Ranking Outstanding Sports Records

by

Bruce L. Golden
R. H. Smith School of Business
Univ. of Maryland

and

Edward A. Wasil
Kogod College of Business Admin.
American University
Goal of Paper

1. Address several key questions --
   - What makes a “great” sports record?
   - What factors separate “good” records from “great” records?
   - What are the “great” sports records?

2. Rank the greatest active sports records –
   - season records
   - career or multiple-year records
   - daily or single-game records
Motivation

1. It’s fun to argue the merits of your favorite sports records. E.g.,
   - Ted Williams vs. Joe DiMaggio?
   - Eric Dickerson vs. O. J. Simpson?
   - Michael Jordan vs. Wilt Chamberlain?
   - Will Beamon’s record fall by 1990?

2. It’s a challenge since comparison of sports records must be carried out in a rigorous and comprehensive manner and employ a formal ranking method.
Two Levels of Paper

1. Sports fans should find paper to be thought-provoking.

2. Nontrivial application of analytic hierarchy process (AHP).
   - data requirements are numerous
   - subjective judgments are required
   - each hierarchy is full
   - complicating issues
The Records Themselves

1. Measurable achievements

2. Relatively recent (after 1920)

3. Historical data available

4. Professional athletes in team sports (primarily)
# Great Season Records

<table>
<thead>
<tr>
<th>Sport</th>
<th>Athlete</th>
<th>Year</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitting Streak</td>
<td>B Joe DiMaggio</td>
<td>1941</td>
<td>56</td>
</tr>
<tr>
<td>Home Runs</td>
<td>B Roger Maris</td>
<td>1961</td>
<td>61</td>
</tr>
<tr>
<td>Slugging Average</td>
<td>B Babe Ruth</td>
<td>1920</td>
<td>.847</td>
</tr>
<tr>
<td>Runs Batted In</td>
<td>B Hack Wilson</td>
<td>1930</td>
<td>190</td>
</tr>
<tr>
<td>Scoring Average</td>
<td>BA Wilt Chamberlain</td>
<td>1961-62</td>
<td>50.4</td>
</tr>
<tr>
<td>Yards Gained Rushing</td>
<td>F Eric Dickerson</td>
<td>1984</td>
<td>2105</td>
</tr>
<tr>
<td>Points Scored</td>
<td>F Paul Hornung</td>
<td>1960</td>
<td>176</td>
</tr>
<tr>
<td>Points Scored</td>
<td>H Wayne Gretzky</td>
<td>1985-86</td>
<td>215</td>
</tr>
</tbody>
</table>

| B: Baseball        | BA: Basketball   | F: Football | H: Hockey |
# Great Career Records

<table>
<thead>
<tr>
<th>Record</th>
<th>Sport</th>
<th>Athlete</th>
<th>Year</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Runs</td>
<td>B</td>
<td>Henry Aaron</td>
<td>1954-76</td>
<td>755</td>
</tr>
<tr>
<td>Stolen Bases</td>
<td>B</td>
<td>Lou Brock</td>
<td>1961-79</td>
<td>938</td>
</tr>
<tr>
<td>Hits</td>
<td>B</td>
<td>Pete Rose</td>
<td>1963-86</td>
<td>4256</td>
</tr>
<tr>
<td>Slugging Average</td>
<td>B</td>
<td>Babe Ruth</td>
<td>1914-35</td>
<td>.690</td>
</tr>
<tr>
<td>Strikeouts</td>
<td>B</td>
<td>Nolan Ryan</td>
<td>1966-86</td>
<td>4277</td>
</tr>
<tr>
<td>Points Scored</td>
<td>BA</td>
<td>K. Abdul-Jabbar</td>
<td>1970-86</td>
<td>36474</td>
</tr>
<tr>
<td>Points Scored</td>
<td>F</td>
<td>George Blanda</td>
<td>1949-75</td>
<td>2002*</td>
</tr>
<tr>
<td>Yards Gained Rushing</td>
<td>F</td>
<td>Walter Payton</td>
<td>1975-86</td>
<td>16193</td>
</tr>
<tr>
<td>Consecutive Games, Touchdown Passes</td>
<td>F</td>
<td>Johnny Unitas</td>
<td>1956-60</td>
<td>47</td>
</tr>
<tr>
<td>Points Scored</td>
<td>H</td>
<td>Gordie Howe</td>
<td>1947-80</td>
<td>2358**</td>
</tr>
</tbody>
</table>

* includes point totals from the AFL
** includes point totals from the WHA
# Great Day/Game Records

<table>
<thead>
<tr>
<th>Sport</th>
<th>Athlete</th>
<th>Year</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points Scored</td>
<td>BA Wilt Chamberlain</td>
<td>1962</td>
<td>100</td>
</tr>
<tr>
<td>Yards Gained Rushing</td>
<td>F Walter Payton</td>
<td>1977</td>
<td>275</td>
</tr>
<tr>
<td>Yards Gained Passing</td>
<td>F Norm Van Brocklin</td>
<td>1951</td>
<td>554</td>
</tr>
<tr>
<td>Long Jump</td>
<td>TF Bob Beamon</td>
<td>1968</td>
<td>29’2 1/2”</td>
</tr>
</tbody>
</table>

TF: Track and Field
Data Collection Obstacles

1. Lots of data
2. Different leagues (e.g., NFL & AFL)
3. Different length seasons
4. Degree of specialization
Runs Batted In Data Set

Best Marks of All Time

1. Hack Wilson 1930 190
2. Lou Gehrig 1931 184
3. Hank Greenberg 1937 183
4. Lou Gehrig 1927 175
5. Jimmie Foxx 1938 175
Runs Batted In Data Set -- continued

