A background image showing five Arsenal football players in their red and white home kit running across a green pitch. They are all smiling and appear to be celebrating a goal or a victory. The player in the center is running towards the camera with his mouth open in a shout. The other players are running alongside him, some looking towards the camera and others looking towards the field. The background is a blurred crowd of spectators in a stadium.

# **Offense or Defense: Which contributes more to a team's success?**

Emma King



# Study Information

- English Men's Premier League
  - 20 teams per year
  - 380 total matches a year
  - Informations covers 2011- 2022/23 season
- Analyzed Clean Sheets and average number of goals per game versus the winning percentage of each team
  - Clean sheets = defensive statistic
  - Goals per Game = offensive statistic
- Where should teams spend money?



**Premier  
League**



# Hypothesis

Null:

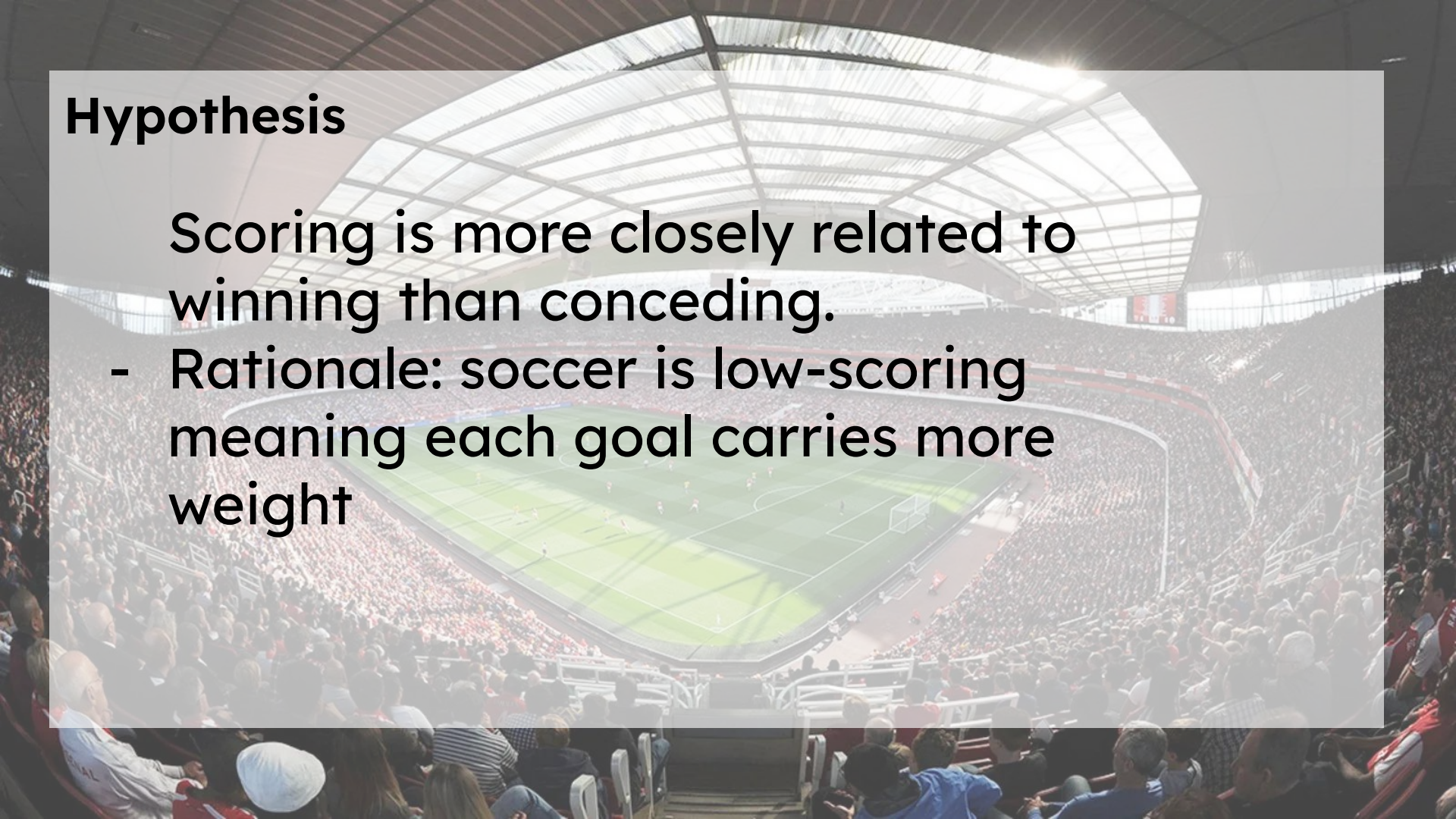
1. There is no connection between winning percentage and goals scored per game.
2. There is no connection between winning percentage and goals conceded per game.



