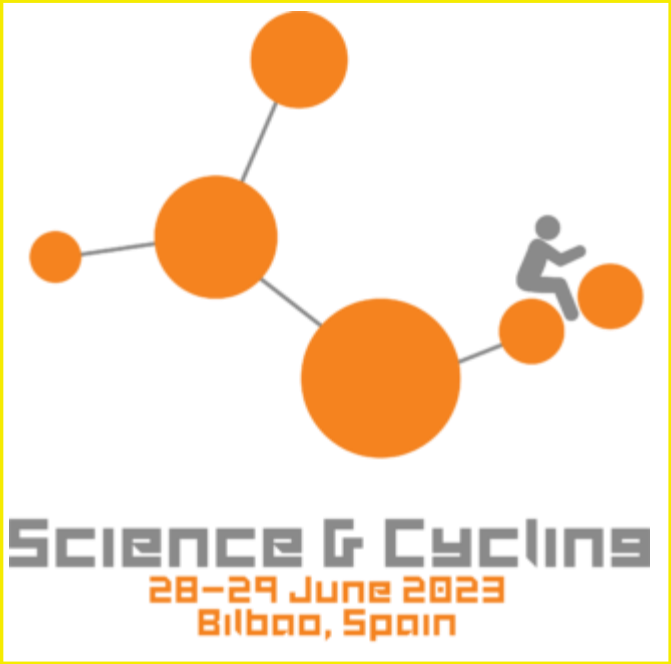
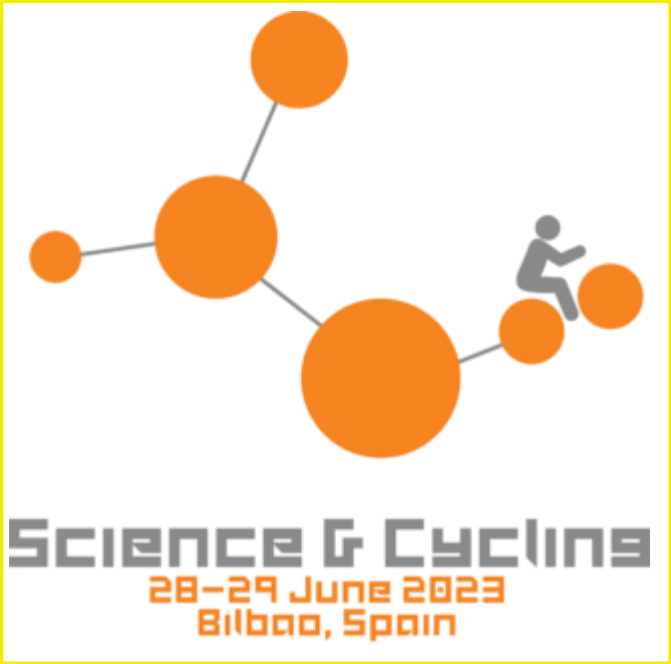


How strong is strong enough – torque demands across cycling disciplines.

Chris Peden, John Wakefield and Peter Leo

@ChrisPeden82, @Pelotrain, @peter__leo



Chris Peden

@ChrisPeden82

How Strong is Strong Enough?

Honestly?

WE JUST DON’T KNOW

What do we know about S&C?

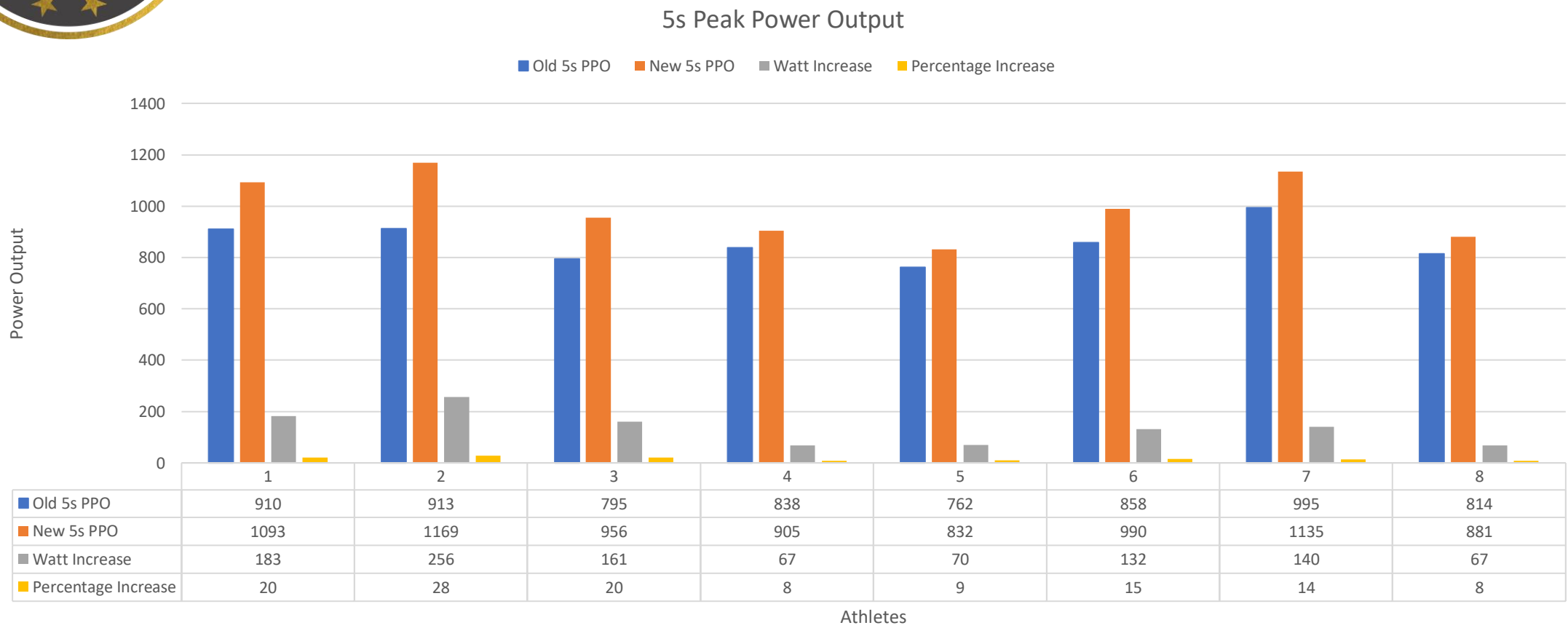
- Peak Power (Wingate & 6s Sprint) ✓
- Time Trial Performance ✓
- Power at OBLA (4 mmol.L^{-1}) ✓
- Detraining effect within 4-8 weeks ✗
- Maintenance is key ✓

(Aagaard et al., 2011; Rønnestad et al., 2015, 2016, 2017; Gil-Cabrera et al., 2021; Valenzuela et al., 2021; Rønnestad, 2022)

My approach to S&C

- Working with a mix of UCI WTW and UCI CTW riders
- Research to Practice
- Communication with coach and rider and planning accordingly around races
- Exercise Selection
- Volume (Sets & Reps)
- Range of Motion
- RPE/RIR (subjective feedback)
- Injury management

What am I seeing?



	1	2	3	4	5	6	7	8
Old 5s PPO	910	913	795	838	762	858	995	814
New 5s PPO	1093	1169	956	905	832	990	1135	881
Watt Increase	183	256	161	67	70	132	140	67
Percentage Increase	20	28	20	8	9	15	14	8

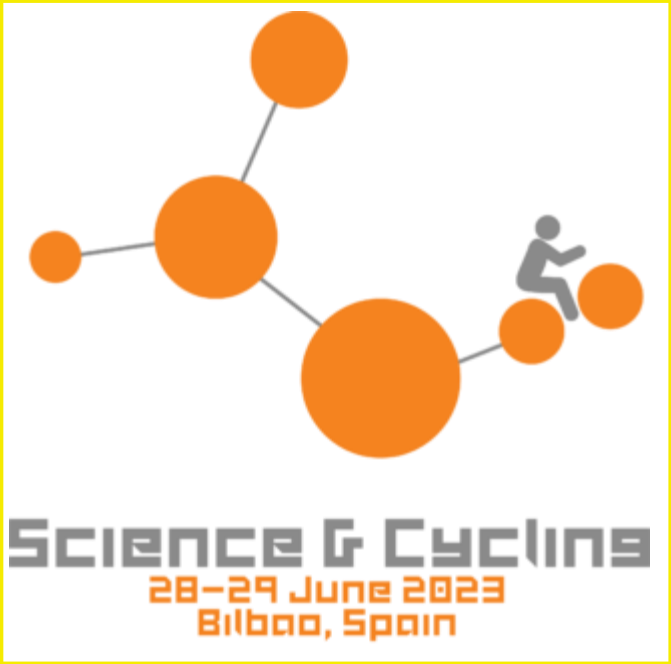
Average Watt Increase: 135w ± 67w Average Percentage Increase: 15% ± 7%

Final thoughts…

- Develop athletic qualities that cycling doesn't provide
- ↑ Strength = ↑Torque
- In-Season S&C is hard to manage but not impossible

What do we know about S&C?

