Analysis of MN Timberwolves Shot Data

Amber Duevel

2/28/2022

#graphic from the internet for the plot  
court<-rasterGrob(readJPEG("Use\_nba\_court.jpg"),width=unit(1,"npc"), height=unit(1,"npc")) #creating court and sizing correctly  
  
logo <- rasterGrob(readJPEG("logo.jpg"),width=unit(1.7, "npc"), height=unit(1.5, "npc")) #creating and sizing the logo of the team for reference on the plot  
  
#gathering multiple seasons of shot data from the Timberwolves so I'm able to compare each season with the next  
shotData2013 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2013)

## Minnesota Timberwolves 2012-13 shot data

shotData2014 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2014)

## Minnesota Timberwolves 2013-14 shot data

shotData2015 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2015)

## Minnesota Timberwolves 2014-15 shot data

shotData2016 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2016)

## Minnesota Timberwolves 2015-16 shot data

shotData2017 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2017)

## Minnesota Timberwolves 2016-17 shot data

shotData2018 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2018)

## Minnesota Timberwolves 2017-18 shot data

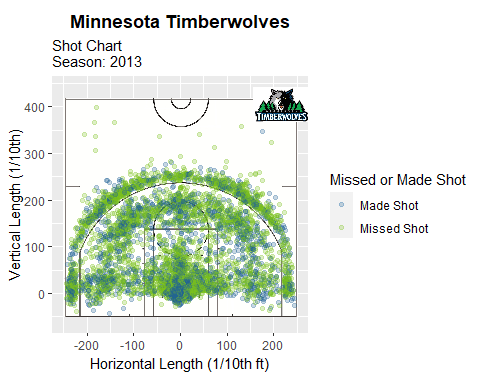
shotData2019 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2019)

## Minnesota Timberwolves 2018-19 shot data

shotData2020 <- teams\_shots(teams="Minnesota Timberwolves", seasons = 2020)

## Minnesota Timberwolves 2019-20 shot data

#combining all the seasons together into one data set so I'm able to display all of them at the same time  
animation\_shotData <- bind\_rows(shotData2013, shotData2014, shotData2015, shotData2016, shotData2017, shotData2018, shotData2019, shotData2020)   
  
#plotting the shots for multiple seasons  
Type\_of\_shot <- ggplot(animation\_shotData, aes(x=locationX, y=locationY)) +   
 #adding and scaling the court onto the plot so the shots are accurately displayed  
 annotation\_custom(court, xmin=-250, xmax=250, ymin= -50, ymax=420) +  
 #setting the points to made/missed shots   
 #setting it to a lighter color so there's a noticeable difference between points  
 geom\_point(aes(color = typeEvent), alpha=0.25) +  
 #x and y limits for the graph  
 xlim(-250, 250) +  
 ylim(-50, 420) +  
 coord\_fixed() +  
 #making the title bold so it'll stand out  
 theme(plot.title = element\_text(hjust = 0.5,face="bold"))+  
 #labeling the axis and the variable  
 #the length of the court is displayed in a 1/10th of a foot  
 labs(x="Horizontal Length (1/10th ft)", y="Vertical Length (1/10th)", color= "Missed or Made Shot")+  
 #setting the missed/made shots to the Timberwolves team colors  
 scale\_color\_manual(values=c('#1E6194','#79C019'))+  
 #adding the Timberwolves' logo  
 annotation\_custom(logo, xmin=180, xmax=250, ymin= 380, ymax=430)  
   
  
#adding animation to represent each season  
 animation\_plot <- Type\_of\_shot +   
 #each frame represents a new season  
 transition\_states(yearSeason)+  
 #cleaning up the display of the plot  
 enter\_fade()+  
 exit\_shrink()+  
 view\_follow()+  
 #labeling the year of the season  
 transition\_time(yearSeason)+  
 #adding the season year, team name and type of plot to the title  
 ggtitle("Shot Chart\n Season: {frame\_time}", label= unique(animation\_shotData$nameTeam))  
  
animation\_plot  
   
#setting the time spent on each frame for each season  
animate(animation\_plot, nframes= 8, duration = 10)