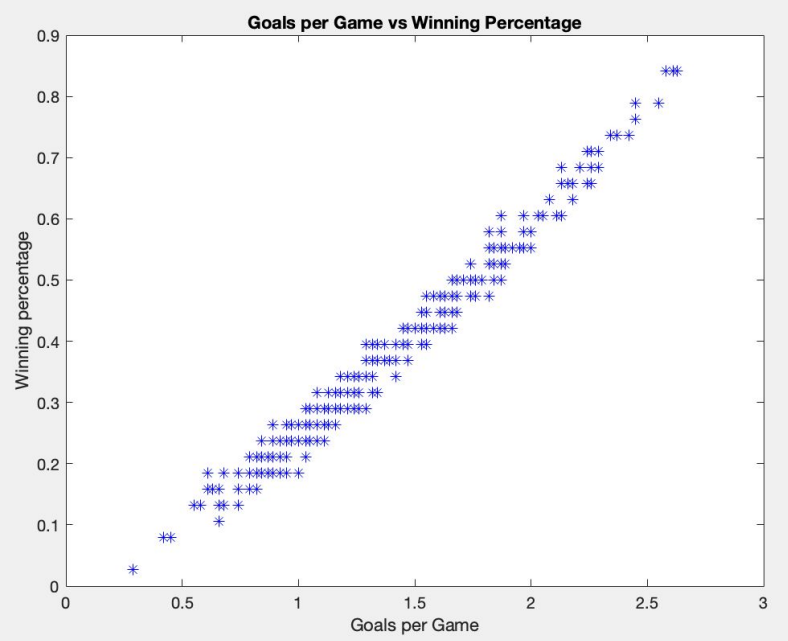
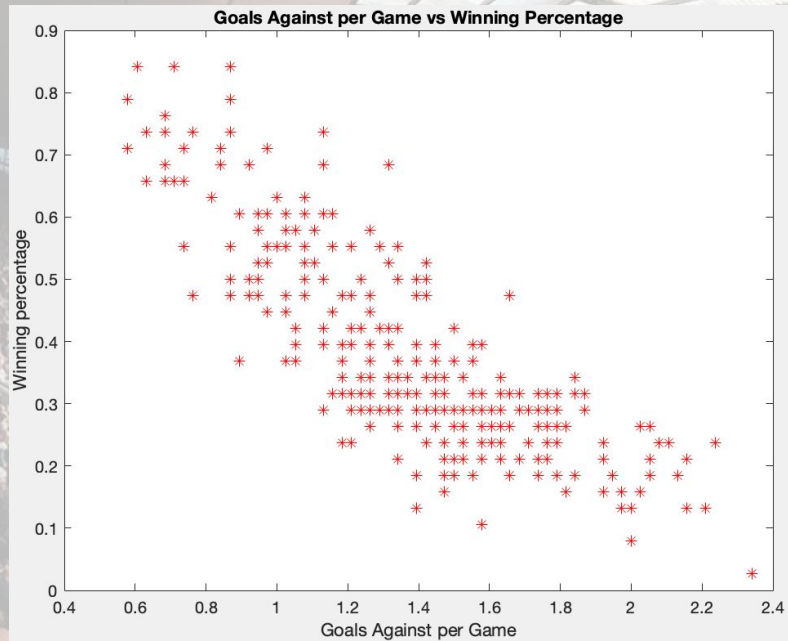
# Hypothesis

Scoring is more closely related to winning than conceding.

