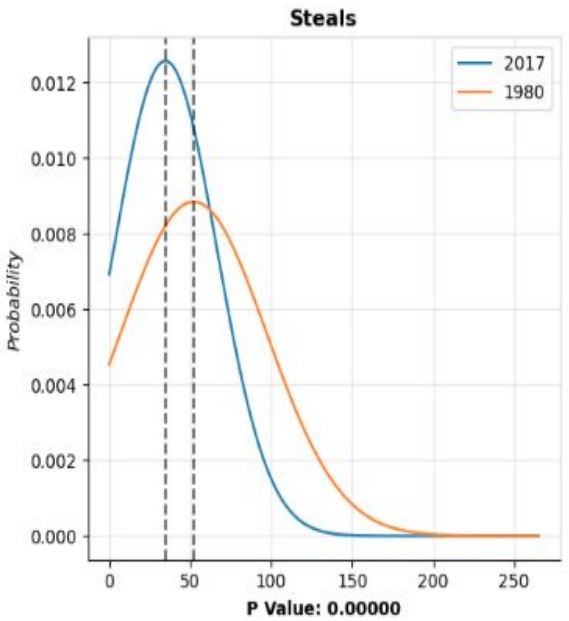
Null Hypothesis:
There was no change from 1980 to 2017 in the statistic being measured.

We can see that the pvalue for each comparison is below .01, so we can say with 99% confidence that the average player in 2017 performs differently in these categories than players from 1980 did

Which has lead to...







Less blocks, less assists, less steals, and less exciting games.

Conclusion/Next Steps

- The 3 pointer rule changed the way top athletes train, and in turn has effected the league statistics.
- To study this phenomenon further, I could look at newer data from more recent years to confirm that the trend is still occurring or look at the statistics for each game since 1980 and study the trend.

Sources

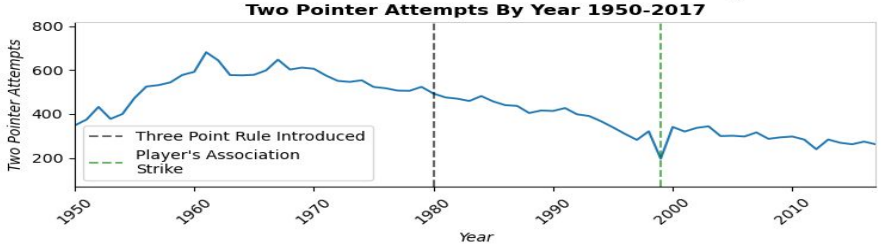
- Dataset: https://www.kaggle.com/drgilermo/nba-players-stats?select=Seasons_Stats.csv
- Rules:

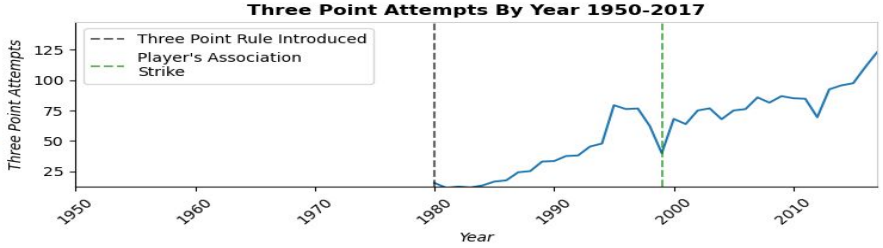
  https://cdn.nba.net/nba-drupal-prod/nba-rules-changes-history.pdf

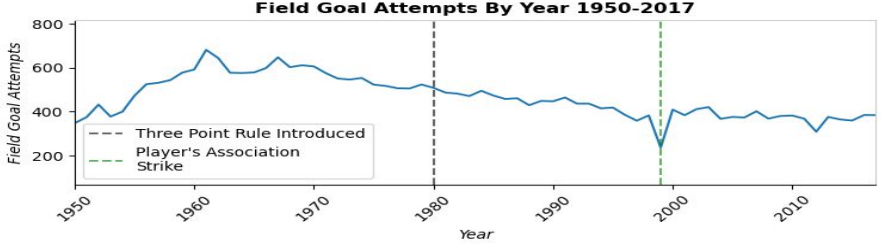
Wait, where can I check out more from this author?

