

# PREDICTING 40 YARD DASH PERFORMANCE USING ANTHROPOMETRIC AND PERFORMANCE VARIABLES COLLECTED AT THE 2024 NATIONAL FOOTBALL LEAGUE COMBINE

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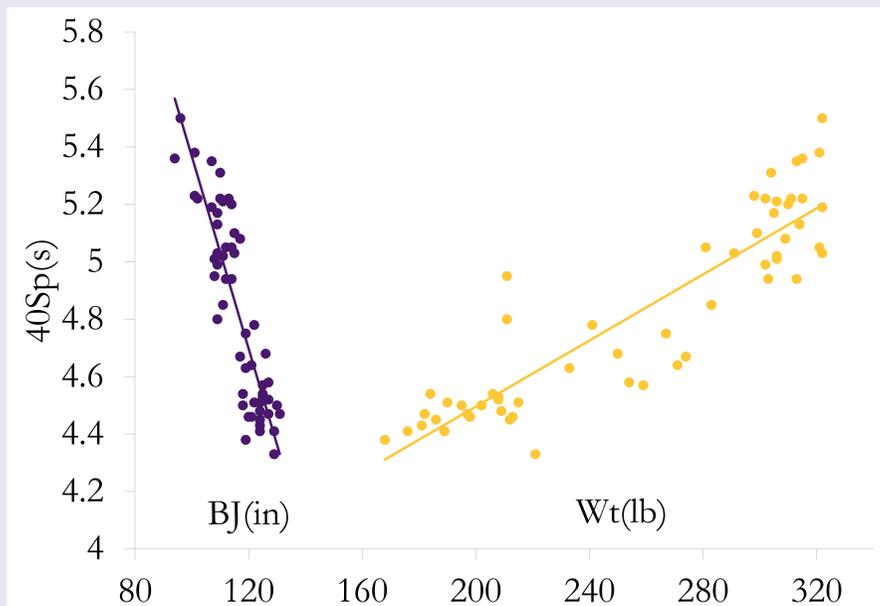
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## INTRODUCTION

- Sprint Performance is a popular metric used to suggest an athlete's overall ability
- This is particularly true in events like the NFL Combine, where athletes train for weeks to perform well in the 40 yd sprint (40Sp)
- However, it is not always feasible or practical for an athlete to solely train for sprinting
- Due to these factors, it is possible that other metrics may be of use for predicting sprint performance
- The purpose of this study was to determine if 40Sp could be predicted using other measurables taken during the 2024 NFL Combine

## METHODS

- Height (ht, cm) and weight (wt, kg) along with data from performance tests conducted at the 2024 NFL Combine (40Sp, s; Vertical Jump [VJ], cm; Broad Jump [BJ], cm; 3 Cone Drill [3C, s]; 20yd Shuttle [20Sh, s]) of 321 players were analyzed from open-source databases.
- Two forward linear regression models were calculated to predict 40Sp time based off all other variables of interest
  - The first model excluded athletes listwise; eliminating any athletes who did not complete all tests.
  - The second model excluded athletes pairwise, allowing all athlete testing data to be used in creation of the regression model.
- Significance of relationships was set at  $p \leq 0.05$ .
- Data are presented as mean  $\pm$  SD, and 95% CIs are presented for all regression equations.



ELITE-LEVEL PLAYER  
PERFORMANCE IN 40Sp CAN BE  
PREDICTED USING HORIZONTAL  
POWER PERFORMANCE  
DEMONSTRATED DURING THE  
BROAD JUMP AND ATHLETE BODY  
WEIGHT

## RESULTS

- For the listwise excluded model ( $n = 56$ ), a significant regression equation was found ( $F(2, 53) = 251.277, p < 0.01$ ) with an adjusted  $R^2$  of 0.901.
- 40Sp ( $4.83 \pm 0.34s$ ) was significantly predicted by Wt and BJ.
- Ht ( $p = 0.81$ ), VJ ( $p = 0.44$ ), 3C ( $p = 0.08$ ), and 20Sh ( $p = 0.70$ ) were not significant predictors of 40Sp in the tested population.
- 40Sp ( $4.73 \pm 0.31s$ ) was again significantly predicted by Wt and BJ.
- Ht ( $p = 0.93$ ), VJ ( $p = 0.84$ ), 3C ( $p = 0.36$ ), and 20Sh ( $p = 0.40$ ) were not significant predictors of 40Sp in the tested population.

## CONCLUSION

- These data suggest that elite-level player performance in the 40Sp can be predicted using the horizontal power exhibited in the broad jump performance and body weight of the athlete.

## PRACTICAL APPLICATIONS

- These findings support assessing elite-level athletes short-burst sprint performance and explosive power by focusing on horizontal power specifically exhibited in the BJ.
- These NFL combine measures of BJ and Wt support coaches with assessments that maximize limited space and time to evaluate athletes and provide a practical correlate to the 40Sp.
- Strength and conditioning professionals who work with athletes where 40Sp or other sprinting performance is valued should focus on developing lower body horizontal power to help athletes.
- Additional consideration may focus on helping athletes cut weight prior to test day, and then build that athlete back up to his playing weight in sports like football where special value is placed on the 40Sp during the Combine, but may not hold practical use on the field.