- Rationale: soccer is low-scoring meaning each goal carries more weight



# Data

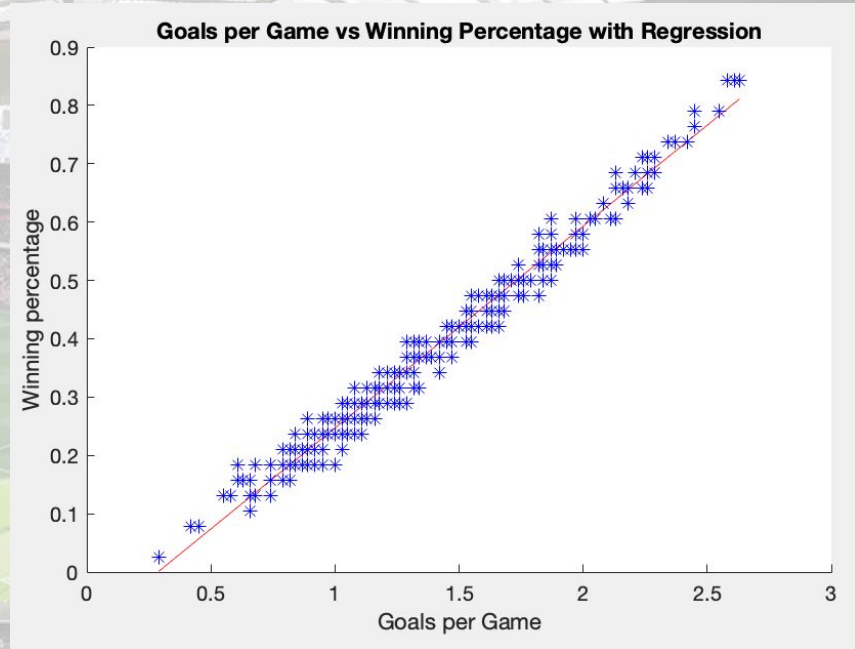
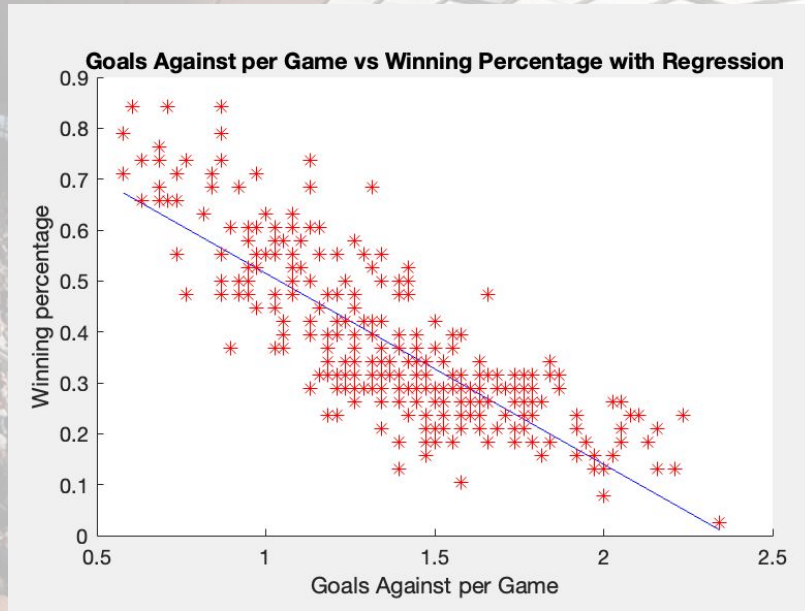




# Regression slope

Slope =  $-.38$

Slope =  $.35$



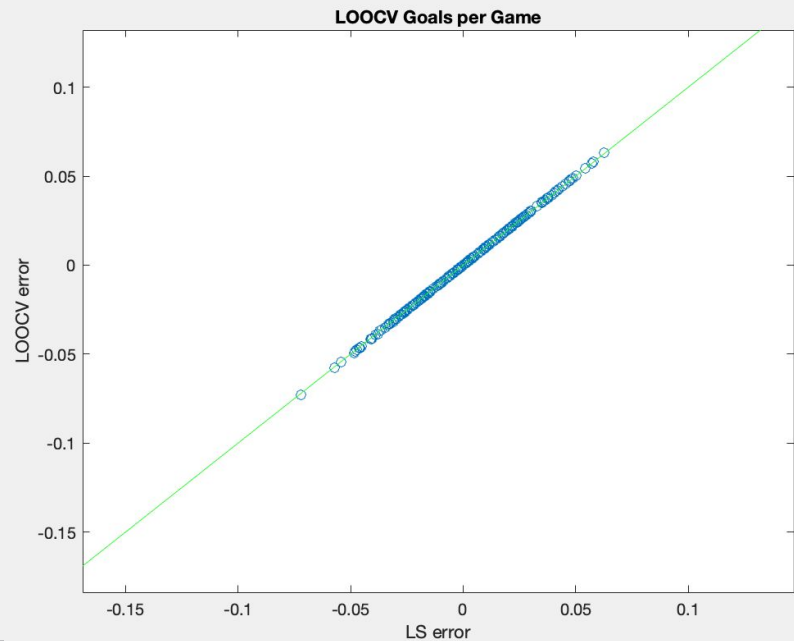
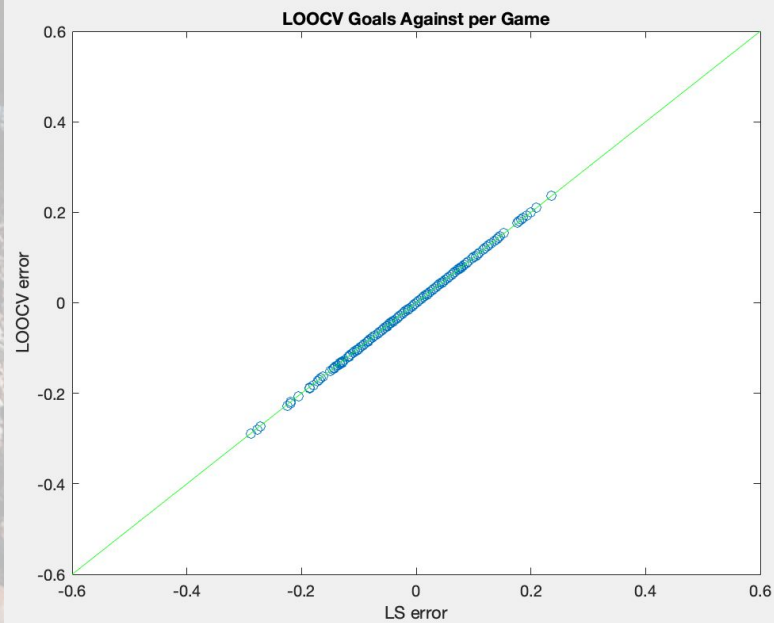
# Data

