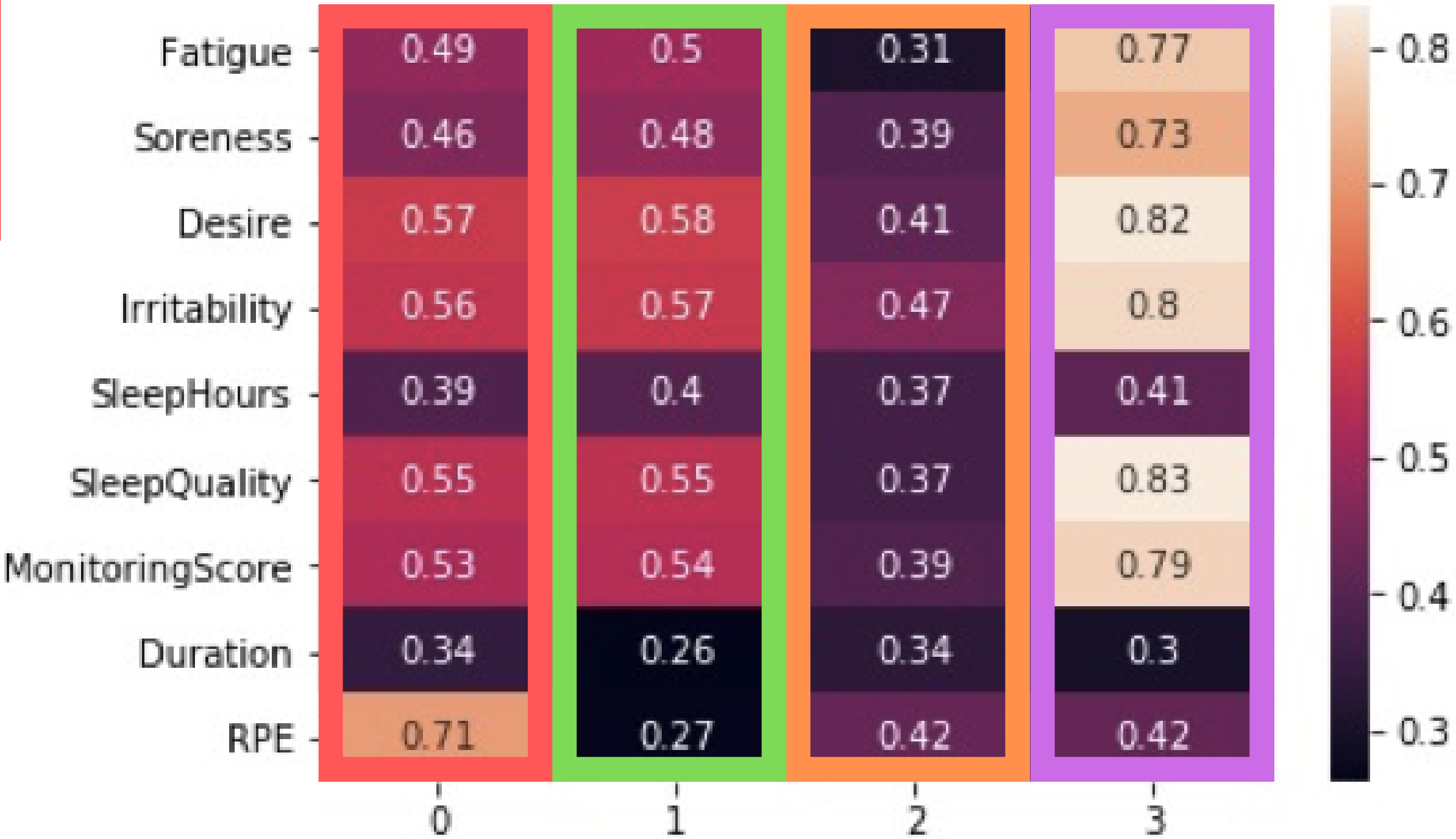




**PLAY  
SMART**

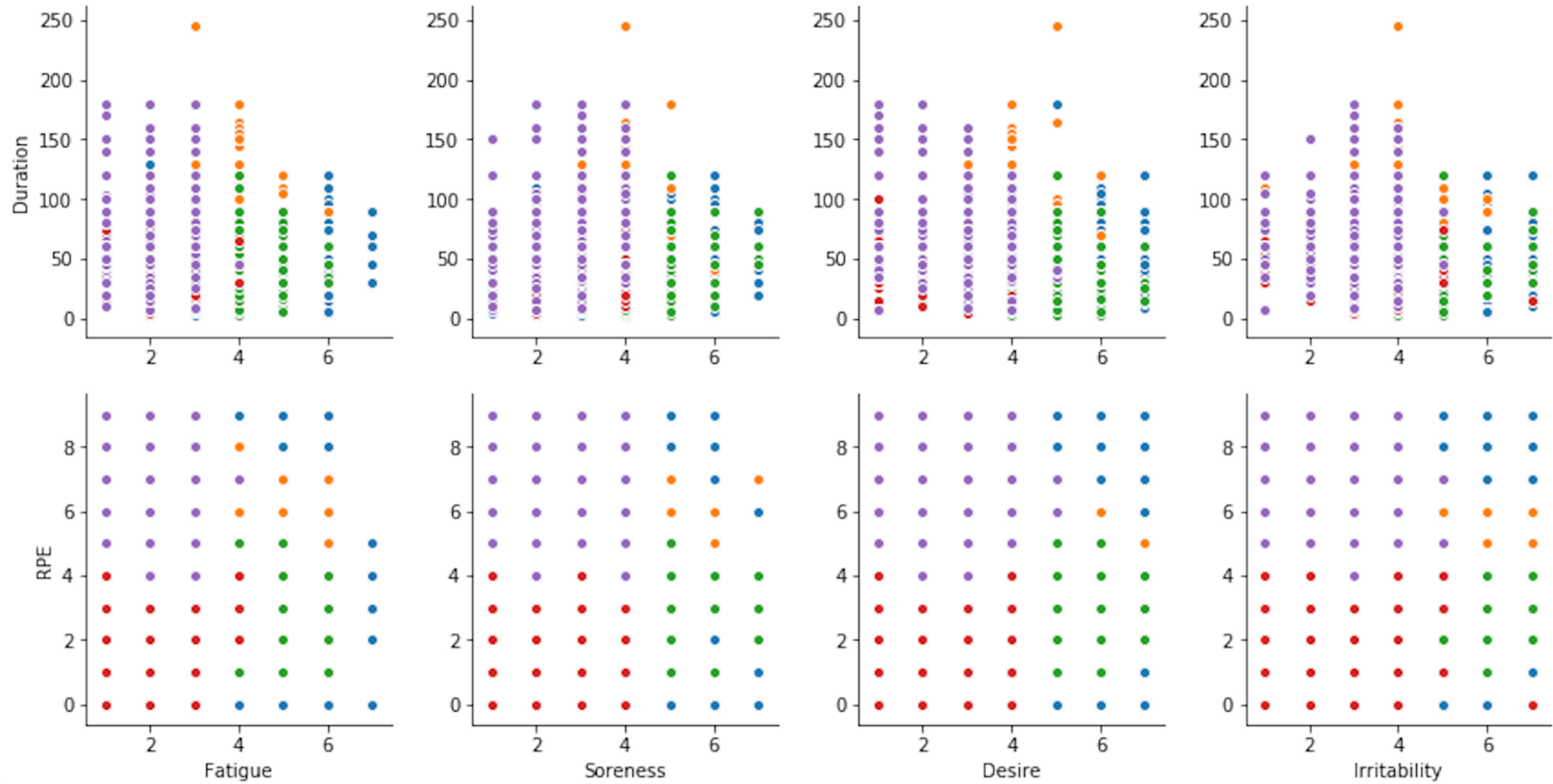
**PUTTING PLAYERS FIRST**

The most exciting phrase to hear in science, the one that heralds new discoveries, is not  
‘Eureka!’ but ‘That’s funny...’ - Isaac Asimov



And...that's funny!

