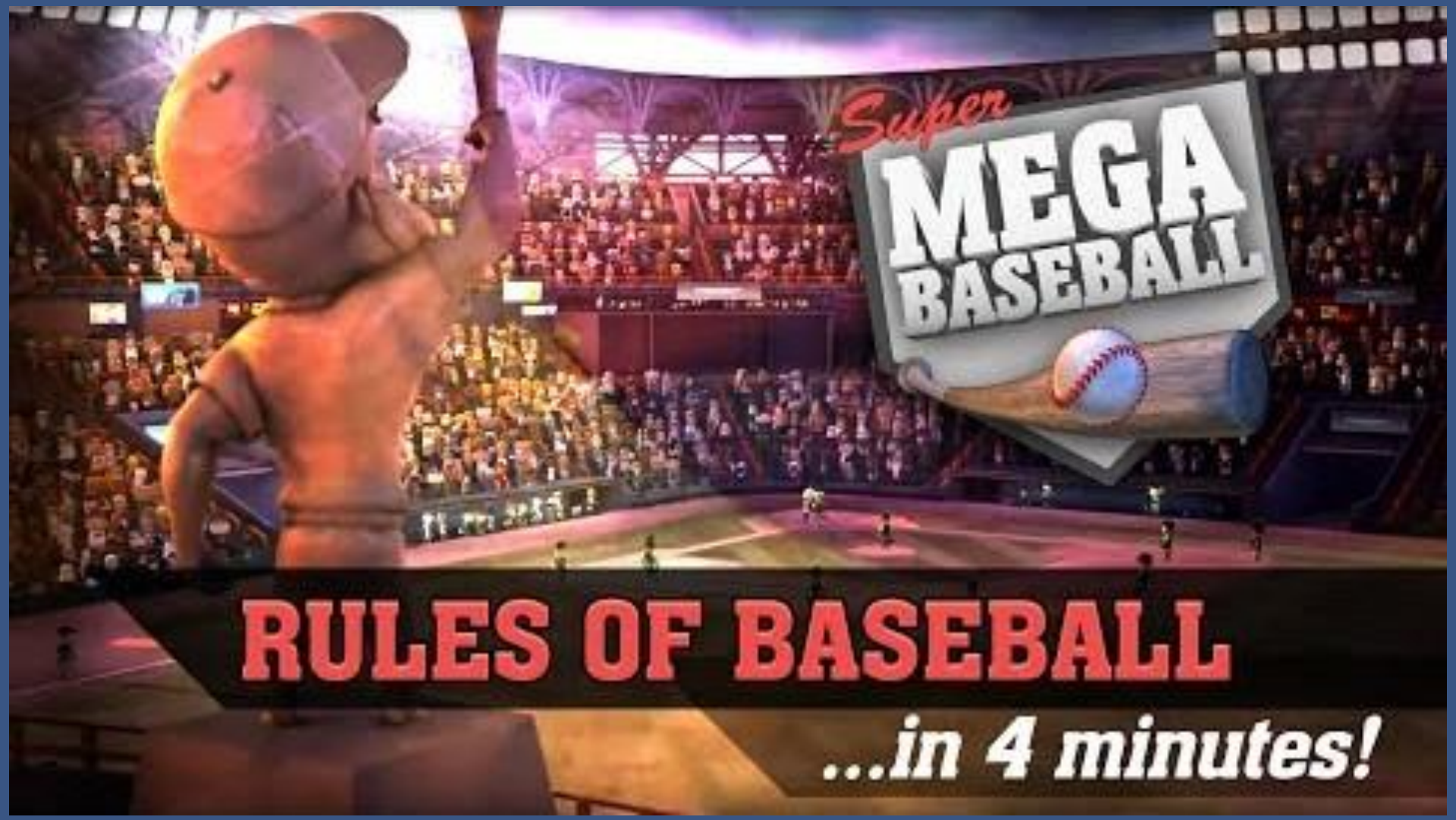
Baseball I

Produced by Dr. Mario | UNC STOR 538

Overview of Baseball



History of Sabermetrics

- Society of American Baseball Research (SABR)
  - August 10, 1971 in Cooperstown, NY
  - Founded by Bob Davids
  - 16 Original “Statihistorians”
  - Publication: *Baseball Research Journal*
  - Yearly Dues: $25 (Student)

- Objectives of SABR
  - To foster the study of baseball as a significant American social and athletic institution.
  - To establish an accurate historical account of baseball through the years.
  - To facilitate the dissemination of baseball research information.
  - To stimulate the best interests of baseball as our national pastime.
  - To cooperate in safeguarding the proprietary interests of individual research efforts of members of the Society.

