

Shooting Guard Percentiles

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Statistical Conditions

Using statistics from Basketball Reference. Player has played over 20 games and over 6 minutes per game.

Loading Packages

```
lapply(
  c('heatmaply', # devtools::install_github('talgalili/heatmaply')
    'mclust', #install.packages('mclust')
    'dplyr', # devtools::install_github('hadley/dplyr')
    'plotly', # devtools::install_github('ropensci/plotly')
    'nbastatR', # devtools::install_github('abresler/nbastatR')
    'purrr', # devtools::install_github('hadley/purrr')
    'tidyr' # devtools::install_github('hadley/tidyr')
  ),
  library,
  character.only = T
)

options(digits = 4)
```

Using Statistics from Basketball Reference

Start by creating per minute stats. Then, use rank function to create rank vector for each stat. Use rank values to find percentile.

```
stat_2019 <- bref_players_stats(season = "2019", tables = c("advanced", "totals", "per game", "per 36"))
  filter(countGames > 20) %>%
  filter(minutesPerGame > 6) %>%
  filter(slugPosition == 'SG') %>%
  mutate(df_size = length(ptsPerGame) - 1) %>%
  mutate(ptsPerMinute = ptsPerGame / minutesPerGame, fgaPerMinute = fgaPerGame / minutesPerGame) %>%
  mutate(astPerMinute = astPerGame / minutesPerGame, tovPerMinute = tovPerGame / minutesPerGame) %>%
  mutate(trbPerMinute = trbPerGame / minutesPerGame, orbPerMinute = orbPerGame / minutesPerGame, drbPerMinute = drbPerGame / minutesPerGame) %>%
  mutate(blkPerMinute = blkPerGame / minutesPerGame, stlPerMinute = stlPerGame / minutesPerGame, pfPerMinute = pfPerGame / minutesPerGame) %>%
  mutate(pts_pg_rank = rank(ptsPerGame), pts_pm_rank = rank(ptsPerMinute), fga_pg_rank = rank(fgaPerGame), fga_pm_rank = rank(fgaPerMinute),
  ast_pg_rank = rank(astPerGame), ast_pm_rank = rank(astPerMinute), tov_pg_rank = rank(tovPerGame), tov_pm_rank = rank(tovPerMinute),
  trb_pg_rank = rank(trbPerGame), trb_pm_rank = rank(trbPerMinute), orb_pg_rank = rank(orbPerGame), orb_pm_rank = rank(orbPerMinute),
  drb_pg_rank = rank(drbPerGame), drb_pm_rank = rank(drbPerMinute), blk_pg_rank = rank(blkPerGame), blk_pm_rank = rank(blkPerMinute),
  stl_pg_rank = rank(stlPerGame), stl_pm_rank = rank(stlPerMinute), pf_pg_rank = rank(pfPerGame), pf_pm_rank = rank(pfPerMinute)) %>%
  mutate(pctFG_rank = rank(pctFG), pctFG3_rank = rank(pctFG3), pctFG2_rank = rank(pctFG2), pctFT_rank = rank(pctFT),
  pctEFG_rank = rank(pctEFG), pctTS_rank = rank(pctTrueShooting)) %>%
  mutate(ratioOWS_rank = rank(ratioOWS), ratioOBPM_rank = rank(ratioOBPM), ratioDWS_rank = rank(ratioDWS), ratioWS_rank = rank(ratioWS),
  ratioWSPer48_rank = rank(ratioWSPer48), ratioBPM_rank = rank(ratioBPM), ratioDBPM_rank = rank(ratioDBPM)) %>%
  mutate(ratioOWS_percentile = (100 * (ratioOWS_rank - 0.5) / df_size), ratioDWS_percentile = (100 * (ratioDWS_rank - 0.5) / df_size),
  ratioWS_percentile = (100 * (ratioWS_rank - 0.5) / df_size), ratioWSPer48_percentile = (100 * (ratioWSPer48_rank - 0.5) / df_size),
  ratioOBPM_percentile = (100 * (ratioOBPM_rank - 0.5) / df_size), ratioDBPM_percentile = (100 * (ratioDBPM_rank - 0.5) / df_size))
```

```

mutate(ratioBPM_percentile = (100 * (ratioBPM_rank - 0.5) / df_size), ratioVORP_percentile = (100 *
mutate(ratioPER_percentile = (100 * (ratioPER_rank - 0.5) / df_size)) %>%
mutate(pts_pg_percentile = (100 * (pts_pg_rank - 0.5) / df_size), pts_pm_percentile = (100 * (pts_pm
mutate(fga_pg_percentile = (100 * (fga_pg_rank - 0.5) / df_size), fga_pm_percentile = (100 * (fga_pm
mutate(ast_pg_percentile = (100 * (ast_pg_rank - 0.5) / df_size), ast_pm_percentile = (100 * (ast_pm
mutate(tov_pg_percentile = (100 * (tov_pg_rank - 0.5) / df_size), tov_pm_percentile = (100 * (tov_pm
mutate(tov_ast_rank = rank(astPerMinute/tovPerMinute), tov_ast_percentile = (100 * (tov_ast_rank) -
mutate(trb_pg_percentile = (100 * (trb_pg_rank - 0.5) / df_size), trb_pm_percentile = (100 * (trb_pm
mutate(orb_pg_percentile = (100 * (orb_pg_rank - 0.5) / df_size), orb_pm_percentile = (100 * (orb_pm
mutate(drb_pg_percentile = (100 * (drb_pg_rank - 0.5) / df_size), drb_pm_percentile = (100 * (drb_pm
mutate(blk_pg_percentile = (100 * (blk_pg_rank - 0.5) / df_size), blk_pm_percentile = (100 * (pts_pm
mutate(stl_pg_percentile = (100 * (stl_pg_rank - 0.5) / df_size), stl_pm_percentile = (100 * (stl_pm
mutate(pf_pg_percentile = (100 * (pf_pg_rank - 0.5) / df_size), pf_pm_percentile = (100 * (pf_pm_ran
mutate(pctFG_percentile = (100 * (pctFG_rank - 0.5) / df_size), pctFG3_percentile = (100 * (pctFG3_r
mutate(pctFG2_percentile = (100 * (pctFG2_rank - 0.5) / df_size), pctFT_percentile = (100 * (pctFT_r
mutate(pctEFG_percentile = (100 * (pctEFG_rank - 0.5) / df_size), pctTS_percentile = (100 * (pctTS_r
mutate(pts_percentile = pts_pg_percentile + pts_pm_percentile / 200, ast_percentile = ast_pg_perce
mutate(fga_percentile = fga_pg_percentile + fga_pm_percentile / 200, tov_percentile = tov_pg_perce
mutate(trb_percentile = trb_pg_percentile + trb_pm_percentile / 200, orb_percentile = orb_pg_perce
mutate(drb_percentile = drb_pg_percentile + drb_pm_percentile / 200, blk_percentile = blk_pg_perce
mutate(stl_percentile = stl_pg_percentile + stl_pm_percentile / 200, pf_percentile = pf_pg_percei
mutate(rebound_percentile = (trb_percentile + orb_percentile + drb_percentile) / 3) %>%
mutate(total_percentile = (pts_percentile + ast_percentile + fga_percentile - tov_percentile + rebou

