

# HW3 - SDS 315

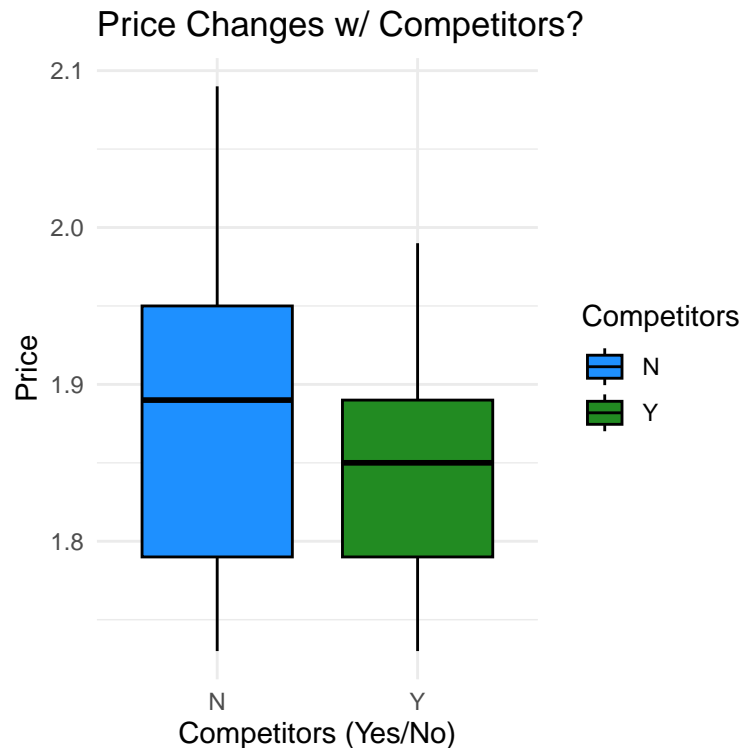
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Github Link: <https://github.com/Ahantya/SDS315/blob/main/HW3/HW3Markdown.Rmd>

## Problem 1 - Gas Prices

A.



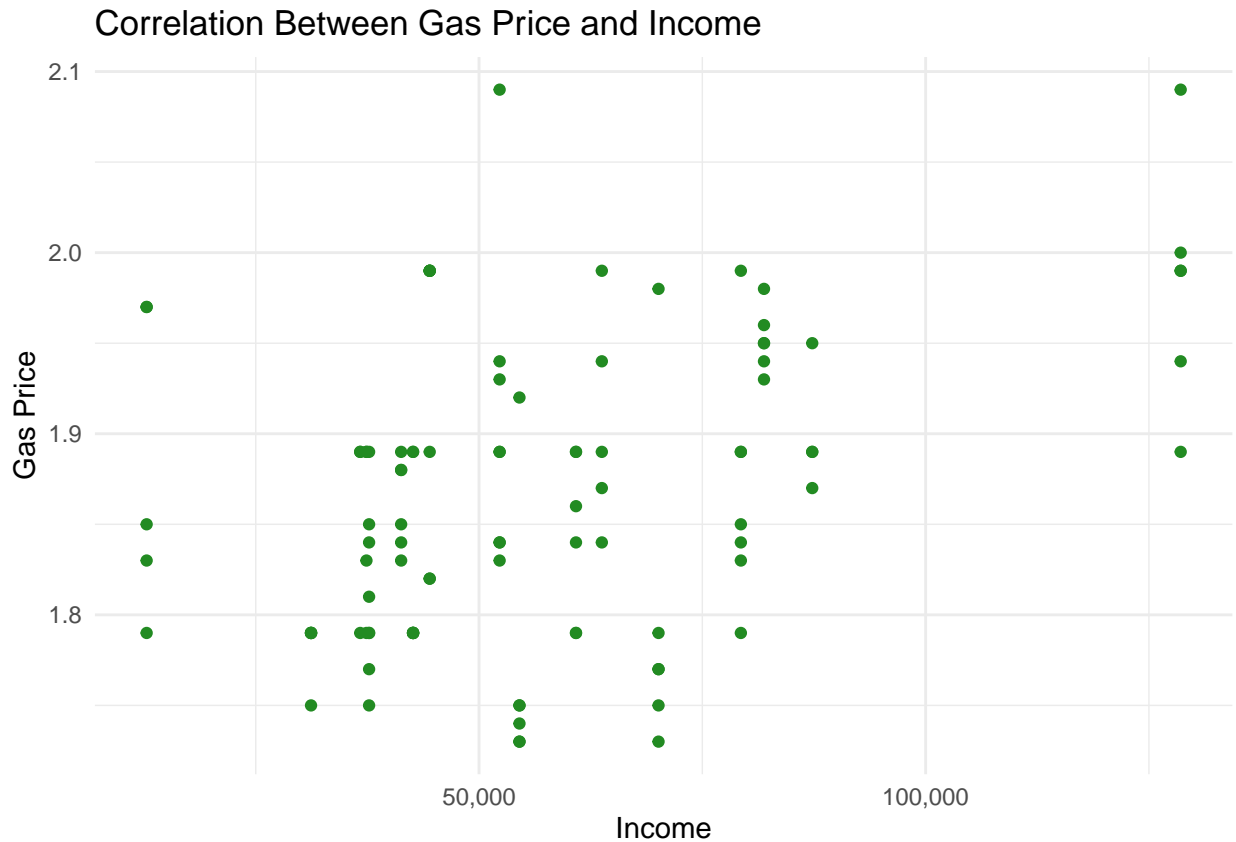
```
##      name      lower  upper level  method  estimate
## 1 diffmean -0.05445879 0.00770673 0.95 percentile -0.02348235
```

