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As a Steelers fan, I watched the recent game against the Baltimore Ravens and was very impressed with Boswell’s ability to carry the team to victory by getting 6 field goals, making up the entirety of the points for Pittsburgh’s win. I chose to analyze how important a kicker is to an NFL team’s success. I analyzed a variety of kicker performance statistics to see their relationship to team performance. I looked at statistics by game to see the kicker’s extra point percentage, field goal percentage, kicker points, kicker points missed, etc. across all games in every current NFL kicker’s career. I made graphs, performed tests, and developed models to analyze a kicker’s effect on game outcomes.

I first looked at some statistics to get a better understanding of the data. Then I made boxplots to compare kicker points/kicker points missed and whether the kicker’s team won or lost. There appears to be more kicker points in games when teams won and vice versa. Also, there appears to be less kicker points missed in games when teams won and vice versa. Looking at a histogram of the percentages of team score that is kicker points across all games, the distribution is skewed to the right which makes sense. Although it does happen, such as in the game I mentioned initially, it is not common for most of a team’s score to be from kicker points. It was interesting to see that most of the percentages lay between 20-40%. On average, from this data, 20-30% of a team’s score is made up of kicker points. If these points are missed out on, this could cause a big change in team performance.

I performed two t-tests to highlight differences in kicker points/kicker points missed between groups in the win/loss variable. These both had low p-values meaning that there are significant differences between games won and games lost. Kicker points are higher overall in games won and vice versa. Kicker points missed are higher overall in games lost. I also performed two chi-square tests to look at the association between different field goal percentage levels/extra point percentage and wins/losses. I made the field goal and extra point percentage variables into categorical variables by grouping the values into different thresholds (less than 50% = Low, 50-70% = Medium, etc.). With low p-values, these tests revealed that there is an association between these percentages and games won or lost.

I wanted to build models, but I made sure to check for multicollinearity before I did so. I refrained from combining any highly correlated (correlation coefficient > 0.7) in the same model so that it was as reliable as possible. I first created a model to predict team score based on kicker points, kicker points missed, field goal percentage, and extra points percentage. The R^2 tells us that 33.67% of the variation in team score can be explained by these kicker statistics. The standard error for the model was around 8 which is slightly high in terms of team score. All the variables in the model were significant meaning that they are at least somewhat important to predicting a team’s score. I also created a logistic regression model to predict the binary variable win/loss. I included kicker points and kicker points missed as predictors. The predictors were both significant in the model summary (kicker points is more significant). The coefficients can be exponentiated and then interpreted as odds. For each additional kicker point, the odds of winning the game increase by about 26.2%. For each additional kicker point missed, the odds of winning the game decrease by about 4.2%. Points that kickers contribute have a more positive impact on the outcome of the game than points they miss out on have a negative impact.

Overall, if I used more data to run this analysis like including past kickers with longer careers, the results may have been different and possibly more accurate. I also could have considered more variables such as distance the individual kicks were from for each game to make the project more involved. There is a relationship between kicker performance and game result. The chances of winning a game significantly increase when a kicker is doing better. Without kicker points, most of these team scores would decrease by about 20-40% on average. About 12% of the variation in wins and losses can be explained by kicker points and kicker points missed alone. However, there are also instances when a kicker does not gain many points for their team, and the team still wins the game. Boswell gaining 18 points for the Steelers is not a common occurrence, but it shows how crucial a kicker’s performance can be to a team’s success in certain instances.