

What is a streaky team?

It is best to begin with definitions and then move on to various analytic metrics. Streakiness is a pretty limited concept often referring to consecutive occurrences, such as games, at bats, plate appearances, etc. However, these streaks are arbitrary and usually chosen after the fact when looking backwards, such as (among many other examples):

- Player of the week
- Player of the month
- Batting average over .400 in last 10 games
- ERA under 3.0 in last 10 starts

There are some longer-range streaks that get attention, especially a team's record before and after the All-Star game, usually referred to as first and second half of the season.

These are all interesting but I am interested in a more objective approach that is defined by time and not after the fact by specific accomplishments. Therefore, I will use the concept of "intervals" and the broad terms will be "unevenness" and "consistent" instead of "streaky". I am especially interested here in team performances since the sample sizes for individual players can be pretty small, making analysis more difficult. Of course, the team results flow from the aggregate of individual performances.

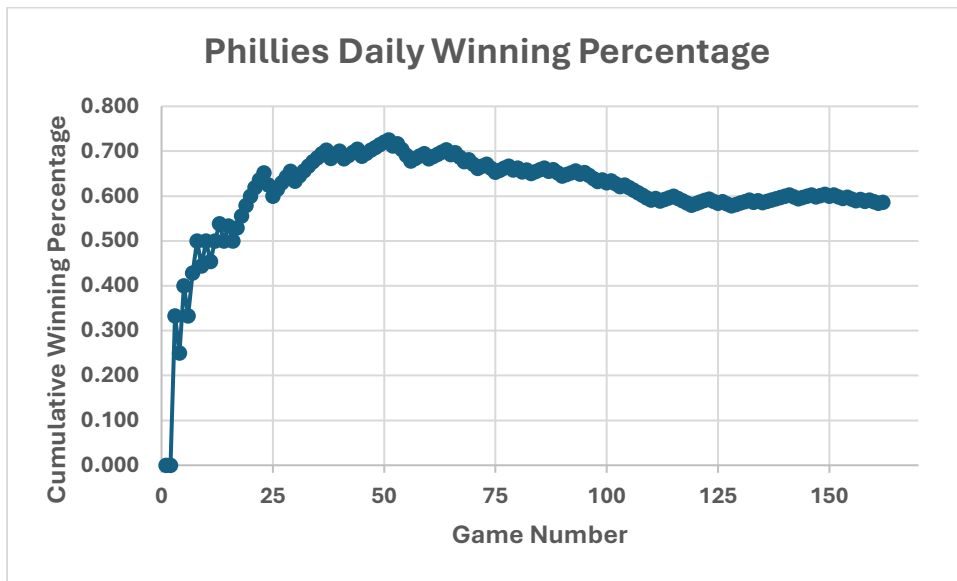
There are many useful metrics, some of which have been in common use for a long time, while others are of more recent vintage. I will use intervals of 10 games. This is an arbitrary choice, but it provides a standard which is widely used. Obviously other ranges could be chosen, but the basic results are likely to be the same. The measures I used to examine the 10-game intervals are:

- Wins
- Run differential
- OPS
 - Offensive
 - Pitching (OPS of opponents)
 - Batting and pitching OPS differential