History of Sabermetrics

- Bill James
  - Author and Researcher Focused on Baseball
  - Publication: *Baseball Abstracts* (Annual Since 1977)
  - Term Coined in 1980: “Saber” = “SABR”
  - Sabermetrics Is the Search for Objective Knowledge About Baseball
  - One of Time Magazines 100 Most Influential (2006)

- Sabermetrics
  - Using Mathematics and Statistics to Understand Baseball
  - Development of Advanced Metrics to Measure Performance
  - Textbooks by Gabriel Costa, Michael Huber, and John Saccoman
    - *Understanding Sabermetrics* (2008)
    - *Practicing Sabermetrics* (2009)

History of Sabermetrics

- *Moneyball: The Art of Winning an Unfair Game*
  - Authored by Michael Lewis (2003)
  - About Oakland Athletics MLB Season in 2002
  - General Manager Billy Beane
  - Finished with the Same Number of Wins as New York Yankees
  - Payroll Difference: $44M to $125M
  - Statistical Analyses Proved Flaws in Classic Statistics
  - Identified Undervalued Players Using Different Metrics such as On-Base Percentage
  - Used Statistics to Modify Playing Style (Devaluation of Steals)

History of Sabermetrics

History of Sabermetrics

- Jim Albert
  - Statistics Professor at Bowling Green State University
  - *Sabermetrics: The Past, The Present, and The Future* (2010)
  - *Analyzing Baseball Data with R* (2014)
- Useful Websites
  - www.baseballprospectus.com
  - www.hardballtimes.com
  - www.retrosheet.org
- Free Data Sources
  - Lahman Database
  - Retrosheet
  - PITCH F/X

Classic and Modern Metrics

- **Measuring Batting**
  - **Batting Average (AVG)**

$$AVG = \frac{H}{AB}$$

  - **On-base Percentage (OBP)**

$$OBP = \frac{H + BB + HBP}{AB + BB + HBP + SF}$$

  - **Slugging Percentage (SLG)**

$$SLG = \frac{S + 2D + 3T + 4HR}{AB}$$

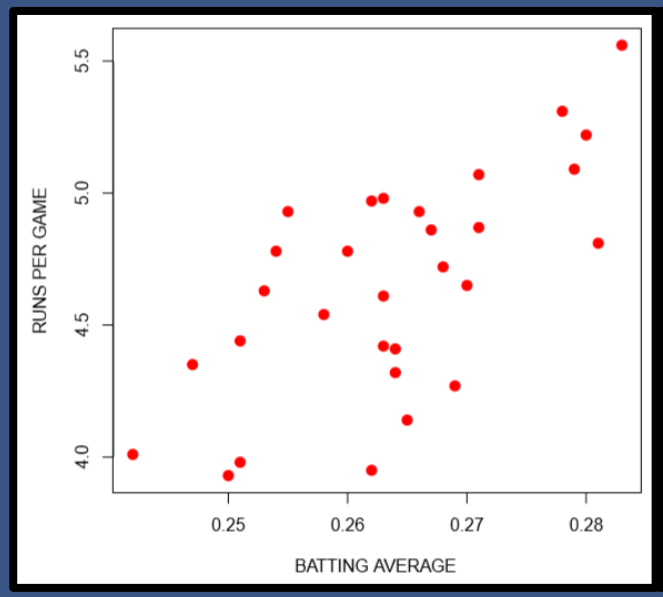
  - **OPS**

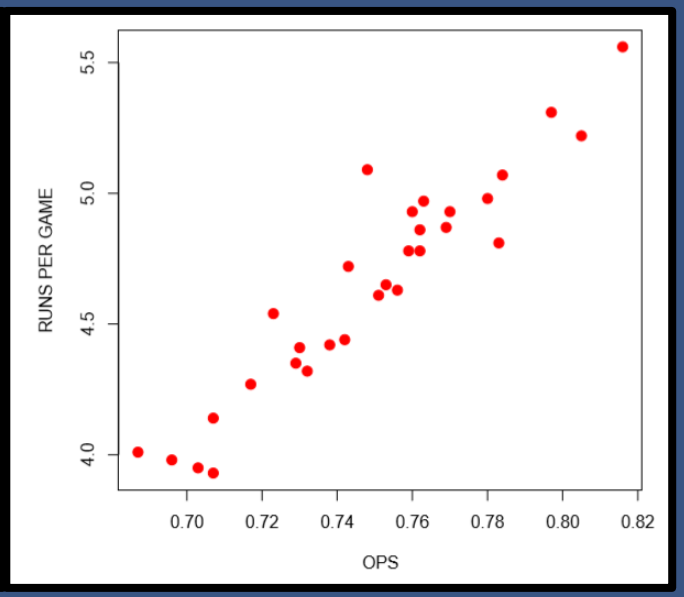
$$OPS = OBP + SLG$$

H = Hit
AB = At-bat
BB = Walk
HBP = Hit by Pitch
SF = Sacrifice Fly
S = Single
D = Double
T = Triple
HR = Home Run

