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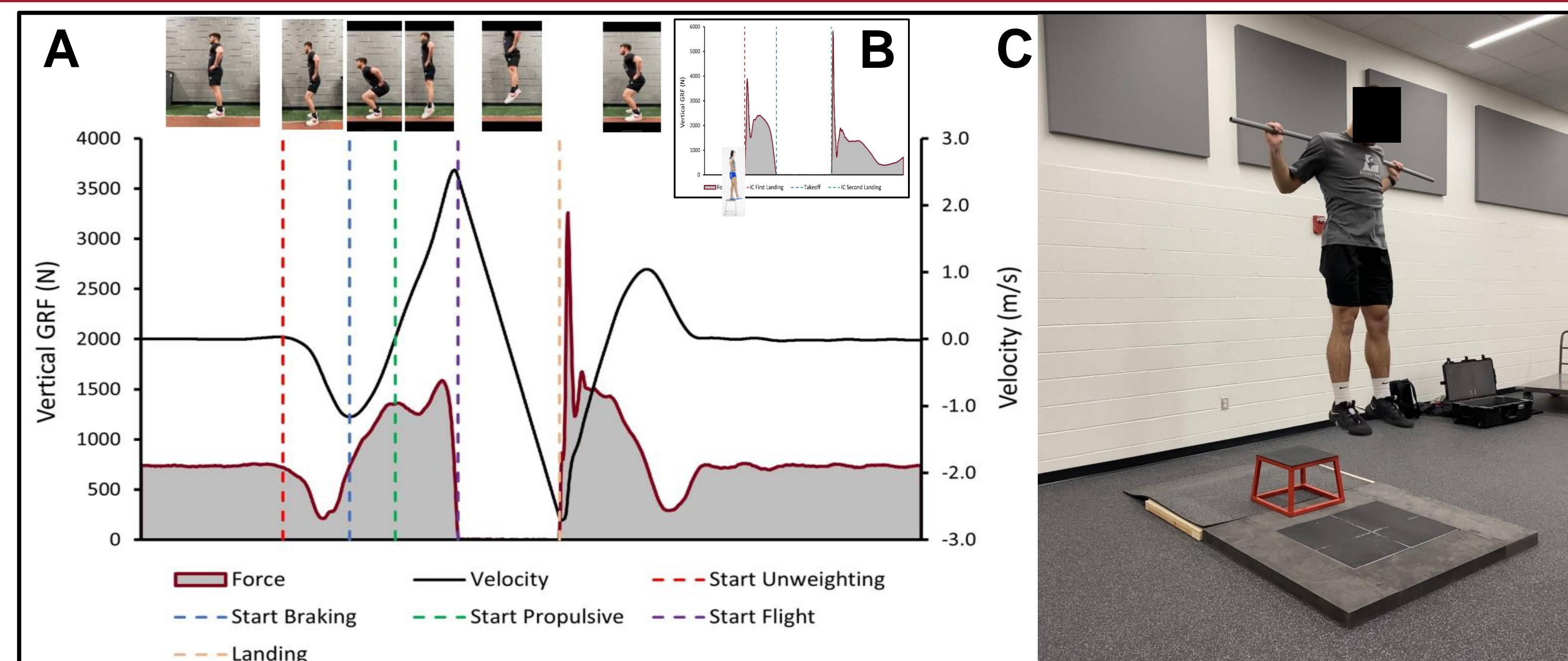
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## INTRODUCTION

- It is important to have measurements that can help determine the needs of the individual athlete as it pertains to power production.
- The reactive strength index (RSI) is a measurement of the ratio between jump height (RSI<sub>JH</sub>) or flight time (RSI<sub>FT</sub>), and ground contact time while performing a maximal effort drop jump (DJ).
- Modified RSI (mRSI) is the ratio between jump height (mRSI<sub>JH</sub>) or flight time (mRSI<sub>FT</sub>), and time-to-takeoff (TTT) when performing a maximal countermovement vertical jump (CMJ).
- The purpose of this study was to evaluate the relationship between RSI and mRSI and provide descriptive data reflective of Division III athletes.

## METHODS



**Figure 1.** Vertical ground reaction force (GRF) for the countermovement jump (A), and drop jump (B), and a participant performing the drop jump (C).

- Data collection consisted of 214 Division III athletes (129 males and 85 females) of various sports.
- Participants performed a set of three countermovement jumps and three drop jumps from a 30-cm box onto a set of force plates (Hawkin Dynamics, Westbrook, ME) and vertical ground reaction force (vGRF) was used to quantify RSI and mRSI based off either jump height based off take-off velocity or flight time.
- Pearson's correlations were used to determine the associations between the RSI variables and descriptive statistics with quartiles to display the 25th, 50th, and 75th percentile as well as each individual sport's mean values.

## RESULTS

**Table 1a.** Descriptive statistics by sport for each reactive strength index variation. Data is represented as mean±standard deviation (25th, 50th, and 75th percentiles).

