

Edwin's project (DS102/104)

How has 3-pointer change NBA Basketball?



Background

- In recent 7 to 8 years, we have experience a lot more hype regarding the 3 point shot in the NBA.
- More and more players including centers are shooting threes
- More players are also taking ridiculous long distance shot from the center of the logo
- It is basic logic that as we get further from the rim, accuracy of the shot declines
- Yet why are more people shooting it and how has it changed the NBA?

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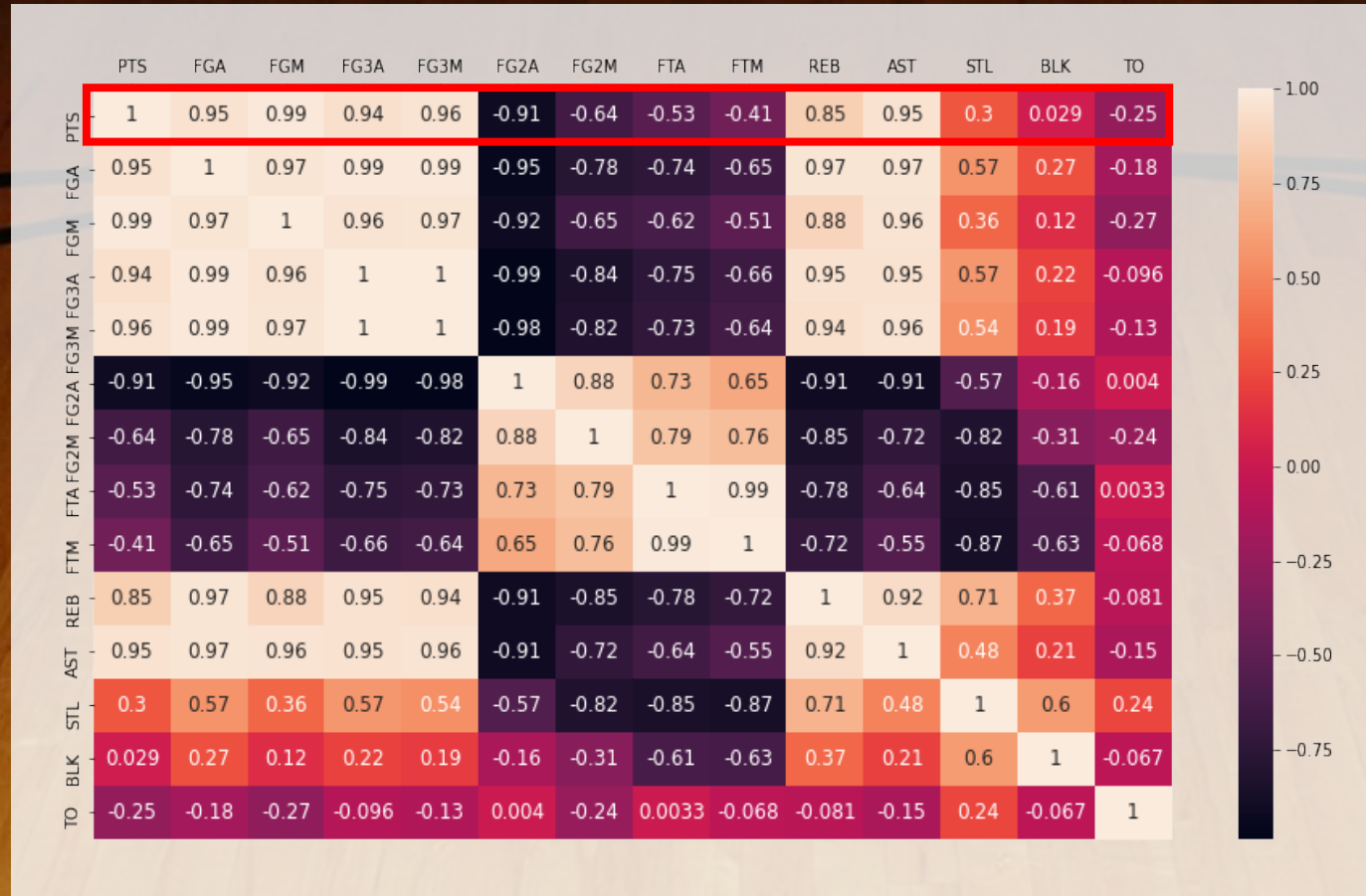


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**How has the 3 pts
shot affect points
scored?**

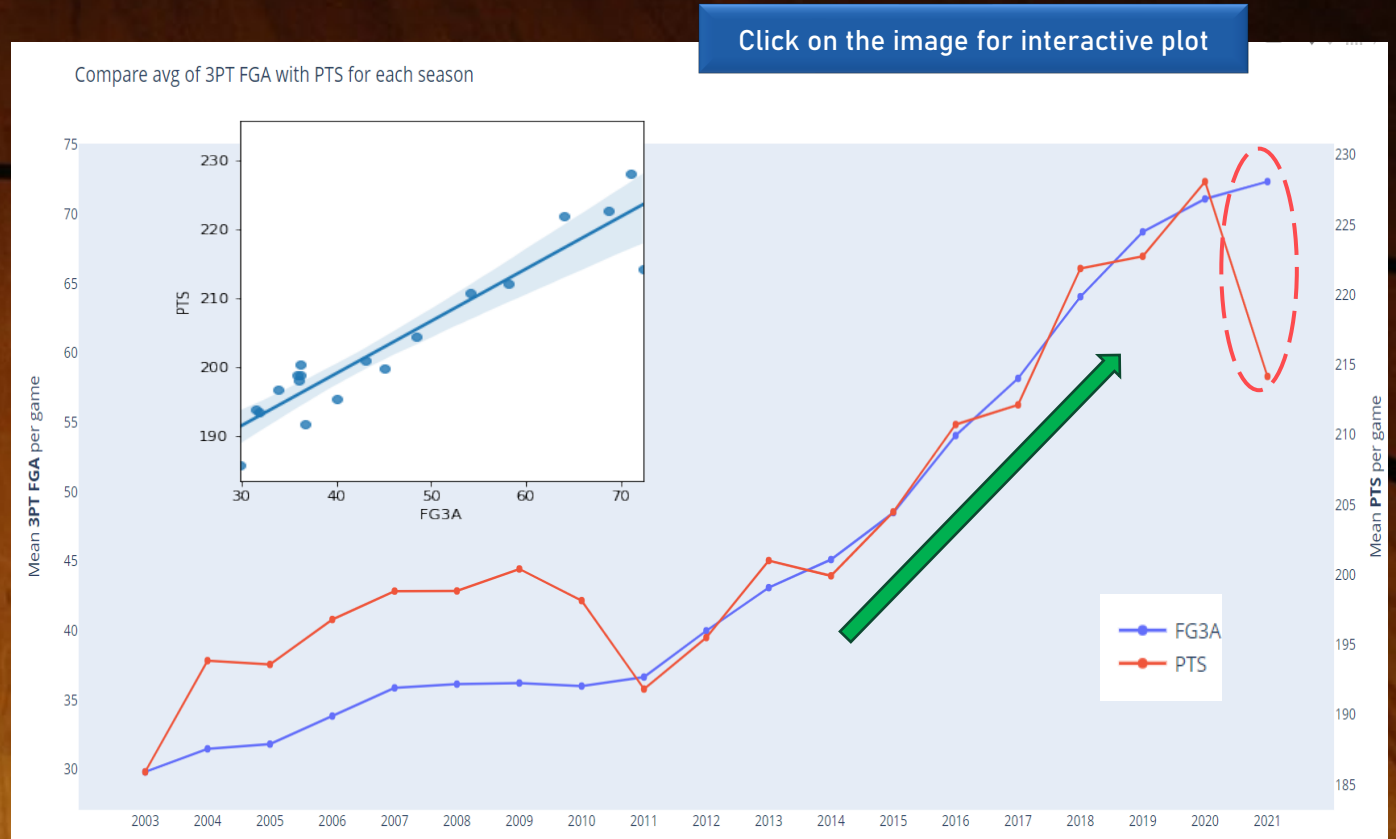
Correlation of points with other Statistics