```

```

## parsed http://www.basketball-reference.com/leagues/NBA_2019_advanced.html
## parsed http://www.basketball-reference.com/leagues/NBA_2019_totals.html
## parsed http://www.basketball-reference.com/leagues/NBA_2019_per_game.html
## Advanced
## Assigning NBA player dictionary to df_dict_nba_players to your environment
## Totals
## PerGame

```

```
size = length(stat_2019$ptsPerGame) - 1
```

Overview

Throughout this section players will be evaluated based on two simple factors: per game production, and per minute production. This takes into account the total volume of their “raw” offensive stats, as well as the volume compared to their time on the court. In doing this, we are looking at players who produce at a high level while on the court, as well as players who can produce at a high volume of minutes.

The criteria do not necessarily speak to the efficiency of the player. The top 20% will be evaluated in the following criteria.

Raw Offensive Stats

Top 20% in points per game and points per minute, combined:

```

stats_2019 <- stat_2019[order(-stat_2019$pts_percentile),] %>%
  filter(pts_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pts_percentile))

```

```

## [1] "Devin Booker"      "Bradley Beal"      "Donovan Mitchell"
## [4] "Zach LaVine"       "Klay Thompson"     "DeMar DeRozan"

```

```
## [7] "Jrue Holiday"      "CJ McCollum"      "Buddy Hield"
## [10] "Lou Williams"      "Victor Oladipo"    "JJ Redick"
## [13] "Tim Hardaway Jr."  "Jordan Clarkson"   "Josh Richardson"
## [16] "Eric Gordon"       "Malcolm Brogdon"   "Jeremy Lamb"
## [19] "Terrence Ross"     "Evan Fournier"     "101.064606741573"
## [22] "99.9241573033708"  "98.8061797752809"  "97.6713483146067"
## [25] "96.5365168539326"  "94.8342696629214"  "94.8286516853933"
## [28] "93.1601123595506"  "92.0477528089888"  "90.9466292134831"
## [31] "89.7668539325843"  "88.0758426966292"  "88.0702247191011"
## [34] "86.4129213483146"  "85.1713483146067"  "84.0983146067416"
## [37] "82.997191011236"   "81.8679775280899"  "80.1938202247191"
## [40] "80.126404494382"
```

Top 20% in assists per game and assists per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$ast_percentile),] %>%
  filter(ast_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ast_percentile))
```

```
## [1] "Jrue Holiday"      "Devin Booker"      "DeMar DeRozan"
## [4] "Bradley Beal"      "Lou Williams"      "Victor Oladipo"
## [7] "Zach LaVine"       "Dwyane Wade"     "Donovan Mitchell"
## [10] "Josh Richardson"   "Marcus Smart"      "Jamal Crawford"
## [13] "Evan Fournier"     "Malcolm Brogdon"   "CJ McCollum"
## [16] "Kevin Huerter"     "Will Barton"       "Dion Waiters"
## [19] "JJ Redick"         "101.064606741573"  "99.9297752808989"
## [22] "98.7949438202247"  "97.6544943820225"  "96.564606741573"
## [25] "95.4185393258427"  "94.2724719101124"  "92.6039325842697"
## [28] "92.5758426966292"  "90.8792134831461"  "89.7837078651685"
## [31] "88.126404494382"   "88.058988764045"   "86.3679775280899"
## [34] "85.1769662921348"  "83.5421348314607"  "83.5365168539326"
## [37] "81.8679775280899"  "80.6657303370786"
```

Top 20% in rebounds per game and rebounds per minute, combined (including offensive and defensive):