Sport	n	RSI <sub>FT</sub>	RSI <sub>JH</sub>	mRSI <sub>FT</sub>	mRSI <sub>JH</sub>
Men	129	2.18±0.59 (1.78, 2.17, 2.54)	1.41±0.62 (1.02, 1.34, 1.65)	0.73±0.13 (0.64, 0.74, 0.81)	0.51±0.13 (0.42, 0.5, 0.58)
Women	85	1.52±0.68 (1.02, 1.24, 1.76)	0.74±0.49 (0.43, 0.57, 0.89)	0.56±0.1 (0.48, 0.55, 0.62)	0.31±0.08 (0.25, 0.3, 0.35)
Football Linemen	27	1.7±0.43 (1.37, 1.62, 2.03)	0.9±0.32 (0.69, 0.91, 1.11)	0.65±0.13 (0.54, 0.64, 0.76)	0.41±0.11 (0.33, 0.4, 0.49)
Football TE, LB	23	2.08±0.39 (1.88, 2.06, 2.22)	1.25±0.27 (1.1, 1.25, 1.36)	0.71±0.11 (0.64, 0.72, 0.78)	0.48±0.09 (0.44, 0.49, 0.52)
Football RB, QB, DB, Rec	47	2.41±0.42 (2.14, 2.37, 2.68)	1.66±0.35 (1.45, 1.6, 1.94)	0.77±0.09 (0.69, 0.78, 0.83)	0.56±0.08 (0.49, 0.55, 0.61)
Football Specialist	5	1.93±0.57 (1.82, 1.96, 2.41)	1.35±0.58 (1.15, 1.42, 1.77)	0.71±0.15 (0.59, 0.73, 0.75)	0.48±0.14 (0.36, 0.45, 0.58)
Men's Basketball	13	2.45±0.51 (2.14, 2.26, 2.77)	1.53±0.51 (1.22, 1.37, 1.91)	0.8±0.14 (0.74, 0.81, 0.83)	0.57±0.14 (0.5, 0.54, 0.6)
Men's Tennis	8	1.55±0.3 (1.34, 1.52, 1.71)	0.8±0.25 (0.66, 0.76, 0.99)	0.59±0.06 (0.55, 0.58, 0.62)	0.39±0.06 (0.35, 0.39, 0.41)
Men's Track	6	3.38±0.51 (3.05, 3.49, 3.72)	3.05±0.91 (2.52, 2.95, 3.74)	0.9±0.15 (0.88, 0.96, 0.98)	0.73±0.13 (0.75, 0.79, 0.79)
Women's Basketball	11	1.96±0.59 (1.52, 1.83, 2.43)	1.0±0.37 (0.69, 1.02, 1.31)	0.64±0.09 (0.58, 0.67, 0.69)	0.34±0.07 (0.29, 0.35, 0.37)
Women's Lacrosse	17	1.31±0.32 (1.12, 1.2, 1.43)	0.6±0.2 (0.44, 0.54, 0.76)	0.52±0.09 (0.46, 0.5, 0.6)	0.28±0.06 (0.24, 0.27, 0.32)
Women's Soccer	23	1.14±0.21 (0.96, 1.11, 1.31)	0.51±0.14 (0.44, 0.48, 0.63)	0.54±0.07 (0.49, 0.54, 0.58)	0.29±0.05 (0.26, 0.3, 0.32)
Women's Tennis	11	1.08±0.37 (0.94, 1, 1.04)	0.39±0.23 (0.28, 0.29, 0.4)	0.46±0.06 (0.42, 0.46, 0.49)	0.25±0.04 (0.22, 0.25, 0.28)
Women's Track	12	2.71±0.61 (2.32, 2.68, 3.01)	1.64±0.50 (1.32, 1.79, 1.9)	0.67±0.10 (0.6, 0.66, 0.73)	0.41±0.08 (0.36, 0.4, 0.45)
Women's Volleyball	11	1.32±0.28 (1.13, 1.28, 1.51)	0.56±0.20 (0.47, 0.56, 0.62)	0.54±0.07 (0.49, 0.55, 0.6)	0.3±0.06 (0.27, 0.29, 0.34)

**Table 1b.** Pearson's correlations represented as r [95% confidence intervals], n = 214.

	RSI <sub>FT</sub>	RSI <sub>JH</sub>	mRSI <sub>FT</sub>	mRSI <sub>JH</sub>
RSI <sub>JH</sub>	0.92 [0.9, 0.94]			
mRSI <sub>FT</sub>	0.72 [0.65, 0.78]	0.73 [0.66, 0.78]		
mRSI <sub>JH</sub>	0.74 [0.67, 0.8]	0.79 [0.74, 0.84]	0.96 [.95, 0.97]	

DB, defensive back; LB, linebacker; mRSI<sub>FT</sub>, Reactive strength index as the ratio between flight time and time-to-takeoff when performing a countermovement jump; mRSI<sub>JH</sub>, Reactive strength index as the ratio between jump height derived from takeoff velocity and time-to-takeoff when performing a countermovement jump; QB, quarterback; RB, running back; Rec, receiver; RSI<sub>FT</sub>, Reactive strength index as the ratio between flight time and contact time when performing a drop jump; RSI<sub>JH</sub>, Reactive strength index as the ratio between jump height derived from takeoff velocity and contact time when performing a drop jump; TE, tight end.

## CONCLUSIONS & PRACTICAL APPLICATIONS

- Calculations of RSI and mRSI are not equivalent and the use of jump height or flight time are not interchangeable, therefore practitioners should be consistent in the method used to calculate these metrics.
- RSI and mRSI values will be different based off the demands of each individual sport, position, and phase of training. Sports and training phases with a higher explosive power emphasis should be expected to perform higher on both the RSI and mRSI and displayed in Table 1.
- These scores can be used as an indication for training needs and sport readiness for Division III athletes.