# Workload vs. Fatigue



**"Here for her friends"**  
Low Motivation, Less  
Tired, Medium  
Workload



**"Better than I think"**  
Medium Motivated,  
Medium Tired, Low  
Workload

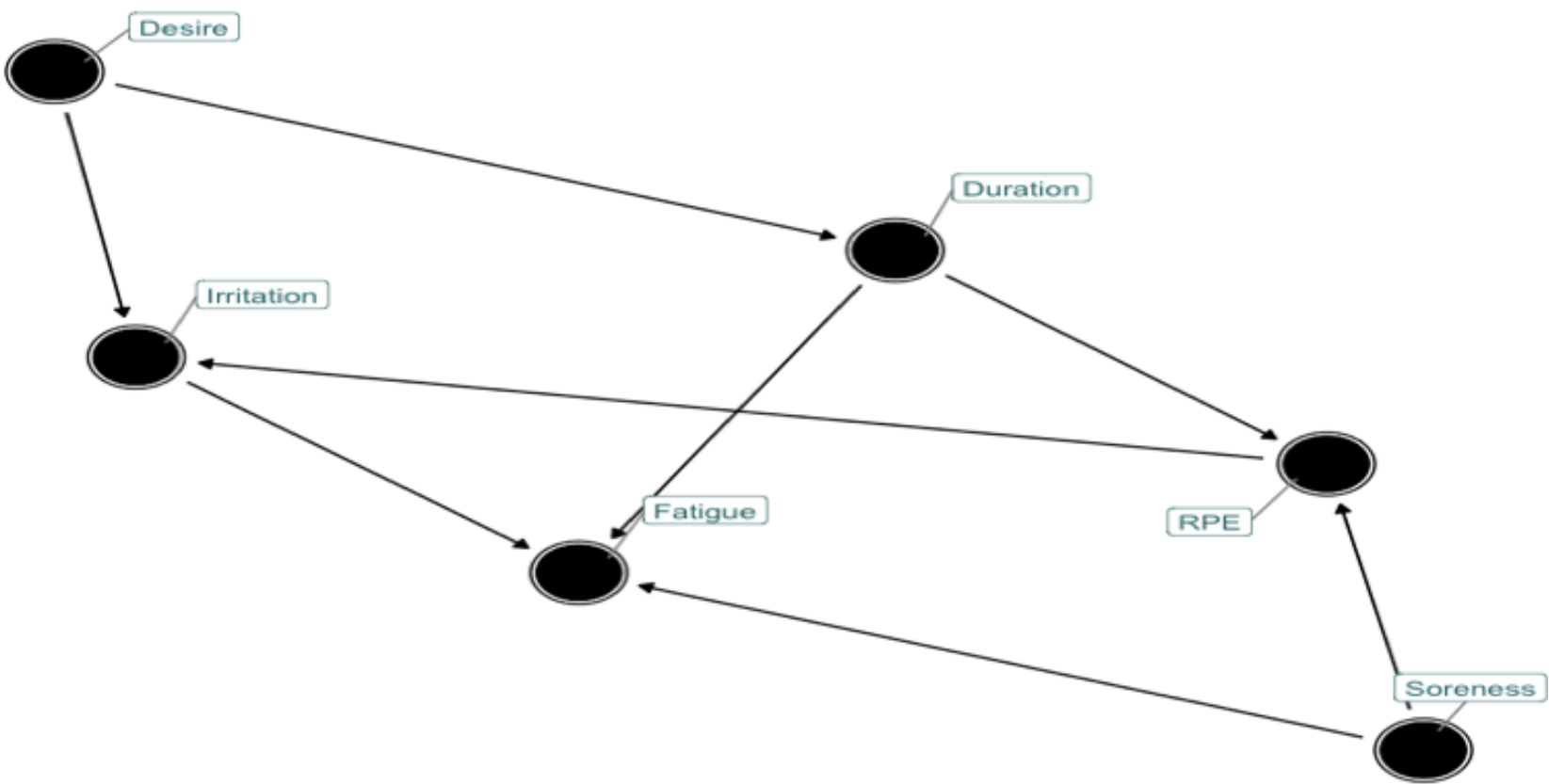


**"Apathetic Achievers"**  
Medium Motivated,  
Medium Tired, Medium  
Sleep, High Workload



**"Motivated Achiever"**  
High Motivated, High  
Tired, Good Sleep,  
Medium Workload

# Actionable Recommendation



True causal effect of workload on fatigue:

Workload influences perceived fatigue but differently for different groups and clusters of players on different days

Recommendation for the Canadian National Women's Rugby Team

Create a PLAYER MANAGEMENT SYSTEM based on the players' perceived fatigue level to get the best out of the players, to pushing the ones that are highly motivated to help them achieve better results,

Develop different STRATEGIES FOR GAMES based on the players' data of perceived fatigue and workload to have the best players for a particular game on a particular date depending on the data on their fatigue and workload level.

Streamline TRAINING/CARE PLAN for players at the team level and individual player based on clusters membership