- Scan the QR code to read my review on The Benefits of Strength Training on Cycling Performance and its usefulness for Elite Male and Female Professional Cyclists.



John Wakefield

@Pelotrain

How road and MTB XC athletes can benefit from “on-bike” strength training

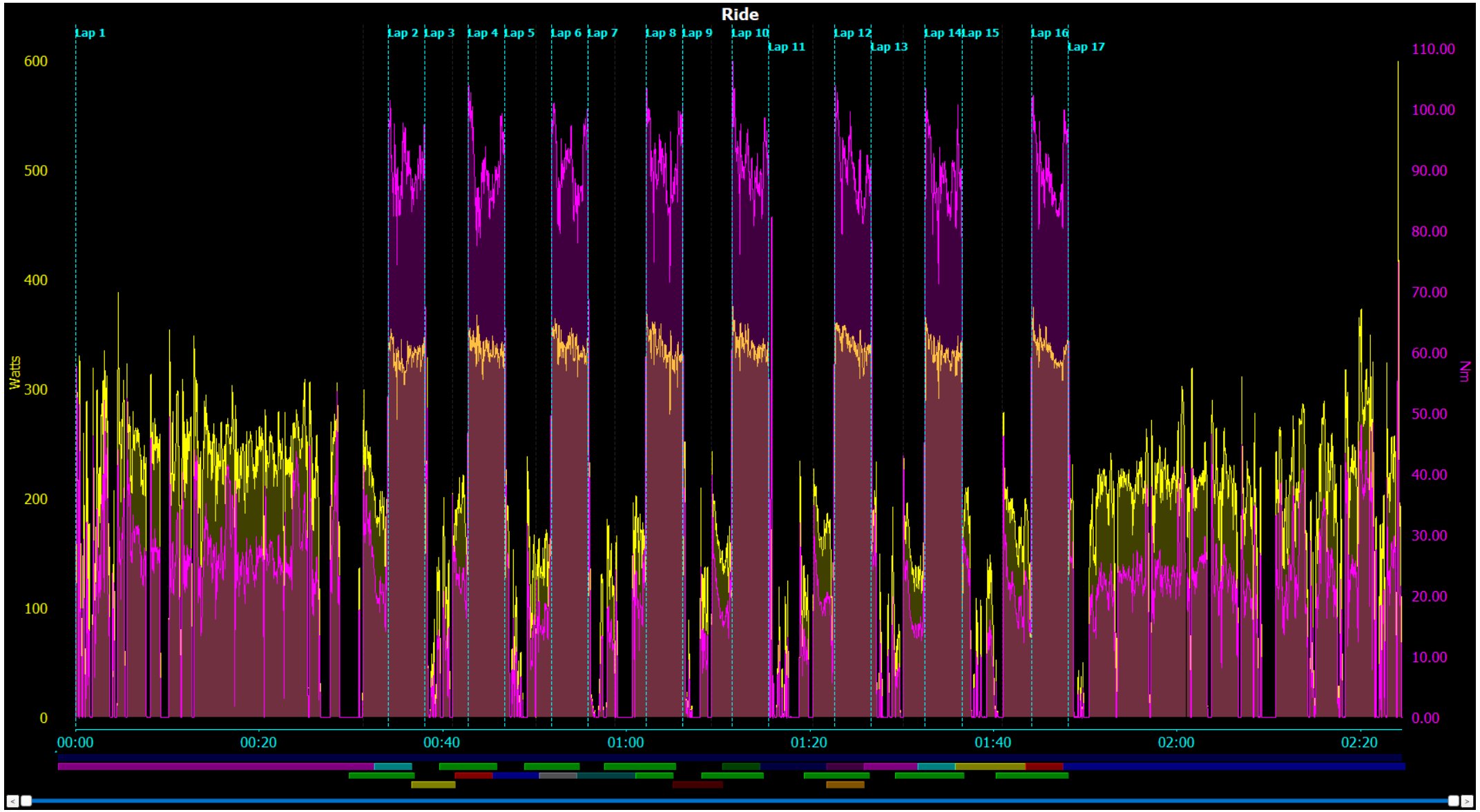
- What is torque?
- How do we measure it?
- What do we know?
- What do we see in real world implementation with athletes?

What is Torque?

Torque is the rotational force applied to the pedals during each pedal stroke.

It is calculated by multiplying the force applied to the pedals, by the crank length (lever arm). Crank length will be constant, so torque is really an indicator of the force applied to the pedal.

How do we measure it?



What do we know?

No studies have conclusively shown that low cadence work improves performance – Why?

Probably methodology related:

- Need to use really low cadence (maybe fear of injuring the cyclist)
- Measuring performance in terms of recent advances – durability instead of VO_{2max} or PPO

Recent study highlights importance of torque

International Journal of Sports Physiology and Performance, (Ahead of Print)
https://doi.org/10.1123/ijspp.2022-0233