Correlation Coefficient  
-.8107 for Goals Against  
.99884 for Goals For



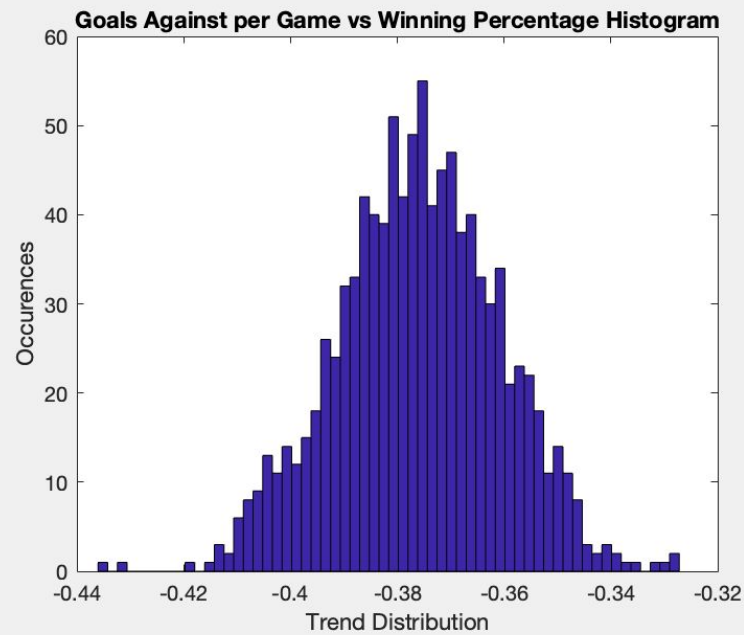
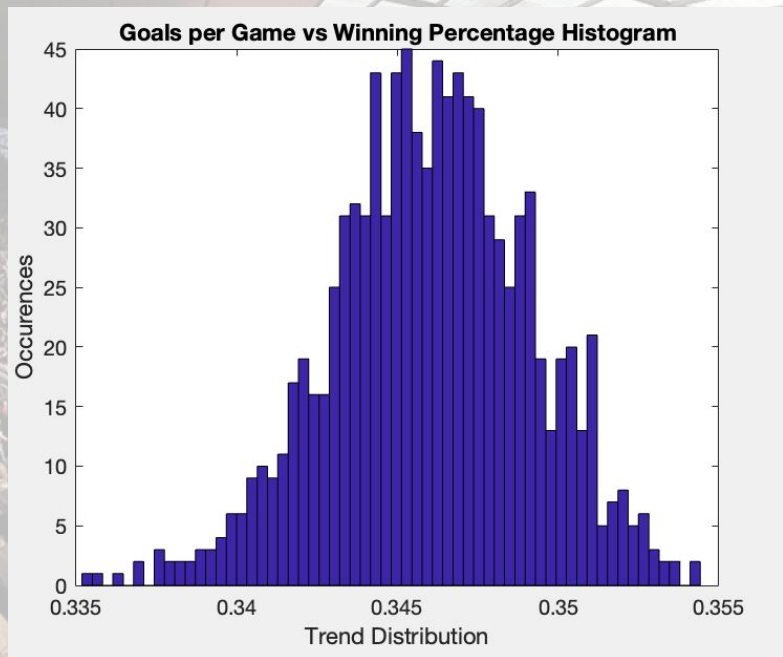


