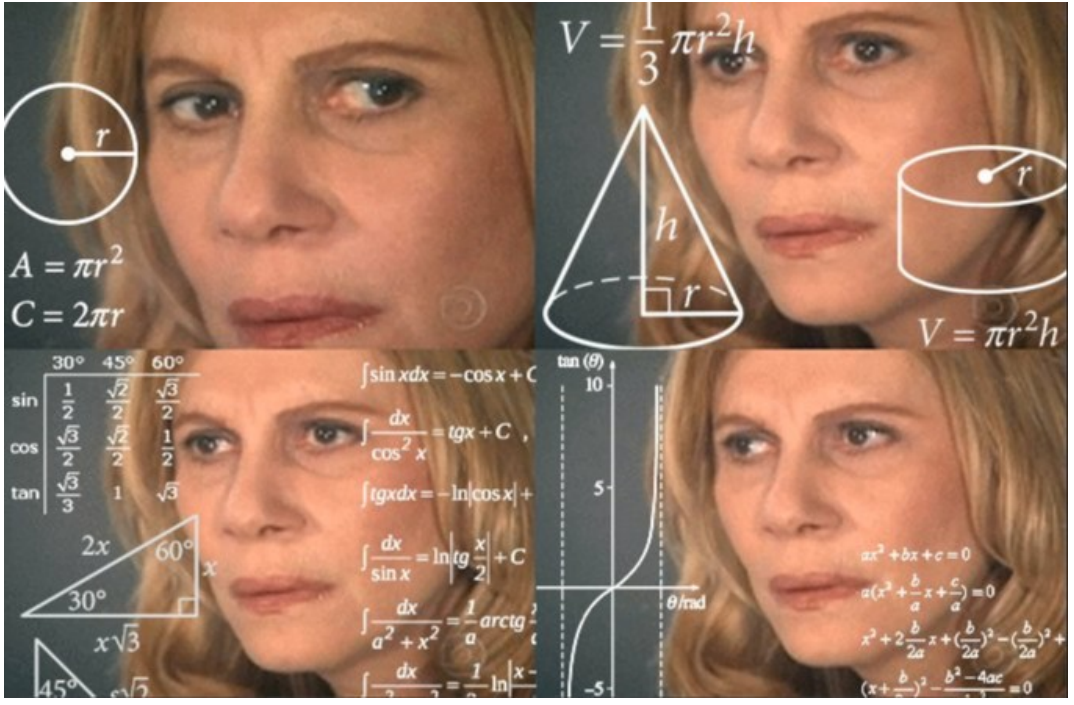
Will Fields, PhD

Evaluation of Game Event Data to Assess Team Performance

The Essential Nature of Sports

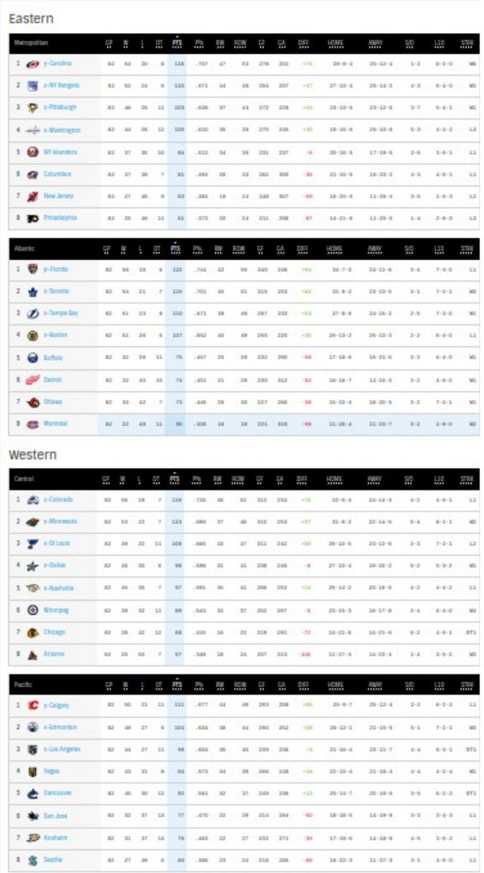
The Essential Nature of Analytics