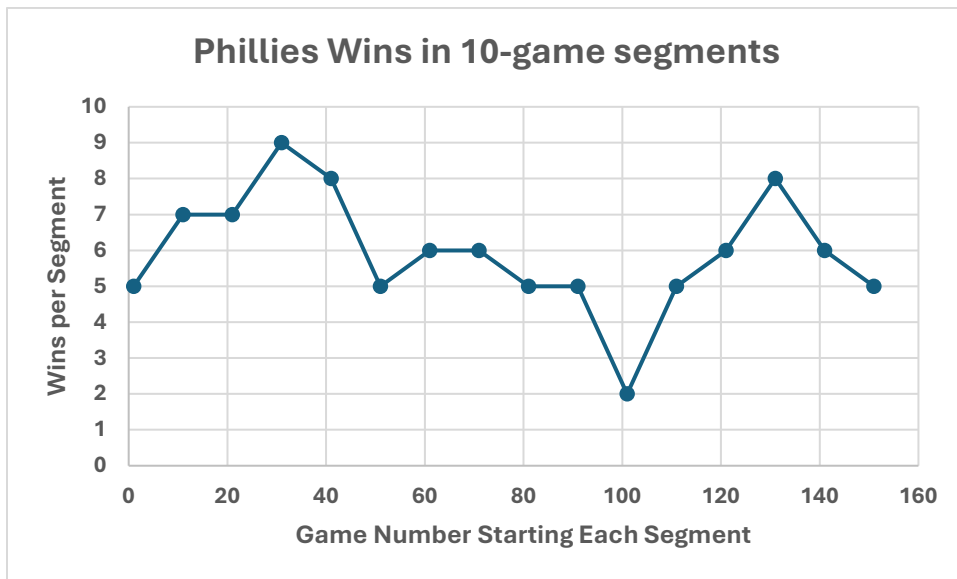
Wins

The present study examined the 2024 season. I started by looking at the Phillies who had a reputation among sportswriters as being quite streaky or uneven. Figure 1 is their winning percentage after each day's games. There was a pretty rapid rise in the first portion of the

season and then a long, gradual decline for most of the rest of the year with more stability in the last 50 games. However, this basic graph obscures short term variations.

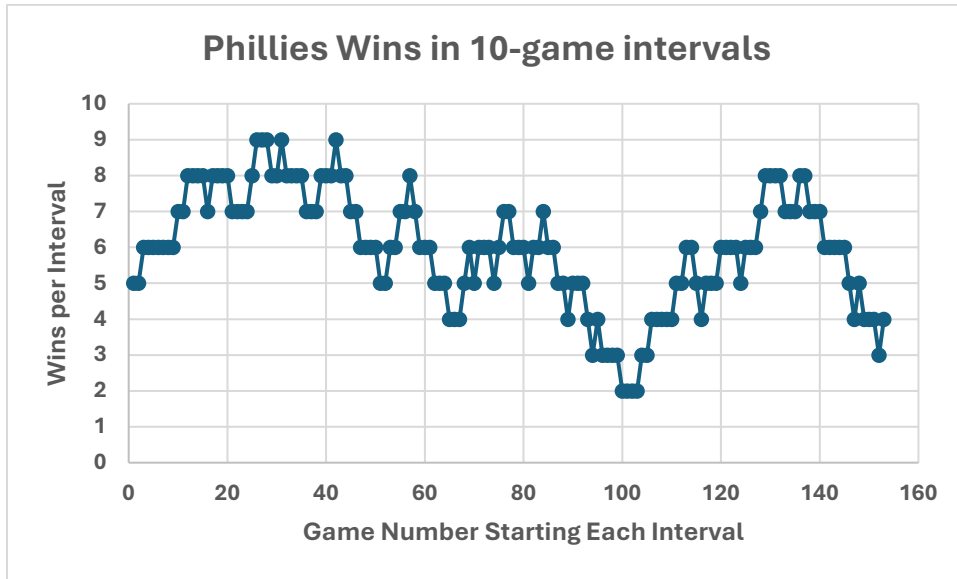


For Figure 2, I chopped the Phillies season into 10-game segments: Games 1-10, 11-20, etc. We see a number of hot and cold periods which is actually the norm for most teams.

