AN ANALYSIS OF 20-YARD SPRINT PERFORMANCE WITHIN NCAA DIVISION-I FOOTBALL ATHLETES PREPARING FOR PRO DAY

S. Norwood, M.R. Rink, Q.R. Johnson, D. Cabarkapa, A.C. Fry

Jayhawk Athletic Performance Laboratory, University of Kansas, Lawrence Kansas

BACKGROUND

The NFL Combine and subsequent Pro Days are utilized to evaluate athleticism within collegiate American football populations. In collaboration with the University of Kansas Football sports performance staff, a training program which encompassed speed, strength, and agility was implemented, and the data presented here was from week two of the training program.

PURPOSE

The purpose of this study was to analyze initial sprint performance of American football collegiate athletes at specific distance intervals based on position groups.

METHODS

Athletes were grouped (i.e., Bigs, Mids, Skill); 10 (Bigs; n=4, mean±SD; height= 194.31±1.53 cm; weight= 130.09±11.51 kg, Mids; n=5, height= 188.98±5.702 cm; weight= 105.6±9.22 kg, Skill; n=1, height= 188.98 cm; weight= 89.86 kg) NCAA Division-I, American football athletes participated in this study. 20-yard linear sprinting speed data was collected at 333 Hz by using the 1080 Sprint 2 with a concentric load of 1kg. Absolute and relative maximal sprinting speed were assessed in 5-yard intervals. One-way ANOVA and descriptive statistics were performed on all variables, including the mean and standard deviations for sprinting speed relative to sprint distance. The Shapiro-Wilks test was conducted for normality, and the a priori alpha level was set at 0.05 for all analyses.

RESULTS

Significant differences were observed for measures of split time [s] 5-10 yds (p=0.020), average speed [m/s] 5-10 yds (p=0.027), split time [s] 10-15 yds (p=0.018), and average speed [m/s] 10-15 yds (p=0.025) between groups. No significant differences were observed for measures of split time 0-5 yds, avg. speed 0-5 yds, total time, and peak speed were observed. All measurements of significance were led by the Skill group.

CONCLUSIONS

The data collected can be interpreted that the distance intervals of 5-10 yds and 10-15 yds showed the most significant differences between the groups from both a velocity and duration standpoint. While the initial 5-yards and last 5-yards showed no significant differences between any groups. Recommendations to sport performance professionals may suggest training programs to emphasize technique and speed development to improve the absolute metrics shown in the present study.
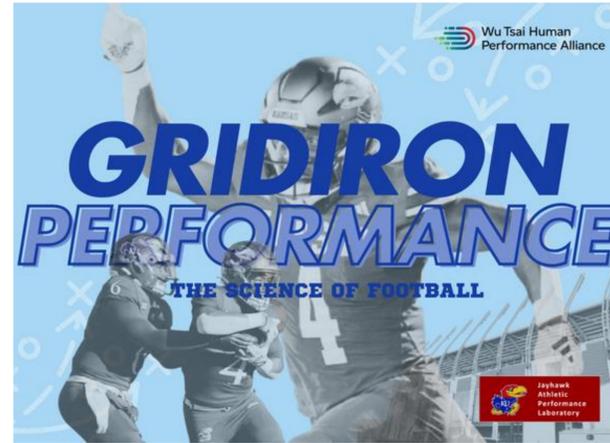

Table 1. One-way ANOVA, descriptive statistics, means and standard deviations ($\bar{x} \pm$ SD), for 20-yard sprint performance.

