Optimizing Rugby Training Under Fatigue

Problem Statement

Fatigue is a critical factor affecting our gameplay as the Canadian National Women's Rugby Team, but we have no way of objectively measuring it and optimizing our program around it. In our analysis, the Data Me Down team attempts to identify, using regression techniques, (1) the factors that allow us to **define** and **measure fatigue**, and (2) how we can **optimize** our **program** around **predicted fatigue** throughout the season to **maximize game performance**.

Solution

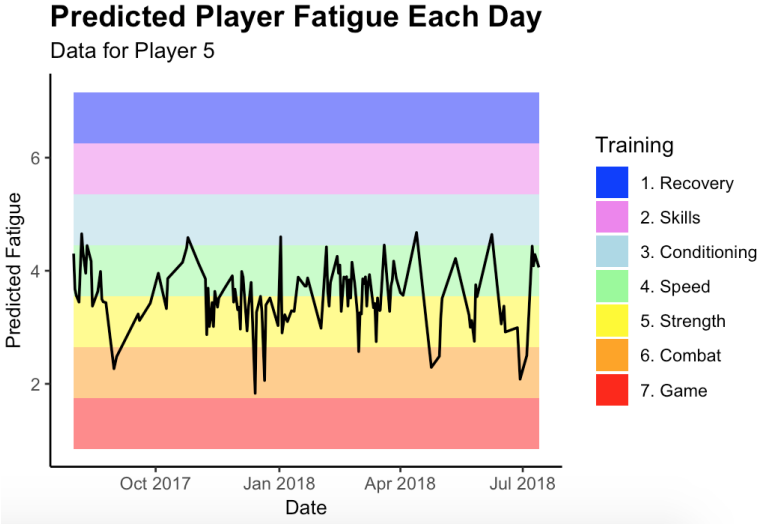
Our solution consists of a two-prong **load management approach**. (1) We have created an interactive line chart that shows the predicted fatigue of all (or a select few) players on each given day. This **predicted level of fatigue** is then used to **assign a training regime** that will allow a player to perform training that will push them **optimally** without pushing them too hard. (2) The second part of our solution is a graphic that shows **how many times** each training regime was prescribed for a **given player**. This interactive chart would allow trainers to look at overall performance of a player based on what type of training they have to do most due to fatigue. Based on this figure, we can identify ways to **improve certain types of training** or **identify players** that spend **greater than average time with high fatigue** and address their lifestyle habits to reduce time spent in fatigue.

Analysis

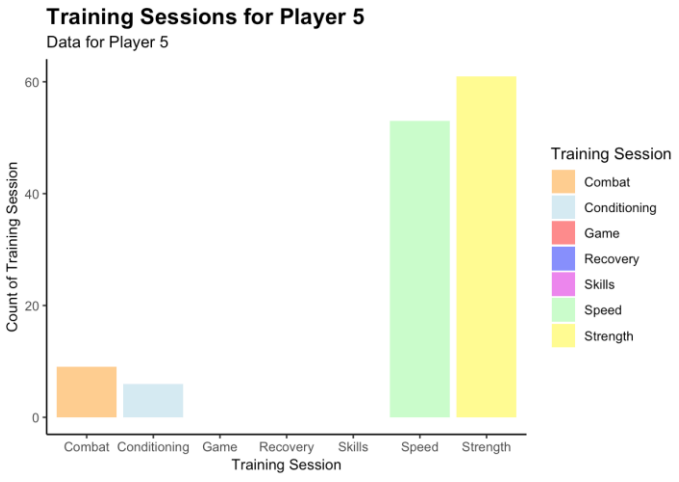
Regression Predicting Fatigue

Predicted Fatigue	Coef.	P-value	Model Characteristics		Comments
Soreness	0.2601	0.000	R-square	0.961	*We ran a number of models to accurately predict and define "Fatigue"; this model was the most accurate for our purposes. All predictors are significant and 96.1% of the variation in y-hat is explained by our predictors. This model also fulfills all 4 key assumptions to validate our model.*
Desire	0.3215	0.000	F-sig	0.000	
Irritability	0.1616	0.000			
Illness	-0.1065	0.000			
SleepIndex	0.0233	0.000			

Fatigue Over Time



Training Regime Quantity/Player



We observe that Player 5's fatigue levels fluctuate from 2 to almost 5. Based on this, the trainer would assign anywhere from Conditioning to Combat training on a given day. The chart on the right shows how many of each training regimes Player 5 did.