- To be confused in a group



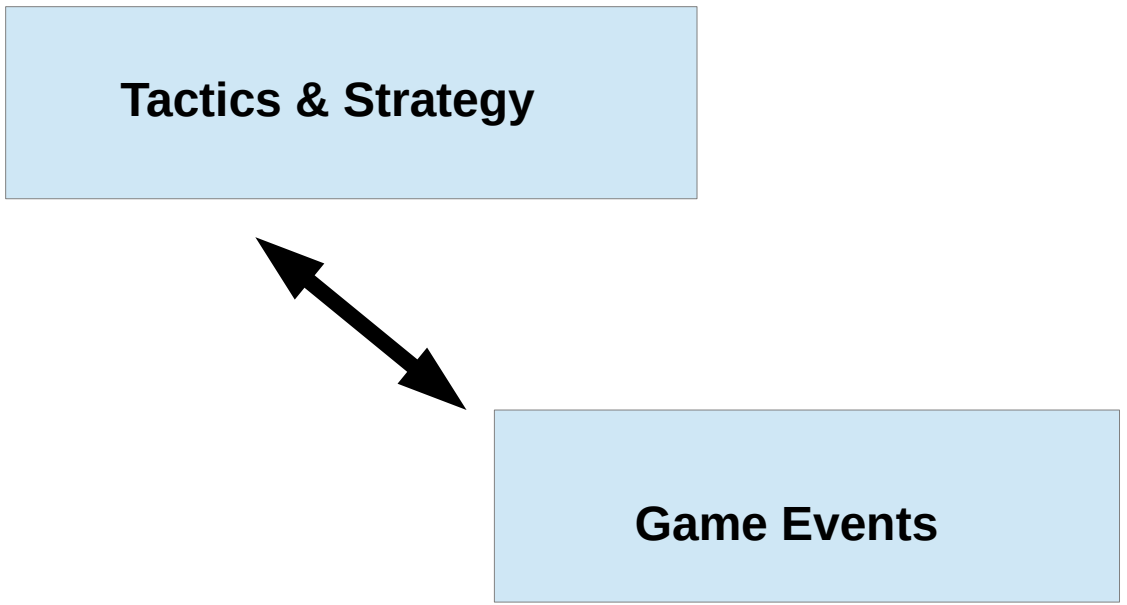
https://knowyourmeme.com/photos/1279128-math-lady-confused-lady

Which Teams Are the Best?

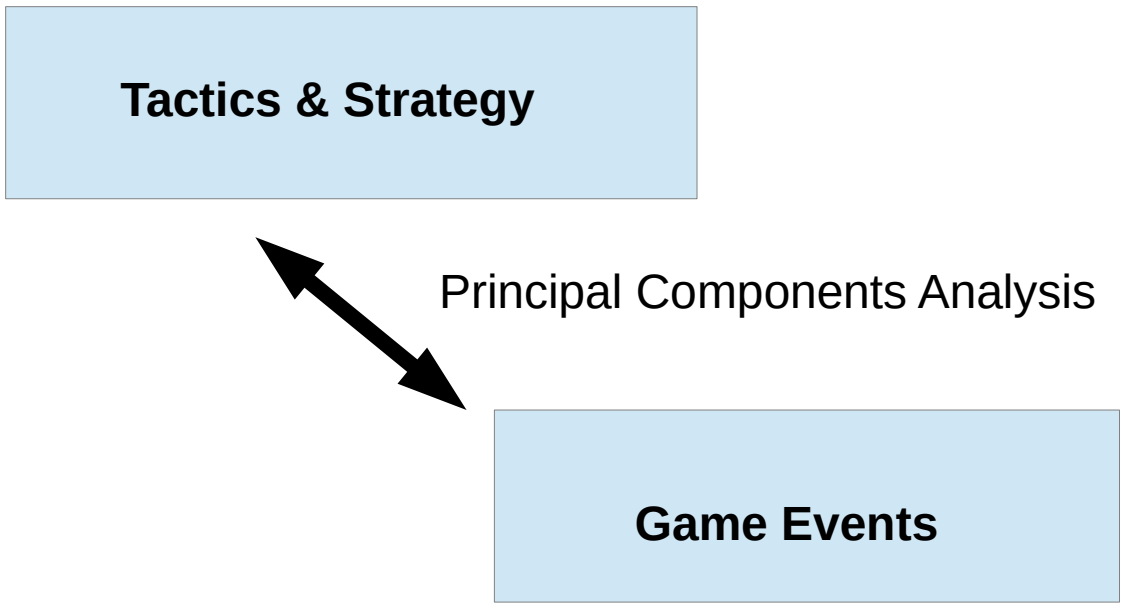


???

