Why Sabermetrics?

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Traditional Baseball Statistics

- AVG, RBI, ERA, Pitcher W/L
- Summarize outcomes
- Easy to understand
- 100+ years of history

Limitations of Traditional Statistics

- Record outcomes, not player skill
- Blend context and randomness
  with player performance
- Not predictive of future performance
- Hard to compare across teams and eras

Why These Limitations Matter

- Players can look better or worse than they actually are
- Teams can misjudge talent and make poor roster decisions
- Fans can misunderstand what drives player performance

The Sabermetric Hypothesis

We can make better decisions regarding players and teams if we:

1. Isolate **player performance** (signal) from things outside their control (noise)

2. Measure player contributions in terms of **runs**

3. Focus on **predictive** power

What Sabermetric Stats Do Differently

- Translate on-field events into *run value*
- Reduce the impact of noise on player and team evaluations
- Separate skills (e.g. hitting a ball hard) from outcomes (e.g. hit/out)
  where possible

Key Concept: Linear Weights

- Events (single, double, etc) contribute to run scoring in different amounts
- Each event has an average impact to run scoring, based on large data samples
- When this event occurs, how many runs score before the end of the half-inning, on average?
- Foundation of modern hitting stats:
  - Weighted On-Base Average (wOBA)
  - Weighted Runs Created Plus (wRC+)
  - Wins Above Replacement (WAR)

Linear Weights for Key Batting Events

Event	Average Run Value
Single	+0.44
Double	+0.74
Triple	+1.01
Home Run	+1.39
Walk	+0.29
Out	-0.27

"On average, a home run increases a team's expected runs in that half-inning by **1.39 runs**."

Key Concept: Regression to the Mean

- Observed results (e.g. hit or out, win or loss) contain randomness, especially in small samples, but even in 'large' samples
- Over time, repeating the process over and over again isolates skill from randomness
- "Regression to the mean" attempts to isolate this randomness in a shorthand fashion

Key Concept: Strikeouts & Walks

- Extremely high amount of signal (player skill) vs. other stats (hit, run allowed, etc.)
- Pitchers & hitters
- 'Stabilize' extremely quickly in-season
- Simple to understand
- Easy to observe

Changing How We Think About Baseball

- Player evaluation: more individual, less contextual
- Frame performance in terms of contribution to winning games (WAR)
- Cautiously look at short-term results

Discussion Topics / Q&A

- Where traditional stats still matter
- Limits & misuse of modern statistics
- How to combine both approaches
- Where does scouting fit in?
- What questions modern stats *can't* answer