

A method for the unbiased comparison of MLB and NBA career statistics across era

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Abstract

Career statistics are commonly used to compare players from different eras, however cross-era comparison is biased due to significant changes in success factors underlying sports achievement (i.e. performance enhancing drugs). The comparison of athletes is more than simply a topic of casual discussion among fans, it is also an issue of critical importance to the history of each major professional sport and the institution (Hall of Fame) in charge of preserving the sport's history. Here we develop and test an objective statistical method for normalizing career success metrics across time dependent factors. This method preserves the overall functional form of the probability distribution of career achievement, both at the season and career level. We re-rank the top-50 all-time records in MLB and the NBA and find that certain achievements (home runs, strikeouts, rebounds) are more sensitive to time-dependent success factors than others (hits, wins).

1 Introduction

Individual success in competitive endeavors, such as professional sports [1,2,3] and academia [2,4], depends on many factors: some factors are time dependent whereas others are time independent. These factors range from the inevitable (rule changes, improved nutrition and training techniques, talent dilution of players from league expansion) to the controversial (performance enhancing drugs). In order to compare human achievements from different time periods, success metrics should be normalized to a common index so that the time dependent factors do not bias the comparison of the statistical measures. In order to address the problem of time dependent factors, we develop a novel approach which removes the time-dependent factors by normalizing a player's annual achievement by a unbiased ability average. The output of our approach are 'detrended' success measures that are more appropriate for comparing and evaluating the relative merits of players from different historical eras. In this paper we demonstrate the utility of our detrending method by analyzing distributions of individual success in two professional sports leagues, Major League Baseball (MLB) and the National

Basketball Association (NBA). We use comprehensive data comprising more than 21,000 individual player careers (data from Sean Lahman’s Baseball Archive: <http://baseball1.com/index.php> and the Database Sports Basketball Archive: <http://www.databasebasketball.com/>.)

In order to make our statistical analysis accessible, we use the most natural measures for accomplishment, the statistics that are listed in every box-score and on every baseball and basketball card, so that the results are tangible to historians and casual fans interested in reviewing and discussing the “all-time greats.” In particular, this study addresses two relevant cultural questions:

- (i) How to quantitatively account for economic, technological, and social factors that influence the rate of success in competitive professions.
- (ii) How to use career statistics in an unbiased fashion to help in the both the standard, as well as, retroactive induction of athletes into a Hall of Fame. This is particularly important given the recent ‘inflation’ observed for home runs in Major League Baseball, a phenomena that is believed to be related to the widespread use of Performance Enhancing Drugs (PED).

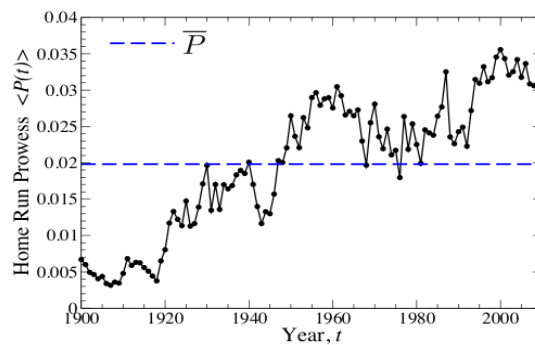


Fig. 1: The seasonal prowess $\langle P(t) \rangle$ measures the relative success rate per opportunity using appropriate measures for a given sport. The home-run prowess demonstrates a significant increasing trend since 1920, reflecting the emergence of the modern “slugger” in MLB. Physiological, technological, economic, and social factors play a strong historical role in the evolution of home-run prowess. By normalizing accomplishments with respect to $\langle P(t) \rangle$, we blindly account for seasonal variations due to all such factors.

2 Methods

We define prowess as an individual player’s ability to achieve a success x (e.g. a home run, point scored) in any given opportunity y (e.g. an AB in MLB or minute played in the NBA). In Fig. 1 we plot the average number of home runs over the 110-year period 1900-2009 in order to demonstrate the non-stationary evolution of home-run ability in MLB. Clearly, the occurrence of a home-run in 1920 was relatively more significant (rare) than the occurrence of a home-run in 1998.

The average prowess serves as an index for comparing accomplishments in distinct years. We conjecture that the changes in the average prowess are related to league-wide factors which can be quantitatively removed (detrended) by normalizing accomplishments by the average prowess for a given season. We first calculate the prowess $P_i(t)$ of an individual player i as $P_i(t) \equiv x_i(t) / y_i(t)$, where

$x_i(t)$ is an individual's total number of successes out of his/her total number $y_i(t)$ of opportunities in a given year t .

To compute the league-wide average prowess, we then compute

$$\langle P(t) \rangle \equiv \sum_i x_i(t) / \sum_i y_i(t) \quad (1)$$

The summation index i runs over all players with at least y_c opportunities during year t , so that $\sum_i y_i(t)$ is the total number of opportunities of all $N(t)$ players during year t . We use a cutoff $y_c \equiv 100$ AB (batters), 100 IPO (pitchers), and 0 Min. (basketball players) which eliminates statistical fluctuations that arise from players with very short seasons.

We now introduce the detrended metric for the accomplishment of player i in year t ,

$$x_i^D(t) \equiv x_i(t) \times \bar{P} / \langle P(t) \rangle \quad (2)$$

where \bar{P} is the average value of $\langle P(t) \rangle$ over the entire period analyzed. The choice of discounting the achievement $x_i(t)$ with respect to \bar{P} is arbitrary, and we could just as well normalize with respect to $\langle P(2000) \rangle$, placing all values in terms of current "2000 US dollars," as they do in economics.

Using this method, we calculate detrended metrics for both single season ($x_i^D(t)$) corresponding to Eq. (3) and total career accomplishments X_i^D corresponding to the sum of seasonal detrended metrics

$$X_i^D \equiv \sum_{s=1}^L x_i^D(s) \quad (3)$$

where s is the season index and L is the player's career length measured in seasons.

In Fig. 2 we plot the league averages

$$\langle x \rangle \equiv \frac{1}{N(t)} \sum_{i=1}^{N(t)} x_i(t) \quad \text{and} \quad \langle x^D \rangle \equiv \frac{1}{N(t)} \sum_{i=1}^{N(t)} x_i^D(t) \quad (4)$$

for points and home runs, calculated using all $N(t)$ players in a given year t . The left column shows the traditional metrics, while the right column shows the average for detrended metrics. The detrended average is nearly constant across era, especially in the case of HR, demonstrating the utility of our normalization methods to standardize achievement. See ref. [3] for additional development and discussion of the methods.

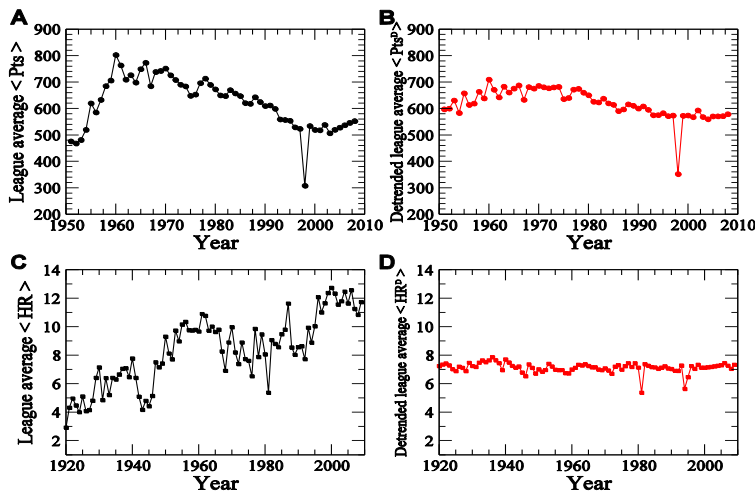


Fig. 2: The annual league average for Pts (NBA) and Home runs (MLB) given in Eq. (6) and calculated before (A,C) and after (B,D) detrending. This method normalizes each season statistic to a baseline prowess $\langle P(t) \rangle$ calculated using all players in a given season. Significant dips are due to league strikes resulting in game cancellations.

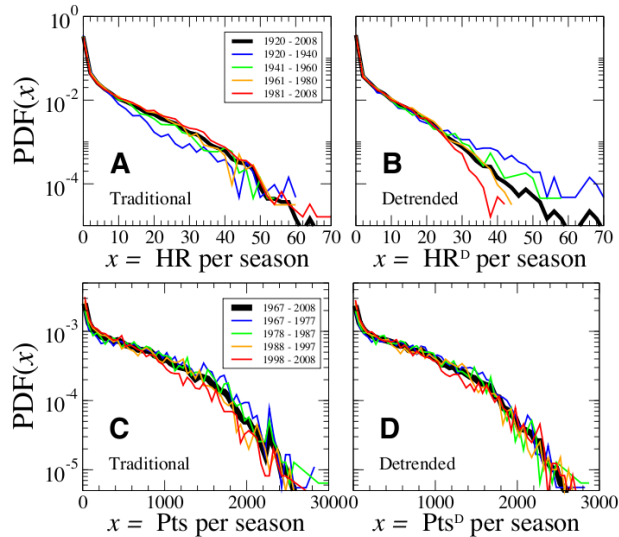


Fig. 3: Probability density function (PDF) of traditional and detrended statistics plotted on log-linear axes, separated by eras indicated in the legend. The detrended measures in panels (B,D) show increased data collapse towards a universal distribution $P(x)$ for smaller values of x confirming that our method normalizes with respect to the bulk of the league’s player achievement. However, in the case of HR, this method in fact pronounces some outlier seasonal performances, such as Babe Ruth’s career years during the 1920’s, which tips the balance in the all-time rankings (see the Appendix Table S1).

3 Results

The goal of this method is to define a statistic that is more suitable for the across-era comparison of season and career achievement measures. We define our detrended statistics by normalizing achievement with respect to annual player averages which serves as a proxy for the underlying era-dependent trends in physiological, technological, and economic factors. We find that certain statistics (home runs, strikeouts, rebounds) are more affected by the detrending method (and underlying success factors) than others (wins, hits).

Fig. 3 shows the probability density function (pdf) of seasonal statistics, HR in MLB and points scored in the NBA, before and after we apply the detrending method. We separate the statistics according to arbitrarily chosen non-overlapping eras, and demonstrate that detrending method normalizes the statistical measures on the aggregate, so that the pdfs in panels (B,D) approximately collapse onto a universal function, except for the right tails. This enhancement effect is pronounced for HR statistics, indicating that extreme home-run achievements can be significantly deflated or inflated by time-dependent factors. As a result, the significant HR seasons for $x^D > 30$ in panel (B) are either significantly above or below the all-time distribution (thick black curve), which causes a significant re-ranking of the all-time home run list at the season (see extensive Tables in [3]) and the career level (see Table S1).

Fig. 4 show the pdfs of career statistics which are stationary under detrending, indicating that the extremely right-skewed (heavy-tailed) distributions for human success result from intrinsic properties underlying achievement and not inflationary factors that influence success rates. This fact

suggests that Babe Ruth and Karl Malone were not “born on another planet,” but rather, follow naturally from a universal success distribution with statistically regular extreme value statistics. See [2,4] for further discussion of the analytic properties of $P(x)$ as predicted by a theoretical career progress model [2]. Among the numerous storylines in the re-ranked tables, Babe Ruth becomes the undisputed home-run king ($HR^D = 1215$) with Mel Ott, Lou Gehrig, and Jimmie Foxx, the 3 runners up, tallying merely half as many detrended HR, a result that signifies the significant lead Babe Ruth had over his cohort when it came to home-run prowess.

For NBA careers, we provide 6 extensive tables in the Supplementary Information Appendix which list the top-50 all-time achievements according (i) traditional rankings and (ii) our detrended rankings, for the statistical categories of points (Pts), rebounds (Reb) and assists (Asst.) at both the season and career level; we also provide a top-20 ranking for career home runs, and refer the curious reader to ref. [3] for additional tables listing MLB top-50 all-time achievements.

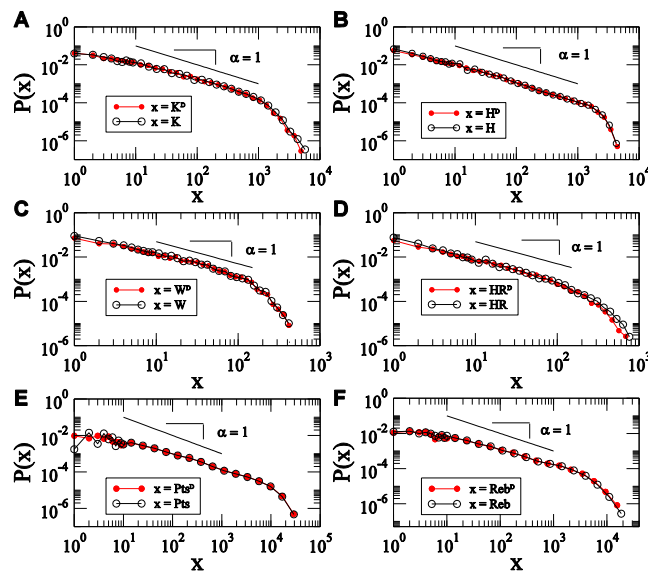


Fig. 4: Probability distributions $P(x)$ plotted on log-log axes for traditional and detrended career statistics: strikeouts (A), hits (B), wins (C), home runs (D), points (E) and rebounds (F). The solid line corresponding to a Pareto (power) -law distribution with scaling exponent $\alpha = 1$ is shown for visual comparison. For MLB, we use careers belonging to the 90-year period 1920-2009 and for the NBA we use careers belonging to the 56-year period 1951-2006.

4 Conclusions

Concepts and methods from statistical physics [1,2,3] and network science [5,6] applied to professional sports data have uncovered statistical laws that describe the underlying nature of competition. Surprisingly, academia also exhibits analogous statistical patterns that conceivably emerge from the general principles of competitive systems, such as the Matthew “rich-get-richer” effect [2,4,7] and the extremely high barriers to entry which results in many “sudden-death” careers [2,8].

