COMP 2256 Final Project

Introduction

This was the final project for my Tableau class. In this project, I talked about Kyle Lowry, an NBA basketball player, and how although he is an underrated player, he is one of the best players in the league. I chose this topic because basketball is one of my favourite sports and Kyle is one of my favourite players. I know most people don't watch basketball, so my goal was to explain all the concepts and ideas in a way that non-basketball people could understand.

About the data

The data came from the following sources:

Regular Season Stats and Height data: *https://www.basketball-reference.com/*
Hustle and Shot Zone Stats: *https://www.nba.com/stats/*

- I exported each season stats as CSV and cleaned with Excel. I then unioned each season in Tableau

RAPTOR and WAR stats: *https://projects.fivethirtyeight.com/nba-player-ratings/*

- I downloaded the data from the website and cleaned it using Excel

D-LEBRON stats from https://www.bball-index.com/

- I copied the stats into Excel and cleaned the data

Kyle's Shot Chart: *https://github.com/swar/nba_api*
https://towardsdatascience.com/make-a-simple-nba-shot-chart-with-python-e5d70db45d0d
https://medium.com/@fastbreakstatistics/creating-the-nba-shotchart-using-python-5c595374d905

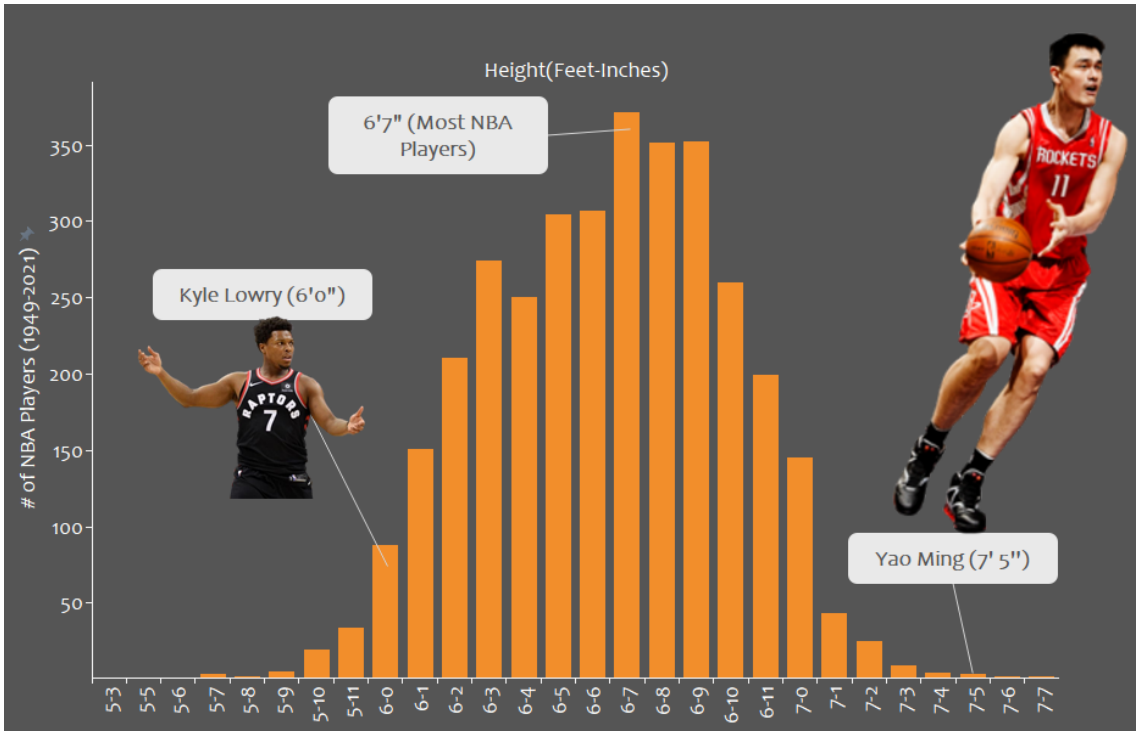
- I downloaded the API from this website and extracted Kyle's shots data using Python. I used https://towardsdatascience.com/make-a-simple-nba-shot-chart-with-python-e5d70db45d0d to instruct me. Then, I had to do some more complicated activities in Tableau. The instructions I used are here but I had to:
    - import a background image of a basketball court
    - create calculated fields using HEXBINS, which I've never used before
    - create a parameter that would adjust the size of the shapes
    - create a few more calculated fields to adjust shape and color, and position the shapes correctly in the worksheet

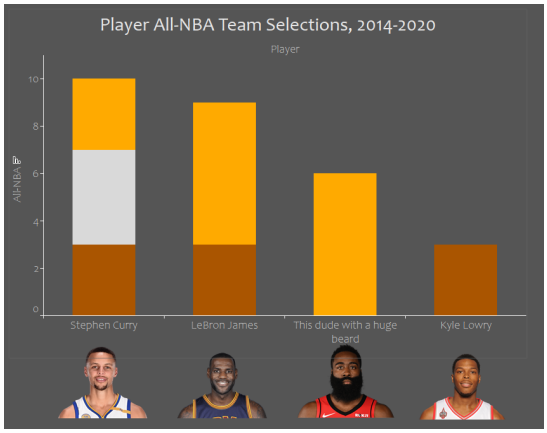
The most difficult thing for me was using containers in my dashboards. I decided to create super long dashboards, which made it a bit more difficult to place containers. I used floating containers for

