Is ebiking exercise or cheating?

An experimental study estimating minutes of moderate physical activity.



ISCycle

CYCLING & SOCIETY

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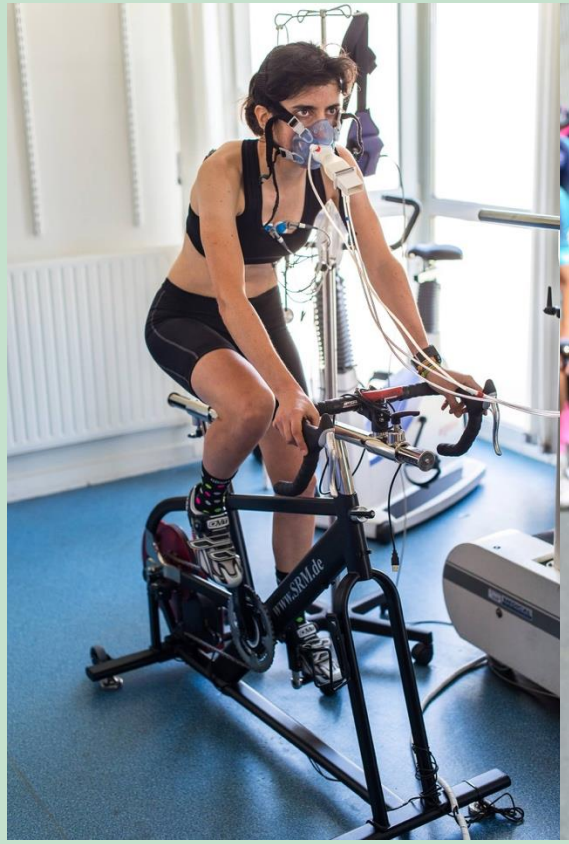
Personal Background

Research background in **high performance and elite athletes**, including professional cyclists (e.g., Tour de France).

Lifelong cyclist – completed all **21 stages of the Tour de France** (2017 & 2018)

Initial perception: *"E-bikes are not real cycling."*





Turning point

- Accident 2024→ physical limitations
- Joined the ISCycle project
- Started commuting with an e-bike → changed perception



Shift *in Perspective*

Before: Cycling = effort, performance, competition.

Now: E-bike = accessibility, health, inclusion.



*Ebikes as a sustainable **active** travel mode?*



- Active travel as co-beneficial
- Ebikes lower barriers
- But is it cheating?

- Physical inactivity: a major global health challenge.
- WHO recommends > 150 min (MVPA)/week
- E-bikes: potential to increase activity → but are they “real” exercise?
- Debate: does motor assistance reduce intensity below MVPA thresholds?



E-bikes are associated with a lower probability of reaching WHO targets for MVPA due to reduced duration and a reduced cardiovascular effort during riding (Haufe et al. 2022)

E-biking requires less physical effort than conventional cycling, but it still provides MVPA (McVicar et al. 2022).

Haufe, S., Boeck, H. T., Häckl, S., Boyen, J., Kück, M., van Rhee, C. C., Graf von der Schulenburg, J. M., Zeidler, J., Schmidt, T., Johannsen, H., Holzwart, D., Koch, A., & Tegtbur, U. (2022). Impact of electrically assisted bicycles on physical activity and traffic accident risk: a prospective observational study. *BMJ open sport & exercise medicine*, *8*(4).
McVicar, J., Keske, M.A., Daryabeygi-Khotbehsara, R., Betik, A.C., Parker, L. and Maddison, R. (2022) 'Systematic review and meta-analysis evaluating the effects electric bikes have on physiological parameters', *Scand J Med Sci Sports*, 32(7), 1076-1088,

