Coming from Behind: Patterns of Scoring and Relation to Winning

By David W. Smith

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Last year in Denver, I presented my analysis of game scores in relation to overall team success. The inspiration for that study was the common assertion that the ability to win close games is an indication of "clutch" performance and that better teams will stand out in these games over the course of a season. In fact, I found that success in close games is not an especially good predictor of the best teams and that the ability to win games by a large margin is much more closely related to overall winning percentage.

As noted, last year's study was based entirely on the final score of each game. This leaves open some large questions relating to the pattern of scoring within a game. Some questions that were suggested then were:

- How important is it to get an early lead?
- Do good teams come from behind more often?
- Do wins in the last at bat indicate a strong team?

I have now examined these more subtle features by using line score data. The information came from several sources: Retrosheet and STATS, Inc. provided the greatest portion, while Mike Grahek, John Agius, Ed Hartig, and Luke Kraemer generously pitched in as well. I am very grateful for this help. Much of this information is already on the Retrosheet web site, but a great deal more will be available in the next few months.

Table 1. Data analyzed in present study.

Seasons	Team-Seasons	Games	Innings	Runs	Runs/Game	Runs/Inning
73*	1566	122906	2204661	1074251	8.74	0.487

*1901, 1904, 1909, 1910, 1912, 1913, 1918
1936, 1938-1942, 1944-2003

Table 2 presents a summary of the basic run-scoring data by inning for all games from these 73 seasons. There are several interesting features. First of all, note that the highest scoring inning for both home and visitor is the first inning. There is a substantial drop off in the second inning, probably because the bottom of the order is involved. The home team scores more in each inning from 1 through 8, but then the trend reverses and for the 9th inning plus all extra innings, the visitors outscore the home team each time.

Table 2. Runs per inning for Visiting and Home teams

Inning	Games	Vis R/Inn	Hom R/Inn	Inning	Games	Vis R/Inn	Hom R/Inn
1	122906	0.514	0.607	10	11513	0.462	0.336
2	122906	0.409	0.453	11	6453	0.461	0.335
3	122906	0.464	0.518	12	3610	0.432	0.337
4	122906	0.478	0.516	13	2022	0.465	0.326
5	122906	0.467	0.514	14	1141	0.450	0.343
6	122723	0.488	0.526	15	620	0.476	0.308
7	122428	0.473	0.513	16	352	0.438	0.321
8	122044	0.470	0.502	17	189	0.444	0.323
9	121697	0.450	0.415	18	101	0.317	0.287
				19-26	135	0.511	0.311

How do these facts fit into the winning of games, which is, after all, our ultimate question? It is conventional wisdom that the home team has an advantage by batting last, but let's see just how big that advantage is (Table 3).

Table 3. Performance of visiting and home teams in all games, 9 inning games and extra inning games.

	Games	Visitor Win	Home Win	Visitor W pct	Home Wpct
All	**122493**	**56425**	**66068**	**0.461**	**0.539**
9 Inning	**111167**	**51006**	**60161**	**0.459**	**0.541**
Extra Inn	**11326**	**5419**	**5907**	**0.478**	**0.522**

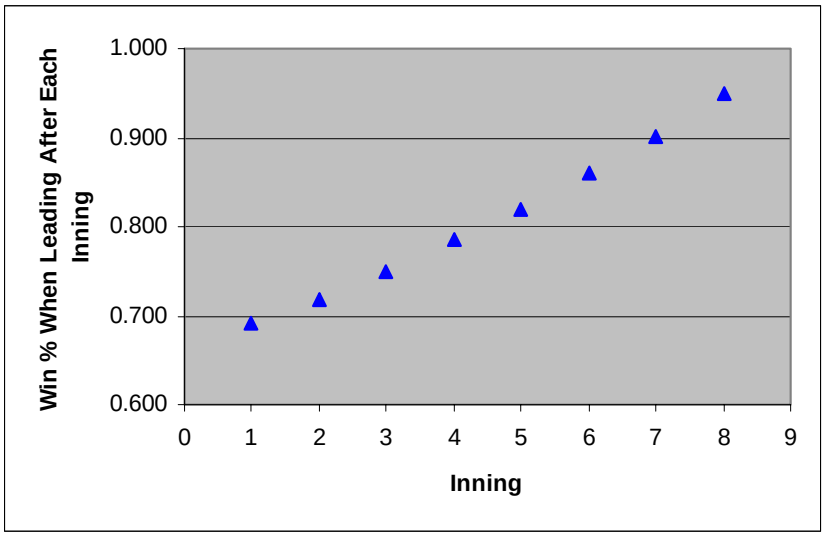
As expected, the home team does do better, but perhaps surprisingly that advantage is less in extra inning games than in regulation contests. In fact, we may ask why the home team wins more than half the time, given the distinct scoring advantage the visiting team has in the 9th inning and later. The answer, of course, is that the rules are a bit different in extra innings, with the game ending if and when the home team takes the lead, whereas the visitors keep batting, no matter how many runs they score. This argument applies to the 9th inning differences as well. This suggestion is borne out by the data in Table 4, which show the winning margin in extra inning games for visiting and home teams. The only margin in which the home team predominates is the one run victory and four is their maximum possible margin, while the visitors win many extra inning games by more than one run, including several by more than four.