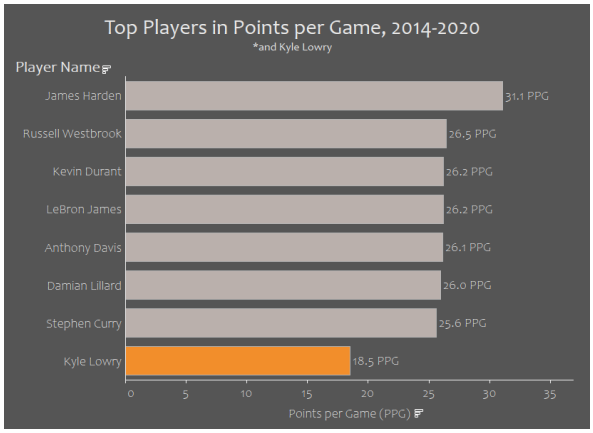
the first dashboard, but switched to tiled for the others. Sizing containers correctly was a big problem.

The last thing I'd like to caution readers about is in sports, when analyzing players or teams, stats only tell a small part of the story. One needs to look at the big picture (stats, scouting, genetics, psychology, etc.) to analyze a player. Also, some stats (like points per game) don't always paint an accurate picture on how great a player is. Try to understand what each stat is trying to tell you.

