The differences between (semi-)professional cyclist and coach in the execution and perception of training sessions

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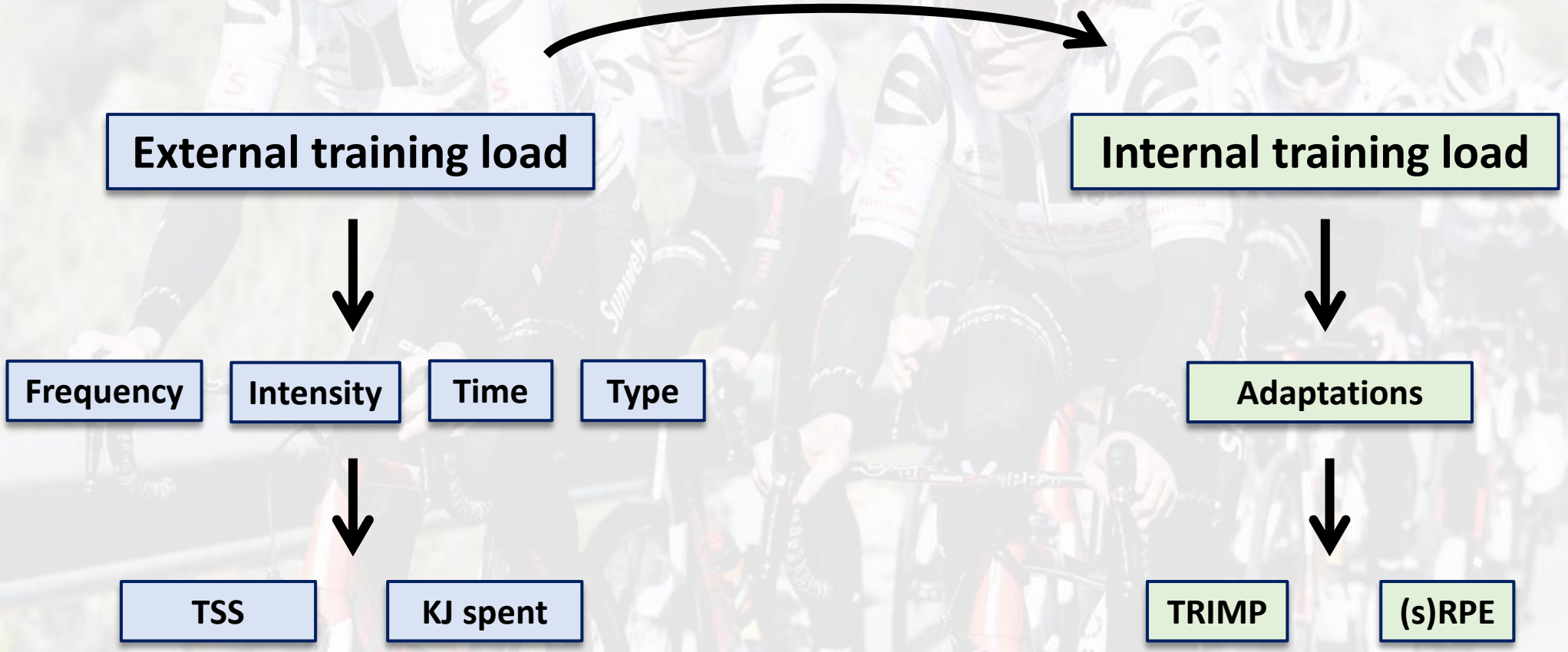
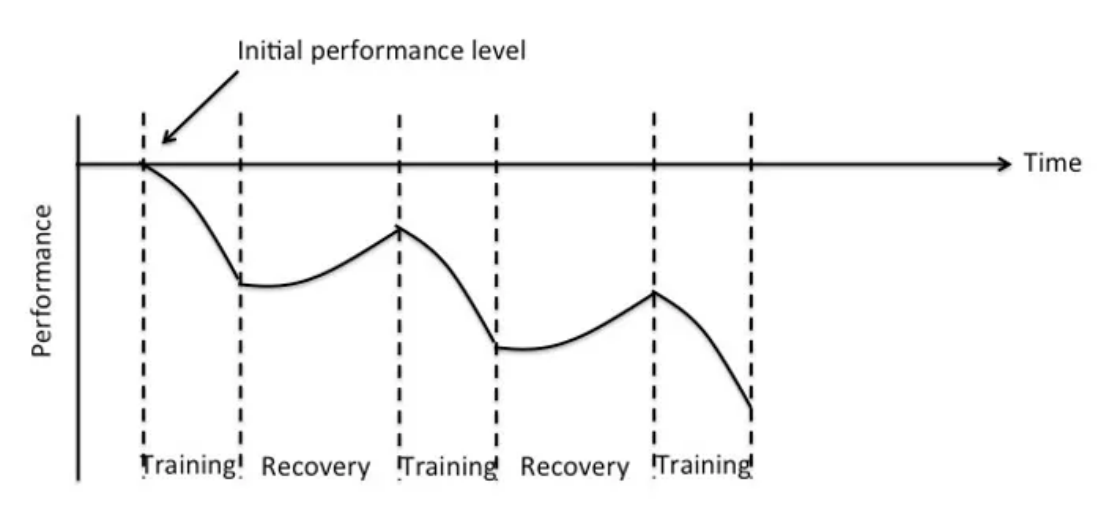
Introduction