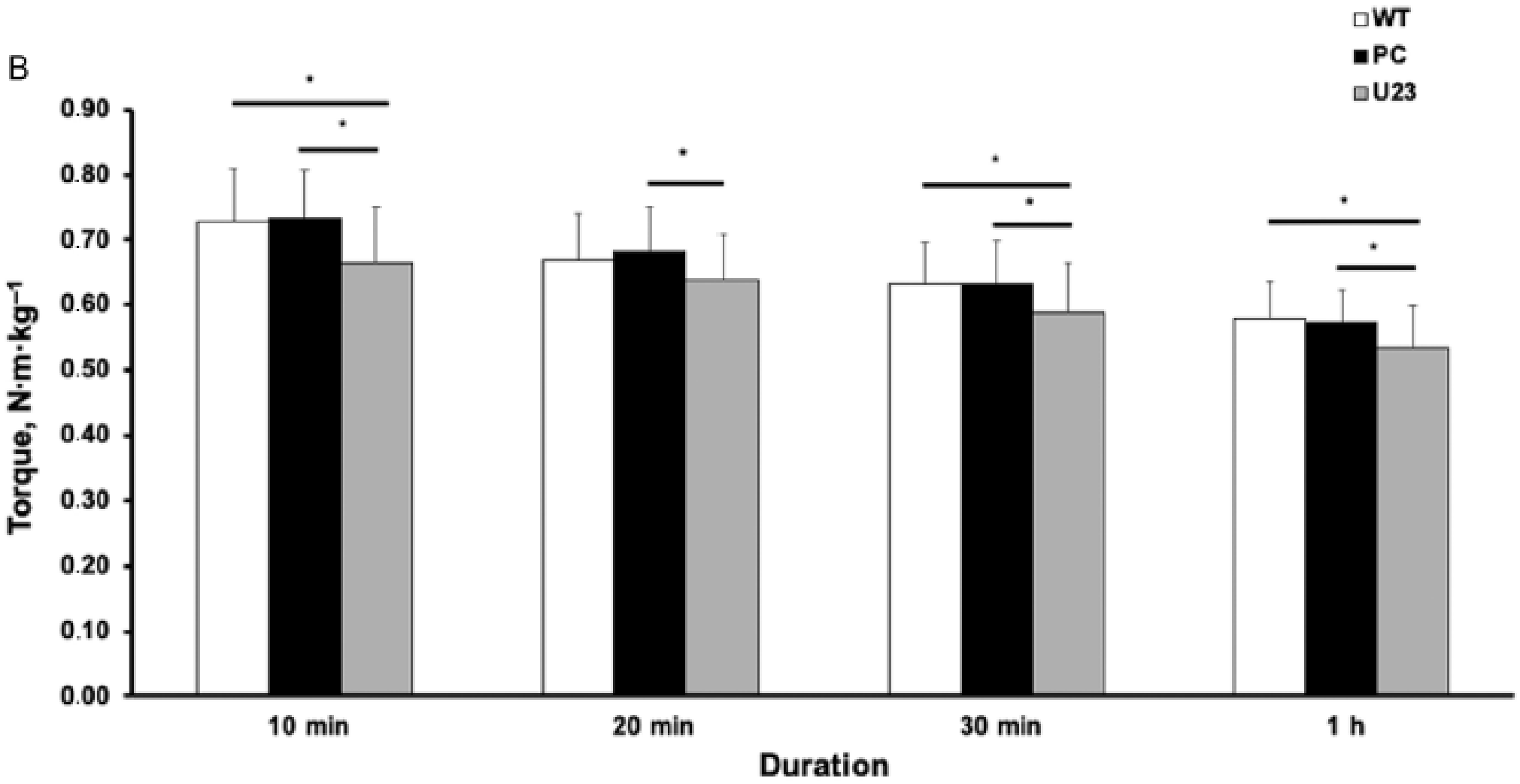
First Published Online: Dec. 5, 2022

Human Kinetics
ORIGINAL INVESTIGATION

Influence of Torque and Cadence on Power Output Production in Cyclists

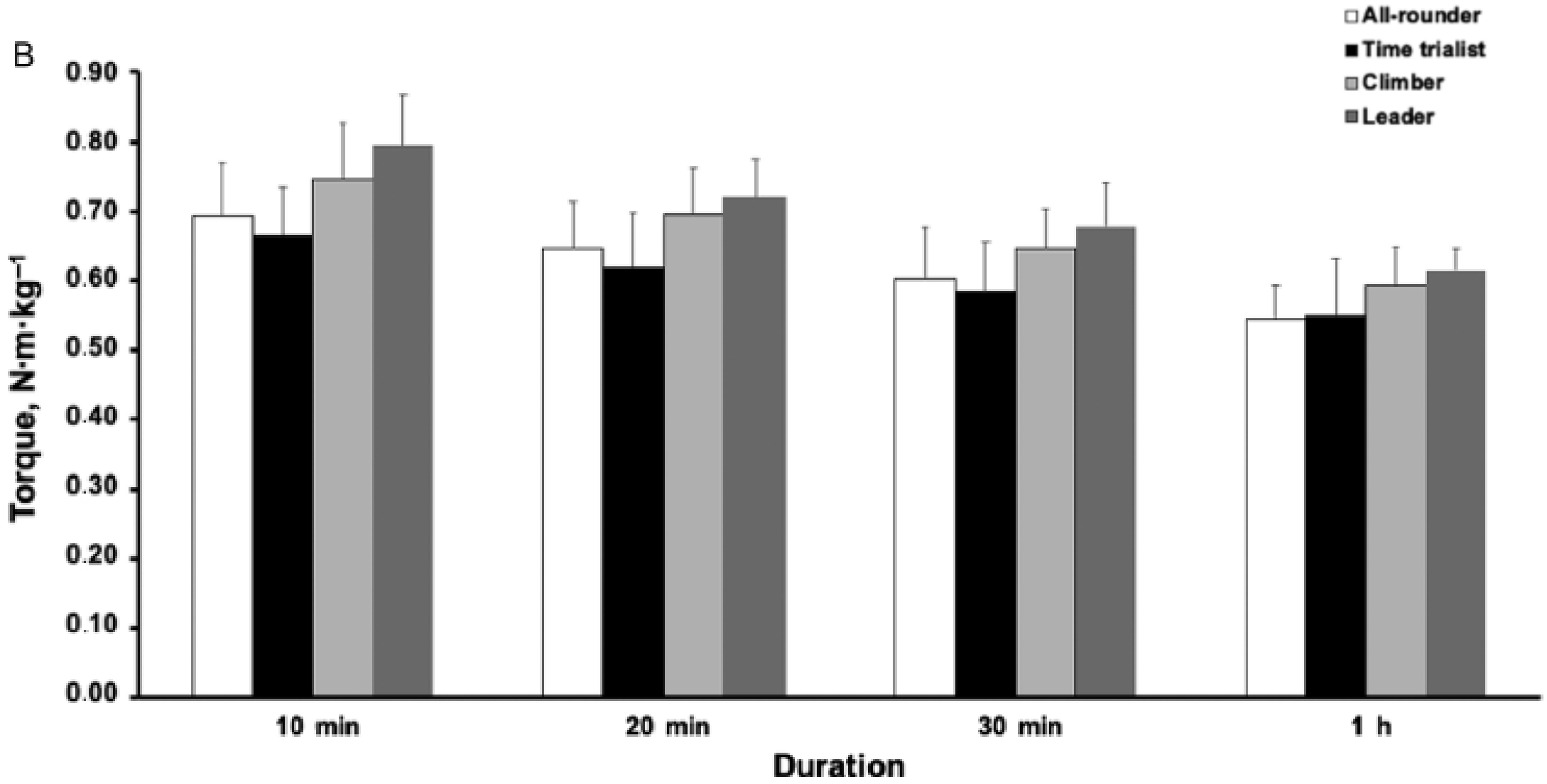
Peter Leo,[1] Manuel Mateo-March,[2,3] Pedro L. Valenzuela,[4,5] Xabier Muriel,[6] Alexis Gandía-Soriano,[7] Andrea Giorgi,[8,9] Mikel Zabala,[10] David Barranco-Gil,[2] Iñigo Mujika,[11,12] Jesús G. Pallarés,[5] and Alejandro Lucia[2,4]

What do we know?



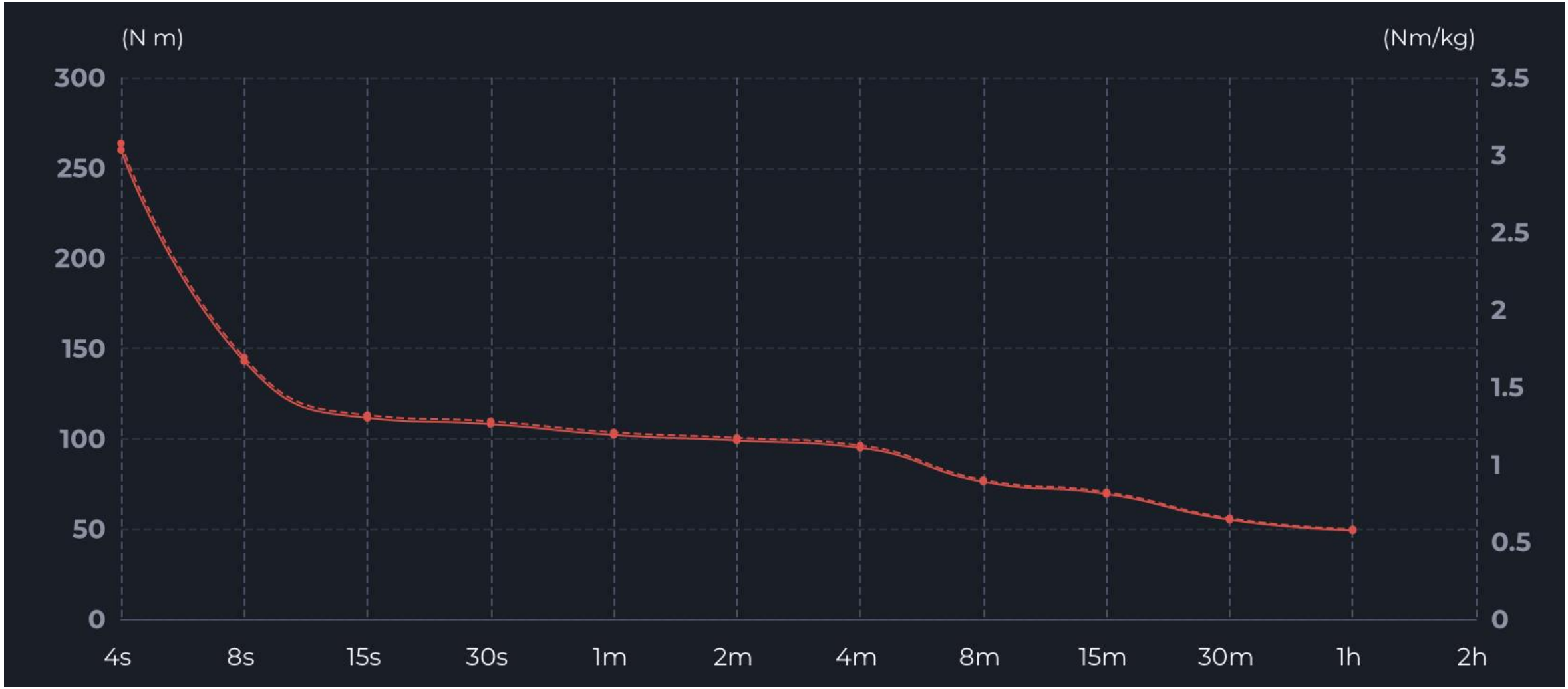
(Leo et al., 2022)

What do we know?