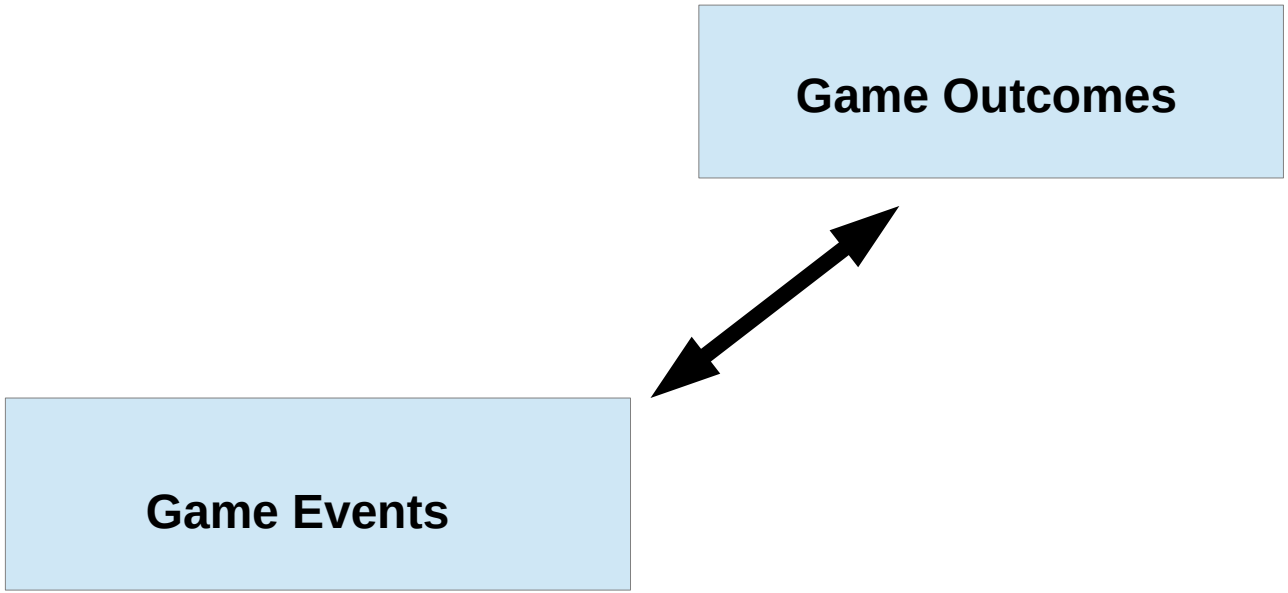
A Different Approach



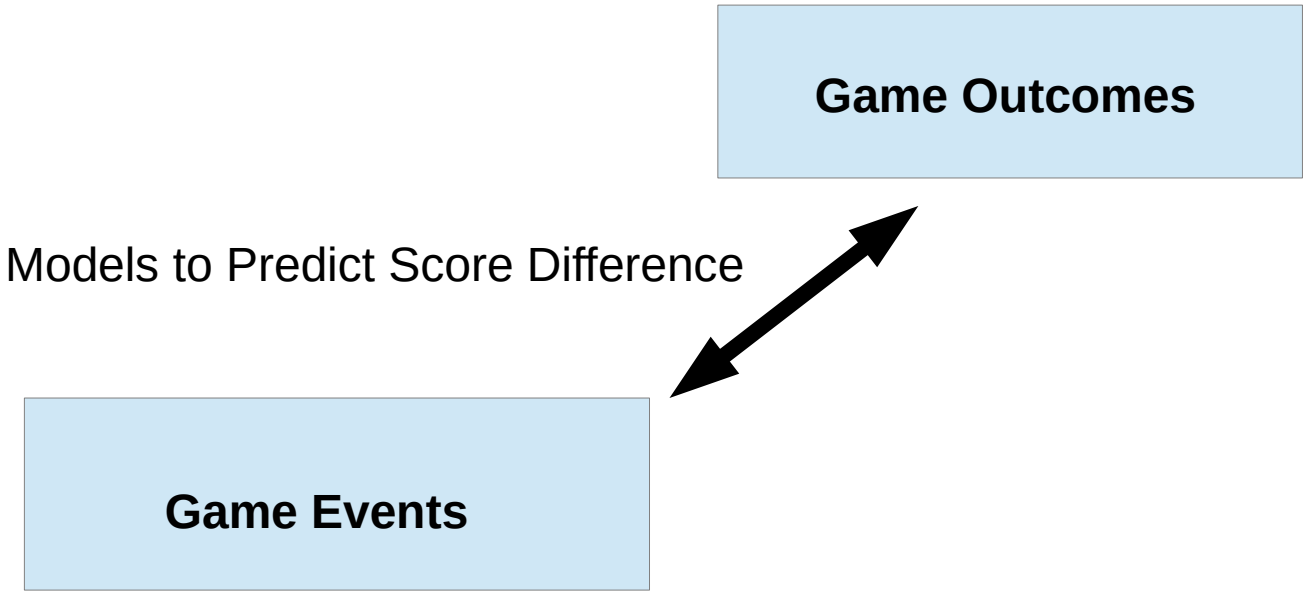
A Different Approach



