Which 300 Game Winner Was "The Best?"

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Abstract - In this paper we will look at pitchers in Major League Baseball who have won 300 or more career games and seek to determine which pitcher was most effective at improving his team's chances of winning.

Baseball and numbers go together. Statistics are a huge part of baseball. No sport is so driven and characterized by numbers. Various numbers hold places of high regard in ways unmatched by any other sport. Twenty wins in a season, a .300 batting average, and 500 career homeruns are all numbers that immediately signify something special to fans of America's pastime. Football has nothing of that sort. A season of 1000 yards rushing used to mean something but with the 16 game schedule it is now a measure of adequacy, not greatness. Basketball has 20,000 career points but otherwise has no numbers that immediately mark a player as one of the all-time greats.

For pitchers, many numbers are special. An earned run average under 2.00, 20 wins in a season, and 200 strikeouts in a season are all marks of greatness. In this paper we will look at another number. We will look at pitchers with 300 career wins. That is a mark of greatness over a long career. Table 1 lists all of the pitchers who have won at least 300 games.

Rank	Name	Career Wins
1	Cy Young	511
2	Walter Johnson	417
3	Grover Cleveland Alexander	373
3	Christy Mathewson	373
5	Warren Spahn	363
6	Kid Nichols	361
7	Pud Galvin	360
8	Tim Keefe	342
9	Steve Carlton	329
10	John Clarkson	328
11	Eddie Plank	326
12	Nolan Ryan	324
12	Don Sutton	324
14	Phil Niekro	318
15	Gaylord Perry	314
16	Tom Seaver	311
17	Hoss Radbourn	309

18	Mickey Welch	307
19	Lefty Grove	300
19	Early Wynn	300

Table 1

Another number, however, tells another aspect of the greatness of pitchers. Some argue that looking at wins alone speaks as much of longevity as it does greatness. They would argue that a pitcher's winning percentage is a better gauge of the greatness of a pitcher. Table 2 lists those same pitchers, this time ranked by winning percentage rather than by wins.

Rank	Name	Career Wins	Career Pct
1	Lefty Grove	300	.680
2	Christy Mathewson	373	.665
3	John Clarkson	328	.648
4	Grover Cleveland Alexander	373	.642
5	Kid Nichols	361	.634
6	Eddie Plank	326	.627
7	Cy Young	511	.618
8	Hoss Radbourn	309	.613
9	Tim Keefe	342	.603
10	Tom Seaver	311	.603
11	Walter Johnson	417	.599
12	Warren Spahn	363	.597
13	Mickey Welch	307	.594
14	Steve Carlton	329	.574
15	Don Sutton	324	.559
16	Early Wynn	300	.551
17	Gaylord Perry	314	.542
18	Pud Galvin	360	.539
19	Phil Niekro	318	.537
20	Nolan Ryan	324	.526

Table 2

This view of greatness takes Lefty Grove from the bottom of the list to the top of the list. It drops Pud Galvin 11 places and Walter Johnson nine.

As anyone who is much of a baseball fan knows, there is always room for argument. Some, this author included, would argue that even this number should be refined to account for another factor. Looking at earned run averages would be a possibility but baseball has changed much from era to era so that number has somewhat changed in meaning. One thing, though, does not change. Does a pitcher improve his team's chances of winning? Consider Warren Spahn and Walter Johnson. These two pitchers have roughly similar winning percentages. However,

during the time Walter Johnson pitched, his teams had a combined winning percentage of .492 while Warren Spahn's teams had a combined winning percentage of .532. Thus, Johnson's personal winning percentage was .107 better than that of his teams, while Spahn's was only .065 better than that of his teams. Tom Seaver pitched for a number of very poor New York Mets teams. Should such pitchers be penalized for their team's weaknesses? What we will do in this paper is consider which of these pitchers did the most to improve his team's chances of winning. Table 3 ranks these pitchers by their individual vs. team winning percentage differential.

Rank	Name	Career Wins	Career Pct	Pct Differential
1	Grover Cleveland Alexander	373	.642	.113
2	Cy Young	511	.618	.109
3	Walter Johnson	417	.599	.107
4	Tom Seaver	311	.603	.104
5	Lefty Grove	300	.680	.102
6	Christy Mathewson	373	.665	.101
7	Warren Spahn	363	.597	.065
8	Kid Nichols	361	.634	.064
9	Pud Galvin	360	.539	.062
10	Hoss Radbourn	309	.613	.0541
11	Eddie Plank	326	.627	.0540
12	Steve Carlton	329	.574	.052
13	John Clarkson	328	.648	.051
14	Phil Niekro	318	.537	.045
15	Mickey Welch	307	.594	.039
16	Gaylord Perry	314	.542	.026
17	Tim Keefe	342	.603	.024
18	Nolan Ryan	324	.526	.023
19	Early Wynn	300	.551	.022
20	Don Sutton	324	.559	.019

Table 3

The largest changes from judging by winning percentage to the differential are John Clarkson (down 10), Pud Galvin (up nine), Walter Johnson (up eight), and Tim Keefe (down seven).

Using just a straight pair of numbers, as in the Johnson - Spahn comparison above, does not give the fairest possible comparison. This gauge still has its limitations. For example, in 1965, Warren Spahn pitched for the New York Mets, with a team winning percentage of .309, and the San Francisco Giants, with a team winning percentage of .586. Some adjustment needs to be made to account for times when a pitcher toiled for multiple teams.

Considerations

A number of factors will be considered in compiling our mechanism for a "fair" comparison.