Table 4. Winning margin in extra inning games for visiting and home teams.

Margin	Visitor	Home
1	2962	5434
2	1359	283
3	617	130
4	252	60
5	133	0
6	57	0
7	25	0
8	10	0
9	2	0
10	1	0
11	0	0
12	1	0

Let's turn now to the value of an early lead. Figure 5 presents the winning percentage of all teams across all seasons when leading after one, two, three, etc innings.

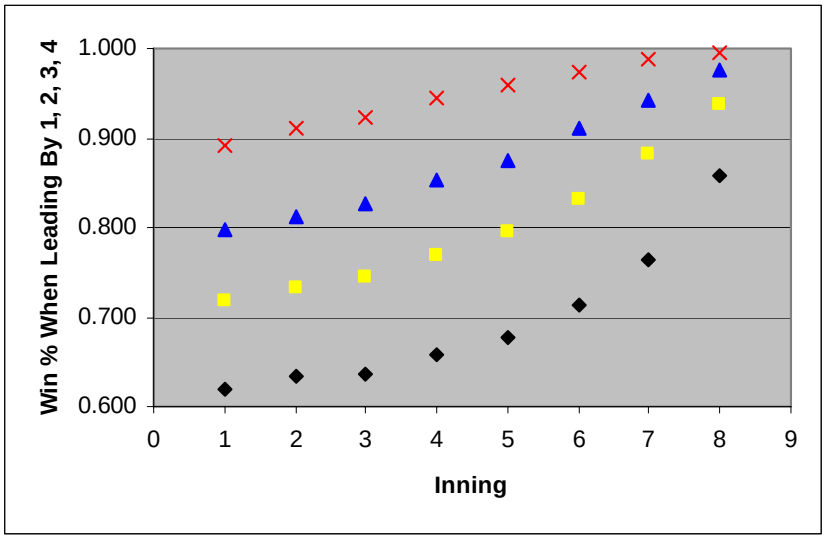
Figure 1 Winning percentage for teams leading after the indicated number of inning.



The pattern is striking. Teams which lead after one inning win nearly 70% of the time and the winning percentage gets consistently better with each passing inning. A lead after 8 innings will hold up 95% of the time. This is a point worth keeping in mind the next time you hear an announcer praise a team for the way its great bullpen gets the job done.

Of course, the size of the lead matters as well, as shown in Figure 2.

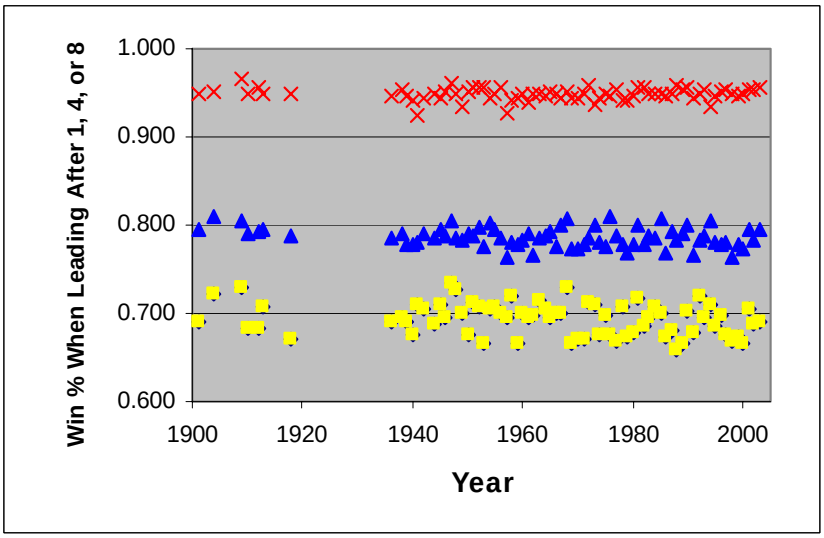
Figure 2. Winning percentage for teams leading by indicated margin after each inning.