- 3PT FGA/FGM have a very strong positive correlation to points
- 2PT FGM has a weaker than expected negative correlation to points
- Other factors that has strong correlation to points is REB and AST

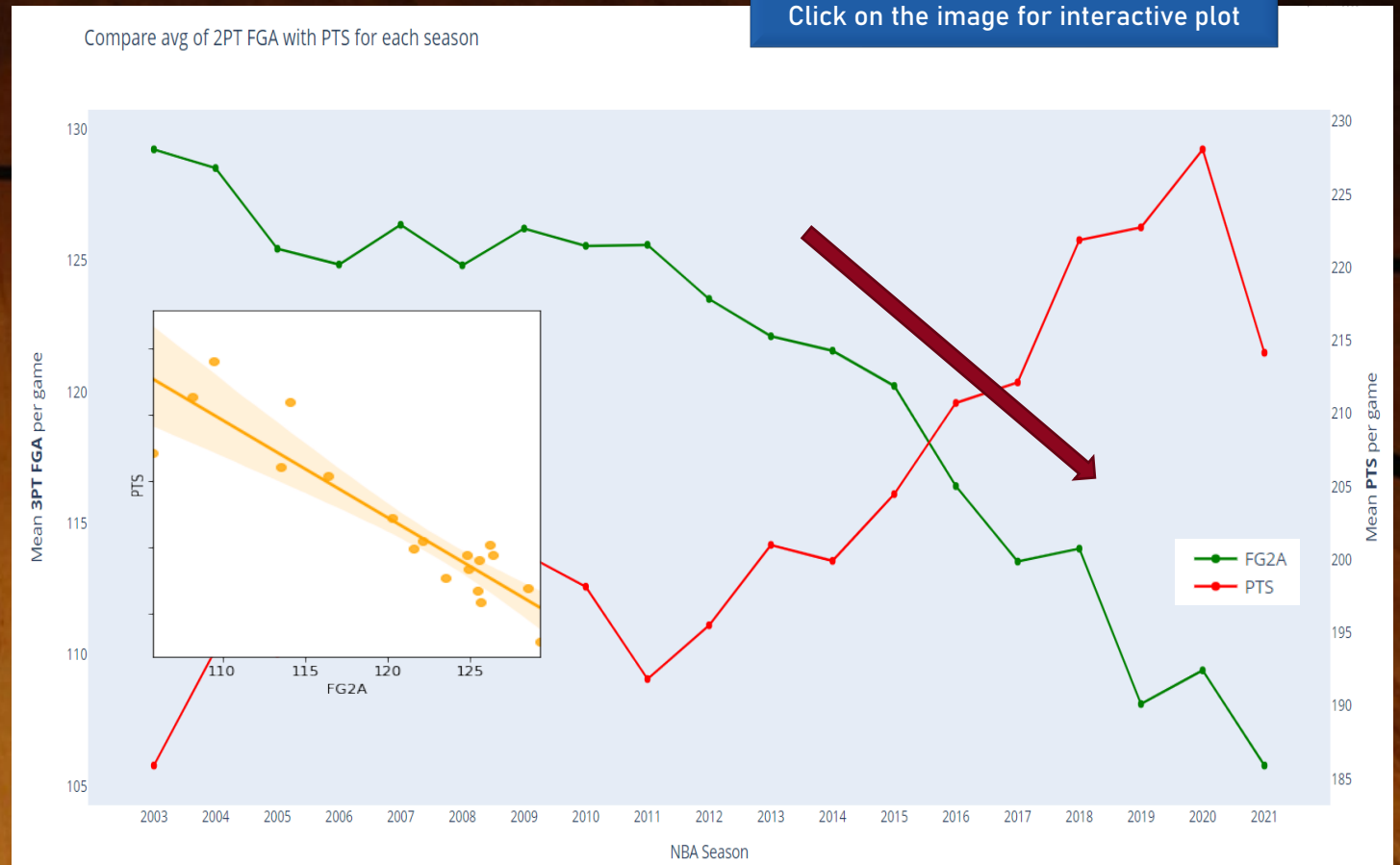
Comparing 3-Pointer to PTS across seasons

- Generally, points scored increase in line with increase in 3-PT FGA, esp from 2011 onwards
- There is a drop in pts in 2021 season shown as number of games data recorded was not complete
- Interesting to note is that despite the small number of games overall 3pt FGA increased