First, performances (both individual and team) vary from season to season. Therefore we will look at each individual season and the individual/team differential.

Secondly, if a pitcher appears in only one game during a season for a team with a .600 winning percentage, and loses that game, his differential would be -.600. If another pitcher, pitching for the same team, wins 10 games while losing 20, his .333 winning percentage would result in a differential of -.267. However, the second pitcher's performance is arguably worse than the first pitcher's due to the number of games pitched. We will therefore consider the percentage of a team's games in which a pitcher appears when assigning a weight to a particular differential for a given pitcher.

Simply weighting a differential by this percentage, however, gives a distinct advantage to pitchers from the earlier years of baseball. In the early years, a team might have just two pitchers, one of whom would pitch 75% of the team's games. In the modern era, most starting pitchers will pitch only every fourth or fifth game. To account for this difference, the weight we will use will be the ratio of the number of starts by the pitcher and the average number of starts by the five pitchers in the league who started the most games.

Lastly, to really get a feel for how much the pitcher improved his team, we should compare him to the winning percentage for only those games in which he did not have a decision. Using the complete team percentage includes the pitcher under question and thus is affected by his performance. Eliminating his decisions from the total gives a better representation of what the team could do without him.

Methodology

For each season in which one of these pitchers performed, I found the mean of the number of games started by the five pitchers who had the most starts in the league. I only considered the league in which the pitcher played since at various times different leagues played different numbers of games. I then considered the pitcher's number of starts as a percentage of that number. I will call that number GS%. Based on the GS%, I assigned a weight to be used when considering the pitcher's winning percentage differential. Table 4 shows the weights assigned to various percentages.

GS% is above	but less than	weight
125%	--------	1.2
80%	125%	1
0%	80%	GS%

Table 4

The reasoning here is that a winning percentage, either good or bad, obtained from a small number of games should not count as much as one achieved when the pitcher was actually a "regular" contributor. I put "regular" in quotes because of the fact that different eras in baseball so the typical starting pitcher working widely disparate numbers of games. These numbers are, admittedly, arbitrary. One nice thing about this approach is the way it takes care of a case in

which a pitcher played for multiple teams in a season. I kept the pitcher's totals for each team separate, with each portion of the season getting its own GS% and thus its own weight.

I then took the team's record and removed the pitcher's totals and calculated the adjusted team winning percentage. Subtracting that percentage from the pitcher's percentage and multiplying that number by the weight gave the pitcher's season weighted differential.

Lastly, I took the total of all of the weighted differentials and divided it by the sum of the seasonal weights and obtained the "average weighted differential," or AWD.

Results

Table 5 gives the pitcher's ranked by their AWD.

Rank	Name	Career Wins	Career Pct	Pct Differential	AWD
1	Grover Cleveland Alexander	373	.642	.113	.1346
2	Walter Johnson	417	.599	.107	.1329
3	Tom Seaver	311	.603	.104	.1211
4	Cy Young	511	.618	.109	.1198
5	Lefty Grove	300	.680	.102	.1147
6	Christy Mathewson	373	.665	.101	.1094
7	Pud Galvin	360	.539	.062	.0903
8	Hoss Radbourn	309	.613	.054	.0848
9	Warren Spahn	363	.597	.065	.0688
10	Phil Niekro	318	.537	.045	.0671
11	Mickey Welch	307	.594	.039	.0607
12	Steve Carlton	329	.574	.052	.0576
13	Eddie Plank	326	.627	.054	.0561
14	Kid Nichols	361	.634	.064	.0529
15	Gaylord Perry	314	.542	.026	.0352
16	John Clarkson	328	.648	.051	.03068
17	Nolan Ryan	324	.526	.023	.03066
18	Tim Keefe	342	.603	.024	.0243
19	Don Sutton	324	.559	.019	.0203
20	Early Wynn	300	.551	.022	.0105

Table 5

By this measure, the most successful 300 game winners were Grover Cleveland Alexander, Walter Johnson, Tom Seaver and Cy Young. Most changes here are fairly small, though Kid Nichols dropped six places. Phil Niekro and Mickey Welch moved up four places. Of course, any manager would have been happy to have any of these pitchers on his team.

Two pitchers benefited the most by using the AWD. Those were Hoss Radbourn and Pud

Galvin. In 1883 and 1884, Galvin posted winning percentages of .613 and .676 respectively, while his team had adjusted winning percentages of .273 and .419 respectively. In 1883, Radbourn had a winning percentage of .658 while, without him, the team's percentage was .400. Clearly they improved their teams' chances of winning.

Conclusion

I realize, of course, that rational people could disagree with my methodology and conclusions. This does not account for a number of other factors that would affect a pitcher's success. For example, it has been claimed that Lefty Grove was often kept from pitching against the powerful Yankee teams of his day. Perhaps his totals would not be so impressive. Some, like Walter Johnson who one year had a batting average of .433, benefited from the fact that they were also fairly decent hitters, contributing significantly to their chances of success with their batting. Of course, arguments over the numbers and other factors are what makes baseball such an interesting game.

References

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Biography

Fred Worth received his B.S. in Mathematics from Evangel College in Springfield, Missouri in 1982. He received his M.S. in Applied Mathematics in 1987 and his Ph.D. in Mathematics in 1991 from the University of Missouri at Rolla. He has presented papers at meetings of the American Mathematical Society and the Mathematical Association of America. He has also given a number of workshops at home school conventions. He is a member of SABR (The Society for American Baseball Research), hence the inspiration for this paper. He has been teaching at Henderson State University since August, 1991.