QUANTIFICATION OF GAME AND PRACTICE DEMANDS OF NCAA DIVISION II COLLEGE FOOTBALL PLAYERS USING GLOBAL POSITIONING SYSTEMS

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PURPOSE

The purpose of this study was to quantify the physical demands among different position group classifications in college football throughout a full competitive season and the differences between the groups.

METHODS

- 32 male NCAA Division II football players wore 10hz GPS units throughout the 2022 fall football season.
- Athletes were divided into three categories: skill (QB, RB, SAM, WR, S, and CB), big skill (TE, OLB and ILB), and bigs (C, OT, DT, and DE).
- The season was divided into three types of events: fall camp, in-season practice, and games.
- From the data recorded, total distance (TD), walk distance (WD, ≤2.5mph), jog distance (JD, 2.5-10.7 mph), run distance (RD, 10.7-14.1 mph), sprint distance (SD, >14.1 mph), and top speed (TS) were used for the analysis.

RESULTS

- There was a significant difference ($p \leq 0.05$) in TD between all groups in fall camp and in-season practice. There was no significant difference ($p > .05$) in TD among any groups in games.
- The RD was significantly ($p < .001$) greater in the skill group for fall camp and in-season practice but was significantly ($p \leq 0.05$) greater in big skills during games.
- SD and TS were also significantly ($p < .001$) greater during fall camp and in-season practice for the skill position group, but there was no significant difference ($p > .05$) with the big skills in these metrics during games.
- The bigs position group was significantly ($p < .001$) lower than both groups in RD, SD, and TS for all event types. See Table 1. for descriptive statistics.

CONCLUSION

No significant difference in TD were observed for games. This indicates that all athletes cover similar distance just in different ways throughout a game. However, the skill group covers greater distances at higher speeds than any other group during fall camp and in-season practice, but similar SD and TS to big skills in games.

PRACTICAL APPLICATION

The data suggests that skill, big skill, and bigs experience different demands throughout a competitive football season. This information implies that each player type may need a specific training approach for high-speed running.

Skill players may benefit from a progressive increase in high-speed running to prepare them for their intense fall camp and in-season practice demands. Big skill may need more top speed exposure during practices to prepare them for game demands and improve performance.

> Skill players cover greater distances at higher speeds during practices and fall camp than other groups but have similar distances and speeds as big skill players during games.


Classification	Speed Range (mph)
Walk	< 2.5
Jog	2.5 – 10.7
Run	10.7 – 14.1
Sprint	> 14.1
Hard Running	> 10.1

Table 1
Position Group Differences Within Fall Camp, In-Season Practice, and Games

	Fall Camp			In-Season Practice			Games		
	Skill	Big Skill	Bigs	Skill	Big Skill	Bigs	Skill	Big Skill	Bigs
Total Distance (yds)	5926.9 ±917.5	5558.2 ±851.6†	4725.7 ±643.6†§	5368.1 ±1183.2	5544.3 ±921.5	4322.7 ±826.9†§	5036.9 ±1087.9	5388.9 ±1521.7	4807.8 ±961.8
Walk Distance (yds)	2981.3 ±464.6	3016.4 ±468.3	2891.1 ±419.2	2531.1 ±588.2	2628.9 ±563.6	2529.1 ±529.7	3012.1 ±573.6	2864.1 ±834.6	2767.2 ±464.3
Jog Distance (yds)	2671.4 ±619.2	2386.7 ±494.7†	1815.8 ±424.5†§	2562.5 ±664.0	2754.9 ±502.9†	1784.8 ±413.6†§	1798.7 ±717.2	2240.1 ±765.2†§	1994.6 ±673.9
Run Distance (yds)	182.6 ±94.0	117.7 ±54.1†	16.8 ±17.5†§	187.4 ±137.6	124.1 ±52.3†	7.9 ±10.9†§	141.9 ±81.7	178.6 ±88.3†	39.7 ±28.4†§
Sprint Distance (yds)	91.7 ±76.7	37.3 ±33.9†	1.9 ±4.4†§	87.1 ±70.2	36.3 ±34.9†	.92 ±3.1†§	84.1 ±73.1	106.1 ±105.3	6.3 ±10.1†§
Top Speed (mph)	18.7 ±1.7	17.2 ±1.6†	13.8 ±1.8†§	18.6 ±1.7	17.3 ±1.8†	12.9 ±2.2†§	18.6 ±2.2	18.1 ±1.9	14.9 ±1.7†§