Claim: Gas stations charge more if they lack direct competition in sight.

Evidence: At a 95% confidence interval, the difference in mean prices between gas stations with competitors and gas stations without competitors is from -0.056 to 0.008. Because zero is contained within this confidence interval, there is no statistical significance (at the 5% level) to claim that gas stations charge more if they lack direct competition in sight.

Conclusion: The theory is unsupported by the evidence, as there is no data to support a statistically significant difference between prices and gas stations with / without competition in sight.

B.



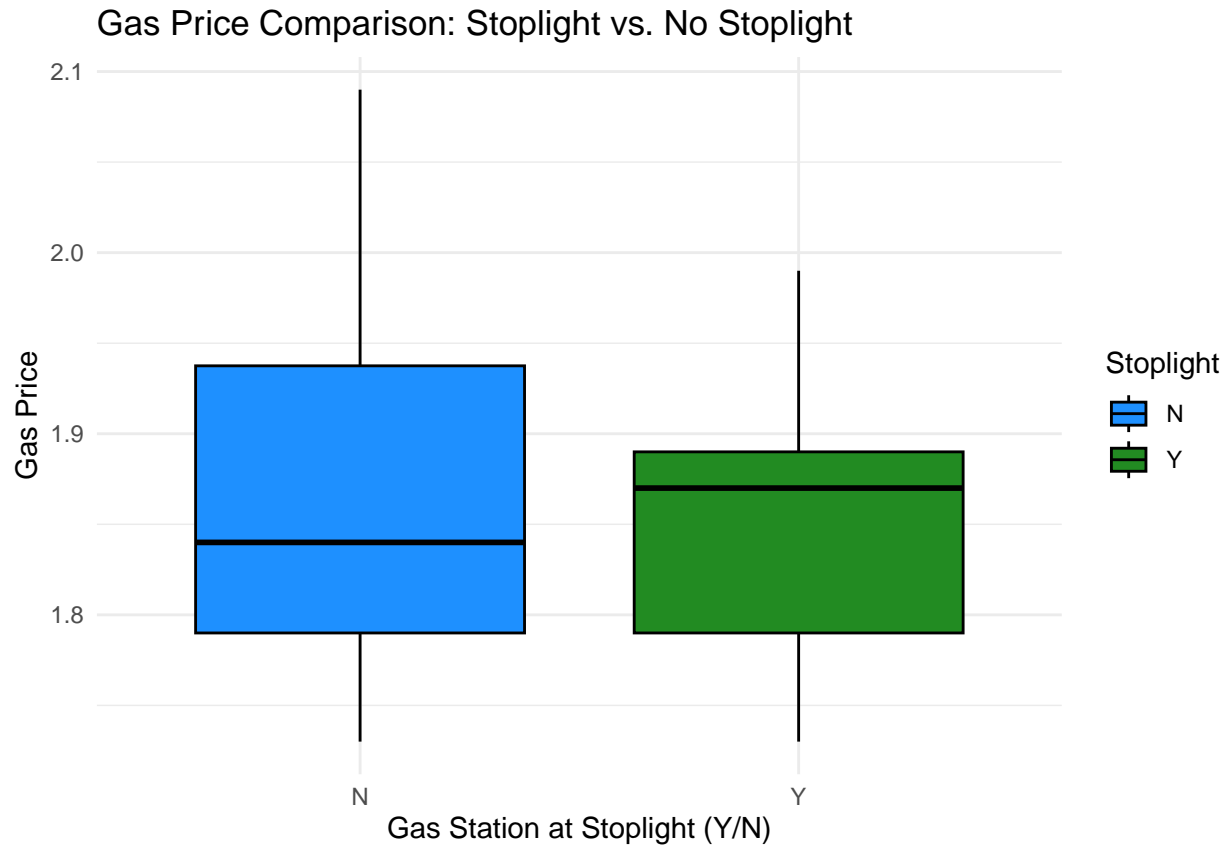
```
##   name      lower    upper level    method  estimate
## 1   cor -0.1942742 0.1991488 0.95 percentile 0.3961546
```