Height, Awards and Points per Game charts

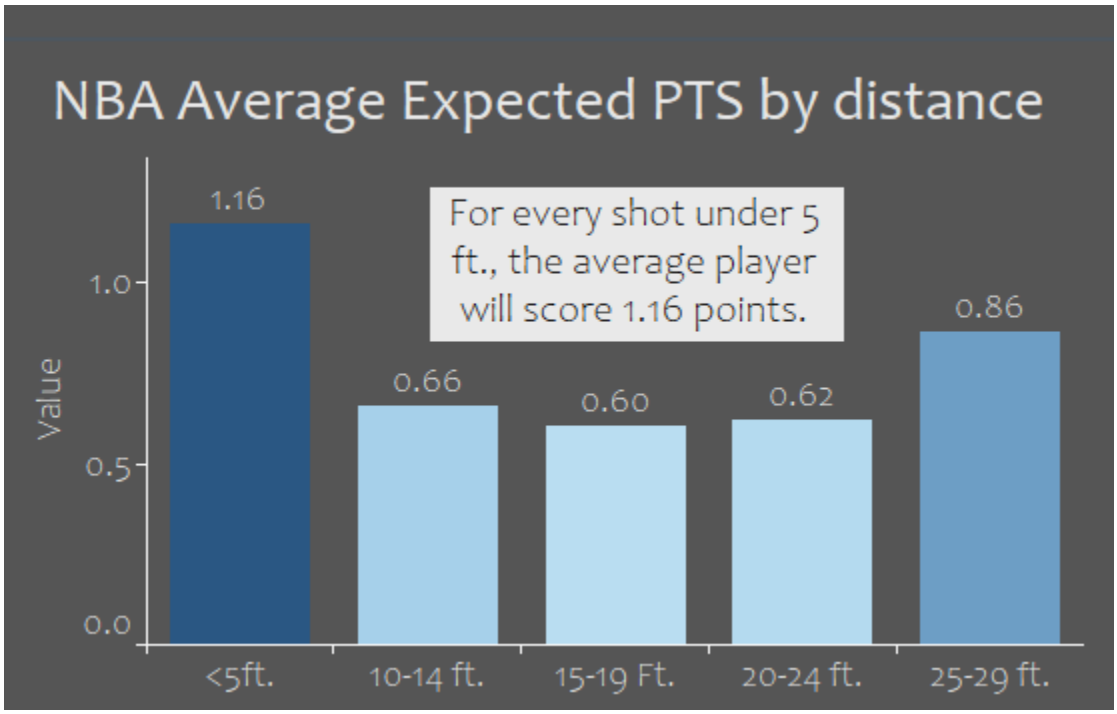






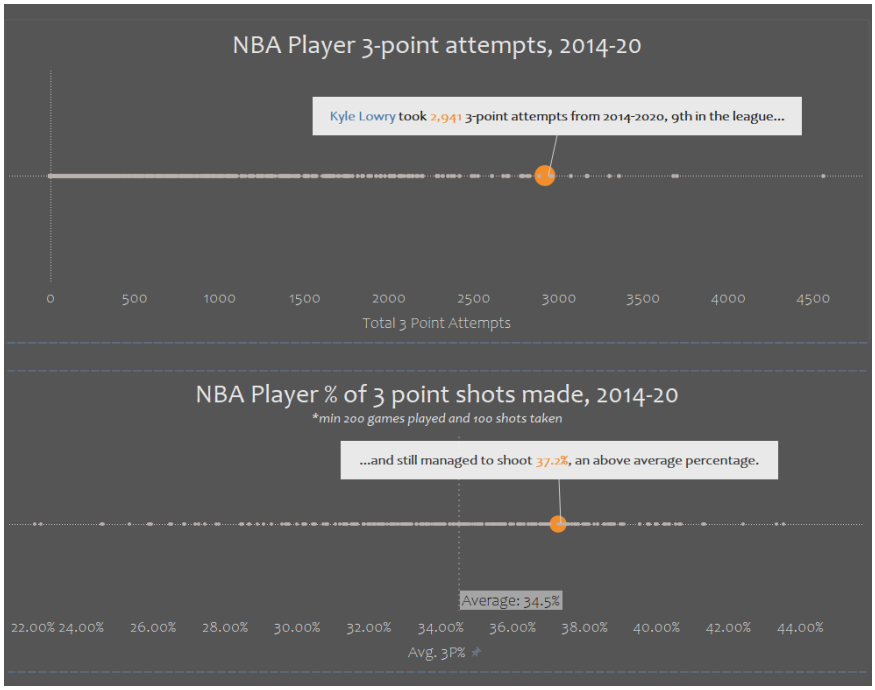
The main point of these 3 charts is to show how certain stats and information can make a player look bad, and to emphasize later on how these limitations don't limit Kyle in what he does.

Expected Points per Distance



This chart illustrates where the most efficient places to shoot are on a basketball court, and serves as a general illustration for the rest of the dashboard. The most important thing I wanted to show was that the most efficient shots to take are near the basket and at the 3-point line.

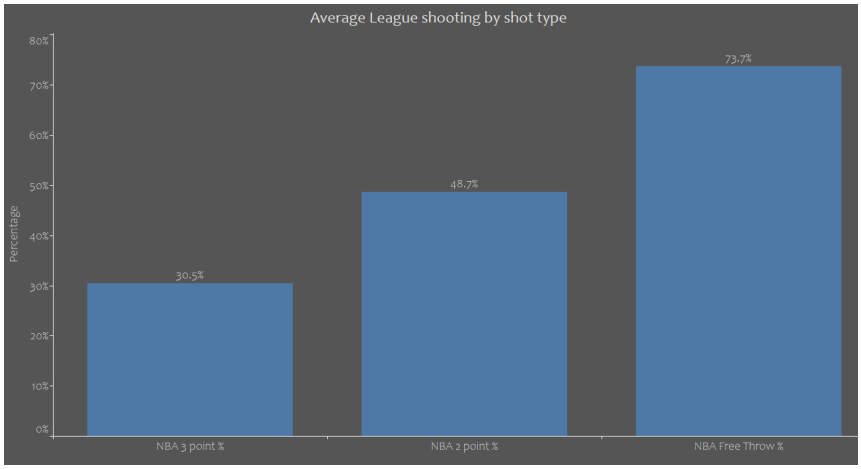
NBA 3-point attempts and percentage



I wanted to show how Kyle compared to other players in the league, not just top-10 or top-20. I considered a scatter chart, but ultimately decided on a timeline-like chart.

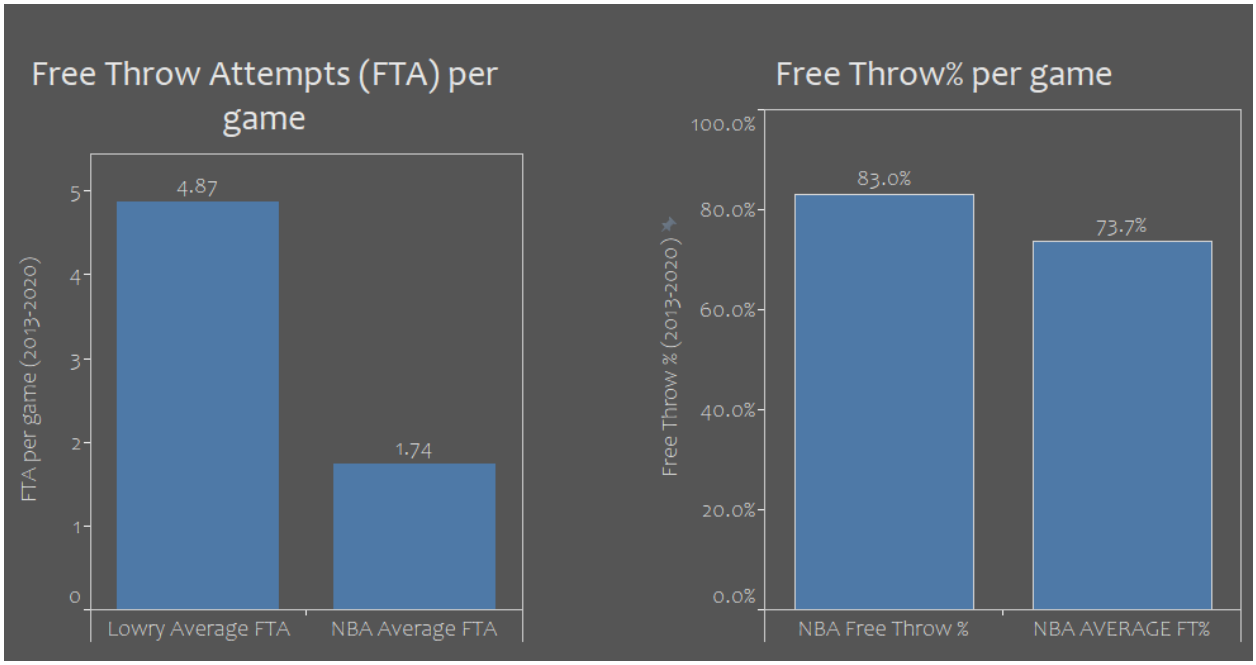
I've done timeline charts in my previous projects and the idea was similar here. I created a calculated field with MIN(0) and added it to the view, and another calculated field that calculated total 3 point attempts. I didn't remember how to highlight Kyle's position in the chart, but in the end I created a calculated field, wrote [Player Name] = "Kyle Lowry", and put it in the color mark, and annotated the position.