```
stats_2019 <- stat_2019[order(-stat_2019$trb_percentile),] %>%
  filter(trb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$trb_percentile))
```

```
## [1] "DeMar DeRozan"      "Victor Oladipo"    "Jeremy Lamb"
## [4] "Buddy Hield"        "Jrue Holiday"      "Bradley Beal"
## [7] "Zach LaVine"        "Will Barton"       "Malcolm Brogdon"
## [10] "DeAndre' Bembry"    "Josh Jackson"      "Pat Connaughton"
## [13] "Jaylen Brown"       "Donovan Mitchell"  "Devin Booker"
## [16] "Dwyane Wade"      "Danny Green"       "CJ McCollum"
## [19] "Kent Bazemore"      "Justin Holiday"    "101.01404494382"
## [22] "99.9073033707865"   "98.8061797752809"  "96.4691011235955"
## [25] "96.4241573033708"   "96.4016853932584"  "94.1657303370786"
## [28] "93.1376404494382"   "91.9803370786517"  "90.373595505618"
## [31] "90.3511235955056"   "88.1432584269663"  "88.064606741573"
## [34] "85.6207865168539"   "85.5758426966292"  "82.9691011235955"
## [37] "82.9522471910112"   "82.7780898876404"  "80.1938202247191"
## [40] "80.0252808988764"
```

```
stats_2019 <- stat_2019[order(-stat_2019$orb_percentile),] %>%
  filter(orb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$orb_percentile))
```

```
## [1] "Buddy Hield"      "Jrue Holiday"    "Bradley Beal"
## [4] "Pat Connaughton"  "Dwyane Wade"   "Jordan Clarkson"
## [7] "Malcolm Brogdon"  "Rodney McGruder" "Jaylen Brown"
## [10] "CJ McCollum"      "David Nwaba"     "Josh Jackson"
## [13] "Kevin Huerter"    "Danny Green"     "Jeremy Lamb"
## [16] "Donovan Mitchell" "101.042134831461" "99.3061797752809"
## [19] "99.2837078651686" "96.002808988764" "95.9691011235955"
## [22] "95.9634831460674" "95.9578651685393" "92.0421348314607"
## [25] "92.0196629213483" "91.9297752808989" "87.0084269662921"
## [28] "86.9522471910112" "86.9073033707865" "86.9016853932584"
## [31] "86.8904494382022" "86.8061797752809"
```

```
stats_2019 <- stat_2019[order(-stat_2019$drb_percentile),] %>%
  filter(drb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$drb_percentile))
```

```
## [1] "DeMar DeRozan"    "Victor Oladipo"   "Jeremy Lamb"
## [4] "Zach LaVine"      "Will Barton"     "Jrue Holiday"
## [7] "Bradley Beal"     "DeAndre' Bembry" "Buddy Hield"
## [10] "Josh Jackson"     "Malcolm Brogdon" "Devin Booker"
## [13] "Jaylen Brown"     "Justin Holiday"   "Klay Thompson"
## [16] "Kent Bazemore"    "Donovan Mitchell" "Pat Connaughton"
## [19] "Alec Burks"       "Josh Hart"        "Danny Green"
## [22] "101.030898876404" "99.9241573033708" "98.8174157303371"
## [25] "97.5308988764045" "95.3904494382023" "95.2443820224719"
## [28] "95.2162921348315" "92.626404494382" "92.4803370786517"
## [31] "90.9016853932584" "89.1657303370787" "88.9915730337079"
## [34] "86.3848314606742" "86.2387640449438" "86.1741573033708"
## [37] "83.5814606741573" "83.3455056179775" "80.2556179775281"
## [40] "80.2331460674157" "80.1994382022472" "80.1095505617977"
```

Bottom 20% in turnovers per minute and top 20% in ast/tov per minute percentile ratio:

```
stats_2019 <- stat_2019[order(-stat_2019$tov_pm_percentile),] %>%
  filter(tov_pm_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$tov_pm_percentile))
```

```
## [1] "Garrett Temple"      "Wayne Ellington"
## [3] "Danny Green"         "Kentavious Caldwell-Pope"
## [5] "Courtney Lee"        "David Nwaba"
## [7] "Bruce Brown"         "Rodney Hood"
## [9] "Malik Beasley"       "Khyri Thomas"
## [11] "Landry Shamet"       "Damion Lee"
## [13] "Treveon Graham"     "Pat Connaughton"
## [15] "John Jenkins"        "Terrance Ferguson"
## [17] "Dwayne Bacon"        "Langston Galloway"
## [19] "19.6629213483146"    "18.5393258426966"
## [21] "17.4157303370787"    "16.2921348314607"
## [23] "15.1685393258427"    "14.0449438202247"
```