Claim: The richer the area, the higher the gas prices.

Evidence: At a 95% confidence interval, the correlation in prices between gas stations and the median household income in the surrounding of the gas station ranges from are -0.189 to 0.203. Because zero is contained within this confidence interval, there is no statistical significance (at the 5% level) to claim that gas stations charge more if they lack direct competition in sight.

Conclusion: The theory is unsupported by the evidence, as there is no data to support a statistically significant correlation between the median household income and the gas prices.

C.



```
##      name      lower      upper level      method      estimate
## 1 diffmean -0.03778687 0.03015666 0.95 percentile -0.003299916
```

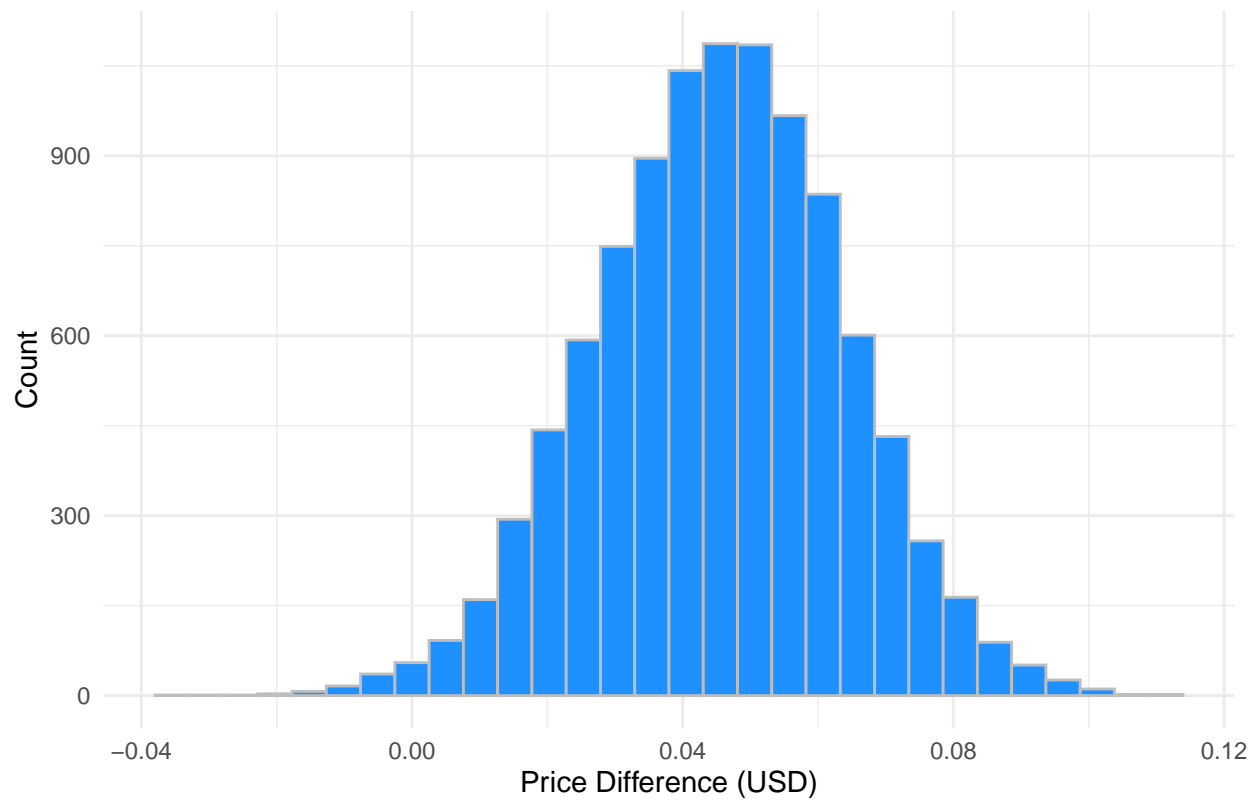
Claim: Gas stations at stoplights charge more.