Average League shooting by Type



This chart was simply to illustrate how shooting free throws is easier for players than other shots, and how advantageous it is for players to shoot these kinds of shots. Nothing much to say here; I used NBA regular season stats from 2014-2020 and averaged out the league's free throw, 2-point and 3point shots.

Kyle's Free Throw Attempts and Percentage per game

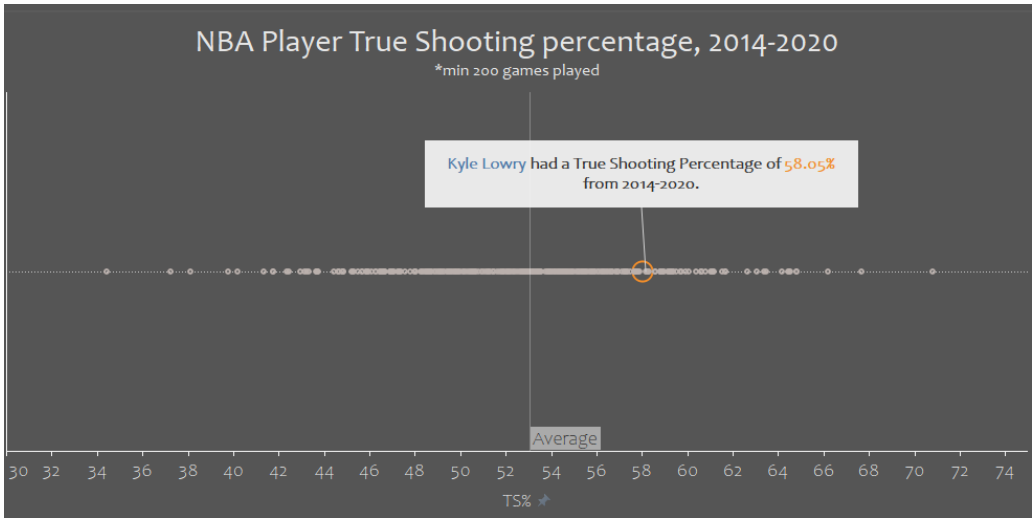


I wanted to compare Kyle's free throw attempts and percentage to the rest of the league, and show that:

1. he is taking more efficient shot attempts (in this case free throws), and
2. he makes these types of shots at a higher rate than other players.

I used the NBA season stats and created 2 different bar charts, one with Kyle's stats and one with the NBA's stats.

True Shooting Percentage



True Shooting Percentage was something I'd heard about before, but never really understood until doing this project.

