CSC343 Phase 3 - Discussion

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Our data is derived from the past 10 NBA seasons, from 2011 to 2021. In the following sections, we will detail our findings related to these 3 investigative questions. To do this, we will reference views created in the queries.sql file.

Three-Pointers Analysis

The first question we want to answer is to find out if there is a real increase in threes attempted and threes made. The FG_Threes view details these two stats, as well as a three-point field goal percentage, on a per season basis. Indeed, we see that players are both attempting and making roughly 30% more threes today compared to 10 years ago. What we did not expect was to see three-point percentage stay remarkably unchanged, suggesting that players have not gotten more accurate in their shooting in spite of shooting more.

Finally, with the FG_Proportions view, we examine what proportion of shots taken are threes. Consistent with our findings above, players are current taking roughly 25.6% of their shots from behind the arc, a noticeable increase from 22.2% in 2011. Although there is a statistically significant increase, it is very slight and not nearly as exaggerated as we would would have thought.

Since we have data on over 2 million shot attempts over the past 10 years, we figured that we could categorize this data in further granularity. The Shot_Freq_Latest view produces a frequency histogram of shot attempts in the 2020-21 season by distance in feet. From this view, we can observe strong evidence supporting the narrative that players are choosing to take fewer midrange twos in favor of playing close to the basket or shooting threes. There is a large spike in shot attempts within 4 feet of the basket, and another spike at 24 feet, where the three point line is located.

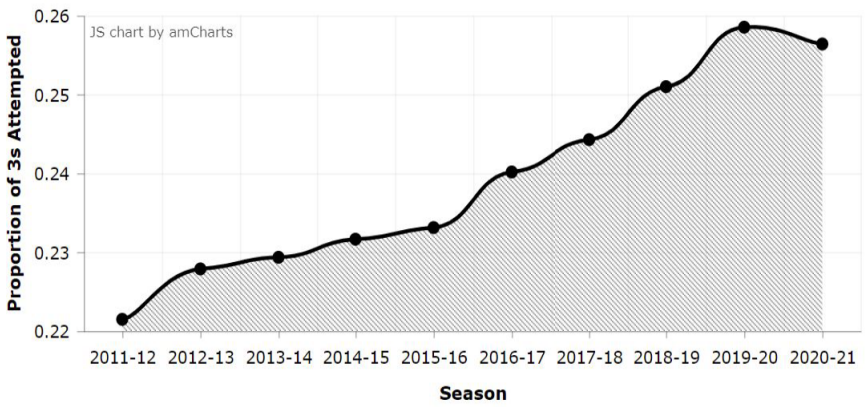

Figure 1: Proportion of 3-Pointers Attempted by Year

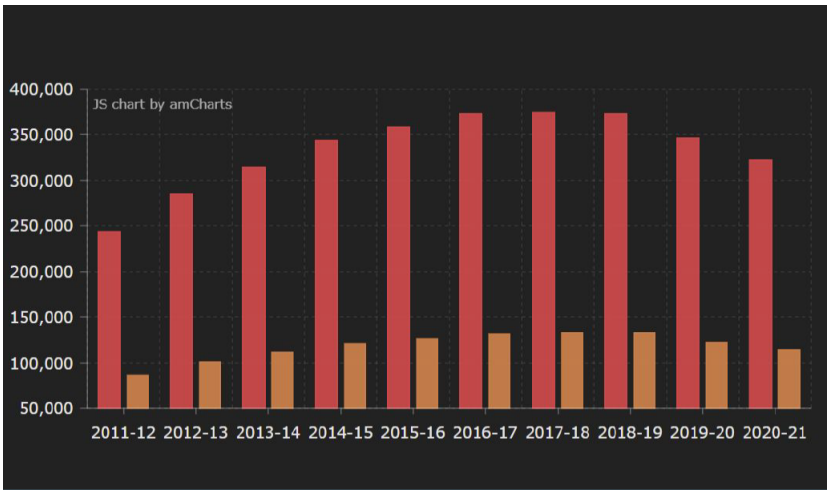

Figure 2: Field Goals Attempted (red) and Field Goals Made (orange) by Year

Scoring, Pace, and Efficiency Analysis

The narrative is that teams are playing faster and more efficiently, and thus are scoring more. To investigate this, the Game_Scores view shows the min, average, and max scores for games in each season. Average points scored per game has increased from 97.4 in 2011 to 112.4 in 2021. Since in the previous question, we've established that field goal percentage is not actually rising, this means that teams must be scoring more points in a game purely by playing faster. Although min and max score data is interesting to observe, we can't really get to any objective conclusions from these outliers.

The Average_Player_Stats view shows the key per game stats for an average NBA player. We see that the average player of 2021 is scoring a full point more than the average player of 2011, from 7.9 points per game to 8.9 points per game. They're also shooting twice the number of threes, from 0.3 per game to 0.6 per game. As evidence of greater scoring, we see assists per game are also trending up, which is consistent since an assist is only registered upon a successful shot attempt by a teammate.