(Leo et al., 2022)

What am I seeing/doing working with athletes



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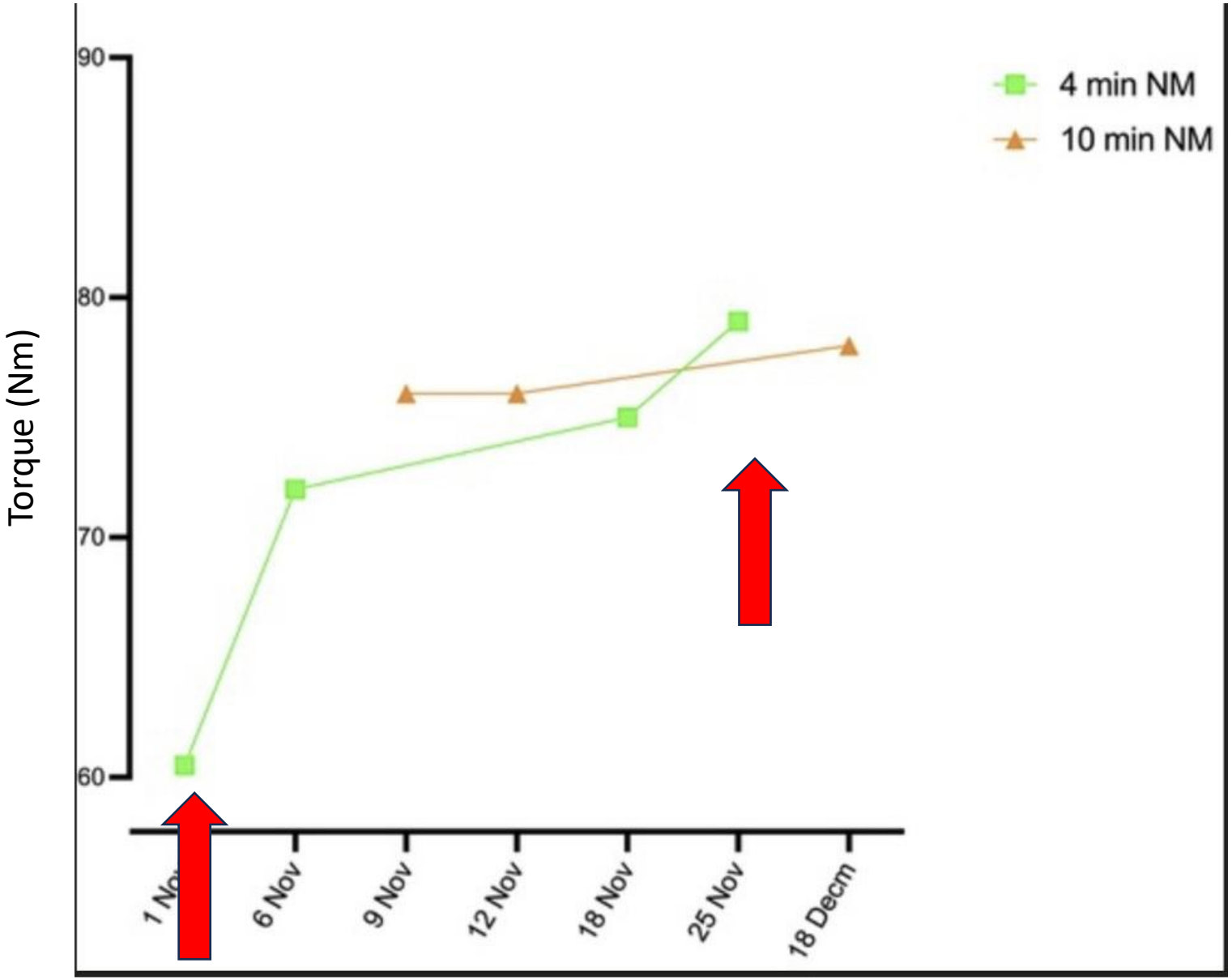

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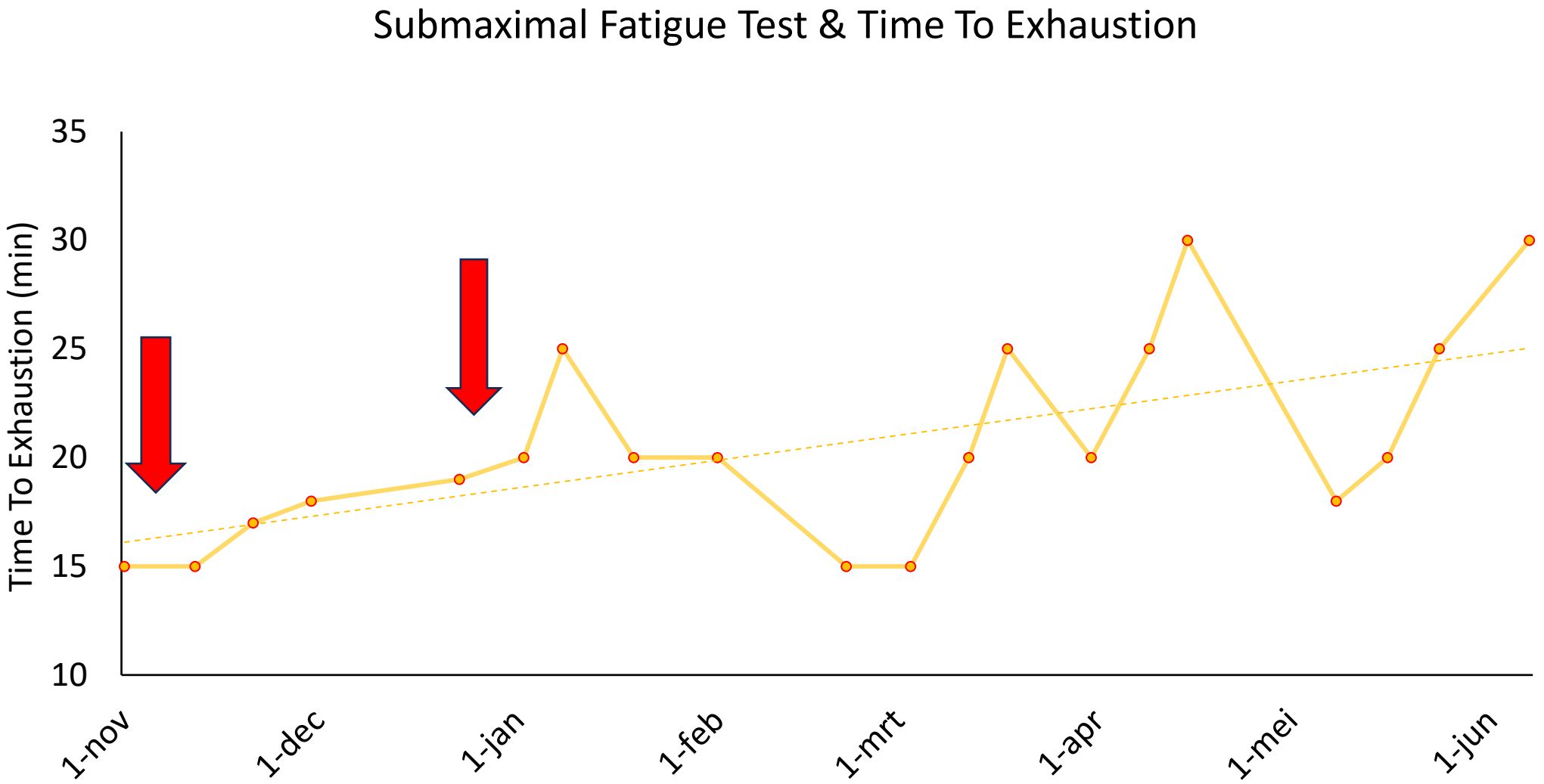