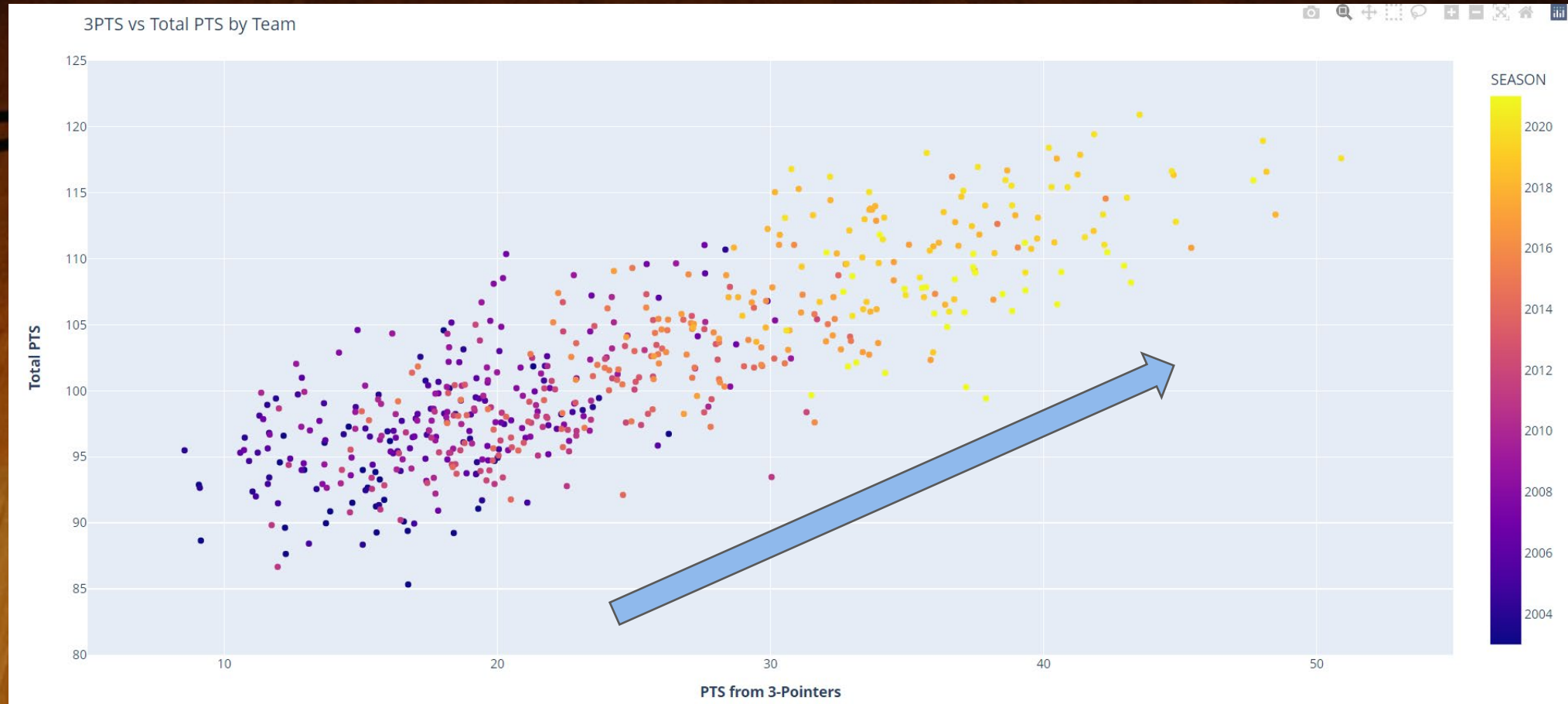


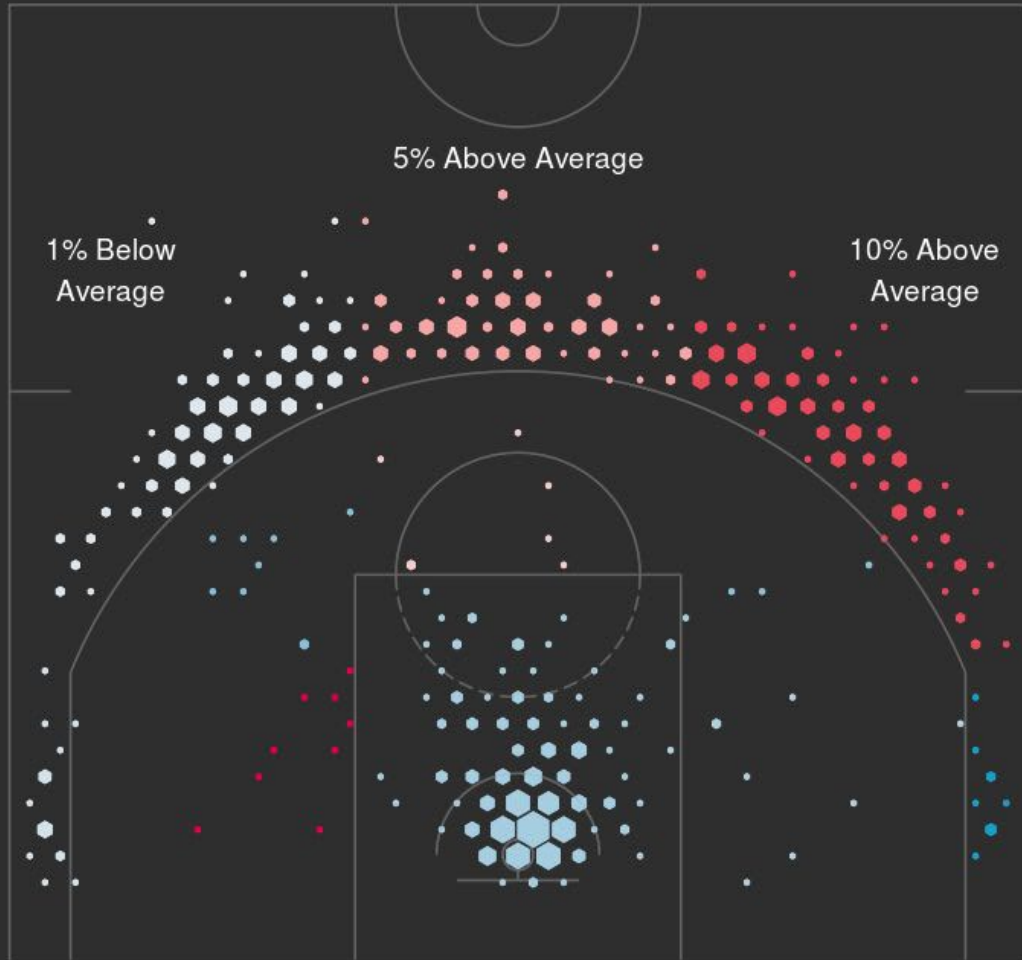
Comparing 2-Pointer to PTS across seasons

- Generally, points scored increase in line with decrease in 2-PT FGA, esp from 2011 onwards
- There is a drop in pts in 2021 season shown as number of games data recorded was not complete
- Interesting to note is that despite the small number of games overall 3pt FGA increased