Introduction

- Overtraining syndrome (Meeusen et al., 2013)
- Overuse injuries (Drew and Finch, 2016)
- De-training (Sanders et al., 2017)



Introduction

- Misbalance between designed training plan and executed training (Foster et al., 2001)

- Mismatch between intended intensity(iRPE) and load (isRPE) and perceived intensity (RPE) and load (sRPE) of training sessions (Foster et al., 2001, Viveiros et al., 2011, Brink et al., 2014, Murphy et al., 2014, Rabelo et al., 2016, Barnes, 2017)

Rating	Perceived Exertion
6	No exertion
7	Extremely light
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

Aims of the study

- Investigate if the training program as designed by the coach differs from the execution of the training program by the cyclist

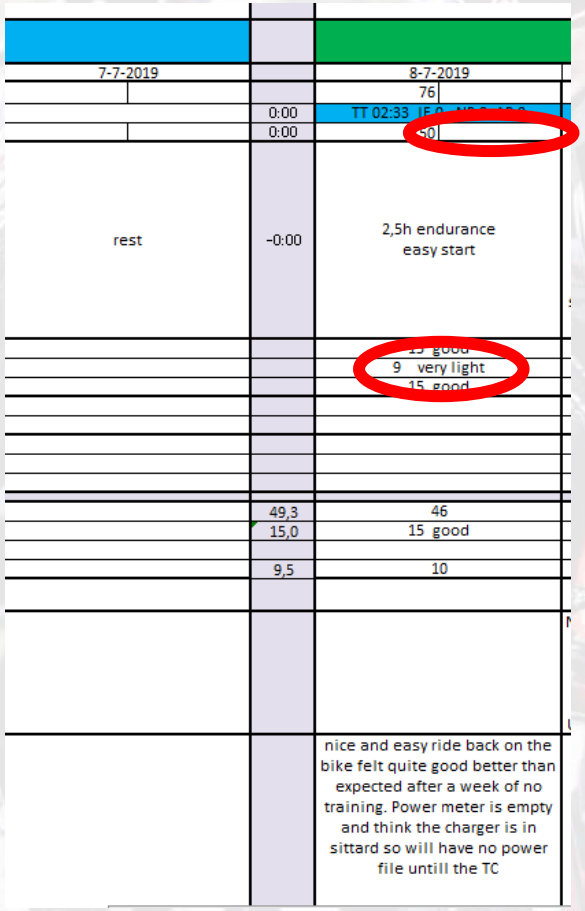
- When the training is in fact executed as designed by the coach, does the perceived intensity and training load by the cyclist differ with the intended intensity and training load by the coach?