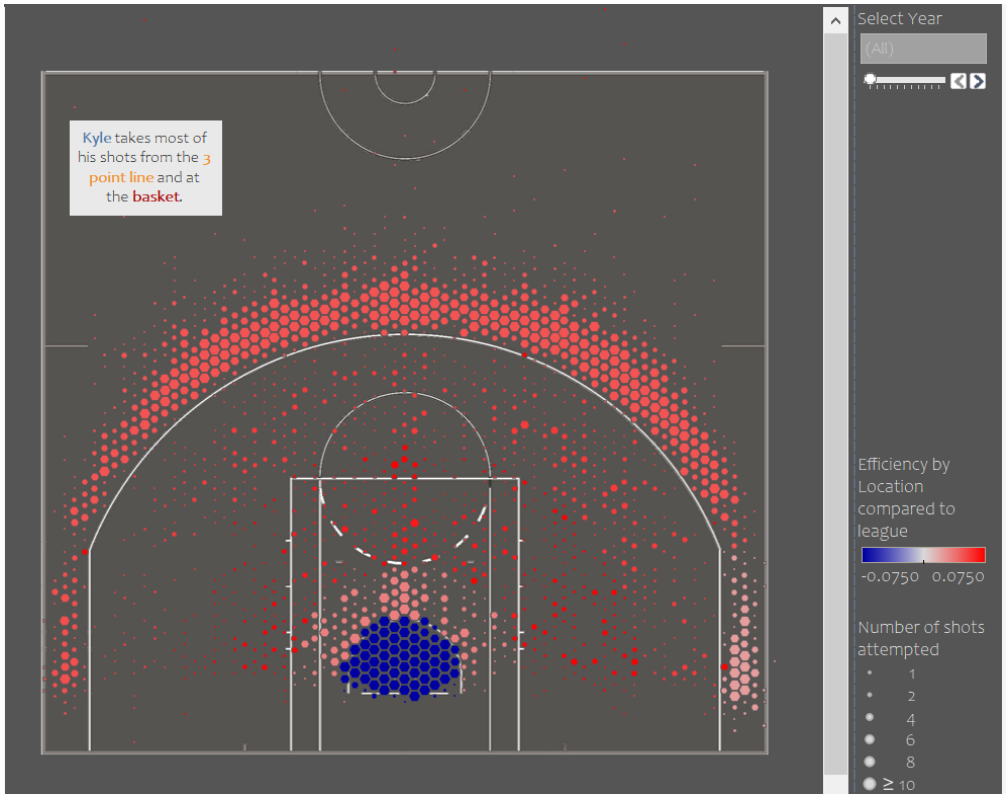
I learned that the stat Points per Game doesn't show how efficient a player scored. (For example, a player who scored 30 points on 15 shots was more efficient than a player who scored 30 points on 50 shots). Another popular stat, Field Goal Percentage (shots made / shots taken) undervalues 3-point shots and doesn't take into account free throws.

True shooting percentage accounts for 3-pointers and free throws and is a more accurate stat for efficiency.

To build the chart, I created a 'timeline chart' similar to other charts before, highlighted Kyle, and annotated him. Again, I wanted to compare Kyle to the rest of the league.

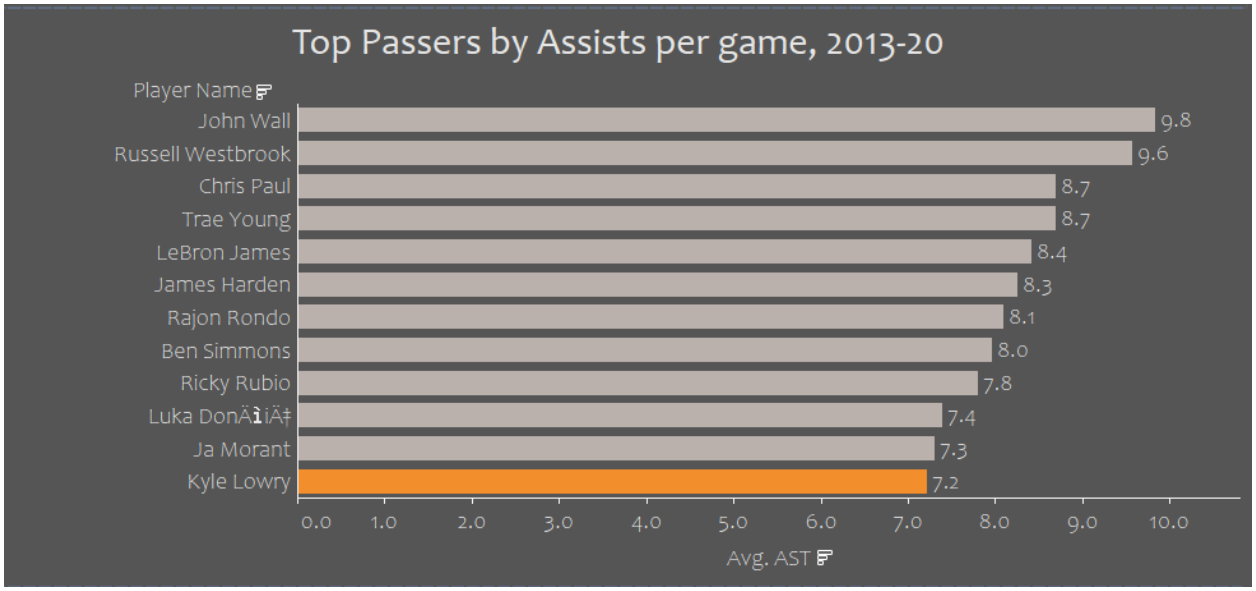
One note: The best player in True Shooting, according to this chart, is Rudy Gobert. He is a 7-footer who spends most of his time next to the basket. In fact, a lot of the best players in True Shooting are taller players. This is my own opinion, but these players have a higher percentage because they grab missed shots and put them in the basket, or other players pass to them in easy-to-score positions. This stat, while better than Points per Game, doesn't tell the WHOLE picture of how good a player is.