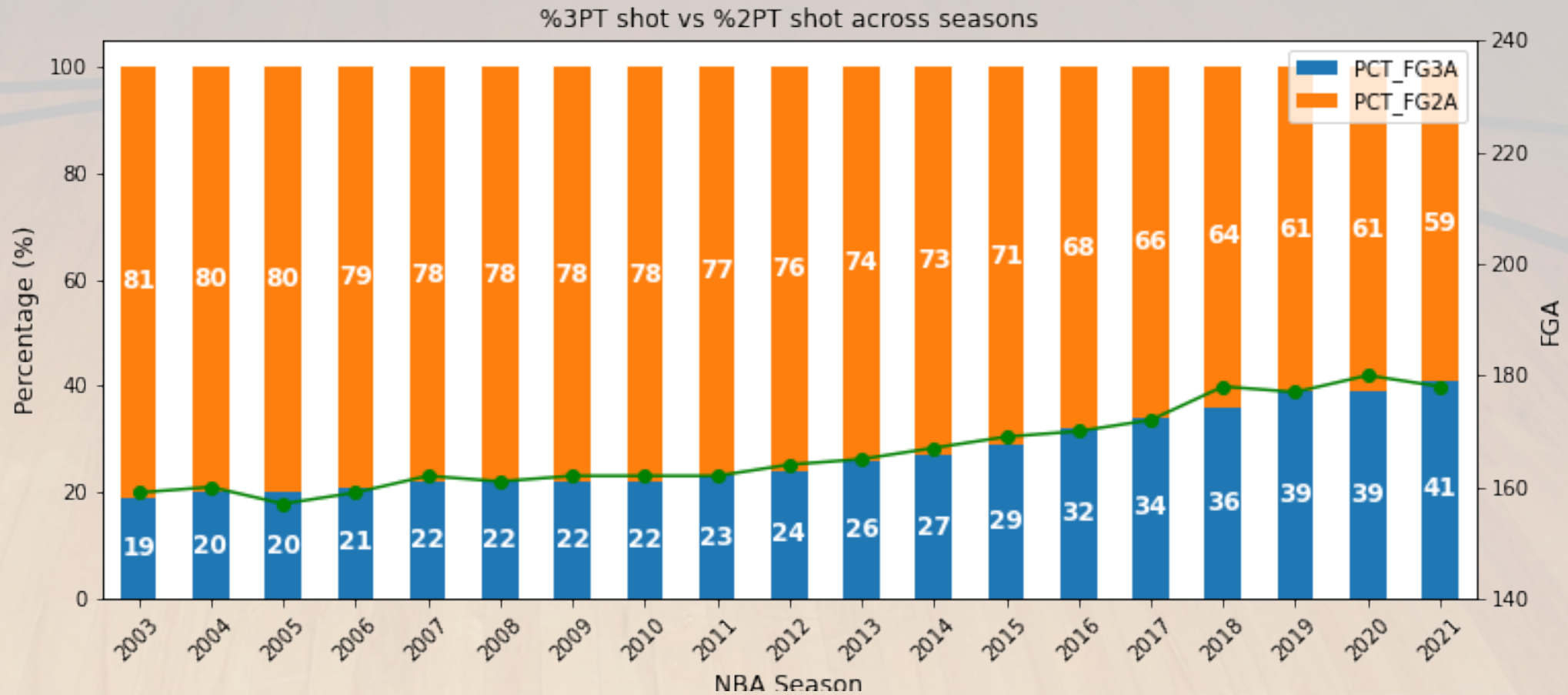
PTS scored by teams increase as more of these points are made up of 3 pointers





How has the number of 3 pts shot attempts and pace of the game changed?

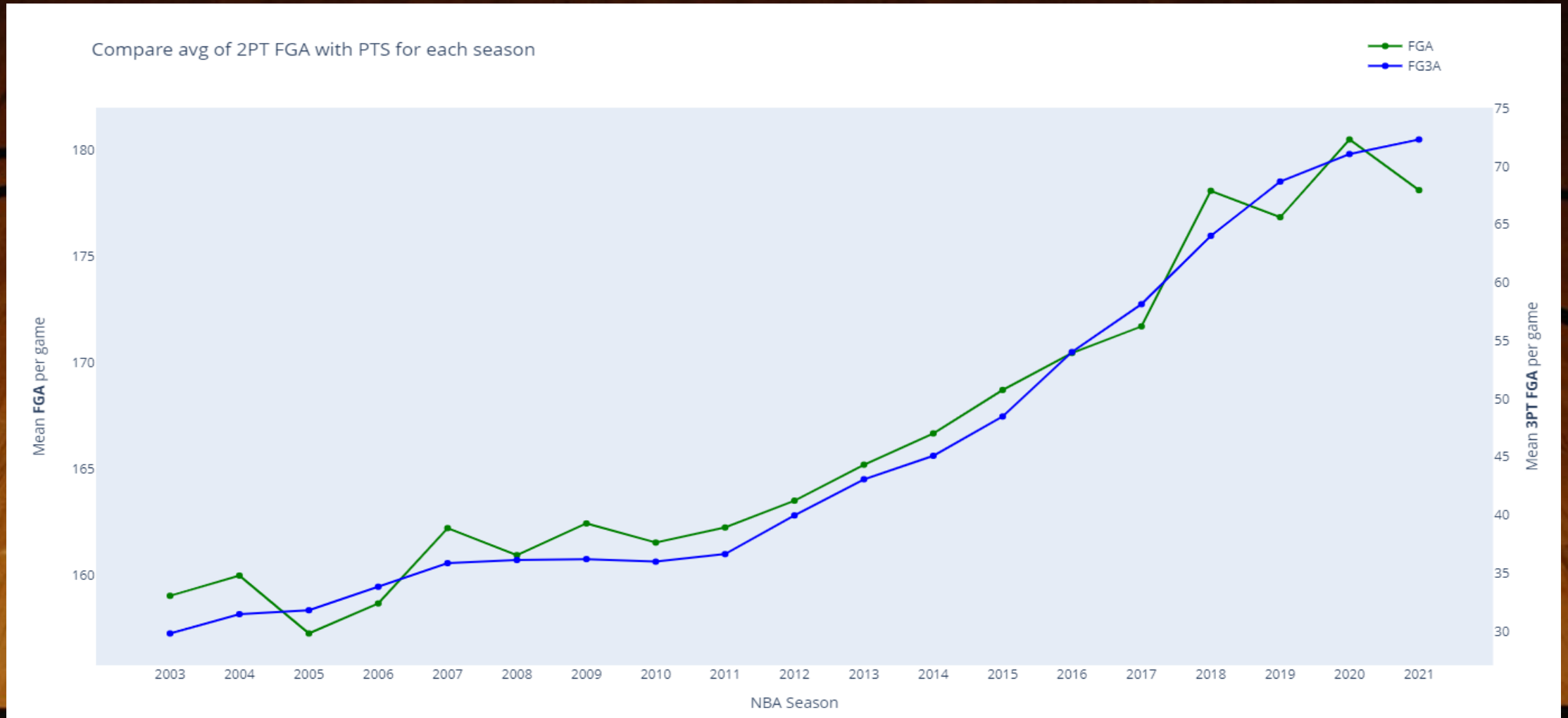
Proportion of 3PT to 2PT shots across seasons



