Does SEC Bias Exist in Winning the Heisman Trophy?

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Abstract: This study explores the Heisman selection process in recent history (since 2003) and examines conference as a predictor for Heisman votes. This study's goal is to determine if there is bias in Heisman votes towards SEC players over other conferences. The Heisman Trophy's purpose is to determine the best player in NCAA College Football, so it is important to examine if players from all conferences are given an equal chance of winning, depending on skill, not their conference.

I. Introduction

The Heisman Trophy is the most prestigious individual award in all of College Football. It is determined by a poll of sportswriters, and it decides the most outstanding college football player of the regular season. The Heisman Trophy is a coveted award, as it has important implications in the NFL Draft. Of 85 eligible Heisman winners in the NFL draft, 58 have been selected in the first round, 23 were the first overall pick, and 39 were the first five to be picked (Heisman Trust). While other factors play a role in their selection including NFL Combine results, performance in college, and injuries, the Heisman Trophy is

sought after to pad elite players' resumes before beginning their professional football careers.

College football is divided into conferences. Historically, these are schools in a similar geographic location, and they are broken into two different categories: FBS and FCS (ESPN). The former includes what are referred to as Power Five conferences: The Big Ten, Big 12, ACC, PAC-12, and the SEC. While players from all conferences are eligible for Heisman votes, very rarely do players outside of these conferences receive any votes, and they have never won a Heisman since the Bowl Championship Series (BCS) era started in 1998 (Friedman, C). The SEC, which stands for Southeastern Conference, will be the focus of this study.

Before analyzing potential bias in determining the Heisman winner, it is important to understand the Heisman selection process. The winner is determined by 870 media votes and every former Heisman winner (57 as of 2023). Additionally, the public at large has the ability to cast a single vote bringing the total vote count to 929. Each voter can pick three players, and they receive points depending on what rank they are voted: 5 points for 1st place, 3 points for 2nd place, and 1 point for 3rd place (Heisman Trust). The three players that receive the most points are deemed finalists, and the winner is announced at the Heisman Ceremony.

The Heisman Trophy started in the year 1935. For the purposes of this study, we will look at data from 2000 to the 2022 season. Before then, there were far less quarterbacks picked than in recent years; for example, 19 out of 23 Heisman Trophy winners picked since the year 2000 were quarterbacks. Because of the high prevalence of quarterbacks that

win Heisman Trophy winners in modern times, this study will begin its analysis no earlier than in 2000, which is when this trend began.

Additionally, we will only include quarterbacks in our predictive models. As mentioned previously, in recent history Heisman winners have trended to be quarterbacks, with there only being three running backs and one wide receiver chosen as Heisman winners since 2000. Even in years where a quarterback did not win the trophy, quarterbacks did receive Heisman Trophy votes, meaning there is sufficient data to examine only quarterbacks in every season. Running backs and wide receivers do not share the same statistics as quarterbacks, thus it is best to omit these players when ample data regarding Heisman votes is available for quarterbacks.

FiveThirtyEight recently did a study of player statistics and Heisman Winners to determine common traits that Heisman winners share (Paine). Based on Heisman selections from 1998 to 2016, their study shows that there are certain traits that all Heisman winners have. Their study found that all Heisman winners: 1) must be a quarterback or running back, 2) be part of a Power Five Conference[1], 3) be on a team with three or fewer losses, 4) quarterback must run for at least 15 touchdowns, 5) quarterback must not have worse than: 30 passing touchdowns, 1 rushing touchdown, and 11 interceptions. These results make a good baseline for this study's model.

The goal of this study is to determine if there exists bias towards players from the SEC in the Heisman balloting process. Determining if bias exists could influence elite quarterbacks' decision-making process when determining which school, they want to play

[1] Notre Dame, an unaffiliated team, is also included

for. If there is a significant bias of Heisman votes towards SEC players, this could potentially cause players to choose an SEC school over a comparable school in a different conference. Additionally, if voters in the Heisman process are aware that there exists a bias towards the SEC over other conferences, it may influence their decision-making process when deciding between elite players in a given year.