- Focus on the **individual** perception

Subjects

- 9 male, 2 female cyclists
- 1 coach

Research design



7-7-2019		8-7-2019
		76
	0:00	TT 02:33
	0:00	50
rest	-0:00	2,5h endurance easy start
		9 very light
		15 good
	49,3	46
	15,0	15 good
	9,5	10
		nice and easy ride back on the bike felt quite good better than expected after a week of no training. Power meter is empty and think the charger is in sittard so will have no power file untill the TC

Research design

- Low-intensity: <11
- Intermediate intensity: 11-14
- High-intensity: >14

Foster et al. (2001)

Statistical analyses

- Independent samples t-test grouped by variables
- Pearson's correlation coefficients (r) and (standardized) typical error of measurement (TEE)
- Magnitudes of correlation: < 0.1 trivial, 0.1-0.3 small, 0.3-0.5 moderate, 0.5-0.7 large, 0.7-0.9 very large, and 0.9-1.0 almost perfect
- TEE was considered as: <0.1 trivial, 0.1-0.3 small, 0.3-0.6 moderate, 0.6-1.0 large, 1.0-2.0 very large, >2.0 extremely large

Results

Execution of training program

- 747 training sessions
- No differences
- *Very large* relationships

	Coach	Cyclist	R
Duration (min)	164 ± 80	167 ± 92	0.87
isRPE/sRPE (AU)	2005 ± 1207	2011 ± 1358	0.86

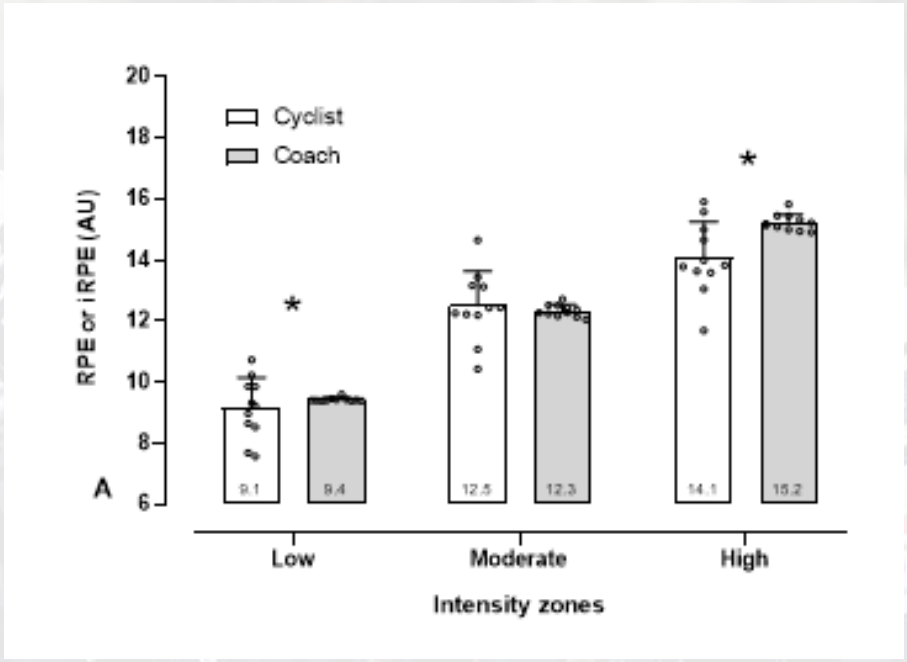
- Individual level:
  - *Large* correlations
  - Sig. Difference for duration for 1 participant
  - TEE *moderate* to *large:*
    - 22 – 54 minutes
    - 344 – 1036 sRPE