Evidence: At a 95% confidence interval, the difference in mean prices for gas stations at stoplights and gas stations not at stoplights ranges from -0.039 to 0.306. Because zero is contained within this confidence interval, there is no statistical significance (at the 5% level) to claim that gas stations at stoplights charge more.

Conclusion:

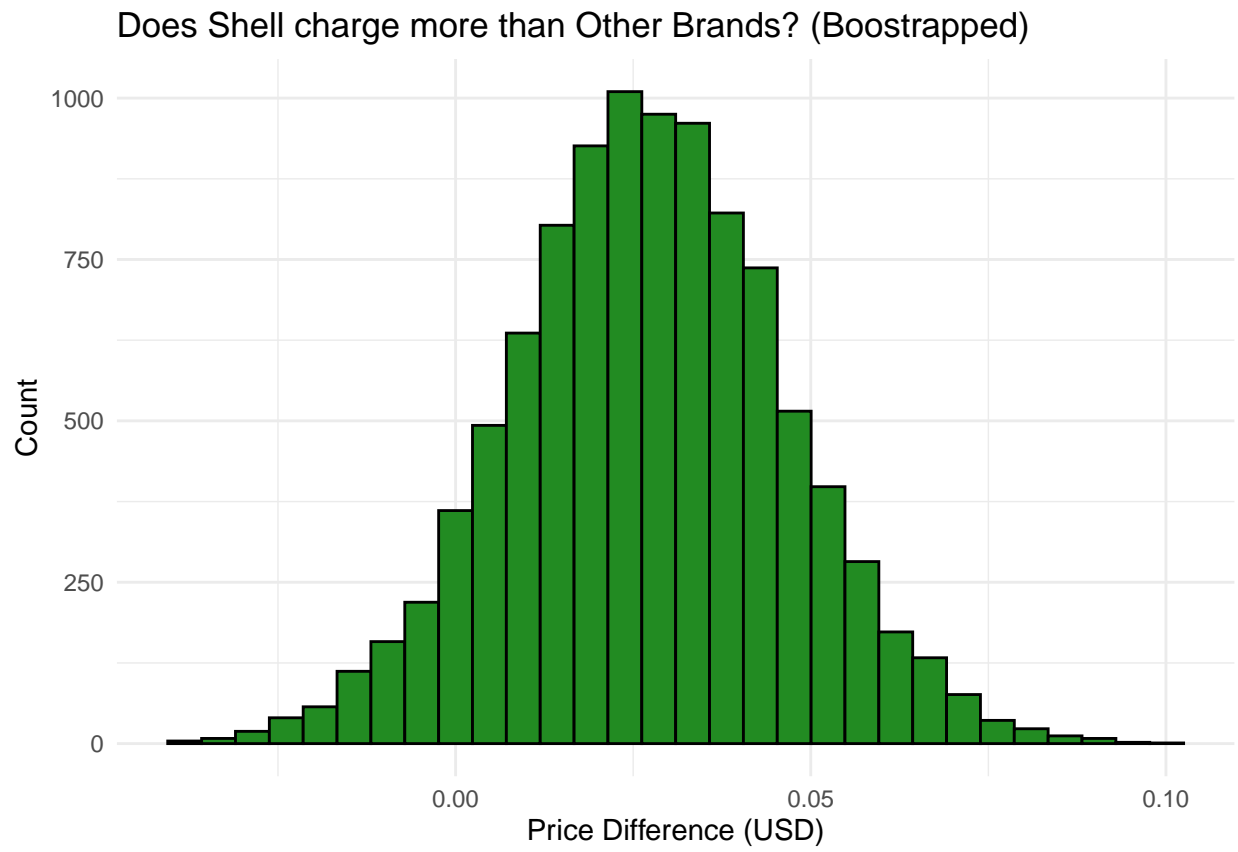
D.

### Does Direct Highway Access increase Gas Prices? (Boostrapped)



Claim: Gas stations with direct highway access charge more.