```
## [25] "12.9213483146067"      "11.7977528089888"
## [27] "10.6741573033708"      "9.55056179775281"
## [29] "8.42696629213483"      "7.30337078651685"
## [31] "6.17977528089888"      "5.0561797752809"
## [33] "3.93258426966292"      "2.80898876404494"
## [35] "1.68539325842697"      "0.561797752808989"

stats_2019 <- stat_2019[order(-stat_2019$tov_ast_percentile),] %>%
  filter(tov_ast_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$tov_ast_percentile))

## [1] "Pat Connaughton"      "Langston Galloway" "Courtney Lee"
## [4] "Dwayne Bacon"         "Josh Richardson"   "John Jenkins"
## [7] "Marcus Smart"         "Landry Shamet"     "Jrue Holiday"
## [10] "Austin Rivers"        "Jamal Crawford"    "DeMar DeRozan"
## [13] "Malcolm Brogdon"      "Victor Oladipo"    "Iman Shumpert"
## [16] "Lou Williams"         "Rodney Hood"       "Jeremy Lamb"
## [19] "Furkan Korkmaz"       "101.11797752809"   "99.9943820224719"
## [22] "98.3089887640449"     "98.3089887640449" "96.623595505618"
## [25] "95.5"                 "94.376404494382"  "93.252808988764"
## [28] "92.1292134831461"     "91.0056179775281" "89.8820224719101"
## [31] "88.7584269662921"     "87.6348314606742" "86.5112359550562"
## [34] "84.2640449438202"     "84.2640449438202" "84.2640449438202"
## [37] "82.0168539325843"     "80.8932584269663"
```

Offensive Efficiency & Advanced Stats

Top 20% in field goal percent, 2-point percentage, 3-point percentage, and free throw percentage:

```
stats_2019 <- stat_2019[order(-stat_2019$pctFG_percentile),] %>%
  filter(pctFG_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFG_percentile))

## [1] "Malcolm Brogdon"      "Joe Harris"        "Norman Powell"
## [4] "David Nwaba"          "DeMar DeRozan"     "E'Twaun Moore"
## [7] "Bradley Beal"         "Dwayne Bacon"      "Malik Beasley"
## [10] "Jrue Holiday"         "Jordan McRae"       "Devin Booker"
## [13] "Klay Thompson"        "Zach LaVine"        "Pat Connaughton"
## [16] "Danny Green"          "Jaylen Brown"       "Sterling Brown"
## [19] "CJ McCollum"          "100.561797752809"   "99.438202247191"
## [22] "98.314606741573"      "96.0674157303371"   "96.0674157303371"
## [25] "96.0674157303371"     "93.2584269662921"   "93.2584269662921"
## [28] "91.5730337078652"     "90.4494382022472"   "89.3258426966292"
## [31] "87.0786516853933"     "87.0786516853933"   "87.0786516853933"
## [34] "84.8314606741573"     "82.5842696629213"   "82.5842696629213"
## [37] "82.5842696629213"     "80.3370786516854"

stats_2019 <- stat_2019[order(-stat_2019$pctFG2_percentile),] %>%
  filter(pctFG2_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFG2_percentile))

## [1] "Donte DiVincenzo"      "Pat Connaughton"
## [3] "Ryan Broekhoff"        "Malik Beasley"
```

```
## [5] "Terrance Ferguson"      "Sterling Brown"
## [7] "Bradley Beal"           "Gerald Green"
## [9] "David Nwaba"            "Malcolm Brogdon"
## [11] "Norman Powell"          "Kentavious Caldwell-Pope"
## [13] "Wayne Ellington"        "Jrue Holiday"
## [15] "Jordan McRae"           "Devin Booker"
## [17] "MarShon Brooks"         "Jaylen Brown"
## [19] "Joe Harris"             "100.561797752809"
## [21] "99.438202247191"        "98.314606741573"
## [23] "96.6292134831461"       "96.6292134831461"
## [25] "94.9438202247191"       "93.8202247191011"
## [27] "92.6966292134831"       "91.5730337078652"
## [29] "90.4494382022472"       "89.3258426966292"
## [31] "88.2022471910112"       "87.0786516853933"
## [33] "85.9550561797753"       "84.8314606741573"
## [35] "83.7078651685393"       "82.5842696629213"
## [37] "81.4606741573034"       "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctFG3_percentile),] %>%
  filter(pctFG3_percentile > 80)
```

```
print(c(stats_2019$namePlayer, stats_2019$pctFG3_percentile))
```

```
## [1] "Joe Harris"      "Danny Green"      "Seth Curry"
## [4] "Dwayne Bacon"   "E'Twaun Moore"    "Buddy Hield"
## [7] "Bryn Forbes"     "Malcolm Brogdon"  "Landry Shamet"
## [10] "Ryan Broekhoff" "Klay Thompson"    "Malik Beasley"
## [13] "Norman Powell"  "Damion Lee"       "JJ Redick"
## [16] "Antonio Blakeney" "Allonzo Trier"    "Luke Kennard"
## [19] "Kevin Huerter"   "100.561797752809" "99.438202247191"
## [22] "98.314606741573" "97.1910112359551" "96.0674157303371"
## [25] "94.9438202247191" "93.2584269662921" "93.2584269662921"
## [28] "91.5730337078652" "90.4494382022472" "88.7640449438202"
## [31] "88.7640449438202" "87.0786516853933" "85.3932584269663"
## [34] "85.3932584269663" "83.7078651685393" "82.0224719101124"
## [37] "82.0224719101124" "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctFT_percentile),] %>%
  filter(pctFT_percentile > 80)
```