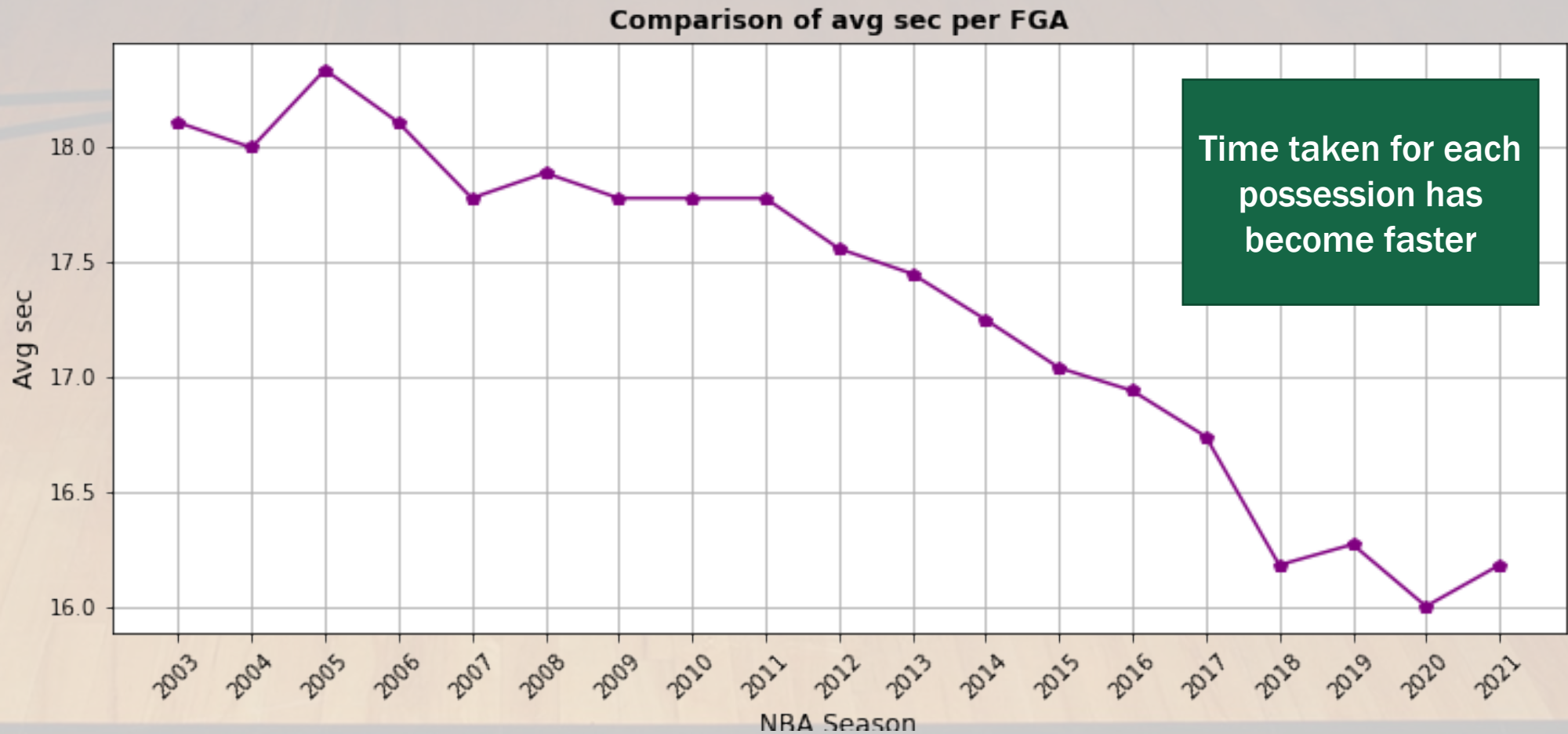
Assumptions regarding pace of game

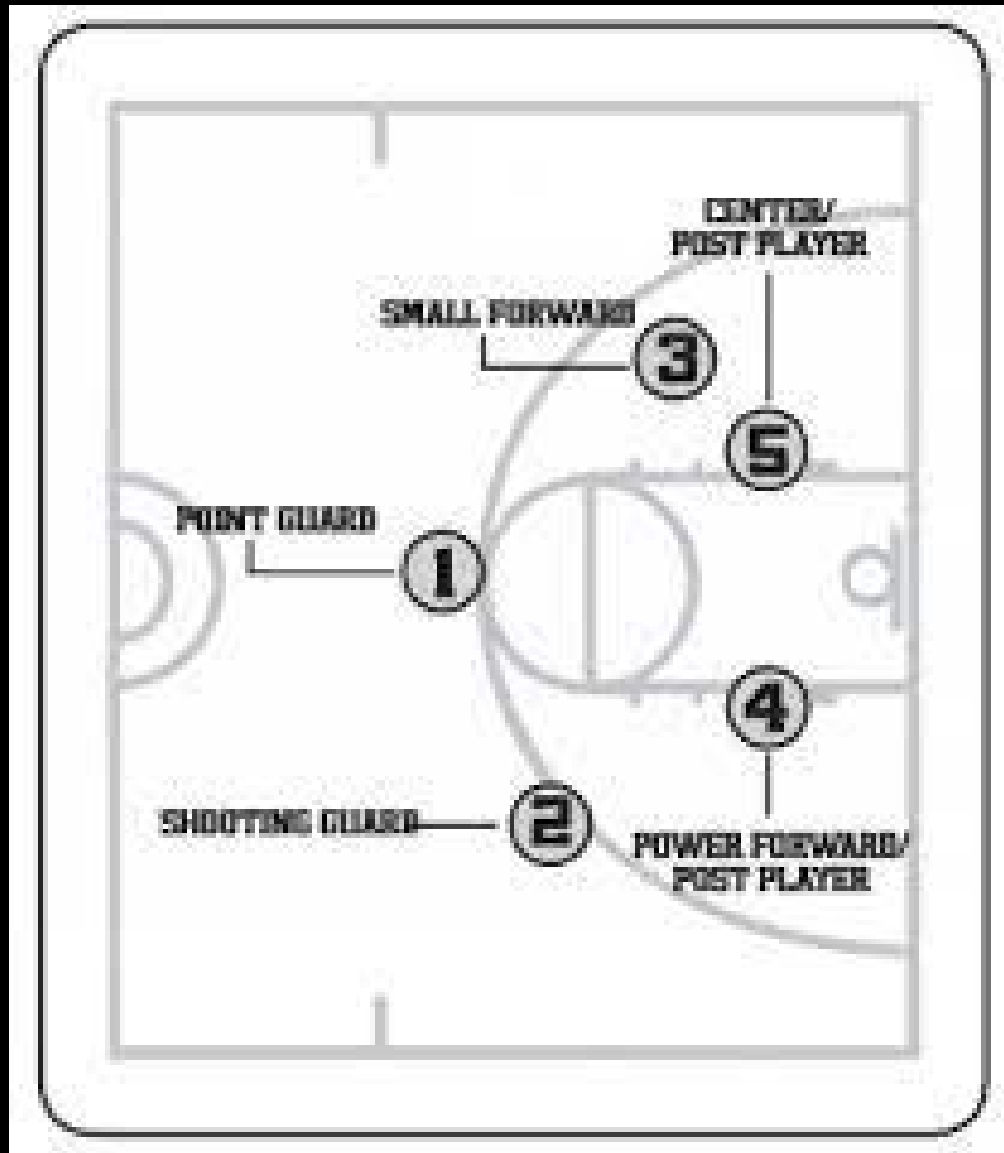
- As each basketball game has a fixed amount of time, we can assumed that with greater number of possessions, the faster the pace of the game
- Generally each possession usually ends with a field goal attempt (FGA)
- Thus, we can assume one FGA to be the same as one possession, which can further be illustrated as pace of the game
- Each possession has also maximum time limit of 24 seconds
- A basketball game last for a total of 48 active minutes (excludes free throws and start balls after violations)
- Amounts to about 120 possessions is the entire game if each possession is 24 seconds

