

# Factors of disagreement between coaches and players of a high-level basketball team when assessing individual session perceived exertions

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*FACTORS OF DISAGREEMENT BETWEEN COACHES AND PLAYERS OF A HIGH-LEVEL BASKETBALL TEAM WHEN ASSESSING INDIVIDUAL SESSION PERCEIVED EXERTIONS*

KEY WORDS: Session-RPE, Team sport, Coaching process

ABSTRACT: the main objective of this study was to evaluate the concordance between the coaches and the players of a Spanish high-level female basketball team when evaluating the hardness of practice sessions looking into the factors that could modulate the alleged biases of the coaches. The three staff members severely underestimated the players' session perceived exertion, which meant that, as a group, they were not capable of planning the desired intensity along the registered period. Furthermore, this study allowed us to detect what aspects of coaching knowledge should deserve more attention with each staff members if we desired less biased judgments about the players' perceptions, who were the most relevant and common source of bias.

Do expert coaches really get to know their players? For instance, can basketball coaches accurately judge a player's training stress after a practice session? We do not ignore the dramatic importance of monitoring the training load, generally understood as the physical/physiological stress or fatigue produced by practice and competition on the players, but we may need to understand in advance if coaches and players share their criteria about what easy or hard practice sessions are if we want to help coaches to understand how to build effective teamwork. As Abraham and Collins (2006) stated, that expert coaches try to develop "the performance of their athletes through the identification and setting of individual performance goals" (p. 561) using a broad range of knowledge, "the two most important sources of knowledge [being] sport-specific and pedagogic in nature" (p. 562). By means of validated and easy to use scales of perceived exertion (Calahorra, Torres-Luque and Lara-Sánc 2014), some authors have compared the session training load planned by the coaches and the training load experienced by the players bringing to light differences between each in the judgement of this aspect of performance: Marroyo, Medina, García-Lóez, García-Tormo and Foster (2014), who compared volleyball coaches' and players' rated exertion of practice sessions in a more rigorous way, found major differences between both groups after physical training sessions but not after the technical-tactical ones nor after the games.

From a different but comparable perspective, differences between the perceived session exertion level of players/athletes and the planned intensity level by the coaches have been also reported in different sports. The closest example is the study by Brink, Frenchen, Jordet and Lemmink (2013) with U17, U19 footballers who declared higher intensity than their professional coaches in easy and intermediate training sessions. Similarly, 40 Brazilian top-level judokas declared higher intensities than planned by the coaches in four different sessions (Viveiros, Costa Caldas, Moreira, Naakamura and Saldanha Aoki 2011), but 8

well-trained swimmers declared harder levels when low-intensity exercise was expected by the coaches and softer levels when high-intensity exercise (Wallace, Stlattery and Coutts 2009). The same same to happen with 15 competitive university runners (Foster, Heimann, Esten, Brice and Porcari 2001).

Therefore, the main objective of this study was to evaluate the concordance between the coaches and the players of a Spanish high-level female basketball team when evaluating the hardness of practice sessions looking into the factors that could modulate the alleged biases of the coaches.

## Method

This study was undertaken in season 2013-14. Three coaches and nine players (26±5 years old) from the Spanish *Liga femenina 2* (2<sup>nd</sup> National Division) took part voluntarily in accordance with the Declaration of Helsinki. The three members of the staff were top qualified coaches: the 1<sup>st</sup> coach was in her third season with the team; the 2<sup>nd</sup> coach was in the squad for his first year; the physical trainer had a degree in sports sciences and was in the squad for his first season.

The team performed four training sessions per week plus one official match. At least 10 minutes after the completion of each session a rating of the difficulty of the whole training session was solicited from each participant using the 0-10 point Borg category RPE scale modified by Foster (1998). For 9 weeks (February and March) the physical trainer collected the data starting by inputting his own assessment and then noting the evaluation of the other coaches and players without permitting any cross contamination of the responses.

The first four weeks were used to let the participants learn and get used to the exertion assessment procedures and the following five weeks as data collection. The rated perceived and

estimated exertions were considered to be the dependent variables and the following factors the explanatory variables: *player* (9), *week* (5) and *practice day* (post-game/mid-week/pre-game). The pre-processing and processing of the data was made on R (3.0.2) (R Core team, 2013).

