How Well They Play the Game

by

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The Concept

What do you want to know?

What is the best way to rate a baseball player? The goal in baseball is for the team to win, so the best way to rate a player is by how much he contributes to winning games. This is simple in concept but in practice it becomes a daunting task to objectively rate players this way. So what most player rating systems will do is have one or more people make a subjective judgment about players, vote on the rankings, then average out the votes to create the final rankings. But rating players this way is just an opinion, and it isn't surprising that they show widely different results. There's no specific set of criteria used to create these rankings, so we don't even know what they mean.

There are, however, objective rating systems, which include both offense and defense, that estimate how much players contribute to winning games. The oldest of these is the total player rating (TPR), the concept first introduced in 1984 by Pete Palmer and John Thorn[2]. The TPR was a great first step in generating a logical, mathematically based system, but there are significant flaws in the method that produce some very questionable ratings. The best system in place today that rates players total contribution to winning games in my opinion is *Win Shares*[1], developed by Bill James, which assigns shares of the team's actual wins to individual players. Win shares is a dramatic improvement to the TPR and gives a reasonably accurate measure of a player's value… that is his contribution to winning games. James created his own player rankings using the win shares system in *The New Bill James Historical Baseball Abstract*[3] but ultimately made it a subjective ranking system without a final numeric value. So why did James not use this great system to provide an objective player rating? Could it be that there is no such thing as an overall objective player rating? Well, it depends on what you want to know.

I have always wanted to know how well a MLB player has played the game but have never found a comprehensive system that rates a player this way. The point of any rating system is to compare players to each other, so I decided that, when comparing any two players in baseball history, this system will attempt to answer the question:

Who played better, on average, over their career?

What do I mean by *better?* If we want to know who the *better* home run hitter is between Hank Aaron and Harmon Killebrew for example, we have to compare them on an equal basis. Aaron hit 755 for his career and Killebrew 573, but Aaron had over 4000 more at-bats. If we put their career homers on the same basis (per at-bat), Aaron hits a home run in 6.1% of his at-bats, Killebrew in 7.0% of his. So with all at-bats being equal between Aaron and Killebrew (they're not, but for the sake of argument here let's say they are), Killebrew is the *better* home run hitter.

To determine who played better overall, Aaron or Killebrew, we have to include all aspects of their play on offense and defense, and compare them on an equal basis. I conduct a derivative analysis of James' win shares to develop this rating… the player's ***career performance rating.*** In this system, Aaron played better, on average, over his career because his contribution to winning games is greater than Killebrew's contribution to winning games, everything being equal (as equal as I can get it).

The ratings are based solely on the players' play on the field… it is not the intent of this system to consider other ways a player has contributed to the game. For example, Jackie Robinson's rating is based on his play on the field. His historical significance is not a factor in his rating.

The other question that I think everyone wants to know, or at least has an opinion about, is… who should be in the Hall of Fame? The rules for voting players into the HoF today are "based upon the individual's record, ability, integrity, sportsmanship, character and contribution to the game" which translates into… vote for whoever you want. I think that HoF induction should be based on two specific criteria which measure the players' ability to win games*:*

1. Career performance

   The career performance rating is a measure of the degree to which he contributes to winning games for the chances he is given over his career... how well he played the game, although the rating does not include the post season. In most cases a player's post season will be a very small part of his overall career and will therefore not change his overall rating. However there are some players who have played more, or had a very large impact on baseball history, in the post season which could impact the rating. So if the player falls below the hurdle I set for career performance for the HoF, a subjective assessment of his post season career can be used to adjust the rating slightly.

2. Career value

   The player's overall contribution to winning games is a measure of his overall value. I use another derivative analysis of win shares to generate this rating, which quantifies the number of wins the player has created for his career… his career value rating. One potential problem with a career value rating is that there can be circumstances within a player's career, other than injury, that prevent him from playing. For example Joe DiMaggio's ability to create wins was hindered by the fact that WWII cut three seasons out of his career. So his career value rating is underestimated compared to other players with "normal" careers. A subjective adjustment is needed in his case to account for circumstances beyond his control that limited his value. A player should have a high amount of wins in his career to qualify for the HoF to which I assign a second numeric hurdle. It is not appropriate to include a post season adjustment to the career value rating because this would be unfair to good players on average or weaker teams.

If a player meets both the performance hurdle and the career value hurdle (with the subjective adjustments if necessary), and there are no other extenuating circumstances that would prevent his induction, I believe he should be in the Hall of Fame. Of course there is no right level to set for these hurdles, and you can tweak them if you want, but the reality is that the windows to set them are fairly small.

To develop the career ratings I begin with Bill James' Win Shares system, which starts with the team's wins.

Pythagorean Wins

A team's wins can be predicted from the runs they score and the runs they allow in a season[4]. If we plot predicted win % calculated using the Pythagorean Theorem, versus actual win % for each team in history, they are highly correlated but not perfectly correlated because of the variation in how teams actually win.

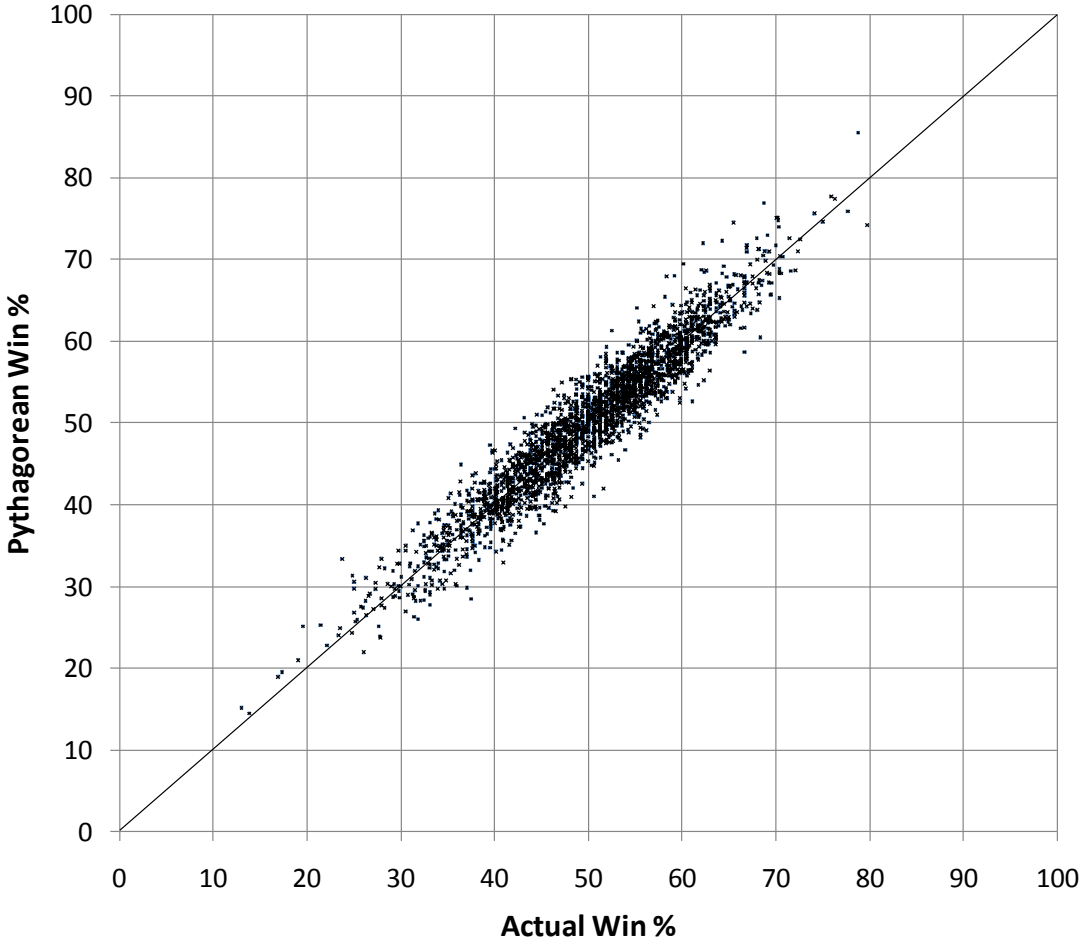
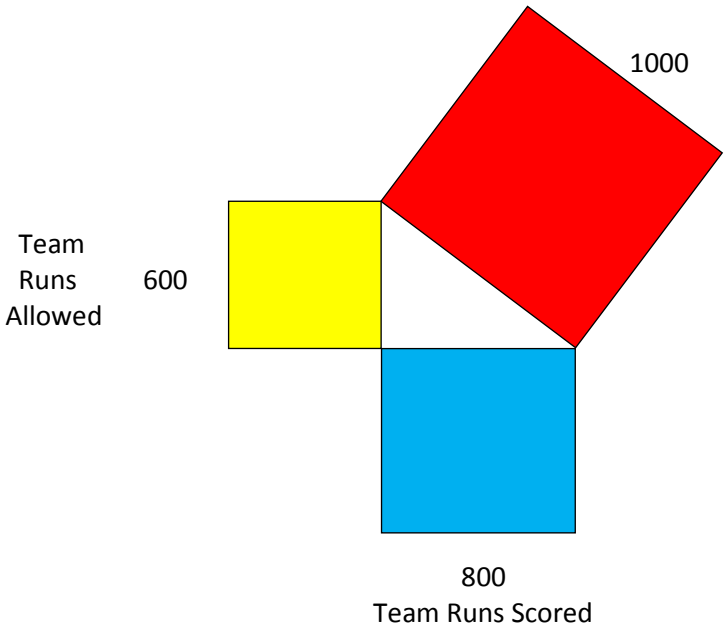


Figure 1. Pythagorean winning percentage, calculated for all teams in MLB history (1876-2009), versus the team's actual winning percentage.

Why am I even talking about predicted wins when we already have actual wins for each team in history?

Players do their best to drive in and score runs on offense and prevent runs on defense, but they don't actually "win". Pythagorean wins are calculated from the runs the players score and allow. It's what should have happened based on the players' performances. The fact that a team actually won a few more or less games than what they should have, is a matter of luck… it happens randomly. Actual wins introduce an element of luck or variability that I don't want to incorporate into the player ratings. We have to squeeze out as much variability as possible in creating the player ratings, so Pythagorean wins will be the basis I will work off for each team in history. They're more representative of the players' actual performances.

I'll go through an example of how to determine a team's predicted won/loss record from their runs scored and runs allowed using the Pythagorean Theorem… it's all about squares. Let's say a team scores 800 runs in a season (the length of the side of the blue square) and allows 600 runs to be scored by their opponents (the length of the side of the yellow square). The Pythagorean Theorem states that the size of the red square will equal the size of the blue and yellow squares added together, or 1000 squared.



The team's predicted winning percentage is the size of the blue square divided by the size of the red square or in this example, 800 squared divided by 1000 squared.

$$\text{Pythagorean Winning \%} = \frac{800^2}{1000^2} \times 100 = \frac{800 \times 800}{1000 \times 1000} \times 100 = 64\,\%$$

This team should win 64% of their games. For a 162 game season their record should end up being 104-58.

Based on the 104 wins the team should get, we now have to determine how much each player on the team has contributed to those wins. The best system to use to determine this is *Win Shares*[1], developed by Bill James around 2001. So if there is already a system in place that rates players' contribution to winning, why do I need to create another system? Well, I'm actually building another system using win shares as the base. Win shares provides a value for the player's overall contribution to winning games over his career. To be able to directly compare any two players in history and determine

"who played better, on average, over their career", I will need to convert the *value* rating into a *performance* rating. I'll define each so you understand what I mean by performance and value.

Performance

What I have always wanted to know is how good one player is versus another, straight up, head to head. But in baseball this never happens, it's not a tennis match. So I guess what I want to know is, which player would I choose to play in a critical situation, or game, or series, given a choice. I specifically want to know how one player *performs*, on average, versus another player, on average, taking their whole careers into account. To do this you have come up with a kind of career batting average that takes into account everything the player does, not just hitting average. This would be a measure of the player's overall performance.

The dictionary defines performance as the accomplishment of an act or feat. In baseball the accomplishment is a success, however you want to define a success. The acts are chances, either plate appearances or fielding chances. Batting average, for example, is a performance measure. Add up the number of successes (hits) and divide by the number of chances (at bats). But the real measure of success in baseball is the team's wins, so the best player performance measure is the contribution to those wins per the chances the player is given.

Player Performance = Wins per Chance

If we want to measure who is the "better" player, that is a *performance* measure. When we want to know who is better we're thinking who will succeed or win more often, everything being equal.

Who is the "best" free throw shooter in the history of the NBA? Do we look up who made the most free throws? We can, it's Karl Malone, but that won't tell us who the best is. The best is who makes the most free throws per chance…. it's Mark Price. He made 90% of his free throw chances. Malone made 74% for his career. If the game is on the line and we have the option to choose any player to shoot 2 free throws, Price is our guy. If he's not available we can find at least a hundred other players better than Malone. It's the same in baseball. The player who creates the most wins per chance, is playing the best overall.

Value

The dictionary defines value as "worth". We can define value in this context as the player's worth to the team. And their worth to the team, excluding the financial component, is defined as how many wins they create for the team. The more wins they create in any given season, the more valuable they are to the team. The player that creates the most wins in the league in any given year would be the most valuable player, the MVP.

A player's value is determined by two things, (1) how well they play, their performance, and (2) how much they play.

Value	=	Performance	x	Amount of play
		(1)		(2)

We have already defined player performance as the player's wins divided by their chances, and their amount of play is defined as their total chances.

Value	=	$\frac{\text{Total wins}}{\text{Total chances}}$	x	Total chances
		(1)		(2)

The "total chances" units cancel out, so player value can be defined simply as total wins… in a given season, and in sum, their career. Just remember…. there are two parts to the value rating.

Player Value = Total Wins

Here are 4 players with different career values based on their Pythagorean wins normalized to 162 game seasons, and with an adjustment for time.

	Career Value (Wins)
Pete Rose	610
Carl Yastrzemski	561
"Sliding" Billy Hamilton	399
Mickey Cochrane	306

If you conclude that, among this group, Pete Rose played the best over his career, you would be wrong! This is a common misinterpretation of value ratings. We don't know who is playing better from the value ratings. We have to break out the performance component to understand the quality of play. When we do that, these players performed at about the same level, on average, for their careers. The difference in the career wins between them is due to their amount of play. Rose increased his value because he played more than any player in history. Playing more added to his value, but playing more didn't make him a better player. Playing better would have made him a better player.

Here are several infielders with about the same career value in this system.

Player	Career Value (Wins)
Al Rosen (3B)	213
Eddie Stanky (2B)	214
Puddin' Head Jones (3B)	215
Larry Bowa (SS)	210

Who is the best player in this group? By now you know that we can't answer this question from the value rating alone because value is based on performance *and* amount of play. When we break out the two components, Rosen is the best player.

	Performance	Amount of Play
Al Rosen (3B)	Excellent	Short career
Eddie Stanky (2B)	Good	Moderate (-) length career
Puddin' Head Jones (3B)	Average	Moderate (+) length career
Larry Bowa (SS)	Below Average	Relatively long career

Al Rosen was an excellent player who had a short career. Larry Bowa was a below average player who played a relatively long time. Both accumulated the same number of wins in total for their careers so they have the same career value.

Let's look at a hypothetical example of two identical twins who come up to the majors at age 21 and have identical careers to age 30. Let's say they get 250 wins for these 10 years. Twin A then dies, and Twin B continues to play through age 40, and he gets 230 additional wins. Here is a summary of their careers and their value and performance ratings. Assume they play full seasons each year.

	Age 21-30 (Wins)	Age 31-40 (Wins)	Career Value (Total Wins)	Career Performance Rating (Avg Wins/Season)
Twin A	250	0	250	25
Twin B	250	230	480	24

Who is the better player, Twin A or B? We already know the answer because they are identical. If your question is, who is the *better* player, the performance measure tells us that…. 25 vs. 24 is close to the truth. The value ratings (480 vs 250) measure the total contribution of the player to the team, not the quality of their play. When comparing whether any player is *better* versus any other, performance is the bedrock measure.

Let's compare a real example of value and performance for two players, Ted Williams and Ty Cobb. The value ratings are the sum of the player's Pythagorean wins normalizing all seasons to 162 games and with an adjustment for time. The performance ratings are the Pythagorean wins put on an equal basis (i.e. per 650 equal plate appearances and 1320 innings, an equal full season).

Player	Career Value (Wins)	Career Performance (Wins per equal season)
Ty Cobb	806	42.7
Ted Williams	631	46.1

Cobb is a much more valuable player than Williams overall. This means that Cobb created more wins in his career than Williams did. If your question is, who is more valuable for his career, the answer is Cobb, using the career wins measure. Cobb had a very long career as did Williams, but Williams missed almost 5 full seasons to defend the United States in years of war. If you want to compare any two players, the rating system you use has to be fair to both. Are the career value ratings for Cobb and Williams a fair

way to compare them? Of course not! There are circumstances within William's career that are preventing him from adding to his value.

If your question is, who played better over his career, the answer is Williams. The performance rating tells you that Williams will create more wins than Cobb if you give them equal chances.

> In this system, if we give both players 650 equal plate appearances in a season, and 1320 equal innings at their position in the field, the average Williams will create more wins (46.1) than the average Cobb (42.7). Everything being equal, Williams wins more so he is the *better* player.

Are the performance ratings a fair way to compare the players? They are, because they are on the same basis. There are adjustments for time, age, etc, to make them as fair as possible.

Value and performance are both important measures about a player, so would you want to combine them to obtain some kind of unified player rating? Forget about it… they have different units (wins and wins/chance) so they cannot be combined mathematically to generate anything meaningful. If you give each some relative weight and combine them you can get a number that is…… meaningless. Value and performance are two separate things.

- The player's contribution to the team's wins is a measure of their total value. The higher the player wins in a season, the more valuable the player is in getting his team to the post season. The sum of their wins by season is the measure of their career value.
- Performance measures the quality of play, and tells you whether a particular player plays "better" than another. The better performer is who should play in a critical situation to maximize the team's probability of achieving a win.

If your question is, who should be in the Hall of Fame, that is a different question. Players in the HoF tend to be of average or better ability, and play for a long time and accumulate a lot of statistics. They generally have high *value*. They are not necessarily the best players, the best *performers*. I believe Hall of Famers should be the best performers *and* have high total value to be inducted. In other words they should play very well for a long time to qualify for the HoF.

What was your question again?

The Win Share

Refer to *Win Shares*[1] by Bill James and Jim Henzler if you want the long version by the inventors. Here is my commentary.

Baseball has many perceptual biases when it comes to what is important to winning. One of them I'll call the "first place bias". A good player on a first place team gets rated higher than a good player on a last place team…. perceptually. This is unavoidable because the first place player's good teammates are helping him win more, so it appears as though he is winning more. The good player on the bad team looks like a bigger loser because his team is losing more. It appears to be the absolute truth, but in reality, it often is not.

There are perceived biases in regard to both offense and fielding, and many are even due to the use of statistics (objective measures) that don't always correlate with winning. For example there is a perception that a player with a batting average below say .270 is not a particularly good offensive player. It might be true, but there are many instances where players with low batting averages create far more runs than players with averages over .300. Batting average is one way of looking at offensive performance, but may not always be indicative of the player's run creation and contribution to winning.

In 1961 Roger Maris hit 61 homers, which is still the single season record as of 2009 (according to me). You would think that this was one of the best offensive seasons, but it is not even remotely close to the best 10 in history. Maris' teammate, Mickey Mantle, hit 54 home runs the same year and had a far better offensive season because he hit more singles, had many more walks, and stole more bases creating significantly more runs (and wins) than Maris. Home runs are one component of run creation, but by itself does not tell you the player's overall offensive worth to the team.

Fielding is even more difficult to assess accurately. There is a perception that players who make spectacular plays in the field are the best defensive players. It's probably true a majority of the time but sometimes it's not. Derek Jeter makes some spectacular plays in the field… is he a great fielding shortstop (hint)? Fielding statistics themselves can often be very misleading. *Win Shares*[1] addresses many of these perceived and statistical biases and has been a major advancement in rating players' true defensive contribution to winning.

It's very hard to break out the individual's contribution to the team's win perceptually because there are these inherent biases that the knowledgeable baseball scholar is not even aware of, let alone the average fan. As a practical matter, subjectively rating players across history, has little meaning, when it comes to how they contribute to winning. Of course it's very complicated to do it objectively, and nothing will be the absolute truth. But win shares are much closer to the truth than any perceptual opinion, well in my opinion anyway.

In baseball, each player tries to create runs from his hitting chances and, if he is successful in getting on base, from his base-running ability. He tries to prevent the opponent from scoring runs by making, or contributing to, outs when on defense. He is credited for "batting" and "fielding" win shares based on a complex series of calculations from a player's raw offensive and defensive statistics developed by Bill James in *Win Shares*. Team and league stats are also used as benchmarks to develop the ratings.