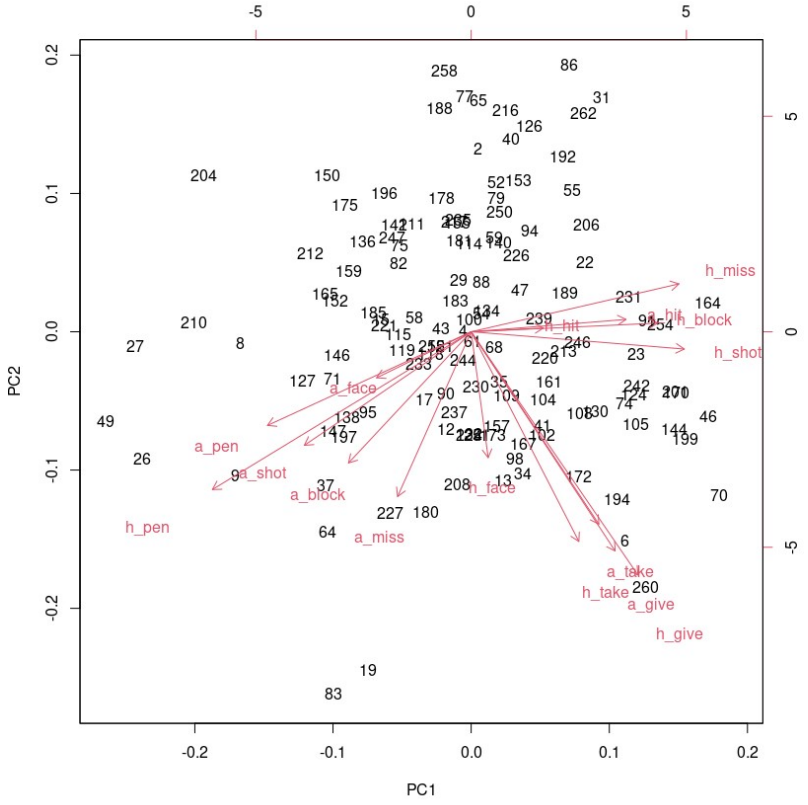
A Different Approach



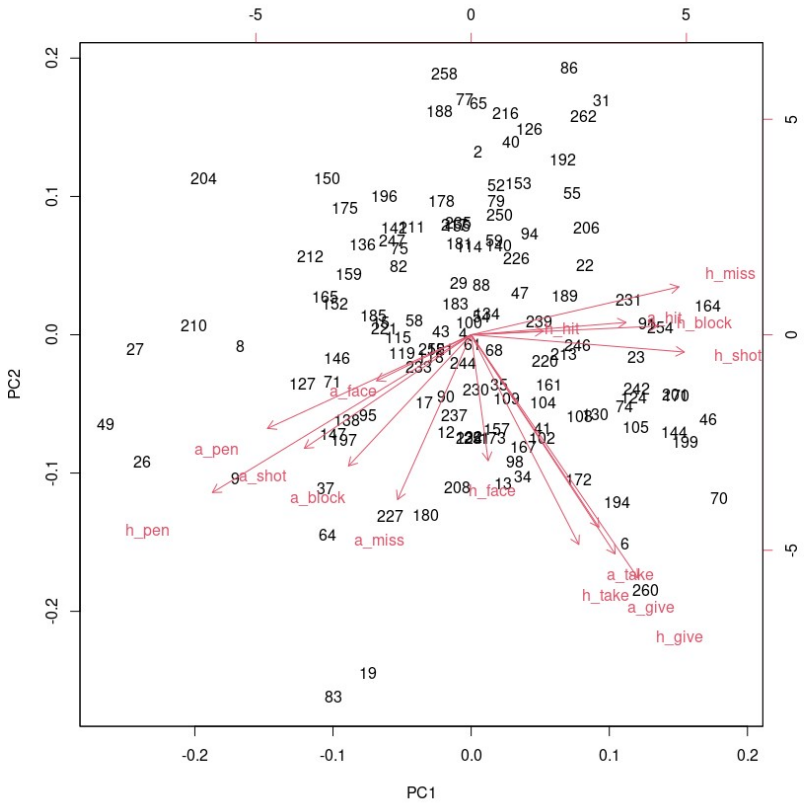
A Different Approach



How Do Teams Play?