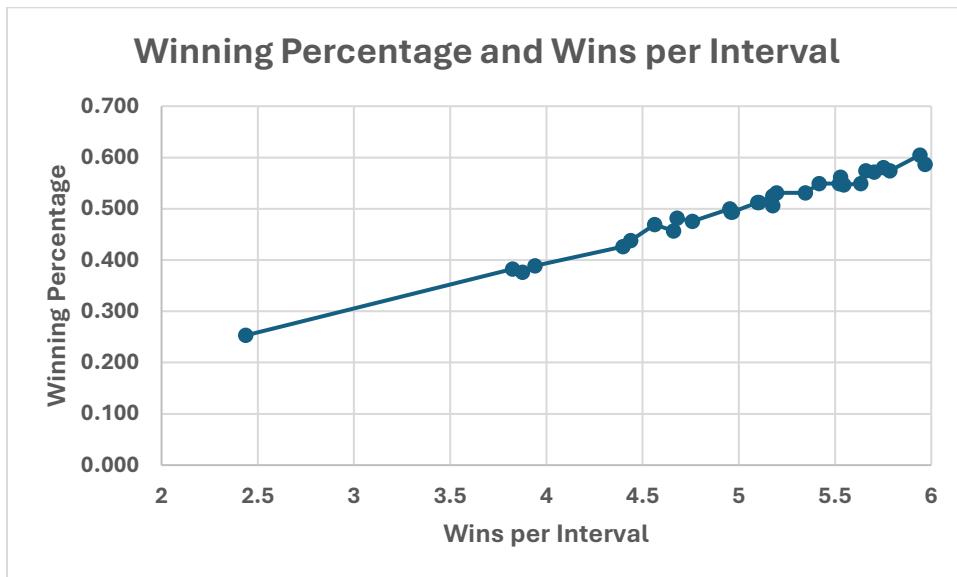


These particular 10-game segments may not be the most informative since they are arbitrary rigid decades. Therefore, I used a standard statistical technique of calculating the moving average of 10 game intervals. The first interval is games 1-10, the second is 2-11, the third is 3-12, etc, so they overlap. Over the full season, there are 153 of these 10-game intervals for each team, concluding with games 153-162. The results for the Phillies are in Figure 3, which is

choppier partly due to the fact that the y-axis only has integer values. However, the general shape is similar to Figure 2, which supports the choice of 10 games as the interval to study. The Phillies had an average of 5.97 wins over the 153 intervals.

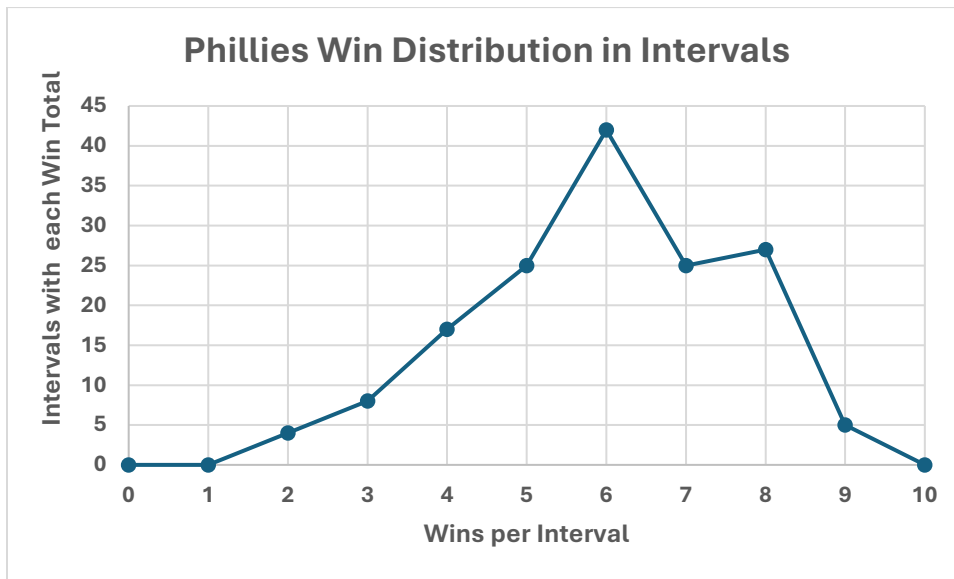


How does success in these intervals relate to success over the whole season? That relation is shown in Figure 3 for all teams.