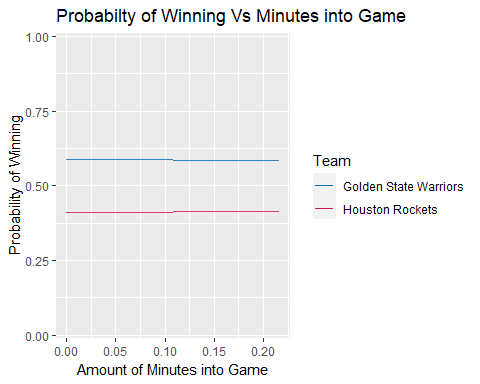
 Findings:  
-Three points shots are missed more compared to two point shots.  
-Layups are made more than they are missed.  
-In the 2020 season, there are less shots inside the three point line compared to previous seasons.  
-Very few half court or far away shots are taken but almost all are missed shots. -A lot of shots are taken as layups or near the hoop.

Explanation:  
When looking at the graph there is more green displayed at the three point line compared to blue. This means more shots are missed than made at this line. There is also very few shots that are taken far from the three point line (close to half court). Almost all of these points are green for each season. We can view these points as buzzer beater shots that are shot at the last seconds of the game. Most of these shots are missed which can inform us that these are difficult shots to make. The team has a very low probability of making this type of shot. Each season has a new spot where more shots are taken. In 2020 season, we can see that there are less shots taken inside the three point line compared to other seasons. In every season there is a lot of blue at the net or near it. This means that a lot of layups are made each season. This can inform us that making layups can be seen as an easier shot to make. Or this is the Timberwolves strongest type of shot. Other information we can gather from this is rebounds made. If a player misses a shot, another player can rebound it and make the shot. This could be a strength for the Timberwolves and that’s why there is more blue points near the net. I also found it interesting how throughout every season the graph shows more green points than blue. This means that the team has more missed shots overall. Knowing this information we can infer that the Timberwolves might not be a strong shooting team.

#gathering the probability of winning data in a specific game  
win <- win\_probability(game\_ids = c(21700002), filter\_non\_plays = T, nest\_data = FALSE, return\_message = TRUE)

## Getting win probability and play-by-play for game 21700002

#graphing the data points for each team  
plot<-ggplot(win, aes(x=minuteGame, y=pctWinProbHome))+  
 #graphing the probability of the home team winning the game  
 geom\_line(aes(y=pctWinProbHome, color=nameTeamHome), alpha=.8)+  
 #graphing the probability of the away team winning the game  
 geom\_line(aes(y=pctWinProbAway,color=nameTeamAway), alpha=.8)+  
 #labeling the x and y axis  
 labs(x="Amount of Minutes into Game", y="Probability of Winning", color="Team")+  
 #labeling the title  
 ggtitle("Probabilty of Winning Vs Minutes into Game")+  
 #matching the team colors to the plot of the line  
 scale\_color\_manual(values = c('#006BB8','#D31145'))  
  
#adding animation to the plot  
animation\_plot <- plot + transition\_reveal(minuteGame)+  
 #keeping the y axis constant and only moving the x axis  
 view\_follow(fixed\_y=TRUE)  
  
animation\_plot



For this graph I used a new data set which was the probability of winning the game. I compared two teams, Golden State Warriors and Houston Rockets. As the game went on the graph shows the probability of each team winning. The graph fluctuates throughout the game and there isn’t a set increase or decrease for either team. At some points during the game the lines move towards fifty percent which could mean the game is close. Once there is only a couple minutes left in the game the lines move toward 80 percent and 20 percent. Due to the lines not ending at 100 and 0 percent it means the score difference wasn’t a huge gap.