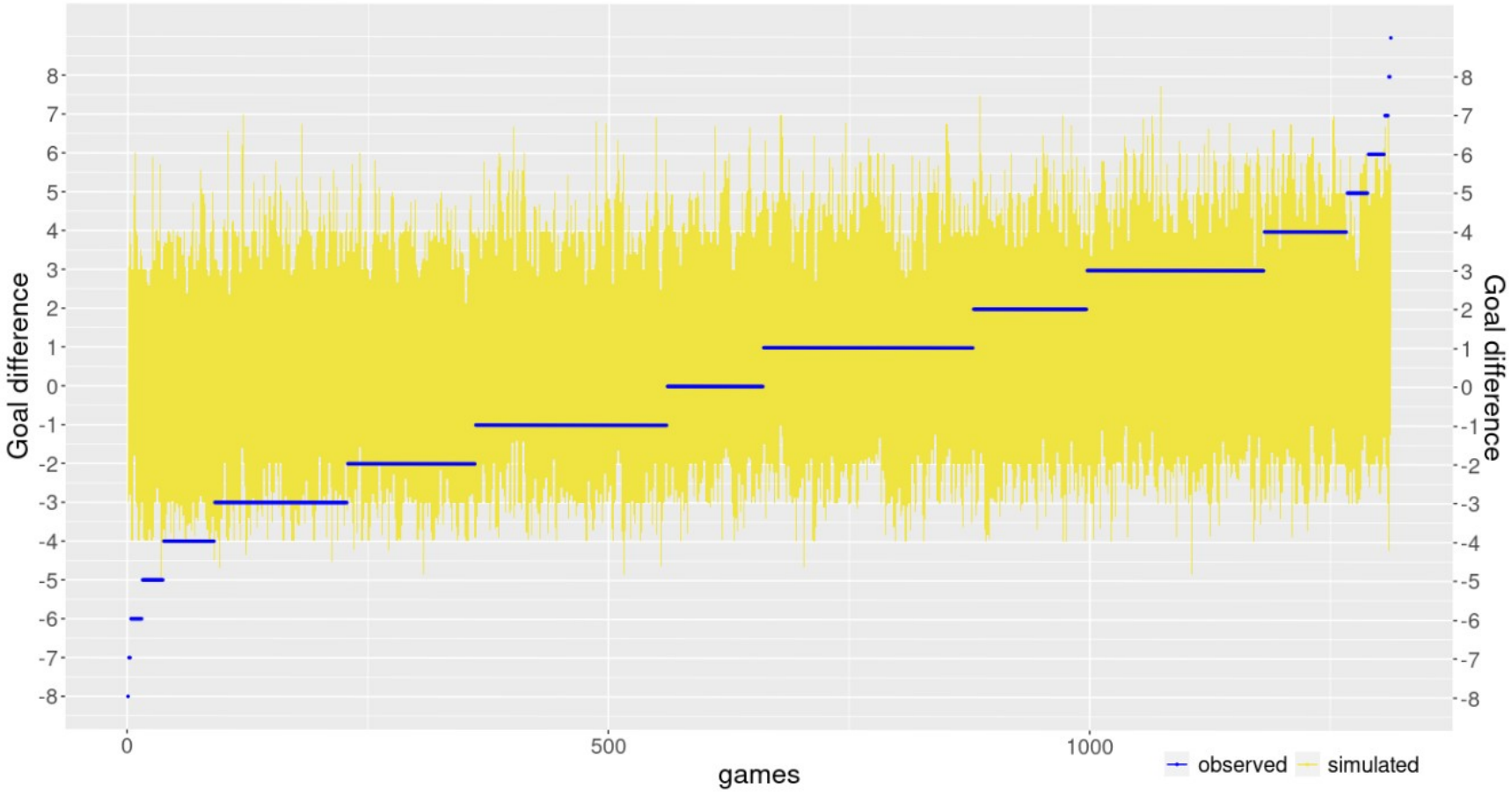


How Do Teams Play?