II. Data Collection

Player data used in this paper was collected from Sports-Reference. Quarterback data was collected from the year 2000 to the year 2022 on this website. This included player name, school, conference, games played, passes completed, passes attempted, pass percentage, passing yards, passing yards per attempt, adjusted passing yards per attempt, passing touchdowns, passing interceptions, pass rate, rushing attempts, rushing yards, rush average, and rushing touchdowns. I exported the data from each year and compiled it into a single Excel file. For the full data set, I included the top twenty-five quarterbacks by passing yards per attempts for each year. If there was a quarterback who received Heisman votes and was not in this set, I added them and their stats to the Excel file. Additionally, the amount of votes each quarterback received was collected on this website and appended to the file containing quarterback data.

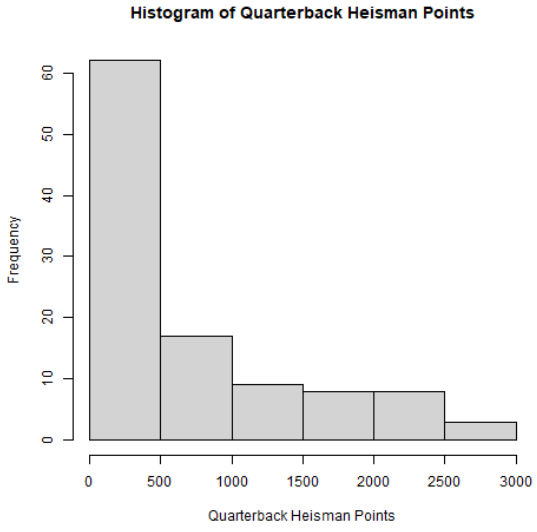
An additional component was strength of schedule. For this, I scraped data from Team Rankings with a Python script that exported a table of each team's strength of schedule for each year to a csv file. I copied this data into the Excel file containing player statistics and used VLOOKUP to match each player's team's strength of schedule to their statistics for that season, after modifying the datasets so that the format of their school

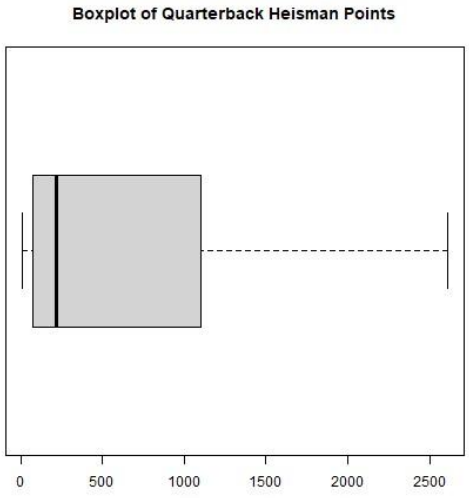
names was consistent. Team Rankings does not publish their methodology for calculating strength of schedule, but it is consistent for each season. Importantly, their data begins with the 2003 season, meaning that we will not include player data before the 2003 season in our analysis.

Once everything was compiled, I exported the Excel file to a csv file and I loaded the large dataset into R. I first removed all players from the 2000, 2001, and 2002 season, and players with zero Heisman votes. Then I removed unnecessary columns to our analysis. In the end, the dataset included conference, strength of schedule, passing touchdowns, rushing touchdowns, interceptions, and Heisman points received. In total there were 107 entries. I needed to turn the categorical variable of conference into a binary one before I could begin analysis, so I gave the value of 1 if the school belonged to the SEC conference, and a value of 0 if not.

III. Descriptive Statistics

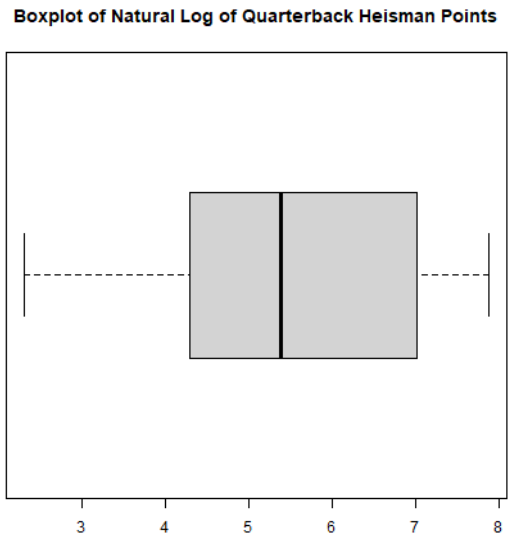
Looking at histogram and boxplot of quarterback Heisman votes, it is quite severely right skewed. Taking a look at the predictors deemed by FiveThirtyEight to be significant

