



# Can the NFL Combine Predict Career Performance?

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## INTRODUCTION

Each year, college football players hoping to be drafted into the NFL are invited to the NFL Combine. There, the players perform certain drills, like the 40 yard dash, vertical jump, and bench press, generating a set of statistics on each player. They also take basic measurements such as height and weight. Our hypothesis was that players with better results would be drafted earlier and have more success in the NFL. Thus, we hoped to be able to predict draft pick number and future success in the NFL based on these statistics.

## DATASET

We scraped all 1999-2015 NFL Combine and NFL Draft Results from Pro Football Reference's website.

- 5601 Players, 39 Variables
- Not all Combine participants were drafted and not all drafted players participated in the Combine

## METHODS

Measurements from the NFL Combine drills:

- 40 Yard Dash
- Bench Press (225 lbs)
- Vertical Jump
- Broad Jump
- Three Cone Drill
- Shuttle Run

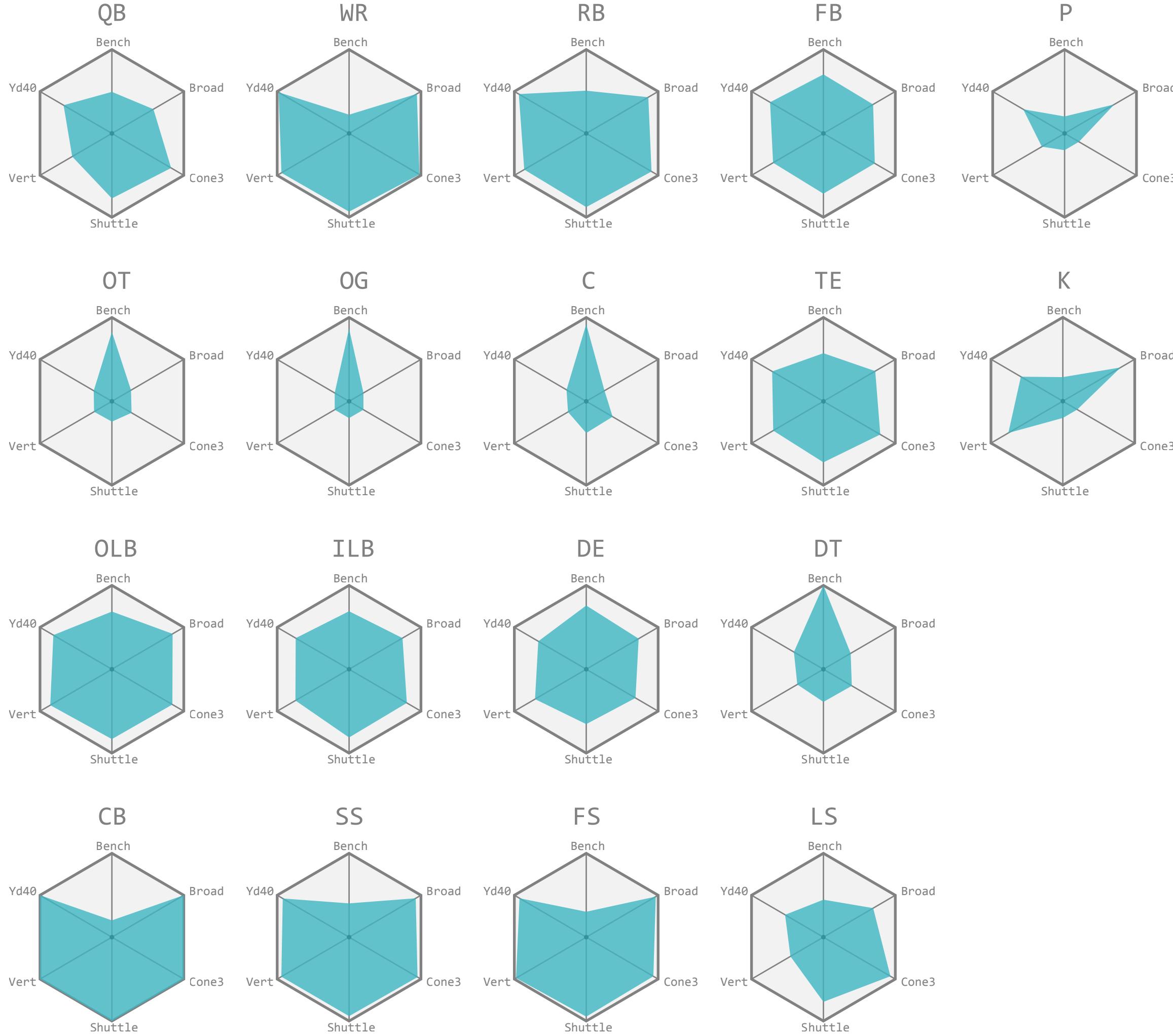
Approximate Value (AV) is a widely-used football metric, independent of position, that measures the value a player contributes to their team during a season. Career AV is a weighted sum of a player's season-by-season Approximate Values. We defined "success" in the NFL to be average Career AV per season.

