Association of Perception-Action Coupling with Concussion History and Self-Rated Function

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BACKGROUND AND PURPOSE

- Up to 1.2 million injuries per year occur in high school and college football, most of which are sprains and strains.
- Athletes who have sustained a concussion appear to be at greater risk for sustaining a musculoskeletal injury.
- Risk factors for football-related injury may include deficits in reaction time (RT), memory, and peripheral vision.
- RT encompasses amount of time required for: 1) perception, 2) decision, and 3) motor response.
- Cognitive control refers to brain processes associated with perception, memory, and action.
- Perception-action coupling specifically refers to rapid responsiveness to environmental stimuli.
- Anticipation and/or rapid muscle activation that initiates movement and optimizes stiffness of body segments.

RESULTS

- Reactive agility performance summary statistics for cohort of 71 college football players presented in Table 1.
- Performance differences in right-left directions found to have strong associations with Concussion History.
- Stratified RT, Speed, and Deceleration % Difference mean and median values presented in Table 2.
- Results of univariable and multivariable analyses for association with Concussion History presented in Table 3.

PARTICIPANTS AND PROCEDURES

- 71 NCAA Division I-FCS football players (19.5 ± 1.1 yrs; 103.49 ± 21.53 kg; 186.45 ± 6.35 cm) tested.
- Testing conducted 2 months after conclusion of football season and 3 weeks prior to initiation of spring practices.
- Concussion history based on athlete self-report of previous diagnosis as having sustained at least one concussion.

CONCLUSION

- Reactive agility test may relate to perception-action coupling deficiency that underlies the association between concussion and increased musculoskeletal injury risk.

REFERENCES