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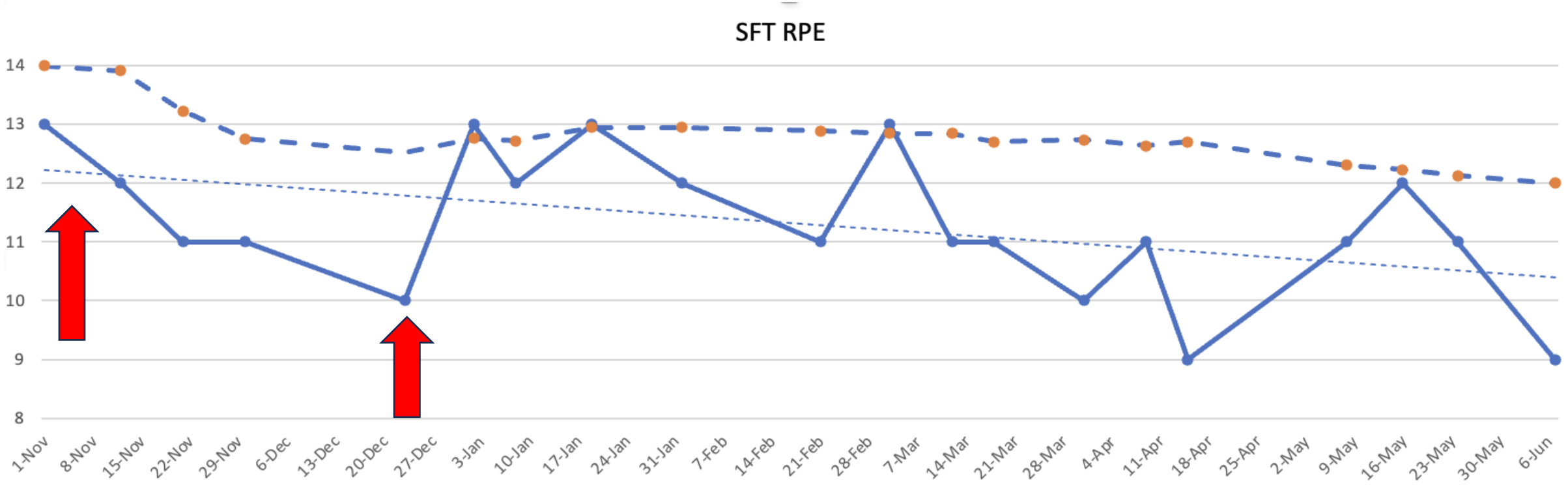
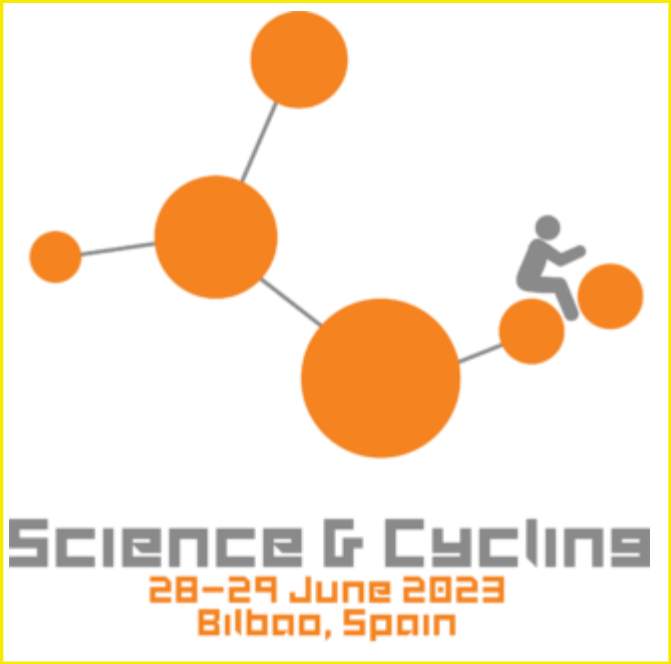