## CONCLUSION

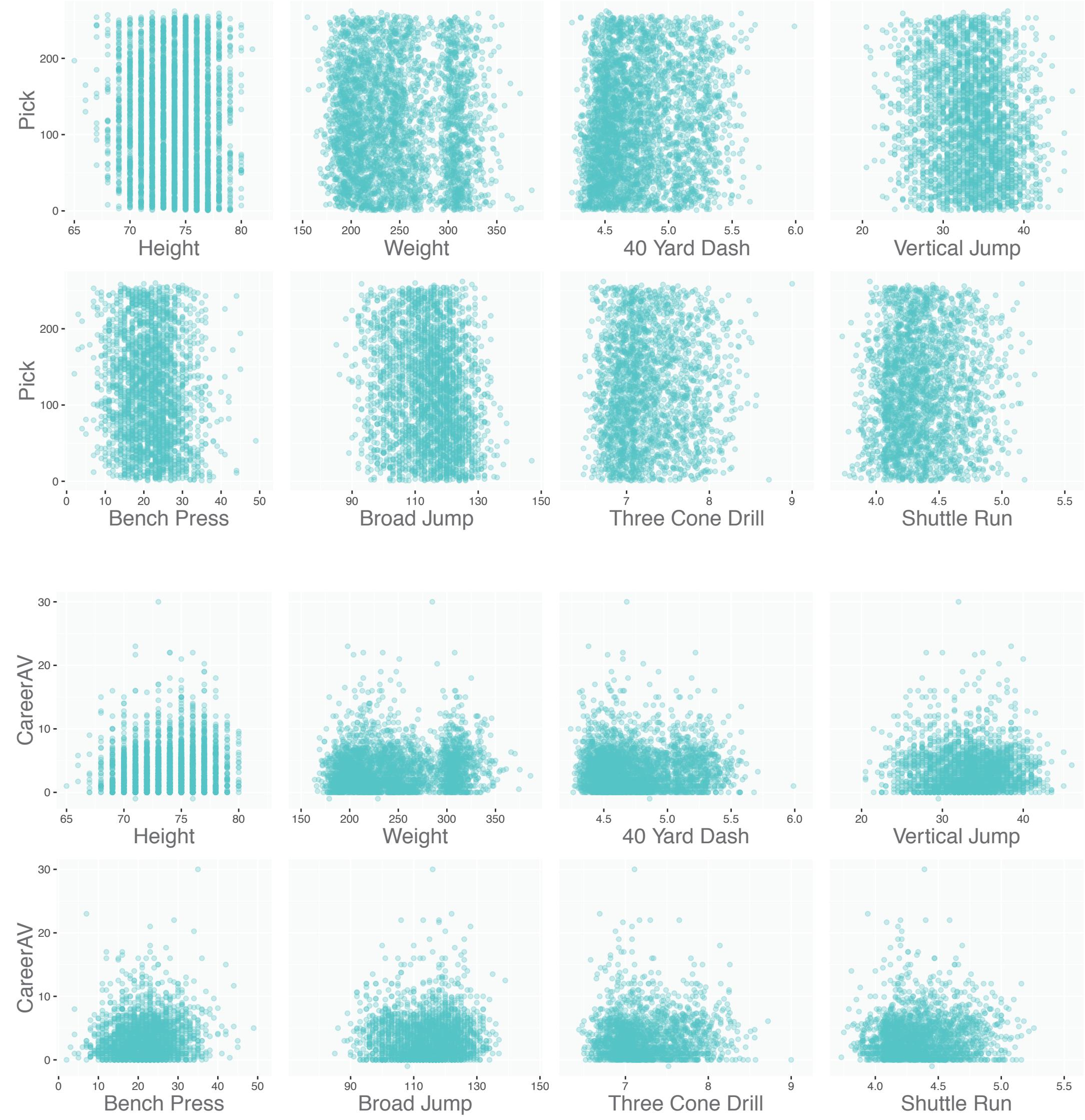
We attempted to find correlations between Combine results and both draft pick number and Career AV per season using multiplots, correlation coefficients, and linear regression.

We also explored correlations between combine results and position-specific metrics, such as tackles for cornerbacks and sacks for linebackers, using visual analysis of scatter plots and computing correlation coefficients.