Aims

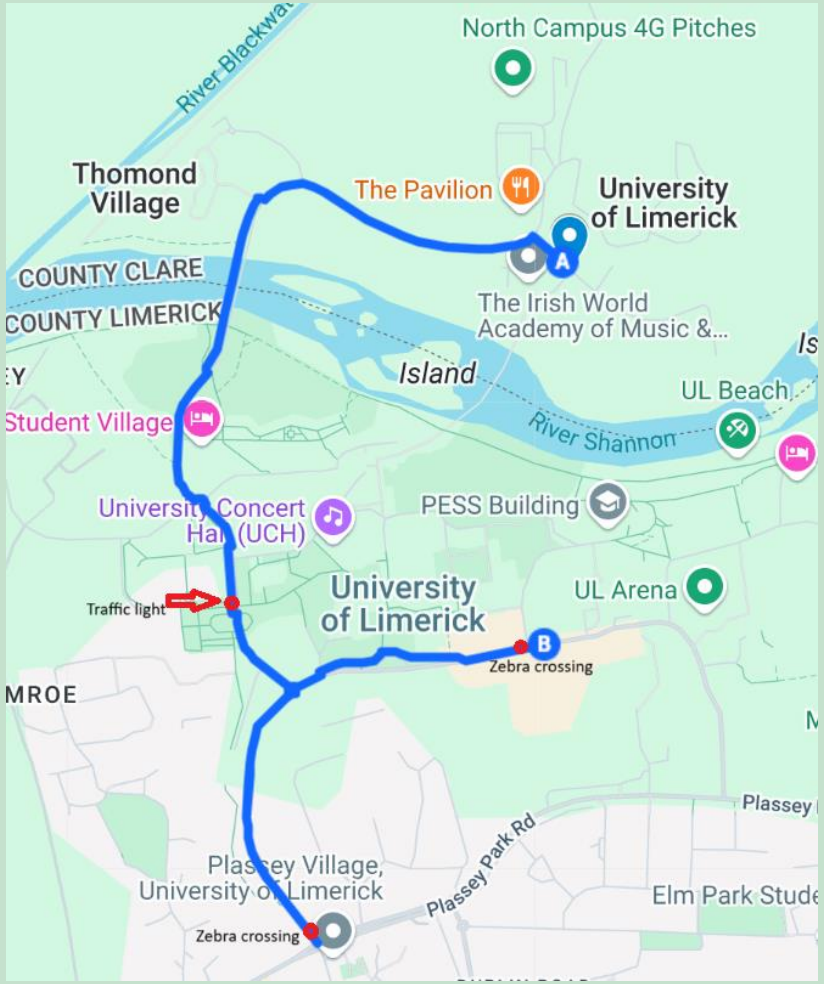


To determine whether riding an e-bike meets the criteria for moderate-to-vigorous physical activity (MVPA)

To investigate the effects of ebike power settings and cycling intensity on minutes of MVPA

Methods

- 19 Participants biked a standard 5km loop *six* times with a 10 min break between
- Repeated-measures with 6 conditions combining
  - 3 power levels (off, mid, full)
  - 2 effort levels (natural, brisk)
- Speed, heart rate, perceived intensity measured (qualitative)