Win shares starts with the team, and are defined as the team's wins in a season times 3. Why 3? Well for our purposes it really doesn't matter as long as we treat each player the same. One way of thinking about it is that 3 players are getting credit for a win, in a fair and balanced way. For an average team today that goes 81-81 in a season, the total win shares available to that team is 81 x 3 = 243. The players on the team are allotted shares of the 243 wins, based on how they contribute offensively and defensively.

The common challenge to win shares is that it must not be fair to good players on bad teams, and it won't be fair if all the runs scored on offense and all the runs allowed on defense are used to create the ratings. The reason that the win shares system works and is fair to all players, is that it uses *marginal* runs. Only the runs scored above 50% of the league average are used in the batting analysis, and only those runs allowed less than 150% of the league average are used for the defensive ratings. It's these marginal runs that are correlated to the team's wins. The use of marginal runs in the analysis, results in good players on bad teams taking a large share of the team's wins, and good players on

good teams taking a smaller share. The net effect is that they come out similar. The most dramatic example of a great player on a losing team is probably Nap Lajoie's 47 win shares (one of the highest in history) in 1910 with the Cleveland Naps who went 71-81 for the season.

Wins shares also does a good job in normalizing many differences in baseball that have occurred over time. They compare players' value relative to each other in the same league in the same year. So the players are all competing against each other under the same rules. If there is a rule change from one year to next, the players still compete relative to each other, so the rule change can be effectively normalized out. For example, the pitching mound was lowered in 1969 to increase offensive performance since it had been declining for many years. So it became easier to hit and batting averages went up in 1969. Roberto Clemente increased his batting average in 1969 but then the average MLB batting average went up in 1969. Theoretically, let's say players improved their offensive stats by 5% in 1969 and Clemente improved his by 5%. Clemente is not going to get 5% more win shares because he is competing relative to the other players for the same fixed number of wins. The effect of the lower pitching mound has been normalized out.

Now you might say that certain players may have an advantage over others with this change but we're not going there. If you want to go there, you might as well stop here, and forget about comparing any player to any other, because you can create millions of what ifs. We can only rate a player for what they do, when they do it. I think it's valid to make an adjustment to what they actually do to get differences between players on a more equal basis. But if you want to start trying to estimate what a player would do under a prior rule that's in the category of making up stats. The players play under the rules at the time, that's all we can go by. The baseball is still thrown by a pitcher, hit by a batter, and fielded by a fielder. The rules were not converted to cricket.

The win shares calculations are also adjusted for different eras because some statistics are not available in the earlier eras of baseball. The formulas are adjusted to credit contributions to the team's wins in as fair a way as possible using the available statistics from history. Bill James put a lot of thought into this system to make the values as fair and accurate as possible. The calculations also include an adjustment for differences in ball parks.

The concept of win shares is simple but the analysis is very complex. The most important thing is that the values that come out of this mathematical complexity actually make sense. It's made a huge leap in accurately determining player *value* ratings especially on defense. The concept is to assign shares of the team's wins to each player using their raw statistics. The goal in baseball is to win, so count up the team's wins and quantify each player's contribution to them. As I discussed previously, I will use Pythagorean wins instead of actual wins because Pythagorean wins are what the player should have created in a given season. The total league Pythagorean wins will not precisely add up to the actual wins which introduces a tiny amount of variability, but actual wins will introduce about 10 times more variability into the ratings, because of the random nature of how teams win games.

We have to give up the purity the win shares system which represents the "true" amount of players' wins, all of which precisely add up to the teams wins, to be able to compare players fairly across eras. Once we start making adjustments to the win share we lose the purity of the actual win, but we create a rating system that is much more fair and comparable between players.

The Basic Formula

My goal in developing this system is to put each player in history on the same basis using all their career stats. To get to a career rating, let's start with another performance rating, the batting average.

$$\text{Career Batting Average} = \frac{\text{Total hits}}{\text{Total at-bats}}$$

Using this as a guide, to generate a "complete" player rating, we would want total offense instead of just total hits and total offensive chances instead of at-bats…. and the same for defense.

$$\text{Career Performance Rating} = \frac{\text{Total offense}}{\text{Total offensive chances}} + \frac{\text{Total defense}}{\text{Total defensive chances}}$$

Win shares provides us with the total offensive and total defensive ratings, which I will convert to Pythagorean wins. These are *value* ratings, the total wins the player achieves in each season and, in sum, his career. The offensive chances are plate appearances, and the defensive chances…. innings are best.

$$\text{Career Rating} = \frac{\text{Total Offensive Pythagorean Wins}}{\text{Total Plate Appearances}} + \frac{\text{Total Defensive Pythagorean Wins}}{\text{Total Innings}}$$

If we could stop here the exercise would be very simple. Win shares (which are not simple to determine) are available for all players in major league history thanks to Bill James and Jim Henzler, and we have plate appearances and innings (or estimated innings from *Win Shares*) for each player as well. But win shares, as calculated, and the player's chances are not directly comparable across time and even within a season, so there are significant adjustments that need to be made to make them fair.

So the final basic formula becomes:

$$\text{Career Performance Rating} = \frac{\text{Total } \textit{Equal} \text{ Offensive Wins}}{\text{Total } \textit{Equal} \text{ Plate Appearances}} + \frac{\text{Total } \textit{Equal} \text{ Defensive Wins}}{\text{Total } \textit{Equal} \text{ Innings}}$$

This basic formula is used to create a cumulative rating for each age of the player. A final age adjustment is then made. After all the adjustments to make things "equal" we can then compare any two players and conclude who played better, on average, for their career.

The Career Rating

A career *performance* rating is the best way to objectively compare any two players' ability to play baseball. Players get thousands of chances on offense and defense over their careers. If we measure their total "successes" and divide them by their

thousands of "chances" we can get an accurate measure of their performance and how they compare to other players. In creating the ratings for MLB players, I measure them based on their entire career.

The ratings are completely objective… they fall where they fall, and the rating system is applicable for any player, except pitchers. I tried to include pitchers, but their ratings are several times higher than position players when put on the same basis. There is no way to objectively compare pitchers to position players using a performance rating because the role of the pitcher is so different. A separate system will have to be developed for pitchers. There is no subjective element in the career performance rating. If you want to make a minor subjective adjustment, go right ahead.

Players have to have a minimum of 3000 plate appearances (or close for 19th century players) to qualify in the rankings, but of course I can rate any player. You will find quite a few instances where players who have a relatively low number of plate appearances, say 3000 or 4000, are better *performers* than some players that may have say 10,000 plate appearances. The performance ratings measure their quality of play. Separate career value ratings measure their quantity of wins.

Player wins are determined by the *Win Shares* rating system, converted to Pythagorean wins, and equal chances are defined as plate appearances and/or innings, which are all adjusted so they are as comparable as possible. The performance ratings are normalized to a season basis (650 plate appearances and 1320 innings) so you can think of the ratings as the player's contribution to the number of wins in an average, full season.

The Method

The 5 steps that are required to derive a fair player performance rating are:

1. Portioning team Pythagorean wins to the player starting with his win shares by season
2. Adjusting wins for the talent level in the leagues over time
3. Normalizing the player's chances to account for differences between teams
4. Computing a cumulative performance rating for each age of the player
5. Adjusting for player age to achieve the final rating

1. Player Pythagorean Wins

Win shares, based on Bill James' formulas in *Win Shares*[1], for each player's season, are converted to player Pythagorean wins using the correlations in Figure 1. This assigns a reasonably accurate portion of the team's expected wins to each player in each season.

2. Talent Level

As MLB progressed from its inception in 1871 (or 1876), the talent level of the players has gradually improved. In the 1870's, the game was localized to the Northeast/Northcental US, and the vast majority of players came from these areas. There weren't any Latin American players, Asian players, or even players from California. Over time the number of teams and players has increased but so has the geographical range and populations from which players have come. And the game will become even more international with time, continuing to draw on larger and larger populations.

The population from which players are drawn has increased at a faster rate than the number of players in the leagues. In 1901, at the time of the formation of the AL, players were exclusively drawn from the US population at a level of no more than about 4 million per team. In 2001 players were drawn from the US, Canada, Latin America, Japan, and other countries at a level of at least 15 million per team. So not only is talent increasing with time, it is also being drawn from larger populations. This results in an increase in the overall talent of *all* the players in the leagues. The top talent in baseball is better today but so is the bottom level talent. And it is the bottom talent in the leagues that has actually improved more over time.

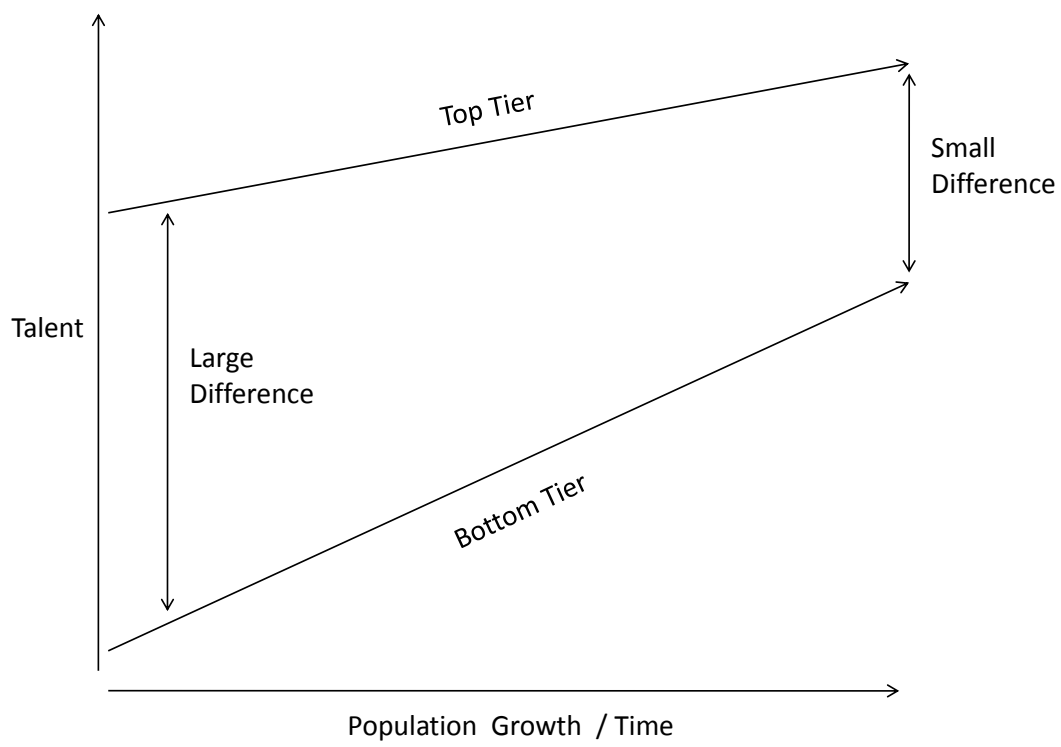


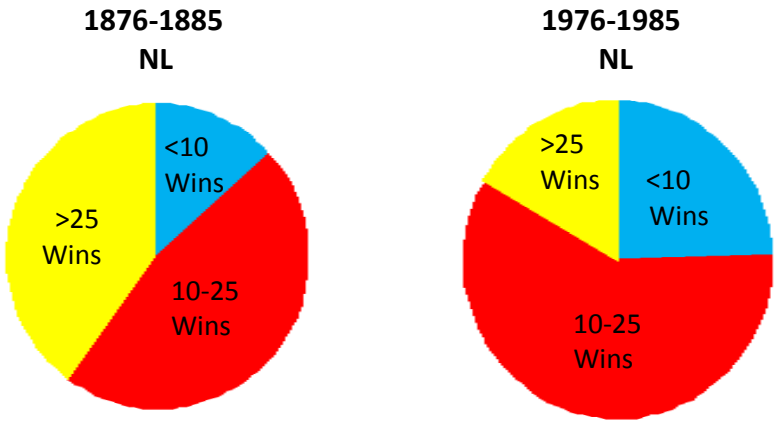
Figure 2. The narrowing of the talent level occurs when the population growth rate exceeds the growth rate of the players in the leagues.

In the 19th century there were a lot of marginal players in the leagues, but today every single player who makes it to the majors is an incredibly good baseball player. With such a large talent pool today, teams can fill up the lower level with very talented players, resulting in a smaller difference between the worst and best players in the leagues. This is not a new concept. Gould proposed this basic idea in 1996 in *Full House*[5].

The improvement of the lower level players makes it harder for today's top level talent to gain wins than it did the best players from a hundred years ago. This is a problem with the win shares system when we want to compare players between eras because wins shares measures relative value at a point in time.

The number of wins is fixed in each season based on the number of games played, that does not change. In a league where there are a lot of really bad players (in the early years of baseball), these players will not take many wins from the pie. But in a league where there are a lot of good lower tier players (today), they will manage to get a win, or 2, or 3 reducing the wins available for everyone else.

In the first decade of MLB, about 40% of the wins went to the players who get at least 25 wins in a season. 100 years later only about 17% of the available wins went to those getting more than 25 wins. The better players' slice of the pie (the yellow section) has gradually gotten smaller with time… it has become harder for them to gain wins.



In 1876 the everyday left fielder for the Cincinnati Red Stockings was Redleg Snyder. Redleg was the worst everyday player in the history of MLB as far as I can tell. He was not able to get even a fraction of a win for the entire season. He is the extreme case but there were a lot of poor everyday players in the 19th century. Poor players take very few wins from the pie, making them available to the others. As time has progressed, the quality of the lower tier players has improved. These players are able to gain a few wins, making fewer available for the better players.

Here are the MVP's and the LVP's (least valuable players) from the first season of MLB and a recent season in the NL for everyday players, normalizing their wins to a 162 game season.

	MVP	LVP
1876	Ross Barnes - 53 wins	Redleg Snyder - 0 wins
2008	Albert Pujols - 35 wins	Jeff Francoeur - 7 wins

The difference in talent between Barnes and Redleg is very large, mainly because Redleg is so bad. The difference between Pujols and Francour is much smaller, even though Pujols is a top 10 player all-time, mainly because Francour is not that bad of a player.

It is far more difficult for Pujols to gain wins today that it was for Barnes in 1876. If we compare them directly without an adjustment for time, Barnes will look better than he is, and Pujols will look worse than he really is. We have to make an adjustment for time to be able to more fairly compare their relative ability.

The spread in the talent difference between the worst and best players in the league can be used to make the adjustment for time. This spread can be quantified using a basic statistic called the standard deviation (SD). There are all kinds of adjustments that need to be made to the SD due to league expansions, years of war, and the PED era which affected the talent level in the leagues.

Here is what I have determined is the inverse in the strength of the league talent using the adjusted SD. The higher the adjusted SD, the weaker the talent level and the easier it is to gain wins.

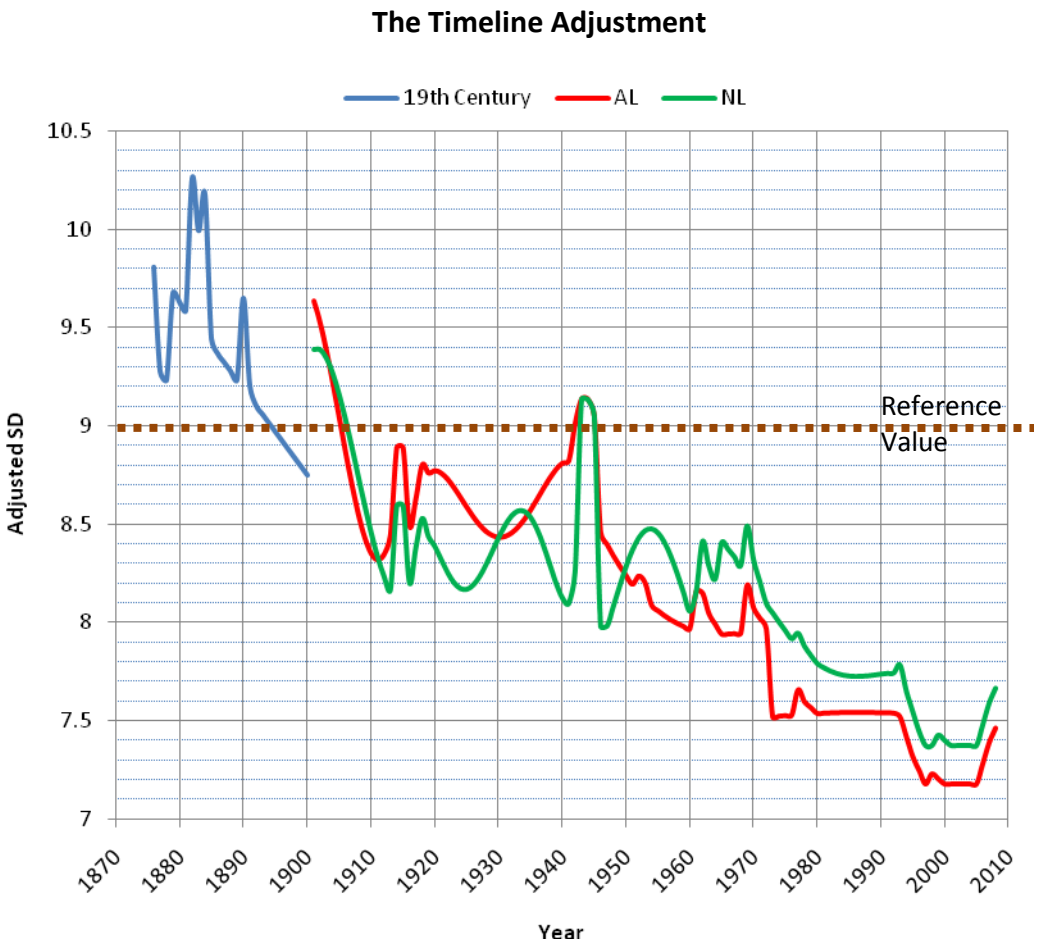


Figure 1. The adjusted standard deviation of player Pythagorean wins (normalized to 162 game seasons) throughout history, reflecting the ease/difficulty in achieving wins. Leagues are combined in the 19th century because of the instability in the leagues and fewer players. Leagues are separated beginning in 1901 (note that the formation of the new AL league resulted in a significant dilution of talent and increase in both league SD's in 1901). Spikes (up or down) are due to league expansions/contractions, years of war, introduction of the designated hitter, or the PED era.

For each player in each year their wins are adjusted by the applicable value in Figure 3 relative to a fixed baseline value (of 9.0… there is nothing magical about the reference value). This will enable fairer comparisons of players across time.

3. The Chances

- Plate Appearances

As teams win more they will tend to get more plate appearances. Actually the more they win from their offensive run production the more plate appearances they will tend to get. So a team will have an expected number plate appearances based on their

offensive Pythagorean wins. But there is considerable variation in how teams actually get plate appearances, the largest of which is due to differences in the game across time. In 1893 the pitcher's mound was moved back about 10 feet to its current distance of 60 feet 6 inches which resulted in the highest offensive environment in the history of baseball. Less than 10 years after that the leagues were in their lowest offensive environment, the dead ball era. It's no coincidence that the team with the highest number of plate appearances per game came in 1893 and the team with the lowest came from the dead ball era. Other factors that introduce variability in how teams get plate appearances include ball park effects, the effect of the pitcher hitting in the lineup over time, the designated hitter, and the number of extra inning or shortened games. And then there is just normal variability.

To generate the offensive component of the player performance rating we need to divide his offensive wins by his plate appearances. The pool of wins in the league in any year is always fixed as the number of games. But the plate appearances by the teams and therefore the players on the team vary due to the factors I described above. Generating a performance rating for a player from a team in 1893 will result in a lower rating than it should be because we are dividing a fixed number of wins by a larger number of plate appearances. And the opposite is true for a player from the dead ball era. So I correct the player's plate appearances each season by a factor, defined as the team's expected plate appearances (the trend line in Figure 4) divided by the team's actual plate appearances (the appropriate data point in Figure 4). This corrects for variations in plate appearances that do not affect the way players gain wins.