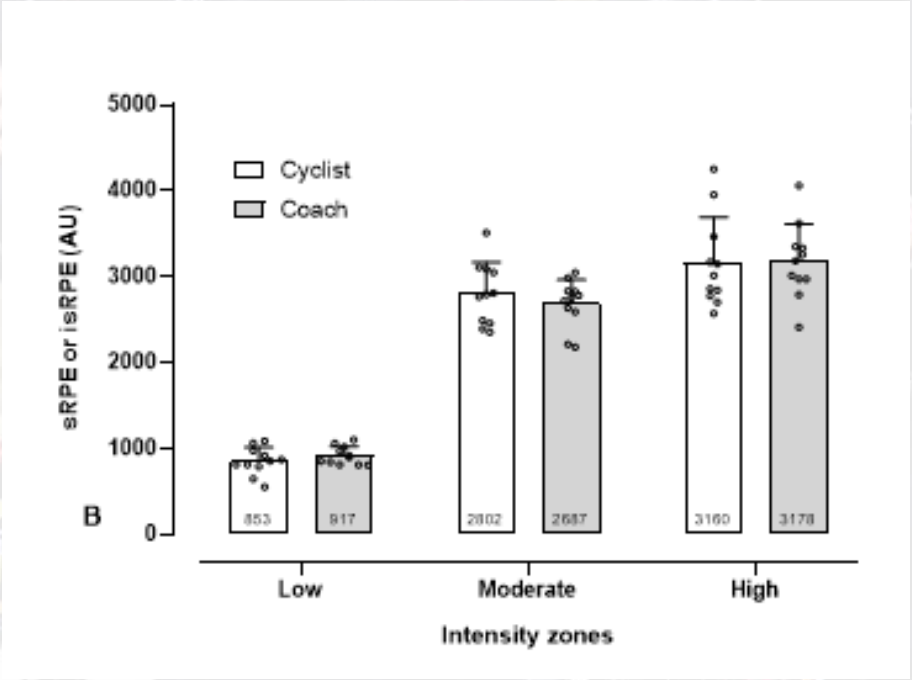
Perception of training program

- 22 training sessions excluded
- No differences
- *Very large* relationships

	Coach	Cyclist	R
iRPE/RPE (AU)	11.5 ± 2.1	11.3 ± 2.6	0.73
isRPE/sRPE (AU)	1988 ± 1211	2012 ± 1352	0.87

- Individual level:
  - *Large* correlations
  - Lower (2 participants) or higher (2 participants) RPE compared with RIE
  - TEE *moderate* to *very large:*
    - RPE: 1.1 - 1.9
    - sRPE: 329 -1002


A
RPE or iRPE (AU)
20
18
16
14
12
10
8
6
Cyclist
Coach
*
*
9.1
9.4
12.5
12.3
14.1
15.2
Low
Moderate
High
Intensity zones


B
sRPE or isRPE (AU)
5000
4000
3000
2000
1000
0
Cyclist
Coach
853
917
2802
2687
3160
3178
Low
Moderate
High
Intensity zones