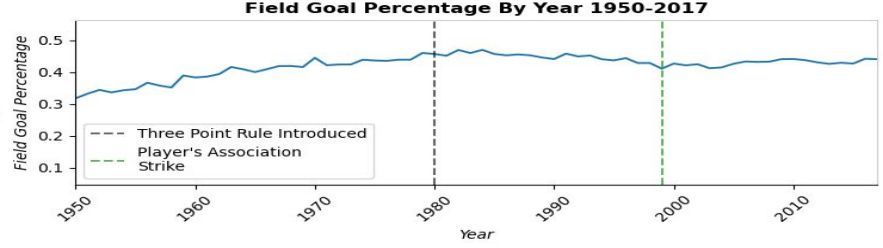
- check me out on github!
- or try my linkedin!

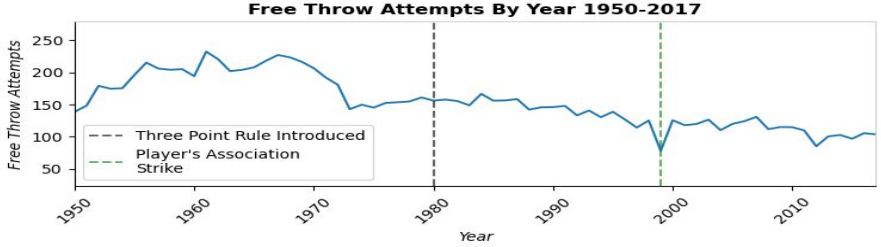
Average Player Statistics Over the Years