E.

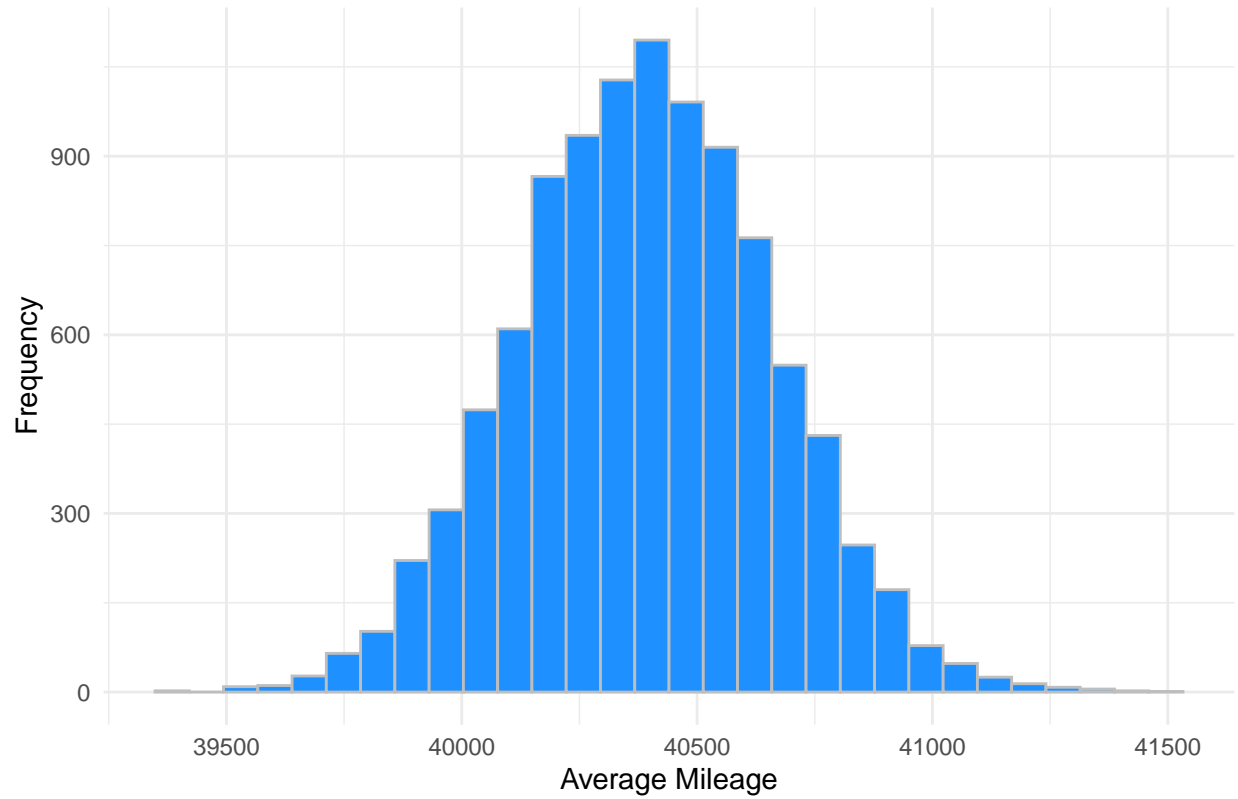


Claim: Shell charges more than all other non-Shell brands.