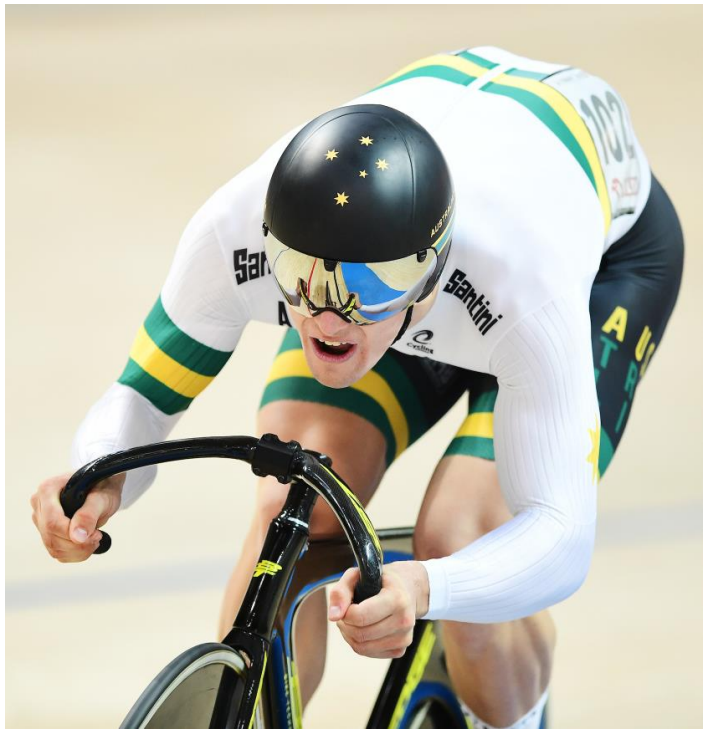


Peter Leo

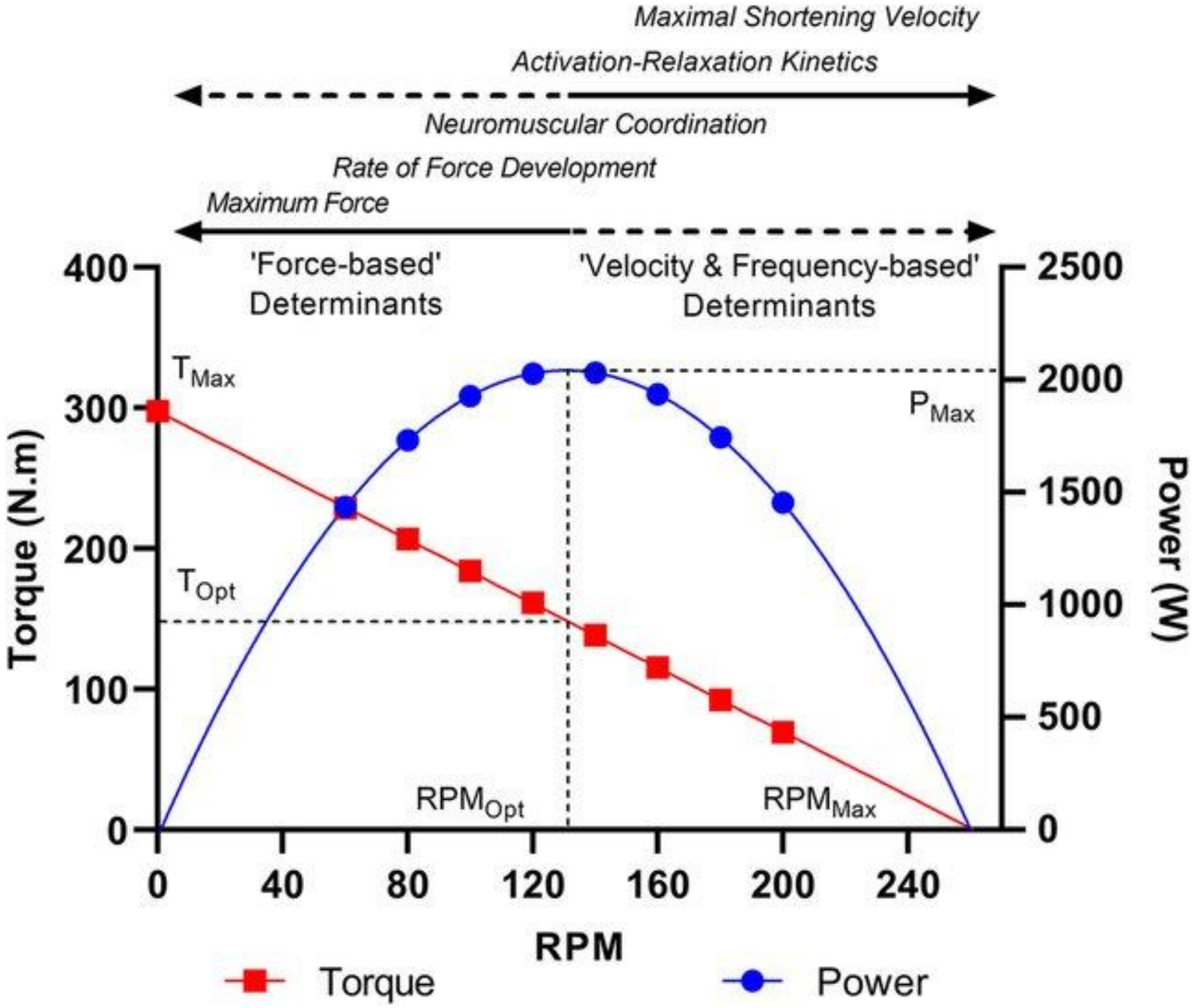
@peter__leo

@Peter-Leo

Torque development for BMX and track cyclists

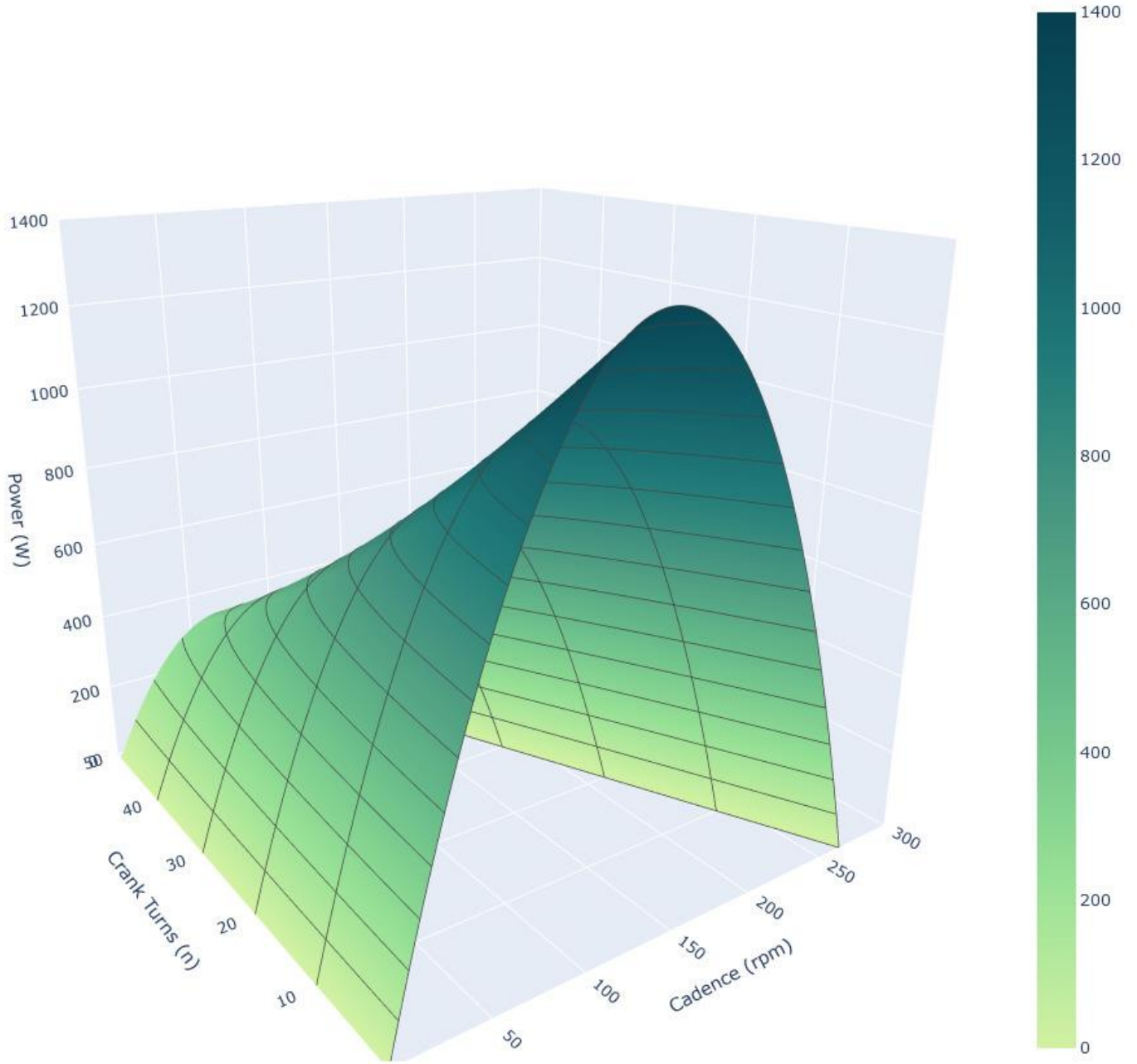


Torque Cadence Power Relationship



(Gardner et al., 2007; Douglas et al., 2021; Kordi et al., 2020)

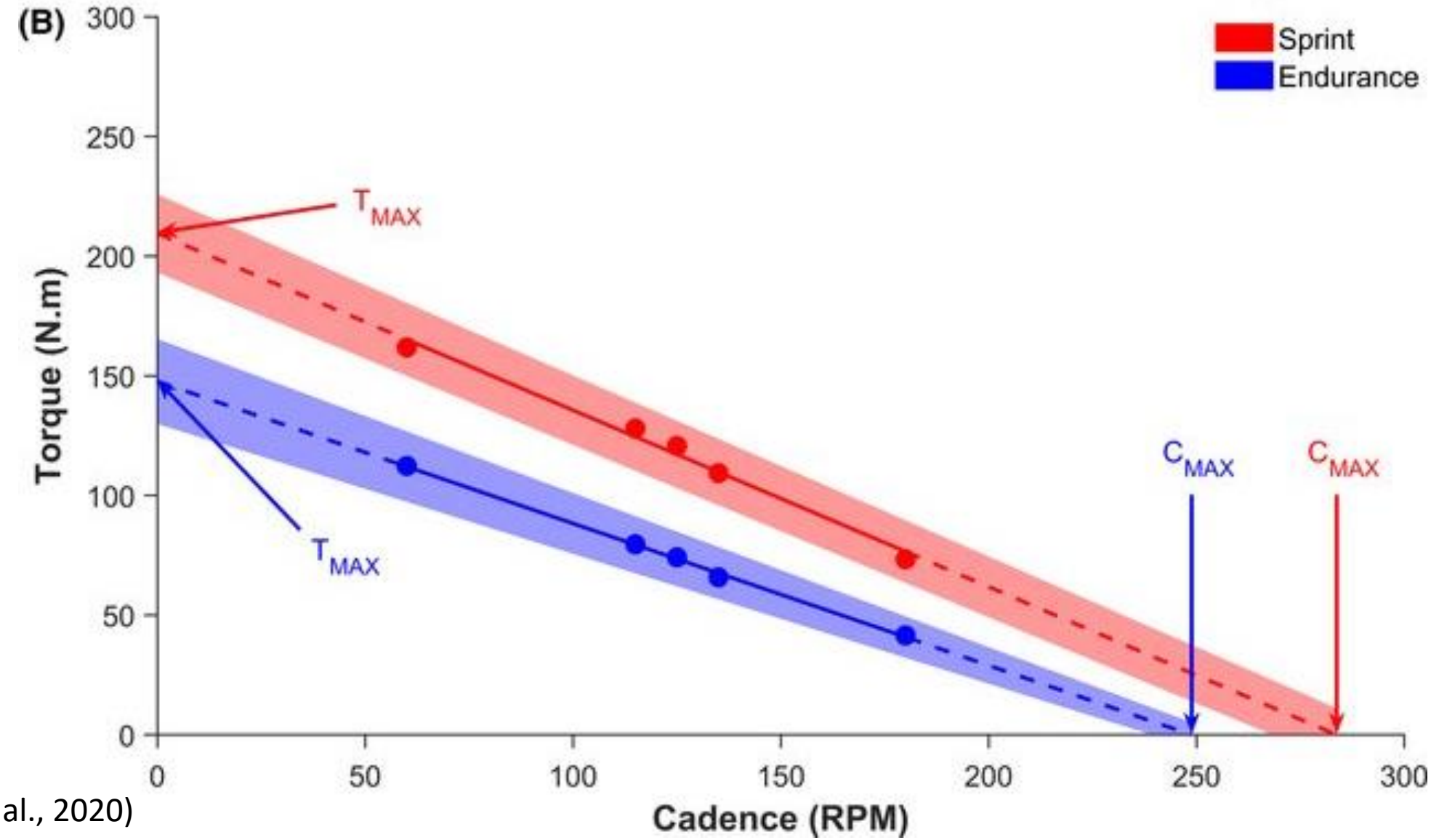
Torque Cadence Power Relationship



(Leo et al., 2023, unpublished)

