

## DSC 530 Term Project

The NFL Draft is a critical process where teams select college football players, aiming to acquire future stars. A common assumption is that first-round picks outperform later-round selections. This study examines whether first-round picks significantly outperform later-round picks using fantasy football points as a key performance metric.

Do first-round draft picks perform significantly better than later-round picks? By analyzing fantasy points (PPR), total yards, touchdowns, and games played, we assess whether draft position correlates with NFL success.

The EDA revealed several significant trends:

- Distribution of Fantasy Points: Right-skewed, with most players scoring low and a few elite performers dominating.
- Draft Round vs. Performance: The Probability Mass Function (PMF) and Cumulative Distribution Function (CDF) showed that first-round picks are more likely to play more games and accumulate higher yardage compared to later-round selections.
- Statistical Significance: A t-test comparing first-round picks to later-round picks ( $p\text{-value} \approx 0$ ) confirmed that first-round picks significantly outperformed later-round picks in fantasy points.
- Regression Analysis: A linear regression model found a negative correlation (-10.27 per round) between draft round and fantasy points, meaning that each increase in draft round results in approximately 10 fewer fantasy points per season. However, the R-squared value (0.047) indicated that draft round alone is not a strong predictor of performance, and other factors must be considered.

While this analysis provides meaningful insights, some important factors were not considered:

- Positional Differences: Quarterbacks, running backs, and wide receivers contribute differently to fantasy points.
- Injuries: Some later-round players may have had high potential but were impacted by injuries.
- Games Started vs. Games Played: Not all players who appear in games have a starting role, which impacts their ability to generate fantasy points.
- Team Strength and Coaching: A player's team situation plays a crucial role in their opportunities and performance.

One of the key assumptions made was that fantasy points followed a normal distribution. However, normality tests (Shapiro-Wilk test, histograms) revealed that fantasy points are right-skewed, meaning a log-normal or gamma distribution would have been a better fit for modeling player performance.

A major challenge in this analysis was isolating the impact of draft round from other factors such as team fit, playing time, and injuries. Additionally, the low R-squared value in regression analysis (0.047) showed that draft round alone does not fully predict success, suggesting the need for a more comprehensive model with additional explanatory variables.

This study provides strong evidence that first-round picks perform significantly better than later-round picks. The t-test confirmed first-round picks score significantly higher fantasy points, while regression analysis demonstrated a negative relationship between draft round and performance. However, draft round alone is not the sole determinant of success. Future research should include positional analysis, team strength, and injury history to develop a more comprehensive predictive model. While draft capital is essential, great players can emerge from any round under the right circumstances.