## Results

Table 1 shows the mean values and standard deviations of the efforts declared by the players and the players' efforts estimated by the staff members, who, generally speaking, underestimated the exertion level declared by the players ( $4.34 \pm 1.62$ ): the trainer was the closest to the players ( $4.20 \pm 1.21$ ), the 1<sup>st</sup> coach was second closest ( $3.93 \pm 1.11$ ) and the 2<sup>nd</sup> coach was the worst estimator ( $2.88 \pm 1.18$ ) of all. After performing Welch's unpaired t-tests, these differences happened to be significant for the first ( $t = 3.72$ ,  $df = 471.5$ ,  $p\text{-value} < 0.000$ ) and second coaches ( $t = 10.80$ ,  $df = 493.3$ ,  $p\text{-value} < 0.000$ ) and very considerable for the physical trainer ( $t = 1.87$ ,  $df = 509.5$ ,  $p\text{-value} = .061$ ).

As shown in Table 2, every member of staff had a different bias profile according to the factors considered (week of the season, type of practice session and player). By means of a three-way ANOVA, we calculated the effects of the sources of bias considered as sources in the variability of the estimation errors. The model Week x practiceDay x Player was highly informative for the three coaches, accounting for a significant amount of variability despite the not so long period analysed. In the three cases (1<sup>st</sup> coach, 2<sup>nd</sup> coach, trainer), the estimation errors of the efforts declared (the difference between the player's value and staff's value) were affected by who the player observed was ( $F = 3.87$ ,  $p = .002$ ;  $F = 18.99$ ,  $p = .000$ ;  $F = 6.30$ ,  $p = .000$ ). The errors were not equally distributed in the 5 weeks for the two coaches ( $F = 2.96$ ,  $p = .032$ ;  $F = 10.63$ ,  $p = .000$ ) and the day of practice in relation to the competition clearly affected the 2<sup>nd</sup> coach and the physical trainer ( $F = 10.63$ ,  $p = .000$ ;  $F = 8.83$ ,  $p = .000$ ). Interactions between factors were different for each member of staff as can be seen on Table 2.

## Discussion

The high variability of the exertion levels caused on the players (total SD is greater than a third of the total mean, Table 1) may explain the great deal of errors made by the three members of the staff, but the issue was precisely if basketball coaches were capable of integrating basic features of coaching and practice planning into their analytic thinking. Our results are not totally congruent with the findings of Marroyo et al. (2014) who reported that 12 mid-level volleyball players scored higher than two expert and two beginner coaches after physical training but not after technical-tactical training (as in our case) or matches. Those two expert volleyball coaches show that accurate judgement of the exertion in a session is possible, although in our case, regardless of the fact that the 1<sup>st</sup> coach and the trainer were far better observers than the 2<sup>nd</sup> coach, the three staff were severely biased, unable to consider the particularities of the players or the type of practice day. Having the physical trainer as the best evaluator of the players' training load cannot be considered a surprise because he was in charge of the control of this aspect of coaching and had the inevitable feedback from the players about his own estimations every time he interrogated them. The poorer performance by the 2<sup>nd</sup> coach may be due to a distribution of duties we are not aware of yet. We should remember that the data remained unknown during data collection despite the accumulation of error, avoiding any correction based on the knowledge of previous estimations.

In conclusion, the three staff severely underestimated the players' session perceived exertion which means that, as a group, they were not capable of planning the desired intensity (Viveiros et al., 2011; Wallace et al., 2009). Furthermore, this study allowed us to detect what aspects of coaching knowledge (Abraham et al., 2006) should deserve more attention with each staff member if we desired less biased judgments about the perceptions of each and every player. More precisely, the players were the most relevant and common source of bias.