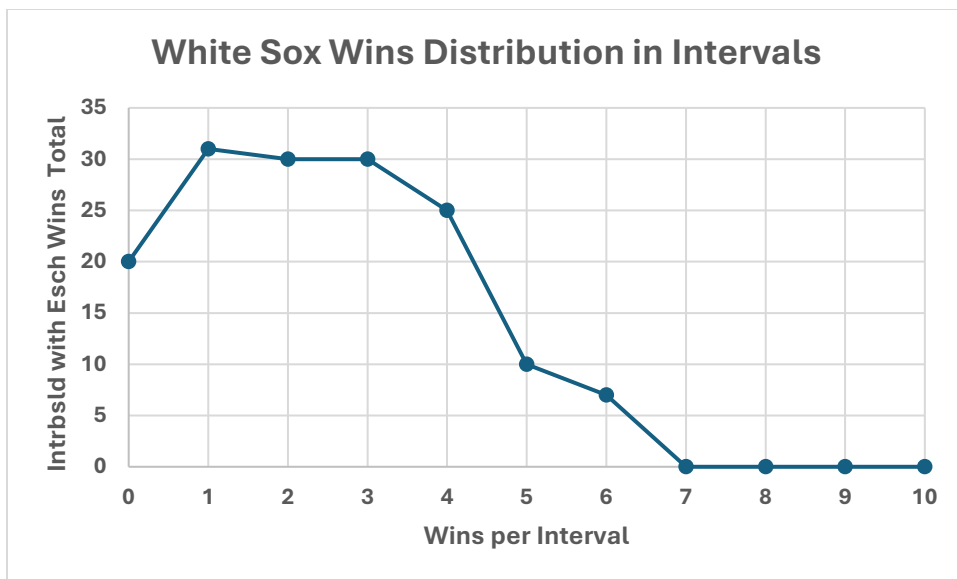
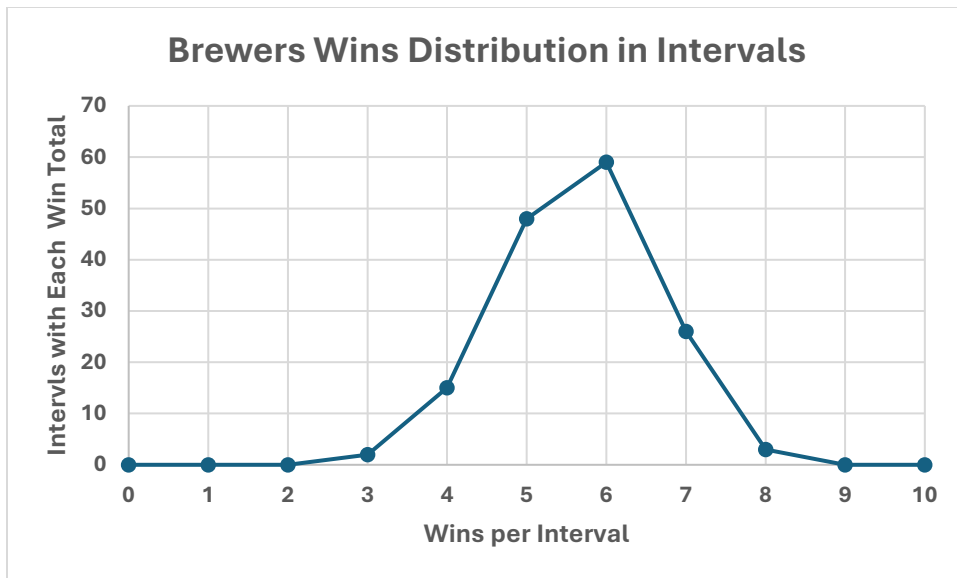
This is an extremely strong relation. The quite reasonable and perhaps surprising conclusion is that over the long term of the full season, even extreme unevenness in the shorter intervals averages out. This will be examined in more detail below.

Another way to evaluate unevenness is through the distribution of wins in each of these 10-game intervals. Figure 4 has those results for the Phillies.



Intervals with 6 wins were the most frequent (42 of 153 or 27%) and the pattern is fairly symmetrical around that value. This matches their average of 5.97 wins per interval very nicely.

In consideration of my central topic of unevenness, we have to ask: Is this a typical pattern? Figures 5 and 6 present the distributions of two very different cases, namely the Brewers and the White Sox.



These patterns are very instructive. First, we see that Milwaukee was very consistent, also with 6 as their most frequent number of wins but with significantly more: 59 for 39% of all intervals. Their pattern is more tightly clustered than that of the Phillies although the Brewers average was lower at 5.67 wins per interval.