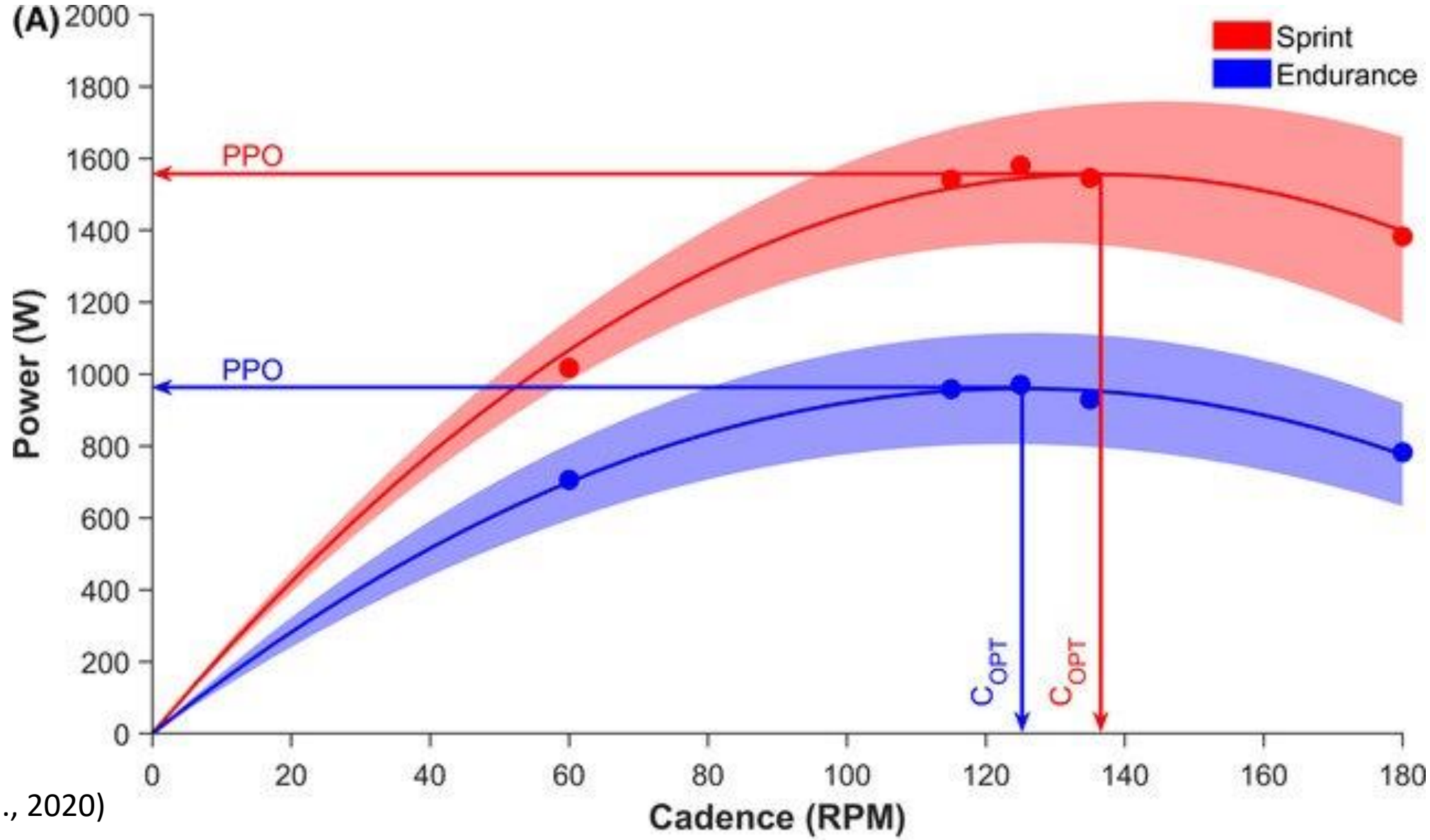

letsgo
letsgo
motorhomes .com
EXCHANGE
www.SRM.de

Track Sprint/BMX vs. Track Endurance



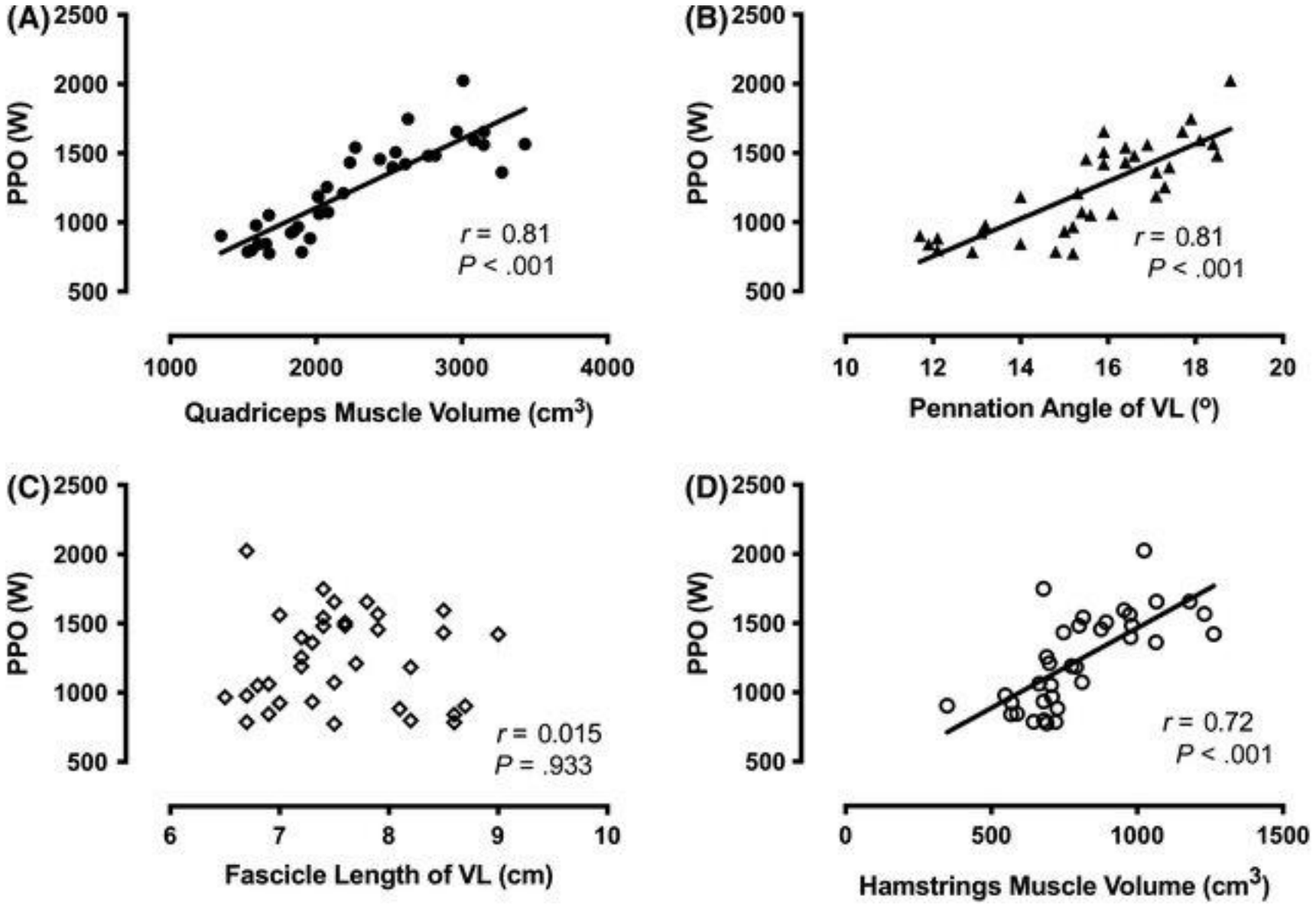
(Kordi et al., 2020)

Track Sprint/BMX vs. Track Endurance



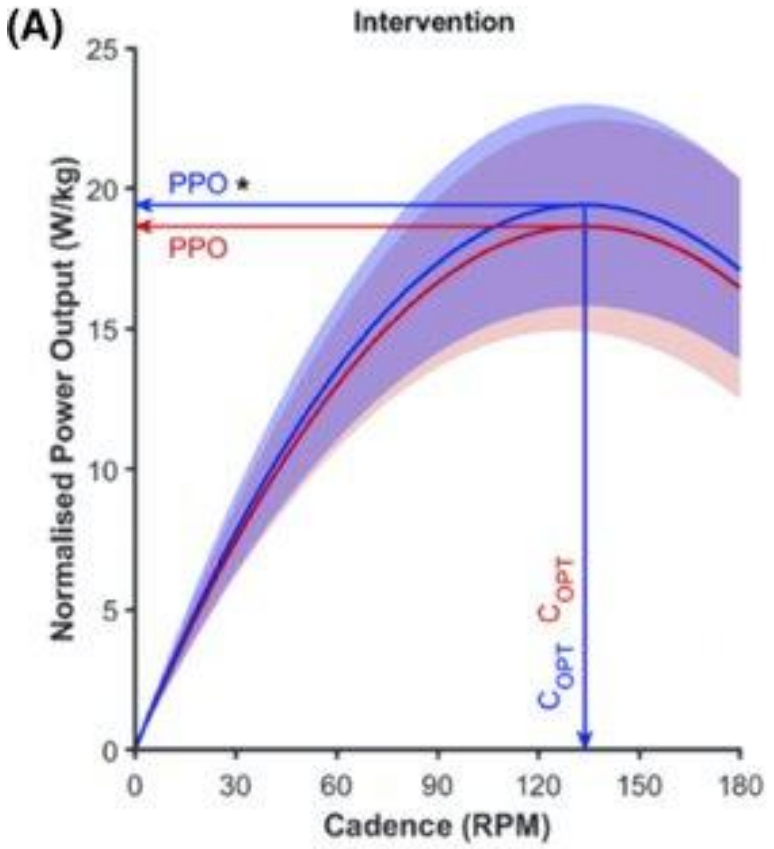
(Kordi et al., 2020)