*Data are mean ± SD
† Significantly different ($p \leq 0.05$) for Skill
§ Significantly different ($p \leq 0.05$) to Big Skill

FALL CAMP

IN-SEASON PRACTICE

GAMES
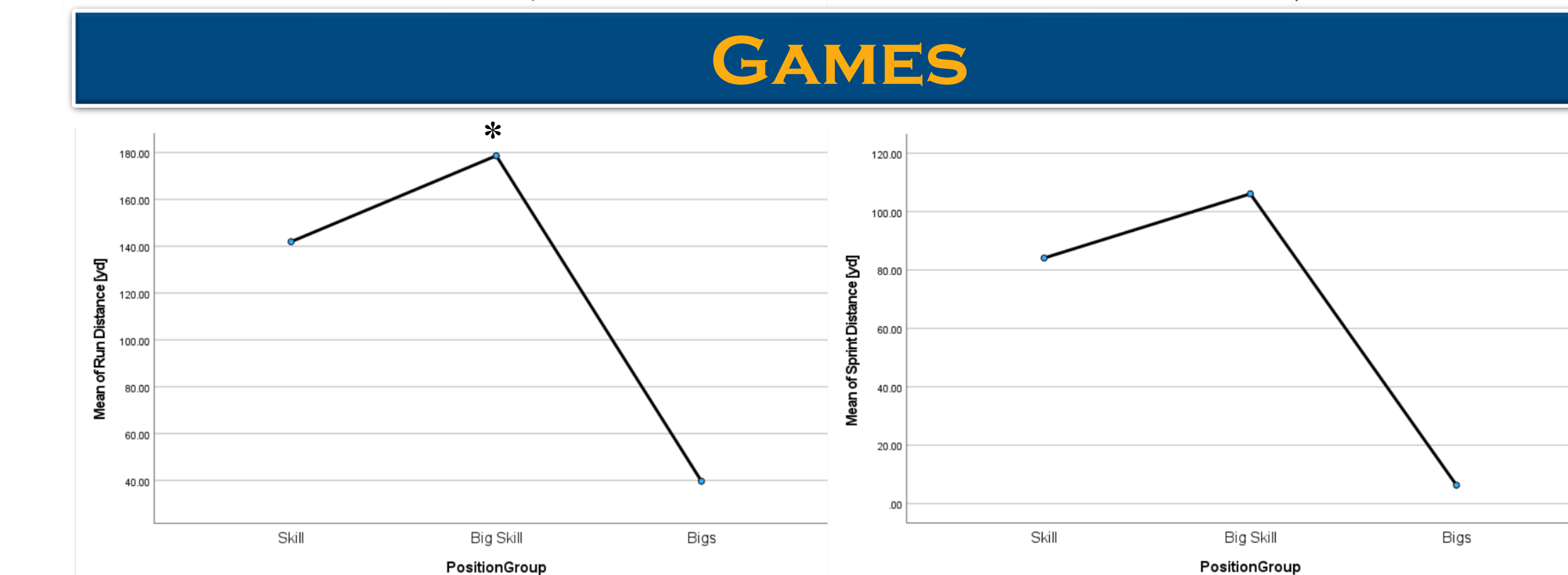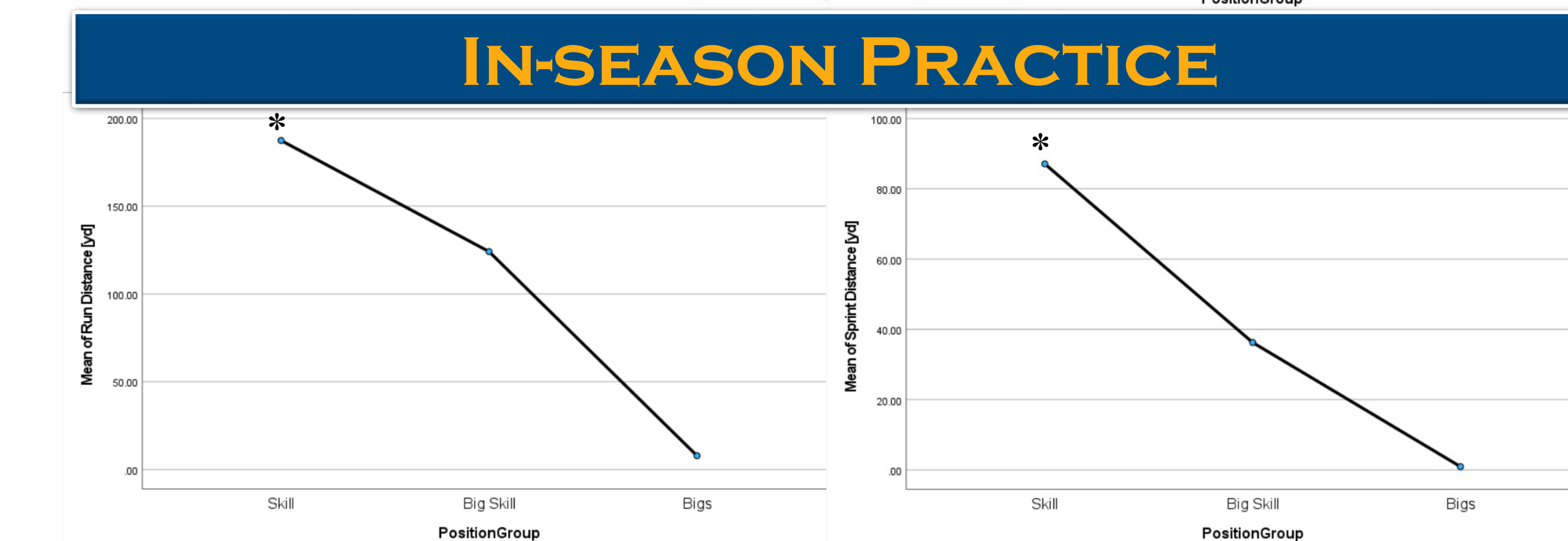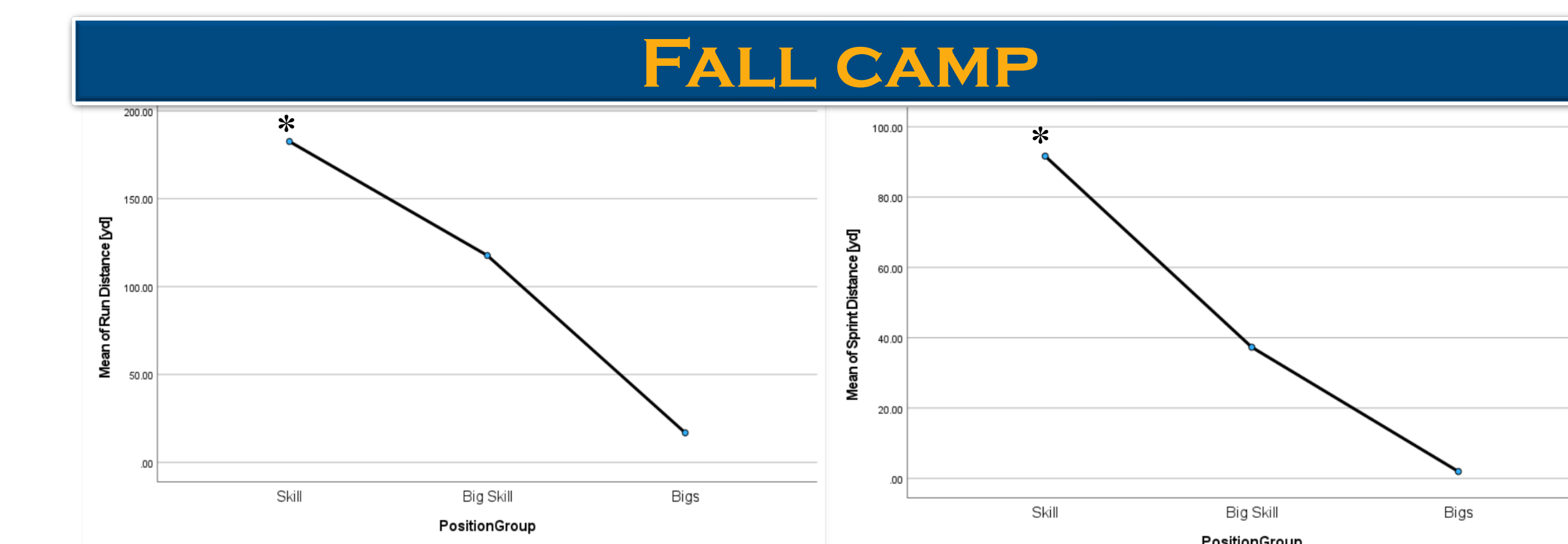
✱ Significantly higher than other groups