The influence of training load variables on subjective perceptions of session intensity in youth sport

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1.0 – Introduction

- To effectively periodise training, coaches and practitioners must understand the internal response that a prescribed training load will elicit in their athletes[1].
- At present, research examining the impact of training load markers on perceptions of intensity is limited to senior sport[1,2,3].
- Therefore, the purpose of this study was to determine the influence of training load markers on subjective perceptions of session intensity in youth hockey, rugby and football.

2.0 – Methods

- 30 youth athletes (age 17.8 ± 0.6 years; height 173 ± 9 cm; body mass 74.6 ± 14.4 kg) participated in the study.
- All participants wore a 10 Hz GPS unit (S5 Optimeye, Catapult Sports) and Heart Rate belt for all field based training sessions across a 14 week in-season period.
- Following each session participants provided a rating of perceived exertion (RPE) on a modified Borg category ratio-10 (CR-10) scale.
- Sessions were grouped based on the participants RPE rating as "Easy", "Moderate" and "Hard". A total of 157 hockey sessions, 208 rugby sessions and 163 football sessions were analysed.
- Principal Component Analysis (PCA) was used to determine the variance explained by training load markers for sessions perceived to be "Easy" "Moderate" and "Hard" for each sport.

3.0 – Results

Hockey	Easy		Moderate		Hard	
	PC1	PC2	PC1	PC2	PC1	PC2
Variance Explained %	67.37	21.31	67.00	23.94	60.69	25.88
Cumulative Value %	67.37	88.68	67.00	90.93	60.69	86.57
Rotated Component Loadings						
Total Distance	0.96	0.64	0.96	0.11	0.84	0.45
High Speed Running	0.00	0.99	0.96	0.11	0.84	0.45
PlayerLoad	0.96	0.81	0.96	0.20	0.82	0.54
PlayerLoad$_{slow}$	0.92	-0.25	0.89	-0.39	0.14	0.94
Heart Rate Exertion Index	0.83	0.04	0.84	-0.20	0.09	0.83

Rugby	Easy		Moderate		Hard	
	PC1	PC2	PC1	PC2	PC1	PC2
Variance Explained %	68.65	19.25	65.79	18.59	62.41	18.33
Cumulative Value %	68.65	87.90	65.79	84.38	62.41	80.75
Rotated Component Loadings						
Total Distance	0.83	0.44	0.80	0.49	0.60	0.68
High Speed Running	0.15	0.97	0.12	0.96	0.03	0.92
PlayerLoad	0.92	0.31	0.87	0.40	0.71	0.62
PlayerLoad$_{slow}$	0.94	-0.15	0.90	-0.10	0.92	0.03
Heart Rate Exertion Index	0.77	0.34	0.80	0.19	0.77	0.22

Football	Easy		Moderate		Hard	
	PC1	PC2	PC1	PC2	PC1	PC2
Variance Explained %	71.05	12.96	58.92	25.26	59.52	24.30
Cumulative Value %	71.05	84.02	58.92	84.18	59.52	83.83
Rotated Component Loadings						
Total Distance	0.77	0.55	0.93	0.07	0.82	0.25
High Speed Running	0.19	0.94	0.11	0.95	0.06	0.96
PlayerLoad	0.84	0.47	0.94	-0.17	0.93	-0.11
PlayerLoad$_{slow}$	0.93	0.44	0.71	-0.55	0.80	-0.47
Heart Rate Exertion Index	0.66	0.45	0.81	0.19	0.89	0.10

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4.0 – Conclusion

- For Hockey, the impact of total distance and PlayerLoad reduced for 'Hard' sessions, while high speed running became the most influential factor.
- Physical contact is the predominating factor in 'Hard' Rugby sessions as PlayerLoad $_{Slow}$ maintains the highest component loading.
- For Football, PlayerLoad explains the most variance in 'Hard' sessions suggesting accelerations and decelerations are key factors in the increased intensity of football training

5.0 – Practical Applications

- Findings of the present study aid practitioners in the prescription and periodisation of training by providing important information as to the most influential training variables to manipulate to achieve a desired internal response to training.

6.0 – References

[1]Gaudino et al. (2015). Factors influencing perception of effort (Session Rating of Perceived Exertion) During Elite Soccer Training. IJSPP
[2]Gallo et al. (2015). Characteristics impacting on session rating of perceived exertion training load in Australian footballers. JSS
[3]Bartlett et al. (2016). Relationships between internal and external training load in team sport athletes: evidence for an individualised approach. IJSPP