Does Training Affect Match Performance?

A Study Using Data Mining And Tracking Devices

Fernández, J. Medina, D., Gómez A., Arias M., Gavaldà R.
From Training Variation to Match Performance
Daniel Kahneman's and Aaron Coutts “Thinking, Fast and Slow”
Observing Physical Variables in Time

- **High Speed Running (HSR)**
- **Time (Week)**
- **Absolute Difference**
- **Similar Pattern**

**Player A**

**Player B**
Observing Physical Variables in Time

High Speed Running (HSR)

Time (Week)

W1 W2 W3 W4 W5 W6 W7

Player A Fit Profile
Player B Fit Profile

20 15 10 5 0
Normalizing to Compare Players Fairly

The graph shows the HSR in Player’s Standard Deviation over time (Weeks W1 to W7) for Player A and Player B. The lines represent the performance fluctuations of both players, allowing for a fair comparison.
Calculating Magnitude of Variation/Oscillation

$$\frac{|X_1| + |X_2| + |X_3|}{3}$$
Calculating Magnitude of Variation/Oscillation

\[ \frac{|X_3| + |X_4| + |X_5|}{3} \]

HSR in Player’s Standard Deviation

Time (Week)

W1  W2  W3  W4  W5  W6  W7

Player A
Multidimensional Space

Variables in Player's Standard Deviation

Time (Week)
Variations are Transformed into Data Points in 15-dimensions
Cluster Analysis Over Training Physical Variables
Cluster Analysis Over Training Physical Variables

Higher Variation

Lower Variation
Associating with Player’s Next Match Physical Variables

Training Variations

Match Performance

Higher Variation

Lower Variation

Associating with Next Match
 Associating with Player’s Next Match Physical Variables

Training Variations

Lower Variation

Match Performance

Lower Physical Values

Higher Physical Values

Higher Variation

Associating with Next Match
Standardized Difference of Means

Locomotor

Metabolic

Mechanical

3-Weeks Average

1, Mins 3w

TLO

DEC

HSR

AMP

HEF

PER

DSL

DEC

PER

MAX

SPR

DIS

PEN 3w
Good News (1)

Training Variations

- Higher Variation
- Lower Variation

Match Performance

- Higher Physical Values
- Lower Physical Values

Associating with Next Match
Good News (2)

Slow-Thinking Process

Fast-Thinking Process

\[ \sum_{i=2}^{W+1} \frac{||S_i - S_{i-1}||}{W} \]
Thank you! Questions?