In order to account for changes in relative player ability over time, we have developed a detrending method that accounts for inflationary and deflationary factors (PEDs, changes in the physical construction of bats and balls, sizes of ballparks, talent dilution of players from expansion, etc.) and allows for an objective comparison of players across time. Remarkably, we find using our detrending method, that the distributions of career success are invariant after we normalize accomplishments to local ability averages quantified by $\langle P(t) \rangle$. By analyzing the distribution of success across the *entire* set of players (an entire labor force), we can calculate universal benchmarks that can be used for the identification of extraordinary careers. Also, since these benchmarks are calculated using detrended metrics, the benchmarks are robust and stable with respect to the time-dependent factors (see refs. [2,3] for methods to calculate the benchmarks based on the extreme value statistics of the Gamma distribution that is used to model the longevity and success distribution $P(x)$). Specifically, these statistical laws can be used by the Baseball Hall of Fame to address issue (ii), raised above, in the context of induction criteria.

Another surprising observation in this comprehensive study is the large numbers of "one-hit wonders", along with much smaller, but statistically significant and theoretically predictable, number of stellar "iron-horse" careers. In MLB, we find that roughly 3% of non-pitchers (pitchers) have a career lasting only one at-bat (lasting an inning or less) and 5% of non-pitchers complete their in-and-out career with only one hit! Yet, the same profession also sustains careers that span more than 2,000 games, 10,000 at bats and 4,000 innings pitched [3]. The same story can be told for the NBA, where 3% of careers end with careers that span between 1-12 minutes played, and 2% of careers last only 1 game! Yet, the average career length is roughly 273 games (roughly 3 seasons), while the maximum career length is owed to Robert Parish with 1,611 games, almost six times the average! For a higher resolution of in-game opportunities, Kareem Abdul-Jabbar's career spanned 57,446 minutes played, roughly 9 times the average career length in minutes! Similar results have also been observed for professional tennis careers [6]. We quantify this surprising finding with a statistical law which "bridges the gap" between the large number of players with very few career accomplishments and the few players with legendary career accomplishments.

5 References

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- [2] A. M. Petersen *et al.*, "[Quantitative and Empirical Demonstration of the Matthew Effect in a Study of Career Longevity](#)," *Proceedings of the National Academy of Sciences USA*, vol. 108, pp. 18-23, 2011.
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- [7] A. M. Petersen *et al.*, "[Statistical Regularities in the Rank-citation Profile of Scientists](#)," (*Nature Scientific Reports*, vol. 1, art. 181, 2011).
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Supplementary Information Appendix:

A method for the unbiased comparison of MLB and NBA career statistics across era

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In Table S1 we list top-20 rankings for MLB home runs (see the Online Supplementary Information for A. M. Petersen, O. Penner, H. E. Stanley, Methods for detrending success metrics to account for inflationary and deflationary factors. Eur. Phys. J. B 79, 67-78 (2011). DOI: 10.1140/epjb/e2010-10647-1) for additional top-50 rankings. In Tables S2-S7 we list top-50 rankings for points, assists and rebounds over the career and for individual seasons. For the two types of rankings, career and season, the columns are organized as follows:

Career Tables S1–S4: The 4 columns on the left of each table list information for the “traditional rank” of career statistics, where the top 50 players are ranked along with their final season (career length in seasons listed in parenthesis) and their career metric tally. The 5 columns on the right of each table list information for the “detrended rank” ($Rank^*$) of career statistics, where the corresponding traditional rank (Rank) of the player is denoted in parenthesis. L denotes the career length of the player. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Season Tables S5–S7: The 4 columns on the left list the traditional ranking of season statistics, where the top 50 players are ranked along with the year. The right columns list the detrended ranking of season statistics $Rank^*$. $Y\#$ denotes the number of years into the career. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Rank	Name	Traditional Rank		Rank*(Rank)	Name	Detrended Rank	
		Final Season (L)	Career Metric			Final Season (L)	Career Metric
1	Barry Bonds	2007 (22)	762	1(3)	Babe Ruth	1935 (22)	1215
2	Hank Aaron	1976 (23)	755	2(23)	Mel Ott	1947 (22)	637
3	Babe Ruth	1935 (22)	714	3(26)	Lou Gehrig	1939 (17)	635
4	Willie Mays	1973 (22)	660	3(17)	Jimmie Foxx	1945 (20)	635
5	Ken Griffey Jr.	2009 (21)	630	5(2)	Hank Aaron	1976 (23)	582
6	Sammy Sosa	2007 (18)	609	6(124)	Rogers Hornsby	1937 (23)	528
7	Frank Robinson	1976 (21)	586	7(192)	Cy Williams	1930 (19)	527
8	Alex Rodriguez	2009 (16)	583	8(1)	Barry Bonds	2007 (22)	502
8	Mark McGwire	2001 (16)	583	9(4)	Willie Mays	1973 (22)	490
10	Harmon Killebrew	1975 (22)	573	10(18)	Ted Williams	1960 (19)	482
11	Rafael Palmeiro	2005 (20)	569	11(13)	Reggie Jackson	1987 (21)	478
12	Jim Thome	2009 (19)	564	12(14)	Mike Schmidt	1989 (18)	463
13	Reggie Jackson	1987 (21)	563	13(7)	Frank Robinson	1976 (21)	444
14	Mike Schmidt	1989 (18)	548	14(10)	Harmon Killebrew	1975 (22)	437
15	Manny Ramirez	2009 (17)	546	15(577)	Gavvy Cravath	1920 (11)	433
16	Mickey Mantle	1968 (18)	536	16(718)	Honus Wagner	1917 (21)	420
17	Jimmie Foxx	1945 (20)	534	17(18)	Willie McCovey	1980 (22)	417
18	Ted Williams	1960 (19)	521	18(557)	Harry Stovey	1893 (14)	413
18	Frank Thomas	2008 (19)	521	19(5)	Ken Griffey Jr.	2009 (21)	411
18	Willie McCovey	1980 (22)	521	20(28)	Stan Musial	1963 (22)	410

TABLE S1: Ranking of Career Home Runs (1871 - 2009).

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Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		Career Metric
		Final Season (L)	Career Metric			Name	Final Season (L)	
1	Kareem Abdul-jabbar	1988 (20)	38387	1(2)	50	Karl Malone	2003 (19)	38033
2	Karl Malone	2003 (19)	36928	2(1)	-100	Kareem Abdul-jabbar	1988 (20)	36687
3	Michael Jordan	2002 (15)	32292	3(3)	0	Michael Jordan	2002 (15)	32511
4	Wilt Chamberlain	1972 (14)	31419	4(7)	42	Shaquille O'neal	2008 (17)	29575
5	Julius Erving	1986 (16)	30026	5(5)	0	Julius Erving	1986 (16)	28934
6	Moses Malone	1994 (21)	29580	6(4)	-50	Wilt Chamberlain	1972 (14)	28615
7	Shaquille O'neal	2008 (17)	27619	7(6)	-16	Moses Malone	1994 (21)	28532
8	Dan Issel	1984 (15)	27482	8(10)	20	Hakeem Olajuwon	2001 (18)	27177
9	Elvin Hayes	1983 (16)	27313	9(8)	-12	Dan Issel	1984 (15)	26362
10	Hakeem Olajuwon	2001 (18)	26946	10(16)	37	Reggie Miller	2004 (18)	26361
11	Oscar Robertson	1973 (14)	26710	11(12)	8	Dominique Wilkins	1998 (15)	26110
12	Dominique Wilkins	1998 (15)	26668	12(21)	42	Allen Iverson	2008 (13)	26040
13	George Gervin	1985 (14)	26595	13(9)	-44	Elvin Hayes	1983 (16)	26035
14	John Havlicek	1977 (16)	26395	14(22)	36	Kobe Bryant	2008 (13)	25797
15	Alex English	1990 (15)	25613	15(13)	-15	George Gervin	1985 (14)	25666
16	Reggie Miller	2004 (18)	25279	16(20)	20	Patrick Ewing	2001 (17)	25129
16	Rick Barry	1979 (14)	25279	17(14)	-21	John Havlicek	1977 (16)	24796
18	Jerry West	1973 (14)	25192	18(15)	-20	Alex English	1990 (15)	24551
19	Artis Gilmore	1987 (17)	24941	19(11)	-72	Oscar Robertson	1973 (14)	24459
20	Patrick Ewing	2001 (17)	24815	20(19)	-5	Artis Gilmore	1987 (17)	24023
21	Allen Iverson	2008 (13)	23983	21(16)	-31	Rick Barry	1979 (14)	23893
22	Kobe Bryant	2008 (13)	23820	22(23)	4	Charles Barkley	1999 (16)	23748
23	Charles Barkley	1999 (16)	23757	23(28)	17	Gary Payton	2006 (17)	23374
24	Robert Parish	1996 (21)	23334	24(18)	-33	Jerry West	1973 (14)	23115
25	Adrian Dantley	1990 (15)	23177	25(31)	19	Kevin Garnett	2008 (14)	23111
26	Elgin Baylor	1971 (14)	23149	26(24)	-8	Robert Parish	1996 (21)	22615
27	Clyde Drexler	1997 (15)	22195	27(25)	-8	Adrian Dantley	1990 (15)	22230
28	Gary Payton	2006 (17)	21813	28(27)	-3	Clyde Drexler	1997 (15)	22035
29	Larry Bird	1991 (13)	21791	29(34)	14	David Robinson	2002 (14)	21578
30	Hal Greer	1972 (15)	21586	30(38)	21	Ray Allen	2008 (13)	21338
31	Kevin Garnett	2008 (14)	21277	31(35)	11	Mitch Richmond	2001 (14)	21192
32	Walt Bellamy	1974 (14)	20941	32(26)	-23	Elgin Baylor	1971 (14)	21163
33	Bob Pettit	1964 (11)	20880	33(29)	-13	Larry Bird	1991 (13)	20946
34	David Robinson	2002 (14)	20790	34(44)	22	Tim Duncan	2008 (12)	20921
35	Mitch Richmond	2001 (14)	20497	35(40)	12	Clifford Robinson	2006 (18)	20726
36	Tom Chambers	1997 (16)	20049	36(47)	23	Dirk Nowitzki	2008 (11)	20641
37	John Stockton	2002 (19)	19711	37(54)	31	Paul Pierce	2008 (11)	20204
38	Ray Allen	2008 (13)	19661	38(37)	-2	John Stockton	2002 (19)	20203
39	Bernard King	1992 (14)	19655	39(33)	-18	Bob Pettit	1964 (11)	20033
40	Clifford Robinson	2006 (18)	19591	40(58)	31	Vince Carter	2008 (11)	19768
41	Walter Davis	1991 (15)	19521	41(30)	-36	Hal Greer	1972 (15)	19734
42	Terry Cummings	1999 (18)	19460	42(50)	16	Scottie Pippen	2003 (17)	19595
43	Bob Lanier	1983 (14)	19248	43(36)	-19	Tom Chambers	1997 (16)	19433
44	Tim Duncan	2008 (12)	19246	44(32)	-37	Walt Bellamy	1974 (14)	19277
45	Eddie Johnson	1998 (17)	19202	45(56)	19	Glen Rice	2003 (15)	19146
46	Gail Goodrich	1978 (14)	19181	46(42)	-9	Terry Cummings	1999 (18)	19051
47	Dirk Nowitzki	2008 (11)	19084	47(49)	4	Dale Ellis	1999 (17)	18999
48	Reggie Theus	1990 (13)	19015	48(39)	-23	Bernard King	1992 (14)	18914
49	Dale Ellis	1999 (17)	19002	49(71)	30	Tracy Mcgrady	2008 (12)	18808
50	Scottie Pippen	2003 (17)	18940	50(41)	-21	Walter Davis	1991 (15)	18748