Second, the White Sox teach us something else. Their very sad most common interval had 1 win (31% of all intervals) and their best had 6 wins with an average of 2.44 wins per interval. The distribution appears startlingly different from the Phillies and Brewers, but in terms of consistency, they varied relatively little during the season. A major lesson here is that consistent performance is not necessarily good performance.

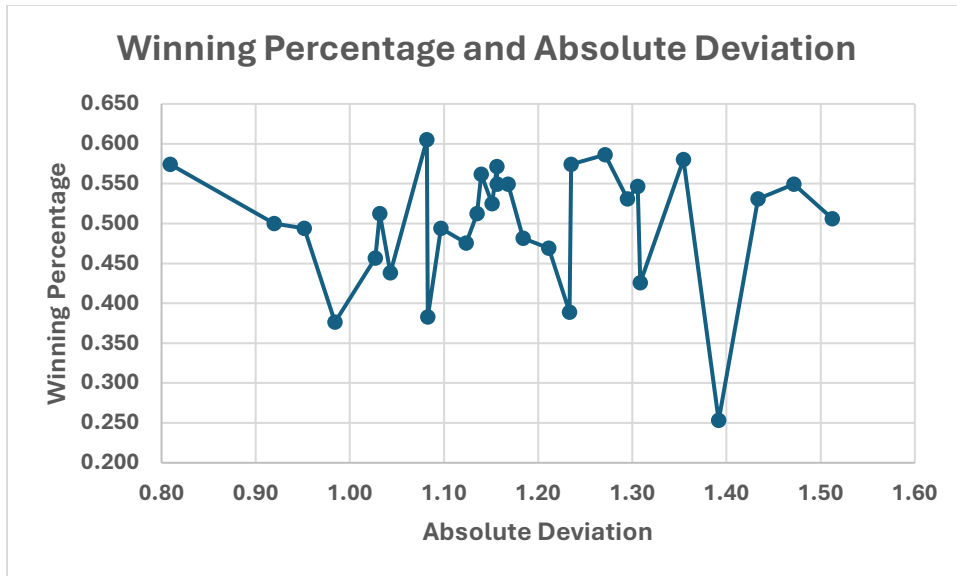
However, visual comparison can only tell us so much. I desired a quantitative approach that would allow the comparison of all teams, with an emphasis on consistency and not necessarily on success. The statistical method I chose is called the Average Absolute Deviation (https://en.wikipedia.org/wiki/Average_absolute_deviation). It is designed to do exactly the kind of comparison between distribution patterns that is relevant here. The procedure is as follows:

1. For each team, calculate the average value of the 153 intervals.
2. Determine the difference between each individual interval and the average.
3. Sum these differences and divide by the total number of intervals.

The higher the value obtained in step 3, the more uneven the distribution is. Low values indicate consistency. The results for the 30 teams are in Table 1.

1	Twins	1.51	11	Angels	1.23	21	Giants	1.10
2	Mets	1.47	12	Pirates	1.21	22	Marlins	1.08
3	Tigers	1.43	13	Rangers	1.18	23	Dodgers	1.08
4	White Sox	1.39	14	Dbacks	1.17	24	Nationals	1.04
5	Yankees	1.35	15	Braves	1.16	25	Cardinals	1.03
6	A's	1.31	16	Guardians	1.16	26	Blue Jays	1.03
7	Astros	1.31	17	Mariners	1.15	27	Rockies	0.98
8	Royals	1.29	18	Orioles	1.14	28	Rays	0.95
9	Phillies	1.27	19	Cubs	1.13	29	Red Sox	0.92
10	Padres	1.23	20	Reds	1.12	30	Brewers	0.81

This is a remarkable range of deviations with some good teams at both ends. The Yankees, with the best record in the American League, were the fifth most uneven team. The White Sox were the 4th most uneven team. At the bottom end, the Rockies, Rays and Red Sox did not win a lot of games, but they are strongly in the consistent group. However, the Brewers, who were division winners, were definitely the most stable of all teams. The overall relation between consistency and winning is shown in Figure 7.