Variable	Bigs	Mids	Skill	p
Total time [s]	3.42 ± 0.22	3.15 ± 0.10	3.07	0.08
Top speed [m/s]	7.14 ± 0.36	7.62 ± 0.22	7.94*	0.05
Average speed [m/s]	5.37 ± 0.34	5.81 ± 0.18	5.96*	0.07
Peak speed [m/s]	7.96 ± 0.50	8.68 ± 0.66	9.61*	0.09
Split time [s] 0–5 yd	1.33 ± 0.14	1.19 ± 0.10	1.19	0.27
Average speed [m/s] 0–5 yd	3.48 ± 0.35	3.87 ± 0.31	3.85	0.25
Peak speed [m/s] 0–5 yd	5.72 ± 0.35	6.14 ± 0.34	6.52	0.12
Split time [s] 5–10 yd	0.77 ± 0.02	0.73 ± 0.02	0.71*	0.02
Average speed [m/s] 5–10 yd	5.97 ± 0.19	6.30 ± 0.14	6.48*	0.03
Peak speed [m/s] 5–10 yd	7.02 ± 0.23	7.19 ± 0.24	7.63	0.14
Split time [s] 10–15 yd	0.68 ± 0.02	0.64 ± 0.02	0.61*	0.02
Average speed [m/s] 10–15 yd	6.71 ± 0.24	7.14 ± 0.20	7.44*	0.03
Peak speed [m/s] 10–15 yd	7.61 ± 0.29	7.91 ± 0.33	8.61	0.06
Split time [s] 15–20 yd	0.64 ± 0.04	0.59 ± 0.02	0.55	0.07
Average speed [m/s] 15–20 yd	7.12 ± 0.43	7.67 ± 0.27	8.17*	0.05
Peak speed [m/s] 15–20 yd	7.96 ± 0.50	8.68 ± 0.66	9.61	0.09

* = significantly different when compared to Bigs and Mids (p < 0.05).

Figure 1. Average speed of 5-yard interval performance, sectioned by position group
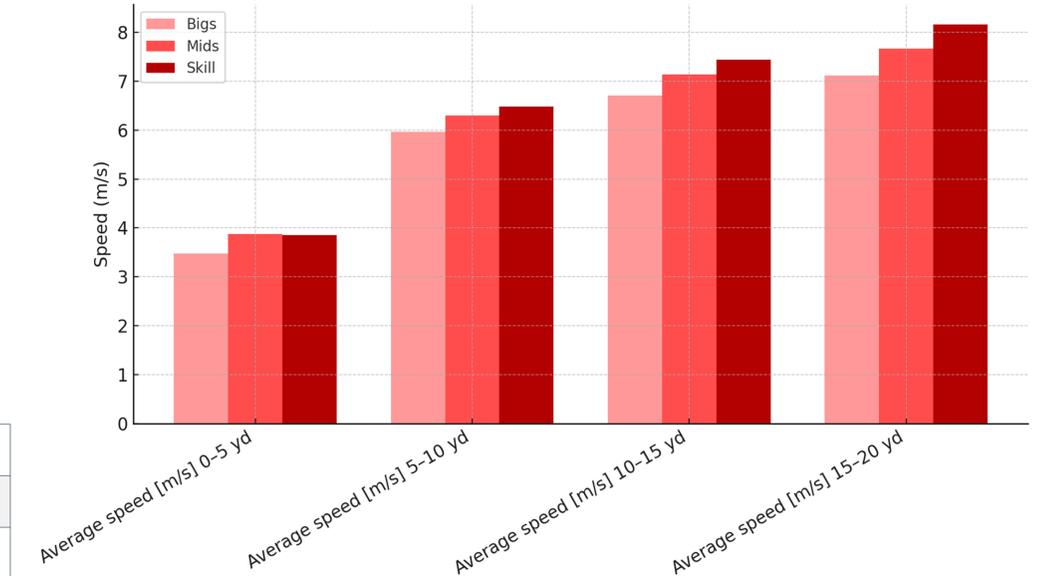
PRACTICAL APPLICATIONS

With the utilization of sprint performance technology, the 20-yard sprint assessment provided valuable information to better assist NFL Combine and Pro Day preparation. This information can be utilized by sports performance professionals to enhance athletic development, progression, and performance by identifying key distances that rely technical proficiency.

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