Moderate-Vigorous Physical Activity

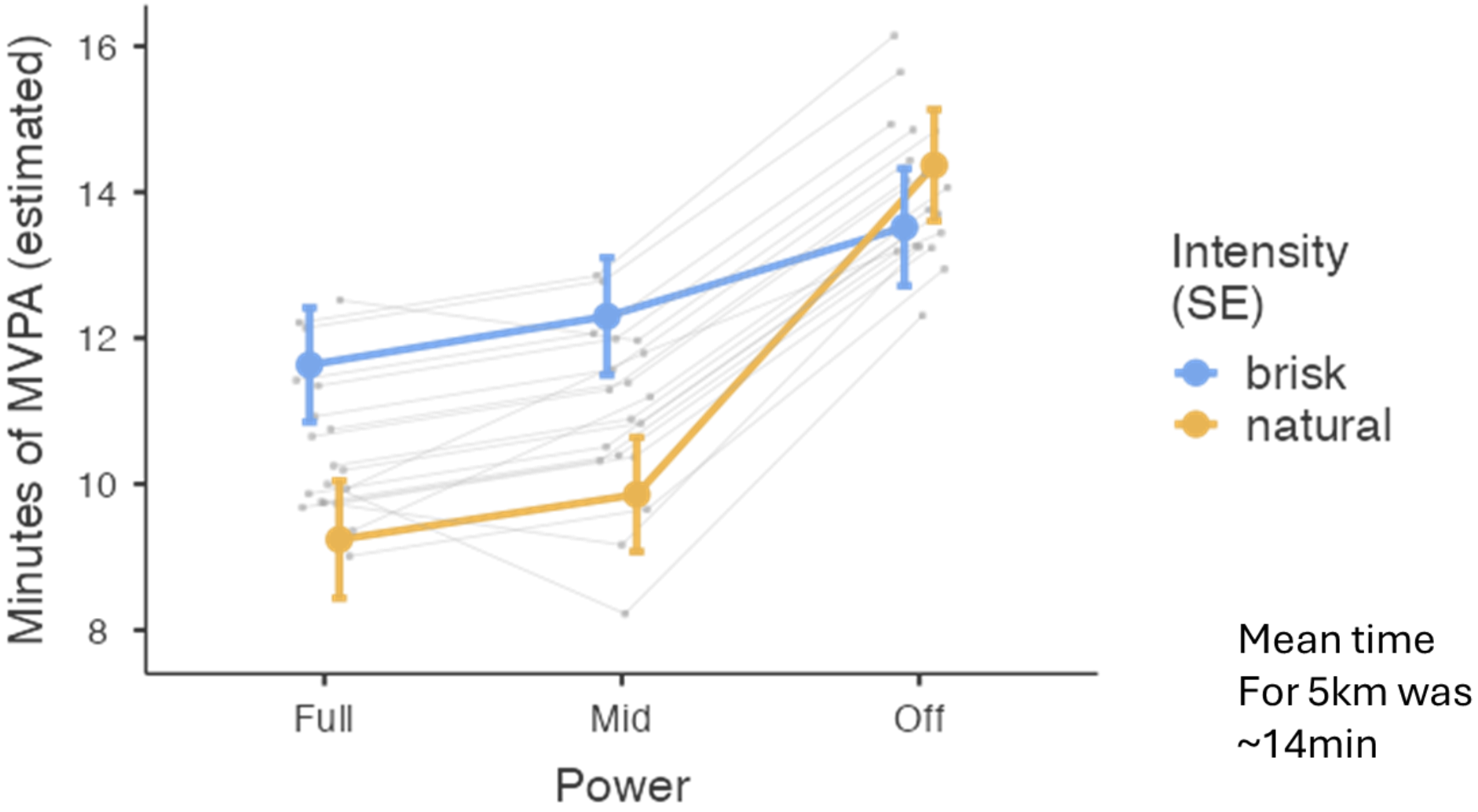
Moderate (Vigorous) Physical Activity:
Simple estimation is >64% of Maximum Heart Rate 🚴

Maximum Heart Rate = 220 – Age (eg 220 - 30 = 190)
MVPA Threshold = HR Max * 64% (eg 190 * 64% = 122)

