Three-point-shooting-determines-game-outcome

Jon Michael Stroh

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```
library(tidyverse)
library(broom)
library(knitr)
library(readxl)
```

```
marchmadness2021 <- read_excel("Data/March_Madness_2021_AllGames_Data.xlsx")
```

Data Exploration and Practice

More3s Frequency of winning team out shooting losing team on 3 point shots (variable more3s equals 0 if losing team made more three point shots, 0.5 if equal amount were made, and 1 if the winning team made more three point shots):

```
marchmadness2021 <- marchmadness2021 %>% mutate(more3s = factor(if_else(W3P > L3P , 1, if_else(W3P == L3
```

```
marchmadness2021 %>% count(more3s)
```

```
## # A tibble: 3 x 2
##   more3s      n
## * <fct>   <int>
## 1 0          15
## 2 0.5         9
## 3 1          42
```

In the 2021 tournament, the winning team made more three pointers in 63.6% (42/66) of games, the teams tied in 13.6% (9/66) of games, and the losing team made more three pointers in 22.7% (15/66) of games.

Better3s Frequency of winning team out shooting losing team on 3 point shot percentage (variable better3s equals 0 if losing team made a higher percentage of three point shots, 0.5 if an equal percentage were made, and 1 if the winning team made a higher percentage):

```
marchmadness2021 <- marchmadness2021 %>% mutate(better3s = factor(if_else( (W3P/W3PA) > (L3P/L3PA) , 1,
```

```
marchmadness2021 %>% count(better3s)
```

```
## # A tibble: 2 x 2
##   better3s     n
## * <fct>    <int>
## 1 0           15
## 2 1           51
```

In the 2021 tournament, the winning team made a higher percentage of three pointers in 77.3% (51/66) of games, while the losing team made a higher percentage in only 22.7% (15/66) of games.

```
marchmadness2021 %>% count(more3s, better3s, sort = TRUE)
```

More and Better 3s?

```
## # A tibble: 6 x 3
##    more3s better3s     n
##    <fct>  <fct>    <int>
## 1 1      1           38
## 2 0      0            9
## 3 0.5    1            7
## 4 0      1            6
## 5 1      0            4
## 6 0.5    0            2
```

In 2021, in only 13.6% (9/66) of games did the winning team make less 3s and a lower percentage of them. In contrast, in 68.2% (45/66) of games did the winning team either make more 3s and shoot a higher percentage (38 games) or tie on the number of makes and shoot a higher percentage (7 games).

More 2s   Frequency of winning team out shooting losing team on 2 point shots (variable more2s equals 0 if losing team made more two point shots, 0.5 if equal amount were made, and 1 if the winning team made more two point shots):

```
marchmadness2021 <- marchmadness2021 %>% mutate(more2s = factor(if_else(W2P > L2P , 1, if_else(W2P == L2

marchmadness2021 %>% count(more2s)
```

```
## # A tibble: 3 x 2
##    more2s     n
## * <fct>  <int>
## 1 0         20
## 2 0.5        4
## 3 1         42
```

In only 42 games did the winning team make more 2 point baskets, and in 20 games the losing team made more (4 ties).

Better 2s ??   Frequency of winning team out shooting losing team on 2 point shot percentage (variable better2s equals 0 if losing team made a higher percentage of two point shots, 0.5 if equal amount were made, and 1 if the winning team a higher percentage of two point shots):

```
marchmadness2021 <- marchmadness2021 %>% mutate(better2s = factor(if_else((W2P/W2PA) > (L2P/L2PA), 1, i

marchmadness2021 %>% count(better2s)
```

```
## # A tibble: 3 x 2
##    better2s     n
## * <fct>    <int>
## 1 0           21
## 2 0.5          1
## 3 1           44
```

WOW– in only 44 games did the winning team out shoot the losing team on 2 point percentage, and in 21 games, the losing team out shot the winning team on 2 point percentage.

Finally FGs? morefgs   Frequency of winning team out shooting losing team in general (more shots made) (variable morefgs equals 0 if losing team made more shots, 0.5 if equal amount were made, and 1 if the

winning team made more shots):

```
marchmadness2021 <- marchmadness2021 %>% mutate(morefgs = factor(if_else(WFG > LFG , 1, if_else(WFG == L

marchmadness2021 %>% count(morefgs)
```

```
## # A tibble: 3 x 2
##    morefgs      n
## * <fct>    <int>
## 1 0            7
## 2 0.5          3
## 3 1           56
```

In 84.8% of games the winning team made more field goals (makes sense, only other option to win then is by making more 3s as a portion of those field goals or more free throws or both). There were 3 ties.

FG percentage? betterfgs