Discussion

Execution of training program

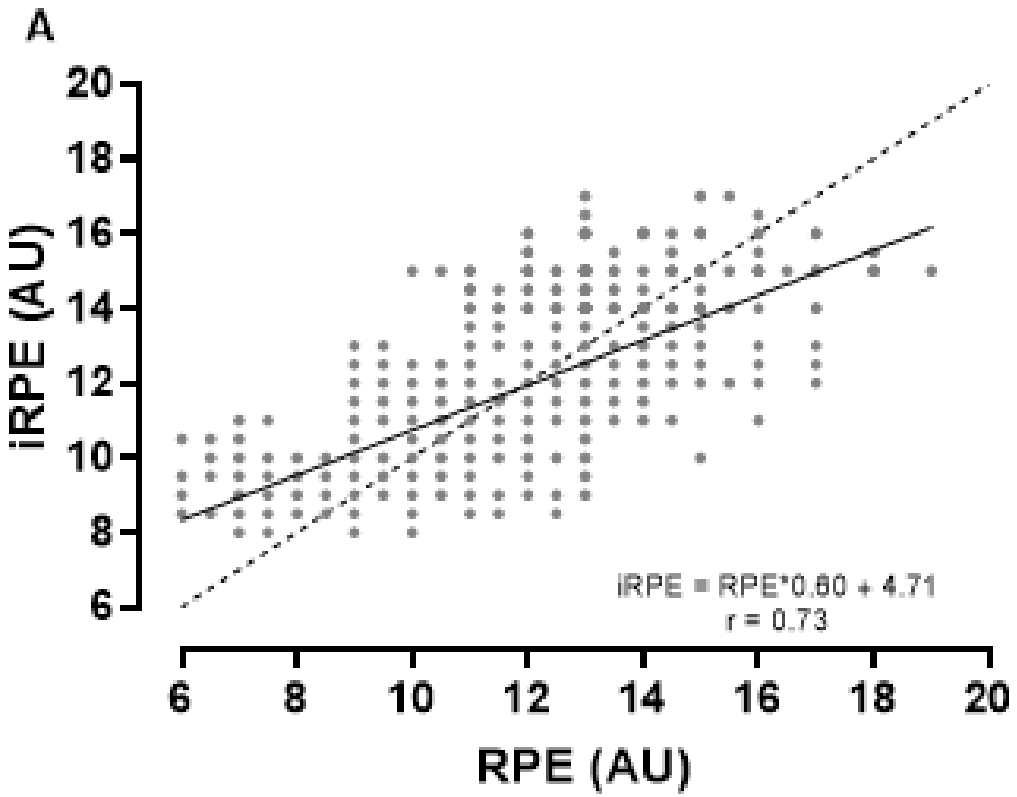
- *Moderate* to *large* differences between planned and executed training program on individual level

- On average 42 minutes longer training durations -> ~25%

- In contrast with previous research (Foster et al., 2001)