Kyle's Shot Chart



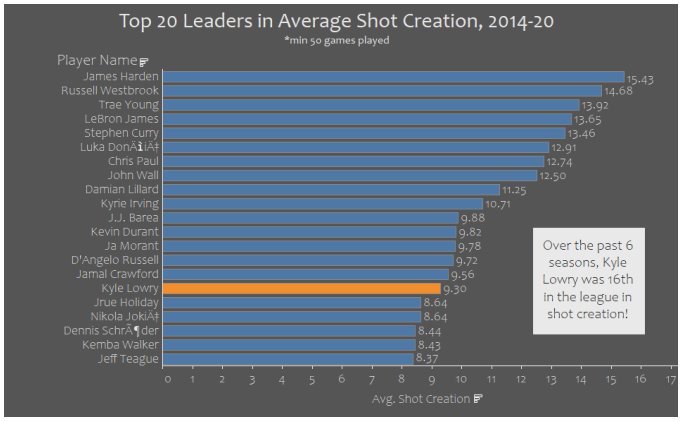
This was by far the most complicated chart to make. Most of what I did is documented on page 1. I decided to put this at the end to emphasize where Kyle takes most of his shots, and how efficient he is.

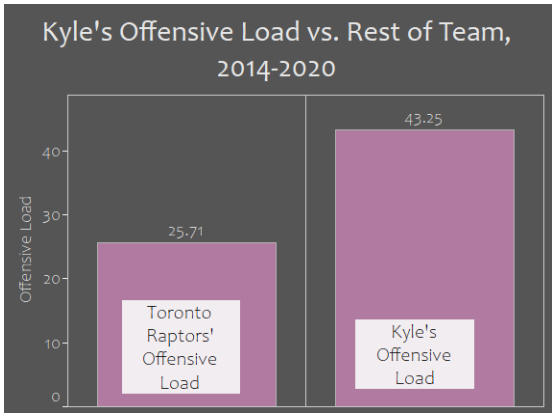
Top Passers by Assists



This is simply to show that Kyle is one of the best passers in the league, but also as a segue to show that there is more to a player than just passing. Made a simple bar chart using regular season data from https://www.basketball-reference.com/.

Shot Creation





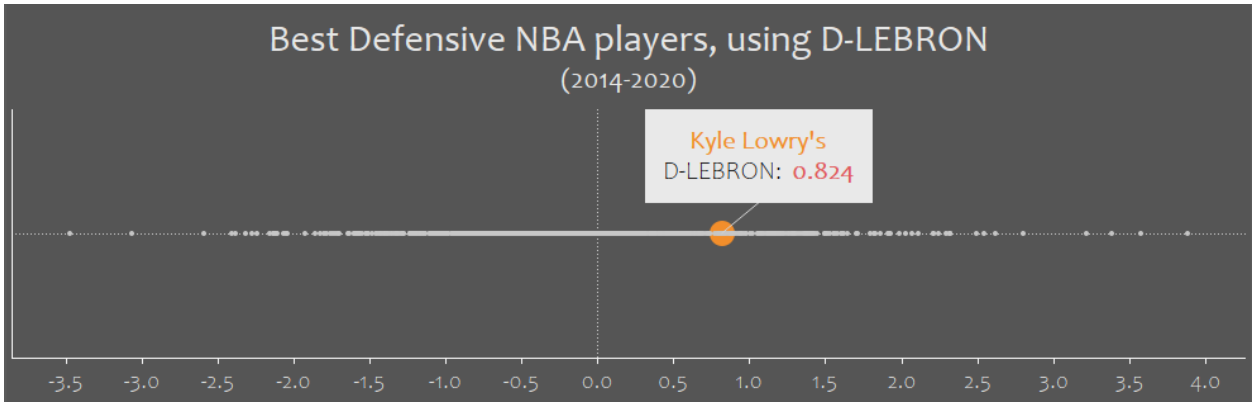
I didn't know about shot creation and offensive load until I started this project. I watched the following video to learn more about it.
https://www.youtube.com/watch?v=yoLgSWA7n6g&list=PLtzZl14BrKjTJZdubjNEY5jUofGOiy51x&index=5&ab_channel=ThinkingBasketball

I wanted to show that:

1. there is more to creating a shot for others than just passing the ball
2. Kyle does a lot of work to score and help his team score
3. He is one of the best players at creating shots for his teammates

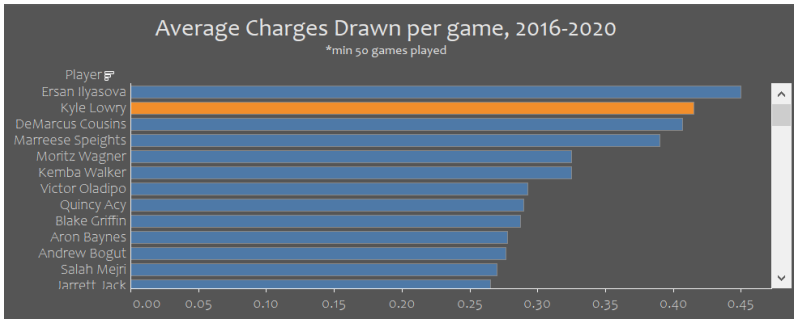
I used basketball per 100 stats from basketball-reference.com, and using the formulas from https://fansided.com/2017/08/11/nylon-calculus-measuring-creation-box-score/, created calculated fields to calculate shot creation and offensive load. Then, I created bar charts and added annotations.

