

# Efficiency Changes – An Analytical Look at the NBA's Mentality Shift

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**Abbreviated abstract:** The National Basketball Association (NBA) has always been about gaining a competitive edge over opponents. With the increased awareness and emphasis in analytics, the NBA's shift toward data-driven efficiency has changed everything from team composition to shot selection. In this work, NBA data from the past 10 seasons are evaluated to identify where and how efficiency changes have taken place to see analytics in action.

**Related publications:** (up to 2 references)

– Skinner, Brian *et al*, PLoS One 7 (1), e30776 (2012)

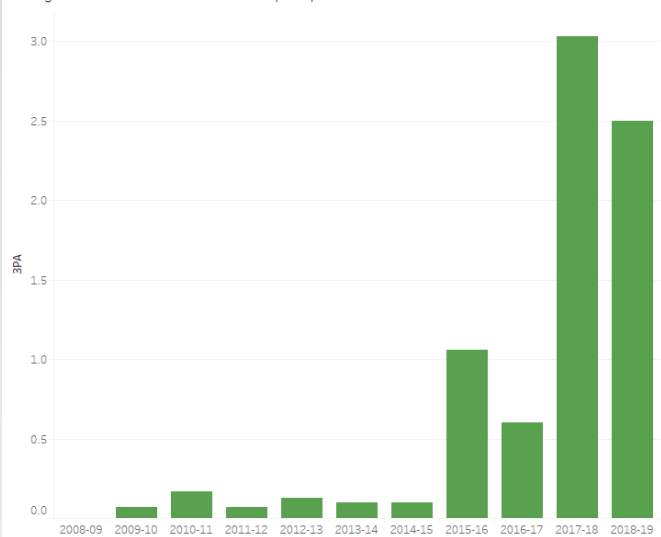
# What is an Efficient Shot, and Why Does it Matter?

- Determined by average shooting percentages, the most efficient shots to take in the modern NBA are close-up layups and 3-point shots
  - Distance from the net affects the average expected points scored per shot along with how much the shot is worth (2-pointer vs. 3-pointer).
  - How has this revelation changed the way teams operate?

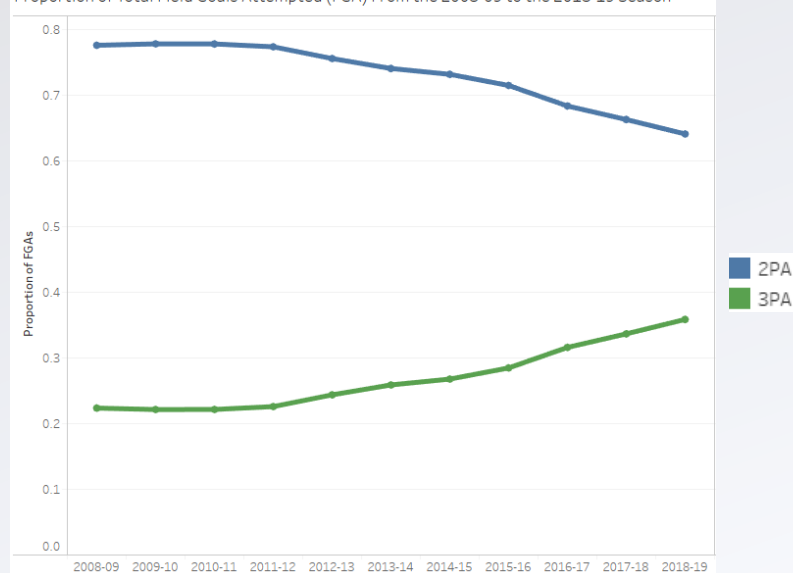
Shot Distance	2018-19 League Average Shooting %	Expected Points Scored Per Shot
0-3 Feet	65.80%	1.32
3-10 Feet	40%	0.8
10-16 Feet	41.30%	0.83
16-3 Point Line	40.10%	0.8
3 Pointer+	35.50%	1.07

# A Look Into the Data: an Evolving Game

Average All-NBA Center 3-Points Attempted per Game From the 2008-19 to the 2018-19 Season



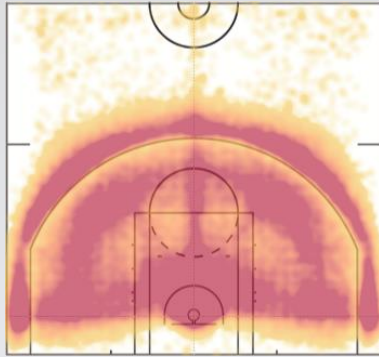
Proportion of Total Field Goals Attempted (FGA) From the 2008-09 to the 2018-19 Season



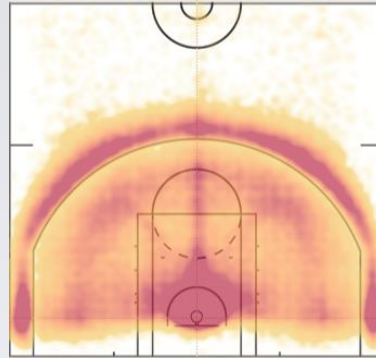
- Teams have shifted toward developing 3-point shooting in all positions
  - Current All-NBA Centers have become substantially better at shooting 3s compared to their predecessors
- The proportion of total Field Goals that are 2-point shots have decreased compared over the past 10 seasons
  - Data obtained from the official NBA API and scraped from basketball-reference

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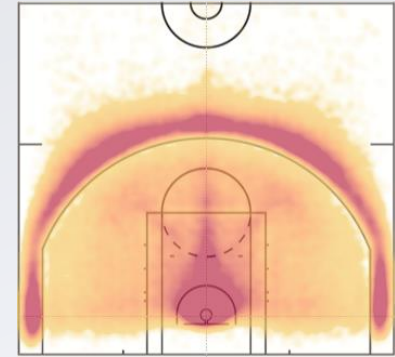
# Findings: Efficient Shot Selection



2008-09 NBA Shot  
Heat Map



2013-14 NBA Shot  
Heat Map



2018-19 NBA Shot  
Heat Map

- How has the NBA adjusted to the analytics takeover?
  - Disappearing mid-range 2-pointers over the past 10 seasons
  - Shift toward higher efficiency shot selection, 3-pointers, lay-ups