Players	Estimated Exertion										
	Declared Exertion			1st coach		2nd coach		Trainer		Staff's Overall	
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	20	3.48	1.14	2.85	0.52	2.90	0.79	3.15	0.88	2.97	0.74
2	19	5.45	1.72	4.61	1.11	3.21	0.71	4.26	1.15	4.03	1.16
3	20	4.43	1.72	3.88	1.11	3.70	1.08	4.70	1.08	4.09	1.16
4	18	3.61	0.70	3.33	0.57	1.67	0.77	3.39	0.70	2.80	1.05
5	19	6.42	1.56	5.21	1.27	2.63	1.54	5.79	0.98	4.54	1.87
6	19	3.24	0.69	3.58	0.69	2.42	1.26	4.00	1.00	3.33	1.20
7	19	5.00	1.56	4.45	0.97	3.61	0.79	4.61	1.01	4.22	1.01
8	16	3.31	0.70	3.53	0.64	2.94	1.00	3.81	1.05	3.43	0.97
9	19	3.95	0.90	3.95	0.76	2.79	1.23	4.00	0.82	3.58	1.10
Total	169	4.34	1.62	3.93	1.11	2.88	1.18	4.20	1.21	3.67	1.30

Table 1. Mean values and standard deviations of the efforts declared by the players and estimated by the coaches after practice sessions.

Sources of bias	df	SS	MS	F	p	Partial $\eta^2$
<i>1<sup>st</sup> coach</i>						
Week (W)	4	13.757	3.439	2.956	.032	.232
Practice day (D)	2	1.087	.543	.467	.630	.023
Players (P)	8	35.984	4.498	3.866	.002	.442
WxD	8	4.635	.579	.498	.850	.093
WxP	32	57.591	1.809	1.555	.094	.560
DxP	16	47.414	2.963	2.547	.009	.510
WxDxP	59	63.997	1.085	.932	.602	.585
Residuals	39	45.375	1.163			
<i>F= 1.498, df (129,39), p=0.073, R2 = 0.832, adjusted R2= 0.276</i>						
<i>2<sup>nd</sup> coach</i>						
Week (W)	4	25.886	6.471	5.869	.000	.376
Practice day (D)	2	23.437	11.719	10.629	.000	.353
Players (P)	8	167.498	20.937	18.990	.000	.796
WxD	8	60.402	7.550	6.848	.000	.584
WxP	32	50.191	1.568	1.423	.146	.538
DxP	16	38.604	4.127	2.188	.023	.473
WxDxP	59	97.104	16.659	1.493	.093	.693
Residuals	39	43.000	1.103			
<i>F= 3.256, df (129,39), p=0.000, R2 = 0.915, adjusted R2= 0.634</i>						
<i>Physical trainer</i>						
Week (W)	4	5.166	1.292	1.275	.296	.116
Practice day (D)	2	17.873	8.963	8.823	.000	.311
Players (P)	8	51.105	6.388	6.301	.000	.564
WxD	8	17.059	2.132	2.105	.059	.302
WxP	32	33.563	1.049	1.036	.456	.459
DxP	16	21.693	1.356	1.339	.112	.354
WxDxP	59	55.523	.941	.929	.607	.584
Residuals	39	39.500	1.013			
<i>F= 1.546, df (129,39), p=0.058, R2 = 0.836, adjusted R2= 0.295</i>						

Table 2. Bias profiles of each coach when judging the players' efforts.

**FACTORES DE SESGO DE LOS ENTRENADORES DE BALONCESTO DE ELITE EN LA ESTIMACIÓN DE LOS ESFUERZOS DE LOS JUGADORES**  
**PALABRAS CLAVE:** Session-RPE, Deporte colectivo, Entrenamiento

**RESUMEN:** el principal objetivo de este estudio fue evaluar la concordancia entre los entrenadores y los jugadores de un equipo femenino español al valorar la dureza de las sesiones de entrenamiento, prestando especial atención a los factores moduladores de los posibles sesgos en el cuerpo técnico. Los tres entrenadores infravaloraban notablemente los valores de fatiga declarados por los jugadores tras las sesiones, lo que implicaba que, en conjunto, no eran capaces de planificar correctamente la intensidad del ejercicio propuesto en cada periodo. En este sentido, esta investigación nos permitió detectar en qué aspectos del pensamiento de cada entrenador se debía incidir para reducir sus sesgos particulares y el más común entre los tres: los jugadores mismos.

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