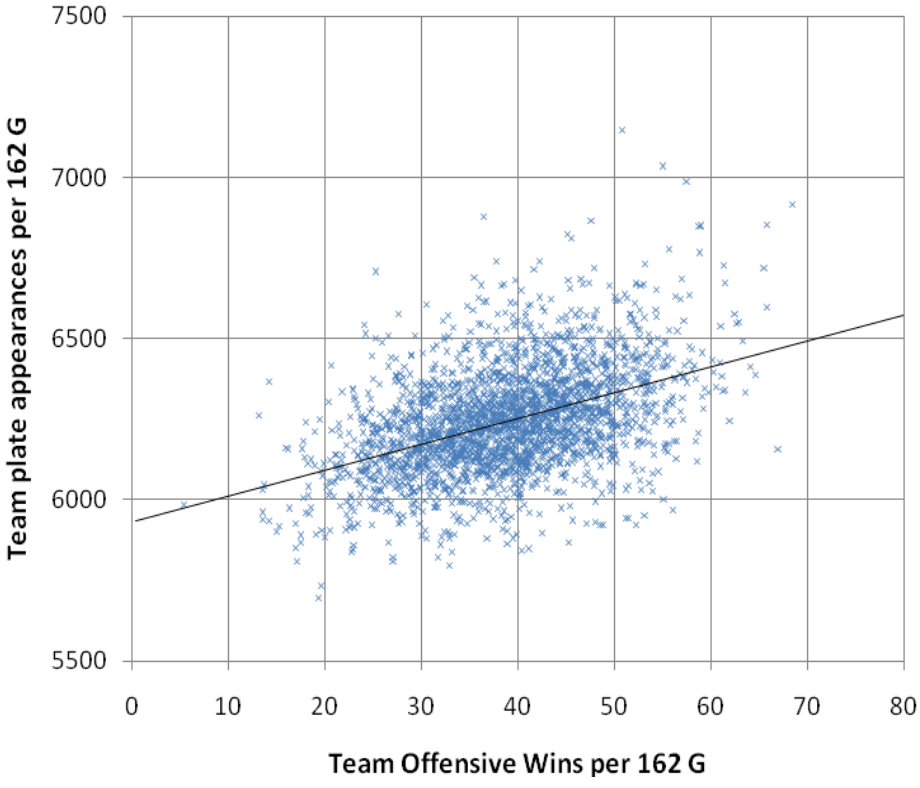


Figure 4. Team plate appearances vs. their offensive wins. The trend line reflects the expected team plate appearances for a given amount of offensive wins.

- Innings

It is best to use innings as the basis for fielding chances. Innings are all the same throughout the history of baseball so we don't have to adjust them, except that I add 9 innings for each game a player is playing DH. Because we have the batting ratings on a plate appearance basis we need to use the right number of innings that equate to one plate appearance… it's not 1:1. It is actually almost exactly 2:1 so I'll put the fielding wins on a 2 inning basis (actually 2.03). That puts the all players on an equal basis and is fine for play beginning in 1954 but before that we don't have innings. In that case estimated innings are used in *Win Shares*[1].

4. The Career Rating

The career rating is calculated for each year of play by summing all the player's stats to that year. The batting wins are put on a basis of 650 plate appearances and the fielding wins on a basis of 1320 innings, about a full season for a player. The overall rating is the sum of the two.

The development of a career rating for each year enables the calculation of an adjustment for age using the derivative of the career rating, i.e the change in the rating versus the prior year.

5. Player Age

My point of view in creating the career rating is that we have to use all of the player's statistics. We should not be discarding portions of their careers or adding or projecting what it might become beyond when they retire. They did what they did… it all counts.

Players retire at different ages. So how do you compare say, Tony Kubek who retired at age 29 because he had back problems, to say, Rickey Henderson who played through age 44? We don't have to adjust Kubek because age is not affecting his performance, but at some point we have to adjust Henderson because the effects of age will set in and begin to reduce his performance. By just averaging out Henderson's stats including the years he plays past age 29 is not fair to him because he is declining in many of these "out" years and his career average will go down.

Before making the age correction, the player's stats in their declining seasons have to be normalized to compare them fairly. Let's say Player A and Player B are performing at the same level at age 38. That is they are creating the same number of wins per chance but they are both performing significantly worse than they have been on average over their career, which is very typical for any player at this age. Player A played the full season but Player B only played about half the season. When we combine all the player stats after age 38, Player A declines more because he played more, and player B declines less because he played less. That is not fair to Player A. So I will normalize the players season to a full season (pegged to 4 times the number of games played in plate appearances) starting when age effects begin to occur, if their career rating is declining and if the player is playing enough to normalize the season (>15% of a full season). If the player is playing at 15% of a full season or less, their rating will not change when applying the age adjustment. If the career rating is increasing I do not make any adjustment.

To correct for the decline in a players performance with age I first compute the rate at which an average player's career performance declines with age, the *baseline derivative* of the career rating. To do this I used 349 players from all eras (except the PED era) and all positions, who have continuous play from their mid-20's until their retirement at ages from 34-45.

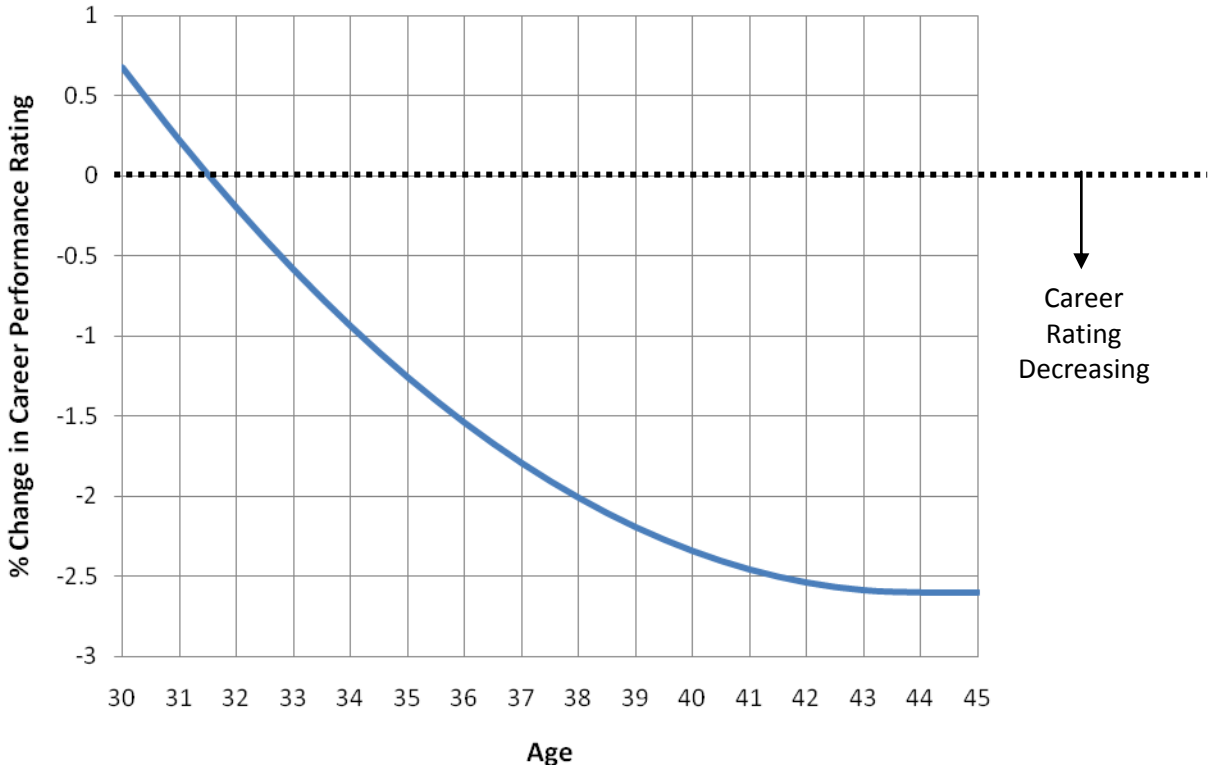


Figure 5. The baseline derivative of the career performance rating developed from 349 players with continuous play from their mid 20's to their retirement age of at least 34. This is the average change in the career rating with age. After age 31 the average player's career rating begins to decline.

To make the correction for age I will subtract out the rate at which the typical player declines after age 31 from the actual rate of the player to re-adjust the career rating.

For example if a "good" player perfectly follows the typical career progression he will peak at a career rating of 25. If he retires at any age after 31 his career rating will be maintained at 25 with the correction for age (Figure 6).

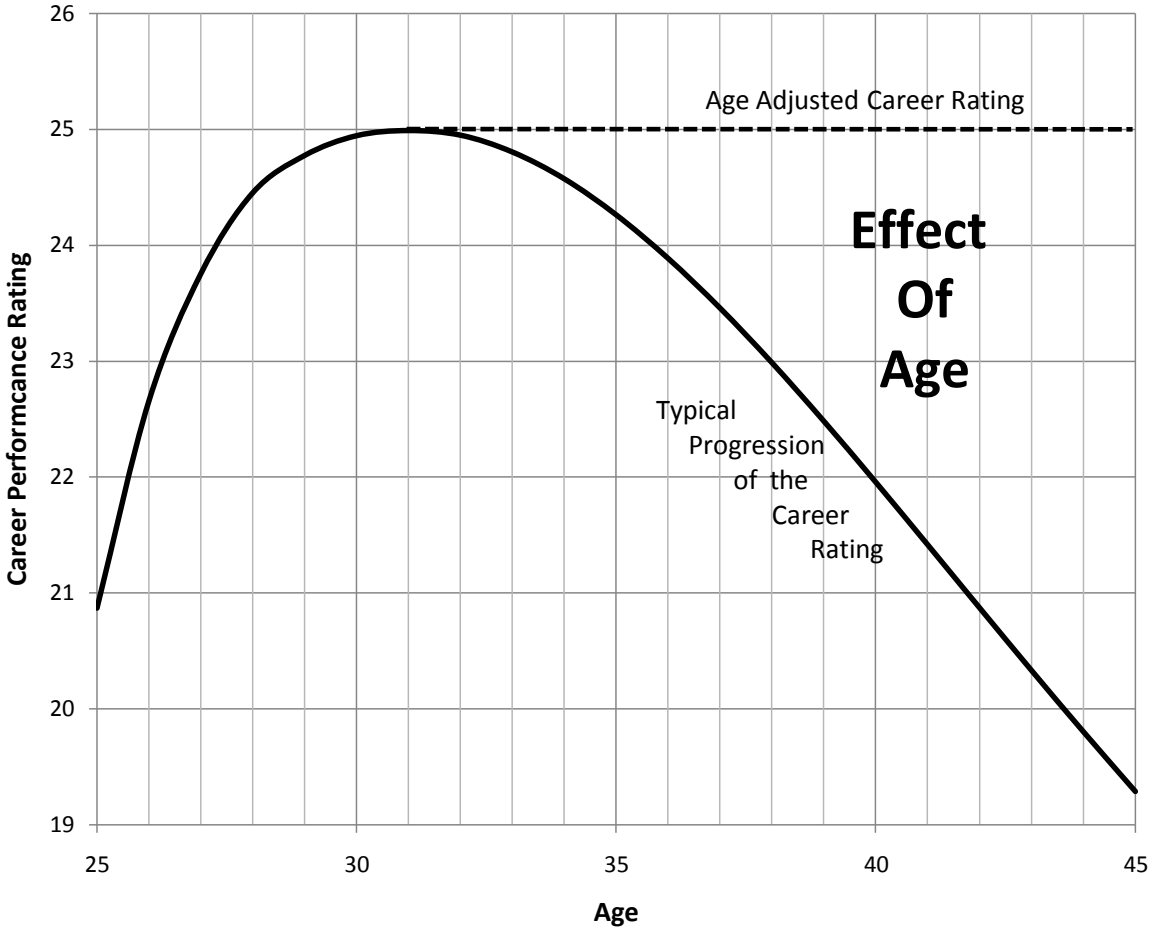


Figure 6. Example of a typical career rating progression for a "good" player,showing the effect of aging. The curve represents the cumulative player's stats to that age, not season by season performance.

The 3 steps that are required to develop the career value rating are:

1. Portioning team Pythagorean wins to the player starting with his win shares by season
2. Adjusting wins for the talent level in the leagues over time
3. Normalizing the player's seasons to 162 games

Steps 1 and 2 are the same as used to develop the performance rating, and step 3 is a simple multiplying factor to normalize all players' seasons to 162 games. The player's career value rating is the sum of the adjusted wins per season.

Example Calculation

I'll use Mike Schmidt as the example of how I calculate the player's career ratings, which includes an overall rating as well as separate batting (includes all offense), and fielding ratings.

- Career Performance

1. The first step is to calculate batting and fielding Pythagorean wins from Schmidt's win shares in each year. This is done by multiplying the batting and fielding wins in each year by the ratio of the team's Pythagorean winning percentage to their actual winning percentage.

Table1. Calculation of Pythagorean batting and fielding wins from win shares.

		A	B	C	D	E	F	G	H	I	J	K
Year	Team	Team Runs Scored	Team Runs Allowed	Pythag Win %	Team Wins	Team Losses	Actual Win %	Pythag / Actual Win %	Bat Win Shares	Field Win Shares	Pythag Bat Wins	Pythag Field Wins
				A^2 x 100/ (A^2 + B^2)			D x 100 /(D + E)	C / F			H x G	I x G
1972	PHI	503	635	38.6	59	97	37.8	1.019	0.3	0.4	0.3	0.4
1973	PHI	642	717	44.5	71	91	43.8	1.015	6.7	3.4	6.8	3.5
1974	PHI	676	701	48.2	80	82	49.4	0.976	30.1	8.6	29.4	8.4
1975	PHI	735	694	52.9	86	76	53.1	0.996	22.1	5.8	22.0	5.8
1976	PHI	770	557	65.6	101	61	62.3	1.053	28	7.5	29.5	7.9
1977	PHI	847	668	61.7	101	61	62.3	0.989	27	5.8	26.7	5.7
1978	PHI	708	586	59.3	90	72	55.6	1.068	17.7	5.1	18.9	5.4
1979	PHI	683	718	47.5	84	78	51.9	0.916	26.7	6.6	24.5	6.0
1980	PHI	728	639	56.5	91	71	56.2	1.006	30.7	6.7	30.9	6.7
1981	PHI	491	472	52.0	59	48	55.1	0.943	25.8	3.7	24.3	3.5
1982	PHI	664	654	50.8	89	73	54.9	0.924	30.8	5.8	28.5	5.4
1983	PHI	696	635	54.6	90	72	55.6	0.982	28	7.1	27.5	7.0
1984	PHI	720	690	52.1	81	81	50.0	1.043	20.9	4.8	21.8	5.0
1985	PHI	667	673	49.6	75	87	46.3	1.070	23.7	2.5	25.4	2.7
1986	PHI	739	713	51.8	86	75	53.4	0.970	26.6	4.5	25.8	4.4
1987	PHI	702	749	46.8	80	82	49.4	0.947	19.5	6.6	18.5	6.3
1988	PHI	597	734	39.8	65	96	40.4	0.986	11.6	2.5	11.4	2.5
1989	PHI	629	735	42.3	67	95	41.4	1.022	2.1	0.6	2.1	0.6

2. The Pythagorean wins in each year are adjusted for the differences in the talent level of the leagues across history. This is done by multiplying the wins by the ratio of the adjusted standard deviation given in Figure 1, to a reference value (9.0). The batting and fielding wins are readjusted depending on the quality of the "ninth" batter (this adjustment gets mathematically complex… it does not change the overall rating, but just shifts the batting and fielding ratings back to the right proportions).

Table 2. The timeline adjustment

		J	K	L	M	N	O	P	Q	R
Year	League	Pythag Bat Wins	Pythag Field Wins	Adj SD	Reference	Adj Bat Wins	Adj Field Wins	Fraction of Bat Wins from 9th hitter*	Time adj. Bat Wins	Time adj. Field Wins
						J x M/L	K x M/L		N+O-R	O/{1-[(-P x N) / (N+O)]}
1972	NL	0.3	0.4	8.10	9	0.3	0.5	-0.066	0.3	0.5
1973	NL	6.8	3.5	8.05	9	7.6	3.9	-0.066	7.4	4.0
1974	NL	29.4	8.4	8.00	9	33.0	9.4	-0.065	32.5	9.9
1975	NL	22.0	5.8	7.96	9	24.9	6.5	-0.065	24.5	6.9
1976	NL	29.5	7.9	7.92	9	33.5	9.0	-0.064	33.0	9.5
1977	NL	26.7	5.7	7.95	9	30.2	6.5	-0.063	29.9	6.9
1978	NL	18.9	5.4	7.88	9	21.6	6.2	-0.063	21.3	6.5
1979	NL	24.5	6.0	7.83	9	28.1	6.9	-0.062	27.7	7.3
1980	NL	30.9	6.7	7.79	9	35.7	7.8	-0.061	35.2	8.2
1981	NL	24.3	3.5	7.77	9	28.2	4.0	-0.061	27.9	4.3
1982	NL	28.5	5.4	7.75	9	33.0	6.2	-0.060	32.7	6.6
1983	NL	27.5	7.0	7.74	9	32.0	8.1	-0.059	31.6	8.5
1984	NL	21.8	5.0	7.73	9	25.4	5.8	-0.059	25.1	6.1
1985	NL	25.4	2.7	7.73	9	29.5	3.1	-0.058	29.4	3.3
1986	NL	25.8	4.4	7.73	9	30.0	5.1	-0.057	29.8	5.3
1987	NL	18.5	6.3	7.73	9	21.5	7.3	-0.056	21.2	7.6
1988	NL	11.4	2.5	7.73	9	13.3	2.9	-0.055	13.2	3.0
1989	NL	2.1	0.6	7.73	9	2.5	0.7	-0.055	2.5	0.7

* = $-9.160 \times 10^{-8} (\text{year})^3 + 5.531\ 10^{-4} (\text{year})^2 - 1.113 (\text{year}) + 745.487$
except for play in the AL after 1972, in which the value used is 0.08.

3. The plate appearances each year are adjusted by the ratio of the expected team plate appearances (based on the team's Pythagorean batting wins) to the actual team plate appearances in Figure 4.

Table 3. Plate appearance adjustment

		S	T	U	V	W
Year	Team	Team Bat Wins per 162 G	Exp. Team PA per 162 G	Team PA per 162 G	PA	Adj PA V x T/U
1972	PHI	23.6	6119	6087	40	40
1973	PHI	31.6	6183	6156	443	445
1974	PHI	37.1	6227	6117	686	698
1975	PHI	44.5	6286	6363	674	666
1976	PHI	51.0	6338	6236	705	717
1977	PHI	53.4	6357	6290	667	674
1978	PHI	44.9	6289	6152	616	630
1979	PHI	39.1	6243	6219	675	678
1980	PHI	43.7	6280	6265	652	654
1981	PHI	49.3	6324	6270	434	438
1982	PHI	40.6	6255	6107	631	646
1983	PHI	41.6	6262	6218	669	674
1984	PHI	45.0	6290	6283	632	633
1985	PHI	38.2	6236	6122	645	657
1986	PHI	43.5	6278	6268	657	658
1987	PHI	32.7	6192	6190	613	613
1988	PHI	34.4	6205	6092	451	459
1989	PHI	37.7	6231	6126	172	175

4. A career rating is calculated from the adjusted wins, adjusted plate appearances, and innings for each year. For play before 1954 estimated innings are used from *Win Shares.* The wins, plate appearances, and innings are summed up to each year to obtain cumulative values to each year. The career rating is calculated based on 650 plate appearances and 1320 innings, what I define as a full season of play.

Table 4. Calculation of the career rating for each year.

	J	K	W	X	Y	Z	AA	BB	CC
Year	Adj Bat Wins	Adj Field Wins	Adj PA	Inn	Sum adj Bat Wins	Sum adj Field Wins	Sum adj PA	Sum Inn	Career Rating
					Sum J	Sum K	Sum W	Sum X	(Y x 650/AA) + (Z x 1320/BB)
1972	0.3	0.5	40	84	0.3	0.5	40	84	12.61
1973	7.4	4.0	445	964	7.8	4.5	485	1048	16.06
1974	32.5	9.9	698	1433	40.3	14.4	1183	2481	29.80
1975	24.5	6.9	666	1396	64.8	21.3	1849	3877	30.04
1976	33.0	9.5	717	1424	97.8	30.8	2566	5301	32.45
1977	29.9	6.9	674	1310	127.7	37.6	3240	6611	33.14
1978	21.3	6.5	630	1216	149.0	44.2	3870	7827	32.47
1979	27.7	7.3	678	1353	176.7	51.5	4547	9180	32.66
1980	35.2	8.2	654	1315	212.0	59.7	5201	10495	34.00
1981	27.9	4.3	438	849	239.9	63.9	5638	11345	35.09
1982	32.7	6.6	646	1296	272.6	70.5	6285	12641	35.55
1983	31.6	8.5	674	1340	304.2	79.0	6958	13981	35.87
1984	25.1	6.1	633	1234	329.2	85.1	7591	15215	35.57
1985	29.4	3.3	657	1330	358.6	88.4	8248	16545	35.31
1986	29.8	5.3	658	1316	388.4	93.7	8906	17861	35.27
1987	21.2	7.6	613	1223	409.6	101.3	9519	19084	34.97
1988	13.2	3.0	459	901	422.8	104.3	9979	19985	34.43
1989	2.5	0.7	175	340	425.2	105.1	10154	20325	34.04

5. The adjustment for age is made beginning at age 32.

   a. If the career rating is declining compared to the prior year, and total play is more than 15% of a full season (defined as 4 times the number of team games in plate appearances), the season is normalized to a full season. If the career rating is increasing no adjustment is made. If the player is not playing for whatever reason, or is playing a small number of games (≤15% of a normal season's plate appearances), the player's career average will not change after applying the age adjustment.