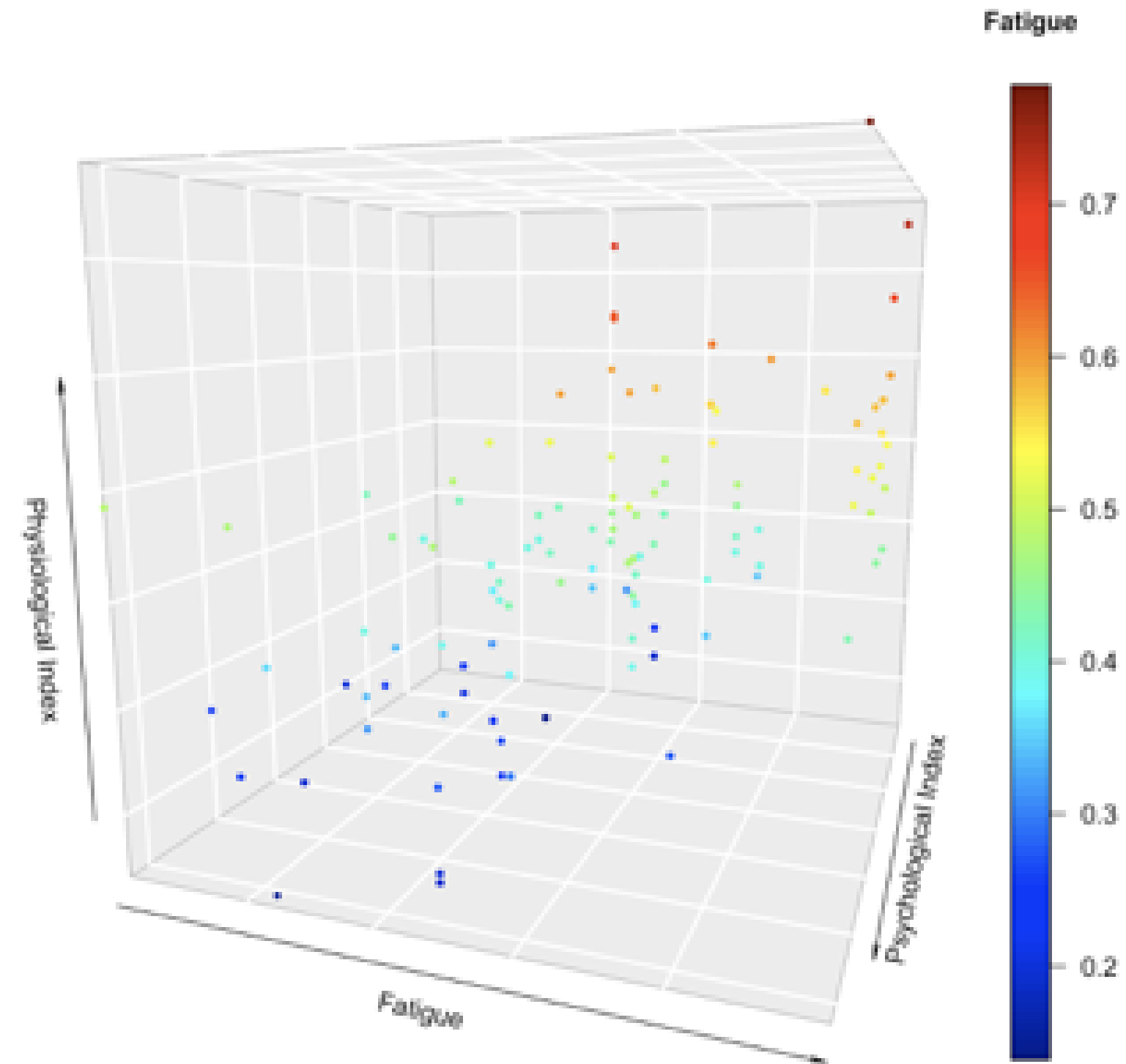
	Here for her friends	Better than I think	Apathetic Achievers	Motivated Achievers
Soreness	0.1500*** (0.025)	0.2527*** (0.033)	0.1529*** (0.023)	0.2215*** (0.034)
Desire	0.2916*** (0.029)	0.2052*** (0.033)	0.2538*** (0.024)	0.1624*** (0.033)
Irritability	0.3786*** (0.032)	0.0946** (0.035)	0.4361*** (0.027)	0.0714* (0.036)
Duration	-0.0357 (0.023)	0.1292* (0.054)	0.1048*** (0.028)	0.0401 (0.033)
RPE	0.1455*** (0.026)	0.1308*** (0.036)	0.1297*** (0.027)	0.1332*** (0.023)

# Fatigue on physiological, psychological factors and workload

Fatigue in Rugby Athletes	
	<i>Fatigue</i>
Soreness	-0.22 (0.16)
Subjective Psychological Index	0.38*** (0.04)
Subjective Physiological Index	0.58** (0.27)
Session Load	0.74*** (0.09)
Intercept	-0.0001*** (0.0000)
Observations	432
Adjusted R <sup>2</sup>	0.49
Residual Std. Error	0.18

Note:

- $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$



# Our methodology: K-means clustering

- Clustering players into K subgroups on the basis of the features
- Each observation belongs to at least one cluster and not more than one
- Within-cluster variation should be as small as possible (we used squared Euclidian distance and the centroid method)
- Elbow-method to determine the optimal number of clusters