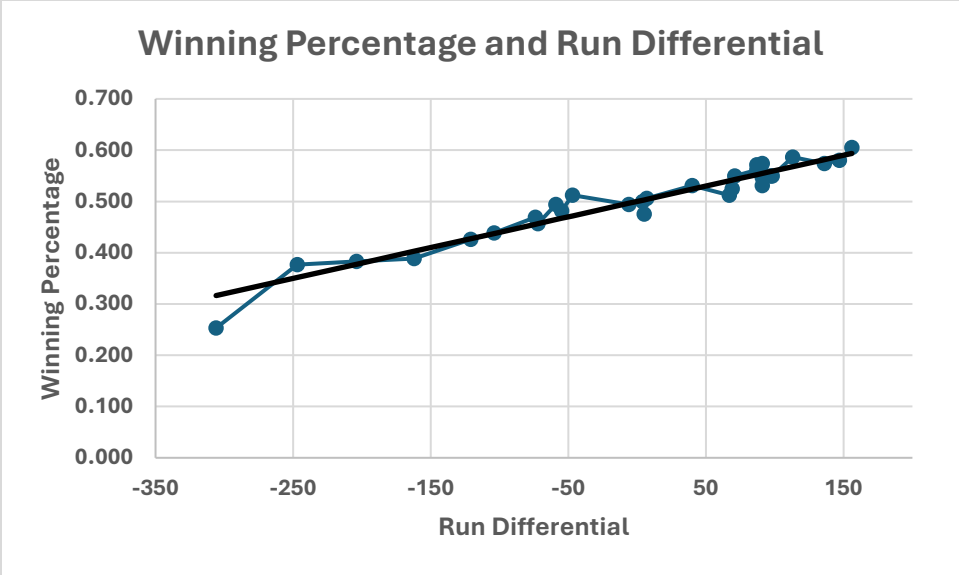


There is no meaningful relationship here as the most consistent team (Brewers) has a good winning percentage, but not the highest. The dismal White Sox had a historically bad winning percentage, but only the fourth-most unevenness as measured by average deviation. The three teams with the highest deviations and therefore the least consistent (Mets, Twins, and Tigers) had very good winning percentages. The large peaks and valleys composed of the data from the rest of the teams lead to the clear conclusion that unevenness in 10-game intervals is a poor predictor of success over the course of the season.

Run Differential

Run differential is the number of runs a team has scored to that point minus the number of runs allowed. It has been common for many years to see these differentials in daily standings.