Best Marks Prior to 1930

1. Lou Gehrig 1927 175
2. Babe Ruth 1921 171
3. Babe Ruth 1927 164
4. Hack Wilson 1929 159
5. Al Simmons 1929 157
Runs Batted In Data Set -- continued

1930 Contemporaries

1. Lou Gehrig 174
2. Chuck Klein 170
3. Al Simmons 165
4. Jimmie Foxx 156
5. Babe Ruth 153
Comparison Methodology

The Analytic Hierarchy Process

- Developed by TL Saaty
- Uses pairwise comparisons
- Eigenvalues lead to priorities on weights
- Allows the combination of subjective with objective judgments
Comparison Methodology -- continued

Example:

<table>
<thead>
<tr>
<th></th>
<th>Duration</th>
<th>Improvement</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>1</td>
<td>3/2</td>
<td>3</td>
</tr>
<tr>
<td>Improvement</td>
<td>2/3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>1/3</td>
<td>1/2</td>
<td>1</td>
</tr>
</tbody>
</table>
Select Best Active Season Sports Record

Duration of Record
- Years Record Has Stood
- Years Record Is Expected To Stand

Incremental Improvement
- % Better Than Previous Record
- % Better Than Contemporaries

Other Record Characteristics
- Glamour
- Purity

DiMaggio 56 game hitting streak
Maris 61 home runs
Ruth .847 slugging average
Wilson 190 runs batted in
Chamberlain 50.4 scoring average
Dickerson 2105 yards gained rushing
Hornung 176 points scored
Gretzky 215 points scored
Select Best Active Career Sports Record

Duration of Record
- Years Record Has Stood
- Years Record Is Expected To Stand

Incremental Improvement
- % Better Than Next Best Record

Other Record Characteristics
- Glamour
- Purity

Aaron  755 home runs
Brock  938 stolen bases
Rose   4256 hits
Ruth   .690 slugging average
Ryan   4277 strikeouts*
Abdul-Jabbar  36474 points scored*
Blanda  2002 points scored
Payton  16193 yards gained rushing*
Unitas  47 consecutive games, touchdown passes
Howe   2358 points scored

* athlete still active
Select Best Active Daily Sports Record

- Duration of Record
  - Years Record Has Stood
  - Years Record Is Expected To Stand

- Incremental Improvement
  - % Better Than Previous Record

- Other Record Characteristics
  - Glamour
  - Purity

Chamberlain  100 points scored
Payton      275 yards gained rushing
Van Brocklin 554 yards gained passing
Beamon      29’ 2 ½” long jump
Select Best Active Season Sports Record

- Duration of Record
  - Years Record Has Stood: 0.800
  - Years Record Is Expected To Stand: 0.200

- Incremental Improvement
  - % Better Than Previous Record: 0.750
  - % Better Than Contemporaries: 0.250

- Other Record Characteristics
  - Glamour: 0.667
  - Purity: 0.333

Records:
- Ruth: 0.171
- DiMaggio: 0.166
- Chamberlain: 0.151
- Wilson: 0.139
- Gretzky: 0.110
- Maris: 0.099
- Hornung: 0.098
- Dickerson: 0.066
Select Best Active Career Sports Record

- Duration of Record
  - Years Record Has Stood: 0.800
  - Years Record Is Expected To Stand: 0.200
- Incremental Improvement
  - % Better Than Next Best Record: 1.000
- Other Record Characteristics
  - Glamour: 0.667
  - Purity: 0.333

<table>
<thead>
<tr>
<th>Name</th>
<th>Glamour</th>
<th>Purity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unitas</td>
<td>0.191</td>
<td>0.185</td>
</tr>
<tr>
<td>Ruth</td>
<td>0.185</td>
<td>0.185</td>
</tr>
<tr>
<td>Payton</td>
<td>0.108</td>
<td>0.108</td>
</tr>
<tr>
<td>Howe</td>
<td>0.097</td>
<td>0.097</td>
</tr>
<tr>
<td>Aaron</td>
<td>0.084</td>
<td>0.084</td>
</tr>
<tr>
<td>Blanda</td>
<td>0.080</td>
<td>0.080</td>
</tr>
<tr>
<td>Abdul-Jabbar</td>
<td>0.078</td>
<td>0.078</td>
</tr>
<tr>
<td>Ryan</td>
<td>0.070</td>
<td>0.070</td>
</tr>
<tr>
<td>Brock</td>
<td>0.058</td>
<td>0.058</td>
</tr>
<tr>
<td>Rose</td>
<td>0.050</td>
<td>0.050</td>
</tr>
</tbody>
</table>
Select Best Active Daily Sports Record

- **Duration of Record**
  - Years Record Has Stood: 0.800
  - Years Record Is Expected To Stand: 0.200

- **Incremental Improvement**
  - % Better Than Previous Record: 1.000

- **Other Record Characteristics**
  - Glamour: 0.667
  - Purity: 0.333

### Results

<table>
<thead>
<tr>
<th>Player</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamberlain</td>
<td>0.350</td>
</tr>
<tr>
<td>Van Brocklin</td>
<td>0.289</td>
</tr>
<tr>
<td>Payton</td>
<td>0.269</td>
</tr>
<tr>
<td>Beamon</td>
<td>0.092</td>
</tr>
</tbody>
</table>
Results of Comparison

• **Season Record**
  - Babe Ruth .847 slugging average
  - Joe DiMaggio 56 game hitting streak

• **Career Record**
  - Johnny Unitas 47 consecutive games, touchdown passes
  - Babe Ruth .690 slugging average

• **Daily Record**
  - Wilt Chamberlain 100 points scored