# LOOCV: Regression Reproducibility





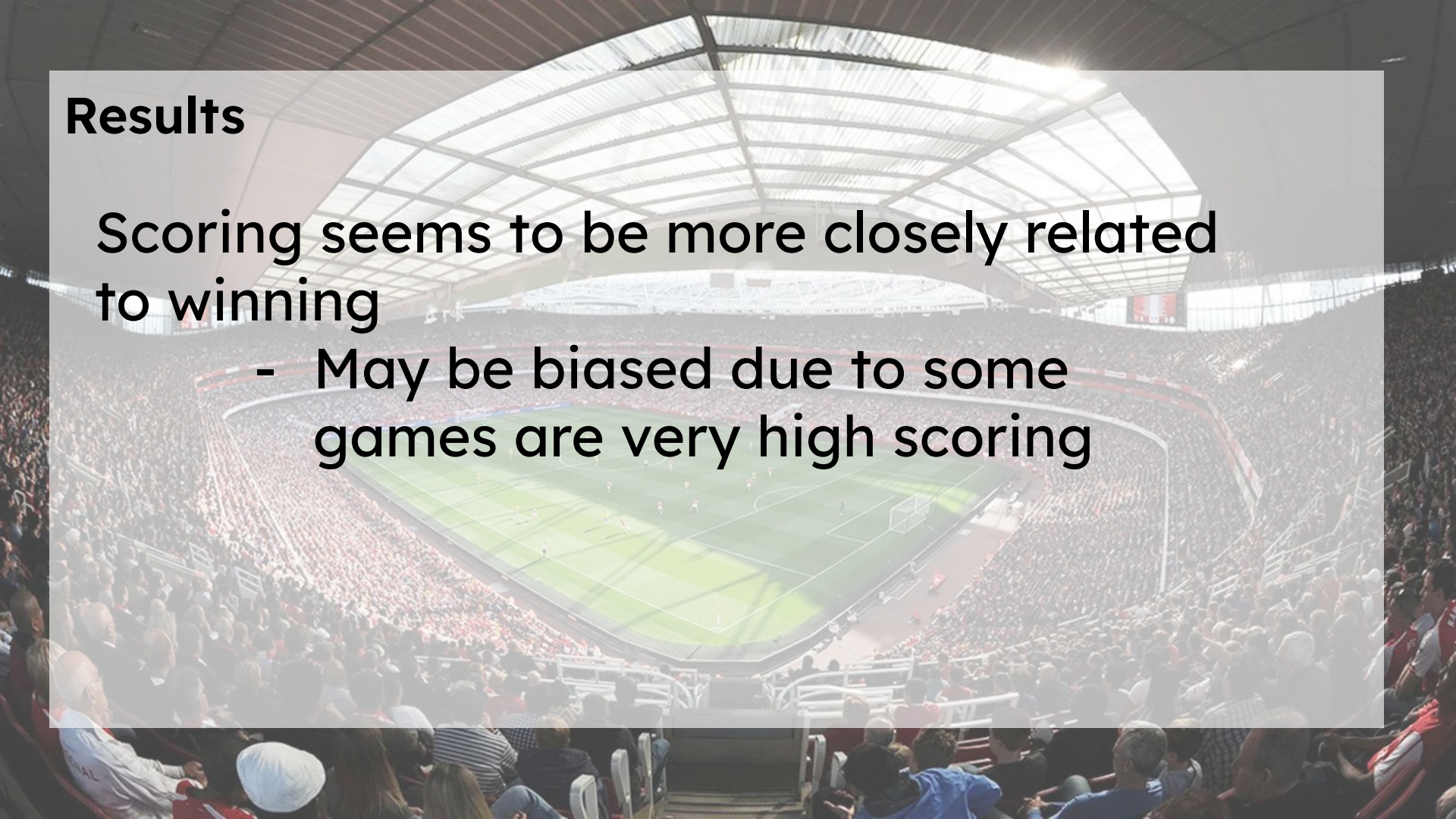
# Histogram: Bootstrap



# Results

Scoring seems to be more closely related to winning

- May be biased due to some games are very high scoring





## Further Studies

- How is spending related to position based shortcomings?
- Offensive player salaries versus defensive player salaries and their connection to winning
- Look across leagues and gender
  - American versus European Style



# References

“Premier League 2022/23 Table & Stats | FootyStats.” *Footystats.org*,  
[footystats.org/england/premier-league](https://footystats.org/england/premier-league).