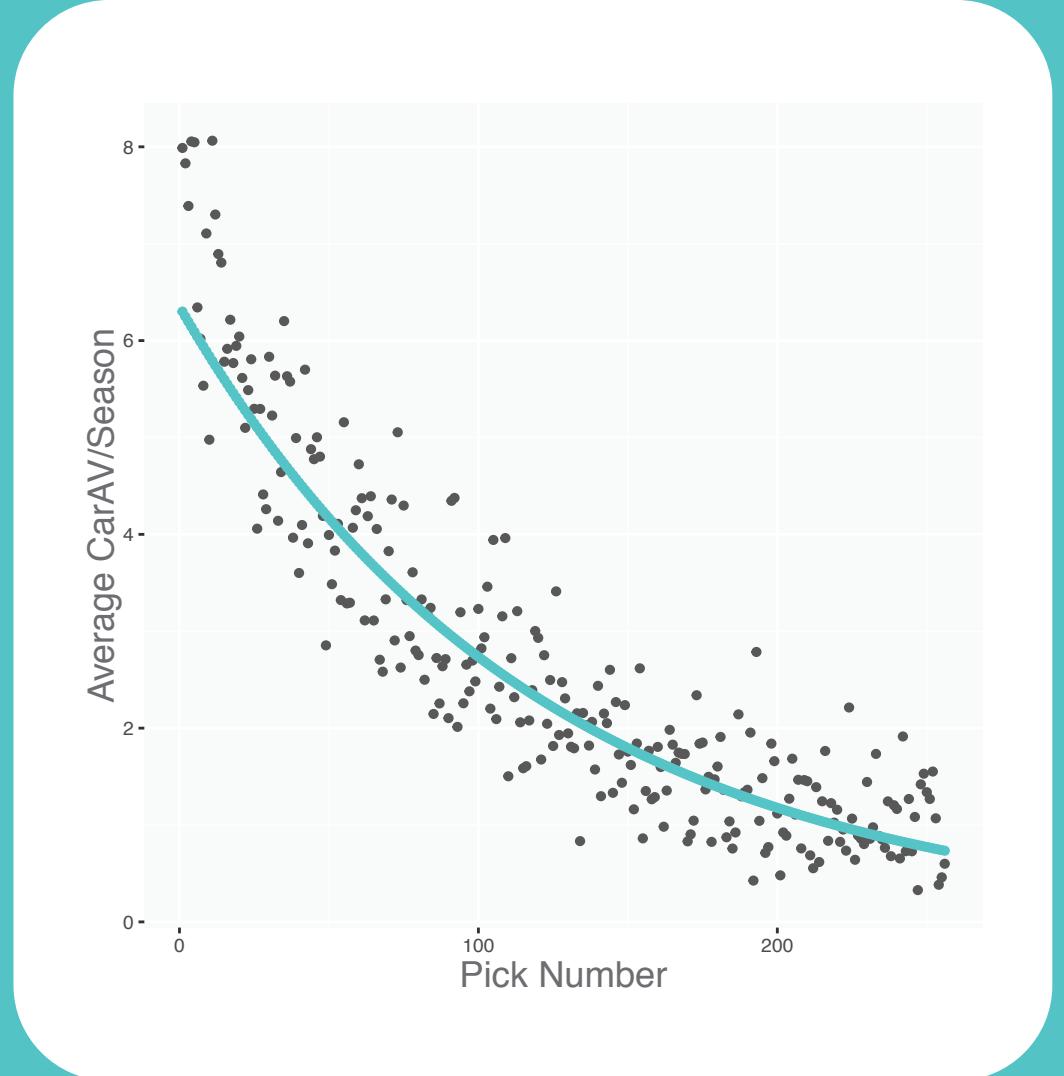
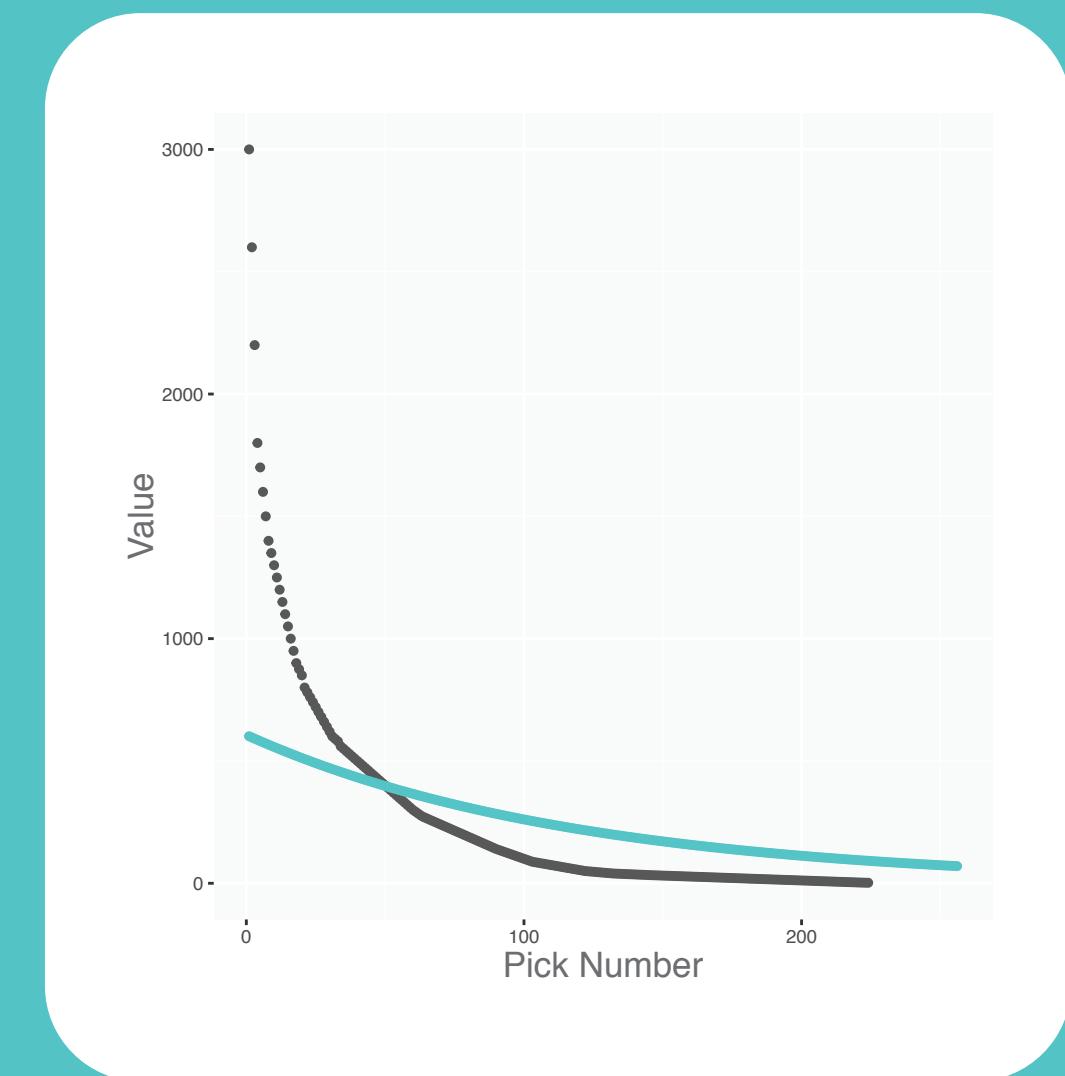
## THE SHAPE OF A PLAYER