3-PTS attempt increases the pace of the game



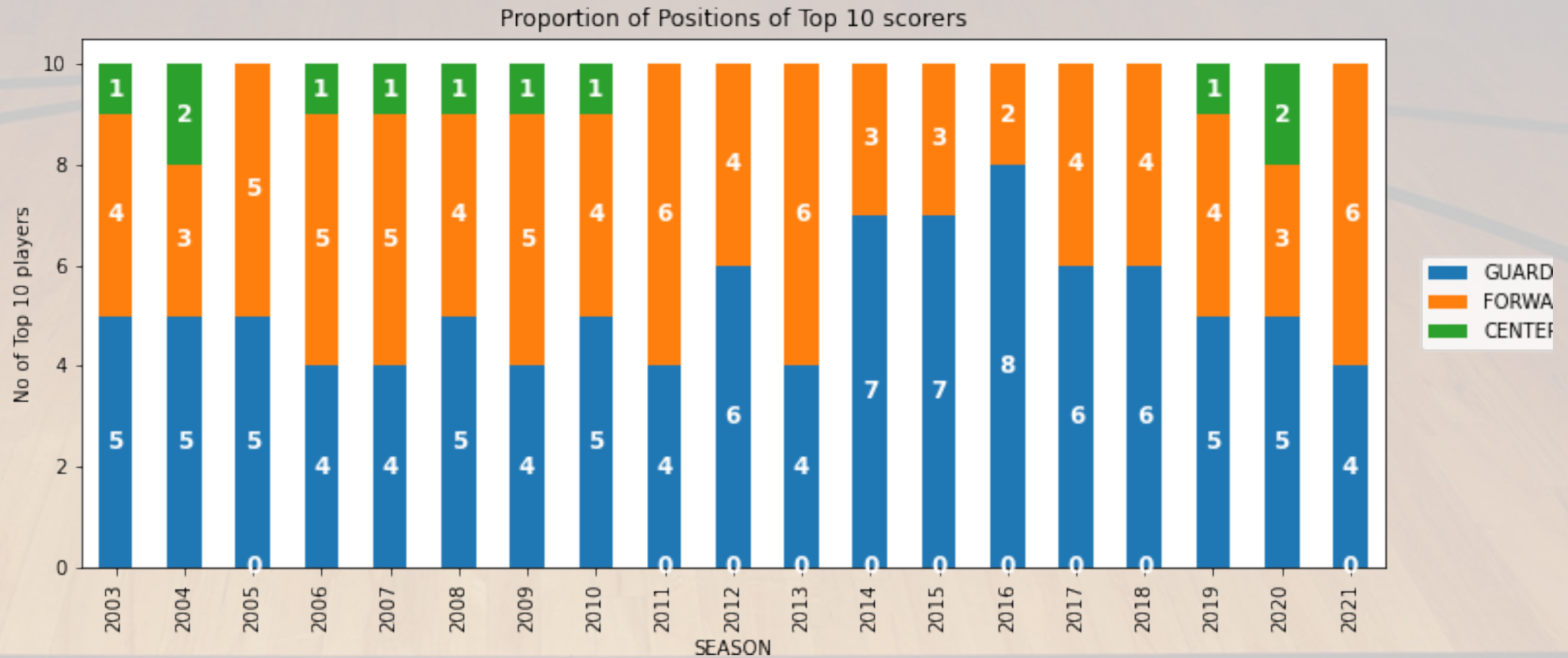
Avg no of seconds per FGA/Possesions



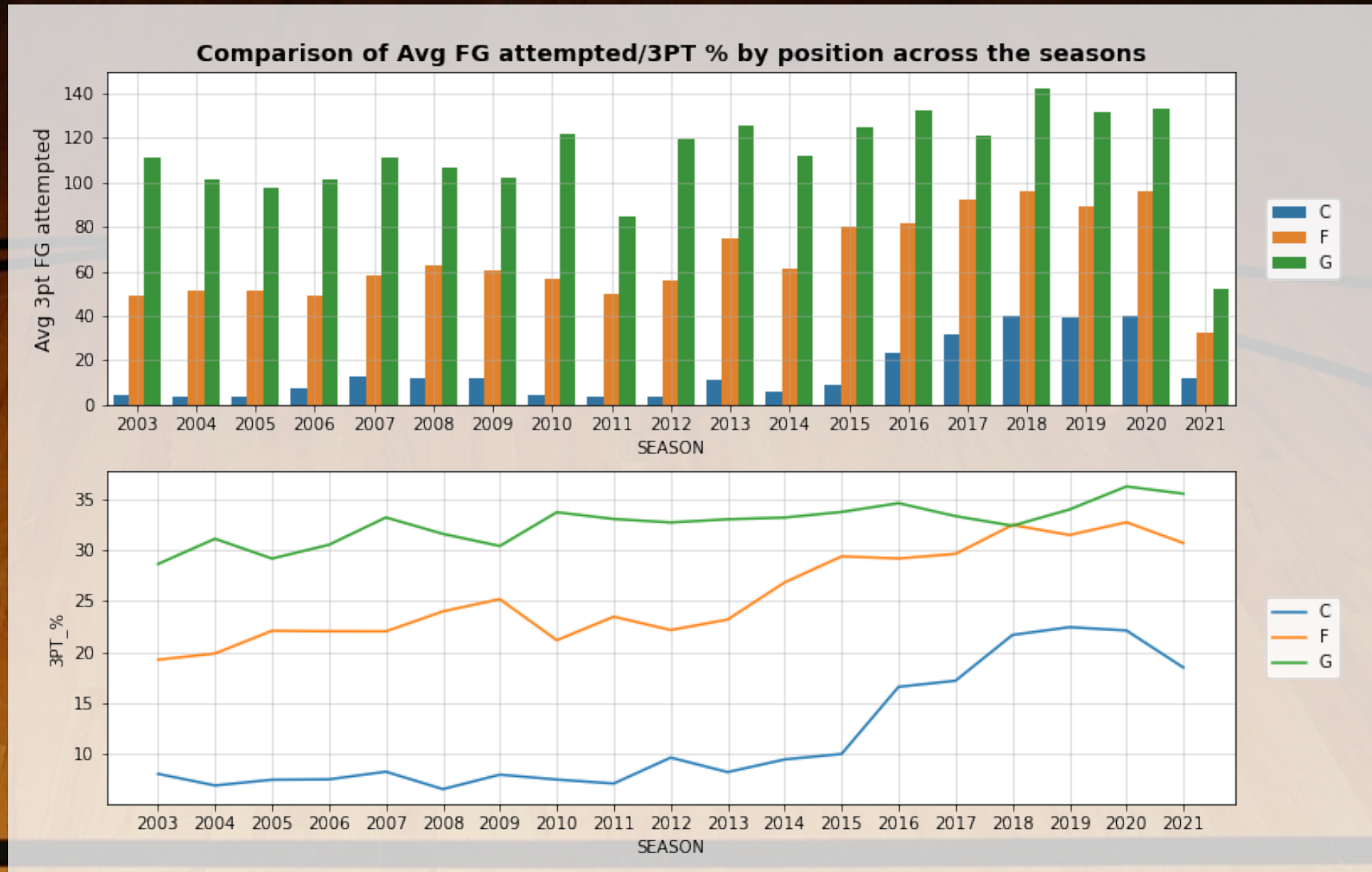


How has the 3 Point Shot affected the Top 10 scorers in NBA?