Classic and Modern Metrics

- Measuring Batting
  - Runs Per Game (R/G)





H = Hit
AB = At-bat
BB = Walk
HBP = Hit by Pitch
SF = Sacrifice Fly
S = Single
D = Double
T = Triple
R = Run
G = Game

Classic and Modern Metrics

- **Measuring Pitching**
  - **Win Percentage (WIN%)**

$$WIN\% = \frac{W}{W + L}$$

  - **Earned Run Average (ERA)**

$$ERA = 9 \times \frac{ER}{IP}$$

  - **Strikeout Rate (K/9)**

$$K/9 = 9 \times \frac{K}{IP}$$

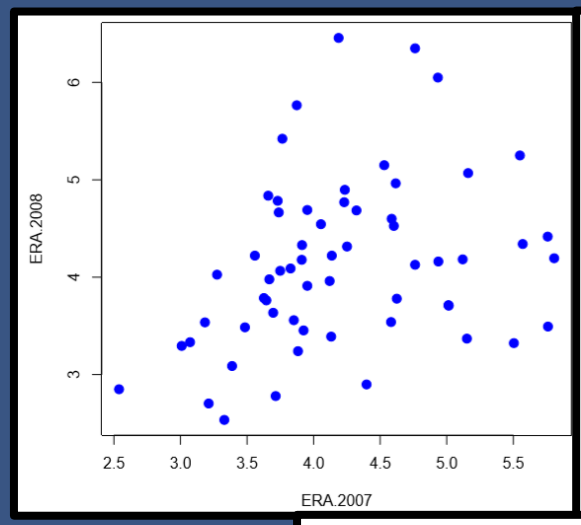
  - **Defense-Independent Pitching Statistic (DIPS)**
  - **DICE**

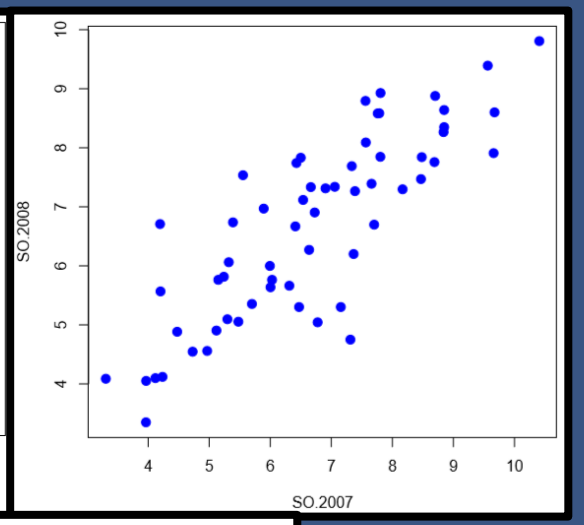
$$DICE = 3 + \frac{13 \times HR + 3(BB + HBP) - 2 \times K}{IP}$$

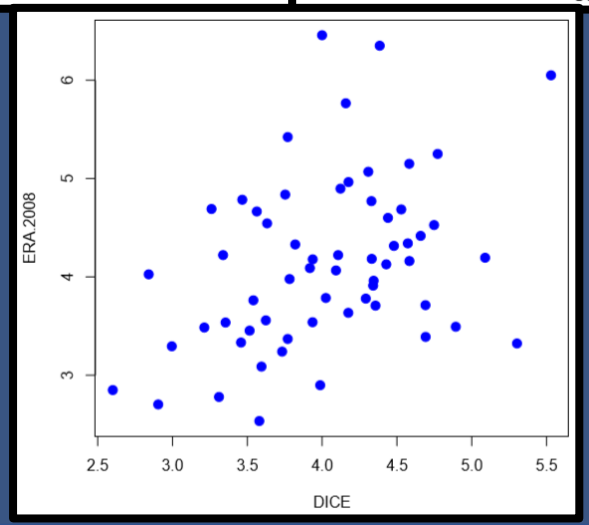
W = Win
L = Loss
ER = Earned Run
IP = Innings
K = Strikeout
HR =Home Run
BB = Walk
HBP = Hit by Pitch

Classic and Modern Metrics

- **Measuring Pitching**







W = Win
L = Loss
ER = Earned Run
IP = Innings
K = Strikeout
HR =Home Run
BB = Walk
HBP = Hit by Pitch