Table 5a. Normalizing partial seasons beginning at age 32.

		CC	J	K	W	X	Y	Z	DD	EE	FF	GG
Year	Age	Career Rating	Adj Bat Wins	Adj Field Wins	Adj PA	Inn	Games per season	PA per full season	Norm. Bat Wins	Norm. Field Wins	Norm. PA	Norm. Inn
								Y x 4	J x Z/W	K x Z/W	W x Z/W	X x Z/W
1972	22	12.61	0.3	0.5	40	84						
1973	23	16.06	7.4	4.0	445	964						
1974	24	29.80	32.5	9.9	698	1433						
1975	25	30.04	24.5	6.9	666	1396						
1976	26	32.45	33.0	9.5	717	1424						
1977	27	33.14	29.9	6.9	674	1310						
1978	28	32.47	21.3	6.5	630	1216						
1979	29	32.66	27.7	7.3	678	1353						
1980	30	34.00	35.2	8.2	654	1315						
1981	31	35.09	27.9	4.3	438	849						
1982	32	35.55	32.7	6.6	646	1296	162	648	32.7	6.6	646	1296
1983	33	35.87	31.6	8.5	674	1340	162	648	31.6	8.5	674	1340
1984	34	35.57	25.1	6.1	633	1234	162	648	25.7	6.3	648	1264
1985	35	35.31	29.4	3.3	657	1330	162	648	29.4	3.3	657	1330
1986	36	35.27	29.8	5.3	658	1316	162	648	29.8	5.3	658	1316
1987	37	34.97	21.2	7.6	613	1223	162	648	22.4	8.0	648	1292
1988	38	34.43	13.2	3.0	459	901	162	648	18.6	4.2	648	1271
1989	39	34.04	2.5	0.7	175	340	162	648	9.1	2.8	648	1259

In Schmidt's case, only years 1984, 1987, 1988, and 1989 are normalized to a full season, because, he is either increasing his career rating, or already playing a full season for the other years after age 31.

b. The career ratings by age are re-calculated using the normalized seasons.

Table 5b. Calculation of career ratings using normalized seasons in player's declining years.

	J or DD	K or EE	FF	GG	HH	II	JJ	KK	LL	MM	NN
Age	Norm. Bat Wins	Norm. Field Wins	Norm. PA	Norm. Inn	Sum Final Bat Wins	Sum Final Field Wins	Sum Final PA	Sum Final Inn	Bat Career Rating	Field Career Rating	Overall Career Rating
					Sum DD	Sum EE	Sum FF	Sum GG	HH x 650 / JJ	II x 1320 /KK	LL + MM
22	0.3	0.5	40	84	0.3	0.5	40	84	5.28	7.33	12.61
23	7.4	4.0	445	964	7.8	4.5	485	1048	10.39	5.67	16.06
24	32.5	9.9	698	1433	40.3	14.4	1183	2481	22.12	7.68	29.80
25	24.5	6.9	666	1396	64.8	21.3	1849	3877	22.78	7.26	30.04
26	33.0	9.5	717	1424	97.8	30.8	2566	5301	24.79	7.66	32.45
27	29.9	6.9	674	1310	127.7	37.6	3240	6611	25.63	7.51	33.14
28	21.3	6.5	630	1216	149.0	44.2	3870	7827	25.03	7.45	32.47
29	27.7	7.3	678	1353	176.7	51.5	4547	9180	25.26	7.40	32.66
30	35.2	8.2	654	1315	212.0	59.7	5201	10495	26.49	7.50	34.00
31	27.9	4.3	438	849	239.9	63.9	5638	11345	27.66	7.44	35.09
32	32.7	6.6	646	1296	272.6	70.5	6285	12641	28.20	7.36	35.55
33	31.6	8.5	674	1340	304.2	79.0	6958	13981	28.41	7.46	35.87
34	25.7	6.3	648	1264	329.9	85.3	7606	15245	28.19	7.38	35.57
35	29.4	3.3	657	1330	359.2	88.5	8263	16575	28.26	7.05	35.30
36	29.8	5.3	658	1316	389.0	93.9	8922	17891	28.34	6.92	35.27
37	22.4	8.0	648	1292	411.4	101.9	9570	19183	27.94	7.01	34.95
38	18.6	4.2	648	1271	430.0	106.2	10218	20455	27.35	6.85	34.20
39	9.1	2.8	648	1259	439.1	108.9	10866	21714	26.27	6.62	32.89

c. The age adjustment is applied to each year starting at age 32 using the baseline derivative in Figure 5 for the data in column PP in Table 5c. The last year is then re-adjusted to the actual play because most players are playing only a fraction of a season in their last year which can skew the final rating down too much if normalized to a full season.

Table 5c. Applying the age adjustment to the overall career rating, and re-adjusting the final year.

	NN	OO	PP	QQ	RR	W	Z	SS
Age	Overall Career Rating before age adj	% Rate of Change vs Prior Year	Baseline % Rate of Change	Diff vs baseline	Age Adj Overall Career Rating	Last Year Adj PA	PA per full season	Final Overall Career Rating
		[(NN/prior yr NN)-1] x 100		OO-PP	After age 31 Prior yr RR x [1+(QQ/100)]			Prior yr RR x [1+(QQ/100 x W/Z)]
22	12.61				12.6			
23	16.06				16.1			
24	29.80				29.8			
25	30.04				30.0			
26	32.45				32.4			
27	33.14				33.1			
28	32.47				32.5			
29	32.66				32.7			
30	34.00				34.0			
31	35.09				35.1			
32	35.55	1.307	-0.198	1.505	35.6			
33	35.87	0.892	-0.585	1.477	36.1			
34	35.57	-0.845	-0.938	0.093	36.2			
35	35.30	-0.735	-1.257	0.522	36.4			
36	35.27	-0.111	-1.542	1.431	36.9			
37	34.95	-0.886	-1.793	0.907	37.2			
38	34.20	-2.150	-2.010	-0.140	37.2			
39	32.89	-3.843	-2.193	-1.649	36.6	175	648	37.0

d. The same calculation is done for the batting rating.

Table 5d. Applying the age adjustment to the batting career rating, and re-adjusting the final year.

	LL	TT	UU	VV	WW	W	Z	XX
Age	Batting Career Rating before age adj	% Rate of Change vs Prior Year	Baseline % Rate of Change	Diff vs baseline	Age Adj Batting Career Rating	Last Year Adj PA	PA per full season	Final Batting Career Rating
		[(LL/prior yr LL)-1] x 100		TT-UU	After age 31 Prior yr WW x [1+(VV/100)]			Prior yr RR x [1+ (QQ/100 x W/Z)]
22	5.28			5.3				
23	10.39			10.4				
24	22.12			22.1				
25	22.78			22.8				
26	24.79			24.8				
27	25.63			25.6				
28	25.03			25.0				
29	25.26			25.3				
30	26.49			26.5				
31	27.66			27.7				
32	28.20	1.943	-0.198	2.142	28.2			
33	28.41	0.777	-0.585	1.362	28.6			
34	28.19	-0.799	-0.938	0.139	28.7			
35	28.26	0.245	-1.257	1.502	29.1			
36	28.34	0.302	-1.542	1.844	29.6			
37	27.94	-1.405	-1.793	0.388	29.8			
38	27.35	-2.109	-2.010	-0.099	29.7			
39	26.27	-3.966	-2.193	-1.773	29.2	175	648	29.6

e. The fielding rating can be calculated similarly or it's just simpler to subtract the batting rating from the overall rating.

Final Career Fielding Rating = 37.0 – 29.6 = 7.4

Mike Schmidt's final performance ratings are:

Overall	37.0
Offense	29.6
Fielding	7.4

This example rounds values just for demonstration purposes. I'm actually using 15 significant digits in computing the ratings so there is no loss in accuracy.

I also provide a rating category using the key below. Schmidt's performance rating categories are:

Overall:	Great +
Offense:	Great
Fielding:	Good +

The fielding category is based on the players fielding contribution to the team, not how they field their position. This will result in most shortstops and catchers having above average rating categories and 1st basemen having below average categories because this is how they contribute to winning with their gloves. Schmidt's overall fielding category is good+ based on his contribution to the team. He is one of the best fielding 3rd baseman of all-time, but 3rd base is of average importance relative to the other fielding positions. You can also compare him vs an average 3rd baseman using the average fielding ratings key by position (see below).

- Career Value

I also compute normalized, time adjusted career value ratings. Just remember when looking at career value you have to understand the circumstances around the player's career.

The Pythagorean player wins, adjusted for time, in Table 2 are normalized to a 162 game season based on the games the team actually played each year. The normalized wins for each season are summed to achieve their career wins.

Table 6. Calculation of career value.

		Q	R	YY	ZZ	AAA	BBB
Year	Team	Time adj Batting Wins	Time adj Fielding Wins	Team Games	Final Batting Wins	Final Fielding Wins	Final Overall Wins
					Q x 162/YY	R x 162/YY	ZZ + AAA
1972	PHI	0.3	0.5	156	0.3	0.5	0.8
1973	PHI	7.4	4.0	162	7.4	4.0	11.5
1974	PHI	32.5	9.9	162	32.5	9.9	42.5
1975	PHI	24.5	6.9	162	24.5	6.9	31.4
1976	PHI	33.0	9.5	162	33.0	9.5	42.5
1977	PHI	29.9	6.9	162	29.9	6.9	36.7
1978	PHI	21.3	6.5	162	21.3	6.5	27.8
1979	PHI	27.7	7.3	162	27.7	7.3	35.0
1980	PHI	35.2	8.2	162	35.2	8.2	43.4
1981	PHI	27.9	4.3	107	42.3	6.5	48.8
1982	PHI	32.7	6.6	162	32.7	6.6	39.2
1983	PHI	31.6	8.5	162	31.6	8.5	40.1
1984	PHI	25.1	6.1	162	25.1	6.1	31.2
1985	PHI	29.4	3.3	162	29.4	3.3	32.7
1986	PHI	29.8	5.3	161	30.0	5.4	35.3
1987	PHI	21.2	7.6	162	21.2	7.6	28.8
1988	PHI	13.2	3.0	161	13.3	3.0	16.3
1989	PHI	2.5	0.7	162	2.5	0.7	3.2
Sum					440	107	547

Schmidt's career value ratings (as total wins) are:

Overall	547
Offense	440
Fielding	107

Career Performance Rating Key

An average player in this system is rated at about 20 overall. An average rating for a batter is about 15, and a fielder about 5. Fielding ratings vary by position so the average by position is provided as well. Rating categories are provided using the following key.

Performance

Category	Overall	Batting	Fielding**	C	1B	2B	3B	SS	LF	CF	RF
Elite	40	37.0	11.5								
Great	35	31.5	9.9								
Excellent	30	25.9	8.4								
Good	25	20.4	6.8								
Average	**20**	**14.8**	**5.2**	**8.0**	**2.5**	**6.2***	**5.5***	**7.6**	**3.5**	**5.3**	**3.5**
Below Avg	15	10.0	3.6								
Poor	10	5.3	2.1								
Terrible	5	0.5	0.5								

	2B	3B
<1930	**5.5**	**6.3**
1930-1945	**5.9**	**5.9**
>1945	**6.8**	**5.1**

*2B and 3B have changed over time

**A position is indicated for each player in the reference section which where he played the most games, however the fielding rating is from his total defensive play at all positions. So, for example, Ernie Banks is listed at 1B but he played about 45% of his career at shortstop. If you compare his fielding rating to other 1st basemen he appears to be the best fielding 1st baseman in history, but much of his career fielding rating is coming from his play at shortstop. You have to know the details around the player's defensive career to fully understand his fielding rating. Additionally, the performance category is based on the player's contribution to winning games, not on how he fields his position.

Hall of Fame Criteria

For induction into the HoF I recommend the following minimum criteria. It's slightly more difficult for shortstops to obtain the same overall performance than other position players so I reduce the hurdle for shortstops, but only slightly. It's more difficult for catchers to create the same career value as other position players so I reduce the hurdle for catchers by a substantial amount.

	All, except SS	All except C	Shortstop	Catcher
(1) Overall Career Performance	≥ 28.0	--	≥ 27.0	--
(2) Overall Career Value	--	≥ 375	--	≥ 300

Subjective adjustments to each rating, if appropriate, are defined in the Results Section.

The Results

In a Nutshell

- Babe Ruth is Superman
- Fielding is overrated
- Walking is underrated
- Batting average doesn't mean that much
- Barry Larkin is a slam dunk for the Hall of Fame
- If you're already in the Hall of Fame, you may or may not be a Hall of Famer

Best 3

1. Babe Ruth comes out #1 regardless of how I do the analysis… regardless of how anybody does the analysis for that matter. There seems to be little doubt he is the best position player of all time. Not only could he hit, he could walk.
2. Ted Williams is second, by a pretty wide margin. He is usually ranked lower, on average around 6th as best I can tell, being downgraded because he missed almost 5 full seasons because of his military service in WWII and the Korean War which reduced his totals. He walked at the highest rate of any player in history.
3. Honus Wagner is the best all around position player in the history of the game. This honor usually goes to Willie Mays but Mays played a defensive position that is only of about average importance. Wagner played mostly shortstop and was a fantastic defensive player. He was also among the best 10 offensive players, light years above any other shortstop in history, comparable to Mays, Gehrig, and Musial as a batter.

The Center Fielders

Mantle, Cobb, Mays, and Speaker….. Mickey Mantle and Ty Cobb come out essentially tied as the best center fielder of all-time, 4th overall. Almost every comparative list has Cobb and Willie Mays ahead of Mantle primarily because they use career totals as the primary measures to compare them, and both Mays and Cobb played much longer. But playing more doesn't make you better… you know. Mantle retired after age 36 so he does not have the totals compared to the others. But if you want to know who played better over their career, Mantle comes out the same as Cobb, and slightly higher than Mays who is #6 overall. Tris Speaker, one of the elite defensive center fielders in history, ranks 8th. He was a great offensive player as well.

Best Active Player

Albert Pujols is the best active player (as of 2009) ranked tied for 6th all-time with Willie Mays at this point in his career (age 29). He is a punishing hitter, ranked as the 3rd

all-time best offensive player, about equal to Mickey Mantle. He is also the highest ranked 1st baseman, well ahead of Lou Gehrig at this point.

Eating Your Wheaties

At the time Barry Bonds was age 35, he ranked 8th all-time in this system, but then passed Speaker, Mays, Cobb, Mantle, Wagner, Williams, and Ruth himself by age 39. This is truly a superhuman feat. He must have been eating his Wheaties… or something like that. Bonds accomplished this in the years from 2001-2004. To see how much he improved his performance we can look at his performance by season.

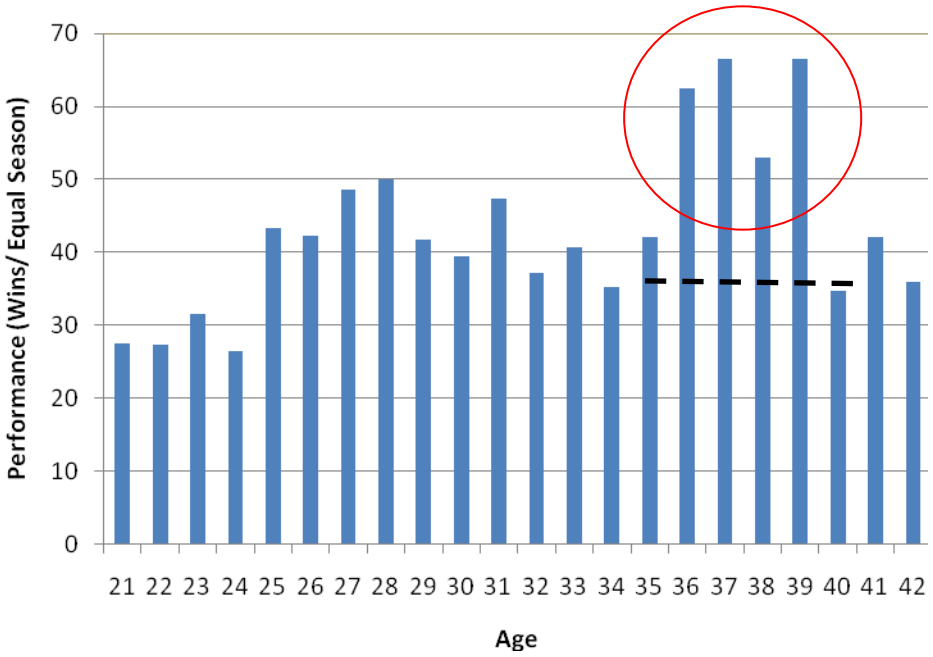


Figure7. Season by season performance ratings for Barry Bonds (not age adjusted). The ratings are normalized wins per equal 650 plate appearances and 1320 innings.

If we use an average baseline rating of about 36 for Bonds for ages 36-39, he is performing about *70%* above what would be expected for these 4 years. That is an enormous increase in his performance. He is even performing about 25% better than his peak year in his prime at age 28. There have been extreme years in the history of baseball, but this by far surpasses any player's performance in his late 30's. In fact 3 of these years are the best performances of any player in history.

If Bonds had followed a typical career progression after age 31 his performance ratings by season would have declined instead of dramatically increasing as it did after age 34. It looks like Bonds started eating his Wheaties after age 34. If that's the case then I can estimate his career rating up to age 34, and at the end of his career, because I create career ratings for each age.

Before Wheaties, Bonds' career rating at age 34 was 39.3 (Figure 8), comparable to Stan Musial and tied for 9th all-time including active players. After Wheaties, Bonds is

better than Babe Ruth. Of course I can't prove that Wheaties made Bonds better than Ruth. Only Barry Bonds would know for sure.

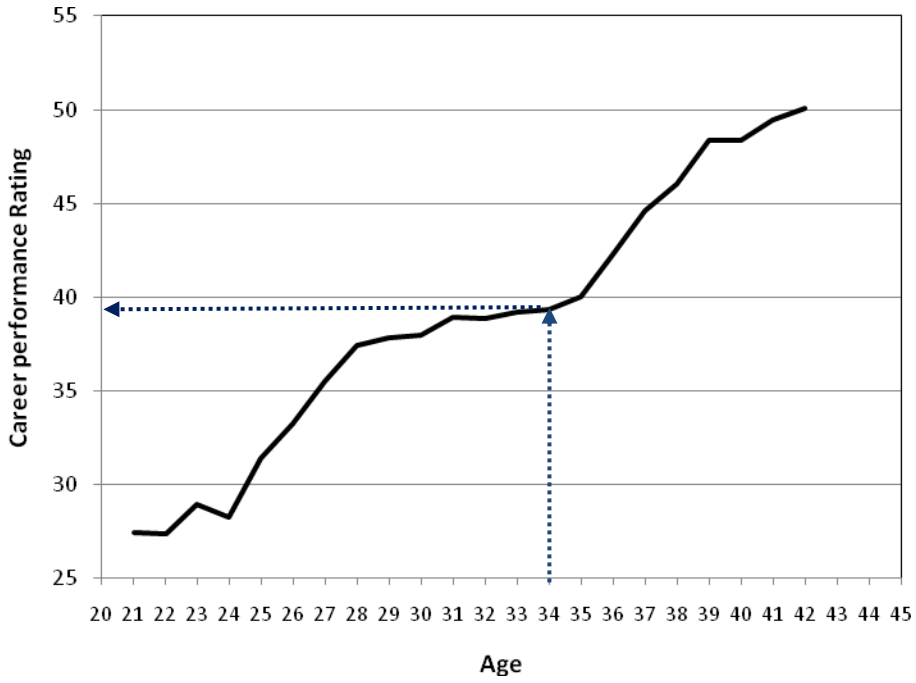


Figure 8. Barry Bonds' career performance progression, age adjusted. The ratings are cumulative to each age, not season by season.

There are a lot of other extreme seasons in the period between 1993 and 2005. In the ratings tables I indicate with an asterisk whether a player has played a significant amount of his career in this era. It is valid to question whether a player's rating is elevated during this period. If the player has done all the right things, his rating will be as accurate as I can get it. If a player is "doing something else" his rating may be falsely elevated. My estimate is from 60-90% of players in this era are "doing something else". What a mess! The real mess will come very shortly when many players from this era will become eligible for the HoF. That ought to be interesting. It also becomes difficult to create player rankings, like a best 100 list, because here are too many unknowns about players from this era.