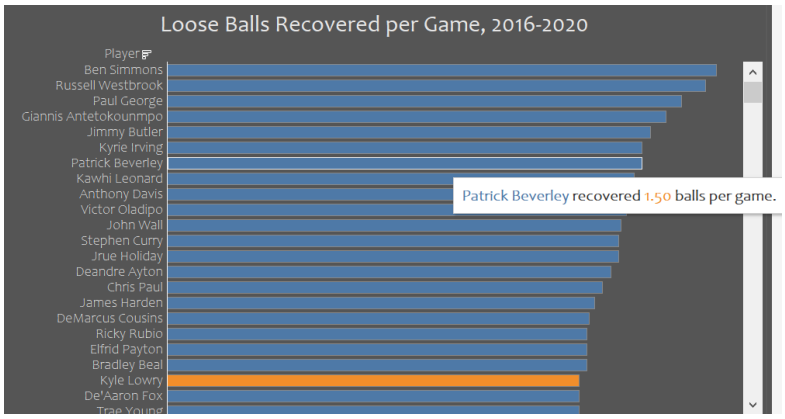
D-LEBRON

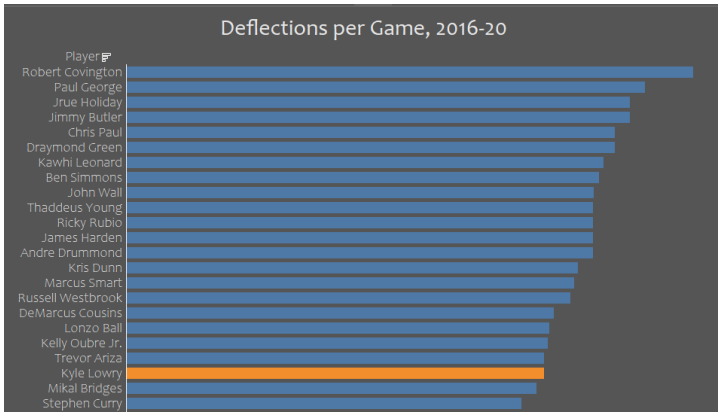


I wanted to show Kyle's defensive impact compared to the league. I took stats from https://www.bball-index.com/ and created a timeline chart. I wanted to show that, compared to the league, Kyle is still an above average defender despite his height limitations.

