SPRINT STEP KINEMATIC ASYMMETRIES DO NOT DIFFER ACROSS BASKETBALL, FOOTBALL, AND TRACK ATHLETES

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INTRODUCTION

- Interlimb asymmetry has been identified as the differences in strength and performance between the limbs of an individual.
- The presence of asymmetry can vary depending on the demands of the sport. While track, football, and basketball have different sport demands, all require sprinting.
- Yet it remains unclear if the demands required by various sports result in differing interlimb asymmetries during sprinting and if that is a potential risk factor of an injury.

PURPOSE

- To identify differences in contact time, flight time, and step length asymmetries during sprinting between basketball, football, and track athletes.

METHODS

- Ninety-three male collegiate athletes (basketball = 13, football = 66, and track = 14) completed two to three trials of sprints over 30 meters with sprint step kinematics measured with the Optojump-Next system.
- The best-timed trial of each athlete was analyzed with a focus on asymmetries in contact time, flight time, and step length over four steps.
- The average asymmetry between these steps was used for analysis. Asymmetries were quantified using the symmetry index equation [(higher value-lower value)/total*100].
- A one-way analysis of variance (ANOVA) was then conducted to determine the differences in contact time, flight time, and step length asymmetries between the groups.
- Significance was set at an alpha level of $p < 0.05$.

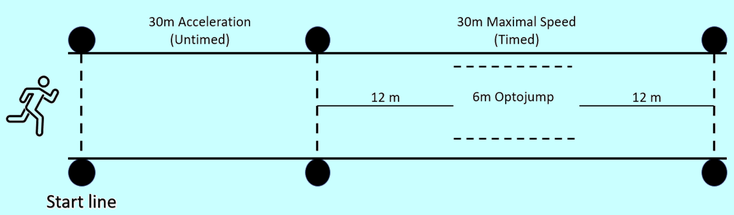
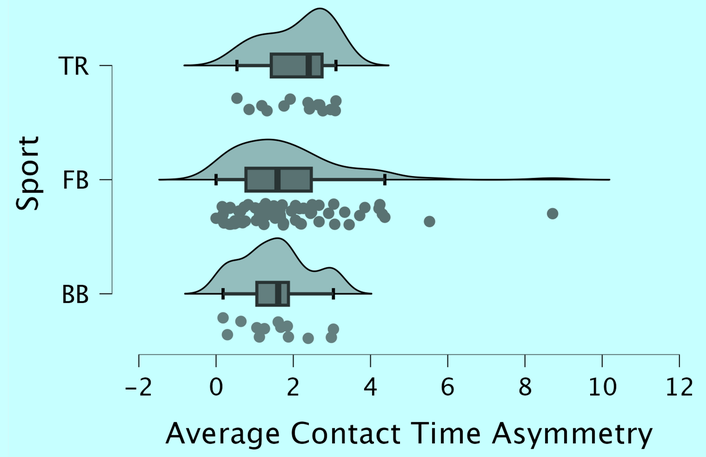
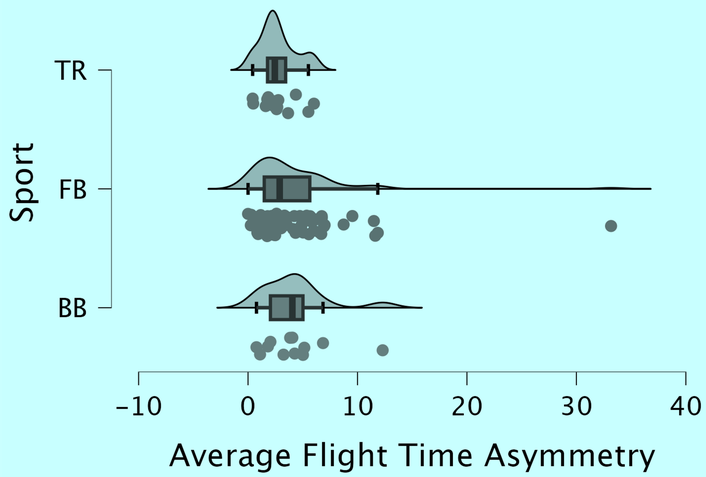


Figure 1. Illustrates the set up for fly sprint testing.





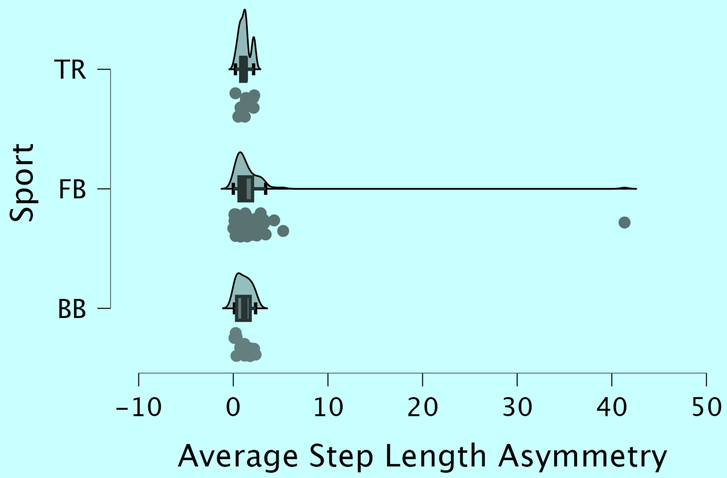


Table 1. Means ± Standard Deviations and between group comparisons of Sprint Asymmetries.

	All Athletes	Football (n=17)	Basketball (n=14)	Track (n=15)
Step Length Asymmetry (%)	1.75. ± 4.27	2.00 ± 5.04	1.12± 0.76	1.19 ± 0.62
Contact Time Asymmetry (%)	1.87 ± 1.35	1.88 ± 1.50	1.54 ± 0.91	2.12 ± 0.86
Flight Time Asymmetry (%)	3.90 ± 4.11	4.08 ± 4.62	4.26 ± 2.99	2.73 ± 1.66

§ = significant difference from distance group † = significant difference from jumpers & throwers group

RESULTS

- There was no significant difference in contact time asymmetries between the basketball (1.536 ± 0.912%), football (1.880 ± 1.499%), and track athletes (2.116 ±0.858%) (p=0.537).
- There was no significant difference in flight time asymmetries between the basketball (4.262 ± 2.993%), football (4.080 ± 4.619%), and track athletes (2.730 ± 1.664%) (p=0.511).
- Finally, no significant differences were found in step length asymmetries between the basketball (1.117 ± 0.758%), football (1.997 ±5.039%) and track athletes (1.194 ± 0.617%) (p=0.693).

CONCLUSION

- Despite differences in training between each sport, it appears that there is no significant differences in sprinting asymmetry between the three sports

PRACTICAL APPLICATIONS

- Lack of differences in the spatiotemporal asymmetry variables during the sprinting indicate that current training methods yield similar and only minimal asymmetry patterns among basketball, football, and track athletes.

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