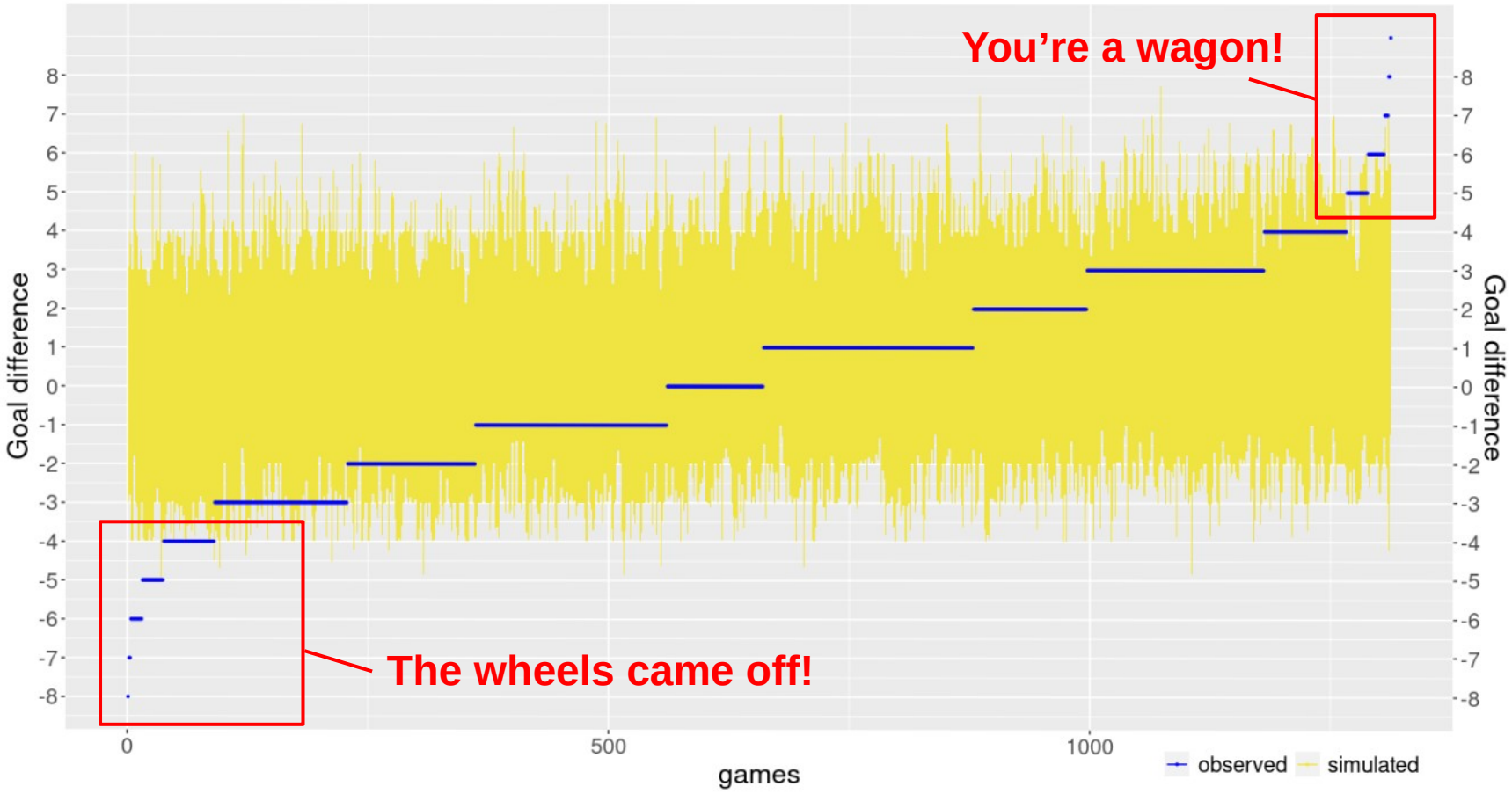


https://xkcd.com/1838

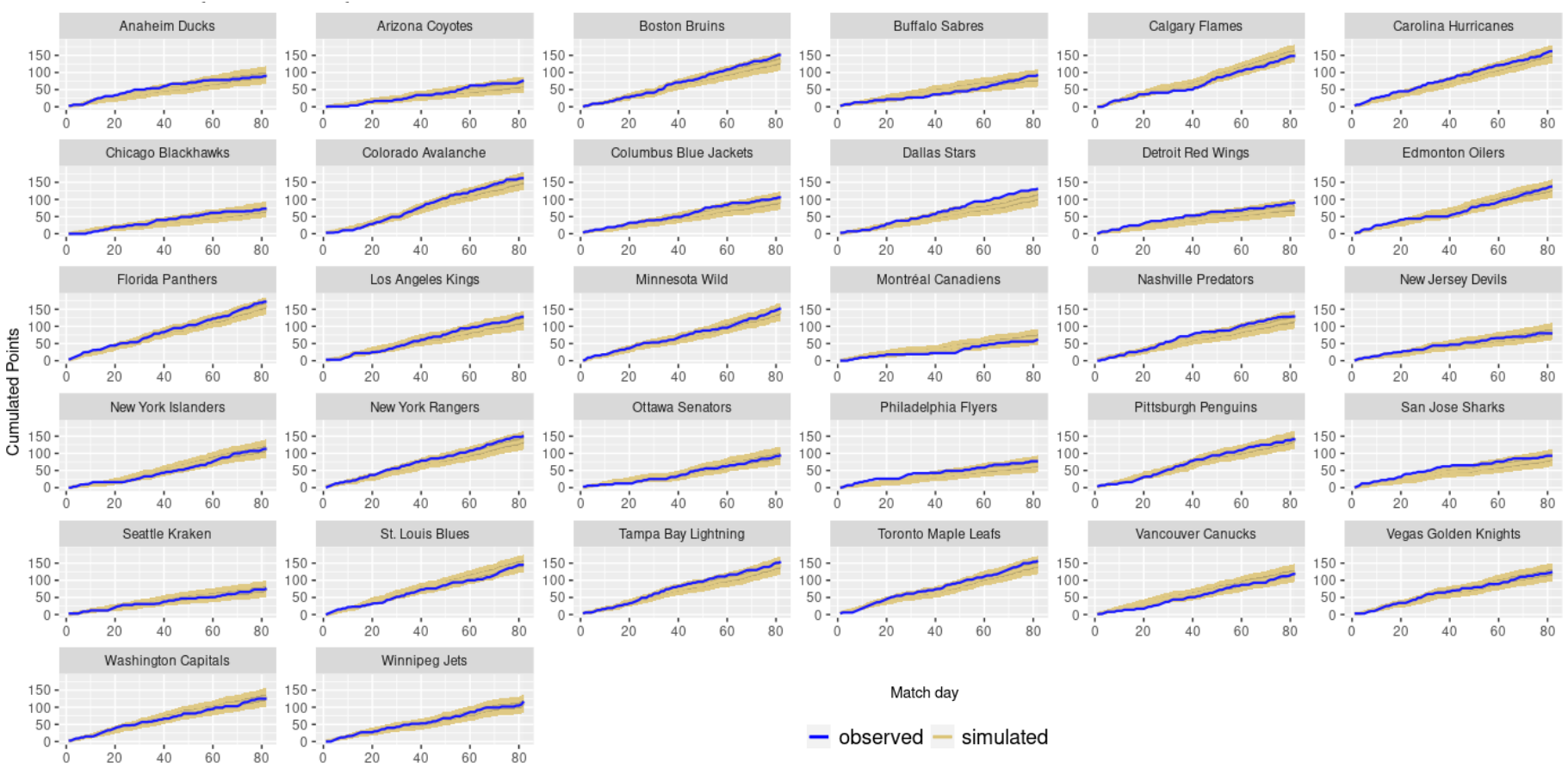
Score Differences Look Better



Modeled Score Differences Capture Observed Data



Projected Points



Problem: “Goodhart’s Law”