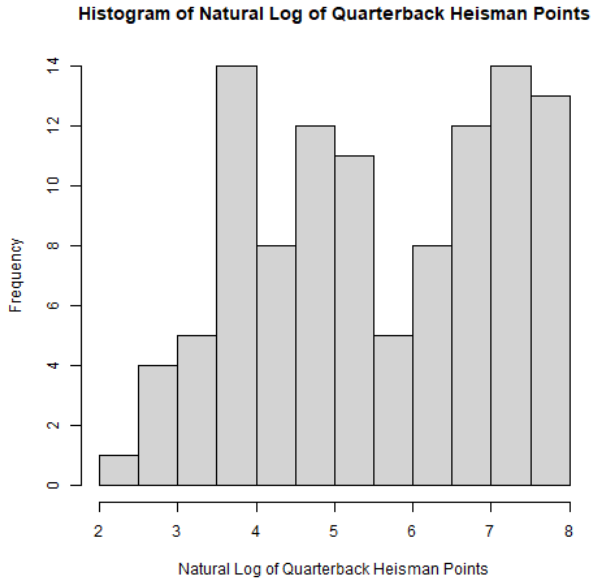




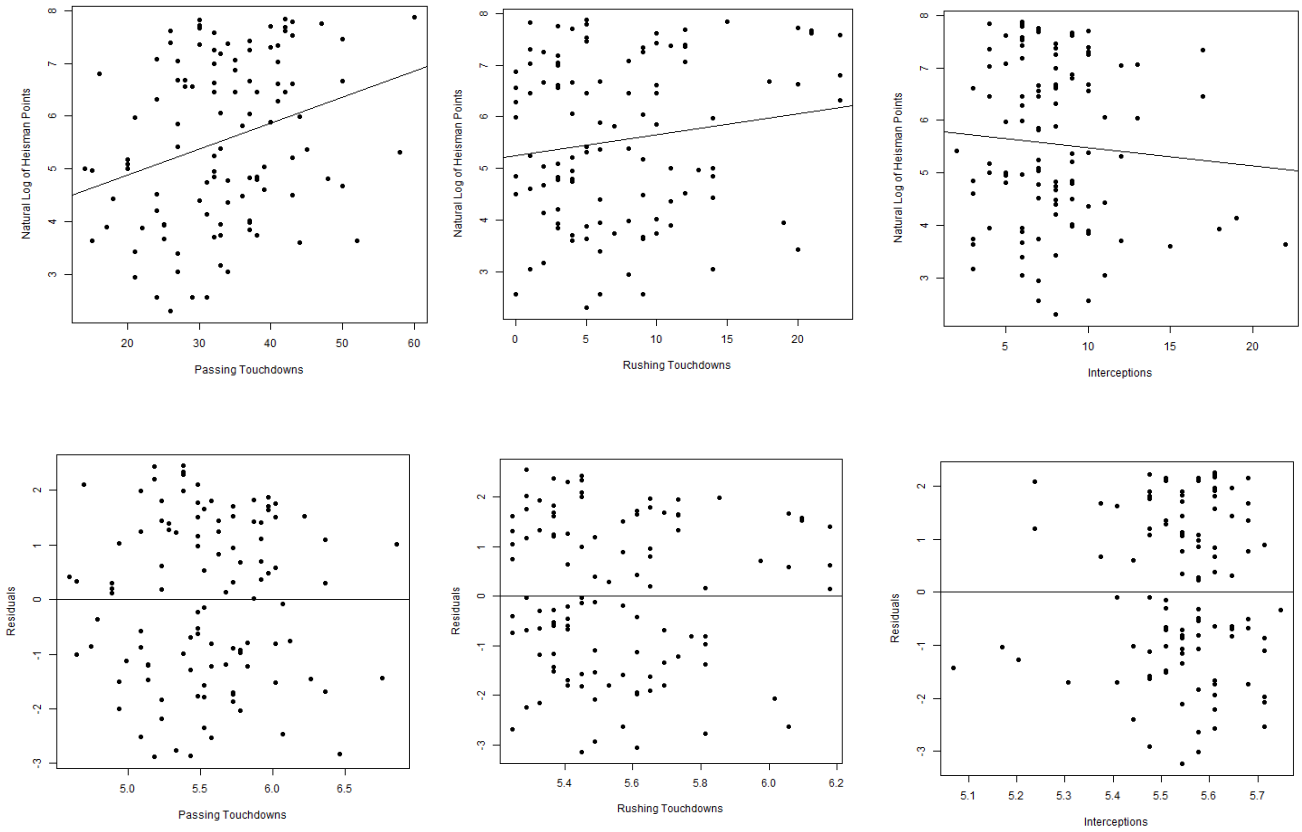
for determining Heisman winner, passing touchdowns, rushing touchdowns, and interceptions individually against Heisman votes, we see a pretty clear lack of fit. By also examining the residual plots of these plots, homoscedasticity is violated, and we cannot use a linear model without transforming.