TABLE S2: Ranking of Career Points (1951 - 2006). The left columns lists the traditional ranking of career statistics, where the top 50 players are ranked along with their final season (career length in seasons listed in parenthesis) and their career metric tally. The right columns list the detrended ranking of career statistics $Rank^*$, where the corresponding traditional ranking of the player is denoted in parenthesis. L denotes the career length of the player. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Name	Detrended Rank	
		Final Season (L)	Career Metric				Final Season (L)	Career Metric
1	Wilt Chamberlain	1972 (14)	23924	1(1)	0	Wilt Chamberlain	1972 (14)	19896
2	Bill Russell	1968 (13)	21620	2(3)	33	Moses Malone	1994 (21)	19323
3	Moses Malone	1994 (21)	17834	3(4)	25	Kareem Abdul-jabbar	1988 (20)	17782
4	Kareem Abdul-jabbar	1988 (20)	17440	4(2)	-100	Bill Russell	1968 (13)	17424
5	Artis Gilmore	1987 (17)	16330	5(5)	0	Artis Gilmore	1987 (17)	16924
6	Elvin Hayes	1983 (16)	16279	6(7)	14	Karl Malone	2003 (19)	16907
7	Karl Malone	2003 (19)	14967	7(8)	12	Robert Parish	1996 (21)	16178
8	Robert Parish	1996 (21)	14715	8(6)	-33	Elvin Hayes	1983 (16)	16136
9	Nate Thurmond	1976 (14)	14464	9(12)	25	Hakeem Olajuwon	2001 (18)	15463
10	Walt Bellamy	1974 (14)	14241	10(13)	23	Buck Williams	1997 (17)	14522
11	Wes Unseld	1980 (13)	13769	11(16)	31	Shaquille O'neal	2008 (17)	14414
12	Hakeem Olajuwon	2001 (18)	13747	12(18)	33	Dikembe Mutombo	2008 (18)	14148
13	Buck Williams	1997 (17)	13018	13(17)	23	Charles Barkley	1999 (16)	14120
14	Jerry Lucas	1973 (11)	12942	14(20)	30	Charles Oakley	2003 (19)	13740
15	Bob Pettit	1964 (11)	12849	15(21)	28	Dennis Rodman	1999 (14)	13515
16	Shaquille O'neal	2008 (17)	12566	16(23)	30	Kevin Garnett	2008 (14)	13479
17	Charles Barkley	1999 (16)	12546	17(11)	-54	Wes Unseld	1980 (13)	13439
18	Dikembe Mutombo	2008 (18)	12359	18(22)	18	Kevin Willis	2006 (21)	13424
19	Paul Silas	1979 (16)	12357	19(24)	20	Patrick Ewing	2001 (17)	13099
20	Charles Oakley	2003 (19)	12205	20(9)	-122	Nate Thurmond	1976 (14)	12891
21	Dennis Rodman	1999 (14)	11954	21(10)	-110	Walt Bellamy	1974 (14)	12219
22	Kevin Willis	2006 (21)	11901	22(30)	26	Tim Duncan	2008 (12)	12151
23	Kevin Garnett	2008 (14)	11682	23(32)	28	David Robinson	2002 (14)	11915
24	Patrick Ewing	2001 (17)	11606	24(28)	14	Jack Sikma	1990 (14)	11839
25	Elgin Baylor	1971 (14)	11463	25(35)	28	Otis Thorpe	2000 (17)	11667
26	Dan Issel	1984 (15)	11133	26(19)	-36	Paul Silas	1979 (16)	11657
27	Bill Bridges	1974 (13)	11054	27(34)	20	Bill Laimbeer	1993 (14)	11513
28	Jack Sikma	1990 (14)	10816	28(26)	-7	Dan Issel	1984 (15)	11361
29	Caldwell Jones	1989 (17)	10685	29(29)	0	Caldwell Jones	1989 (17)	11347
30	Tim Duncan	2008 (12)	10546	30(14)	-114	Jerry Lucas	1973 (11)	11112
31	Julius Erving	1986 (16)	10525	31(31)	0	Julius Erving	1986 (16)	10873
32	David Robinson	2002 (14)	10497	32(43)	25	Horace Grant	2003 (17)	10697
33	Dave Cowens	1982 (11)	10444	33(42)	21	A.c. Green	2000 (16)	10685
34	Bill Laimbeer	1993 (14)	10400	34(47)	27	Ben Wallace	2008 (13)	10643
35	Otis Thorpe	2000 (17)	10370	35(45)	22	Vlade Divac	2004 (16)	10637
36	Johnny Kerr	1965 (12)	10092	36(15)	-140	Bob Pettit	1964 (11)	10436
37	Bob Lanier	1983 (14)	9698	37(33)	-12	Dave Cowens	1982 (11)	10351
38	Sam Lacey	1982 (13)	9687	38(52)	26	Shawn Kemp	2002 (14)	10074
39	Zelmo Beaty	1974 (12)	9665	39(46)	15	Maurice Lucas	1987 (14)	9945
40	Dave Debusschere	1973 (12)	9618	40(50)	20	Larry Bird	1991 (13)	9908
41	Mel Daniels	1976 (9)	9528	41(57)	28	Dale Davis	2006 (16)	9851
42	A.c. Green	2000 (16)	9473	42(37)	-13	Bob Lanier	1983 (14)	9790
43	Horace Grant	2003 (17)	9443	43(38)	-13	Sam Lacey	1982 (13)	9732
44	Bailey Howell	1970 (12)	9383	44(55)	20	Michael Cage	1999 (15)	9698
45	Vlade Divac	2004 (16)	9326	45(27)	-66	Bill Bridges	1974 (13)	9682
46	Maurice Lucas	1987 (14)	9306	46(59)	22	P.j. Brown	2007 (15)	9679
47	Ben Wallace	2008 (13)	9243	47(56)	16	Terry Cummings	1999 (18)	9642
48	George McGinnis	1981 (11)	9233	48(48)	0	George McGinnis	1981 (11)	9413
49	Johnny Green	1972 (14)	9083	49(61)	19	Chris Webber	2007 (15)	9356
50	Larry Bird	1991 (13)	8974	50(25)	-100	Elgin Baylor	1971 (14)	9280

TABLE S3: Ranking of Career Rebounds (1951 - 2006). The left columns lists the traditional ranking of career statistics, where the top 50 players are ranked along with their final season (career length in seasons listed in parenthesis) and their career metric tally. The right columns list the detrended ranking of career statistics $Rank^*$, where the corresponding traditional ranking of the player is denoted in parenthesis. L denotes the career length of the player. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Rank	Name	Traditional Rank		Rank*(Rank) % Change		Detrended Rank		Career Metric
		Final Season (L)	Career Metric	Rank*(Rank)	% Change	Name	Final Season (L)	
1	John Stockton	2002 (19)	15806	1(1)	0	John Stockton	2002 (19)	15289
2	Mark Jackson	2003 (17)	10323	2(3)	33	Jason Kidd	2008 (15)	10841
3	Jason Kidd	2008 (15)	10199	3(2)	-50	Mark Jackson	2003 (17)	10222
4	Magic Johnson	1995 (13)	10141	4(5)	20	Oscar Robertson	1973 (14)	10144
5	Oscar Robertson	1973 (14)	9887	5(7)	28	Gary Payton	2006 (17)	9229
6	Isiah Thomas	1993 (13)	9061	6(4)	-50	Magic Johnson	1995 (13)	9145
7	Gary Payton	2006 (17)	8964	7(6)	-16	Isiah Thomas	1993 (13)	8190
8	Rod Strickland	2004 (17)	7987	8(9)	11	Steve Nash	2008 (13)	8090
9	Steve Nash	2008 (13)	7504	9(8)	-12	Rod Strickland	2004 (17)	8005
10	Maurice Cheeks	1992 (15)	7392	10(11)	9	Lenny Wilkens	1974 (15)	7407
11	Lenny Wilkens	1974 (15)	7211	11(14)	21	Guy Rodgers	1969 (12)	7183
12	Terry Porter	2001 (17)	7160	12(13)	7	Tim Hardaway	2002 (13)	7064
13	Tim Hardaway	2002 (13)	7095	13(19)	31	Stephon Marbury	2008 (13)	6920
14	Guy Rodgers	1969 (12)	6917	14(12)	-16	Terry Porter	2001 (17)	6800
15	Muggsy Bogues	2000 (14)	6726	15(10)	-50	Maurice Cheeks	1992 (15)	6653
16	Kevin Johnson	1999 (12)	6711	16(27)	40	Andre Miller	2008 (10)	6469
17	Derek Harper	1998 (16)	6571	17(15)	-13	Muggsy Bogues	2000 (14)	6435
18	Nate Archibald	1983 (13)	6476	18(16)	-12	Kevin Johnson	1999 (12)	6390
19	Stephon Marbury	2008 (13)	6471	19(23)	17	Jerry West	1973 (14)	6340
20	John Lucas	1989 (14)	6454	20(29)	31	Sam Cassell	2008 (16)	6260
21	Reggie Theus	1990 (13)	6453	21(26)	19	John Havlicek	1977 (16)	6164
22	Norm Nixon	1988 (10)	6386	22(17)	-29	Derek Harper	1998 (16)	6162
23	Jerry West	1973 (14)	6238	23(18)	-27	Nate Archibald	1983 (13)	6088
24	Scottie Pippen	2003 (17)	6135	24(24)	0	Scottie Pippen	2003 (17)	6079
25	Clyde Drexler	1997 (15)	6125	25(31)	19	Nick Vanexel	2005 (13)	6002
26	John Havlicek	1977 (16)	6114	26(28)	7	Mookie Blaylock	2001 (13)	5934
27	Andre Miller	2008 (10)	6020	27(35)	22	Allen Iverson	2008 (13)	5911
28	Mookie Blaylock	2001 (13)	5972	28(30)	6	Avery Johnson	2003 (16)	5891
29	Sam Cassell	2008 (16)	5939	29(20)	-45	John Lucas	1989 (14)	5831
30	Avery Johnson	2003 (16)	5846	30(21)	-42	Reggie Theus	1990 (13)	5787
31	Nick Vanexel	2005 (13)	5777	31(25)	-24	Clyde Drexler	1997 (15)	5731
32	Larry Bird	1991 (13)	5695	32(22)	-45	Norm Nixon	1988 (10)	5719
33	Kareem Abdul-jabbar	1988 (20)	5660	33(38)	13	Damon Stoudamire	2007 (13)	5689
34	Michael Jordan	2002 (15)	5633	34(37)	8	Dave Bing	1977 (12)	5428
35	Allen Iverson	2008 (13)	5512	35(34)	-2	Michael Jordan	2002 (15)	5359
36	Dennis Johnson	1989 (14)	5499	36(33)	-9	Kareem Abdul-jabbar	1988 (20)	5290
37	Dave Bing	1977 (12)	5397	37(49)	24	Baron Davis	2008 (10)	5266
38	Damon Stoudamire	2007 (13)	5371	38(44)	13	Kenny Anderson	2004 (14)	5252
39	Kevin Porter	1982 (10)	5314	39(53)	26	Mike Bibby	2008 (11)	5226
40	Jeff Hornacek	1999 (14)	5281	40(41)	2	Karl Malone	2003 (19)	5220
41	Karl Malone	2003 (19)	5248	41(32)	-28	Larry Bird	1991 (13)	5132
42	Rickey Green	1991 (14)	5221	42(40)	-5	Jeff Hornacek	1999 (14)	5064
43	Norm Vanlier	1978 (10)	5217	43(47)	8	Walt Frazier	1979 (13)	5050
44	Kenny Anderson	2004 (14)	5196	44(43)	-2	Norm Vanlier	1978 (10)	5049
45	Julius Erving	1986 (16)	5176	45(58)	22	Chauncey Billups	2008 (12)	5048
46	Sleepy Floyd	1994 (13)	5175	46(36)	-27	Dennis Johnson	1989 (14)	4940
47	Walt Frazier	1979 (13)	5040	47(39)	-20	Kevin Porter	1982 (10)	4928
48	Rick Barry	1979 (14)	4952	48(59)	18	Wilt Chamberlain	1972 (14)	4848
49	Baron Davis	2008 (10)	4902	49(64)	23	Kevin Garnett	2008 (14)	4847
50	Nate Mcmillan	1997 (12)	4893	50(66)	24	Brevin Knight	2008 (12)	4815

TABLE S4: Ranking of Career Assists (1951 - 2006). The left columns lists the traditional ranking of career statistics, where the top 50 players are ranked along with their final season (career length in seasons listed in parenthesis) and their career metric tally. The right columns list the detrended ranking of career statistics $Rank^*$, where the corresponding traditional ranking of the player is denoted in parenthesis. L denotes the career length of the player. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		
		Season (Y#)	Season Metric			Name	Season (Y#)	Season Metric
1	Wilt Chamberlain	1961 (3)	4029	1(1)	0	Wilt Chamberlain	1961 (3)	3543
2	Wilt Chamberlain	1962 (4)	3586	2(2)	0	Wilt Chamberlain	1962 (4)	3248
3	Michael Jordan	1986 (3)	3041	3(7)	57	Kobe Bryant	2005 (10)	3060
4	Wilt Chamberlain	1960 (2)	3033	4(3)	-33	Michael Jordan	1986 (3)	2892
5	Wilt Chamberlain	1963 (5)	2948	5(8)	37	Bob Mcadoo	1974 (3)	2823
6	Michael Jordan	1987 (4)	2868	6(5)	-20	Wilt Chamberlain	1963 (5)	2771
7	Kobe Bryant	2005 (10)	2832	7(6)	-16	Michael Jordan	1987 (4)	2769
8	Bob Mcadoo	1974 (3)	2831	8(37)	78	Kobe Bryant	2002 (7)	2711
9	Kareem Abdul-jabbar	1971 (3)	2822	9(11)	18	Michael Jordan	1989 (6)	2690
10	Rick Barry	1966 (2)	2775	10(4)	-150	Wilt Chamberlain	1960 (2)	2681
11	Michael Jordan	1989 (6)	2753	11(34)	67	LeBron James	2005 (3)	2677
12	Elgin Baylor	1962 (5)	2719	12(49)	75	Tracy Mcgrady	2002 (6)	2651
12	Nate Archibald	1972 (3)	2719	13(9)	-44	Kareem Abdul-jabbar	1971 (3)	2646
14	Wilt Chamberlain	1959 (1)	2707	14(55)	74	Jerry Stackhouse	2000 (6)	2629
15	Wilt Chamberlain	1965 (7)	2649	15(42)	64	Michael Jordan	1996 (12)	2625
16	Charlie Scott	1971 (2)	2637	16(31)	48	Michael Jordan	1995 (11)	2618
17	Michael Jordan	1988 (5)	2633	17(12)	-41	Nate Archibald	1972 (3)	2598
18	Kareem Abdul-jabbar	1970 (2)	2596	18(62)	70	Michael Jordan	1997 (13)	2582
19	George Gervin	1979 (8)	2585	19(43)	55	Kobe Bryant	2006 (11)	2580
20	Michael Jordan	1990 (7)	2580	20(57)	64	Allen Iverson	2005 (10)	2568
21	George Gervin	1981 (10)	2551	21(20)	-5	Michael Jordan	1990 (7)	2540
22	Michael Jordan	1992 (9)	2541	22(66)	66	Gilbert Arenas	2005 (5)	2535
23	Karl Malone	1989 (5)	2540	23(22)	-4	Michael Jordan	1992 (9)	2525
24	Dan Issel	1971 (2)	2538	24(17)	-41	Michael Jordan	1988 (5)	2522
24	Elgin Baylor	1960 (3)	2538	25(68)	63	Shaquille O'neal	1999 (8)	2514
26	Wilt Chamberlain	1964 (6)	2534	26(52)	50	Dwyane Wade	2008 (6)	2498
27	Moses Malone	1981 (8)	2520	27(105)	74	Allen Iverson	2002 (7)	2492
28	Spencer Haywood	1969 (1)	2519	28(23)	-21	Karl Malone	1989 (5)	2482
29	Rick Barry	1971 (6)	2518	29(84)	65	Allen Iverson	2004 (9)	2479
30	Walt Bellamy	1961 (1)	2495	30(19)	-57	George Gervin	1979 (8)	2475
31	Michael Jordan	1995 (11)	2491	31(16)	-93	Charlie Scott	1971 (2)	2472
32	Oscar Robertson	1963 (4)	2480	32(10)	-220	Rick Barry	1966 (2)	2468
32	Dan Issel	1970 (1)	2480	33(12)	-175	Elgin Baylor	1962 (5)	2463
34	LeBron James	2005 (3)	2478	34(21)	-61	George Gervin	1981 (10)	2457
35	Jerry West	1965 (6)	2476	35(53)	33	David Robinson	1993 (5)	2450
36	Julius Erving	1975 (5)	2462	36(14)	-157	Wilt Chamberlain	1959 (1)	2448
37	Kobe Bryant	2002 (7)	2461	37(57)	35	Shaquille O'neal	1993 (2)	2444
38	Adrian Dantley	1981 (6)	2457	38(40)	5	Rick Barry	1974 (9)	2443
39	Adrian Dantley	1980 (5)	2452	39(126)	69	Allen Iverson	2000 (5)	2438
40	Rick Barry	1974 (9)	2450	40(76)	47	Kobe Bryant	2007 (12)	2431
41	Oscar Robertson	1961 (2)	2432	41(115)	64	Karl Malone	1996 (12)	2428
42	Michael Jordan	1996 (12)	2431	42(27)	-55	Moses Malone	1981 (8)	2427
43	Kobe Bryant	2006 (11)	2430	43(36)	-19	Julius Erving	1975 (5)	2414
44	Bob Pettit	1961 (8)	2429	44(82)	46	LeBron James	2008 (6)	2412
45	Bob Mcadoo	1975 (4)	2427	45(131)	65	Karl Malone	1997 (13)	2399
46	Adrian Dantley	1983 (8)	2418	46(26)	-76	Wilt Chamberlain	1964 (6)	2396
47	Alex English	1985 (10)	2414	47(77)	38	Shaquille O'neal	1994 (3)	2390
48	Oscar Robertson	1966 (7)	2412	48(50)	4	Michael Jordan	1991 (8)	2389
49	Tracy Mcgrady	2002 (6)	2407	49(15)	-226	Wilt Chamberlain	1965 (7)	2388
50	Michael Jordan	1991 (8)	2404	50(45)	-11	Bob Mcadoo	1975 (4)	2379

TABLE S5: Ranking of Season Points (1951 - 2008). The left columns list the traditional ranking of season statistics, where the top 50 players are ranked along with the year. The right columns list the detrended ranking of season statistics $Rank^*$. $Y\#$ denotes the number of years into the career.