A lead of four runs at the end of 8 has been converted to a win 99.5% of the time. The raw numbers are 44324 wins and only 213 losses in the 73 seasons examined.

Of course, a modern reality is bullpen specialization with every team feeling obligated to find a closer to handle these situations. I, therefore, analyzed this question across the last century to look for any obvious patterns. As Figure 3 shows, there are no discernible differences from 1901 through 2003 (data shown for leads of all sizes after one, four, and eight innings). What this says about the necessity of a closer is interesting, but not our main topic here.

Figure 3. Winning percentage for teams leading after 1, 4, or 8 innings (all margins combined) from 1901 – 2003.



The final approach to this question of success when leading after 8 innings is to examine individual teams. Since we hear so much about this on broadcasts, it seems a logical extension. In the 73 years studied, there were 1566 team-seasons. Of these, there were 40 teams which never lost a lead after eight innings. The number of wins ranged from 97 for the 1954 Indians to 34 for the 1981 Mets. Here are all the times with unblemished marks in at least 80 games.

Table 5. Teams with prefect records when leading after 8 innings (minimum of 80).

1954	Indians	97
1993	Giants	91
2002	A's	91
1912	Giants	87
1984	Tigers	87
1985	Cardinals	86
1998	Padres	85
1948	Yankees	83
1972	Pirates	83
1950	Red Sox	82
1999	Astros	82
1952	Dodgers	80
1995	Indians	80

By the way, the 1998 Yankees had the largest number of wins when leading after eight, but they lost once, for a mark 102-1 in these situations.

The flip side of this is to ask what teams have the worst marks when leading after eight innings. This will give us some perspective on the good performances. The answer is in Table 6.

Table 6. Teams with worst records when leading after 8 innings

1978	Mariners	41	10	0.804
1939	Browns	36	8	0.818
1952	Pirates	28	6	0.824
1962	Mets	28	6	0.824
2002	Devil Rays	43	9	0.827
1978	Mets	53	11	0.828
1942	A's	44	9	0.830
1963	Mets	42	8	0.840
1949	Reds	43	8	0.843
1979	Padres	49	9	0.845
1999	Cubs	50	9	0.847
1957	Senators	39	7	0.848
1939	Senators	51	9	0.850

There are some teams there that are easily recognizable as pretty poor, but note that the worst performance I could find was for a team that still won over 80% of its games in

these situations. There were only four teams that lost 10 or more times when leading after eight innings, with the 1978 Mets being the only team with 11 losses.

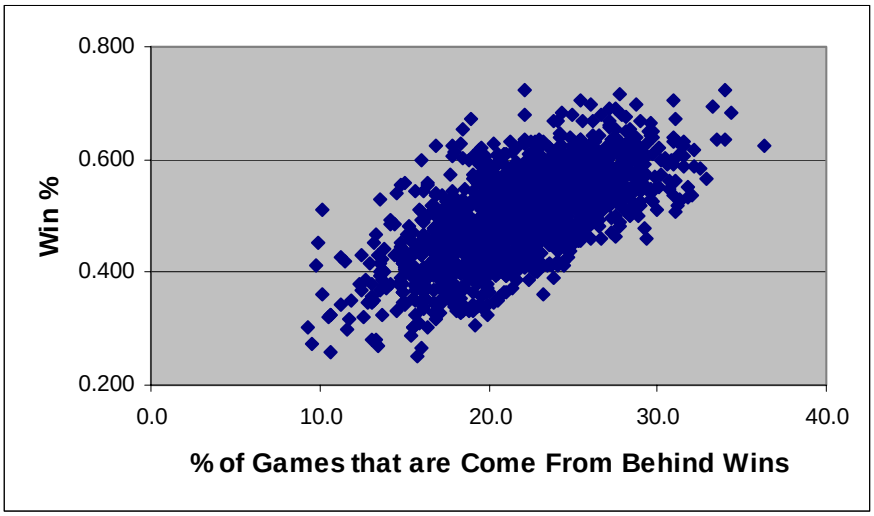
Another achievement that is often associated with successful teams is the ability to win games by coming from behind. A win of this type is to be distinguished from one in which the lead never changed hands. Table 7 presents the raw data, which shows that

Table 7. Percentage of games in which winning team came from behind or never trailed.

