

METABOLIC RESPONSES TO STAND-UP PADDLEBOARD ERGOMETRY IN YOUNG NOVICES



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INTRODUCTION

Stand-up Paddleboarding (SUP) is a water-based outdoor activity where participants stand on a modified surfboard and propel themselves via a long paddle. Commercial SUP ergometers are available and may represent an effective form of aerobic exercise, even in novice performers. Previous studies have examined SUP in advanced performers, but not in novices.

PURPOSE

To investigate the metabolic efficacy of SUP ergometry as an exercise modality in novice performers.

METHODS

- 5 males (21.2±1.1y; 1.77±0.1m; 98.0±25.7kg, peakVO₂ = 38.0±3.5ml·kg⁻¹·min⁻¹) and 5 females (21.2±1.6y; 1.64±0.04m, 60.1±8.3kg, peakVO₂ = 32.5±3.7ml·kg⁻¹·min⁻¹), with no prior SUP experience.
- Day 1 consisted of a treadmill VO₂peak test (Modified Balke-Ware Protocol) and a 1min peak power test on the SUP ergometer. Day 2 consisted of a 10min test on the SUP ergometer at 25% of previously established peak power.
- Metabolic and ergometer data were collected in one-minute increments with four time-intervals used for analysis (0-1min, 3-4min, 6-7min, and 9-10min, labeled T1, T2, T3, and T4, respectively).
- Metabolic data (VO₂, VE and RER) were processed as 5s averages and compared across the time intervals. VO₂ was normalized to previous VO₂peak.
- Power, stroke rate, and stroke length were compared across the time-intervals.
- Significant differences were evaluated via a one-way repeated measures ANOVA with alpha set at p≤0.05. Variance between stroke variables and power was evaluated via an R-squared analysis.

RESULTS

- Metabolic variables differed significantly between T1 and T2 and T1 and T3.
- Power differed significantly between T1 and T2; however, there were no significant differences in stroke rate (p=0.20) and length (p=0.50) across the exercise bout.
- Stroke length and rate were both associated with power (p<0.001). Stroke length and stroke rate explained 7% and 89% of the variance in power, respectively.