The Man

Rounding out the best 10 is Stan Musial. He began his career in the minor leagues as a pitcher but an injury forced him to play the outfield. He had an incredible early career, with 2 monster seasons of over 50 wins. Musial holds the record for all star appearances with Mays and Aaron, because he immediately became a superstar in his first full season at age 21. He followed up the next season with 40 wins and was selected to the all-star team for the first time… and then in the next 19 seasons in which he played. He declined at a slow pace in the second half of his career, had a very good season at age 41, then retired the next year.

Musial was one of the most well liked players to have ever played MLB. Everyone likes Stan Musial, and everyone seems to agree on his ranking…. not in the top 5 but definitely in the top 10. Of course I mean among the *best* 10.

The next 10 by this system: Joe Mauer(A), Rogers Hornsby, Hank Aaron, Joe DiMaggio, Eddie Collins, Lou Gehrig, Mike Schmidt, Joe Morgan, Rickey Henderson, and Frank Robinson (Johnny Mize, Frank Thomas, and Nap Lajoie are tied with Frank Robinson for 20th)…. in that order.

Best Players by Position

Here is the all-time first team based on the overall career performance ratings. This team has the best performers at their positions in the history of baseball. If you're going to the World Series and could choose your fantasy team, this is the one you want if you want to maximize your chance to win.

			Career Performance Rating		
Order	Player	Position	Overall	Batting	Fielding
1	Honus Wagner	SS	44.3	34.6	9.7
2	Ted Williams	LF	46.1	42.0	4.0
3	Babe Ruth	RF	47.5	43.9	3.7
4	Albert Pujols (A)	1B	41.3	38.3	3.0
5	Mickey Mantle	CF	43.0	38.1	4.9
6	Rogers Hornsby	2B	38.3	33.4	4.9
7	Mike Schmidt	3B	37.0	29.6	7.4
8	Joe Mauer (A)	C	38.5	27.1	11.4

Best 5 - Offense

The best 5 batters, which includes base stealing, are similar to the best 5 overall with one exception. Albert Pujols displaces Honus Wagner in the 3rd spot. Wagner is still a fantastic offensive player (in the best 10).

Ruth is the best offensive player of all-time, and Ted Williams a clear second, and these two are in a class of their own. There is a pretty large gap to the #3, #4, and #5 batters, all comparable offensive players… Pujols, Mantle, and Cobb, then another fairly large gap.

Rank	Player	Career Batting Rating
1	B. Ruth	43.9
2	T. Williams	42.0
3	A. Pujols (A)	38.3
4	M. Mantle	38.1
5	T. Cobb	37.6

Best Defensive Players by Position

There are an unusually high number of players from the 1993-2005 era that are at the top of the lists of best defensive players by position. I smell a rat… so I will not mention any of the players who played a significant number of years in this era. Unfortunately I may be excluding some players unfairly.

- I group all the outfielders together. The best outfielders are centerfielders, so the best 3 are all centerfielders.
- The 2nd baseman will come from the modern era because 2B defensive importance has increased over time.
- The 3rd baseman will come from an early era because 3B defensive value was higher then.
- Catchers are the hardest to rate so I'm not sure. I'll go by the ratings but there are many other candidates that may be the best.

Position	Player
C	Joe Mauer
1B	Steve Garvey
2B	Bill Mazeroski
3B	Lee Tannehill
SS	Ozzie Smith
OF	Curt Flood
OF	Tris Speaker
OF	Willie Mays

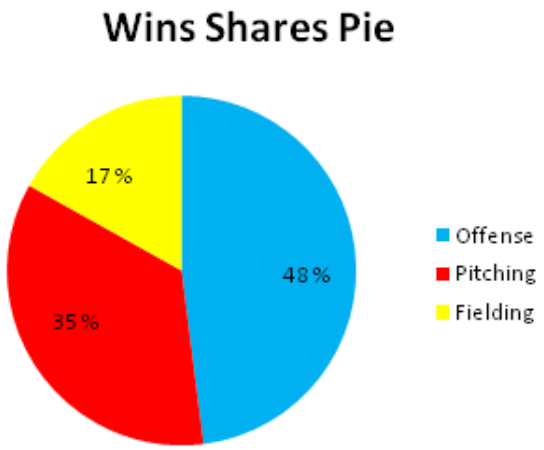
I'll go through each position and discuss the best (or perceived best) defensive players and how their fielding contributes to their overall rating. First some background on the importance of fielding to winning.

Defense is very important to winning. You know the saying, good defense beats good offense. I don't know if it's actually true, but in baseball there is one thing we can say for certain, and that is good fielding does not beat good hitting. We can also say that good fielding does not even come close to beating good hitting.

The game is half offense and half defense by definition. The pitcher is by far the most important player on defense, so fielding is a subset of the defense and a small one at that. On offense the batters share the responsibility more equally (there is a batting order bias but it is relatively small). It's the way baseball is structured. The offense, in total, is roughly about 3 times more important than fielding, in total.

Back to *Win Shares* for a minute…..

In the win shares system the total team wins are split between offense and defense. You would think that it's 50/50 but it's skewed to defense a little because of some quirkiness in the calculations. The split between pitching and fielding will vary depending on the quality of the team's pitching and fielding in that season. Win Shares calculates the split for each team, each season based on 6 defensive factors; some relevant to the pitcher, some relevant to the fielders and a shared factor, that I will not go into here. Refer to *Win Shares* (pp. 26-33) if you're interested in the details. Fielding shares average out at 17% of the pie and fall within the range of 13-21% for essentially all teams in the history of baseball. Fielding was generally slightly higher in the earlier eras of baseball and slightly lower today because of an increase in the rate of strikeouts over time. *The fact that fielding is a relatively small portion of defense, can be considered a law of baseball*. Typically, about 2/3 of defense is attributed to the pitcher and about 1/3 to the fielders. Or you can look at is as, the quality of the pitcher's pitches are about twice as important to winning as the quality of all the fielder's fielding. Here is the average split according to Win Shares.



We are interested in position players… the blue and yellow slices of the pie. For a position player on average, the available batting shares are just under 3 times the fielding shares (48:17)…. or looking at it another way, 74% of the total wins shares available to position players are batting shares, and 26% are fielding shares, on average. The fielding shares are actually different for different positions, but even at catcher or shortstop the available batting shares are about twice the available fielding shares. So for a shortstop, think of it as being twice as easy to win with your bat than your glove. You have to feel sorry for those fielding win shares, they just don't measure up. It's not that they don't count; it's just that there's not that many of them.

- 1st Base

1st basemen contribute the least to winning with their glove on average, so the worst fielders generally play 1st base, or they play 1st base because they can't play any of the other positions. Steve Garvey comes out the best defensive 1st baseman by a whisker but there are a lot of others that are very close because his defensive value is not very high to begin with. Garvey was a good hitter and a good(-) player overall, but not HoF caliber. The other career 1st baseman who are as good defensively include Pete O'Brien, Bill Terry, Wes Parker, Tony Perez, Norm Cash, Vic Power, Joe Adcock, Keith Hernandez, and George Kelly. Terry, Perez, and Kelly are Hall of Famers but none of them are deserving in my opinon… nor are any of the others, although Hernandez is a borderline case.

- 2nd Base

The modern era 2nd basemen have the advantage because defensive value at 2nd base has increased with time primarily because double plays per game have increased over time. Most rate Bill Mazerowski as the best defensive second baseman of all-time as does this rating system, but he has to share the honors with Frank White, Glen Hubbard, Nellie Fox, and Bobby Grich who are really tied with him. Jackie Robinson is probably in the top tier as well but he's harder to rate precisely because he only played about half his games at 2nd base.

As great a defensive player as he was, Maz was an offensive liability to his team. His overall career batting rating is only 8.6, below average(-). As poor a hitter as he was, his batting rating is about the same as his fielding rating (9.2). Maz is winning about the same amount of games with his bat as with his glove, on average throughout his career.

Bill Mazerowski is in the Hall of Fame. Of all players in the HoF he rates the lowest on performance, considered an average(-) player. How could a below average player get into the HoF? Two reasons…. first, his contribution to creating wins for his team based on his fielding prowess is grossly overestimated. And second, he hit a walk off home run in game 7 of the 1960 World Series to win the series for the Pirates. Amazing!

Maz is the best fielding second baseman and a below average offensive player, and ranks about 1000th overall. Rogers Hornsby is the best offensive second baseman of all-time and a below average fielder and ranks 12th overall. Offense is a tad more important than fielding… quite a few tads.

Nellie Fox is also in the HoF. Fox was an average batter if you're being kind to him, but he was a great fielding 2nd baseman. He played a lot of complete seasons for a long time and generated a lot of career value. He is a typical example of a good player who had a relatively long career who got into the HoF. He is ranked about 400th all-time on performance, but had pretty good career value of 361 wins (he just misses the 375 career wins mark I use to determine if a player has HoF career value).

White, Hubbard, and Grich… should they be considered for the Hall of Fame? White could not hit well, nor could Hubbard who also had a short career. Grich is a completely different story… see below.

Of the older era second baseman, Frankie Fritsch and Hughie Critz appear to the best fielders. But 2nd base was not as important position in the pre-war era. 2nd baseman did not contribute to as many outs per inning back then.

- 3rd Base

Earlier era 3rd basemen have the advantage because defensive value has declined for 3rd basemen over time, yet Brooks Robinson is considered by most as the best defensive 3rd baseman. Brace yourself "Brooks Robinson, he's without a doubt the best fielding 3rd baseman of all-time" fans… here we go.

I think everyone can agree that Brooks was a slightly above average hitter. He actually played in a difficult hitter's park but the key offensive measures that adjust for park effects show that his adjusted on-base plus slugging average (OPS+) is 104, barely above average, and his career batting rating by this system is 16.4.... slightly above average. Other adjusted offensive ratings like Offensive Winning Percentage, Batting Runs, or Batting Wins all show the same thing…. Brooks is about average+. And he was a slow runner, poor base stealer, and he didn't walk much. Anyway you look at it he is a slightly above average offensive player for his career. He ranks around 650th all-time on offense, based on his career batting performance rating.

So how does the 650th best hitter of all-time vault into the top 100 and the HoF? It has to be his defense, and on this everyone agrees that Brooks was a great defensive player. Many consider Him the defensive Messiah.

Bernard Goldberg wrote a book called *A Slobbering Love Affair*[6] which is about the media's treatment of Barack Obama in his run for the presidency in 2008. His basic point is that the media was favorably biased in their treatment of Obama, instead of being objective in their reporting. In regard to Brooks Robinson, most everyone seems to have a slobbering love affair with his defensive ability. They perceptually rate him in the stratosphere compared to other players. Is Brooks really that much better defensively than any other player? Is he far and away #1, or among the other mortals?

Brooks Robinson was awarded 16 consecutive gold gloves so he must be the best ever if he won that many. Well, if he truly deserved them, I would agree. The problem is

that he deserves six or seven according to Pythagorean fielding wins, and six according to win shares. That's still a lot and reflects Brooks' great defensive skills, but when you are awarded nine or ten more than you deserve, there is something wrong.

Here are the leading Pythagorean fielding wins for 3rd baseman in the AL from 1960-1975 in which Brooks won the gold glove every year. The few years before and after this, he was not in contention. These are total defensive value ratings.

Year	3rd Base Fielding Wins Leader		Brooks Robinson
1960	**B Robinson**	**6.9**	**6.9**
1961	C Boyer	7.5	5.1
1962	C Boyer	8.0	6.9
1963	**B Robinson**	**6.8**	**6.8**
1964	**B Robinson**	**6.2**	**6.2**
1965	C Boyer	7.4	4.1
1966	M Alvis	5.5	5.5
1967	**B Robinson**	**8.4**	**8.4**
1968	**B Robinson**	**7.1**	**7.1**
1969	**B Robinson**	**7.2**	**7.2**
1970	G Nettles	8.9	5.0
1971	G Nettles	9.1	6.4
1972	G Nettles	7.0	6.8
1973	G Nettles	7.9	5.1
1974	Au Rodriguez	6.3	5.9
1975	G Nettles	7.3	4.7

Are fielding wins off by that much that would warrant Brooks getting 10 more gold gloves? The key defensive stats for Nettles and Brooks from 1970-1975, for example, fall in line with the fielding wins. It seems obvious that Nettle's was the more valuable fielding 3rd baseman over this period.

Win shares fielding ratings for 3rd basemen are quite good in my opinion especially when you comparing players in the same league in the same year. If you want to argue catcher defensive ratings you will have a better case, but not 3rd baseman. You can quibble with fielding wins if the values are close but most of these other years are clear cut. Graig Nettles and Clete Boyer between them really won a total of 8 gold gloves that were awarded to Brooks based on this analysis.

It is a common occurrence that a player gets a long string of consecutive gold gloves. This can occur, but is far too common to actually be the truth. A general rule of gold gloves is that, players who get a lot of them don't deserve quite a few of them. It serves to elevate good defensive players' perceptual defensive abilities, beyond what they are in reality. I'm not trying to slam Brooks because he was awarded more gold gloves than he deserved, because he did deserve six of them which is a lot for any player. I'm just showing the reality that other 3rd basemen were as good, or even better defensively, and that gold glove awards are, more often than not, given to the wrong player. Just because you are given an award doesn't mean you actually deserve it… Yasser Arafat won the Nobel Peace Prize, Rocky won the Oscar for best picture, and Brooks Robinson won 16 consecutive gold gloves.

Tim McCarver gives a great summary[7] of the styles of defensive play by Brooks Robinson and Mike Schmidt which is the basis I'll use to compare their defensive ability. McCarver points out that Brooks' main defensive weakness was that he did not have a

strong throwing arm. For a third baseman he had a relatively weak arm. The reason is that Brooks was actually left handed[8], so his weaker arm was this throwing arm. He did most everything left handed except throw and bat, allowing him to play 3rd base…. he wasn't going to do it as a lefty. To compensate for his weaker arm, McCarver says that Brooks played in shallow, so he had a shorter throw to 1st base. When you play in close at third, the position requires even quicker reactions, and that is where Brooks excelled. He had great reflexes and very sure hands (a strong glove hand since he was really left handed), the best of any 3rd baseman, in my opinion. So you would often see him dive for a hard hit grounder, snag it, get up off the ground, and throw out the runner. It looked like, and was, a spectacular play, but he made the play harder than it had to be because he played in closer to the batter. Brooks' other weakness was that he was slow of foot and didn't move side to side well. That's why he didn't play shortstop or 2nd base.

McCarver goes on to say that Mike Schmidt was pretty much the opposite defensive third baseman in that he had a strong throwing arm, and was very athletic and could move side to side well. So Schmidt played deep at third because he could make the long throw to 1st in time. The ball that Brooks dove for and gloved, Schmidt would move two steps to the side and make the play look more routine. Schmidt had better range because he played deeper and could get to more ground balls. In fact Schmidt made about 7% more assists per inning for his career than Brooks. The types of ground balls that Schmidt could just reach would get by Brooks because he didn't have enough time to react. It's the same effect as playing the infield in with a runner on third. The batter's average goes up because the infielders can't react quickly enough to hard hit grounders. Therefore, the infielders cover less ground, have less range.

ESPN's Baseball Encyclopedia[9] calculates infielder range based on assists per inning, setting the league average at 100. Here are some contemporaries of Brooks' career ranges versus the league norm.

Player	Career Range
Clete Boyer	112
Mike Schmidt	111
Graig Nettles	105
Tim Wallach	105
Brooks Robinson	102

Boyer played some SS so his range is notched up a bit but all these players had better range than Brooks, meaning they make more outs (as assists) per inning than Brooks did. Range is the critical metric for an infielder.

Fielding percentage is important as well and Brooks had the best fielding percentage of any 3rd baseman in history meaning he made fewer errors per fielding chance than anyone. He had fantastic glove skills (he actually deserves some slobbering for this part of his defense).

Player	Career Fielding %
Brooks Robinson	.971
Clete Boyer	.965
Graig Nettles	.961
Tim Wallach	.959
Mike Schmidt	.955

Back to the comparison between Brooks and Schmidt… if you break out play at 3rd base only, on an average full season basis, the key stats look like this.

	Per 1320 Innings @ 3B	
	Assists	Errors
M. Schmidt	351	22
B. Robinson	327	14
Difference	24	8

Schmidt is making more assists (24) but only a few more errors (8) in an average season. The net effect is that he makes more outs per season when accounting for the errors. Brooks made fewer errors per average season but his lack of range reduced his out production more dramatically. This simplified analysis would conclude that Schmidt is the slightly better fielder based on net assists made per average season.

Win Shares gives letter grades to fielders which I think are reasonable although they don't correct for age or time. Among modern era 3rd basemen the letter grades are:

Clete Boyer	A+
Mike Schmidt	A
Tim Wallach	A
Brooks Robinson	A-
6 others (including Nettles)	A-

I thought that Brooks may have incurred a penalty with age because he retired at age 40. But my system corrects for age and in fact he slightly improves his defensive rating with age in this system, while most others marginally decline. Among his contemporaries in the modern era, he's rated 5th defensively by this system, whether you look at the players' total defensive play, or their play at 3rd only. These are the best comparative ratings because they are on the same basis.

		Career Fielding Rating (Wins/Equal Season)	
Rank	Player	All Defensive Play	3rd Base Play Only
1	Graig Nettles	7.6	7.8
2	Tim Wallach	7.5	7.8
3	Clete Boyer	7.5	7.3
4	Mike Schmidt	7.4	7.7
5	Brooks Robinson	7.2	7.2

Nettles, Wallach, and Schmidt are rated the best fielding 3rd baseman in the modern era. All are slightly better than Brooks (Boyer is about the same), but if you want to argue they're all about the same you can (it's a weak argument but well give Brooks the benefit of the doubt). However you cannot argue he was the best in the modern era based on any of these analyses. The best defensive 3rd baseman of all-time by the numbers appears to be Lee Tannehill if you break out his play at 3rd (he also played SS), although Jimmy Collins is comparable, as is Lave Cross. Tannehill, Collins, and Cross had the advantage of playing in an earlier era when 3rd base was a more important defensive position so they made more outs per inning.

Brooks had the highest defensive 3B totals because he played by far the most innings of any third baseman, so he has more total defensive *value.* He had the most putouts (2,697), assists (6,205), double plays (618) and career defensive wins (128). So does that make him the best fielding 3rd baseman? Is Karl Malone the best free throw shooter in the NBA because he made the most free throws? Shooting more free throws doesn't make you a better free throw shooter… making a higher percentage makes you better. Playing more innings doesn't make you a better fielder…. making more outs per inning makes you better.

Brooks had best glove skills (the evidence being he had the highest fielding percentage of any 3rd baseman), but he was not able to get to as many balls and make more outs per inning (the evidence being he had a lower range rating). He did not win quite as much with his glove on a per inning basis. There are other 3rd baseman that made more outs per inning because they had better range.

As far as being the best, Brooks' Achilles heel was his weaker throwing arm, which forced him to play in shallow, which narrowed his range, which lowered his out production, which lowered his fielding wins. He made up for his lack of range to some degree with his great glove skills, and it's clear to me that based on any type of fair analysis, Brooks is in the top tier of defensive 3rd baseman, just not #1. Can we please stop all the slobbering?

As an aside, players who deserve the slobbering love affair treatment based on their overall performance compared to other players at their position (because of batting):

Player	Career Rating Points Ahead of Next Best Player
Honus Wagner – SS	11.5
Babe Ruth – RF	9.5
Ted Williams – LF	6.9

OK, I'll play along with the idea that Brooks is the best defensive third baseman of all-time for the moment. Let's say his defensive value is underestimated, and his fielding rating comes out to be 9.0 instead of 7.2 in this system, which appears to be beyond the upper limit that a modern era third baseman could achieve for a career…. the defensive Messiah rating. Keep in mind that 3rd base is an average defensive position in regard to how a player can contribute to winning. This higher defensive rating for Brooks doesn't get him into the top 200 overall. If we give him Ozzie Smith's defensive rating (11.4), the highest of any shortstop in history, he still doesn't get into the top 100. It doesn't really matter what his fielding rating is because his batting rating is only slightly above average. Fielding is just not going to win that many games compared to offense. That is the way baseball is…. it's like a law of physics. But most who rate Brooks seem to weigh fielding at least as much as offense, and that is going against the laws of physics.

Most comparative player lists rate Brooks on average around 60th among position players, but on performance he ranks roughly 400th in this system, primarily because he is an average(+) offensive player. For Brooks to be rated 60th all-time on performance he would have to play the left side of the infield by himself and have Ozzie Smith and Mike Schmidt's combined defense.