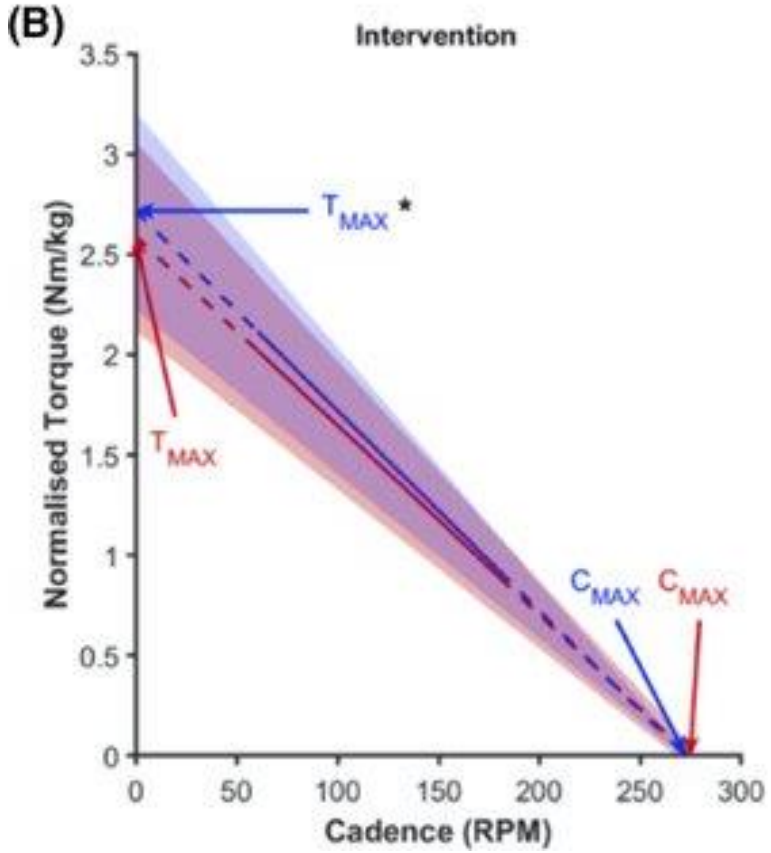
Morphological Adaptations to Peak Power



(Kordi et al., 2020)

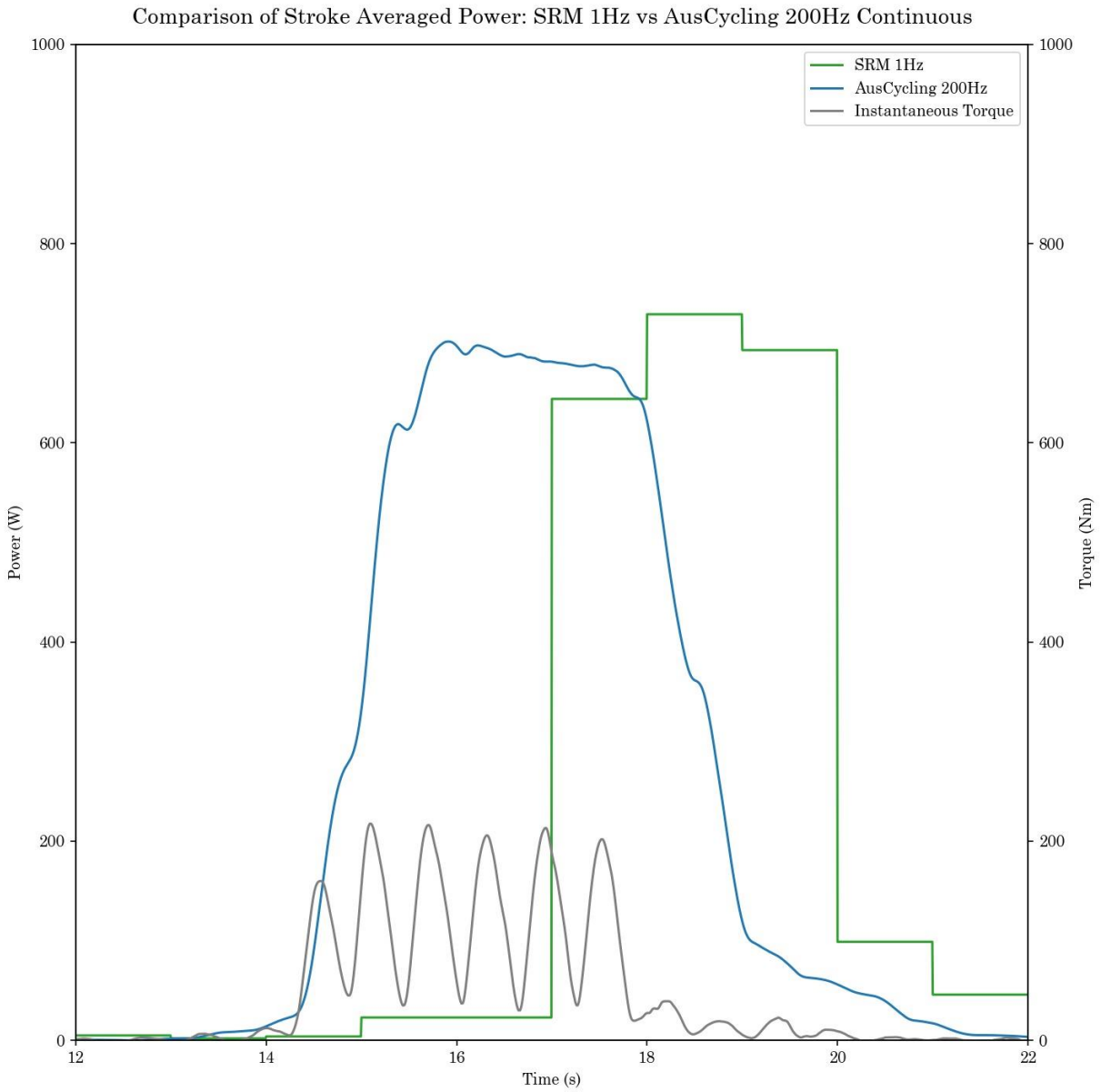
”On Bike“ Isometric Strength





(Kordi et al., 2020)

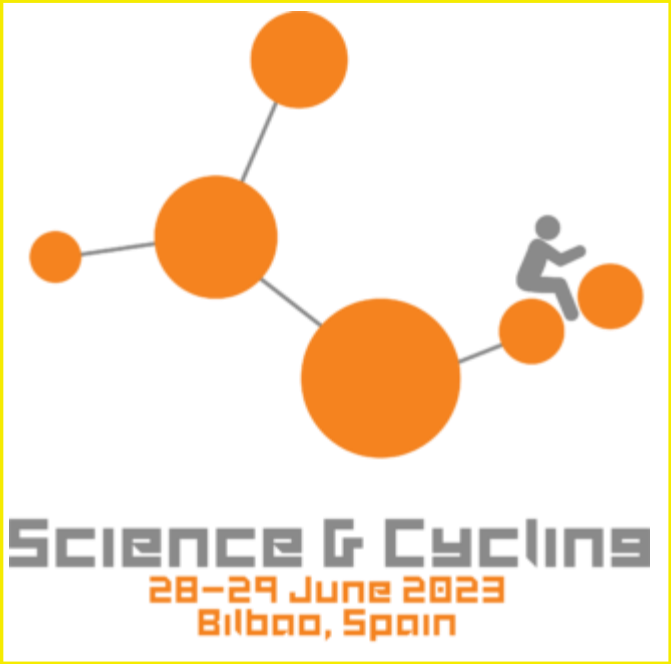
Mind the Sampling Rate



(Leo et al., 2023, unpublished)

Kudos to: Toby Edwards, Scott Gardner and Jim Martin

> **“ Ultimately, we are concerned with an athlete’s expression of power on the bike and not the expression of power in the Olympic lifts, their derivatives or any other gym lift for that matter ”**
>
> ***@tobyedwards_phd***



Thank you.

Let‘s Discuss!