Breakdown of type of player in the Top 10 scorer list



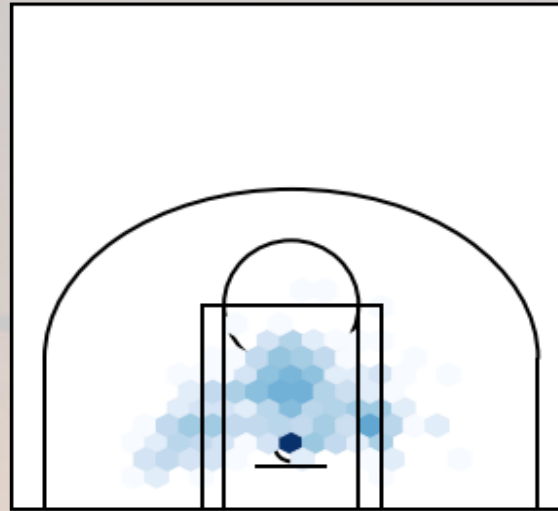
Breakdown 3PT FGA and accuracy for each type of position



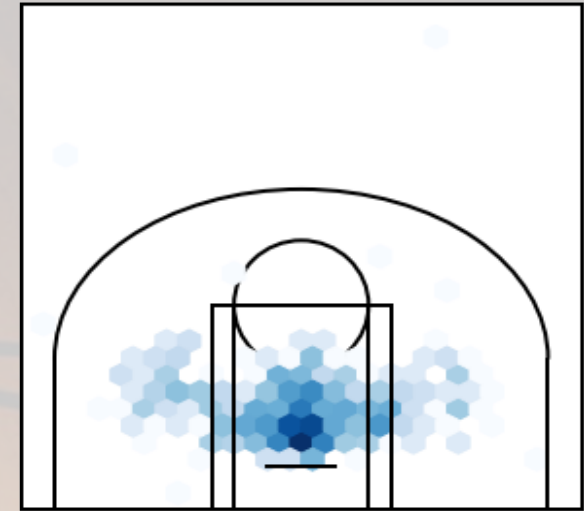
Shot Charts of Top Centers

- In the 2003 and 2010 season, most shots by centers are taken within the 3pt line
- In the later years, no centers made it to top 10 for a few seasons
- In 2019 and 2020, centers made it backed in but the bulk of the shot of these centers include 3pt shots