So why is he always ranked so high? Most ratings will use career totals….. hits, home runs, career wins, and defensive totals. And because Brooks played a very long career (23 years) he amassed a lot of these stats. He has 410 career wins which is a lot but is not that high for a player who played 23 years. He is actually an extreme case of a

player with higher value and lower performance. Some also weigh his best years very heavily and he did have an MVP award in 1964, but he really didn't deserve it since Mantle had one more win with over 100 fewer plate appearances, but it went to Brooks. He had 2 seasons over 30 wins and 6 more between 25-30 so he had good value in his prime but not HoF value. He also played in 4 World Series and was very deserving of the series MVP in 1970, but then he also hit .059 in the series against the Mets in 1969. But the primary reason he is overrated is that his defensive contribution to winning games is very overvalued.

By this rating system Rusty Staub comes out a very similar player to Brooks. They both have about the same career value, the same performance rating, and if you look at them season by season for either value or performance they are very similar. Staub had a better earlier career and Brooks a better mid career, but they had similar type seasons. Staub was a pretty good player in his prime as was Brooks. It's just that neither reached and maintained that HoF level.

In his later years Brooks had a very good year at age 37 but then in his last three years he performed very poorly. These are his performance ratings for those seasons.

Age	Season Performance Rating (Wins/Full Season)	Performance Rating Category
37	26.3	Good+
38	8.4	Poor-
39	4.2	Terrible
40	5.6 (low PA's)	Terrible

This is a piece of indirect evidence that Brooks was not a great player. Great players generally can play through their 30's, barring injury, because as they decline in their 30's, their performance level is still above the average player. Brooks fell of the end of the table at age 38 and could no longer hit at the major league level (he could still field, although not like he did in his prime). Willie Mays had what most consider a terrible last year at age 42, yet his performance rating for that year was 15.1 (below average). It's just that it was so far below his typical performance that it was painful to watch.

Brooks Robinson was a good(-) player overall and had a lot of value because he played complete seasons for a long time. He was a great defensive player, but not the best fielding 3rd baseman in history when it comes to creating wins per standardized season. He has HoF career value, but is not a HoF performer. If only he could have played *better*.

- Shortstop

Ozzie Smith ranks as the best defensive shortstop of all-time with a career fielding rating of 11.4. He was awarded 13 gold gloves, deserving most, but not all of them. Honus Wagner appears to be about equivalent to Ozzie based on his play at short only, but Wagner only played about 2/3rds of his time at short and I can only estimate this rating. Ozzie is well ahead when you look at all their defensive play because Wagner's play at other positions drags down his rating. Ozzie played all his games at short.

Offensively, Ozzie was a slightly below average batter. His career batting rating of 13.7 is average(-) and his park adjusted on-base plus slugging average (OPS+) is well below average (87). His overall career rating is 25.2, putting him in the "good" player category, not in the top 250 all-time. Even though he is the best defensive shortstop of all time, his batting rating still exceeds his fielding rating. Fielding just does not count as

much when it comes to creating wins. When Ozzie gets "hot" with his glove the Cardinals may have won more games but not as many as when Stan Musial got hot with his bat. The Cardinals won a lot more games then, because Musial hit 3 run home runs.

It's a tough case to make for Ozzie being in the HoF based on overall performance. If you count entertainment value then that's something else. He could make fielding plays that would make your jaw drop. But when it comes to creating wins, there are over 250 players better than Ozzie. He is ranked 17th among shortstops in this system, again a tough case to make for the HoF. I loved watching Ozzie play. It's just that if you want to win more, the hitting shortstop is who you want on your team. Alan Trammel, a good hitter and average defensive shortstop creates more wins for the team and is a deserving case for the HoF.

If MLB teams are interested in winning more, they're eventually going to figure out that it's better to play a better hitting, somewhat below average fielding shortstop than a below average hitting, great fielding one. You will still need that baseline level of fielding competency however. It won't work if you decide to play Greg Luzinski at short.

Who is the anti-Ozzie? The worst fielding shortstop of all time appears to be Ed McKean (it could be Jack Rowe but I'll choose McKean) who played in the 19th century. You might think that the worst fielding shortstop would have one of the lowest fielding percentages (that is made a high percentage of errors) but in McKean's case he actually had about an average fielding percentage for the era he played in. The primary reason McKean is so bad a fielder is that he had poor range. The ground ball that McKean dove for and just missed, Ozzie would convert into an out, because Ozzie had much better range. The perception of a shortstop with poor range, diving and missing a ground ball is… he gave it his best, it was just a clean hit. And it is a hit with McKean at short but it's an out with Ozzie at short. The great effort by McKean is actually a bad play in this case… but it doesn't look that way. That's why trying to perceptually rate a fielder's ability is practically impossible. The statistics tell the tale, but even the statistics require that the analysis be done in the proper context. Bill James' formulas in *Win Shares* conduct the fielding analyses in the proper context and generate defensive value measures that are far superior to any other method, and are reasonable estimations of fielders' defensive value.

Compared to an average defensive shortstop, McKean's defensive rating is about 3.4 wins below average. That is very small for the worst fielding shortstop in history. This means that the majority of major league teams would be better off playing an even worse fielder than McKean at short if he were a "good" batter. There is a significant opportunity for teams today to improve their records by playing a better hitting shortstop and sacrifice defense. Here are the best and worst fielding performance ratings for shortstops.

Player	Career Fielding Rating
Ozzie Smith	11.4
Ed McKean	4.2
Difference	7.2

It's very hard for players to increase their fielding ratings very much even compared to the worst fielders in history of MLB. This is because the number of fielding chances hit in the vicinity of the fielder is limited and, because even the worst fielders today have fielding percentages that are already close to the upper limit of 1.000 (no errors). On the other hand, there is a huge opportunity to improve one's batting rating.

Here are the best and worst offensive shortstops of all time. A batting rating of 15 is considered average.

Player	Career Offensive Rating
Honus Wagner	34.6
Hal Lanier	0.7
Difference	33.9

Even if Wagner were as bad a fielder as McKean, he would still be the best shortstop overall because his batting rating is so high. Players can create a lot of runs with their bats but are limited in how they can save runs with their gloves.

The best 10 fielding shortstops of all-time based on their play at short only. Wagner's is a rough estimate because he only played about 2/3^{rds} of his games at short.

Rank	Player	Career Fielding Rating @ SS
1	Ozzie Smith	11.4
2	Honus Wagner	11.4
3	Phil Rizzuto	11.0
4	Dave Concepcion	10.9
5	Art Fletcher	10.9
6	Mark Belanger	10.8
7	Dal Maxvill	10.8
8	Marty Marion	10.6
9	Rick Burleson	10.6
10	Rabbit Maranville	10.4

- Catcher

Win Shares uses four different formulas for different eras to rate catchers because of the importance of various attributes of fielding for the era, and because certain statistics are not available in the earlier eras. The ratings categorize the catchers about right but are the least precise of any of the defensive ratings. I can't say with any confidence that any of the following players are the best defensive catcher, but they were/are all great defensive catchers. So pick one, anyone.

- Johnny Bench

If you poll the knowledgeable baseball fan, the undoubted choice for the best defensive catcher would be Johnny Bench. He played about 20% of his games at other positions (and did not play very well at all at those positions) lowering his overall defensive rating so he doesn't look as good on defense overall, but when you break out his play at catcher, he is among the best.

Bench is often rated the best overall catcher of all-time. He is a clear Hall of Famer and no doubt among the best 10 catchers all-time but he is somewhat overrated when you look at his entire career, for 2 primary reasons.

1. He benefits from the first place bias
2. He had a couple of below average years at the end of his career which notches his rating down a bit.

Bench was very fortunate because he got a lot of exposure to the public during his prime years when he was a fantastic player and played on one of the better teams of all-time.… the Big Red Machine. The Reds were loaded with talent in the mid 1970's having 3 superstars on the team (Morgan, Rose, Bench), as well as four other good players (Perez, Griffy Sr., Foster, Concepcion). He won the World Series MVP in 1976, playing spectacularly. But had he not played on a contender for those years in the 1970's I guarantee you he would not be rated as high by others, because he would not have had a post season "career" and not had the exposure that good teams get. Most remember him for his prime years and his World Series performance in 1976. That is really luck or good fortune, whatever you want to call it because, if he was unlucky, he would had played for the Cubs and not had a post season career.

He had the highest peak season of any catcher (43 wins) but he had a relatively poor finish to his career which pulls down his rating. As good of a defensive catcher as he was, that's how bad he played 3rd base at the end of his career. His last 2 seasons at age 34 and 35 were below average performances for a MLB player which notches his rating down overall. He was a good hitter but not a excellent hitter, again, the perception of his hitting ability I think being higher than it is in reality. If you eliminate the end of his career (which everyone does when rating Bench) I could rate his performance as high as #5 among catchers, but not higher than that. There are at least 4 other catchers that have played better than Bench for their careers: Joe Mauer, Yogi Berra, Carlton Fisk, and Gabby Hartnett.

- Joe Mauer

Mauer is early in his career, having reached about 3000 plate appearances so he has enough playing time to provide an initial rating. He is a very big man, listed at 6'5" 225 lbs and, although he hits for high average, he hit very few home runs in his first five seasons. In his 6th season however he increased his home run power dramatically while maintaining a high batting average, and he walks at a reasonable clip. He is the best offensive catcher in history at this early point in his career as well as the best fielding catcher when you break out his play at catcher only (he DH's when not catching) so he easily ranks as the best catcher of all-time based on his career performance… at the young age of 26. The only other player to have achieved this all around performance is Honus Wagner who is far and away the best hitting shortstop and is tied for best fielding SS (with Ozzie) when you break out his play at SS.

Mauer is the 2nd best active player in baseball after Albert Pujols (as of 2009) and is ranked 11th all-time. Time will tell if he becomes one of the true elite players of the game.

- Yogi

Most all catcher rankings have Yogi Berra and Johnny Bench #1 and #2, some with Yogi # 1 and some with Bench #1. Yogi is the better *performer*, although another player is as good, but it's not Bench. Objectively, Yogi was that good! His career rating even excludes all post season play, and Yogi has 10 World Series rings, the most of any player in history. DiMaggio and Mantle may have helped a little.

Yogi was a very good hitter but his weakness was that he swung at everything and didn't walk a lot. When you don't walk a lot you will make more outs and that reduces run production. He learned to be a fantastic defensive catcher which is why he ranks tied #2 overall behind Mauer.

- Carlton Fisk

Fisk is tied with Yogi overall at #2 in this system. I think in general he is very underrated, even though he is a Hall of Famer. He is often compared to Johnny Bench and not very favorably. I have seen it quoted that Bench's park adjusted on-base plus slugging percentage (OPS+) is higher than Fisk's so Bench was a better overall hitter. That statement is true and false… in that order. The reason is that OPS+ does not correct for age (or era). Bench retired at age 35 and Fisk at age 45. If we made Bench play to age 45 his OPS+ would be a lot lower than 126, a lot lower! Fisk was able to play very well in his later career and maintain his OPS+ rating at a relatively high level. Fisk is the better offensive player when a correction for age is made.

	Career OPS+	Career Performance Batting Rating
Bench	126	20.7
Fisk	117	24.0

Fisk had 3 fantastic years at ages 40, 41, and 42, averaging over 400 plate appearances for those years and actually increasing his career average slightly, a very rare occurrence in the history of baseball for any player, let alone a catcher (of course I'm assuming there was no monkey business going on with Fisk, it was before 1992 when he accomplished this). When you apply the age adjustment he comes up essentially as good as Yogi and well ahead of Bench, overall.

Fisk only played in one World Series in his very long 24 year career and appeared in only one other post season. His perception is helped by a single at-bat in game 6 in the 1975 Series in which he hit the walk off homer in extra innings. He is generally not remembered for his play in his 40's when he played incredibly well. The best way to evaluate Fisk is over his entire career. When you do that he is rated very high, and in the top tier of defensive catchers as well.

- Gabby Hartnett

Hartnett may be a surprising name to appear in the best 5 catchers of all-time. He rates very high defensively (#2 behind Mauer). I can't say with any confidence that this defensive rating is precise, but Hartnett was a great defensive player. And because he also was a very good hitter he will undoubtedly rank high overall. Incidentally, Hartnett was the opposing catcher when Ruth supposedly called his home run shot.

- Gary Carter

Carter is a great defensive catcher as rated by this system. He played about 8% of his innings in the outfield and 1B so his overall defensive rating notches down a little, but when you break out his play at catcher, he is in the top tier. He was not as good a hitter as the above mentioned catchers but was an above average hitter. He ranks 12th overall among catchers, and is a deserving Hall of Famer.

- Outfield

All is not fair among outfielders when it comes to the defensive ratings. Center fielders get more chances than right or left fielders, so they can gain more wins per inning. And because most outfielders play multiple positions it's hard to rate them fairly. I'm just going to lump them all together, giving the center fielders the advantage, since they will be the best defensive outfielders anyway.

Curt Flood, Tris Speaker, and Willie Mays are rated 1, 2, 3 respectively.

Flood is most remembered for his challenge to the "reserve clause", which he actually lost in a Supreme Court decision, but was later reversed in a case brought by other players. This opened up the "Flood" gates for free agency in baseball. He was a fantastic defensive player having a string of 568 chances without an error, and had a perfect fielding year in 1966 of 1.000. But he is also remembered for his uncharacteristic error in the 7th game of the 1968 World Series which contributed to the Cardinals losing the game, and the series to the Detroit Tigers. He was only an average hitter, so net, net a "good" player overall, but not a Hall of Famer.

Speaker is among the best 10 players of all-time. He is one of the very few players who combined great fielding at his position with great offense. The others were Honus Wagner, Willie Mays, and Mike Schmidt. Speaker played a very shallow center field and was able to get to the short fly ball that other players playing a typical depth could not. For the center fielder, playing shallow can increase his out production, the opposite effect seen for the 3rd baseman, or any infielder for that matter.

Willie Mays is the popular choice for the best defensive outfielder of all-time. He is certainly among the best. Mays was a complete player, the only minor flaw he had was that he did not walk as much as he should have, for such a great hitter…. his OBP was below .400. This hurts his batting rating because all the elite batters that are ranked above him have OBP's well above .400, except for Wagner who played in the dead ball era. Other than that, Willie Mays seemed about perfect. He ranks 6th all-time in this system. He may be most remembered for his over the shoulder catch on the warning track in the 1954 World Series.

Other great defensive center fielders include, Tommy Leach who also played a lot at 3rd base, Max Carey, Mike Kreevich, Dom DiMaggio, Tommie Agee, and Curt Welch.

Batting Average

If a player has a batting average 99 points higher than another player we can of course conclude that he is the much better offensive player, well sometimes.

	Career Batting Avg.	Career Batting Rating
George Sisler	.340	20.8 (Good)
Gene Tenace	.241	26.9 (Excellent +)

Sisler hit for average, but he:

- Played in a hitters era, Tenace did not.
- Unbelievably had a lower on-base percentage than Tenace. Sisler walked at one of the lowest rates and Tenace at one of the highest rates of any player in history.
- Did not have much power, Tenace had considerable home run power

- Played in hitter friendly ball parks, Tenace played in extremely difficult hitters' parks
- Played in an earlier era than Tenace when the overall talent level was lower

When all this is factored into the ratings, Tenace comes out significantly ahead of Sisler in creating runs, and wins, per equal plate appearance. I don't mean to imply that this is a typical example, because it is actually an extreme example. But beware of batting average as the primary measure of a players' offensive ability.

Great offensive players with relatively low BA's:

Rickey Henderson	.279
Reggie Jackson	.262
Mike Schmidt	.267
Joe Morgan	.271

Mickey Mantle, the 4rd best hitter of all-time in this system, was not a .300 hitter. Batting average can be very misleading, and it's probably best if we just get rid of it.

Walking

If we have Babe Ruth, the best offensive player in the history of baseball, come to bat in his average plate appearance, what would be the best for his team?

(A) Hit away
(B) Walk

We can use a run estimator formula[10] to approximate the runs Ruth would create if he hits away, using his career hitting stats, versus the runs he would create by walking… Ruth will generate roughly 70% more runs by walking than hitting. So surprisingly, the answer is (B), and it's not even a close call. The primary reason is that when he hits, he will only reach base 34.2% of the time (based on his .342 career batting average… I knew there was a use for batting average) and will therefore make an out most of the time. If he walks he has reached base 100% of the time and importantly has not made an out. The benefit of walking becomes even more important for an average hitter because their batting average is going to be much lower than Ruth's .342.

But walking is boring. We would much rather see Ruth hit a home run and strike out 3 times than to walk 4 times in a game, even thought the 4 walks will create more runs than a home run and 3 strikeouts, on average. So walking gets no respect, and is another perceptual bias that exists in baseball when it comes to a player's contribution to winning. Walking is hidden in the on-base percentage (OBP) statistic, but generally does not get reported on its own. I doubt that many people can quote even their favorite player's walking stats.

A good comparison to illustrate the importance of walking is Mickey Mantle and Willie Mays. Here are their stats and their career batting (total offensive) ratings.

	Slugging Avg (TB/AB)	Batting Avg (H/AB)	Walking Avg* [BB/(AB+BB)]	Career Batting Rating (Offensive Wins per Equal Season)
Mantle	.557	.298	.176	38.1
Mays	.557	.302	.119	34.3

*Walking average varies throughout history but on average is around 0.090 excluding the first decade or so of MLB when the rules were different and walks were very low.

They look like very comparable hitters based on the SA and BA measures although Mays is really the better "hitter" because he played to age 42 while Mantle only played to age 36. Yet Mantle still creates more offensive wins because he walked a lot more. Walking is a very important part of a player's run creation.

As I evaluated players for the HoF, one player that comes out on the margin that surprised me is Jack Clark. His career batting rating is quite high, considered an excellent offensive player. Clark has a low career batting average (.267) but walked at a very high rate (.156 BB Avg) which increased his offensive run production significantly. A player's walking average is not something that is top of mind when we think of their offensive ability. Perceptually we tend to judge player's offense on their "hitting" ability only. Their walking average tends to fade into oblivion.

Ted Williams has the highest walking average (.208) of any player in history. On the other end of the spectrum is Andre Dawson (.056) who walked at one of the lowest rates of any modern era player. "The Hawk" is overrated as a batter because his inability to walk much hurts his run production. When you trade a walk for an at-bat your run production goes down, on average. Most everyone perceives Dawson as a better offensive player than he really is because they will tend to not factor in his walking stats. But win shares does factor in the walking stats and gives us a clean read of the player's offensive value, without all the perceptual biases.

The walking bias is alive and well in MLB.

The Beloved

If you were to take a poll of the most beloved player in MLB history the result would likely be Roberto Clemente, or maybe Jackie Robinson.

- Roberto Clemente

Clemente was listed at 5'11", 175 lb. Yeah right, in his spikes with rocks in his pockets. For a baseball player, he was a relatively small man. He hit for average, and had slightly above average home run power (he hit in a tough home run park), but he just did not have the physique to be a true power hitter. In the field he would make basket catches like Willie Mays, and had a very strong arm and could make spectacular throwing plays. He did make his share of throwing errors but he was still a very good fielder.

He had an unusual career progression in that he played better in the 2nd half of his career. Coming up to the majors at age 20 he was not yet ready for MLB pitchers. After his first 5 years it was questionable whether he was going to make it in MLB. He was playing most of the season in all of these years and his performance level was well below average. He began to play better at age 25 and had a very good year at age 26, but then had another mediocre year at age 27. Had his career ended at this point nobody would know the name Roberto Clemente. Then at age 29, his career took off and he had 8 consecutive years at performance levels above 30 wins per full season, and was still performing well in his last year (Figure 9). He was also the World Series MVP in 1971, in which he performed brilliantly, hitting a solo homer in game 7 in which the Pirates won 2-1.

He just meets the minimum criteria I use for the career performance rating to get into the HoF because his early career was not good. His later career carried the day for him.

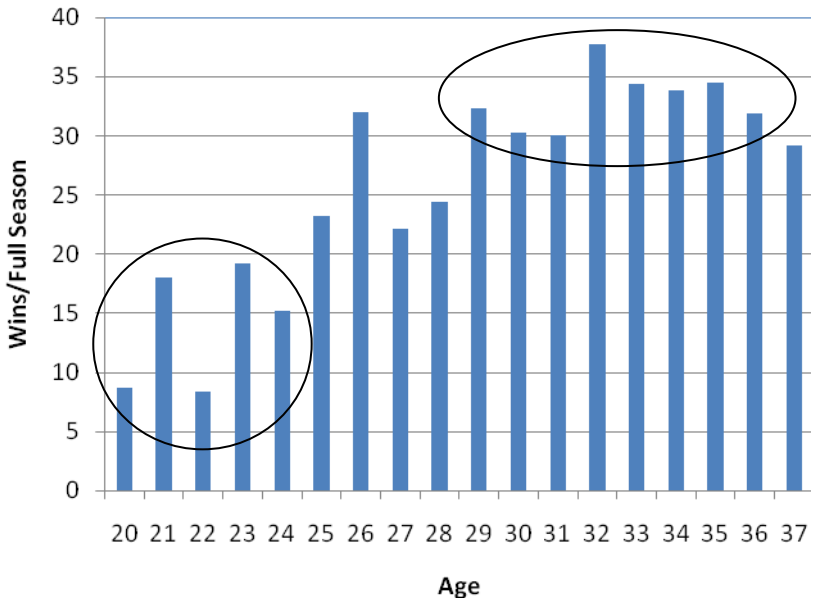


Figure 9. Season by season performance ratings for Roberto Clemente. Each season is adjusted wins per 650 plate appearances and 1320 innings. All adjustments are made except for the age adjustment.