Come From Behind	53074	0.437
Never Trail	68340	0.563

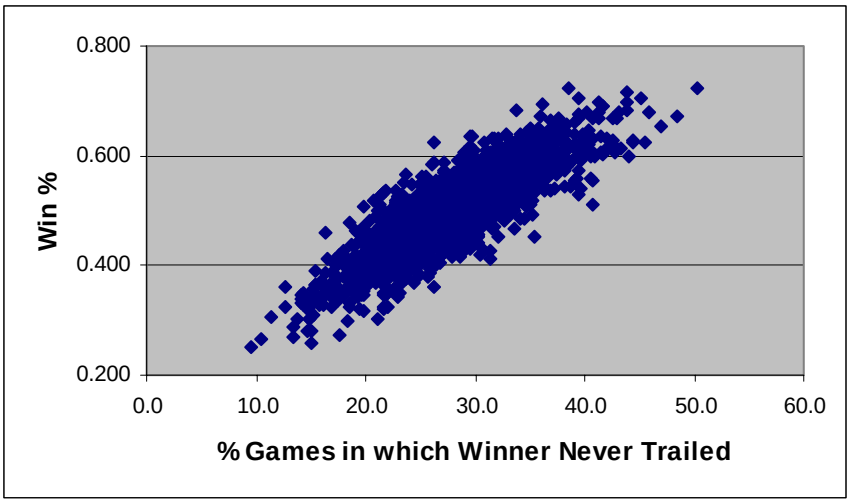
Do the better teams win more games in which they come from behind? Figure 4 presents each team's winning percentage in relation to the percentage of games in which they came from behind to win. The relation is moderately strong, with a correlation coefficient of 0.65.

Figure 4. Winning percentage in relation to percentage of games which are come from behind wins.



The other side of this coin is the relation between winning percentage and % of games in which winner never trailed. These results are shown in figure 5.

Figure 5. Winning percentage in relation to percentage of games in which winner never trailed.



This relation is much stronger, with a correlation coefficient of 0.86. This result is in good agreement with my finding of last year which indicated that winning by a large margin is a better predictor of success than winning close games.

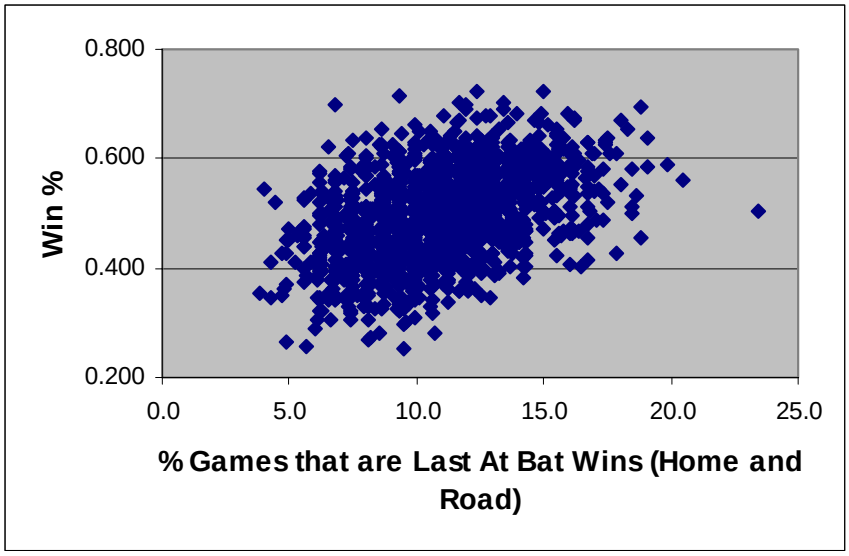
The final topic I will address is the matter of winning in the last at bat. This is certainly exciting and announcers generally praise it strongly. But once again the question is whether it has long term meaning as a predictor of team success. First, the raw numbers are in Table 8. The huge differences between visitors and home are not unexpected.

Table 8. Winning percentage for visiting and home teams in games won in last at bat.

	Wins	Losses	W pct
Visitor	9945	16869	0.371
Home	16869	9945	0.629

The value in overall success is shown in Figure 6. The relation is moderate, with a correlation coefficient of 0.42. The values here are combined for home and road for each team, since the relation is even weaker if they are considered separately.

Figure 6. Winning percentage in relation to percentage of games that are won in last at bat.



Conclusions

- Home teams score more in each of first 8 innings
- Visiting teams score more in each extra inning
- An early lead early is very valuable
- The advent of the closer has not changed late inning success
- Coming from behind and winning in last AB only moderately important
- The most successful teams get the lead and keep it
- Total scoring is by far the best predictor of overall success