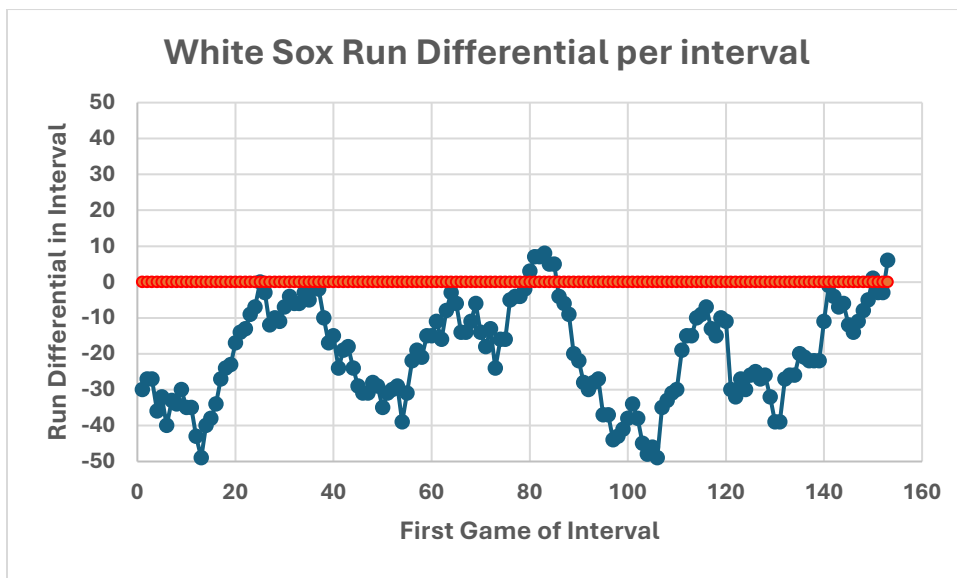
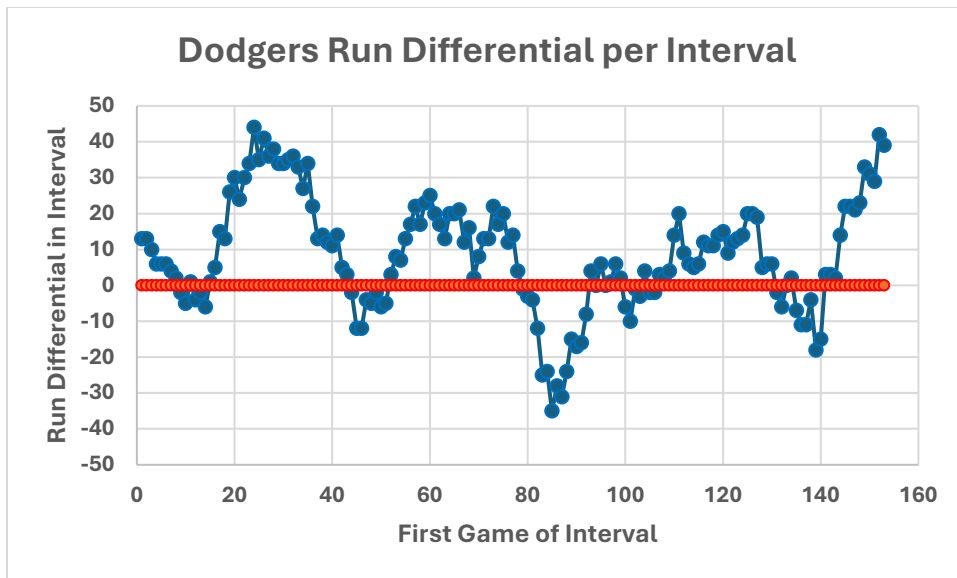
Figure 8 presents the season's winning percentage for all teams in relation to their run differential. Although the differential varies widely, from -306 to 156, there is an unsurprisingly strong relation to winning percentage across the full range of those values.



How about the Absolute Average Deviation for run differential?

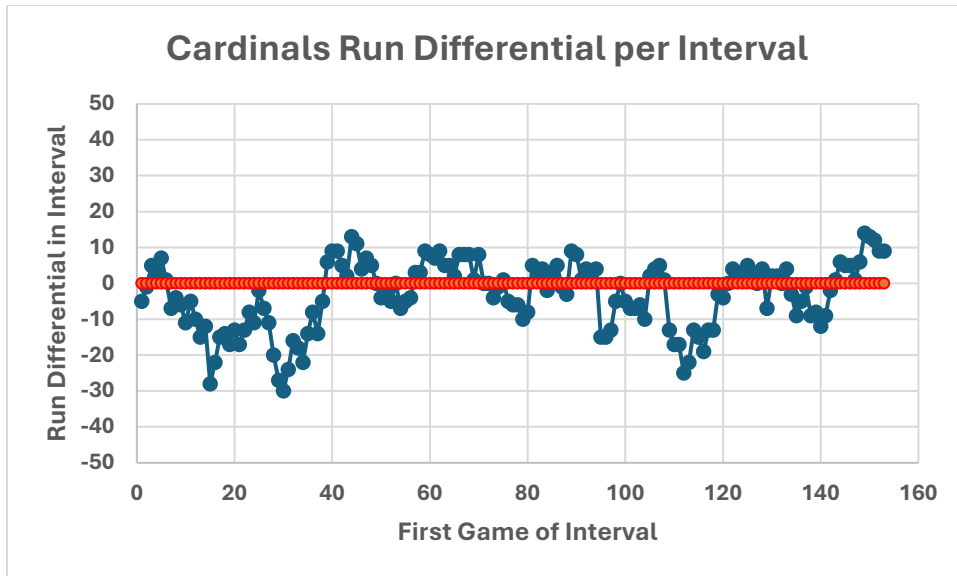
1	Twins	13.6	11	Cubs	10.9	21	Guardians	9.7
2	Mets	13.0	12	Tigers	10.8	22	Red Sox	9.7
3	Dodgers	12.3	13	Yankees	10.7	23	Astros	9.6
4	Dbacks	12.1	14	Padres	10.4	24	Brewers	9.1
5	Royals	11.9	15	Pirates	10.4	25	Giants	8.9
6	White Sox	11.7	16	Mariners	10.4	26	Marlins	8.8
7	Phillies	11.6	17	Blue Jays	10.0	27	Rays	8.7
8	A's	11.5	18	Braves	9.9	28	Rockies	8.4
9	Orioles	11.2	19	Reds	9.9	29	Nationals	8.4
10	Rangers	11.0	20	Angels	9.7	30	Cardinals	7.8