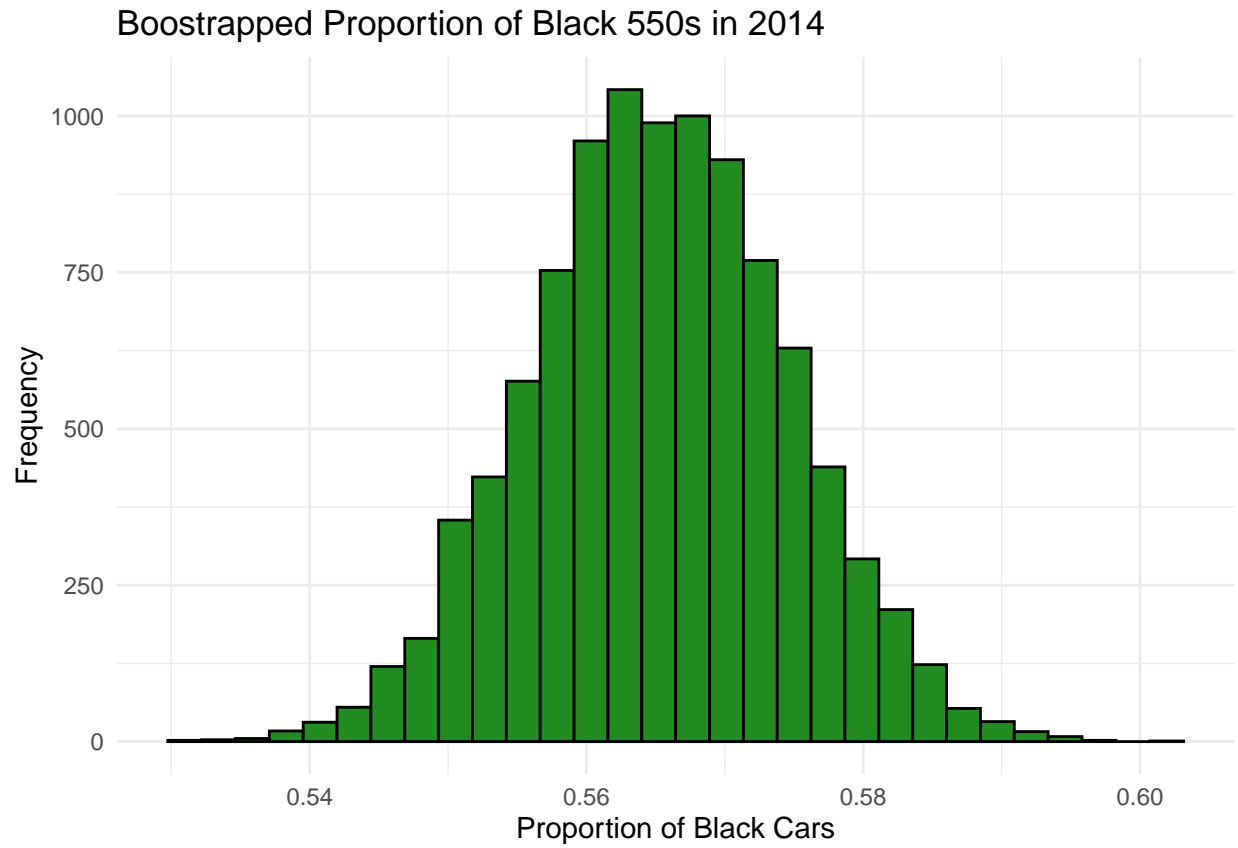
## Problem 2 - Mercedes S-Class Vehicles

### Part A - 2011 S-Class 63 AMGs

Boostrapped Average Mileage (2011 63 AMG)