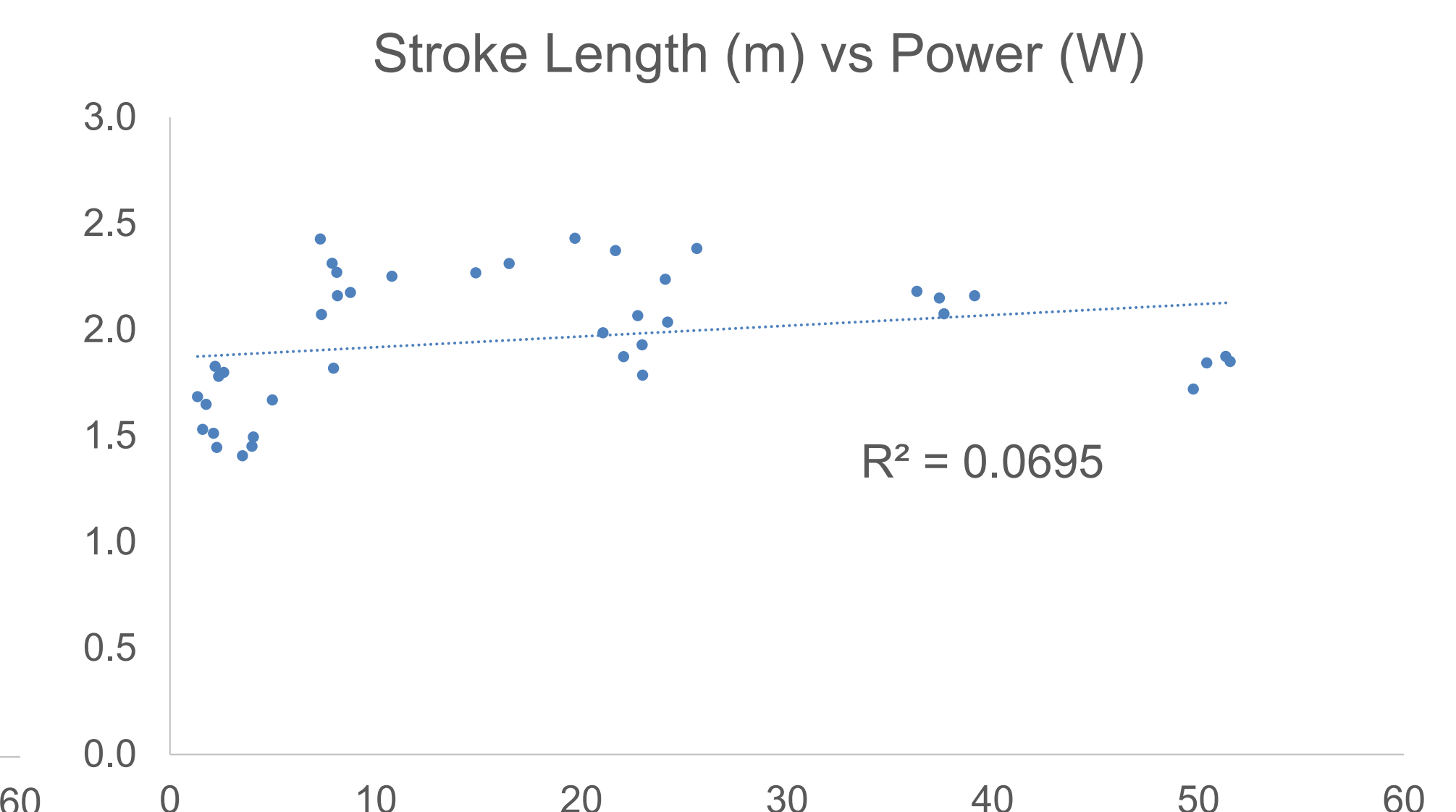
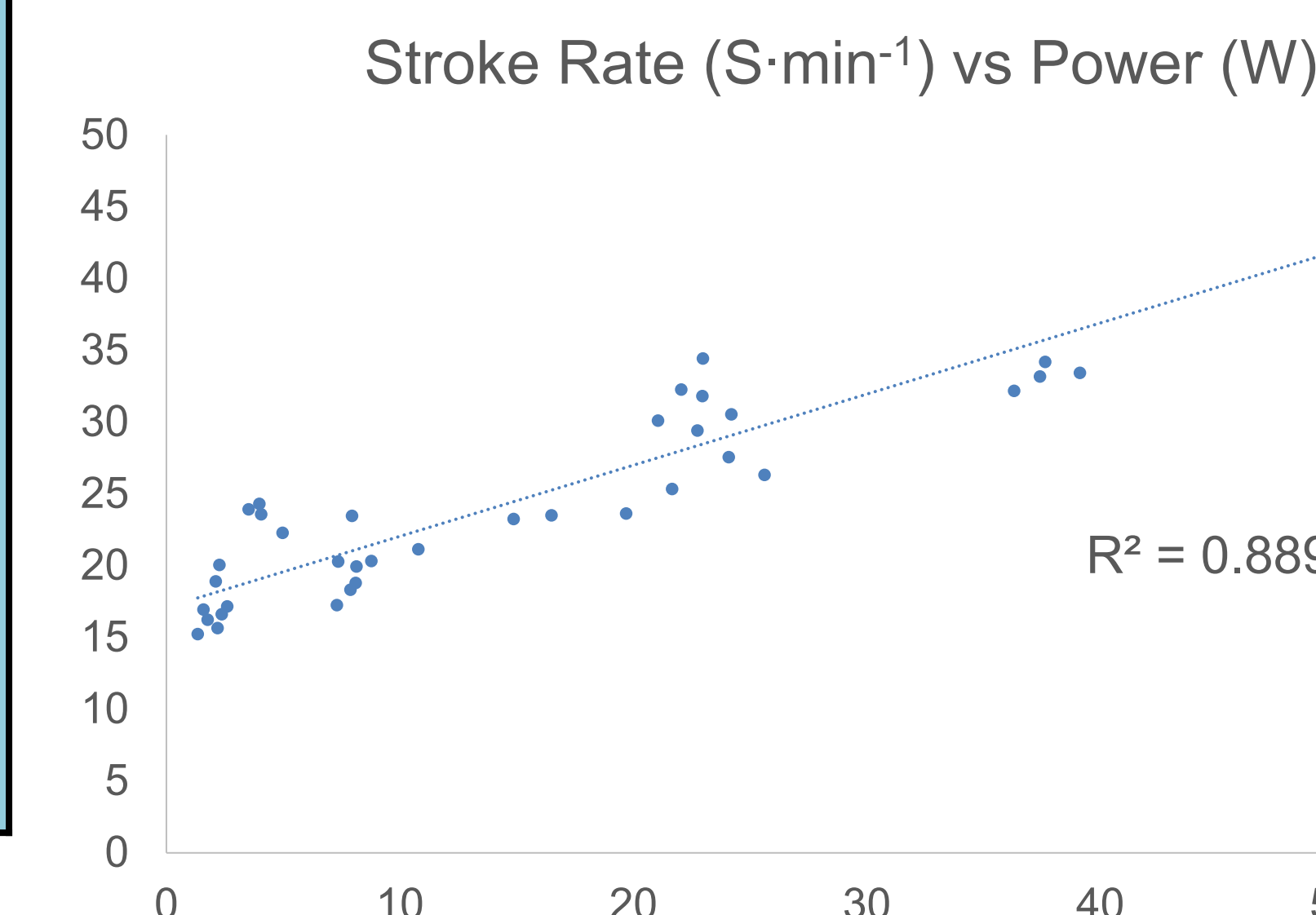
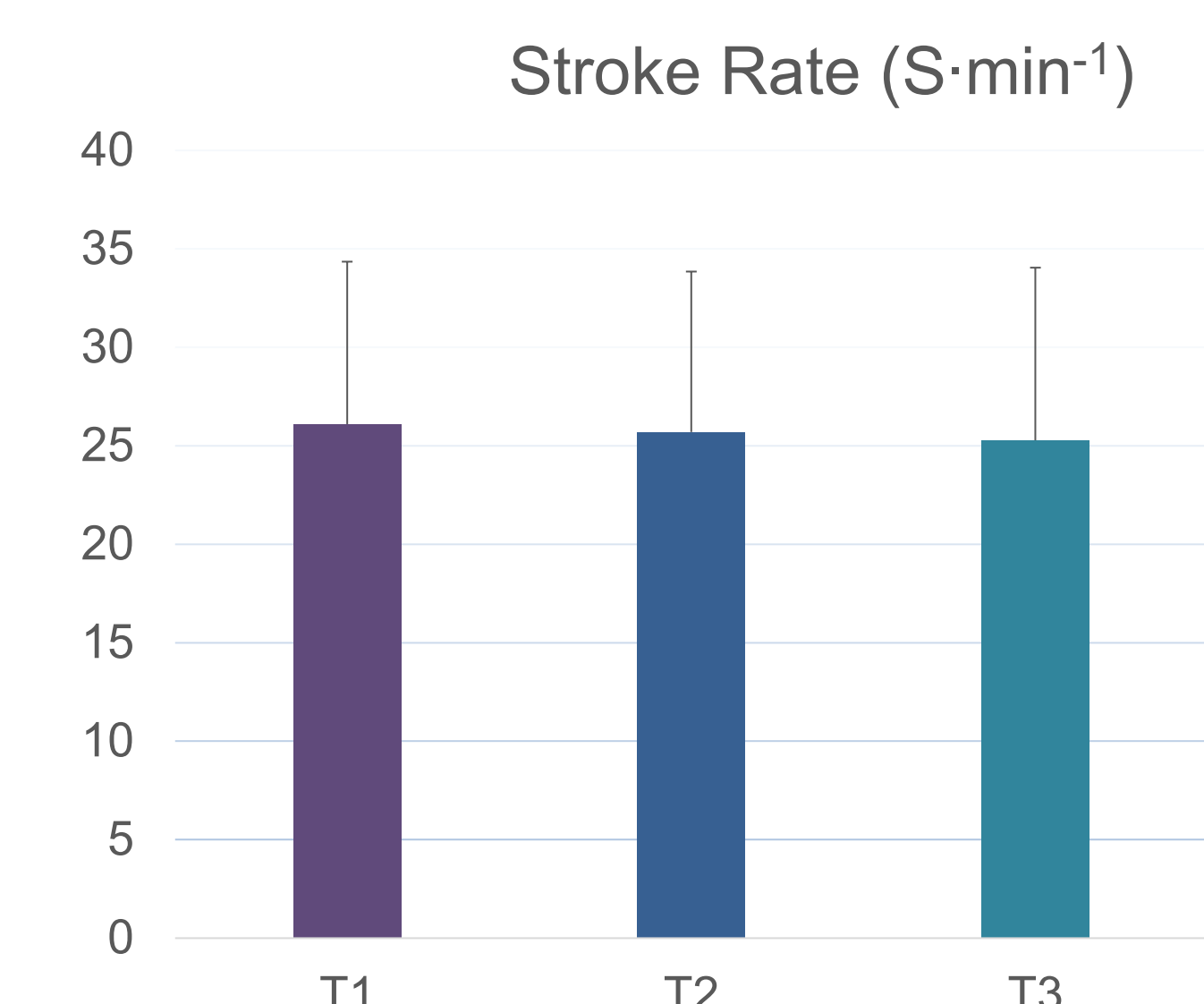
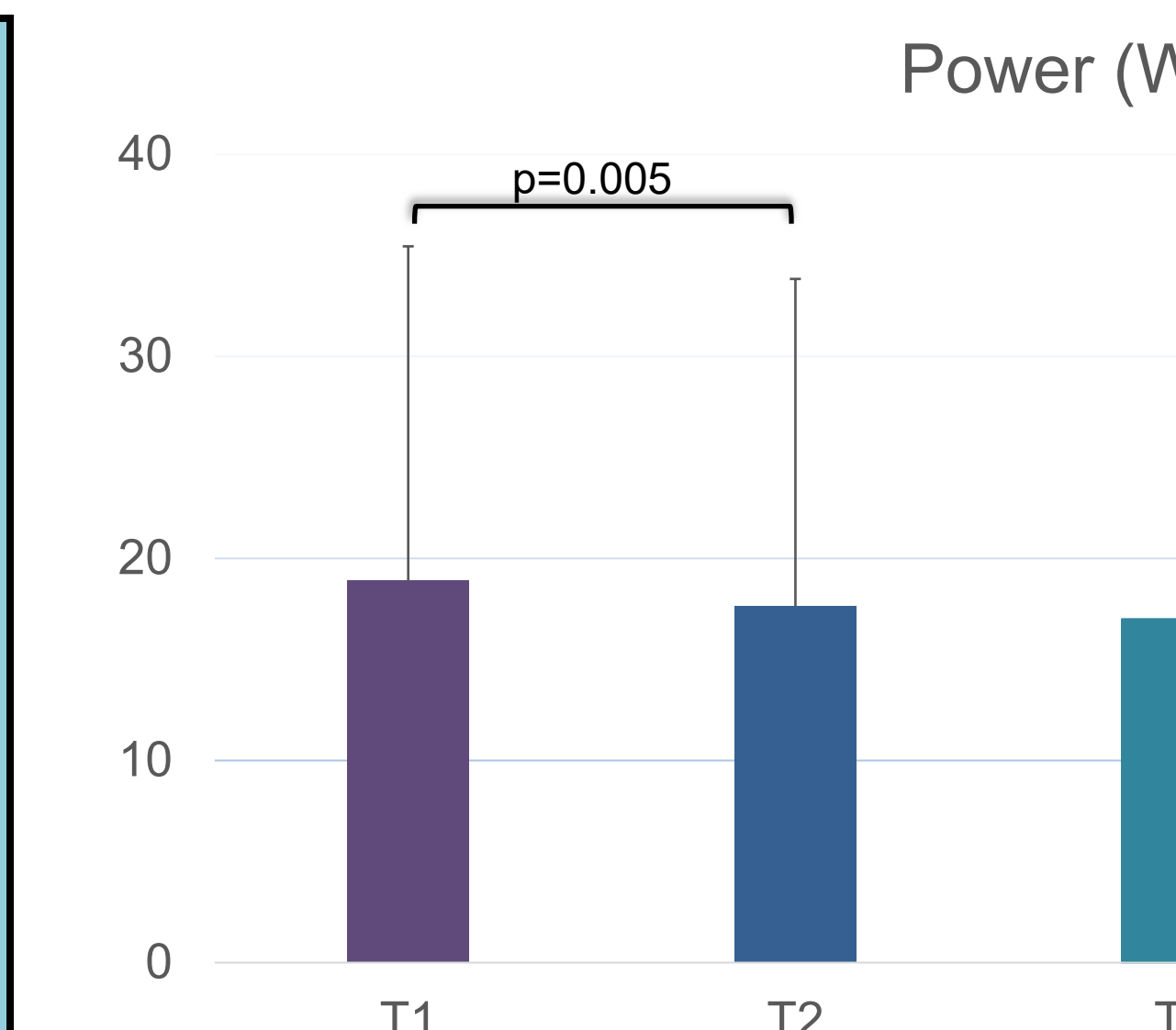
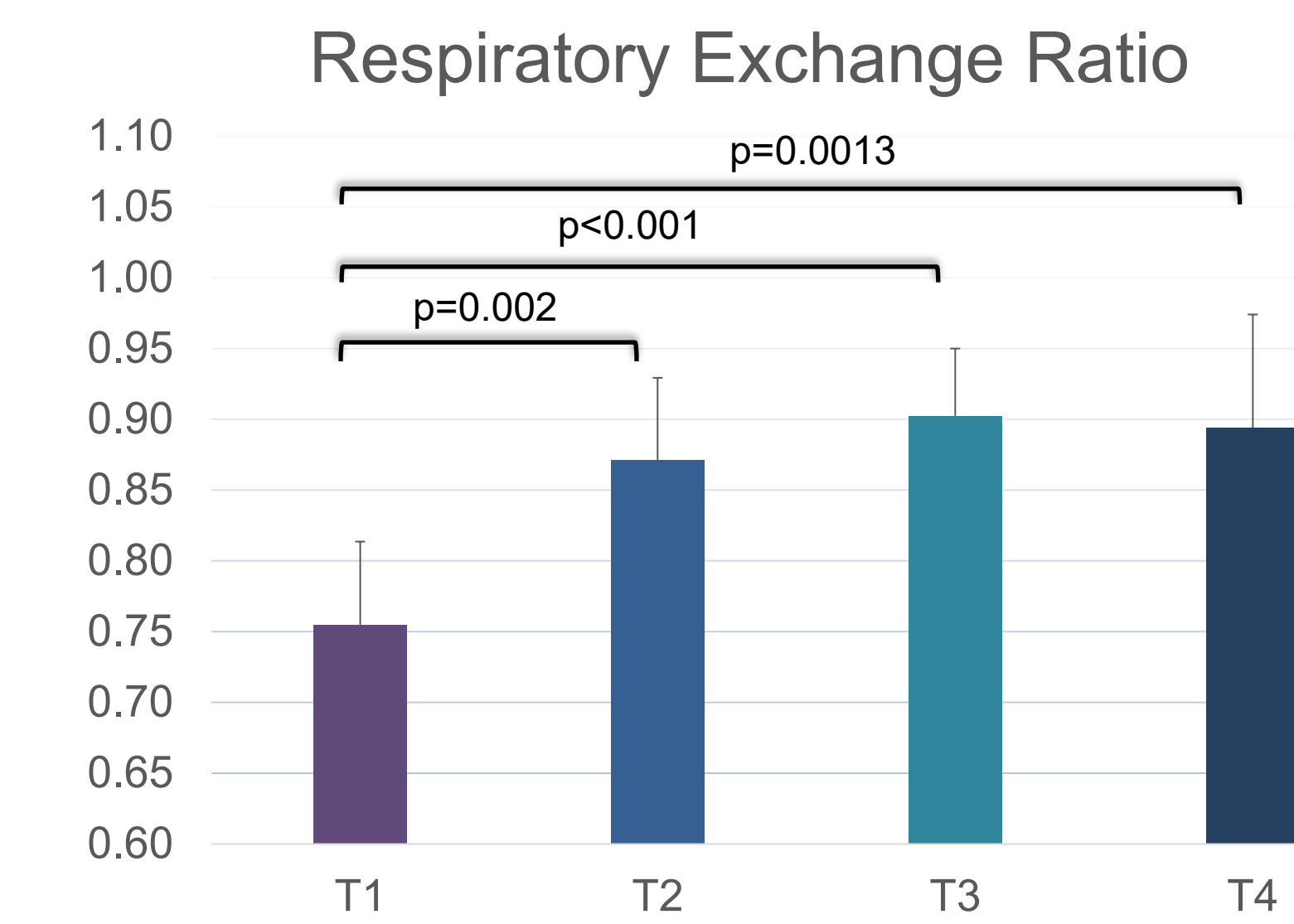