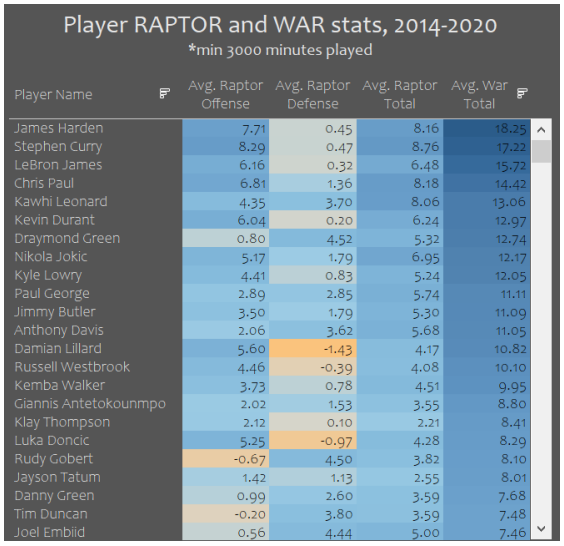
Charges, Loose Balls, Deflections



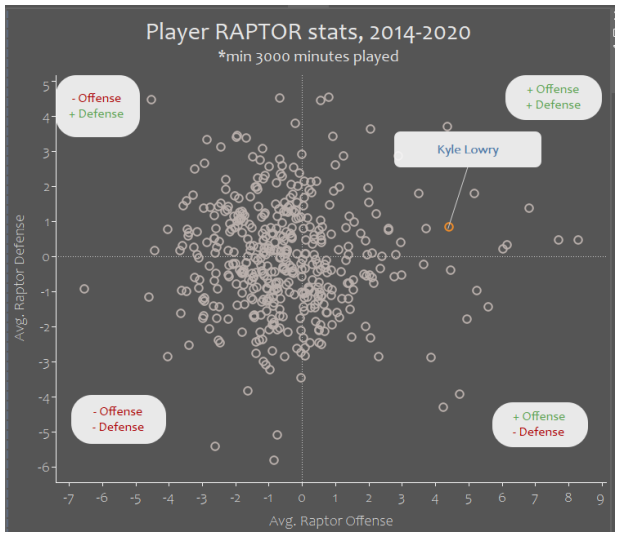


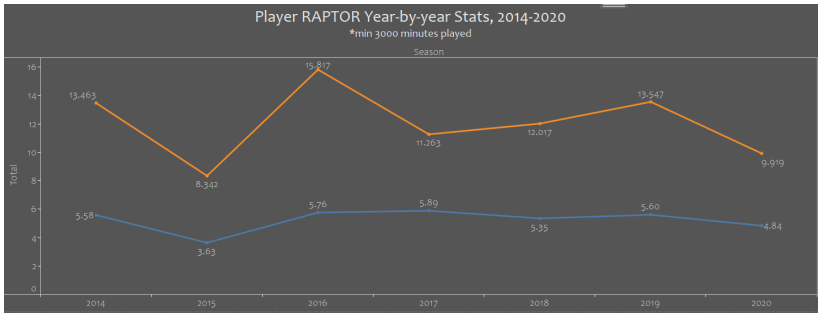


These stats aren't stats that you would normally see on a scoresheet. I wanted to show that Kyle did these small, unheralded things to help his team win. These are advanced stats from https://www.nba.com/stats/ that I downloaded onto Excel and cleaned. I used a calculated field to highlight Kyle's bar.



Player Name	Avg. Raptor Offense	Avg. Raptor Defense	Avg. Raptor Total	Avg. War Total
James Harden	7.71	0.45	8.16	18.25
Stephen Curry	8.29	0.47	8.76	17.22
LeBron James	6.16	0.32	6.48	15.72
Chris Paul	6.81	1.36	8.18	14.42
Kawhi Leonard	4.35	3.70	8.06	13.06
Kevin Durant	6.04	0.20	6.24	12.97
Draymond Green	0.80	4.52	5.32	12.74
Nikola Jokic	5.17	1.79	6.95	12.17
Kyle Lowry	4.41	0.83	5.24	12.05
Paul George	2.89	2.85	5.74	11.11
Jimmy Butler	3.50	1.79	5.30	11.09
Anthony Davis	2.06	3.62	5.68	11.05
Damian Lillard	5.60	-1.43	4.17	10.82
Russell Westbrook	4.46	-0.39	4.08	10.10
Kemba Walker	3.73	0.78	4.51	9.95
Giannis Antetokounmpo	2.02	1.53	3.55	8.80
Klay Thompson	2.12	0.10	2.21	8.41
Luka Doncic	5.25	-0.97	4.28	8.29
Rudy Gobert	-0.67	4.50	3.82	8.10
Jayson Tatum	1.42	1.13	2.55	8.01
Danny Green	0.99	2.60	3.59	7.68
Tim Duncan	-0.20	3.80	3.59	7.48
Joel Embiid	0.56	4.44	5.00	7.46





The last 3 charts are intended to summarize Kyle's impact compared to the league. I also wanted the last 3 charts to be more interactive. The highlight table and scatter plot compares Kyle's RAPTOR and WAR stats compared to the league, while the line graph shows a player's year-by-year stats.

Pictures

www.nba.com
https://www.youtube.com/watch?v=rhvx4PwJeRg&ab_channel=NBA
https://www.sportingnews.com/au/nba/news/how-kyle-lowry-can-adapt-his-game-as-the-toronto-raptors-begin-another-new-era-without-kawhi-leonard/1wkcb4dbr9o7h1ml8oonviwsam
https://images.saymedia-content.com/.image/MTY5MTAzMjkzMDQwMDQzNDgz/usatsi_13773648.jpg
https://fivethirtyeight.com/wp-content/uploads/2018/11/GettyImages-884033384-4x3.jpg?w=575
https://external-content.duckduckgo.com/iu/?u=https%3A%2F%2Fi.ytimg.com%2Fvi%2FoPeRiLi8pg0%2Fmaxresdefault.jpg&f=1&nofb=1
https://grantland.com/wp-content/uploads/2014/06/danny-green-tri1.jpg?w=750
https://www.freeiconspng.com/uploads/yao-ming-png-25.png
https://www.pngarts.com/explore/149172
https://www.nba.com/stats/media/players/700/200768.png
https://images.daznservices.com/di/library/NBA_Global_CMS_image_storage/56/cd/kyle-lowry-free-throw-bucks_17h48oopfjbcd1d6hbbmb5hkdc.jpg?t=1127734964&w=%7Bwidth%7D&quality=80
https://images.saymedia-content.com/.image/MTY5MTAzMjkzMDQwMDQzNDgz/usatsi_13773648.jpg
https://s.hdnux.com/photos/77/51/02/16683166/5/360x0.jpg
https://assets1.sportsnet.ca/wp-content/uploads/2016/02/VC-01.jpg

Music

https://www.youtube.com/watch?v=pbBPEcChMko&ab_channel=monkeyboyz246
https://www.youtube.com/watch?v=vjWwR5FGj1k&ab_channel=AnabolicBeatz