```
print(c(stats_2019$namePlayer, stats_2019$pctFT_percentile))
```

```
## [1] "Malcolm Brogdon"      "Marco Belinelli"
## [3] "Justin Holiday"       "JJ Redick"
## [5] "Ian Clark"           "Nik Stauskas"
## [7] "Jeremy Lamb"          "Buddy Hield"
## [9] "Bryn Forbes"          "Rodney Hood"
## [11] "Malik Monk"           "Lou Williams"
## [13] "Terrence Ross"        "Kentavious Caldwell-Pope"
## [15] "Patrick McCaw"        "Devin Booker"
## [17] "Damion Lee"           "Josh Richardson"
## [19] "Avery Bradley"        "100.561797752809"
## [21] "99.438202247191"      "98.314606741573"
## [23] "97.1910112359551"     "96.0674157303371"
## [25] "94.9438202247191"     "93.8202247191011"
```



```
## [27] "92.6966292134831"      "91.5730337078652"
## [29] "90.4494382022472"      "89.3258426966292"
## [31] "88.2022471910112"      "87.0786516853933"
## [33] "85.3932584269663"      "85.3932584269663"
## [35] "83.7078651685393"      "82.5842696629213"
## [37] "81.4606741573034"      "80.3370786516854"
```

Top 20% in effective field goal percentage and true shooting percentage:

```
stats_2019 <- stat_2019[order(-stat_2019$pctEFG_percentile),] %>%
  filter(pctEFG_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctEFG_percentile))
```

```
## [1] "Danny Green"      "Joe Harris"      "Ryan Broekhoff"
## [4] "Malik Beasley"    "Landry Shamet"   "Seth Curry"
## [7] "Malcolm Brogdon"  "Bryn Forbes"     "Norman Powell"
## [10] "Buddy Hield"      "Pat Connaughton" "JJ Redick"
## [13] "Wayne Ellington"  "E'Twaun Moore"   "Klay Thompson"
## [16] "Terrance Ferguson" "Sterling Brown"  "Dwayne Bacon"
## [19] "Damion Lee"       "100"             "100"
## [22] "98.314606741573"  "97.1910112359551" "96.0674157303371"
## [25] "94.9438202247191" "93.8202247191011" "92.1348314606742"
## [28] "92.1348314606742" "89.8876404494382" "89.8876404494382"
## [31] "88.2022471910112" "87.0786516853933" "85.3932584269663"
## [34] "85.3932584269663" "83.7078651685393" "82.5842696629213"
## [37] "81.4606741573034" "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctTS_percentile),] %>%
  filter(pctTS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctTS_percentile))
```

```
## [1] "Joe Harris"      "Danny Green"      "Ryan Broekhoff"
## [4] "Malcolm Brogdon" "Landry Shamet"    "JJ Redick"
## [7] "Malik Beasley"   "Norman Powell"    "Seth Curry"
## [10] "Buddy Hield"     "Bryn Forbes"      "Devin Booker"
## [13] "Bradley Beal"    "Damion Lee"       "Zach LaVine"
## [16] "Pat Connaughton" "Klay Thompson"    "Dwayne Bacon"
## [19] "Wayne Ellington" "100.561797752809" "99.438202247191"
## [22] "98.314606741573" "97.1910112359551" "96.0674157303371"
## [25] "94.9438202247191" "93.8202247191011" "92.6966292134831"
## [28] "91.5730337078652" "90.4494382022472" "89.3258426966292"
## [31] "88.2022471910112" "87.0786516853933" "85.9550561797753"
## [34] "84.8314606741573" "83.7078651685393" "82.5842696629213"
## [37] "81.4606741573034" "80.3370786516854"
```

Top 20% in offensive box plus-minus and offensive win shares:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioOBPM_percentile),] %>%
  filter(ratioOBPM_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioOBPM_percentile))
```

```
## [1] "Bradley Beal"      "Devin Booker"     "Buddy Hield"
## [4] "Lou Williams"     "Jrue Holiday"     "JJ Redick"
## [7] "CJ McCollum"      "Malcolm Brogdon"  "Zach LaVine"
```

```
## [10] "Danny Green"      "Jordan Clarkson"  "Joe Harris"
## [13] "Landry Shamet"    "Malik Beasley"    "Victor Oladipo"
## [16] "Klay Thompson"    "Wayne Ellington"  "Bryn Forbes"
## [19] "Josh Richardson"  "Terrence Ross"    "100.561797752809"
## [22] "99.438202247191"  "97.752808988764"  "97.752808988764"
## [25] "96.0674157303371" "94.9438202247191" "93.8202247191011"
## [28] "92.6966292134831" "91.5730337078652" "90.4494382022472"
## [31] "89.3258426966292" "87.0786516853933" "87.0786516853933"
## [34] "87.0786516853933" "84.8314606741573" "83.1460674157303"
## [37] "83.1460674157303" "80.3370786516854" "80.3370786516854"
## [40] "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioOWS_percentile),] %>%
  filter(ratioOWS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioOWS_percentile))
```

```
## [1] "Bradley Beal"      "JJ Redick"
## [3] "Buddy Hield"       "Malcolm Brogdon"
## [5] "CJ McCollum"       "Lou Williams"
## [7] "Joe Harris"        "DeMar DeRozan"
## [9] "Jrue Holiday"      "Devin Booker"
## [11] "Jeremy Lamb"       "Danny Green"
## [13] "Josh Richardson"   "Klay Thompson"
## [15] "Malik Beasley"     "Landry Shamet"
## [17] "Bryn Forbes"       "Kentavious Caldwell-Pope"
## [19] "Marcus Smart"      "100.561797752809"
## [21] "99.438202247191"   "98.314606741573"
## [23] "97.1910112359551"  "96.0674157303371"
## [25] "94.9438202247191"  "93.8202247191011"
## [27] "92.6966292134831"  "91.5730337078652"
## [29] "89.8876404494382"  "89.8876404494382"
## [31] "87.6404494382023"  "87.6404494382023"
## [33] "85.3932584269663"  "85.3932584269663"
## [35] "83.7078651685393"  "82.5842696629213"
## [37] "81.4606741573034"  "80.3370786516854"
```

