



# IS THERE A DIFFERENCE BETWEEN OFFENSIVE AND DEFENSIVE LINEMAN'S ABSOLUTE AND RELATIVE PEAK FORCE AND TIME-SPECIFIC FORCE OUTPUTS?



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## INTRODUCTION

Offensive and defensive linemen need a high level of both force and strength for the specific needs of their position. While absolute force is important, relative force (accounting for one's mass) can become a valuable assessment metric for the athlete's overall success at their specific position. Relative and absolute values of peak force (PF) and time-specific force production can also provide more detailed information for the athlete, staff, and the overall need for similarity within the line positions on both sides of the ball.

## METHODS

Seven division II collegiate football offensive linemen (age =  $19.43 \pm 0.98$  mass =  $126.16 \pm 5.91$  kg, height =  $189.36 \pm 2.30$  cm) and six defensive linemen (age =  $21.00 \pm 1.10$  mass =  $113.25 \pm 10.57$  kg, height =  $186.63 \pm 3.29$  cm) volunteered for the study. Any present injury excluded the participant from the study. Each participant performed three IMTP with a knee angle between  $125^\circ$ - $145^\circ$  degrees. Three minutes of rest were given between each IMTP. A wireless uniaxial dual force plate system sampling at 1,000 Hz was used to collect the provided metrics of relative force (peak force, PF50, PF100, PF150, PF200, and PF250) and absolute force (peak force, PF50, PF100, PF150, PF200, and PF250). The best IMTP attempt was used for assessment. A Kruskal-Wallis non-parametric test was used for analysis, an alpha of 0.05 was used for the level of significance.



Figure 1. Representation of the Isometric Mid-Thigh Pull Positioning to receive force output data.

## RESULTS

The present findings observed no significant differences between offensive and defensive linemen for all absolute ( $p = 0.475 - 0.886$ ) and relative variables ( $p = 0.317-0.568$ ).

## CONCLUSIONS

The present findings observed no significant differences between the offensive and defensive linemen for either absolute or relative force values.

## PRACTICAL APPLICATIONS

These findings suggest that although there is typically a distinction between offensive and defensive line performance metrics, the present study observed similar maximum and relative strength performance between the positions. These findings suggest other metrics besides maximum and rapid time-specific force characteristics may be needed to differentiate key performance metrics. Future studies may want to increase sample size for positions and may want to include other movement profiles (agility, explosive speed) to see other potential factors that differentiate offensive vs. defensive line play.

## ACKNOWLEDGEMENTS

UCO Football Team and Strength and Conditioning Staff.



Education and Professional Studies  
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Absolute Values		Relative Values	
PF50ms (N)	P = 0.668	PF50ms (N·Kg <sup>-1</sup> )	P = 0.391
PF100ms (N)	P = 0.475	PF100ms (N·Kg <sup>-1</sup> )	P = 0.317
PF150ms (N)	P = 0.668	PF150ms (N·Kg <sup>-1</sup> )	P = 0.568
PF200ms (N)	P = 0.668	PF200ms (N·Kg <sup>-1</sup> )	P = 0.568
PF250ms (N)	P = 0.886	PF250ms (N·Kg <sup>-1</sup> )	P = 0.568
PF (N)	P = 0.668	PF (N·Kg <sup>-1</sup> )	P = 0.475

Table 1. Data analysis comparison of absolute and relative values between offensive and defensive linemen force outputs. (PF = Peak Force).