## MULTIPLOTS



## DRAFT PICK VALUATION



We found an inverse relationship between the average Career AV per season of a specific draft pick position and draft pick position. Using linear regression, we were able to find how much value each pick has in a given draft. We then compared this to a famous valuation done by a famous former Dallas Cowboys' head coach, Jimmy Johnson, and found that, based on non-position-specific value, he overvalued early picks and undervalued later picks

## RESULTS

We did not find any correlation between a player's NFL Combine measurements and their eventual draft pick position or their NFL success as determined by Career AV per Season, as seen in our scatter plots.

We also ran two multivariate linear regressions with all six NFL Combine measurements as predictors of Career AV per Season and draft pick number. These models performed poorly, accounting for less than 5% of the variation in the target values, with several covariate coefficients that did not make sense. For example, our model indicates that when a player's Vertical Jump decreases, their future success increases.

In addition, we did not find any correlations when we subset the players by position and explored their relationship with both Career AV per Season or position-specific success metrics (such as Sacks per season for linebackers). However, we did find a correlation between draft pick number and Career AV per Season, indicating that, on average, better players do get drafted before worse players.

## CONCLUSION

We concluded that, contrary to our hypothesis, Combine results alone cannot accurately predict either draft pick or eventual success in the NFL. This result was frustrating, because we had hoped to create a predictive model to grade future NFL drafts. However, better players do get drafted earlier, implying that coaches look at other indicators, such as college statistics or traditional qualitative scouting, to identify better players. While pure physical ability is important in football, it seems that all players who are capable of playing at the highest levels have sufficient athleticism, and what really matters are intangibles like situational awareness and on-field decision making. Thus, according to our analysis, the Combine is not a useful event for evaluating talent.