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		
		Season (Y#)	Season Metric			Name	Season (Y#)	Season Metric
1	Wilt Chamberlain	1960 (2)	2149	1(28)	96	Dennis Rodman	1991 (6)	1691
2	Wilt Chamberlain	1961 (3)	2052	2(4)	50	Wilt Chamberlain	1967 (9)	1666
3	Wilt Chamberlain	1966 (8)	1957	3(5)	40	Wilt Chamberlain	1962 (4)	1628
4	Wilt Chamberlain	1967 (9)	1952	4(1)	-300	Wilt Chamberlain	1960 (2)	1605
5	Wilt Chamberlain	1962 (4)	1946	5(2)	-150	Wilt Chamberlain	1961 (3)	1600
6	Wilt Chamberlain	1965 (7)	1943	6(8)	25	Bill Russell	1963 (8)	1595
7	Wilt Chamberlain	1959 (1)	1941	7(3)	-133	Wilt Chamberlain	1966 (8)	1587
8	Bill Russell	1963 (8)	1930	8(6)	-33	Wilt Chamberlain	1965 (7)	1552
9	Bill Russell	1964 (9)	1878	9(11)	18	Bill Russell	1962 (7)	1542
10	Bill Russell	1960 (5)	1868	10(43)	76	Moses Malone	1978 (5)	1537
11	Bill Russell	1962 (7)	1843	11(27)	59	Artis Gilmore	1973 (3)	1532
12	Bill Russell	1961 (6)	1790	11(9)	-22	Bill Russell	1964 (9)	1532
13	Wilt Chamberlain	1963 (5)	1787	13(52)	75	Dennis Rodman	1993 (8)	1530
14	Bill Russell	1965 (10)	1779	14(16)	12	Wilt Chamberlain	1968 (10)	1479
15	Bill Russell	1959 (4)	1778	15(20)	25	Spencer Haywood	1969 (1)	1478
16	Wilt Chamberlain	1968 (10)	1712	16(13)	-23	Wilt Chamberlain	1963 (5)	1477
17	Bill Russell	1966 (11)	1700	17(29)	41	Wilt Chamberlain	1972 (14)	1468
18	Wilt Chamberlain	1964 (6)	1673	18(22)	18	Wilt Chamberlain	1971 (13)	1467
19	Jerry Lucas	1965 (3)	1668	19(37)	48	Elvin Hayes	1973 (6)	1458
20	Spencer Haywood	1969 (1)	1637	20(7)	-185	Wilt Chamberlain	1959 (1)	1456
21	Bill Russell	1958 (3)	1612	21(14)	-50	Bill Russell	1965 (10)	1421
22	Wilt Chamberlain	1971 (13)	1572	22(35)	37	Artis Gilmore	1972 (2)	1420
23	Bill Russell	1957 (2)	1564	23(12)	-91	Bill Russell	1961 (6)	1396
24	Jerry Lucas	1967 (5)	1560	24(96)	75	Dennis Rodman	1997 (12)	1395
25	Jerry Lucas	1966 (4)	1547	24(10)	-140	Bill Russell	1960 (5)	1395
26	Bob Pettit	1960 (7)	1540	26(32)	18	Artis Gilmore	1971 (1)	1391
27	Artis Gilmore	1973 (3)	1538	27(73)	63	Kevin Willis	1991 (7)	1390
28	Dennis Rodman	1991 (6)	1530	28(54)	48	Artis Gilmore	1974 (4)	1385
29	Wilt Chamberlain	1972 (14)	1526	29(48)	39	Kareem Abdul-jabbar	1975 (7)	1384
30	Walt Bellamy	1961 (1)	1500	30(17)	-76	Bill Russell	1966 (11)	1379
31	Wilt Chamberlain	1970 (12)	1493	31(18)	-72	Wilt Chamberlain	1964 (6)	1365
32	Wes Unseld	1968 (1)	1491	32(31)	-3	Wilt Chamberlain	1970 (12)	1341
32	Artis Gilmore	1971 (1)	1491	33(15)	-120	Bill Russell	1959 (4)	1333
34	Bill Russell	1968 (13)	1484	33(119)	72	Dwight Howard	2007 (4)	1333
35	Artis Gilmore	1972 (2)	1476	35(19)	-84	Jerry Lucas	1965 (3)	1332
36	Mel Daniels	1970 (4)	1475	35(24)	-45	Jerry Lucas	1967 (5)	1332
37	Elvin Hayes	1973 (6)	1463	37(36)	-2	Mel Daniels	1970 (4)	1325
38	Mel Daniels	1969 (3)	1462	38(38)	0	Mel Daniels	1969 (3)	1320
39	Bob Pettit	1961 (8)	1459	39(69)	43	Truck Robinson	1977 (4)	1319
40	Julius Keye	1970 (2)	1454	40(106)	62	Moses Malone	1981 (8)	1318
41	Bill Russell	1967 (12)	1451	41(111)	63	Moses Malone	1980 (7)	1307
42	Elgin Baylor	1960 (3)	1447	42(87)	51	Swen Nater	1979 (7)	1306
43	Moses Malone	1978 (5)	1444	42(40)	-5	Julius Keye	1970 (2)	1306
44	Elvin Hayes	1968 (1)	1406	44(67)	34	Artis Gilmore	1975 (5)	1304
45	Nate Thurmond	1968 (6)	1402	45(128)	64	Kevin Garnett	2003 (9)	1302
46	Nate Thurmond	1964 (2)	1395	45(70)	35	Swen Nater	1974 (2)	1302
47	Elvin Hayes	1969 (2)	1386	47(120)	60	Dikembe Mutombo	1999 (9)	1299
48	Kareem Abdul-jabbar	1975 (7)	1383	48(57)	15	Nate Thurmond	1972 (10)	1297
49	Nate Thurmond	1966 (4)	1382	49(99)	50	Moses Malone	1982 (9)	1293
50	Jerry Lucas	1963 (1)	1375	50(21)	-138	Bill Russell	1958 (3)	1290

TABLE S6: Ranking of Season Rebounds (1951 - 2008). The left columns list the traditional ranking of season statistics, where the top 50 players are ranked along with the year. The right columns list the detrended ranking of season statistics $Rank^*$. $Y\#$ denotes the number of years into the career.

Rank	Name	Traditional Rank		Rank* (Rank)	% Change	Detrended Rank		Season Metric
		Season (Y#)	Season Metric			Name	Season (Y#)	
1	John Stockton	1990 (7)	1164	1(1)	0	John Stockton	1990 (7)	1085
2	John Stockton	1989 (6)	1134	2(4)	50	John Stockton	1991 (8)	1061
3	John Stockton	1987 (4)	1128	3(2)	-50	John Stockton	1989 (6)	1052
4	John Stockton	1991 (8)	1126	4(3)	-33	John Stockton	1987 (4)	1007
5	Isiah Thomas	1984 (4)	1123	4(6)	33	John Stockton	1988 (5)	1007
6	John Stockton	1988 (5)	1118	6(9)	33	John Stockton	1994 (11)	998
7	Kevin Porter	1978 (7)	1099	7(5)	-40	Isiah Thomas	1984 (4)	985
8	John Stockton	1993 (10)	1031	8(7)	-14	Kevin Porter	1978 (7)	982
9	John Stockton	1994 (11)	1011	9(16)	43	Mark Jackson	1996 (10)	979
10	Kevin Johnson	1988 (2)	991	9(17)	47	Chris Paul	2007 (3)	979
11	Magic Johnson	1990 (12)	989	11(8)	-37	John Stockton	1993 (10)	972
12	Magic Johnson	1988 (10)	988	12(27)	55	Steve Nash	2006 (11)	959
13	John Stockton	1992 (9)	987	13(26)	50	Steve Nash	2007 (12)	949
14	Magic Johnson	1986 (8)	977	14(34)	58	Oscar Robertson	1964 (5)	947
15	Magic Johnson	1984 (6)	968	15(34)	55	Chris Paul	2008 (4)	945
16	Mark Jackson	1996 (10)	935	16(34)	52	Steve Nash	2004 (9)	933
17	Chris Paul	2007 (3)	925	17(30)	43	Oscar Robertson	1963 (4)	932
18	John Stockton	1995 (12)	916	17(22)	22	Guy Rodgers	1966 (9)	932
19	Isiah Thomas	1983 (3)	914	19(18)	-5	John Stockton	1995 (12)	930
19	Norm Nixon	1983 (7)	914	20(28)	28	Andre Miller	2001 (3)	928
21	Nate Archibald	1972 (3)	910	21(51)	58	Steve Nash	2005 (10)	925
22	Guy Rodgers	1966 (9)	908	22(11)	-100	Magic Johnson	1990 (12)	922
23	Magic Johnson	1989 (11)	907	23(13)	-76	John Stockton	1992 (9)	921
23	Magic Johnson	1985 (7)	907	24(33)	27	Deron Williams	2007 (3)	912
25	Oscar Robertson	1961 (2)	899	25(37)	32	John Stockton	1996 (13)	901
26	Steve Nash	2007 (12)	897	26(10)	-160	Kevin Johnson	1988 (2)	893
27	Steve Nash	2006 (11)	884	27(12)	-125	Magic Johnson	1988 (10)	890
28	Andre Miller	2001 (3)	882	28(43)	34	Oscar Robertson	1966 (7)	867
29	Magic Johnson	1983 (5)	875	29(14)	-107	Magic Johnson	1986 (8)	866
30	Oscar Robertson	1963 (4)	868	30(25)	-20	Oscar Robertson	1961 (2)	865
30	Mark Jackson	1987 (1)	868	31(58)	46	Jason Kidd	2007 (14)	853
32	Muggsy Bogues	1989 (3)	867	32(56)	42	Jason Kidd	2001 (8)	850
33	Deron Williams	2007 (3)	862	32(40)	20	Oscar Robertson	1965 (6)	850
34	Oscar Robertson	1964 (5)	861	32(21)	-52	Nate Archibald	1972 (3)	850
34	Chris Paul	2008 (4)	861	35(15)	-133	Magic Johnson	1984 (6)	849
34	Steve Nash	2004 (9)	861	35(41)	14	Guy Rodgers	1965 (8)	849
37	John Stockton	1996 (13)	860	37(68)	45	Oscar Robertson	1968 (9)	844
38	Magic Johnson	1987 (9)	858	38(23)	-65	Magic Johnson	1989 (11)	841
39	Sleepy Floyd	1986 (5)	848	39(59)	33	Rod Strickland	1997 (10)	839
40	Oscar Robertson	1965 (6)	847	40(52)	23	Guy Rodgers	1962 (5)	836
41	Guy Rodgers	1965 (8)	846	41(114)	64	Wilt Chamberlain	1967 (9)	835
41	Kevin Johnson	1989 (3)	846	42(46)	8	Norm Vanlier	1970 (2)	816
43	Oscar Robertson	1966 (7)	845	43(83)	48	Deron Williams	2006 (2)	808
44	Kevin Porter	1977 (6)	837	43(141)	69	Lenny Wilkens	1967 (8)	808
45	Kevin Johnson	1991 (5)	836	45(19)	-136	Isiah Thomas	1983 (3)	806
46	Norm Vanlier	1970 (2)	832	45(19)	-136	Norm Nixon	1983 (7)	806
46	Michealray Richardson	1979 (2)	832	47(23)	-104	Magic Johnson	1985 (7)	804
48	Terry Porter	1987 (3)	831	47(32)	-46	Muggsy Bogues	1989 (3)	804
49	Isiah Thomas	1985 (5)	830	49(61)	19	Avery Johnson	1995 (8)	801
50	Magic Johnson	1982 (4)	829	50(90)	44	Jason Kidd	2006 (13)	799

TABLE S7: Ranking of Season Assists (1951 - 2008). The left columns list the traditional ranking of season statistics, where the top 50 players are ranked along with the year. The right columns list the detrended ranking of season statistics $Rank^*$. $Y\#$ denotes the number of years into the career.

Electronic-only supplementary information

In Tables S1–S10, we list top-50 tables for 5 career statistics and for 4 season statistics. For the two types of rankings, the columns are organized as follows:

Career Tables S1–S5: The 4 columns on the left of each table list information for the “traditional rank” of career statistics, where the top 50 players are ranked along with their final season (career length in seasons listed in parenthesis) and their career metric tally. The 5 columns on the right of each table list information for the “detrended rank” ($Rank^*$) of career statistics, where the corresponding traditional rank ($Rank$) of the player is denoted in parenthesis. L denotes the career length of the player. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Season Tables S6–S10: The 4 columns on the left list the traditional ranking of season statistics, where the top 50 players are ranked along with the year. The right columns list the detrended ranking of season statistics $Rank^*$. $Y\#$ denotes the number of years into the career. The relative percent change $\%Change = (Rank^* - Rank)/Rank$.