We we also curious on statistical changes in the league's best players. The Top_5_Scorers view gives stats on each season's top 5 scorers. These stats include field goals attempted, threes attempted, proportion of threes taken, and effective field goal percentage. Perhaps unsurprisingly, the league's best players have always maintained a high level of efficiency that has not changed in the past 10 years. We can, however, notice that even these players are attempting more threes per game, even regularly taking more than 50% of their shots from three.

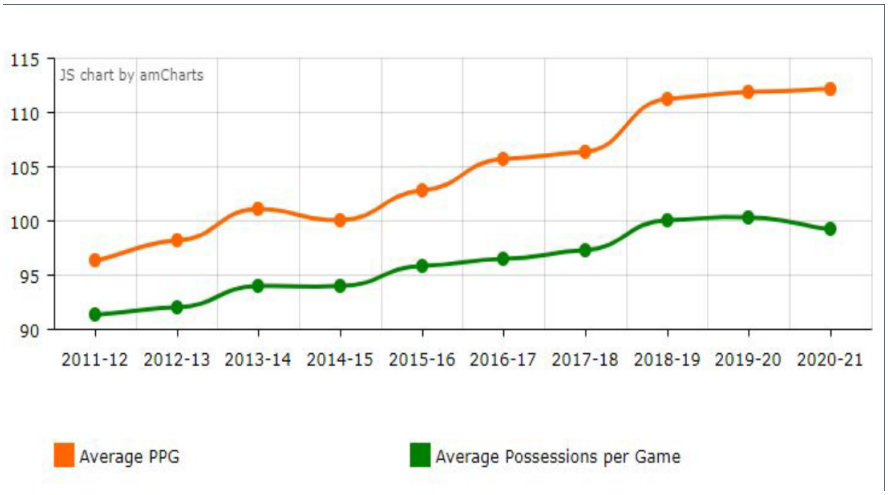

Figure 3: Points per Game and Posessions per Game by Year

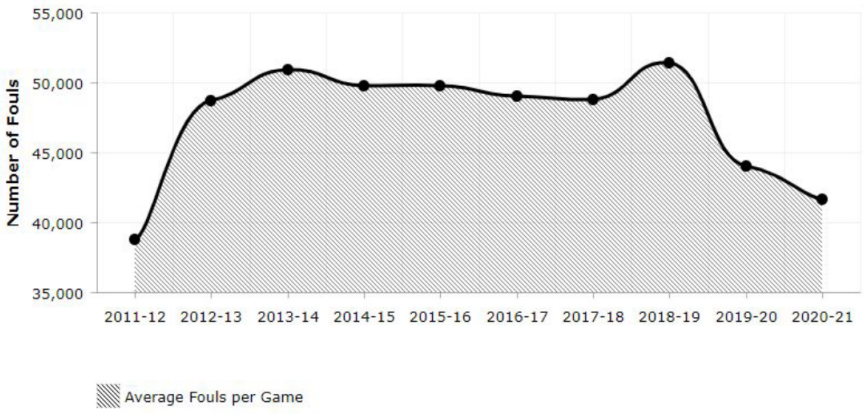

Figure 4: Fouls per Game by Year

Physicality Analysis

Analyzing whether or not the league has gotten less tolerant of physical play has been more difficult for us, since it is a subjective topic by nature. The PF_Stats gives us a measure of how many fouls are being committed in total and average per player per game, grouped by season. We were unable to observe any statistically significant changes in this information, and so we can say that foul rates have basically been unchanged in the past 10 years.

On the other hand, we have the FT_Stats view, which measures total free throws attempted, and average free throws attempted per game per player, grouped by season. In this view too, we are unable to observe any meaningful trends, other than noticing that the rise and fall in free throws attempted is highly correlated with the number of fouls being called as we'd expect.

We were also curious as to whether or not defenses put in more effort to lock down the opposing team in a 'clutch' situation. We define this as a shot attempted within the last 5 minutes of a game, when the score difference is 6 points or less. We expected clutch shots to have a lower field goal percentage. We were surprised in our findings, since although there is a decrease in shooting accuracy in clutch situations, this difference was rather negligible, fluctuating only by fractions of a percent.

Conclusion

What left us with the most lasting impression was how relatively small these changes in statistics were. From watching games, we would have thought that players were taking 50% more threes now than 10 years ago, but the proportional change was only about 3%. Likewise, scoring has increased by 12 points per game on average, but this again was far from the drastic increases that we expected. Finally, we were unable to discern any meaningful changes at all with our findings on free throw and foul rates, in spite of a popular narrative that players are getting more foul calls now than ever before.

Our conclusion is that yes, players are shooting more threes, scoring more in general, playing faster and choosing more efficient shots, but at the same time, popular narratives regarding the direction of the game may be hugely exaggerated.