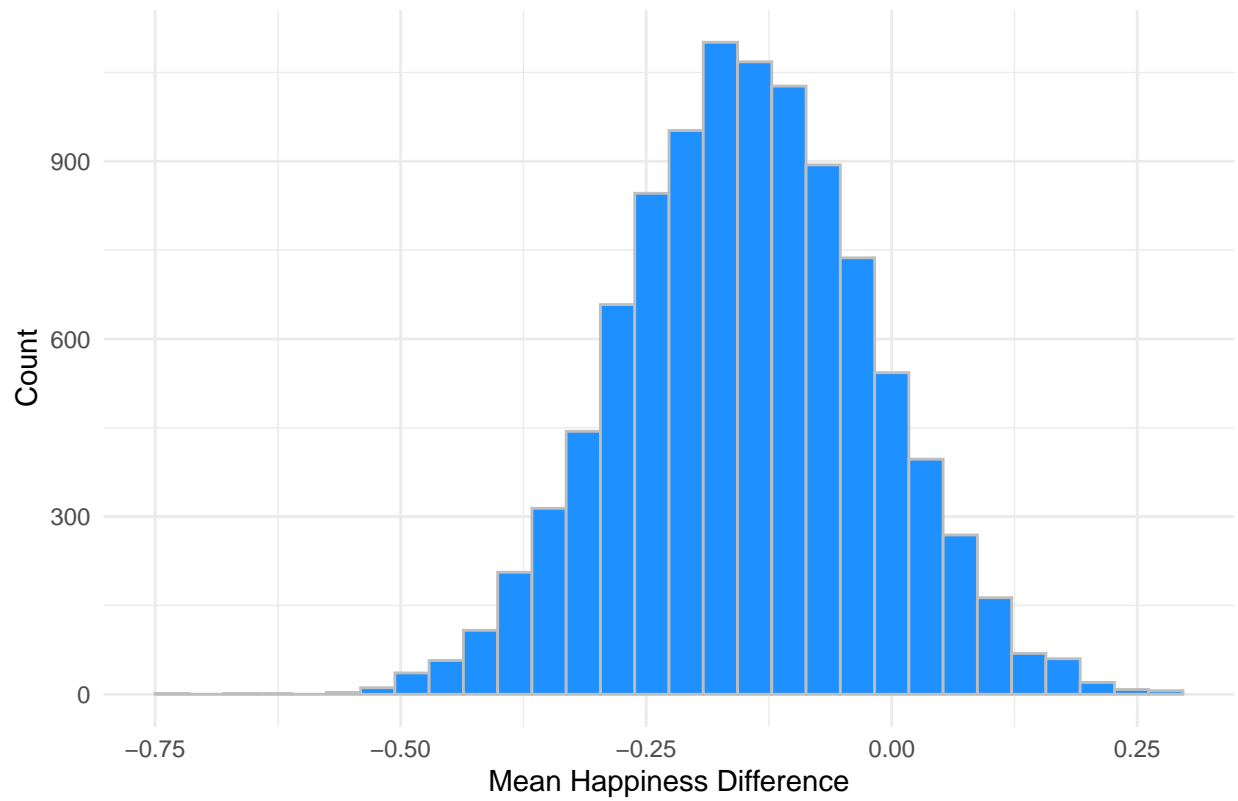
## Part B - 2014 S-Class 550s



## Question 3 - NBC Pilot Surveys

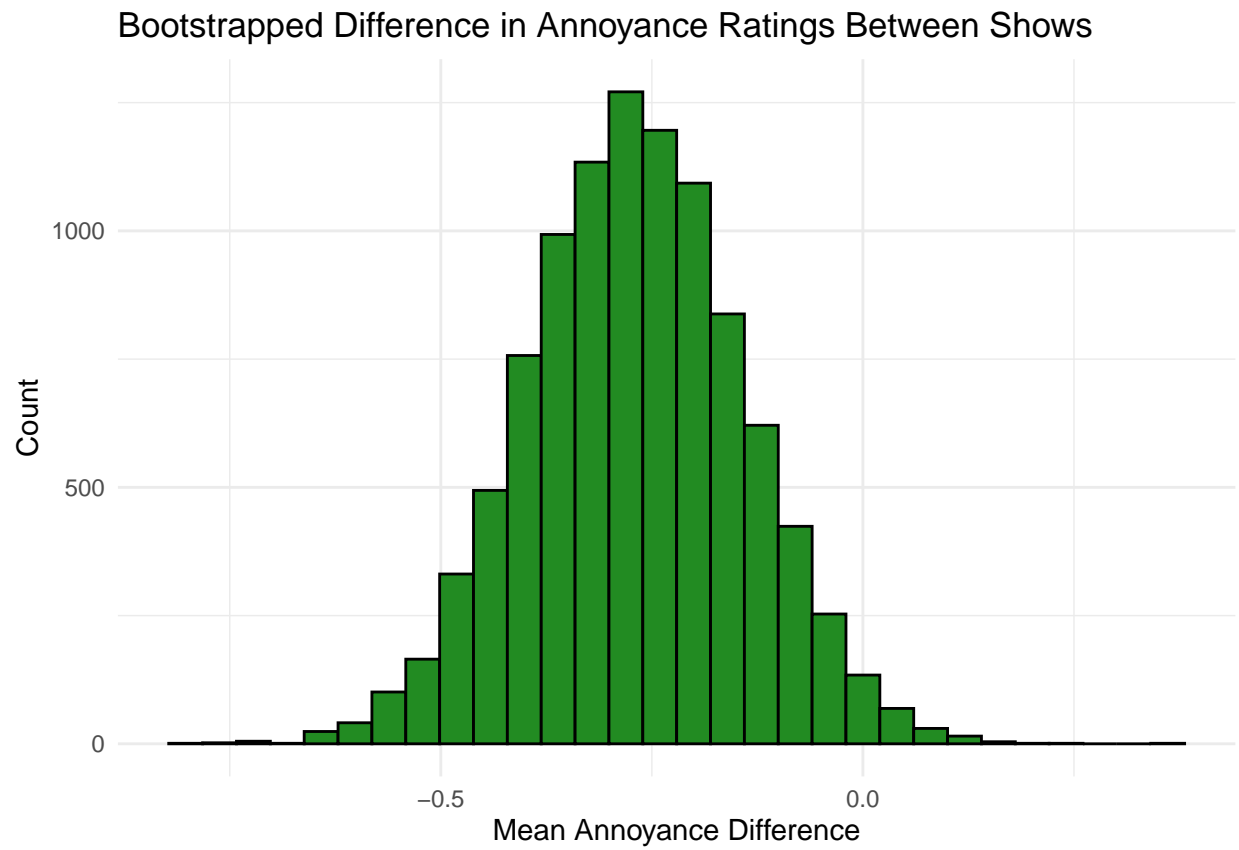
### Part A - Difference of Means in Happiness