Table S1. Ranking of career home runs (1871–2009).

Rank	Name	Traditional Rank		Rank* (Rank)	% Change	Name	Detrended Rank	
		Final Season (L)	Career Metric				Final Season (L)	Career Metric
1	Barry Bonds	2007 (22)	762	1(3)	66	Babe Ruth	1935 (22)	1215
2	Hank Aaron	1976 (23)	755	2(23)	91	Mel Ott	1947 (22)	637
3	Babe Ruth	1935 (22)	714	3(26)	88	Lou Gehrig	1939 (17)	635
4	Willie Mays	1973 (22)	660	3(17)	82	Jimmie Foxx	1945 (20)	635
5	Ken Griffey	2009 (21)	630	5(2)	-150	Hank Aaron	1976 (23)	582
6	Sammy Sosa	2007 (18)	609	6(124)	95	Rogers Hornsby	1937 (23)	528
7	Frank Robinson	1976 (21)	586	7(192)	96	Cy Williams	1930 (19)	527
8	Alex Rodriguez	2009 (16)	583	8(1)	-700	Barry Bonds	2007 (22)	502
8	Mark McGwire	2001 (16)	583	9(4)	-125	Willie Mays	1973 (22)	490
10	Harmon Killebrew	1975 (22)	573	10(18)	44	Ted Williams	1960 (19)	482
11	Rafael Palmeiro	2005 (20)	569	11(13)	15	Reggie Jackson	1987 (21)	478
12	Jim Thome	2009 (19)	564	12(14)	14	Mike Schmidt	1989 (18)	463
13	Reggie Jackson	1987 (21)	563	13(7)	-85	Frank Robinson	1976 (21)	444
14	Mike Schmidt	1989 (18)	548	14(10)	-40	Harmon Killebrew	1975 (22)	437
15	Manny Ramirez	2009 (17)	546	15(577)	97	Gavvy Cravath	1920 (11)	433
16	Mickey Mantle	1968 (18)	536	16(718)	97	Honus Wagner	1917 (21)	420
17	Jimmie Foxx	1945 (20)	534	17(18)	5	Willie McCovey	1980 (22)	417
18	Ted Williams	1960 (19)	521	18(557)	96	Harry Stovey	1893 (14)	413
18	Frank Thomas	2008 (19)	521	19(5)	-280	Ken Griffey	2009 (21)	411
18	Willie McCovey	1980 (22)	521	20(28)	28	Stan Musial	1963 (22)	410
21	Eddie Mathews	1968 (17)	512	21(28)	25	Willie Stargell	1982 (21)	399
21	Ernie Banks	1971 (19)	512	22(25)	12	Eddie Murray	1997 (21)	397
23	Mel Ott	1947 (22)	511	22(8)	-175	Mark McGwire	2001 (16)	397
24	Gary Sheffield	2009 (22)	509	24(16)	-50	Mickey Mantle	1968 (18)	394
25	Eddie Murray	1997 (21)	504	24(113)	78	Al Simmons	1944 (20)	394
26	Fred McGriff	2004 (19)	493	26(470)	94	Roger Connor	1897 (18)	389
26	Lou Gehrig	1939 (17)	493	27(752)	96	Sam Crawford	1917 (19)	386
28	Willie Stargell	1982 (21)	475	28(70)	60	Joe DiMaggio	1951 (13)	382
28	Stan Musial	1963 (22)	475	29(6)	-383	Sammy Sosa	2007 (18)	381
30	Carlos Delgado	2009 (17)	473	30(35)	14	Dave Kingman	1986 (16)	380
31	Dave Winfield	1995 (22)	465	30(31)	3	Dave Winfield	1995 (22)	380
32	Jose Canseco	2001 (17)	462	32(21)	-52	Ernie Banks	1971 (19)	377
33	Carl Yastrzemski	1983 (23)	452	33(91)	63	Hank Greenberg	1947 (13)	376
34	Jeff Bagwell	2005 (15)	449	34(72)	52	Johnny Mize	1953 (15)	375
35	Dave Kingman	1986 (16)	442	34(21)	-61	Eddie Mathews	1968 (17)	375
36	Andre Dawson	1996 (21)	438	36(33)	-9	Carl Yastrzemski	1983 (23)	373
37	Juan Gonzalez	2005 (17)	434	36(594)	93	Ty Cobb	1928 (24)	373
38	Cal Ripken	2001 (21)	431	38(11)	-245	Rafael Palmeiro	2005 (20)	368
39	Mike Piazza	2007 (16)	427	39(125)	68	Chuck Klein	1944 (17)	361
40	Billy Williams	1976 (18)	426	40(999)	95	Harry Davis	1917 (22)	360
40	Chipper Jones	2009 (16)	426	41(667)	93	Dan Brouthers	1904 (19)	356
42	Darrell Evans	1989 (21)	414	42(8)	-425	Alex Rodriguez	2009 (16)	355
43	Jason Giambi	2009 (15)	409	43(802)	94	Frank Schulte	1918 (15)	351
44	Duke Snider	1964 (18)	407	44(135)	67	Bob Johnson	1945 (13)	348
44	Vladimir Guerrero	2009 (14)	407	44(36)	-22	Andre Dawson	1996 (21)	348
46	Al Kaline	1974 (22)	399	46(12)	-283	Jim Thome	2009 (19)	345
46	Andres Galarraga	2004 (19)	399	46(26)	-76	Fred McGriff	2004 (19)	345
48	Dale Murphy	1993 (18)	398	46(40)	-15	Billy Williams	1976 (18)	345
49	Joe Carter	1998 (16)	396	49(153)	67	Rudy York	1948 (13)	343
50	Graig Nettles	1988 (22)	390	50(42)	-19	Darrell Evans	1989 (21)	342

Table S2. Ranking of career hits (1871–2009).

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		
		Final Season (L)	Career Metric			Name	Final Season (L)	Career Metric
1	Pete Rose	1986 (24)	4256	1(1)	0	Pete Rose	1986 (24)	4409
2	Ty Cobb	1928 (24)	4189	2(2)	0	Ty Cobb	1928 (24)	4166
3	Hank Aaron	1976 (23)	3771	3(3)	0	Hank Aaron	1976 (23)	3890
4	Stan Musial	1963 (22)	3630	4(4)	0	Stan Musial	1963 (22)	3661
5	Tris Speaker	1928 (22)	3514	5(6)	16	Carl Yastrzemski	1983 (23)	3537
6	Carl Yastrzemski	1983 (23)	3419	6(8)	25	Honus Wagner	1917 (21)	3484
7	Cap Anson	1897 (27)	3418	7(7)	0	Cap Anson	1897 (27)	3464
8	Honus Wagner	1917 (21)	3415	8(5)	-60	Tris Speaker	1928 (22)	3449
9	Paul Molitor	1998 (21)	3319	9(11)	18	Willie Mays	1973 (22)	3375
10	Eddie Collins	1930 (25)	3315	10(9)	-11	Paul Molitor	1998 (21)	3361
11	Willie Mays	1973 (22)	3283	11(12)	8	Eddie Murray	1997 (21)	3303
12	Eddie Murray	1997 (21)	3255	12(13)	7	Nap Lajoie	1916 (21)	3291
13	Nap Lajoie	1916 (21)	3242	13(10)	-30	Eddie Collins	1930 (25)	3266
14	Cal Ripken	2001 (21)	3184	14(15)	6	George Brett	1993 (21)	3222
15	George Brett	1993 (21)	3154	15(14)	-7	Cal Ripken	2001 (21)	3219
16	Paul Waner	1945 (20)	3152	16(17)	5	Robin Yount	1993 (20)	3209
17	Robin Yount	1993 (20)	3142	17(18)	5	Tony Gwynn	2001 (20)	3175
18	Tony Gwynn	2001 (20)	3141	18(19)	5	Dave Winfield	1995 (22)	3171
19	Dave Winfield	1995 (22)	3110	19(23)	17	Lou Brock	1979 (19)	3150
20	Craig Biggio	2007 (20)	3060	20(22)	9	Rod Carew	1985 (19)	3149
21	Rickey Henderson	2003 (25)	3055	21(27)	22	Roberto Clemente	1972 (18)	3107
22	Rod Carew	1985 (19)	3053	22(26)	15	Al Kaline	1974 (22)	3094
23	Lou Brock	1979 (19)	3023	23(21)	-9	Rickey Henderson	2003 (25)	3089
24	Rafael Palmeiro	2005 (20)	3020	24(20)	-20	Craig Biggio	2007 (20)	3060
25	Wade Boggs	1999 (18)	3010	25(25)	0	Wade Boggs	1999 (18)	3053
26	Al Kaline	1974 (22)	3007	26(29)	10	Sam Crawford	1917 (19)	3046
27	Roberto Clemente	1972 (18)	3000	27(30)	10	Frank Robinson	1976 (21)	3040
28	Sam Rice	1934 (20)	2987	28(24)	-16	Rafael Palmeiro	2005 (20)	3034
29	Sam Crawford	1917 (19)	2961	29(16)	-81	Paul Waner	1945 (20)	2968
30	Frank Robinson	1976 (21)	2943	30(42)	28	Brooks Robinson	1977 (23)	2955
31	Barry Bonds	2007 (22)	2935	31(31)	0	Barry Bonds	2007 (22)	2948
32	Willie Keeler	1910 (19)	2932	32(33)	3	Jake Beckley	1907 (20)	2905
33	Rogers Hornsby	1937 (23)	2930	33(40)	17	Harold Baines	2001 (22)	2900
33	Jake Beckley	1907 (20)	2930	34(32)	-6	Willie Keeler	1910 (19)	2872
35	Al Simmons	1944 (20)	2927	35(47)	25	Vada Pinson	1975 (18)	2863
36	Zack Wheat	1927 (19)	2884	36(52)	30	Tony Perez	1986 (23)	2831
37	Frankie Frisch	1937 (19)	2880	37(58)	36	Billy Williams	1976 (18)	2830
38	Mel Ott	1947 (22)	2876	38(45)	15	Andre Dawson	1996 (21)	2823
39	Babe Ruth	1935 (22)	2873	39(55)	29	Rusty Staub	1985 (23)	2821
40	Harold Baines	2001 (22)	2866	40(50)	20	Al Oliver	1985 (18)	2813
41	Jesse Burkett	1905 (16)	2850	41(36)	-13	Zack Wheat	1927 (19)	2809
42	Brooks Robinson	1977 (23)	2848	42(28)	-50	Sam Rice	1934 (20)	2794
43	Charlie Gehringer	1942 (19)	2839	43(56)	23	Bill Buckner	1990 (22)	2779
44	George Sisler	1930 (15)	2812	44(63)	30	Luis Aparicio	1973 (18)	2771
45	Andre Dawson	1996 (21)	2774	45(57)	21	Dave Parker	1991 (19)	2770
46	Ken Griffey	2009 (21)	2763	46(41)	-12	Jesse Burkett	1905 (16)	2768
47	Vada Pinson	1975 (18)	2757	47(33)	-42	Rogers Hornsby	1937 (23)	2766
48	Luke Appling	1950 (20)	2749	47(46)	-2	Ken Griffey	2009 (21)	2766
49	Derek Jeter	2009 (15)	2747	49(38)	-28	Mel Ott	1947 (22)	2745
50	Al Oliver	1985 (18)	2743	50(53)	5	Roberto Alomar	2004 (17)	2738

Table S3. Ranking of career runs batted in (1871–2009).