Clemente was a very exciting player. You got the impression that he was giving every ounce of effort on every play. His rating, however, has nothing to do with his style of play, that he was taken tragically early in life, or that he was perhaps the most beloved player to have ever played the game. It simply tells you how well he played the game.

- Jackie Robinson

Jackie Robinson was a great ballplayer, a true Hall of Famer, based solely on his play on the field. He was a complete player, an excellent batter, base runner, and a very good defensive player. His career performance rating is 32.5 in this system, way above the minimum I recommend for the HoF.

When we look at the value side of the equation, he has relatively low total career value because he started his MLB career at the late age of 28 for obvious reasons. He has 288 career wins by this system, well below the 375 I use as the guideline for the HoF. It's of course ridiculous to say that he did not have HoF value…. his value is being significantly affected by a racial discrimination policy in MLB. I can guesstimate what additional value he would have if not discriminated against, but it's purely a guess. When we're talking about Jackie Robinson, the decision to put him in the HoF is a no brainer. But what if we're talking about John Doe who did not have any particular historical significance, what do we do with him? Value ratings are an important metric about a player, but are not useful when used to compare players' ability. When comparing Jackie

Robinson's career value (288 wins) to say Buddy Bell's career value (375 wins), the value ratings don't have much…. value.

The first African American to play MLB was of course… Fleet Walker, for the Toledo Blue Stockings in 1884.

The Not So Beloved

- Rogers Hornsby

In *The New Bill James Historical Baseball Abstract*[4], Hornsby is rated 3rd among second baseman, behind Joe Morgan and Eddie Collins. I thought at the time that must be wrong, although Bill James has stated that they are all very comparable players. Hornsby is usually ranked in the top 10 so it definitely seemed wrong. But as I developed this system three 2nd basemen kept floating up to the top… Hornsby, Collins, and Morgan which is not surprising since I'm doing a derivative analysis of James' win shares. As I refined the adjustments, Hornsby does come out as the better performer, but not by that much.

Hornsby had a much shorter career than most realize, essentially ending at age 33. After that his combined play, until he retired at age 41, accounted to only a little over one full season… probably the strangest last 8 years of a career. The more you learn about Hornsby, the worse it gets.

- Ty Cobb

Cobb has the highest career batting average (.366) of any player in history. He played the first 6 years of his career in the dead ball era and had a BA of .346 for those years which is very high for the lowest hitting environment in baseball history. In 1911 the lively ball was introduced and his average spiked to .420, his highest season. He played a long career, and even in his last year he is still hitting for high average at .323, remarkable for a 41 year old. This is all very interesting but batting average is not a very good way to precisely measure a player's offensive run production. Cobb's batting average is 68 points higher than Mickey Mantle's, yet Mantle creates more batting wins in a standardized season.

Batting average says that all hits are equal, which of course is not the case when it comes to run creation. Telling me how many bills you have in your wallet doesn't tell me how much money you have. Telling me your batting average doesn't tell me much about your run production. Slugging average is a significant improvement to the batting average because it gives a weight to each type of hit (1 for single, 2 for double, 3 for triple and 4 for home run) although it slightly overstates the effects of the extra base hits. We are in the 21st century… we can certainly do better than batting average.

Cobb is among the best 5 players to have ever played in the major leagues, and he is one of the most despicable human beings to have ever played in the majors as well.

- Dick Allen

Allen was a great player, as good as Willie Mays in the first half of his career. Then Mays' career went one way and Allen's the other way. Although, when you look at Allen's complete career he is an obvious omission from the Hall of Fame. He did not have a long career, so he doesn't have the totals which are the common metrics used for Hall of Famers, even though he had a lot of career wins and meets the minimum of 375 I use as a guideline for HoF career value. But he had a lackadaisical style, and was a

tumultuous figure. He deserves to be in the HoF based on his ability to win games, but, but, but, but, but, but, but. Maybe he'll get in when Bill James turns into a lug nut[12].

- Benny Kauff

Benny who? Kauff played in the early 20th century. He was indicted for participating in car theft involving a business he ran with his brother, but was acquitted of the crime. The commissioner of baseball at the time banned Kauff from baseball anyway because he thought he was guilty, and an unsavory character. It ended his career at age 30 and his status remains the same to this day. I wanted to make this point in regard to Kauff's rating because he ranks in the best 100 all-time based on performance.

You won't find Benny Kauff in any top all-time 100 list. The only list I have seen him appear on is Bill James' top 100 centerfielders in which he ranks Kauff 94th. There is a 400 greatest players list by Total Baseball (by John Holway and Bob Carroll), and Kauff is not on it. If he is not on any top 100 list or even top 400, wouldn't you conclude that he was not a very good player? But nothing could be further from the truth. There is no doubt that he was an excellent player, his career just ended early and abruptly.

Several top 100 lists include Lou Brock. Does that mean the general consensus is that Lou Brock is a better player than Benny Kauff? Kauff was an excellent player who played a short time, and therefore has low career value. Brock was a good player who played a long time. Kauff is the better player! Brock has more career value!

Underrated Players

- Bobby Grich

It appears that Grich is the most underrated player. I see two primary reasons.

(1) He had a low batting average (.266) giving the impression he was not a good offensive player.

(2) He fell victim to the first place bias, because he never played in a World Series.

Grich was an excellent run creator because he walked a lot… his OBP is .371, 105 points above his batting average, and he had decent home run power, very good for a second baseman. He also played in difficult hitter's parks which made him look like a slightly worse hitter than he really was. This is another example of batting average not reflecting the player's ability to create runs. Grich was also a fantastic defensive player…. playing mostly at second base but also filled in at shortstop.

Joe Gordon (2B) was recently inducted into the HoF, I think in part because he played on 5 World Series Championship teams, 4 of them with the Yankees. He played next to Gehrig for a season, then with DiMaggio. Of course he had much more exposure to the media and the public, and benefited from the first place bias. Grich never played in a World Series and never had the exposure players on great teams get.

Here is an objective comparison of the careers of Grich and Gordon.

	Career Performance Ratings			Career Wins
	Overall	Batting	Fielding	
Bobby Grich	33.2	24.4	8.9	421
Joe Gordon	26.5	18.8	7.8	275 (+70) = 345*

*Gordon missed 2 seasons due to WWII so I'll be extremely generous and give him another 70 wins.

Bobby Grich is an easy selection for the HoF based on his career performance. He has HoF career value as well. He has been on the HoF ballot only once and came nowhere close to being inducted.

As an aside, the best defensive infield to play on the same team at the same time… the Baltimore Orioles in the early-mid 1970's. If you played against the Orioles then, you better not have hit the ball on the ground, well except to 1st base.

Player	Position	Career Fielding Rating
Mark Belanger	SS	10.8
Bobby Grich	2B	8.9
Brooks Robinson	3B	7.2
Boog Powell	1B	2.4

- Will Clark

Clark had peaks and valleys in his career, so there is a range of opinions as to where he ranks. Taking his whole career into account, he is a Hall of Famer.

He had incredible seasons in 1988 and 1989 but did not win the MVP either year. He deserved both of them because he contributed to more team wins those years than any other player. Would it help Clark's chances for the HoF if he had those MVP's in his trophy case? Based on the criteria used today it would probably make a difference, but selections for the Hall of Fame should never be based on any kind of award a player gets. Some years 30 wins are good enough to win an MVP and in other years over 40 wins are not good enough. And even if you get an MVP, your chance of actually deserving it is about fifty/fifty (see MVP section below). MVP awards, gold glove awards, or other awards in baseball are not a good gauge of a player's ability because they're often given to the wrong player. Derek Jeter deserved 2 MVP's and won none; he won 4 gold gloves and deserved none. When Jeter goes into the HoF (deservedly) they will quote his "4 gold gloves" giving the impression he was a good fielder… good grief!

Clark had a few mediocre years as well and was plagued with injuries, mostly in the 2nd half of his career which impacted his performance level and his overall career value. For some reason, some players who have declines in the latter part of their careers get a pass, like Ernie Banks (see below). For other players, like Will Clark, they don't live up to expectations. An objective rating that averages out the player's performance over his career, eliminates these unfair biases. Clark's performance, on average over his career, and his career value are certainly at the HoF level. He also rates as a great(-) offensive player in this system, among the best 40 of all-time. He has been on the HoF ballot only once and came nowhere remotely close to induction. He'll get into the HoF when the criteria for selection is based on a player's contribution to winning games, but who knows how many years that will take.

- Darrell Evans

Evans is another Bobby Grich in regard to batting average and walking… but to an even greater extreme. He has a low career batting average (.248) but walked at a very high rate (.152 BB Avg) so his on-base percentage is a respectable .361. He had good home run power, even though he played a significant portion of his career in a pitcher's park in San Francisco. He was an excellent fielding 3rd baseman although he only played

slightly more than half of his games at 3rd. His overall defensive rating is lower because he played a significant number of games at 1st base.

Evans had one of the highest wins in a season (25.6) for a player at age 40 and he played a very long career retiring at age 42. He has plenty of career value for the HoF and meets the career performance hurdle as well. I think most just can't get past his .248 batting average. But Evans was an excellent(-) offensive player because he did everything else well.

- Alan Trammell

Trammell is among the best 10 shortstops of all-time, and among the best on 10 offense as well, and he was about an average fielder at short. If you can acquire a good hitting shortstop with average fielding skills like Trammell, hang on to him as long as you can because he is going to win more games than a great fielding shortstop who can't hit.

He had a 41 win season in 1987, deserving the MVP, and didn't get it. He has been on the HoF ballot for eight years running now but needs about 4 times the number of votes he has been getting to be inducted... the current members of the Baseball Writers Association of America (BBWAA) are not going to induct him. He is very comparable on both offense and defense to Joe Cronin. If Cronin belongs in the HoF as a player, and I think he does, then Alan Trammell does as well.

<u>Overrated Players</u>

The one player, who is ranked around 12th on average on top 100 lists, that is considerably overrated, is Jimmy Foxx. Foxx is ranked about 50th in this system excluding active players, which is not very close to 12th. He's a Hall of Famer but just not among the elite class of players.

When you look at basic batting stats, Foxx comes up into the elite hitters' class, apparently. He hit for power having a slugging percentage over .600, only one of 5 players to have accomplished that for a full career, he had a high batting average of .325, and he walked a lot. So he did everything a batter needs to do to create runs and he had some huge RBI years as a result.

As with all players we have to make the appropriate adjustments to make his basic stats comparable to other players. There are 3 things that significantly inflate his offensive stats.

(1) He played his career in a hitter's era in the late 1920's through the early 1940's. If we transplanted him into the Mays/Mantle era of the 1950's and 1960's his stats would not be nearly as impressive. Foxx had much better raw offensive stats than both Mays and Mantle, and I don't believe for a millisecond he was nearly as good a batter as either of them.

(2) He hit in extremely hitter friendly parks, so his stats are significantly elevated by the park effect alone.

(3) The spread in the talent level in the AL over his career was high relative to other later eras, meaning that the lower level talent in the AL over these years was relatively poor. The result of this is that the lower tier players do not gain as many wins, making it easier for the better players to increase their win totals.

With adjustments for these effects, Foxx's offensive rating comes down significantly and since he played mostly 1st base his defensive rating is low and overall rating about 40 places lower than most people rate him. On career value, he has about 500 wins (with a subjective adjustment for the end of his career in which he missed a few seasons due to WWII), ranking about 30th on career value which, again is not close to 12th.

Even Ruth and Gehrig fall into these categories although not quite to the same degree as Foxx, but both notch down in the ratings. Gehrig is rated somewhat lower as a result compared to most top 100 lists. Ruth is just so far above everyone else, even when his rating is adjusted down he still maintains the #1 rank.

Foxx is the highest ranked player on most top 100 lists that I think is significantly overrated. Other players who appear on most top 100 lists that are even more overrated are George Sisler, Brooks Robinson, and Ernie Banks.

Hybrid Fielders

By a hybrid fielder I mean a player that played significant portions of his career at more than one position.

- Ernie Banks

Banks played shortstop for the first half of his career and first base for the second half. The ratings are comparable and fair because I correct for age.

	Overall	Batting	Fielding
SS	29.3 (Excellent)	22.5	6.8
1B	18.0 (Average-)	14.9	3.1
Total career	24.9 (Good)	19.7	5.2

Banks couldn't have had more different "careers". He was a HoF performer at shortstop and a slightly below average player as a 1st baseman.

He would rank in the best 5 among shortstops, about equivalent overall to Cal Ripkin and Derek Jeter, and roughly 100th among all players of all time (which is high for a SS) based on his performance rating at short. He was the first home run hitting shortstop, although the general perception of him as an offensive player is slightly overrated because he played in a hitter friendly park. Win shares corrects for park effects so Banks' batting rating notches down a bit because of this. Still, he would rank in the top 5 all-time offensively, among shortstops. He was a below average fielding shortstop, but he more than made up for his defensive weakness with his bat.

After age 30 he moved to 1st base and his career went downhill. As a 1st baseman he was an average batter and a slightly above average defensive player, and when you combine the two he comes out as an average(-) player because 1st basemen don't contribute much to winning with their glove. He ranks somewhere around 1000th among all players based on his play at 1B. For his entire career he averages out to a "good" player, not very close to HoF performance.

So how should he go down in history? If you think it's fair to rate him for the first half of his career, he's a HoF shortstop. If you think it's fair to rate him for his whole career, he's not a HoF performer.

- Rod Carew

Most categorize Carew at second base but he actually played slightly more time (52%) at first base. Overall, he ranks 6th among first basemen and 7th among second baseman and around 50th among all players, a true Hall of Famer. Carew was a singles hitter. 79% of his hits were singles, one of the highest percentages for a good hitter in the modern era. After his move to 1B, he continued to play well and followed a typical career progression until retiring at age 39. In *Baseball's All-Time Best Hitters*[11], Michael Schell rates players based on career batting average, including adjustments for age, eras, and park factors. Carew ranks 2nd in adjusted hitting average behind Ty Cobb, on Schell's list. But Carew falls way down in this system because he did not hit for power and he only walked at a slightly above average rate. He ranks about 37th among all players offensively, still an excellent(+) batter. Batting average is often not a very accurate measure of a player's ability to create runs, and wins.

- Pete Rose

Rose was the quintessential hybrid fielder. He played at least 500 games at 5 different positions. The only positions he didn't play were catcher and shortstop. He started his career at 2B but could not field that position well so he was moved to the outfield, playing mostly in left and right field. Then he moved to 3B for a few seasons and played poorly defensively, until finally moving to 1B for the end of his career, where he was competent but not a very good target for the infielders' throws. He was a defensive misfit wherever he played, yet overall we was about an average fielder. I classify him as a left fielder because he played the most innings in the outfield and more in left field than the other outfield positions.

Rose actually led me toward the age adjustment method. As I was evaluating players based on their wins per plate appearance I was ready to conclude that everyone was overrating Rose because his unadjusted wins per unadjusted plate appearances is quite low. I originally had him out of the best 200. There isn't any question Rose is much better than that. He ranks about 60th all-time with the age adjustment in this system.

Extreme Case

When I saw that Johnny Romano was rated almost as high as Johnny Bench for his career, I thought this whole system might be screwy and I might have to start over. So I went back over every detail… there's nothing wrong. Romano is just perceptually underrated because he has very low career *value.* He played mostly partial seasons and retired early. He is an extreme a case of an excellent player with low value. Romano can't be considered for the HoF because he just did not play enough to have enough of an impact on the game. He just makes the 3000 PA cutoff I use to include players in the ratings. Here are his career ratings compared to Bench's.

	Performance (Wins/Season)	Career Value (Wins)
J. Bench	30.5	411
J. Romano	30.0	151

The weakness of the performance ratings is that they do not incorporate how much the player is playing. The weakness of the value ratings is that they don't tell you

the quality of play. That's why 2 ratings as are needed to adequately evaluate a player. Everyone wants to combine them, but you can't. So we can conclude that Romano was a HoF performer who did not have HoF value. If only he could have played *more*.

Other players with high performance ratings and relatively low career value include Gene Tenace, Gavvy Cravath, Charlie Keller, Benny Kauff, and Al Rosen. None of these players appear on top 100 lists… this is how I know that essentially all comparative player lists do not rank players by how well they play the game. If they did, you would see these players appear on most lists.

19th Century Players

The best 10 who played the majority of their career before 1900, are:

Rank	Pos	Player	Overall Rating
1	CF	Billy Hamilton	31.2
2	1B	Dan Brouthers	30.7
3	1B	Cap Anson	30.5
4	3B	John McGraw	29.8
5	LF	Ed Delahanty	29.2
6	1B	Roger Connor	28.7
7	LF	Jesse Burkett	28.2
8	LF	Jim O'Rourke	28.1
9	LF	Tip O'Neil	27.9
10	LF	Charley Jones	27.5

For positions not listed above, the best 19th century players by this system are:

SS	George Davis	27.4
RF	King Kelly	27.1
C	Buck Ewing	26.2
2B	Hardy Richardson	24.5

Ross Barnes is actually the best 2nd baseman in the 19th century but he played most of his career between 1871-1875 in the National Association, which many don't include as part of MLB. Cap Anson also played 5 years in the National Association, Jim O'Rourke 4 years, and Charley Jones played a few years as well.

Brouthers was the best hitter to play in the 19th century. He was a very big man for this era and had the highest slugging percentage (.519) of any player then. Only three other players had career slugging percentages over .500 because home runs were rare in the 19th century.

All but three players listed above are in the Hall of Fame. Tip O'Neil and Charley Jones had relatively short careers, and Hardy Richardson was a good player, just not Hall of Fame caliber. John McGraw also had a short playing career but then became a famous manager, so was inducted based on the combination of his time as a player and manager.

Best Seasons

A value rating, the player's contribution to the team's wins, can be used to determine the most valuable player in the league in any year. The 10 most valuable in history are listed in the table on the left. The performance rating breaks out the quality of play from the value rating. The 10 best performances in a season are listed in the table on the right. Not only did Mantle have the most valuable season in 1957 he also played better than any other player in history that year. Ruth had his 3rd highest win total in 1920, but he actually played his best that year.

Most Valuable Seasons

Rank	Player	Age	Year	Wins per Season*
1	M. Mantle	25	1957	61.4
2	H. Wagner	34	1908	61.0
3	B. Ruth	28	1923	59.6
4	M. Mantle	24	1956	58.9
5	T. Speaker	24	1912	58.5
6	B. Ruth	26	1921	57.5
7	B. Ruth	25	1920	57.3
8	S. Musial	27	1948	55.9
9	T. Cobb	30	1917	54.8
10	E. Collins	22	1909	53.2

Best Performances in a Season

Rank	Player	Age	Year	Wins per Standard Season**
1	M. Mantle	25	1957	60.6
2	B. Ruth	25	1920	56.7
3	M. Mantle	24	1956	56.2
4	H. Wagner	34	1908	55.7
5	B. Ruth	28	1923	53.5
6	T. Cobb	23	1910	53.2
7	T. Speaker	24	1912	52.4
8	J. Morgan	31	1975	51.9
9	B. Ruth	26	1921	51.7
10	A. Pujols	23	2003	50.7

* Pythagorean Wins normalized to 162 game seasons and adjusted for time

**Normalized Pythagorean wins per equal 650 PA and 1320 innings (not age adjusted), minimum 600 PA

Pythagorean MVP's

Voting for the most valuable player in each league began in 1931. The player who receives the most votes by the Baseball Writers Association of America (BBWAA) is awarded the MVP. Bill James did an analysis of MVP awards compared to the win shares leader in the league and concluded that the BBWAA selects a player within 2 win shares of the league leader exactly half the time[1]. I've done the same analysis with Pythagorean wins and came to the same conclusion.

The correlation of the BBWAA's vote leader to the Pythagorean wins leader:

- 38% match
- 44% are within 1.0 win or less of the Pythagorean wins leader
- 50% are within 2.0 wins or less of the Pythagorean wins leader
- 52% are within 3.0 wins or less of the Pythagorean wins leader
- 62% are within 5.0 wins or less of the Pythagorean wins leader
- 86% are within 10.0 wins or less of the Pythagorean wins leader

If Pythagorean wins between players are accurate to a difference of 2-3 wins per year, the BBWAA MVP agrees with the Pythagorean wins leader about half the time. The 14% of MVP award winners that are not within 10 wins of the Pythagorean wins leader are summarized below.