Raw Defensive Stats

Due to the low number of “per-game” stats in these sections, the percentiles range will be widened.

Top 24% in blocks per game and blocks per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$blk_percentile),] %>%
  filter(blk_percentile > 76)

print(c(stats_2019$namePlayer, stats_2019$blk_percentile))
```

```
## [1] "Jrue Holiday"      "Bradley Beal"      "Josh Jackson"
## [4] "Danny Green"       "Klay Thompson"     "Kent Bazemore"
## [7] "Josh Hart"         "DeMar DeRozan"     "Dwyane Wade"
## [10] "Josh Richardson"   "Will Barton"       "DeAndre' Bembry"
## [13] "Bruce Brown"       "Donovan Mitchell"  "Zach LaVine"
## [16] "Buddy Hield"       "CJ McCollum"       "Terrence Ross"
## [19] "Jeremy Lamb"       "Eric Gordon"       "Jaylen Brown"
## [22] "Gerald Green"     "Pat Connaughton"   "Justin Holiday"
```



```
## [25] "Josh Okogie"      "Marcus Smart"      "Iman Shumpert"
## [28] "Garrett Temple"   "101.008426966292"  "98.8005617977528"
## [31] "98.6207865168539" "98.4803370786517"  "95.4129213483146"
## [34] "95.2780898876404" "94.9859550561798"  "90.3398876404494"
## [37] "90.311797752809"  "90.2275280898876"  "90.1095505617978"
## [40] "90.0140449438202" "89.9016853932584"  "78.5814606741573"
## [43] "78.5702247191011" "78.564606741573"   "78.5533707865169"
## [46] "78.5084269662921" "78.497191011236"   "78.4803370786517"
## [49] "78.4634831460674" "78.3904494382022"  "78.188202247191"
## [52] "78.1825842696629" "78.1713483146067"  "78.1657303370786"
## [55] "78.1432584269663" "78.1207865168539"
```

Top 20% in steals per game and steals per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$stl_percentile),] %>%
  filter(stl_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$stl_percentile))
```

```
## [1] "Marcus Smart"      "Victor Oladipo"      "Jrue Holiday"
## [4] "Justin Holiday"    "Bradley Beal"        "Donovan Mitchell"
## [7] "DeAndre' Bembry"   "Kent Bazemore"       "Josh Okogie"
## [10] "Jeremy Lamb"       "Klay Thompson"       "Josh Richardson"
## [13] "DeMar DeRozan"     "Iman Shumpert"       "Wayne Ellington"
## [16] "Josh Hart"         "Garrett Temple"      "Gary Harris"
## [19] "Zach LaVine"       "101.064606741573"    "99.9241573033708"
## [22] "98.7724719101124"  "97.0926966292135"    "97.0561797752809"
## [25] "95.3848314606742"  "93.75"               "93.7387640449438"
## [28] "92.0477528089888"  "89.1601123595506"    "89.0758426966292"
## [31] "89.0702247191011"  "89.064606741573"     "83.5926966292135"
## [34] "83.5814606741573"  "83.5533707865169"    "83.5308988764045"
## [37] "83.497191011236"   "83.3932584269663"
```

Bottom 20% in fouls per minute, and fouls per game and fouls per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$pf_pm_percentile),] %>%
  filter(pf_pm_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$pf_pm_percentile))
```

```
## [1] "Jeremy Lamb"       "Justin Holiday"      "Pat Connaughton"
## [4] "Victor Oladipo"    "Dion Waiters"        "Jrue Holiday"
## [7] "Dwyane Wade"     "Malik Beasley"       "Klay Thompson"
## [10] "Reggie Bullock"    "Terrence Ross"       "Malcolm Brogdon"
## [13] "JJ Redick"         "Jordan Clarkson"     "Antonio Blakeney"
## [16] "Nik Stauskas"      "Lou Williams"        "John Jenkins"
## [19] "19.6629213483146"  "18.5393258426966"    "17.4157303370787"
## [22] "16.2921348314607"  "15.1685393258427"    "14.0449438202247"
## [25] "12.9213483146067"  "11.7977528089888"    "10.6741573033708"
## [28] "9.55056179775281"  "8.42696629213483"    "7.30337078651685"
## [31] "6.17977528089888"  "5.0561797752809"     "3.93258426966292"
## [34] "2.80898876404494"  "1.68539325842697"    "0.561797752808989"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pf_percentile),] %>%
  filter(pf_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$pf_percentile))
```