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		
		Final Season (L)	Career Metric			Name	Final Season (L)	Career Metric
1	Hank Aaron	1976 (23)	2297	1(1)	0	Hank Aaron	1976 (23)	2362
2	Babe Ruth	1935 (22)	2217	2(3)	33	Cap Anson	1897 (27)	2295
3	Cap Anson	1897 (27)	2076	3(7)	57	Ty Cobb	1928 (24)	2176
4	Barry Bonds	2007 (22)	1996	4(2)	-100	Babe Ruth	1935 (22)	2120
5	Lou Gehrig	1939 (17)	1995	5(20)	75	Honus Wagner	1917 (21)	1986
6	Stan Musial	1963 (22)	1951	6(12)	50	Carl Yastrzemski	1983 (23)	1933
7	Ty Cobb	1928 (24)	1937	7(10)	30	Willie Mays	1973 (22)	1930
8	Jimmie Foxx	1945 (20)	1922	8(6)	-33	Stan Musial	1963 (22)	1911
9	Eddie Murray	1997 (21)	1917	9(9)	0	Eddie Murray	1997 (21)	1899
10	Willie Mays	1973 (22)	1903	10(18)	44	Frank Robinson	1976 (21)	1868
11	Mel Ott	1947 (22)	1860	11(15)	26	Dave Winfield	1995 (22)	1848
12	Carl Yastrzemski	1983 (23)	1844	11(4)	-175	Barry Bonds	2007 (22)	1848
13	Ted Williams	1960 (19)	1839	13(47)	72	Sam Crawford	1917 (19)	1798
14	Rafael Palmeiro	2005 (20)	1835	14(5)	-180	Lou Gehrig	1939 (17)	1796
15	Dave Winfield	1995 (22)	1833	15(31)	51	Nap Lajoie	1916 (21)	1782
16	Ken Griffey	2009 (21)	1829	16(13)	-23	Ted Williams	1960 (19)	1776
17	Al Simmons	1944 (20)	1827	17(23)	26	Reggie Jackson	1987 (21)	1770
18	Frank Robinson	1976 (21)	1812	18(8)	-125	Jimmie Foxx	1945 (20)	1747
19	Manny Ramirez	2009 (17)	1788	19(27)	29	Tony Perez	1986 (23)	1745
20	Honus Wagner	1917 (21)	1732	20(11)	-81	Mel Ott	1947 (22)	1725
21	Alex Rodriguez	2009 (16)	1706	21(14)	-50	Rafael Palmeiro	2005 (20)	1689
22	Frank Thomas	2008 (19)	1704	22(16)	-37	Ken Griffey	2009 (21)	1679
23	Reggie Jackson	1987 (21)	1702	23(28)	17	Ernie Banks	1971 (19)	1661
24	Cal Ripken	2001 (21)	1695	24(45)	46	Tris Speaker	1928 (22)	1653
25	Gary Sheffield	2009 (22)	1676	25(17)	-47	Al Simmons	1944 (20)	1646
26	Sammy Sosa	2007 (18)	1667	25(35)	28	Harmon Killebrew	1975 (22)	1646
27	Tony Perez	1986 (23)	1652	27(42)	35	Willie Stargell	1982 (21)	1640
28	Ernie Banks	1971 (19)	1636	28(40)	30	Willie McCovey	1980 (22)	1635
29	Harold Baines	2001 (22)	1628	29(24)	-20	Cal Ripken	2001 (21)	1625
30	Goose Goslin	1938 (18)	1609	30(32)	6	Mike Schmidt	1989 (18)	1622
31	Nap Lajoie	1916 (21)	1599	31(37)	16	Al Kaline	1974 (22)	1614
32	Mike Schmidt	1989 (18)	1595	31(32)	3	George Brett	1993 (21)	1614
32	George Brett	1993 (21)	1595	33(19)	-73	Manny Ramirez	2009 (17)	1598
34	Andre Dawson	1996 (21)	1591	34(34)	0	Andre Dawson	1996 (21)	1586
35	Harmon Killebrew	1975 (22)	1584	35(29)	-20	Harold Baines	2001 (22)	1573
35	Rogers Hornsby	1937 (23)	1584	36(52)	30	Billy Williams	1976 (18)	1567
37	Al Kaline	1974 (22)	1583	37(35)	-5	Rogers Hornsby	1937 (23)	1557
38	Jake Beckley	1907 (20)	1575	38(22)	-72	Frank Thomas	2008 (19)	1554
39	Jim Thome	2009 (19)	1565	39(53)	26	Rusty Staub	1985 (23)	1550
40	Willie McCovey	1980 (22)	1555	40(25)	-60	Gary Sheffield	2009 (22)	1533
41	Fred McGriff	2004 (19)	1550	41(21)	-95	Alex Rodriguez	2009 (16)	1528
42	Willie Stargell	1982 (21)	1540	42(43)	2	Harry Heilmann	1932 (17)	1521
43	Harry Heilmann	1932 (17)	1539	43(51)	15	Dave Parker	1991 (19)	1515
44	Joe DiMaggio	1951 (13)	1537	44(38)	-15	Jake Beckley	1907 (20)	1511
45	Tris Speaker	1928 (22)	1529	45(26)	-73	Sammy Sosa	2007 (18)	1504
45	Jeff Bagwell	2005 (15)	1529	46(50)	8	Mickey Mantle	1968 (18)	1502
47	Sam Crawford	1917 (19)	1525	47(56)	16	Jim Rice	1989 (16)	1473
48	Jeff Kent	2008 (17)	1518	48(30)	-60	Goose Goslin	1938 (18)	1456
49	Carlos Delgado	2009 (17)	1512	49(103)	52	Dan Brouthers	1904 (19)	1449
50	Mickey Mantle	1968 (18)	1509	50(73)	31	Johnny Bench	1983 (17)	1447

Table S4. Ranking of career strikeouts (1871–2009).

Rank	Traditional Rank			Detrended Rank				
	Name	Final Season (L)	Career Metric	Rank*(Rank)	% Change	Name	Final Season (L)	Career Metric
1	Nolan Ryan	1993 (27)	5714	1(1)	0	Nolan Ryan	1993 (27)	4937
2	Randy Johnson	2009 (22)	4875	2(9)	77	Walter Johnson	1927 (21)	4681
3	Roger Clemens	2007 (24)	4672	3(20)	85	Cy Young	1911 (22)	4216
4	Steve Carlton	1988 (24)	4136	4(4)	0	Steve Carlton	1988 (24)	3615
5	Bert Blyleven	1992 (22)	3701	5(2)	-150	Randy Johnson	2009 (22)	3524
6	Tom Seaver	1986 (20)	3640	6(3)	-100	Roger Clemens	2007 (24)	3483
7	Don Sutton	1988 (23)	3574	7(46)	84	Lefty Grove	1941 (17)	3307
8	Gaylord Perry	1983 (22)	3534	8(27)	70	Tim Keefe	1893 (14)	3241
9	Walter Johnson	1927 (21)	3509	9(5)	-80	Bert Blyleven	1992 (22)	3223
10	Greg Maddux	2008 (23)	3371	10(59)	83	Dazzy Vance	1935 (16)	3208
11	Phil Niekro	1987 (24)	3342	11(26)	57	Bob Feller	1956 (18)	3193
12	Fergie Jenkins	1983 (19)	3192	12(6)	-100	Tom Seaver	1986 (20)	3154
13	Pedro Martinez	2009 (18)	3154	13(75)	82	Amos Rusie	1901 (10)	3138
14	Bob Gibson	1975 (17)	3117	14(29)	51	Christy Mathewson	1916 (17)	3116
15	Curt Schilling	2007 (20)	3116	15(7)	-114	Don Sutton	1988 (23)	3073
16	John Smoltz	2009 (21)	3084	16(43)	62	Rube Waddell	1910 (13)	3054
17	Jim Bunning	1971 (17)	2855	17(79)	78	Kid Nichols	1906 (15)	3042
18	Mickey Lolich	1979 (16)	2832	18(8)	-125	Gaylord Perry	1983 (22)	3015
19	Mike Mussina	2008 (18)	2813	19(52)	63	Pete Alexander	1930 (20)	2926
20	Cy Young	1911 (22)	2803	20(11)	-81	Phil Niekro	1987 (24)	2916
21	Frank Tanana	1993 (21)	2773	21(223)	90	Bobby Mathews	1887 (15)	2871
22	David Cone	2003 (17)	2668	22(66)	66	Red Ruffing	1947 (22)	2804
23	Chuck Finley	2002 (17)	2610	23(48)	52	Eddie Plank	1917 (17)	2748
24	Tom Glavine	2008 (22)	2607	24(12)	-100	Fergie Jenkins	1983 (19)	2740
25	Warren Spahn	1965 (21)	2583	25(57)	56	Bobo Newsom	1953 (20)	2714
26	Bob Feller	1956 (18)	2581	26(25)	-4	Warren Spahn	1965 (21)	2660
27	Tim Keefe	1893 (14)	2562	27(14)	-92	Bob Gibson	1975 (17)	2534
28	Jerry Koosman	1985 (19)	2556	28(119)	76	Gus Weyhing	1901 (14)	2533
29	Christy Mathewson	1916 (17)	2502	29(68)	57	John Clarkson	1894 (12)	2522
30	Don Drysdale	1969 (14)	2486	30(10)	-200	Greg Maddux	2008 (23)	2475
31	Jack Morris	1994 (18)	2478	31(42)	26	Early Wynn	1963 (23)	2471
32	Mark Langston	1999 (16)	2464	32(21)	-52	Frank Tanana	1993 (21)	2417
33	Jim Kaat	1983 (25)	2461	32(84)	61	Pud Galvin	1892 (15)	2417
34	Sam McDowell	1975 (15)	2453	34(17)	-100	Jim Bunning	1971 (17)	2373
35	Luis Tiant	1982 (19)	2416	35(163)	78	Burleigh Grimes	1934 (19)	2361
36	Dennis Eckersley	1998 (24)	2401	36(40)	10	Robin Roberts	1966 (19)	2355
37	Kevin Brown	2005 (19)	2397	37(122)	69	Vic Willis	1910 (13)	2352
38	Sandy Koufax	1966 (12)	2396	38(18)	-111	Mickey Lolich	1979 (16)	2334
39	Charlie Hough	1994 (25)	2362	39(85)	54	Tony Mullane	1894 (13)	2320
40	Robin Roberts	1966 (19)	2357	40(113)	64	Carl Hubbell	1943 (16)	2312
41	Jamie Moyer	2009 (23)	2342	41(106)	61	Jim McCormick	1887 (10)	2301
42	Early Wynn	1963 (23)	2334	42(86)	51	Hal Newhouser	1955 (17)	2275
43	Rube Waddell	1910 (13)	2316	43(129)	66	Jack Powell	1912 (16)	2266
44	Juan Marichal	1975 (16)	2303	44(80)	45	Mickey Welch	1892 (13)	2263
45	Dwight Gooden	2000 (16)	2293	45(28)	-60	Jerry Koosman	1985 (19)	2258
46	Lefty Grove	1941 (17)	2266	46(16)	-187	John Smoltz	2009 (21)	2256
47	Javier Vazquez	2009 (12)	2253	47(114)	58	Tommy Bridges	1946 (16)	2247
48	Eddie Plank	1917 (17)	2246	47(82)	42	Charley Radbourn	1891 (11)	2247
49	Tommy John	1989 (26)	2245	49(13)	-276	Pedro Martinez	2009 (18)	2225
50	Jim Palmer	1984 (19)	2212	50(15)	-233	Curt Schilling	2007 (20)	2222

Table S5. Ranking of career wins (1890–2009).

Rank	Name	Traditional Rank		Detrended Rank				
		Final Season (L)	Career Metric	Rank*(Rank)	% Change	Name	Final Season (L)	Career Metric
1	Cy Young	1911 (22)	511	1(1)	0	Cy Young	1911 (22)	510
2	Walter Johnson	1927 (21)	417	2(2)	0	Walter Johnson	1927 (21)	420
3	Christy Mathewson	1916 (17)	373	3(3)	0	Christy Mathewson	1916 (17)	376
3	Pete Alexander	1930 (20)	373	4(3)	-33	Pete Alexander	1930 (20)	375
5	Pud Galvin	1892 (15)	364	5(5)	0	Pud Galvin	1892 (15)	365
6	Warren Spahn	1965 (21)	363	6(6)	0	Warren Spahn	1965 (21)	362
7	Kid Nichols	1906 (15)	361	7(7)	0	Kid Nichols	1906 (15)	359
8	Greg Maddux	2008 (23)	355	8(8)	0	Greg Maddux	2008 (23)	351
9	Roger Clemens	2007 (24)	354	9(9)	0	Roger Clemens	2007 (24)	350
10	Tim Lincecum	1893 (14)	342	10(10)	0	Tim Keefe	1893 (14)	342
11	Steve Carlton	1988 (24)	329	11(11)	0	Steve Carlton	1988 (24)	329
12	John Clarkson	1894 (12)	328	12(13)	7	Eddie Plank	1917 (17)	328
13	Eddie Plank	1917 (17)	326	13(12)	-8	John Clarkson	1894 (12)	327
14	Don Sutton	1988 (23)	324	14(14)	0	Don Sutton	1988 (23)	324
14	Nolan Ryan	1993 (27)	324	14(14)	0	Nolan Ryan	1993 (27)	324
16	Phil Niekro	1987 (24)	318	16(16)	0	Phil Niekro	1987 (24)	318
17	Gaylord Perry	1983 (22)	314	17(17)	0	Gaylord Perry	1983 (22)	314
18	Tom Seaver	1986 (20)	311	18(18)	0	Tom Seaver	1986 (20)	311
19	Charley Radbourn	1891 (11)	309	19(19)	0	Charley Radbourn	1891 (11)	308
20	Mickey Welch	1892 (13)	307	20(20)	0	Mickey Welch	1892 (13)	307
21	Tom Glavine	2008 (22)	305	21(21)	0	Tom Glavine	2008 (22)	302
22	Randy Johnson	2009 (22)	303	22(25)	12	Bobby Mathews	1887 (15)	300
23	Early Wynn	1963 (23)	300	22(23)	4	Early Wynn	1963 (23)	300
23	Lefty Grove	1941 (17)	300	24(23)	-4	Lefty Grove	1941 (17)	299
25	Bobby Mathews	1887 (15)	297	24(22)	-9	Randy Johnson	2009 (22)	299
26	Tommy John	1989 (26)	288	26(26)	0	Tommy John	1989 (26)	288
27	Bert Blyleven	1992 (22)	287	27(27)	0	Bert Blyleven	1992 (22)	287
28	Robin Roberts	1966 (19)	286	28(28)	0	Robin Roberts	1966 (19)	285
29	Tony Mullane	1894 (13)	284	29(29)	0	Fergie Jenkins	1983 (19)	284
29	Fergie Jenkins	1983 (19)	284	30(31)	3	Jim Kaat	1983 (25)	283
31	Jim Kaat	1983 (25)	283	30(29)	-3	Tony Mullane	1894 (13)	283
32	Red Ruffing	1947 (22)	273	32(32)	0	Red Ruffing	1947 (22)	272
33	Mike Mussina	2008 (18)	270	33(33)	0	Burleigh Grimes	1934 (19)	270
33	Burleigh Grimes	1934 (19)	270	34(35)	2	Jim Palmer	1984 (19)	268
35	Jim Palmer	1984 (19)	268	35(33)	-6	Mike Mussina	2008 (18)	267
36	Eppa Rixey	1933 (21)	266	36(36)	0	Eppa Rixey	1933 (21)	266
36	Bob Feller	1956 (18)	266	36(38)	5	Jim McCormick	1887 (10)	266
38	Jim McCormick	1887 (10)	265	38(36)	-5	Bob Feller	1956 (18)	265
39	Gus Weyhing	1901 (14)	264	39(39)	0	Gus Weyhing	1901 (14)	263
40	Ted Lyons	1946 (21)	260	40(40)	0	Ted Lyons	1946 (21)	259
41	Jamie Moyer	2009 (23)	258	40(44)	9	Al Spalding	1877 (7)	259
42	Jack Morris	1994 (18)	254	42(42)	0	Red Faber	1933 (20)	255
42	Red Faber	1933 (20)	254	43(41)	-4	Jamie Moyer	2009 (23)	254
44	Al Spalding	1877 (7)	253	44(42)	-4	Jack Morris	1994 (18)	253
44	Carl Hubbell	1943 (16)	253	44(44)	0	Carl Hubbell	1943 (16)	253
46	Bob Gibson	1975 (17)	251	46(46)	0	Bob Gibson	1975 (17)	251
47	Vic Willis	1910 (13)	249	47(47)	0	Vic Willis	1910 (13)	250
48	Jack Quinn	1933 (23)	247	48(48)	0	Jack Quinn	1933 (23)	247
49	Joe McGinnity	1908 (10)	246	48(49)	2	Joe McGinnity	1908 (10)	247
50	Amos Rusie	1901 (10)	245	50(50)	0	Jack Powell	1912 (16)	245

Table S6. Ranking of season home runs for the Modern Era (1920–2009).