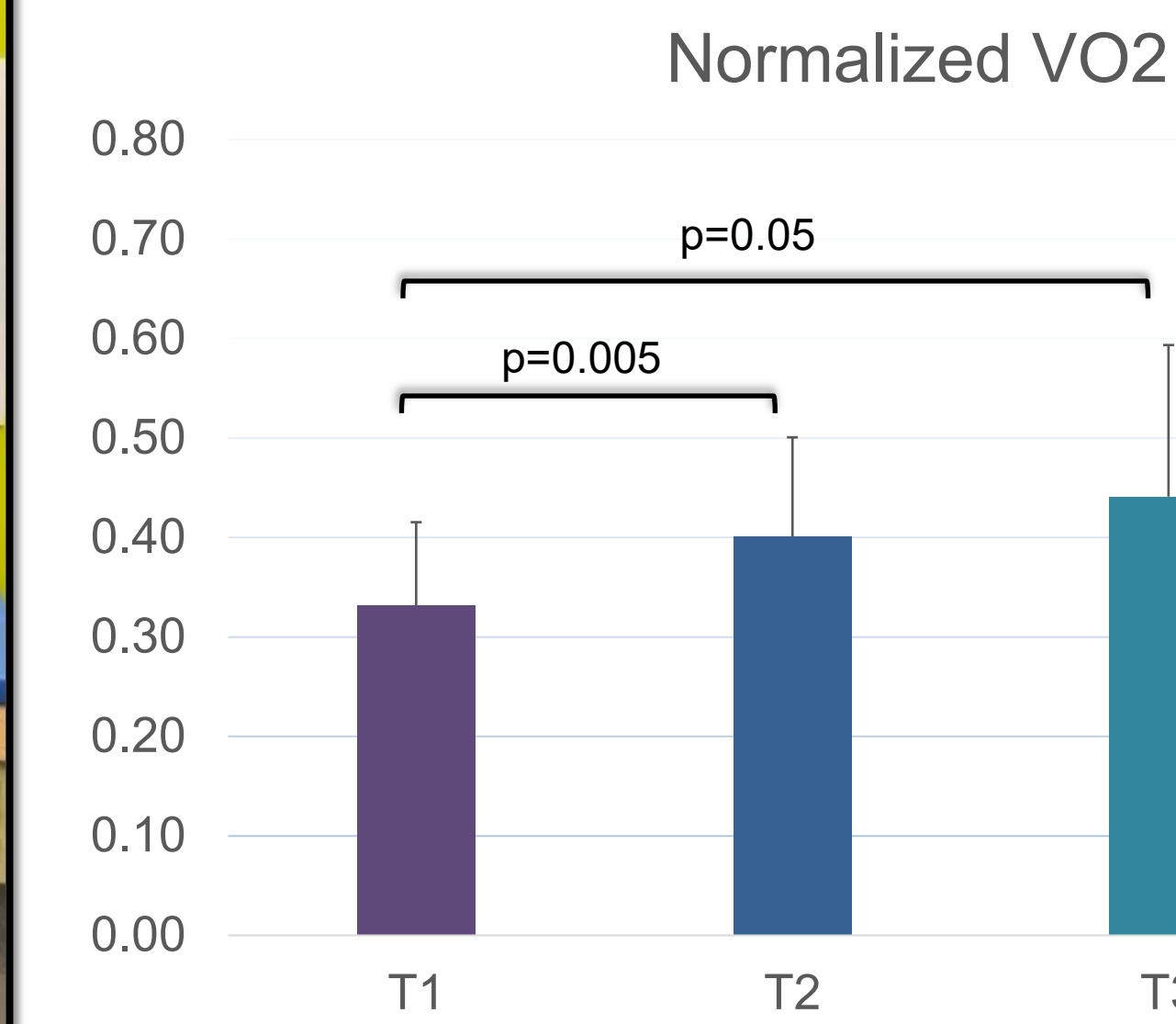
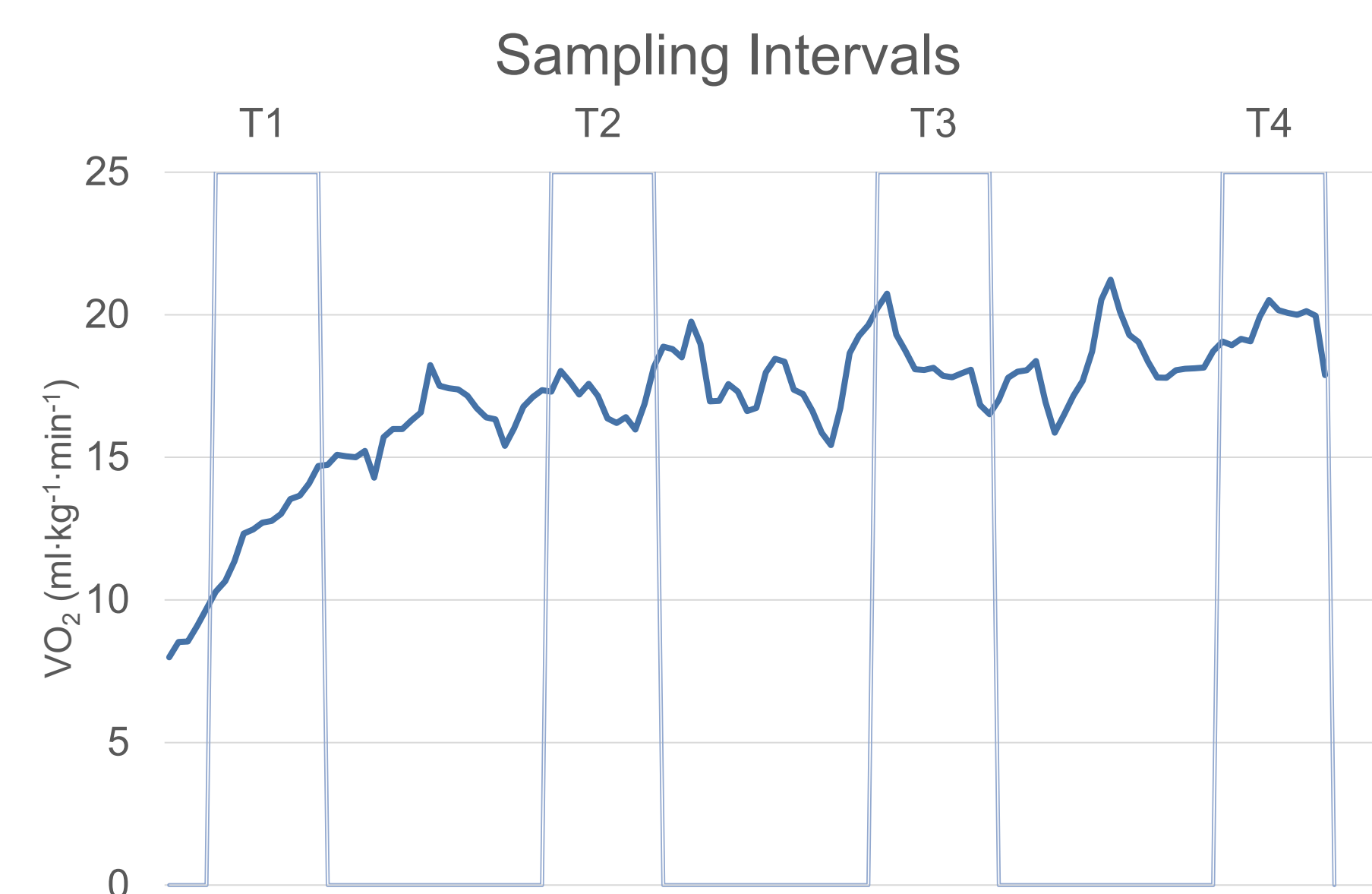
PRACTICAL APPLICATIONS

SUP ergometry is an effective form of aerobic exercise for novice performers.

Novices appear to quickly adapt to the novel exercise.

Variability in power output early in the exercise session may represent a learning effect demonstrated in altered kinematics*.

*See Poster 6: [Whole-Body Kinematics During Stand-Up Paddle Board Exercise](#), Saturday 10-11a



CONCLUSIONS

- Significant differences were found in metabolic variables and power output early in the exercise bout (T1 to T2) with these differences largely non-existent during the rest of the session.
- No significant differences were found in stroke rate and stroke length.
- The variability in power output from T1 to T2 may suggest a learning effect in the subjects that was not reflected in either the stroke rate or stroke length but perhaps in some altered kinematic patterns.