```
## [1] "Patrick McCaw"      "Furkan Korkmaz"      "Seth Curry"
## [4] "Pat Connaughton"    "Grayson Allen"       "Jamal Crawford"
## [7] "MarShon Brooks"     "Tyler Dorsey"        "Lou Williams"
## [10] "Deonte Burton"      "Jordan McRae"        "Jacob Evans"
## [13] "Damion Lee"         "Courtney Lee"        "Khyri Thomas"
## [16] "Ryan Broekhoff"     "Antonio Blakeney"    "Nik Stauskas"
## [19] "John Jenkins"       "19.497191011236"     "19.4803370786517"
## [22] "19.2668539325843"   "19.188202247191"     "16.1994382022472"
## [25] "15.8342696629213"   "13.2106741573034"     "13.1376404494382"
## [28] "12.9297752808989"   "10.6039325842697"     "10.3960674157303"
## [31] "7.78932584269663"   "7.54494382022472"     "7.49157303370786"
## [34] "4.95224719101124"   "4.69943820224719"     "2.26685393258427"
## [37] "2.26123595505618"   "0.564606741573034"
```

Defensive Advance Stats

Top 20% in defensive box plus-minus and defensive win shares:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioDBPM_percentile),] %>%
  filter(ratioDBPM_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioDBPM_percentile))
```

```
## [1] "Bruce Brown"      "Patrick McCaw"      "Marcus Smart"
## [4] "Danny Green"      "Pat Connaughton"    "DeAndre' Bembry"
## [7] "Josh Hart"        "Victor Oladipo"     "Garrett Temple"
## [10] "Justin Holiday"   "DeMar DeRozan"     "Josh Okogie"
## [13] "Donte DiVincenzo" "Iman Shumpert"      "Dwyane Wade"
## [16] "Kent Bazemore"    "Sterling Brown"     "Jrue Holiday"
## [19] "Rodney McGruder"  "Treveon Graham"     "100.561797752809"
## [22] "99.438202247191"  "98.314606741573"    "96.6292134831461"
## [25] "96.6292134831461" "94.3820224719101"   "94.3820224719101"
## [28] "92.6966292134831" "91.0112359550562"   "91.0112359550562"
## [31] "89.3258426966292" "88.2022471910112"   "86.5168539325843"
## [34] "86.5168539325843" "83.7078651685393"   "83.7078651685393"
## [37] "83.7078651685393" "80.3370786516854"   "80.3370786516854"
## [40] "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioDWS_percentile),] %>%
  filter(ratioDWS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioDWS_percentile))
```

```
## [1] "Donovan Mitchell" "Marcus Smart"      "Danny Green"
## [4] "DeMar DeRozan"    "Josh Richardson"   "Terrence Ross"
## [7] "Evan Fournier"     "Justin Holiday"    "Jaylen Brown"
## [10] "Dwyane Wade"     "Klay Thompson"     "Malcolm Brogdon"
## [13] "Garrett Temple"    "Jeremy Lamb"       "Tyreke Evans"
## [16] "Josh Hart"         "Jrue Holiday"      "Pat Connaughton"
## [19] "Victor Oladipo"    "100.561797752809"   "99.438202247191"
## [22] "98.314606741573"   "96.0674157303371"   "96.0674157303371"
## [25] "96.0674157303371"   "93.2584269662921"   "93.2584269662921"
## [28] "91.5730337078652"   "89.3258426966292"   "89.3258426966292"
## [31] "89.3258426966292"   "85.9550561797753"   "85.9550561797753"
## [34] "85.9550561797753"   "82.0224719101124"   "82.0224719101124"
## [37] "82.0224719101124"   "82.0224719101124"
```

Total Advance Stats

Top 20% in box plus-minus, win shares, and win shares per 48 minutes:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioBPM_percentile),] %>%  
  filter(ratioBPM_percentile > 80)
```

```
print(c(stats_2019$namePlayer, stats_2019$ratioBPM_percentile))
```

```
## [1] "Danny Green"      "Bradley Beal"      "Jrue Holiday"  
## [4] "Victor Oladipo"    "Marcus Smart"      "Pat Connaughton"  
## [7] "Malcolm Brogdon"   "Buddy Hield"       "Joe Harris"  
## [10] "DeMar DeRozan"    "Devin Booker"      "Donovan Mitchell"  
## [13] "Josh Richardson"   "Lou Williams"      "CJ McCollum"  
## [16] "Wayne Ellington"   "Jeremy Lamb"       "Zach LaVine"  
## [19] "Terrence Ross"     "100.561797752809"  "98.876404494382"  
## [22] "98.876404494382"   "97.1910112359551"  "96.0674157303371"  
## [25] "94.9438202247191"  "93.8202247191011"  "92.6966292134831"  
## [28] "91.5730337078652"  "90.4494382022472"  "89.3258426966292"  
## [31] "87.6404494382023"  "87.6404494382023"  "85.9550561797753"  
## [34] "84.8314606741573"  "83.7078651685393"  "82.5842696629213"  
## [37] "81.4606741573034"  "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioWS_percentile),] %>%  
  filter(ratioWS_percentile > 80)
```