Year	League	BBWAA Vote Leader	Wins Difference vs. Pythagorean Wins Leader	Pythagorean Wins Leader
1944	NL	Marty Marion	-18.9	Stan Musial
1934	AL	Mickey Cochrane	-18.7	Lou Gehrig
1955	AL	Yogi Berra	-18.0	Mickey Mantle
1992	AL	Dennis Eckersley (pitcher)	-17.1	Frank Thomas
1979	NL	Willie Stargell (co-MVP)	-16.9	Dave Winfield
1958	AL	Jackie Jensen	-15.1	Mickey Mantle
1960	NL	Dick Groat	-14.4	Willie Mays
1996	AL	Juan Gonzalez	-14.1	Alex Rodriguez
1942	AL	Joe Gordon	-13.6	Ted Williams
1963	NL	Sandy Koufax (pitcher)	-13.6	Hank Aaron
1947	AL	Joe DiMaggio	-13.3	Ted Williams
1987	NL	Andre Dawson	-13.0	Ozzie Smith
1984	AL	Willie Hernandez (pitcher)	-12.4	Cal Ripkin Jr.
1955	NL	Roy Campanella	-12.2	Willie Mays
1935	NL	Gabby Hartnett	-12.1	Arky Vaughan
1964	NL	Ken Boyer	-12.0	Dick Allen
1961	AL	Roger Maris	-11.6	Mickey Mantle
1997	NL	Larry Walker	-11.2	Craig Biggio
1937	AL	Charlie Gehringer	-10.9	Joe DiMaggio
1931	NL	Frankie Frisch	-10.8	Bill Terry
1938	NL	Ernie Lombardi	-10.5	Mel Ott
1998	AL	Juan Gonzalez	-10.3	Albert Belle

Marion's selection in 1944 is the worst ever by this analysis, but I find the 9th worst to be particularly outrageous. Joe Gordon won over Ted Williams in 1942. Joe Gordon wasn't even the MVP on his own team in 1942. He finished third in wins on the Yankees to Charlie Keller and Joe DiMaggio. It is very obvious that Williams far outdistanced any player in the AL in 1942... he even won the triple crown. The only plausible explanation for Williams not winning the MVP in 1942 was that he hated the media and the media hated him, and the BBWAA was not about to give him the MVP regardless of what he did on the field. And they stuck it to him again in 1947.

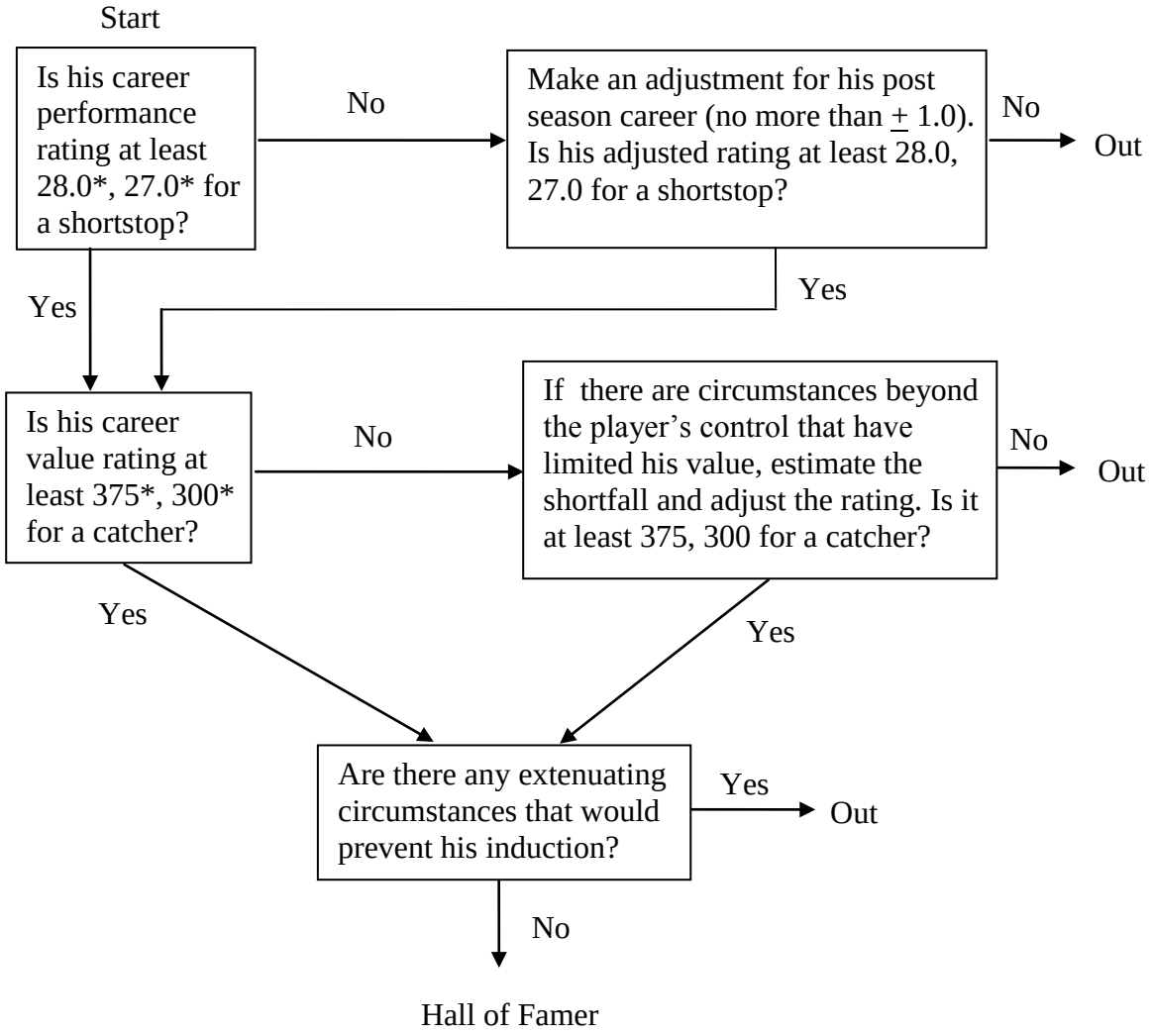
Not only has politics entered into the decision for the MVP, but there are many perceptual biases that strongly influence who gets the award. The major ones in my opinion are… stats like HR's and RBI's are not adjusted for differences in ballparks and other effects, players on winning teams are overrated, the ability of a player to walk is largely ignored, fielding is sometimes grossly overvalued, and breaking a long standing record is weighted too heavily. Combine the politics with the biases that don't correlate well with winning, and half the time you get an MVP that is really not the MVP. I'm not saying that Pythagorean wins are 100% correct, but they are at least reasonable and are certainly not going to give Joe Gordon the MVP over Ted Williams in 1942.

MVP's based on the Pythagorean wins are listed in the reference section for all seasons with the corresponding BBWAA vote leader beginning in 1931.

The Hall of Fame

Induction into the HoF should be based on the player's ability to win games over his career, which can be defined in two different ratings, (1) career performance and (2) career value.

I wanted to come up with some elegant equation to determine if a player should be in the HoF but it's not possible because the career value rating requires a fairly large subjective adjustment for a significant number of players, and because the two ratings cannot be combined in an objective way since they have different units. So I would use the following logic flow to determine if a position player should be inducted.



*If he played part of his career at shortstop or catcher, the hurdles are prorated to define the specific minimum(s). You can change the hurdles if you like, these are mine.

Position players that are currently in the HoF that qualify under these criteria are listed below. There are currently 141 position players in the Hall of Fame, but only about half of them are on this list.

The Winners:

Player	Pos	Start	End	Performance	Value
Johnny Bench	C	1967	1983	30.4	411
Yogi Berra	C	1946	1965	34.4	438
Roy Campanella	C	1948	1957	29.1	231
Gary Carter	C	1974	1992	28.4	406
Mickey Cochrane	C	1925	1937	31.0	306
Bill Dickey	C	1928	1946	32.0	351
Carlton Fisk	C	1969	1993	34.3	445
Gabby Hartnett	C	1922	1941	33.9	370
Cap Anson	1B	1876	1897	30.5	556
Dan Brouthers	1B	1879	1896	30.7	457
Rod Carew	1B	1967	1985	31.7	479
Roger Connor	1B	1880	1897	28.7	475
Jimmie Foxx	1B	1925	1945	31.2	480
Lou Gehrig	1B	1923	1939	37.3	552
Hank Greenberg	1B	1930	1947	32.1	298
Harmon Killebrew	1B	1954	1975	30.1	436
Willie McCovey	1B	1959	1980	32.3	440
Johnny Mize	1B	1936	1953	35.4	397
Eddie Murray	1B	1977	1997	29.4	531
Eddie Collins	2B	1906	1930	37.3	657
Charlie Gehringer	2B	1924	1942	28.8	426
Rogers Hornsby	2B	1915	1937	38.3	588
Nap Lajoie	2B	1896	1916	35.3	556
Joe Morgan	2B	1963	1984	36.8	580
Jackie Robinson	2B	1947	1956	32.5	288
Ryne Sandberg	2B	1981	1997	28.9	403
Wade Boggs	3B	1982	1999	33.3	488
George Brett	3B	1973	1993	32.2	523
Eddie Mathews	3B	1952	1968	32.0	510
Mike Schmidt	3B	1972	1989	37.0	547
Luke Appling	SS	1930	1950	28.2	406
Joe Cronin	SS	1926	1945	26.9	369
George Davis	SS	1890	1909	27.4	459
Cal Ripken Jr	SS	1981	2001	29.4	531
Arky Vaughan	SS	1932	1948	32.7	401
Honus Wagner	SS	1897	1917	44.3	738
Robin Yount	SS	1974	1993	28.5	522
Jesse Burkett	LF	1890	1905	28.2	450
Fred Clarke	LF	1894	1915	29.2	455
Ed Delahanty	LF	1888	1903	29.2	419
Rickey Henderson	LF	1979	2003	36.9	656
Stan Musial	LF	1941	1963	39.1	683
Jim O'Rourke	LF	1876	1893	28.1	460
Al Simmons	LF	1924	1944	28.0	412
Willie Stargell	LF	1962	1982	33.9	422

Zack Wheat	LF	1909	1927	28.3	432
Ted Williams	LF	1939	1960	46.1	631
Carl Yastrzemski	LF	1961	1983	30.9	561
Ty Cobb	CF	1905	1928	42.7	806
Joe DiMaggio	CF	1936	1951	37.3	439
Larry Doby	CF	1947	1959	31.4	313
Billy Hamilton	CF	1888	1901	31.2	399
Mickey Mantle	CF	1951	1968	43.0	659
Willie Mays	CF	1951	1973	41.6	712
Duke Snider	CF	1947	1964	30.5	387
Tris Speaker	CF	1907	1928	40.0	706
Hank Aaron	RF	1954	1976	38.0	718
Roberto Clemente	RF	1955	1972	27.8	424
Sam Crawford	RF	1899	1917	28.4	486
Harry Heilmann	RF	1914	1932	28.6	400
Reggie Jackson	RF	1967	1987	33.3	532
Al Kaline	RF	1953	1974	30.7	511
Mel Ott	RF	1926	1947	34.5	604
Frank Robinson	RF	1956	1976	35.5	595
Babe Ruth	RF	1914	1935	47.5	740
Enos Slaughter	RF	1938	1959	30.5	377
Paul Waner	RF	1926	1945	30.7	470
Dave Winfield	RF	1973	1995	28.9	487
Paul Molitor	DH	1978	1998	31.3	519

The other winners, the players that qualify under these criteria and have been eligible for the HoF but have not been inducted, are:

Player	**Pos**	**Start**	**End**	**Performance**	**Value**
Bobby Grich	2B	1970	1986	33.2	421
Barry Larkin*	SS	1986	2004	32.8	427
Dick Allen	1B	1963	1977	32.7	375
Tim Raines*	LF	1980	2002	31.4	481
Will Clark*	1B	1986	2000	31.3	404
Lou Whitaker*	2B	1977	1995	30.1	440
Roberto Alomar*	2B	1986	2004	29.8	463
Fred McGriff*	1B	1986	2004	29.2	429
Darrell Evans	3B	1969	1989	29.1	423
Alan Trammell*	SS	1977	1996	27.6	392

*Played a portion of their career in the PED era (1993-2005). This is where it gets messy. Which ratings are unfairly elevated and which ones are not?

Of the position players on the ballot in 2010, Larkin is the best player. He is the full package... a very good offensive player and a great fielder. There are very few shortstops in history that have combined this level of offense and defense, so he ranks 3rd overall among shortstops, a better player than Cal Ripkin Jr. Ripkin played more

consecutive games than anyone in history so he has more career value, i.e. more career wins, than Larkin who had quite a few injuries in his career. But if we give them the same chances in a season the average Larkin will create more wins than the average Ripkin.

	Career Performance (Wins/Equal Season)	Career Value (Career Wins)
B. Larkin	32.8	427
C. Ripkin	29.5	531
HoF Hurdle (Shortstop)	27.0	375

- Larkin is the better player
- Ripkin has more career value
- Both are Hall of Famers

Other eligible position players that are not in the HoF but are just below the margin for either performance or career value or both include Reggie Smith, Dwight Evans, Jack Clark, Brian Downing, Stan Hack, Jose Cruz, Sherry Magee, Keith Hernandez, Graig Nettles, Bill Freehan, Bill Dahlen, and Minnie Minoso.

The other two players who would be obvious selections based on their play on the field, but remain ineligible because they fail the "other extenuating circumstances" question, are:

Player	Pos	Start	End	Performance	Value
Joe Jackson	LF	1908	1920	34.7	330 (banned after age 30)
Pete Rose	LF	1963	1986	31.0	610

Joe Jackson is ranked about 25th all-time and about 20th as an offensive player…. he was a great player. At age 29 he participated in throwing the 1919 World Series and admitted to taking part in the scheme at the trial the following year. We can forgive him for this, but we should not *honor* him by inducting him into the HoF because what he did affected the outcome of games. When players cheat to improve their performance by using performance enhancing drugs, we can forgive them when they admit their mistake, but we should not *honor* them buy voting them into the HoF because what they did unfairly changed the outcome of games. If these players are Hall of Famers, then the Hall of Fame ceases to have any meaning.

The position players who are in the HoF that don't make the cut (in red), ranked by performance:

Player	Pos	Performance	Value
Frank Baker	3B	31.5	352
Bill Terry	1B	29.7	323
Frank Chance	1B	29.6	260
Elmer Flick	RF	28.9	321
Hack Wilson	CF	28.8	255
Ralph Kiner	LF	28.2	282
Kirby Puckett	CF	28.1	344

Roger Bresnahan	C	27.7	252
Kiki Cuyler	RF	27.7	333
Ross Youngs	RF	27.7	251
Earl Averill	CF	27.6	304
Billy Williams	LF	27.5	418
Edd Roush	CF	27.2	362
King Kelly	RF	27.1	406
Frankie Frisch	2B	26.8	418
Joe Medwick	LF	26.7	348
Sam Rice	RF	26.6	360
Tony Perez	1B	26.5	386
Lou Boudreau	SS	26.4	305
Buck Ewing	C	26.2	314
Andre Dawson	RF	26.1	412
Goose Goslin	LF	26.0	392
Earle Combs	CF	25.8	254
Sam Thompson	RF	25.8	293
Ernie Lombardi	C	25.7	249
Chick Hafey	LF	25.6	210
Orlando Cepeda	1B	25.4	347
Joe Kelley	LF	25.4	362
Pee Wee Reese	SS	25.4	354
Jimmy Collins	3B	25.4	311
Max Carey	CF	25.3	421
Billy Herman	2B	25.3	340
Phil Rizzuto	SS	25.2	266
Ozzie Smith	SS	25.2	383
Hugh Duffy	CF	24.9	341
Ernie Banks	1B	24.9	379
Hughie Jennings	SS	24.9	257
Richie Ashburn	CF	24.6	376
Tony Lazzeri	2B	24.6	284
Bobby Doerr	2B	24.5	313
Lou Brock	LF	24.4	384
Jim Rice	LF	24.3	340
Chuck Klein	RF	24.3	273
Johnny Evers	2B	24.2	294
Heinie Manush	LF	24.0	313
Dave Bancroft	SS	23.9	311
Joe Sewell	SS	23.9	312
Brooks Robinson	3B	23.6	410
Willie Keeler	RF	23.4	382
Nellie Fox	2B	23.2	361
Bobby Wallace	SS	23.2	358
Bid McPhee	2B	23.0	375
Joe Tinker	SS	23.0	285
Jim Bottomley	1B	22.9	298
George Sisler	1B	22.8	320
Pie Traynor	3B	22.8	306
Harry Hooper	RF	22.7	366
Travis Jackson	SS	22.4	246
Freddie Lindstrom	3B	22.4	220

George Kell	3B	22.3	266	
Red Schoendienst	2B	21.5	296	
Luis Aparicio	SS	21.3	340	
Rick Ferrell	C	21.2	229	
Jake Beckley	1B	21.1	363	
George Kelly	1B	21.1	226	
Rabbit Maranville	SS	20.5	342	
Lloyd Waner	CF	20.3	272	
Tommy McCarthy	RF	19.7	192	
John Ward	SS	19.6	308	He was also a pitcher
Ray Schalk	C	19.3	214	
Bill Mazeroski	2B	17.8	246	

Players on the margin can always be debated, but if the term "Hall of Famer" is to have any relevance, the military model will need to be invoked…. some players will have to get an honorable discharge and other players a dishonorable discharge.

References

(1) Bill James and Jim Henzler*; Win Shares*; STATS Publishing; 2002.
(2) John Thorn and Pete Palmer; *The Hidden Game of Baseball: A Revolutionary Approach to Baseball and Its Statistics;* New York: Doubleday; 1984.
(3) Discovered by Bill James, formulated as Expected Win % = 100 x (Runs Scored)^2 / [(Runs Scored)^2 + (Runs Allowed)^2]
(4) Bill James; *The New Bill James Historical Baseball Abstract*; The Free Press, division of Simon and Schuster; 2001.
(5) Stephen Jay Gould; *Full House: The Spread of Excellence from Plato to Darwin;* Three Rivers Press, trademark of Random House; 1996.
(6) Bernard Goldberg, *A Slobbering Love Affair;* Regnery Publishing, Inc.; 2009
(7) Tim McCarver and Danny Peary; *Tim McCarver's Baseball for Brain Surgeons and Other Fans*; Villard Books, division of Random House; 1998; pp 218-219.
(8) John Eisenberg; *Baseball Digest*; Sept, 2005.
(9) Gary Gillette and Pete Palmer; *The 2006 ESPN Baseball Encyclopedia;* Sterling Publishing Co. Inc.; 2006.
(10) Similar to Pete Palmer's linear weights formula, extrapolated runs, developed by Jim Furtado, uses the basic formula: Extrapolated Runs = 0.50(Singles) + 0.72(Doubles) + 1.04(Triples) + 1.44(Home Runs) + 0.34(Walks) + 0.18(Stolen Bases) – 0.32(Caught Stealing) - 0.096(At Bats - Hits).
(11) Michael J. Schell; *Baseball's All-Time Best Hitters*; Princeton University Press; 1999.
(12) Bill James; *The Politics of Glory*; Macmillan Publishing Co.; 1994; p. 325.

Reference Section

Six ratings are provided for each position player in MLB history with at least 3000 plate appearances…. Mickey Mantle and Willie Mays as a comparative example:

Player			Career		Career Performance (Wins / Equal Season)			Career Value (Career Wins)		
Last	First	Pos	Start	End	Overall	Offense	Fielding	Overall	Offense	Fielding
Mantle	Mickey	CF	1951	1968	43.0 Elite+	38.1 Elite+	4.9 Avg-	659	587	73
Mays	Willie	CF	1951	1973	41.6 Elite+	34.3 Elite-	7.4 Good+	712	589	123

- Mantle is the slightly better player overall (by 43.0 - 41.6 = 1.4 wins per season)
- Mantle is the better offensive player (by 38.1 - 34.3 = 3.8 wins per season)
- Mays is the better fielder (by 7.4 - 4.9 = 2.5 wins per season)
- Mays has more career value (by 712 - 659 = 52 wins)
- They have about the same offensive career value (587 vs 589)
- Mays has more defensive career value (by 123 - 73 = 50 wins)
- Among all position players in history, Mantle's career performance is in the:
    - Elite+ category overall
    - Elite+ category on offense
    - Average- category on defense
- Among all position players in history, Mays' career performance is in the:
    - Elite+ category overall
    - Elite- category on offense
    - Good+ category on defense (center field is an average defensive position… even though Mays is among the best defensive center fielders of all-time his ability to win games with his glove is limited compared to catchers, shortstops, and 2nd basemen, who get more defensive chances)

Pythagorean MVP's are listed as well.