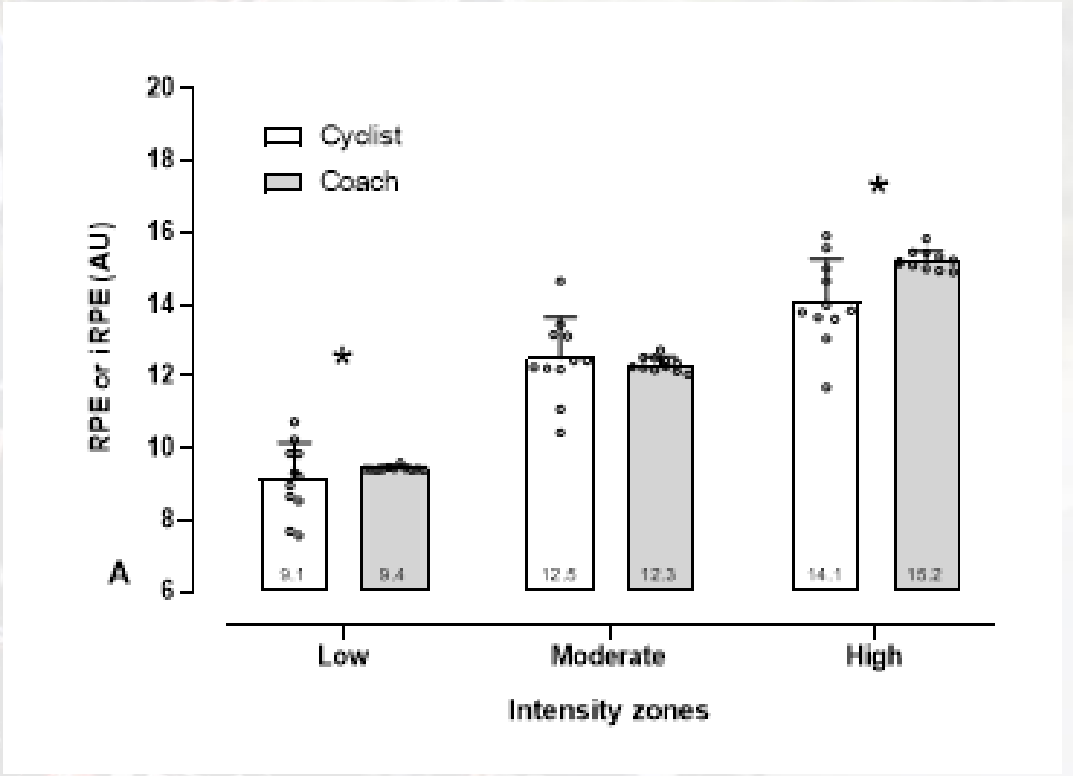
Perception of training program

- Large individual differences in perception
- Influenced by?
  - School exams (Foster et al., 1998)
  - Sleep deprivation (Roberts et al., 2019)
  - Environmental circumstances (Levine et al., 2019)
  - Nutritional status (Pomportes et al., 2019)
  - Fatigue (Rodriquez-Marroyo et al., 2012)



Perception of training program

- Lower RPE for high-intensity training sessions:
  - Mentally overprepared? (Barnes et al., 2017)
  - High-intensity intervals but not entire training?
- Lower RPE for low-intensity training sessions:
  - Polarized training model? (Seiler, 2010)
  - Misinterpretation?
- No differences in sRPE:
  - Longer durations compared with other studies
    (Foster et al., 2001), (Brink et al., 2014), (Barnes et al., 2017)



Take home message

- Cyclists do not always execute the training program as designed
- Perception of the same training session can differ between various cyclists
- Both could influence the outcome of the training program

Thanks for listening!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Additional slides

Table 1: Mean difference (± SD), correlation, and regression coefficients (slope and intercept) between the executed duration of 11 (semi-) professional cyclists and the planned duration by the coach.

Cyclist	Training sessions (N)	Duration cyclist - coach (min)	R	Intercept	Slope	TEE	Standardized TEE
1	49	2.0 ± 22.7	0.95	-8.39	1.07	22.41	0.33 (M)
2	92	23.8 ± 35.1*	0.87	24.95	0.99	35.26	0.56 (M)
3	65	- 8.3 ± 50.8	0.82	23.83	0.82	48.93	0.69 (L)
4	46	- 2.7 ± 30.3	0.95	-11.65	1.05	30.33	0.31 (M)
5	77	- 1.8 ± 49.3	0.87	-9.69	1.05	49.47	0.57 (M)
6	79	25.7 ± 51.9#	0.85	16.42	1.06	52.03	0.62 (L)
7	47	- 1.4 ± 54.1	0.82	17.70	0.90	53.93	0.71 (L)
8	96	- 13.4 ± 31.0	0.93	-14.96	1.01	31.19	0.38 (M)
9	62	3.1 ± 34.5	0.93	-7.79	1.07	34.35	0.39 (M)
10	76	3.3 ± 53.5	0.86	-6.21	1.06	53.64	0.59 (M)
11	58	- 0.7 ± 54.1	0.81	-0.86	1.00	54.49	0.72 (L)

Abbreviations: sRPE, session Rating of Perceived Exertion; sRIE, session Rating of Intended Exertion; TEE, Typical Error of the Estimate. *Sig. (<0.05), #(<0.10) with Independent samples t-test grouped by variables. Standardized TEE's were considered as M(oderate): 0.3-0.6 and L(arge): 0.6-1.0 [1]

Table 2: Mean difference (± SD), correlation, and regression coefficients between the executed sRPE of 11 (semi-) professional cyclists and the planned sRIE by the coach.

Cyclist	Training sessions (N)	sRPE cyclist – sRIE coach (AU)	R	Intercept	Slope	TEE	Standardized TEE
1	49	130 ± 359	0.95	-79.85	1.12	344	0.32 (M)
2	92	149 ± 514	0.90	-2.91	1.09	509	0.49 (M)
3	65	-136 ± 836	0.78	364.60	0.77	790	0.80 (L)
4	46	-133 ± 577	0.93	-237.49	1.04	581	0.40 (M)
5	77	-90 ± 672	0.86	88.76	0.91	668	0.59 (M)
6	79	-41 ± 597	0.88	205.40	0.87	578	0.55 (M)
7	47	13 ± 983	0.76	352.78	0.85	974	0.86 (L)
8	96	-317 ± 445#	0.93	-169.83	0.92	437	0.39 (M)
9	62	75 ± 497	0.93	49.88	1.01	500	0.41 (M)
10	76	179 ± 758	0.88	39.07	1.07	758	0.55 (M)
11	58	362 ± 1033	0.77	115.50	1.10	1036	0.83 (L)