There are definitely some unexpected results here. For example, the Dodgers were the leader in run differential with 156 (average of 8.6 per interval), but were the third most uneven in how they got there. On the other hand, the White Sox were a distant last in run differential with the poor value of -306 (average of -19.8 per interval), but sixth in unevenness, fairly similar to the Dodgers. The season-long patterns of these two teams are figures 9 and 10, which have identical scales for easier comparison. The red line marks 0 for convenient reference.



Obviously the Dodgers had many more intervals with positive differentials than the White Sox, but both had large variations in their intervals during the season.

The Cardinals were at the other end of the unevenness spectrum as the above table shows. Their run differential for the season was 20th in the majors at 47 (average of -3.3 per interval). Their progression through the season is in figure 11, again on the same scale as above.



This is a remarkably stable pattern when compared to the Dodgers and White Sox, but the consistency did not translate very well to success, as the Cardinals had an overall winning percentage of .512 as they won 83 games.

The conclusion from studying run differential is definitely that consistency in this measure is not related to success in winning games.

On-base plus slugging (OPS)

The last decade has seen much wider use of OPS, not only in the media, but also on the scoreboards at the ballpark. The more traditional batting average has not been completely supplanted, but there is definitely a greater appreciation across the baseball world, including by many fans, that OPS is a more meaningful value to follow.

These values are usually used only with batting, but OPS allowed by pitchers is the appropriate counterpart and the difference between the two has great meaning in terms of team performance. Graphs of these values show the expected hot and cold periods, but for the sake of convenience, I chose to avoid presenting these 30 figures and will instead present my analysis in tabular form.

For each of the three OPS measures (batting, pitching, difference), I calculated the Average Absolute Deviation using the procedure described above. All 30 teams were ranked for each of the OPS measures from most uneven to most consistent. I then compiled these three rankings into a single aggregate. Those calculations are summarized in the following table.

Most uneven

<u>Team</u>	<u>Aggregate</u>	<u>Batting</u>	<u>Pitching</u>	<u>Difference</u>
Yankees	1 st	10 th	2 nd	9 th
Tigers	2 nd (tie)	12 th	7 th	3 rd
Dodgers	2 nd (tie)	16 th	4 th	2 nd

Most consistent

<u>Team</u>	<u>Aggregate</u>	<u>Batting</u>	<u>Pitching</u>	<u>Difference</u>
Pirates	30 th	29 th	30 th	27 th
Nationals	29 th	27 th	25 th	29 th
Cardinals	28 th	28 th	20 th	28 th
White Sox	14 th	20 th	13 th	6 th

These results are very interesting. The three most uneven teams in terms of OPS were all in the postseason and two were in the World Series. They won an average of 92 and 2/3 games with a combined winning percentage of .572. On the other hand the three most consistent teams were all very far from the postseason. They won an average of 76 and 2/3 games with a combined winning percentage of .473. Of special note is that the top three teams were at their most uneven in pitching OPS. The White Sox, always a special case in 2024, were in the middle of the pack for consistency with their greatest unevenness in the difference between batting and pitching OPS. It is very clear that consistency by this measure is not related to winning.

Conclusion

All three measures (wins, run differential, and OPS) shows definite peaks and valleys for every team, with some having much wider ranges than others, which is to be expected. Streakiness, or unevenness as I have preferred to call it, can certainly lead to anxiety for a team and their fans, but in the long term being very consistent or stable is not a good predictor of success. One of baseball strengths has always been that perseverance and in-season adjustments have been rewarded with winning records. As many people have noted over the years: "It's a long season".