Classic and Modern Metrics

PO = Put-out
A = Assists
E = Errors

- **Measuring Fielding**
  - **Fielding Percentage (FLD%)**

$$FLD\% = \frac{PO + A}{PO + A + E}$$

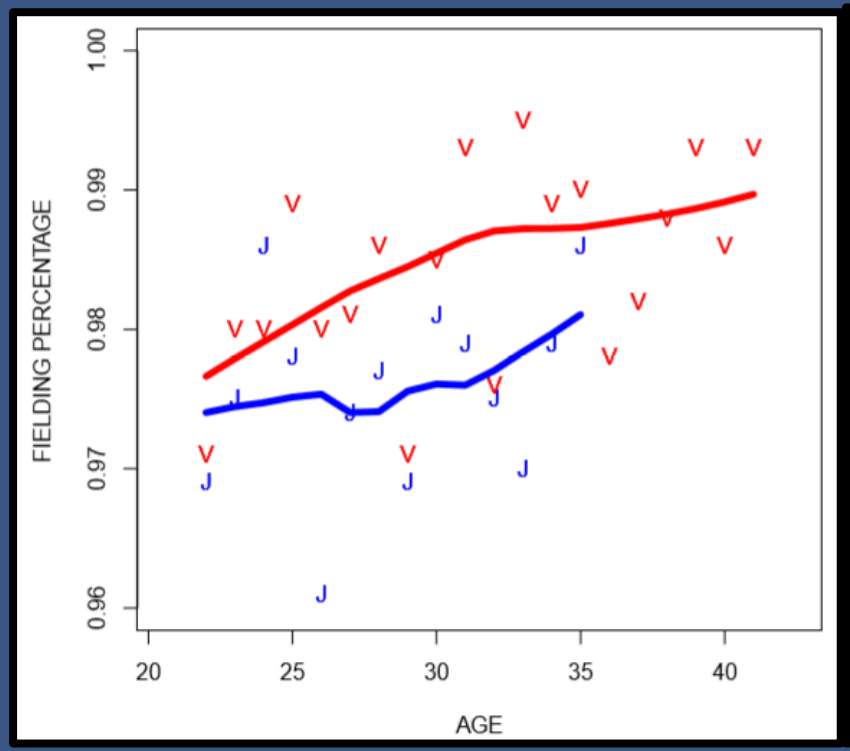
  - **Range Factor (RF)**

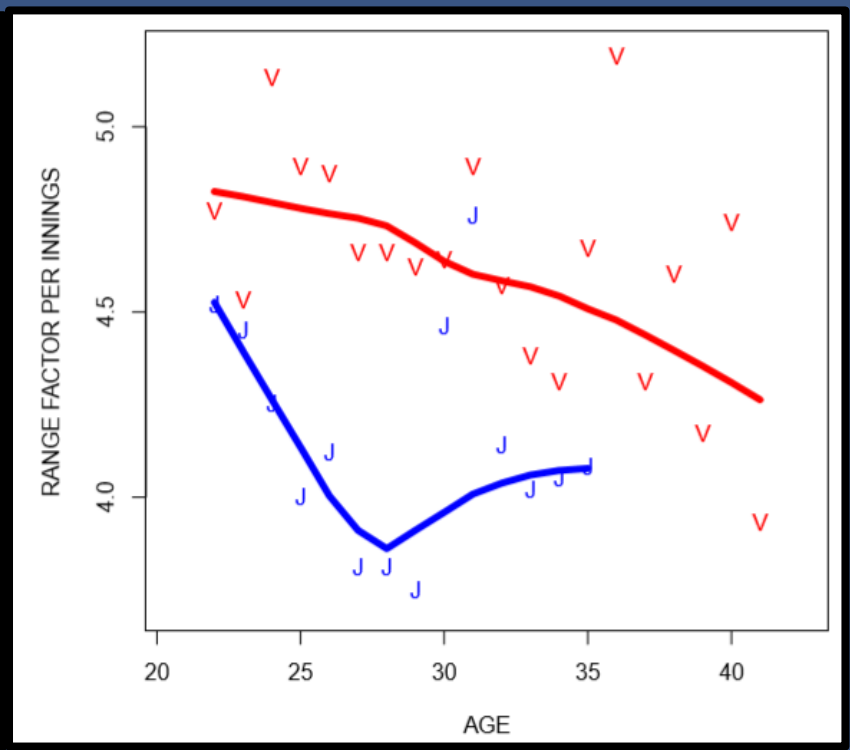
$$RF = 9 \times \frac{PO + A}{IP}$$

Classic and Modern Metrics

PO = Put-out
A = Assists
E = Errors

- Measuring Fielding
  - Omar Vizquel and Derek Jeter
    - Omar (9 Golden Gloves)
    - Derek (3 Golden Gloves)





Final Inspiration

There’s No Crying in Statistics.

- Mahatma Mario