Rank	Name	Traditional Rank		Detrended Rank				
		Season (Y#)	Season Metric	Rank*(Rank)	% Change	Name	Season (Y#)	Season Metric
1	Barry Bonds	2001 (16)	73	1(19)	94	Babe Ruth	1920 (7)	133
2	Mark McGwire	1998 (13)	70	2(8)	75	Babe Ruth	1927 (14)	102
3	Sammy Sosa	1998 (10)	66	3(9)	66	Babe Ruth	1921 (8)	100
4	Mark McGwire	1999 (14)	65	4(72)	94	Babe Ruth	1926 (13)	82
5	Sammy Sosa	2001 (13)	64	5(94)	94	Babe Ruth	1924 (11)	80
6	Sammy Sosa	1999 (11)	63	5(72)	93	Lou Gehrig	1927 (5)	80
7	Roger Maris	1961 (5)	61	7(19)	63	Babe Ruth	1928 (15)	77
8	Babe Ruth	1927 (14)	60	8(61)	86	Jimmie Foxx	1933 (9)	70
9	Babe Ruth	1921 (8)	59	9(94)	90	Babe Ruth	1931 (18)	68
10	Mark McGwire	1997 (12)	58	9(94)	90	Lou Gehrig	1931 (9)	68
10	Ryan Howard	2006 (3)	58	11(10)	-10	Jimmie Foxx	1932 (8)	67
10	Hank Greenberg	1938 (7)	58	12(215)	94	Cy Williams	1923 (12)	66
10	Jimmie Foxx	1932 (8)	58	12(215)	94	Babe Ruth	1923 (10)	66
14	Alex Rodriguez	2002 (9)	57	14(181)	92	Rogers Hornsby	1922 (8)	62
14	Luis Gonzalez	2001 (12)	57	15(10)	-50	Hank Greenberg	1938 (7)	60
16	Hack Wilson	1930 (8)	56	16(301)	94	Ken Williams	1922 (7)	58
16	Ken Griffey	1998 (10)	56	16(592)	97	Rudy York	1943 (8)	58
16	Ken Griffey	1997 (9)	56	18(42)	57	Lou Gehrig	1936 (14)	57
19	Babe Ruth	1928 (15)	54	18(42)	57	Lou Gehrig	1934 (12)	57
19	Babe Ruth	1920 (7)	54	20(16)	-25	Hack Wilson	1930 (8)	56
19	Alex Rodriguez	2007 (14)	54	21(135)	84	Hank Greenberg	1946 (12)	55
19	David Ortiz	2006 (10)	54	21(401)	94	Tilly Walker	1922 (12)	55
19	Mickey Mantle	1961 (11)	54	23(94)	75	Babe Ruth	1929 (16)	53
19	Ralph Kiner	1949 (4)	54	23(899)	97	Charlie Keller	1943 (5)	53
25	Jim Thome	2002 (12)	52	25(301)	91	Rogers Hornsby	1925 (11)	52
25	Alex Rodriguez	2001 (8)	52	25(36)	30	Jimmie Foxx	1938 (14)	52
25	Mark McGwire	1996 (11)	52	25(519)	95	Babe Ruth	1922 (9)	52
25	Willie Mays	1965 (14)	52	28(135)	79	Jimmie Foxx	1934 (10)	51
25	Mickey Mantle	1956 (6)	52	28(1023)	97	Hack Wilson	1927 (5)	51
25	George Foster	1977 (9)	52	28(1023)	97	Cy Williams	1927 (16)	51
31	Johnny Mize	1947 (9)	51	28(457)	93	Ted Williams	1942 (4)	51
31	Willie Mays	1955 (4)	51	32(161)	80	Chuck Klein	1929 (2)	50
31	Ralph Kiner	1947 (2)	51	32(31)	-3	Johnny Mize	1947 (9)	50
31	Andrew Jones	2005 (10)	51	32(31)	-3	Ralph Kiner	1947 (2)	50
31	Cecil Fielder	1990 (5)	51	35(94)	62	Joe DiMaggio	1937 (2)	49
36	Greg Vaughn	1998 (10)	50	35(592)	94	Babe Ruth	1933 (20)	49
36	Sammy Sosa	2000 (12)	50	35(42)	16	Babe Ruth	1930 (17)	49
36	Jimmie Foxx	1938 (14)	50	35(1134)	96	Bill Nicholson	1943 (6)	49
36	Prince Fielder	2007 (3)	50	35(181)	80	Hal Trosky	1936 (4)	49
36	Albert Belle	1995 (7)	50	35(686)	94	Bill Nicholson	1944 (7)	49
36	Brady Anderson	1996 (9)	50	41(181)	77	Mel Ott	1929 (4)	48
42	Larry Walker	1997 (9)	49	41(19)	-115	Ralph Kiner	1949 (4)	48
42	Jim Thome	2001 (11)	49	41(215)	80	Jimmie Foxx	1936 (12)	48
42	Sammy Sosa	2002 (14)	49	41(353)	88	Ted Williams	1946 (5)	48
42	Babe Ruth	1930 (17)	49	45(215)	79	Babe Ruth	1932 (19)	47
42	Frank Robinson	1966 (11)	49	45(1422)	96	Joe Hauser	1924 (3)	47
42	Albert Pujols	2006 (6)	49	45(1422)	96	Jack Fournier	1924 (12)	47
42	Mark McGwire	1987 (2)	49	45(777)	94	Earl Averill	1931 (3)	47
42	Willie Mays	1962 (11)	49	45(1134)	96	Ken Williams	1923 (8)	47
42	Ted Kluszewski	1954 (8)	49	45(3401)	98	George Sisler	1920 (6)	47

Table S7. Ranking of season hits (1890–2009).

Rank	Name	Traditional Rank		Detrended Rank				
		Season (Y#)	Season Metric	Rank*(Rank)	% Change	Name	Season (Y#)	Season Metric
1	Ichiro Suzuki	2004 (4)	262	1(1)	0	Ichiro Suzuki	2004 (4)	259
2	George Sisler	1920 (6)	257	2(13)	84	Wade Boggs	1985 (4)	247
3	Bill Terry	1930 (8)	254	3(2)	-50	George Sisler	1920 (6)	245
3	Lefty O'Doul	1929 (6)	254	4(18)	77	Don Mattingly	1986 (5)	244
5	Al Simmons	1925 (2)	253	5(8)	37	Ty Cobb	1911 (7)	243
6	Chuck Klein	1930 (3)	250	5(27)	81	Kirby Puckett	1988 (5)	243
6	Rogers Hornsby	1922 (8)	250	7(32)	78	Matty Alou	1969 (10)	242
8	Ty Cobb	1911 (7)	248	7(10)	30	Ichiro Suzuki	2001 (1)	242
9	George Sisler	1922 (8)	246	9(16)	43	Rod Carew	1977 (11)	240
10	Ichiro Suzuki	2001 (1)	242	10(36)	72	Joe Torre	1971 (12)	239
11	Heinie Manush	1928 (6)	241	11(44)	75	Nap Lajoie	1910 (15)	237
11	Babe Herman	1930 (5)	241	12(36)	66	Pete Rose	1973 (11)	236
13	Darin Erstad	2000 (5)	240	12(56)	78	Ty Cobb	1917 (13)	236
13	Jesse Burkett	1896 (7)	240	14(18)	22	Ichiro Suzuki	2007 (7)	235
13	Wade Boggs	1985 (4)	240	14(13)	-7	Darin Erstad	2000 (5)	235
16	Willie Keeler	1897 (6)	239	16(42)	61	Stan Musial	1946 (5)	233
16	Rod Carew	1977 (11)	239	17(90)	81	Cy Seymour	1905 (10)	232
18	Ichiro Suzuki	2007 (7)	238	18(36)	50	Tommy Davis	1962 (4)	231
18	Don Mattingly	1986 (5)	238	19(119)	84	Ty Cobb	1909 (5)	230
18	Ed Delahanty	1899 (12)	238	19(36)	47	Willie Wilson	1980 (5)	230
21	Paul Waner	1927 (2)	237	19(211)	90	Pete Rose	1968 (6)	230
21	Joe Medwick	1937 (6)	237	19(211)	90	Felipe Alou	1968 (11)	230
21	Harry Heilmann	1921 (7)	237	23(119)	80	Mike Donlin	1905 (7)	229
21	Hugh Duffy	1894 (7)	237	23(68)	66	Kirby Puckett	1986 (3)	229
25	Jack Tobin	1921 (7)	236	25(29)	13	Joe Jackson	1911 (4)	228
26	Rogers Hornsby	1921 (7)	235	25(3)	-733	Lefty O'Doul	1929 (6)	228
27	Lloyd Waner	1929 (3)	234	25(150)	83	Nap Lajoie	1906 (11)	228
27	Kirby Puckett	1988 (5)	234	25(101)	75	Pete Rose	1969 (7)	228
29	Joe Jackson	1911 (4)	233	25(101)	75	Felipe Alou	1966 (9)	228
30	Nap Lajoie	1901 (6)	232	25(90)	72	Ralph Garr	1971 (4)	228
30	Earl Averill	1936 (8)	232	25(36)	30	Stan Musial	1948 (7)	228
32	Freddie Lindstrom	1930 (7)	231	32(85)	62	Stan Musial	1943 (3)	227
32	Freddie Lindstrom	1928 (5)	231	32(5)	-540	Al Simmons	1925 (2)	227
32	Earle Combs	1927 (4)	231	32(6)	-433	Rogers Hornsby	1922 (8)	227
32	Matty Alou	1969 (10)	231	35(30)	-16	Nap Lajoie	1901 (6)	226
36	Willie Wilson	1980 (5)	230	35(56)	37	Ichiro Suzuki	2009 (9)	226
36	Joe Torre	1971 (12)	230	35(177)	80	Ty Cobb	1907 (3)	226
36	Pete Rose	1973 (11)	230	38(68)	44	Hank Aaron	1959 (6)	225
36	Stan Musial	1948 (7)	230	38(63)	39	Tommy Holmes	1945 (4)	225
36	Tommy Davis	1962 (4)	230	38(3)	-1166	Bill Terry	1930 (8)	225
41	Rogers Hornsby	1929 (15)	229	41(101)	59	Rod Carew	1974 (8)	224
42	Stan Musial	1946 (5)	228	41(113)	63	Tony Oliva	1964 (3)	224
42	Kiki Cuyler	1930 (10)	228	41(11)	-272	Heinie Manush	1928 (6)	224
44	Sam Rice	1925 (11)	227	41(21)	-95	Joe Medwick	1937 (6)	224
44	Nap Lajoie	1910 (15)	227	45(18)	-150	Ed Delahanty	1899 (12)	223
44	Lance Johnson	1996 (10)	227	45(137)	67	Kirby Puckett	1989 (6)	223
44	Rogers Hornsby	1924 (10)	227	45(247)	81	Nap Lajoie	1904 (9)	223
44	Billy Herman	1935 (5)	227	45(119)	62	Paul Molitor	1991 (14)	223
44	Charlie Gehringer	1936 (13)	227	45(9)	-400	George Sisler	1922 (8)	223
44	Jim Bottomley	1925 (4)	227	45(229)	80	Roberto Clemente	1967 (13)	223

Table S8. Ranking of season runs batted in (RBI) (1890–2009).