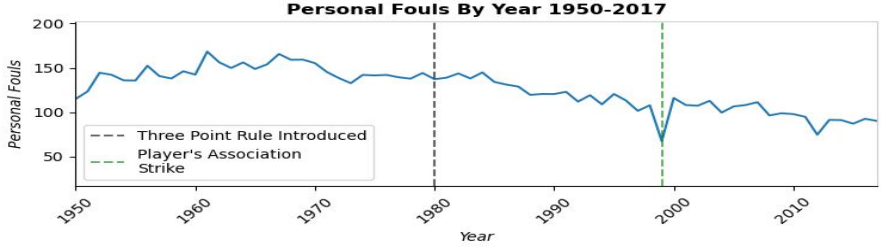


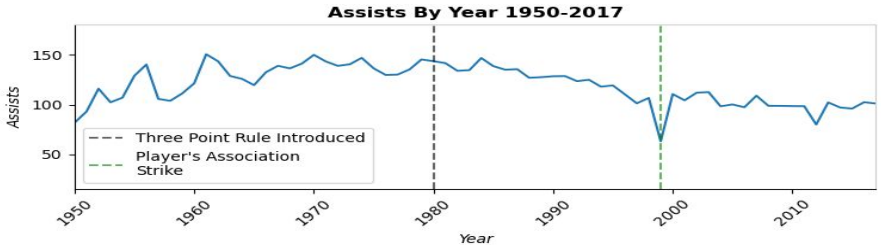


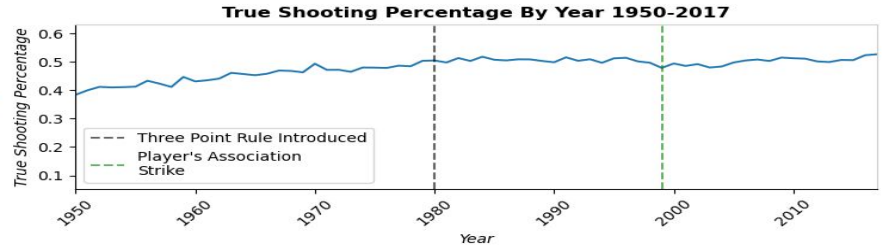




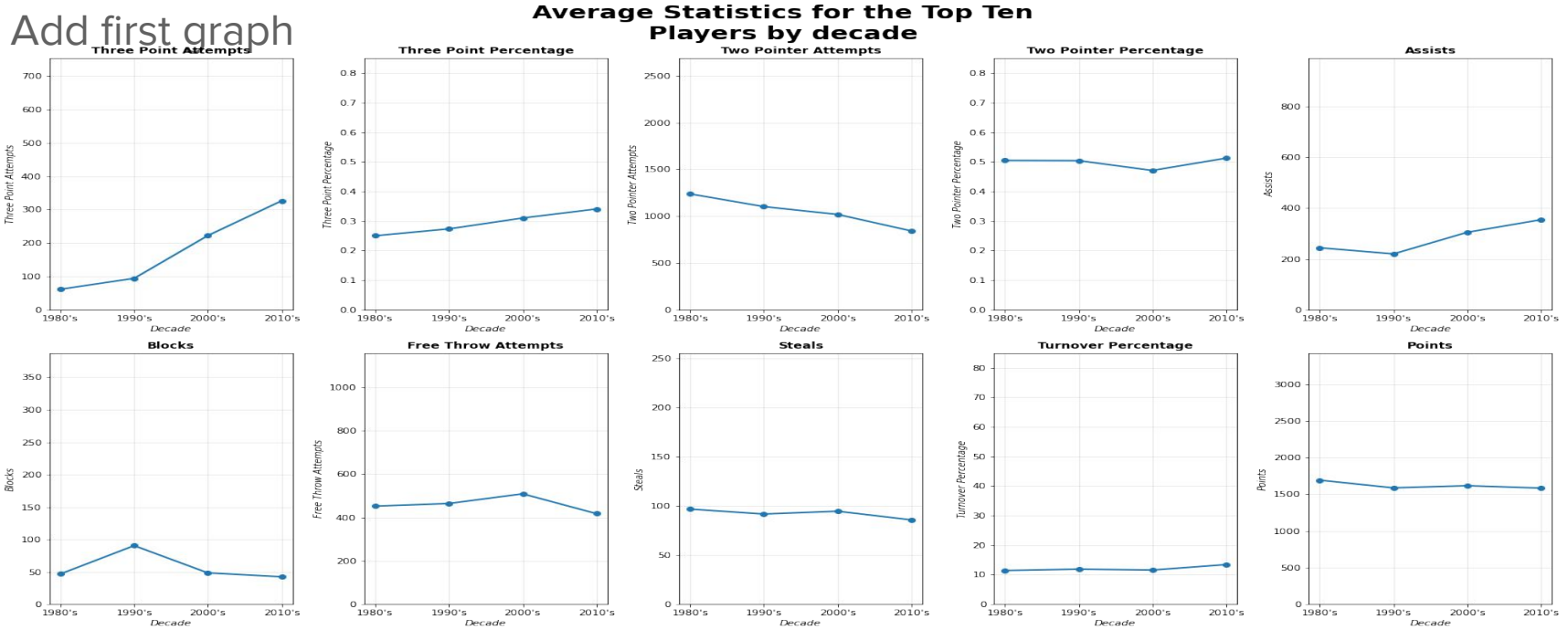




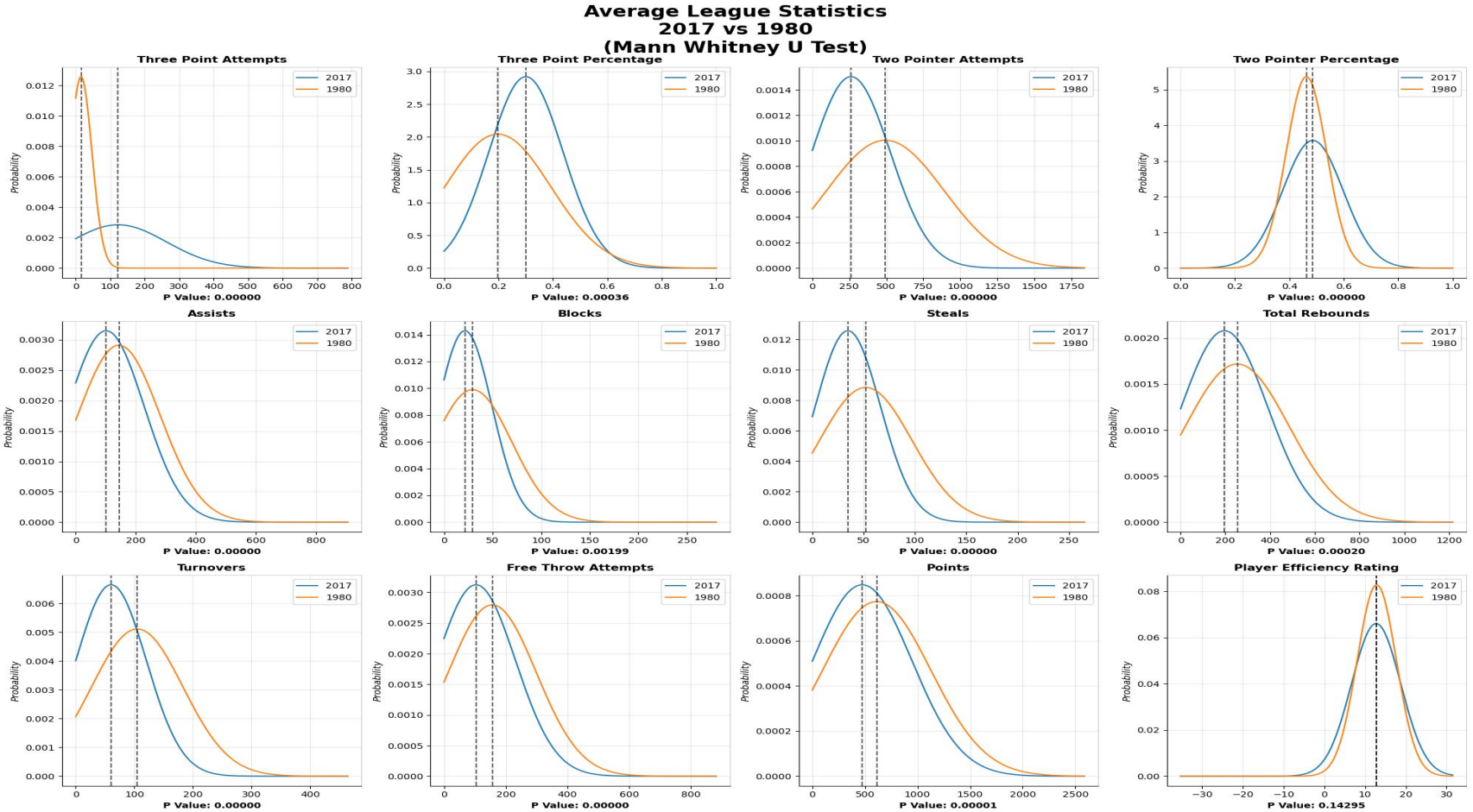




Add first graph



Appendix


Average League Statistics
2017 vs 1980
(Mann Whitney U Test)
Three Point Attempts
P Value: 0.00000
Three Point Percentage
P Value: 0.00036
Two Pointer Attempts
P Value: 0.00000
Two Pointer Percentage
P Value: 0.00000
Assists
P Value: 0.00000
Blocks
P Value: 0.00199
Steals
P Value: 0.00000
Total Rebounds
P Value: 0.00020
Turnovers
P Value: 0.00000
Free Throw Attempts
P Value: 0.00000
Points
P Value: 0.00001
Player Efficiency Rating
P Value: 0.14295
2017
1980
Probability