Vigorous Physical Activity:
> 76% of Maximum Heart Rate
Eg 190 * 76% = 144

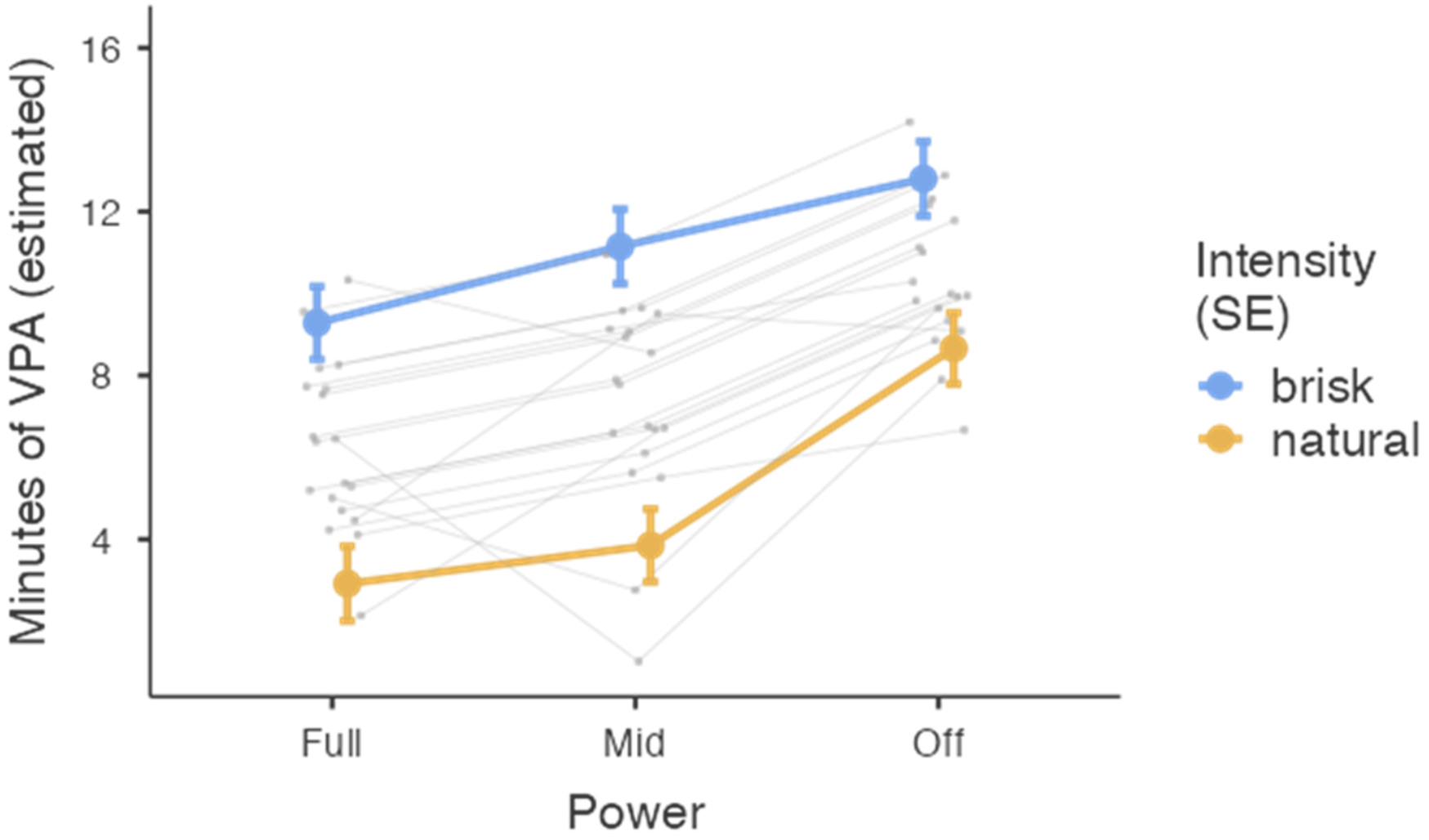


Results — Moderate-Vigorous Physical Activity



Mean time
For 5km was
~14min

Results —Vigorous Physical Activity



Conclusions

Ebiking <u>is</u> physical activity:

- Ebikes provide moderate physical activity
- But somewhat less than acoustic biking
- Decreasing electrical power and increasing intensity produce more exercise



Conclusions

Ebikes as active travel

- If ebikes enable people to ride further and more often, then it may not be less physical activity, and could even be more



Alternative to sedentary travel:

- E-biking offers a flexible and accessible means to achieve MVPA, particularly compared to daily commutes by car or scooters

Societal benefits:

• E-bikes can benefit society by reducing car dependency, congestion and emissions, while improving public health and reducing healthcare costs.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