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Does Neck Strength in Male and Female Youth Soccer Players Affect Head Velocity During Goal-Directed Heading: A Proposal

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Does Neck Strength in Male and Female Youth Soccer Players Affect Head Velocity During Goal-Directed Heading?: A Proposal



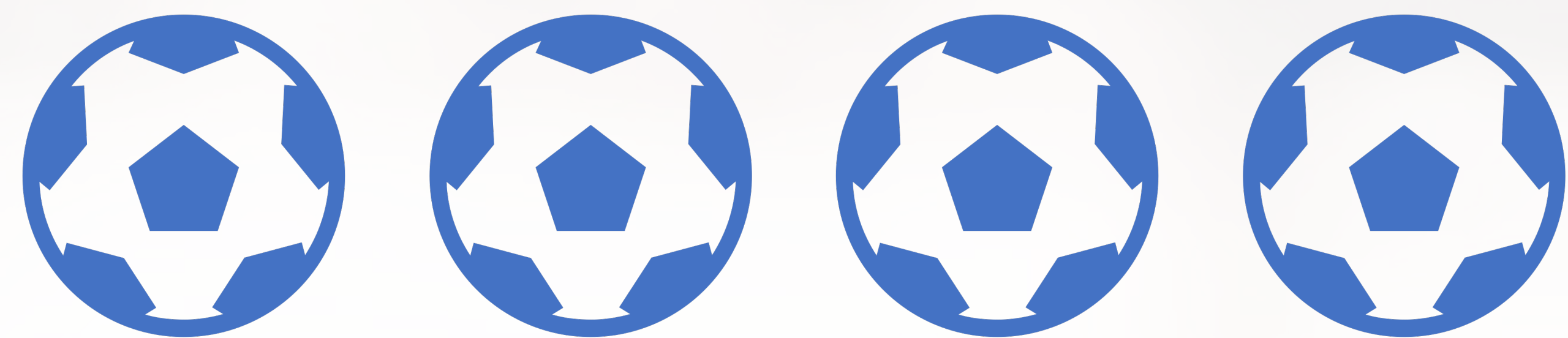
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Introduction

1

- Head impact research in soccer has increased recently, with the intent to reduce the risk of play-related concussions
- Low neck strength and head kinematics (e.g., velocity) have been proposed as risk factors for concussions ¹
- Previous research has primarily focused on collegiate athletes ¹, despite the possible increased risk for youth players due to crucial neurodevelopment occurring in this group ²



Purpose

2

Determine neck strength differences between male and female youth soccer players, and to quantify the relationship between heading velocities and neck strength.

Methods

3

- Participants: male and female youth soccer players (11-13 years old)
- **Neck Strength Protocol**
 - measured using a prone push test with a hand-held dynamometer
- **Heading Protocol**
 - Five headers in the lab to the right, left, and center
 - Three retroreflective markers on participants' heads



Figure 1. GoPro Set Up

- Five GoPro Hero 9 cameras
- ProAnalyst motion capture analysis software will be used to determine head velocities

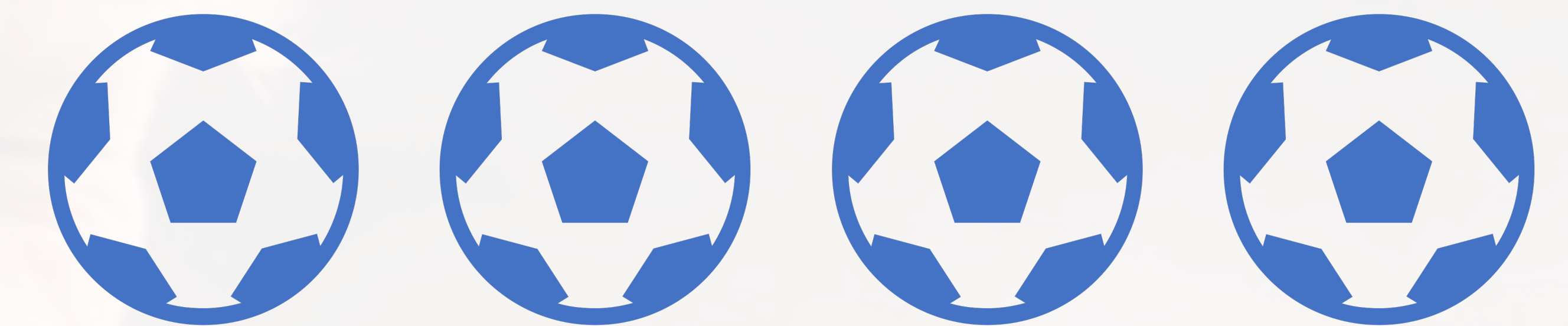
Expected Results

4

- Youth with lower neck strength will have increased head velocities during purposeful heading
- Females will have lower neck strength, and therefore higher head velocities in comparison to their male counterparts

Table 1. Expected neck strength and head velocity results.

Sex	Neck Strength	Head Velocity
♀	↓	↑
♂	↑	↓



References

1. Dezman, D. et al. (2013) *Sports Health*, 5(4), 320-326.
2. Patel, R. et al. (2005). *Sports Med.*, 35(8), 671-84.
3. Riehm, K. (2015). [Watermark]. Getty Images