We can transform the response variable, to deal with the issue of homoscedasticity. Out of a natural log transform, an inverse transform, and a square root transform, the natural log transform best deals with the skewedness of the data. After applying this transformation of the response variable, Heisman votes, we can reexamine the same graphs as before. The new histogram is slightly left-skewed and not quite normally distributed, but it is a great improvement of the previous model. The boxplot is much less problematic than





the former as well. These scatterplots are approximately linear, and the residual plots do not show any signs of a severe skewedness or heteroscedasticity. We can now proceed



using these predictors for a multiple regression model.

IV. Inferential Statistics

To start the model, I am going to create a base model using the criterion found by FiveThirtyEight, using running touchdowns, passing touchdowns, and interceptions as predictors of Heisman Trophy votes. It is a multiple regression model, and as we established in section III, the response variable of Heisman Trophy votes will be

```
Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.87168    0.71183   4.034 0.000105 ***
QB_Data_Tidy$Rush.TD   0.08590    0.02597   3.307 0.001298 **
QB_Data_Tidy$Pass.TD   0.07487    0.01680   4.456 2.13e-05 ***
QB_Data_Tidy$Pass.Int -0.05810    0.04119  -1.411 0.161339
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.431 on 103 degrees of freedom
Multiple R-squared:  0.1845,    Adjusted R-squared:  0.1608
F-statistic: 7.768 on 3 and 103 DF,  p-value: 9.994e-05
```

transformed with a natural log function. Here are the summary statistics for the baseline model:

These three predictors have an R-squared value of 0.1845, meaning they explain 18.45% of the variation within the response variable: the natural logarithm of Heisman votes. It should be noted that both rushing touchdowns and passing touchdowns are statistically significant, however interceptions is not. I will continue to include interceptions in the model, as it was deemed as important in FiveThirtyEight for predicting Heisman winners, thus accomplishing its task in being a baseline model.

Next, we can add the SEC predictor to the baseline model. In the model predicting the natural log of Heisman votes, with passing touchdowns, receiving touchdowns, interceptions, and SEC Conference as predictors, the SEC Conference has a p-value of 0.071211, which is above the threshold of 0.05. Here is a complete summary of the model:

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.68357    0.71145   3.772 0.000272 ***
Rush.TD      0.08324    0.02573   3.236 0.001637 **
Pass.TD      0.07463    0.01662   4.491 1.87e-05 ***
Pass.Int    -0.04665    0.04121  -1.132 0.260279
Conf         0.63686    0.34932   1.823 0.071211 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.415 on 102 degrees of freedom
Multiple R-squared:  0.2102,    Adjusted R-squared:  0.1793
F-statistic: 6.789 on 4 and 102 DF,  p-value: 6.935e-05
```

It is important to note that the significance is just above the threshold with the baseline model decided. If there is collinearity between conference and the other variables, it could slightly decrease the significance of the SEC as a predictor. Determining VIF and correlation values between conference and the other predictors yields the following results:

```
 Rush.TD  Pass.TD Pass.Int     Conf
1.199732 1.224822 1.052283 1.028639
[1] "The correlation between SEC and Rushing Touchdowns is: 0.066908"
[1] "The correlation between SEC and Passing Touchdowns is: -0.041446"
[1] "The correlation between SEC and Interceptions is: -0.156365"
```

The VIF values are all slightly above 1, and the highest correlation found is -0.1564. With VIF values this low and a correlation as weak as this, it is unlikely that collinearity had a significant negative effect on the SEC's significance in the model. Based on these results, I find it unlikely that the model has a problem with collinearity.

A final parameter that has not yet been considered has been strength of schedule. If there is significant interaction between strength of schedule and the SEC, this could be an additional source of bias, as it would show that Heisman votes for SEC players increase at a higher rate than of non-SEC players. Testing for interaction adds three additional predictors to the model: conference, strength of schedule, and the interaction term. I will not use the base model for these predictors, as having six predictors in a model runs the risk of overfitting it. Instead, I will use the three terms necessary to test for interaction. Here are the results:

```
Coefficients:
                          Estimate Std. Error t value Pr(>|t|)
(Intercept)               4.79902    0.23649  20.292  < 2e-16 ***
Conf                      0.63756    0.97309   0.655 0.513808
Schedule.Strength         0.10150    0.02931   3.463 0.000779 ***
Conf:Schedule.Strength   -0.04125    0.08394  -0.491 0.624201
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.471 on 103 degrees of freedom
Multiple R-squared:  0.1382,    Adjusted R-squared:  0.1131
F-statistic: 5.505 on 3 and 103 DF,  p-value: 0.001512
```

```
Analysis of Variance Table

Response: LnHeismanPoints
                        Df  Sum Sq Mean Sq F value    Pr(>F)
Conf                     1   8.511  8.5114  3.9336 0.0499928 *
Schedule.Strength        1  26.700 26.6996 12.3393 0.0006601 ***
Conf:Schedule.Strength   1   0.522  0.5225  0.2415 0.6242009
Residuals              103 222.869  2.1638
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

The only significant predictors in the interaction model are schedule strength and the intercept. The interaction term has a p-value of 0.624 which shows no sign of any significant interaction in the model. Interestingly, in this model the SEC is nowhere near as significant as it was in the previous model, likely due to the significance of schedule strength. Even more interestingly, when looking at the ANOVA table, SEC is significantly different from the average predictor with a p-value of 0.04999. From this result, we see that the interaction term is neither significant as a predictor, nor is it significantly different from the average in the interaction model.

V. Conclusion

I conclude that there is not significant bias towards SEC players in determining Heisman votes in the areas I examined. When the conference variable was added to the baseline model, it did not meet the threshold significance value of 0.05. After examining if there could be collinearity in the model that could weaken its significance, given the VIF values and correlation of conference with other predictors it seems unlikely that collinearity is a concern with the model. An additional source of bias, interaction between conference and schedule strength, also did not prove significant. When in the same model as a predictor contributes very significantly, like strength of schedule, the SEC variable does

not do a great job at predicting the outcome and is not significant. For these reasons, I conclude that there is not SEC bias in determining Heisman votes.

The result I found most surprising was that conference is significantly different than the strength of schedule. I verified this result again by removing the interaction term from the model. I found this shocking, as SEC teams are known for tougher than average schedules, so finding that these two predictors are significantly different completely contradicted my expected outcome when examining strength of schedule. This result makes sense, as most Heisman vote recipients are going to be coming from a decently strong conference to begin with.

Another surprising result was that in the baseline model, interceptions was not significant. This is interesting, as FiveThirtyEight found that no Heisman winner ever had worse than 11 interceptions, so I was expecting this to be significant; however, in my data set, I removed players with no Heisman votes. If I had included these players, this variable almost definitely would have been significant. This is because any quarterback receiving Heisman votes is going to be one of the best in his class; if he is throwing a lot of interceptions, he would not even be in contention.

These results are important, as it shows to many fans of other conferences, that SEC bias, which comes up in conversation very often in December when Heisman ballots are out, is not significant. These results could be useful to the Heisman Trust for the purpose of adding credibility to their award. Additionally, players should not pick an SEC school for the chance of having better Heisman odds alone. The results found about bias in the Heisman trophy is not generalizable to professional sports, because they are typically more balanced

between conferences or divisions. However, basketball to a lesser extent than football could do a similar study of the Naismith trophy. It is selected in a similar manner, with winners being selected by a vote.

One limitation was that I only included SEC as the conference variable. It would be interesting to include dummy variables for all Power Five conferences and examine if there are any other trends that occur. Additionally, I did not examine year as a factor in my analysis. It is plausible that SEC bias is relatively new, and by including data since as early as 2003, I could completely miss a potential new trend of bias. Making these adjustments, I believe that this project could rigorously prove or disprove bias in any of the conferences.

An idea for future research I would find interesting to compare against mine is examining SEC bias in the AP Top 25. Generally, I find that this is much more talked about than bias in the Heisman selection process. The rankings are done in a similar manner as the Heisman trophy, with a voting process. This was a topic I explored briefly, and would examine team strength using a model and comparing them to the human voted rankings. A similar dataset as the one I used that contained strength of schedule could be used for this.

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