Abbreviations: sRPE, session Rating of Perceived Exertion; sRIE, session Rating of Intended Exertion; TEE, Typical Error of the Estimate
*Sig. (<0.05), #(<0.10) with Independent samples t-test grouped by variables. Standardized TEE's were considered as M(oderate): 0.3-0.6 and L(arge): 0.6-1.0 [1]

Table 3: Mean difference (± SD), correlation, and regression coefficients between the perceived RPE of 11 (semi-) professional cyclists and the intended RIE by the coach.

Cyclist	Training sessions (N)	RPE cyclist-RIE coach	R	Intercept	Slope	TEE	Standardized TEE
1	48	0.51 ± 1.27	0.89	2.73	0.74	1.27	0.50 (M)
2	92	-0.40 ± 1.60	0.82	4.41	0.63	1.61	0.71 (L)
3	59	-0.12 ± 1.64	0.74	3.98	0.65	1.62	0.90 (L)
4	46	-1.05 ± 1.77	0.81	5.10	0.64	1.79	0.73 (L)
5	76	-0.20 ± 1.69	0.65	3.59	0.70	1.48	1.17 (VL)
6	79	-1.39 ± 1.52*	0.72	1.20	1.02	1.08	0.97 (L)
7	44	-0.43 ± 1.94	0.75	4.80	0.63	1.94	0.88 (L)
8	92	-1.35 ± 1.38*	0.85	4.52	0.67	1.38	0.61 (L)
9	62	0.23 ± 1.29	0.74	2.34	0.78	1.18	0.92 (L)
10	71	0.98 ± 1.42*	0.77	1.61	0.79	1.32	0.83 (L)
11	56	1.45 ± 1.85*	0.74	5.18	0.51	1.87	0.92 (L)

Abbreviations: RPE, Rating of Perceived Exertion; RIE, Rating of Intended Exertion; TEE, Typical Error of the Estimate

*Sig. (<0.05) with Independent samples t-test grouped by variables. Standardized TEE's were considered as M(oderate): 0.3-0.6, L(arge): 0.6-1.0 and V(ery) L(arge): 1.0-2.0 [1]

Table 4: Mean difference (± SD), correlation, and regression coefficients between the perceived sRPE of 11 (semi-) professional cyclists and the intended sRIE by the coach.

Cyclist	Training sessions (N)	sRPE cyclist-sRIE coach	R	Intercept	Slope	TEE	Standardized TEE
1	48	147 ± 340	0.96	188	0.83	329	0.31 (M)
2	92	149 ± 514	0.90	317	0.74	509	0.49 (M)
3	59	-55 ± 791	0.81	454	0.81	758	0.73 (L)
4	46	-133 ± 577#	0.93	532	0.83	581	0.40 (M)
5	76	-68 ± 649	0.87	403	0.83	644	0.56 (M)
6	79	-41 ± 597	0.88	242	0.89	578	0.55 (M)
7	44	27 ± 986	0.75	676	0.69	965	0.88 (L)
8	92	-288 ± 432	0.94	373	0.94	425	0.37 (M)
9	62	75 ± 496	0.93	244	0.85	500	0.41 (M)
10	71	214 ± 638	0.91	313	0.77	632	0.44 (M)
11	56	356 ± 1000	0.78	857	0.56	1002	0.79 (L)

Abbreviations: sRPE, session Rating of Perceived Exertion; sRIE , session Rating of Intended Exertion; TEE, Typical Error of the Estimate. *Sig. (<0.05), #(<0.10) with Independent samples t-test grouped by variables. Standardized TEE's were considered as M(oderate): 0.3-0.6 and L(arge): 0.6-1.0 [1]