Rank	Name	Traditional Rank		Detrended Rank				
		Season (Y#)	Season Metric	Rank*(Rank)	% Change	Name	Season (Y#)	Season Metric
1	Hack Wilson	1930 (8)	191	1(2)	50	Lou Gehrig	1931 (9)	168
2	Lou Gehrig	1931 (9)	184	2(3)	33	Hank Greenberg	1937 (6)	164
3	Hank Greenberg	1937 (6)	183	3(4)	25	Lou Gehrig	1927 (5)	162
4	Lou Gehrig	1927 (5)	175	4(7)	42	Babe Ruth	1921 (8)	161
4	Jimmie Foxx	1938 (14)	175	5(485)	98	Ty Cobb	1907 (3)	160
6	Lou Gehrig	1930 (8)	174	6(17)	64	Jimmie Foxx	1933 (9)	159
7	Babe Ruth	1921 (8)	171	7(8)	12	Hank Greenberg	1935 (4)	155
8	Chuck Klein	1930 (3)	170	7(4)	-75	Jimmie Foxx	1938 (14)	155
8	Hank Greenberg	1935 (4)	170	9(10)	10	Jimmie Foxx	1932 (8)	153
10	Jimmie Foxx	1932 (8)	169	10(16)	37	Babe Ruth	1927 (14)	152
11	Joe DiMaggio	1937 (2)	167	10(1)	-900	Hack Wilson	1930 (8)	152
12	Sam Thompson	1895 (11)	165	10(930)	98	Honus Wagner	1908 (12)	152
12	Al Simmons	1930 (7)	165	13(989)	98	Ty Cobb	1908 (4)	150
12	Manny Ramirez	1999 (7)	165	13(350)	96	Sherry Magee	1910 (7)	150
12	Lou Gehrig	1934 (12)	165	13(11)	-18	Joe DiMaggio	1937 (2)	150
16	Babe Ruth	1927 (14)	164	16(17)	5	Babe Ruth	1931 (18)	149
17	Babe Ruth	1931 (18)	163	17(126)	86	Joe Torre	1971 (12)	148
17	Jimmie Foxx	1933 (9)	163	17(12)	-41	Lou Gehrig	1934 (12)	148
19	Hal Trosky	1936 (4)	162	17(414)	95	Cy Seymour	1905 (10)	148
20	Sammy Sosa	2001 (13)	160	17(1131)	98	Mike Donlin	1908 (9)	148
21	Hack Wilson	1929 (7)	159	17(21)	19	Ted Williams	1949 (8)	148
21	Ted Williams	1949 (8)	159	17(21)	19	Vern Stephens	1949 (9)	148
21	Vern Stephens	1949 (9)	159	23(126)	81	Babe Ruth	1920 (7)	147
21	Lou Gehrig	1937 (15)	159	24(126)	80	Ted Williams	1942 (4)	146
25	Sammy Sosa	1998 (10)	158	24(452)	94	Sam Crawford	1910 (12)	146
26	Al Simmons	1929 (6)	157	24(106)	77	Harmon Killebrew	1969 (16)	146
26	Juan Gonzalez	1998 (10)	157	24(46)	47	George Foster	1977 (9)	146
28	Alex Rodriguez	2007 (14)	156	24(112)	78	Jim Rice	1978 (5)	146
28	Jimmie Foxx	1930 (6)	156	24(232)	89	Gavvy Cravath	1913 (4)	146
30	Ken Williams	1922 (7)	155	24(34)	29	Tommy Davis	1962 (4)	146
30	Joe DiMaggio	1948 (10)	155	31(30)	-3	Joe DiMaggio	1948 (10)	145
32	Babe Ruth	1929 (16)	154	31(49)	36	Johnny Bench	1970 (4)	145
32	Joe Medwick	1937 (6)	154	33(30)	-10	Ken Williams	1922 (7)	144
34	Babe Ruth	1930 (17)	153	33(63)	47	Don Mattingly	1985 (4)	144
34	Tommy Davis	1962 (4)	153	35(301)	88	Johnny Bench	1972 (6)	143
36	Rogers Hornsby	1922 (8)	152	35(1059)	96	Ty Cobb	1909 (5)	143
36	Lou Gehrig	1936 (14)	152	35(20)	-75	Sammy Sosa	2001 (13)	143
36	Albert Belle	1998 (10)	152	35(21)	-66	Lou Gehrig	1937 (15)	143
39	Al Simmons	1932 (9)	151	39(232)	83	Bill Nicholson	1943 (6)	142
39	Mel Ott	1929 (4)	151	39(25)	-56	Sammy Sosa	1998 (10)	142
39	Lou Gehrig	1932 (10)	151	39(36)	-8	Rogers Hornsby	1922 (8)	142
42	Miguel Tejada	2004 (8)	150	42(26)	-61	Juan Gonzalez	1998 (10)	141
42	Babe Ruth	1926 (13)	150	42(42)	0	Hank Greenberg	1940 (9)	141
42	Hank Greenberg	1940 (9)	150	42(42)	0	Babe Ruth	1926 (13)	141
42	Andres Galarraga	1996 (12)	150	45(19)	-136	Hal Trosky	1936 (4)	140
46	Ryan Howard	2006 (3)	149	45(12)	-275	Manny Ramirez	1999 (7)	140
46	Rogers Hornsby	1929 (15)	149	45(28)	-60	Alex Rodriguez	2007 (14)	140
46	George Foster	1977 (9)	149	45(194)	76	Enos Slaughter	1946 (6)	140
49	Rafael Palmeiro	1999 (14)	148	45(194)	76	Hank Aaron	1963 (10)	140
49	David Ortiz	2005 (9)	148	50(382)	86	Billy Williams	1972 (14)	139

Table S9. Ranking of season strikeouts (1883–2009).

Rank	Name	Traditional Rank		Rank* (Rank)	% Change	Detrended Rank		
		Season (Y#)	Season Metric			Name	Season (Y#)	Season Metric
1	Matt Kilroy	1886 (1)	513	1(17)	94	Toad Ramsey	1887 (3)	557
2	Toad Ramsey	1886 (2)	499	2(1)	-100	Matt Kilroy	1886 (1)	523
3	Hugh Daily	1884 (3)	483	3(2)	-50	Toad Ramsey	1886 (2)	509
4	Dupee Shaw	1884 (2)	451	4(16)	75	Tim Keefe	1883 (4)	478
5	Charley Radbourn	1884 (4)	441	5(13)	61	Mark Baldwin	1889 (3)	463
6	Charlie Buffinton	1884 (3)	417	6(204)	97	Cy Seymour	1898 (3)	457
7	Guy Hecker	1884 (3)	385	6(22)	72	Jim Whitney	1883 (3)	457
8	Nolan Ryan	1973 (7)	383	8(25)	68	Amos Rusie	1890 (2)	445
9	Sandy Koufax	1965 (11)	382	9(129)	93	Dazzy Vance	1924 (5)	443
10	Bill Sweeney	1884 (2)	374	10(3)	-233	Hugh Daily	1884 (3)	442
11	Randy Johnson	2001 (14)	372	11(403)	97	Amos Rusie	1893 (5)	439
12	Pud Galvin	1884 (7)	369	12(27)	55	Amos Rusie	1891 (3)	434
13	Mark Baldwin	1889 (3)	368	13(43)	69	Bill Hutchison	1892 (5)	431
14	Nolan Ryan	1974 (8)	367	14(18)	22	Rube Waddell	1904 (7)	419
15	Randy Johnson	1999 (12)	364	15(42)	64	Charley Radbourn	1883 (3)	417
16	Tim Keefe	1883 (4)	361	16(4)	-300	Dupee Shaw	1884 (2)	412
17	Toad Ramsey	1887 (3)	355	17(578)	97	Amos Rusie	1894 (6)	410
18	Rube Waddell	1904 (7)	349	18(19)	5	Bob Feller	1946 (8)	407
19	Bob Feller	1946 (8)	348	19(5)	-280	Charley Radbourn	1884 (4)	403
20	Randy Johnson	2000 (13)	347	20(29)	31	Tim Keefe	1888 (9)	399
21	Hardie Henderson	1884 (2)	346	21(77)	72	Amos Rusie	1892 (4)	395
22	Jim Whitney	1883 (3)	345	22(496)	95	Amos Rusie	1895 (7)	392
22	Mickey Welch	1884 (5)	345	23(6)	-283	Charlie Buffinton	1884 (3)	381
24	Jim McCormick	1884 (7)	343	24(70)	65	Sadie McMahan	1890 (2)	379
25	Nolan Ryan	1977 (11)	341	24(59)	59	Rube Waddell	1903 (6)	379
25	Amos Rusie	1890 (2)	341	26(74)	64	Jack Stivetts	1890 (2)	377
27	Charlie Sweeney	1884 (2)	337	26(74)	64	Bill Hutchison	1890 (3)	377
27	Amos Rusie	1891 (3)	337	28(216)	87	John Clarkson	1887 (5)	372
29	Tim Keefe	1888 (9)	335	29(90)	67	Pud Galvin	1883 (6)	370
30	Tim Keefe	1884 (5)	334	30(299)	89	Dazzy Vance	1925 (6)	368
30	Randy Johnson	2002 (15)	334	31(49)	36	John Clarkson	1885 (3)	366
32	Nolan Ryan	1972 (6)	329	32(44)	27	Walter Johnson	1910 (4)	364
32	Randy Johnson	1998 (11)	329	33(83)	60	John Clarkson	1889 (7)	357
34	Nolan Ryan	1976 (10)	327	34(64)	46	Ed Morris	1885 (2)	354
35	Ed Morris	1886 (3)	326	35(7)	-400	Guy Hecker	1884 (3)	352
36	Tony Mullane	1884 (4)	325	36(57)	36	Walter Johnson	1912 (6)	343
36	Sam McDowell	1965 (5)	325	37(10)	-270	Bill Sweeney	1884 (2)	342
38	Lady Baldwin	1886 (3)	323	38(887)	95	Doc McJames	1898 (4)	340
39	Curt Schilling	1997 (10)	319	38(79)	51	Bobby Mathews	1885 (13)	340
40	Sandy Koufax	1966 (12)	317	38(321)	88	Matt Kilroy	1887 (2)	340
41	Curt Schilling	2002 (15)	316	41(204)	79	Noodles Hahn	1901 (3)	338
42	Charley Radbourn	1883 (3)	315	41(271)	84	Vic Willis	1902 (5)	338
43	Bill Hutchison	1892 (5)	314	43(12)	-258	Pud Galvin	1884 (7)	337
44	J.R. Richard	1979 (9)	313	44(132)	66	Bill Hutchison	1891 (4)	336
44	Pedro Martinez	1999 (8)	313	44(109)	59	Ed Walsh	1908 (5)	336
44	Walter Johnson	1910 (4)	313	46(78)	41	Rube Waddell	1905 (8)	335
44	John Clarkson	1886 (4)	313	46(147)	68	Toad Ramsey	1890 (6)	335
48	Steve Carlton	1972 (8)	310	46(118)	61	Christy Mathewson	1903 (4)	335
49	Larry McKeon	1884 (1)	308	46(14)	-228	Nolan Ryan	1974 (8)	335
49	Mickey Lolich	1971 (9)	308	50(137)	63	Bob Feller	1941 (6)	334

Table S10. Ranking of season strikeouts for the Modern Era (1920–2009).

Rank	Name	Traditional Rank		Rank*(Rank)	% Change	Detrended Rank		
		Season (Y#)	Season Metric			Name	Season (Y#)	Season Metric
1	Nolan Ryan	1973 (7)	383	1(72)	98	Dazzy Vance	1924 (5)	443
2	Sandy Koufax	1965 (11)	382	2(6)	66	Bob Feller	1946 (8)	407
3	Randy Johnson	2001 (14)	372	3(197)	98	Dazzy Vance	1925 (6)	368
4	Nolan Ryan	1974 (8)	367	4(4)	0	Nolan Ryan	1974 (8)	335
5	Randy Johnson	1999 (12)	364	5(79)	93	Bob Feller	1941 (6)	334
6	Bob Feller	1946 (8)	348	6(1)	-500	Nolan Ryan	1973 (7)	333
7	Randy Johnson	2000 (13)	347	7(75)	90	Bob Feller	1940 (5)	325
8	Nolan Ryan	1977 (11)	341	8(133)	93	Van Mungo	1936 (6)	323
9	Randy Johnson	2002 (15)	334	9(47)	80	Hal Newhouser	1946 (8)	322
10	Nolan Ryan	1972 (6)	329	10(102)	90	Bob Feller	1939 (4)	321
10	Randy Johnson	1998 (11)	329	11(435)	97	Lefty Grove	1926 (2)	317
12	Nolan Ryan	1976 (10)	327	12(124)	90	Bob Feller	1938 (3)	316
13	Sam McDowell	1965 (5)	325	12(400)	97	Dazzy Vance	1923 (4)	316
14	Curt Schilling	1997 (10)	319	12(367)	96	Dazzy Vance	1928 (9)	316
15	Sandy Koufax	1966 (12)	317	15(12)	-25	Nolan Ryan	1976 (10)	310
16	Curt Schilling	2002 (15)	316	16(8)	-100	Nolan Ryan	1977 (11)	301
17	J.R. Richard	1979 (9)	313	17(578)	97	Dazzy Vance	1927 (8)	299
17	Pedro Martinez	1999 (8)	313	18(175)	89	Bobo Newsom	1938 (8)	298
19	Steve Carlton	1972 (8)	310	18(382)	95	Dizzy Dean	1933 (3)	298
20	Mickey Lolich	1971 (9)	308	18(17)	-5	J.R. Richard	1979 (9)	298
20	Randy Johnson	1993 (6)	308	21(2)	-950	Sandy Koufax	1965 (11)	294
22	Mike Scott	1986 (8)	306	21(251)	91	Hal Newhouser	1945 (7)	294
22	Sandy Koufax	1963 (9)	306	23(269)	91	Lefty Grove	1930 (6)	293
24	Pedro Martinez	1997 (6)	305	24(26)	7	J.R. Richard	1978 (8)	289
25	Sam McDowell	1970 (10)	304	24(600)	96	Lefty Grove	1928 (4)	289
26	J.R. Richard	1978 (8)	303	26(767)	96	Lefty Grove	1927 (3)	282
27	Nolan Ryan	1989 (23)	301	27(484)	94	Dizzy Dean	1932 (2)	274
27	Vida Blue	1971 (3)	301	28(499)	94	Red Ruffing	1932 (9)	273
29	Curt Schilling	1998 (11)	300	29(37)	21	Steve Carlton	1980 (16)	272
30	Randy Johnson	1995 (8)	294	30(449)	93	George Earnshaw	1930 (3)	271
31	Curt Schilling	2001 (14)	293	31(10)	-210	Nolan Ryan	1972 (6)	270
32	Roger Clemens	1997 (14)	292	31(528)	94	Lefty Grove	1932 (8)	270
33	Randy Johnson	1997 (10)	291	33(791)	95	Pete Alexander	1920 (10)	269
33	Roger Clemens	1988 (5)	291	34(874)	96	Lefty Grove	1929 (5)	268
35	Randy Johnson	2004 (17)	290	35(1174)	97	Walter Johnson	1924 (18)	267
36	Tom Seaver	1971 (5)	289	36(423)	91	Dizzy Dean	1936 (6)	265
37	Steve Carlton	1982 (18)	286	37(499)	92	Dizzy Dean	1935 (5)	264
37	Steve Carlton	1980 (16)	286	38(964)	96	Pat Malone	1929 (2)	261
39	Pedro Martinez	2000 (9)	284	38(37)	-2	Steve Carlton	1982 (18)	261
40	Tom Seaver	1970 (4)	283	38(20)	-90	Mickey Lolich	1971 (9)	261
40	Sam McDowell	1968 (8)	283	41(346)	88	Johnny Vander Meer	1941 (5)	260
42	Denny McLain	1968 (6)	280	41(1153)	96	George Uhle	1926 (8)	260
43	Sam McDowell	1969 (9)	279	43(537)	91	Hal Newhouser	1944 (6)	259
44	Bob Veale	1965 (4)	276	44(5)	-780	Randy Johnson	1999 (12)	258
44	John Smoltz	1996 (9)	276	45(70)	35	Herb Score	1956 (2)	257
44	Dwight Gooden	1984 (1)	276	46(423)	89	Dizzy Dean	1934 (4)	255
47	Hal Newhouser	1946 (8)	275	46(19)	-142	Steve Carlton	1972 (8)	255
47	Steve Carlton	1983 (19)	275	46(27)	-70	Vida Blue	1971 (3)	255
49	Mario Soto	1982 (6)	274	49(105)	53	Herb Score	1955 (1)	253
49	Fergie Jenkins	1970 (6)	274	49(729)	93	Lefty Gomez	1932 (3)	253