Bootstrapped Difference in Happiness Ratings Between Shows

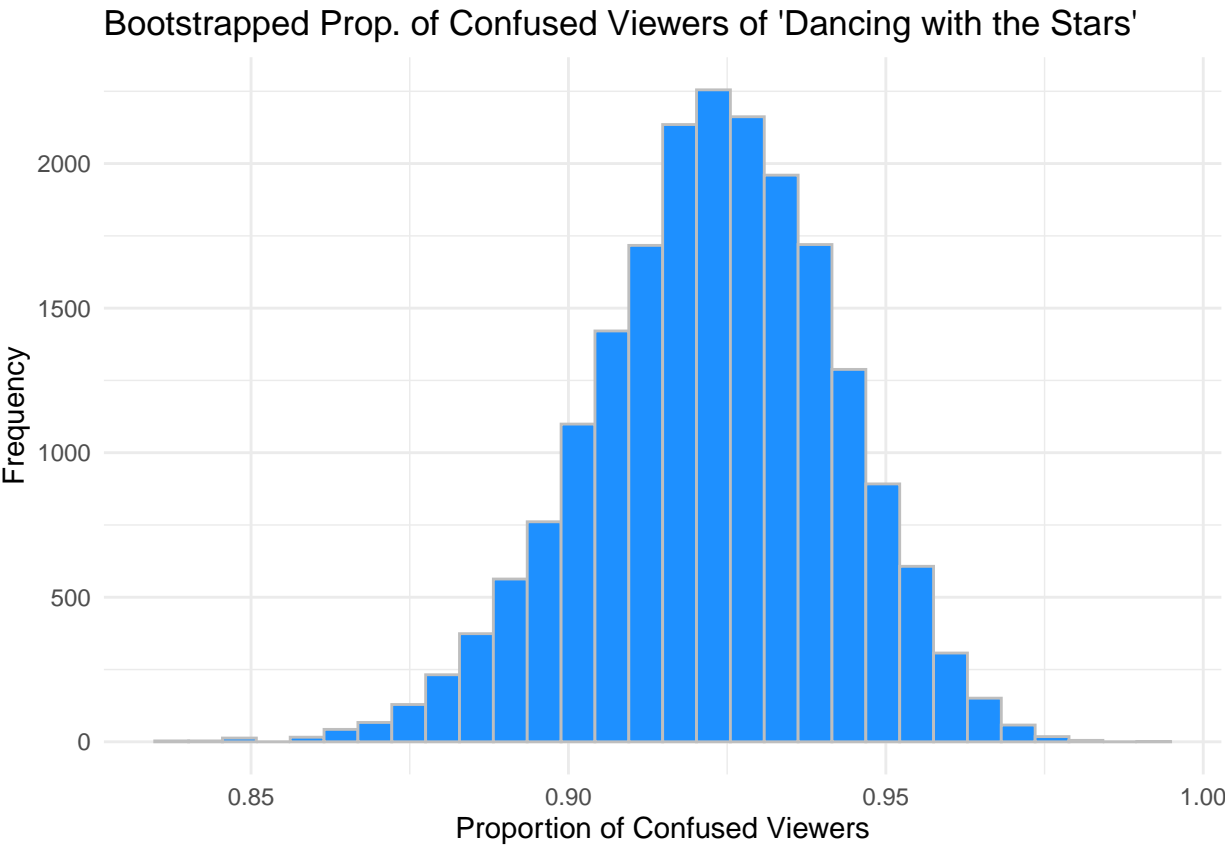




## Part B - Difference of Means in Annoyingness



Part C - Proportion of Confusion in Dancing with the Stars



## Problem 4 - EBay