```
print(c(stats_2019$namePlayer, stats_2019$ratioWS_percentile))
```

```
## [1] "Bradley Beal"      "Malcolm Brogdon"  
## [3] "DeMar DeRozan"     "Buddy Hield"  
## [5] "Danny Green"       "JJ Redick"  
## [7] "CJ McCollum"       "Josh Richardson"  
## [9] "Joe Harris"        "Jrue Holiday"  
## [11] "Jeremy Lamb"       "Klay Thompson"  
## [13] "Marcus Smart"      "Lou Williams"  
## [15] "Donovan Mitchell"  "Malik Beasley"  
## [17] "Terrence Ross"     "Kentavious Caldwell-Pope"  
## [19] "Pat Connaughton"   "100.561797752809"  
## [21] "99.438202247191"   "98.314606741573"  
## [23] "96.0674157303371"  "96.0674157303371"  
## [25] "96.0674157303371"  "93.2584269662921"  
## [27] "93.2584269662921"  "91.5730337078652"  
## [29] "90.4494382022472"  "88.2022471910112"  
## [31] "88.2022471910112"  "88.2022471910112"  
## [33] "85.9550561797753"  "84.8314606741573"  
## [35] "83.7078651685393"  "82.5842696629213"  
## [37] "81.4606741573034"  "80.3370786516854"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioWSPer48_percentile),] %>%  
  filter(ratioWSPer48_percentile > 80)
```

```
print(c(stats_2019$namePlayer, stats_2019$ratioWSPer48_percentile))
```

```
## [1] "Malcolm Brogdon"   "Pat Connaughton"   "Danny Green"  
## [4] "Lou Williams"     "Bradley Beal"      "JJ Redick"  
## [7] "Joe Harris"       "Marcus Smart"      "Malik Beasley"  
## [10] "CJ McCollum"      "Jeremy Lamb"       "DeMar DeRozan"
```

```
## [13] "Buddy Hield"      "Jrue Holiday"      "Josh Richardson"
## [16] "Norman Powell"    "Sterling Brown"    "Victor Oladipo"
## [19] "Wayne Ellington"  "100.561797752809"  "99.438202247191"
## [22] "98.314606741573"  "97.1910112359551"  "96.0674157303371"
## [25] "94.9438202247191" "93.2584269662921"  "93.2584269662921"
## [28] "91.5730337078652" "90.4494382022472"  "89.3258426966292"
## [31] "88.2022471910112" "86.5168539325843"  "86.5168539325843"
## [34] "84.8314606741573" "83.7078651685393"  "82.5842696629213"
## [37] "80.8988764044944" "80.8988764044944"
```

Top 20% in value over replacement player, and player efficiency rating:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioVORP_percentile),] %>%
  filter(ratioVORP_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioVORP_percentile))
```

```
## [1] "Bradley Beal"      "Jrue Holiday"      "Danny Green"
## [4] "Buddy Hield"      "Marcus Smart"      "DeMar DeRozan"
## [7] "Donovan Mitchell" "Joe Harris"         "Josh Richardson"
## [10] "Devin Booker"     "Malcolm Brogdon"    "CJ McCollum"
## [13] "Victor Oladipo"   "Jeremy Lamb"        "Lou Williams"
## [16] "Pat Connaughton"  "Zach LaVine"        "Terrence Ross"
## [19] "100.561797752809" "99.438202247191"    "98.314606741573"
## [22] "96.6292134831461" "96.6292134831461"  "94.9438202247191"
## [25] "92.6966292134831" "92.6966292134831"  "92.6966292134831"
## [28] "89.8876404494382" "89.8876404494382"  "87.6404494382023"
## [31] "87.6404494382023" "84.8314606741573"  "84.8314606741573"
## [34] "84.8314606741573" "82.5842696629213"  "81.4606741573034"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioPER_percentile),] %>%
  filter(ratioPER_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioPER_percentile))
```

```
## [1] "Lou Williams"      "Bradley Beal"      "Devin Booker"
## [4] "DeMar DeRozan"    "Jrue Holiday"      "Zach LaVine"
## [7] "Malcolm Brogdon"   "Victor Oladipo"    "Buddy Hield"
## [10] "Jeremy Lamb"       "Donovan Mitchell"  "CJ McCollum"
## [13] "Jordan Clarkson"   "Klay Thompson"     "Dwyane Wade"
## [16] "Terrence Ross"     "JJ Redick"         "Jordan McRae"
## [19] "Malik Beasley"     "100.561797752809"  "99.438202247191"
## [22] "98.314606741573"  "97.1910112359551"  "96.0674157303371"
## [25] "94.9438202247191" "93.8202247191011"  "92.6966292134831"
## [28] "91.5730337078652" "90.4494382022472"  "89.3258426966292"
## [31] "88.2022471910112" "87.0786516853933"  "85.9550561797753"
## [34] "84.8314606741573" "83.7078651685393"  "82.5842696629213"
## [37] "81.4606741573034" "80.3370786516854"
```