- "When a measure becomes a target, it ceases to be a good measure"
- Solution: make an analysis that will get you to where you want to go, don’t just copy something mindlessly

Photo from https://www.steveglaveski.com/blog/the-curious-case-of-cargo-cults-and-corporate-innovation

Too Many Men Tribute

- New acronym: TEB - Trade, Extend, Buyout
- A brief prospectus for future work

Too Many Men Tribute

- Trade: tensor decomposition to quantify patterns of events

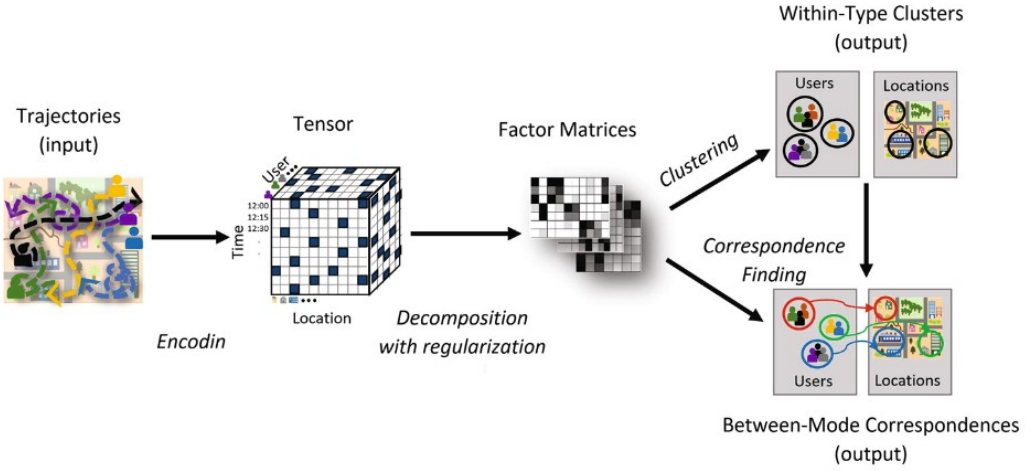


Fig. 1 In MCRD, moving object trajectory data, the input to the method, are encoded into a tensor. Next, decomposition with regularization is used to extract factor matrices for all data types. After that, clusters are found within each data type based on the factor matrices. The last step uses the number of significant factors between elements of multiple data types to find correspondences between clusters

Ellison and Fields (2021) *Geoinformatica*

Too Many Men Tribute

- Trade: tensor factorization to quantify patterns of events
- Extend: refined time series models for predicting score differences

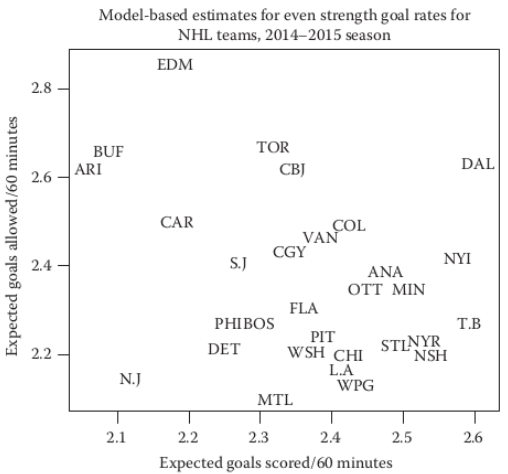


FIGURE 13.4
Model estimates for the rate at which NHL teams would score and allow goals at full strength 5v5 play, accounting for score differential, home/away bias, opponent matchups, and face-off prowess. Rates displayed are for when the team is playing on the road.

Thomas (2017) in *Handbook of Statistical Methods and Analyses in Sports*

Too Many Men Tribute

- Trade for: tensor factorization to quantify patterns of events
- Sign to an extension: refined time series models for predicting score differences
- Buyout: principal components analysis

Questions? Comments? Feedback?

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