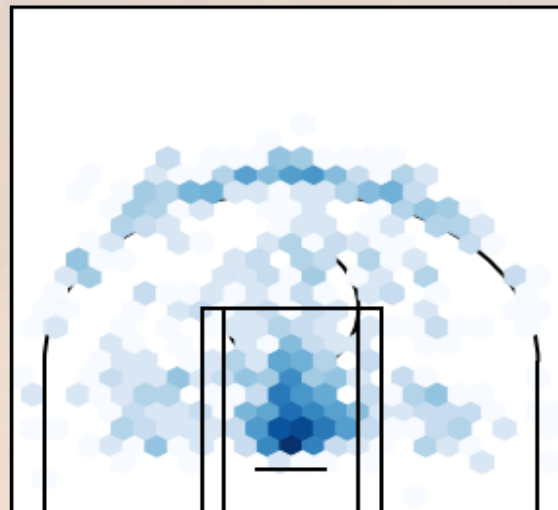
Shaq O'Neal
2003-04 Regular Season



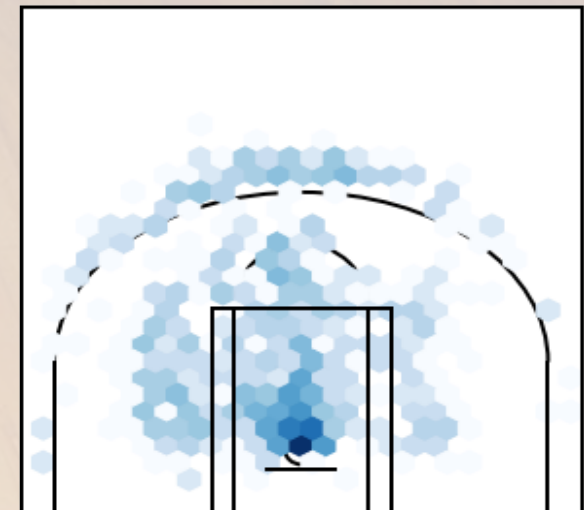
Dwight Howard
2010-11 Regular Season

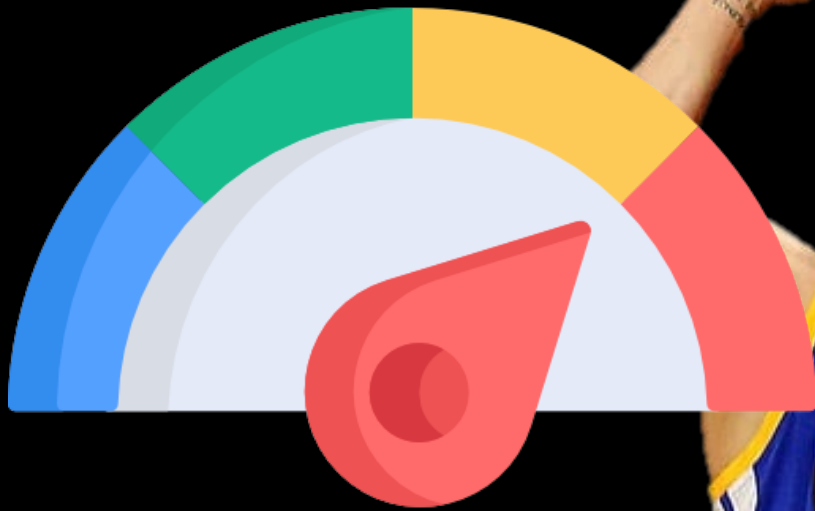


Nikola Jokic
2019-20 Regular Season



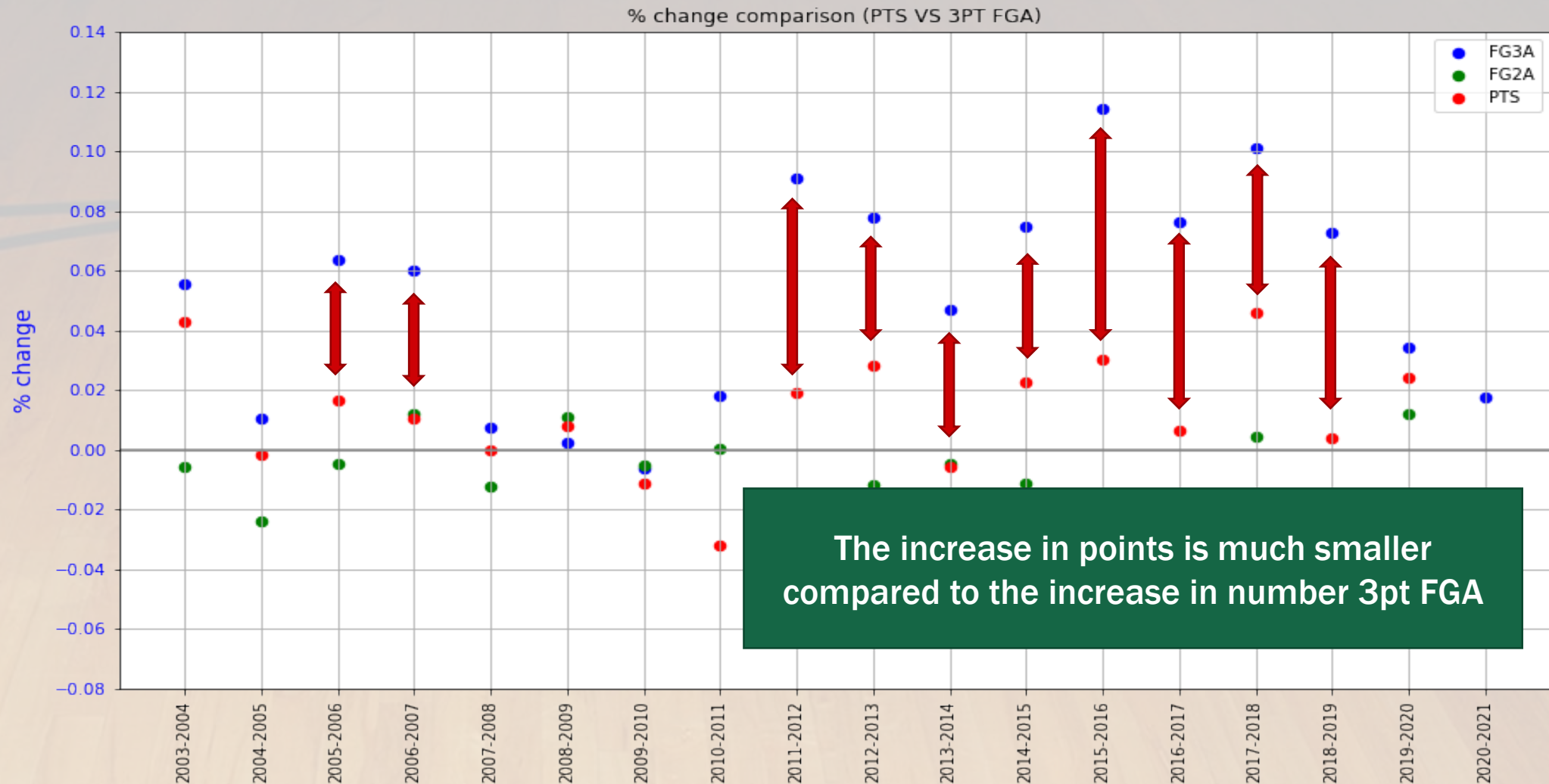
Joel Embiid
2020-21 Regular Season





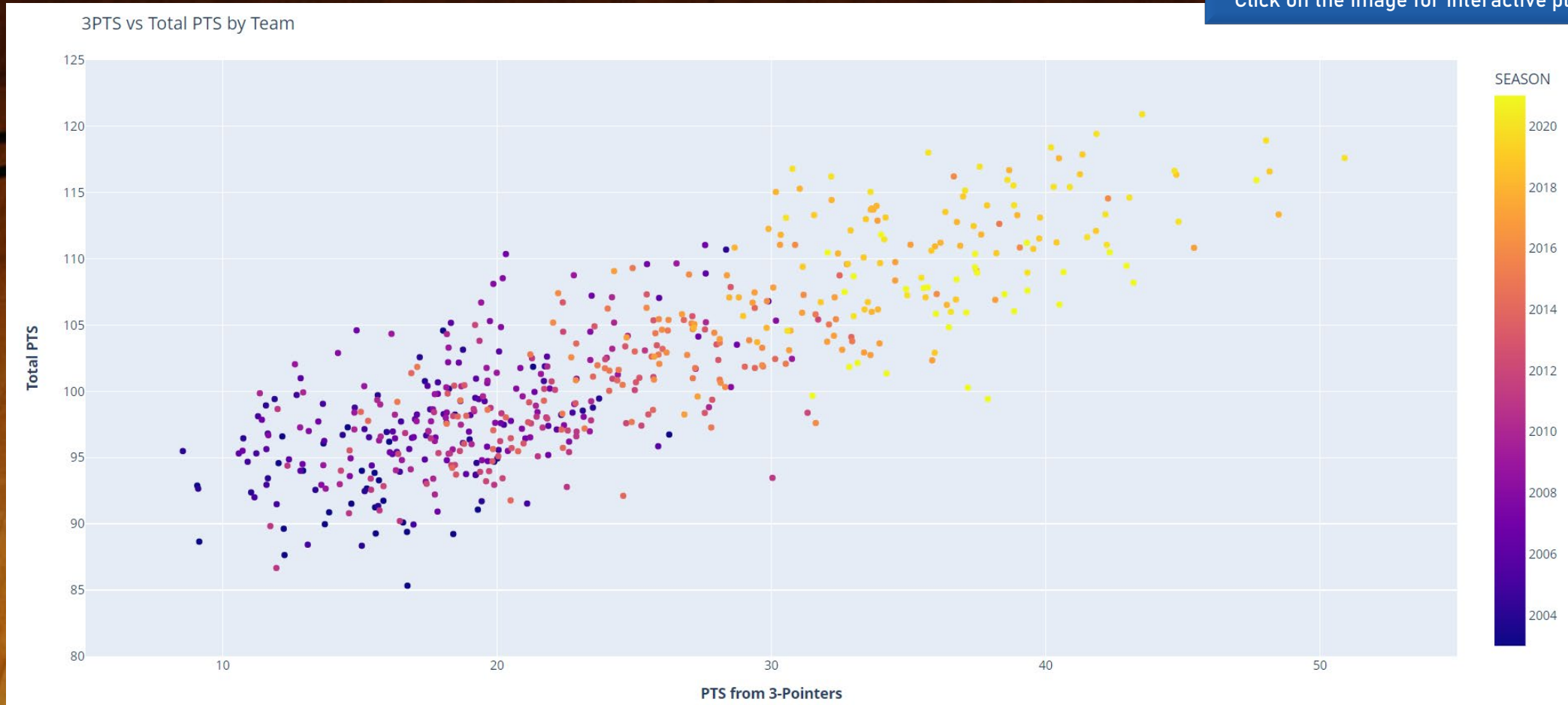
**How efficient is the
3PT in scoring
points and winning?**

Breakdown 3PT FGA and accuracy for each type of position



While points have generally increase with more 3pointers, the team with the most points are not necessarily the one scoring the most 3point shots

Click on the image for interactive plot



Efficiency comes in the form of contribution to wins

Click on the image for interactive plot



Insights

- 3 pointers has definitely change the game in the NBA over the years, in terms of the scorers, the pace of the game
- However, 3 pointers does not seem to be the most efficient method to gain points and win games
- There are other statistics with high correlation to points
- Also pace of the game definitely affects points scored and 2pts seem to have high efficiency to scoring points.
- As such a suggestion for local basketball teams (perhaps even for NBA teams), work on having a faster offense that converts higher pct shot than 3pt.
- Of course for NBA, apart from winning, another consideration is the entertainment value in 3pointers which was not analysed in this case but is also an area that 3pt could have possibly affected the game