WHO WAS #1 PITCHER FOR A SEASON...OR #2 ... OR #1 AND #2 BATTERS?

NEW STATS ARC AND ERP ARE THE ANSWER

All Game Event Data from Project Retrosheet
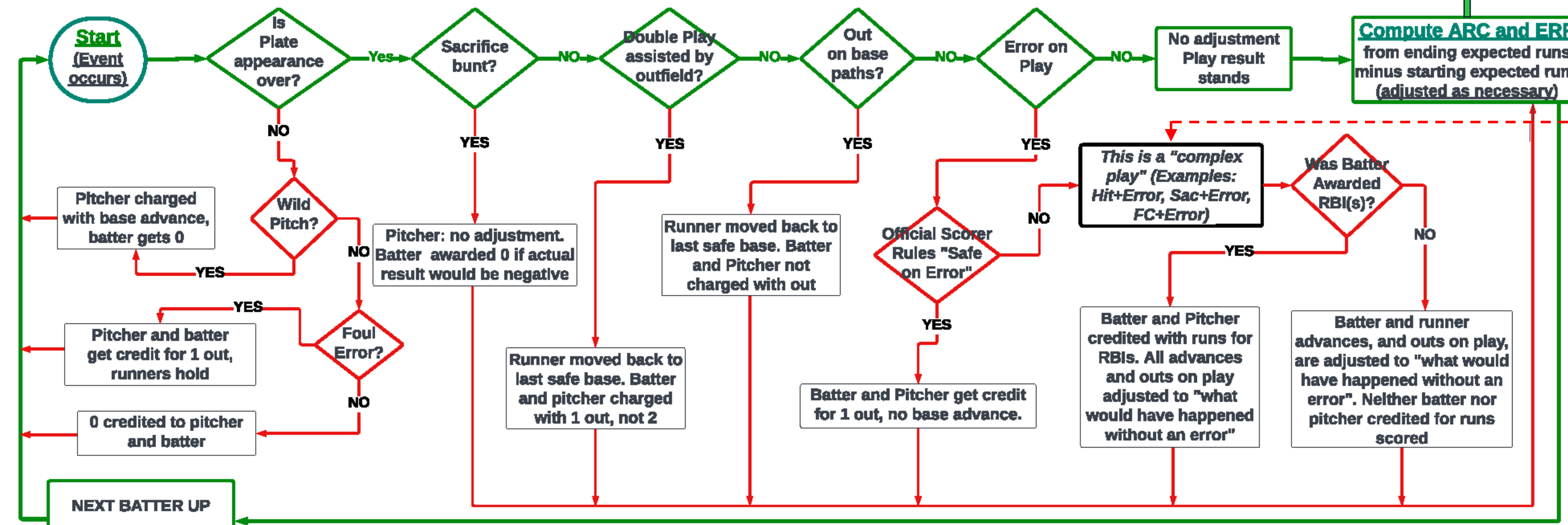All MLB Data From Baseball Reference

CURRENT STATS STRIKE OUT!

ARC "Additional Runs Created" (Batters)
ERP "Expected Runs Prevented" (Pitchers)
192,027 game events from 2019 analyzed for these results

LOGIC FOR ARC AND ERP

97.5% of events computed in GREEN pathway with no adjustment

Green path shows STAT introduced into SABR-literature as RE24, now properly computed

10 Reasons
ARC and ERP Balance and Rank Players Much Better!

1. Intuitive: denominated in runs
2. Unifies diverse numbers to sum a player's season.
3. Incorporates diverse stats like HRs, RBIs, BA; or WHIP, ERA, Saves...into one rankable number.
4. Makes sense. Pitcher and Batter get opposite score of each other for each play
5. It's zero-sum. League average is 0. A good season is positive, a poorer season is negative
6. For relief pitchers, no good statistic even exists...ERP does the job for relief pitching
7. Batters and Pitchers get full impact of double-plays
8. No concept of "inherited" for Pitchers. Now responsible for all runner advances while pitching, starting from base where they inherited a runner
9. After an error, Pitcher is still "fully responsible". If runner scores, Pitcher is charged difference. If P gets the side out, P gets credit for a 4-out inning
10. Fair with new extra inning rule placing a runner on second. Pitcher responsible only past 2nd base

2.5% (4,889/192,027 events) needed adjustment = RED pathways

CORE CALCULATION TABLE
Run Expectation for Remainder of Inning
Table shows the **expected number of runs scored in the remainder of an inning** from the starting situation of runners and number of outs.

numb outs →	0	1	2
Runners on ↓		*Run Expectation*	
none	0.57	0.32	0.13
1st	0.96	0.60	0.27
2nd	1.22	0.75	0.35
3rd	1.43	1.00	0.41
1st+2nd	1.57	1.00	0.48
1st+3rd	1.86	1.23	0.60
2nd+3rd	1.99	1.37	0.67
loaded	2.29	1.64	0.79

The computation is simple. Expeted runs scored at the end of an at-bat minus expected runs scored at the beginning of an at-bat. **Batter and pitcher get the opposite of each other.** Good for the pitcher is bad for the batter, and vice versa.
EXAMPLE : A leadoff single. The ending expectation is 0.96 runs. The starting expectation was 0.57 runs. Therefore batter gets credit for 0.96-0.57=+0.39 ARC . The Pitcher gets the opposite , -0.39 ERP .

A New Duty for the Official Scorer?
In addition to ruling between an error or a hit, the scorer could decide on the "adjusted end result" that the batter and pitcher would be charged with, when adjustment in ARC or ERP is needed. This amounts to approximately 2.01 plays per game (and over half of those already have an error involved).
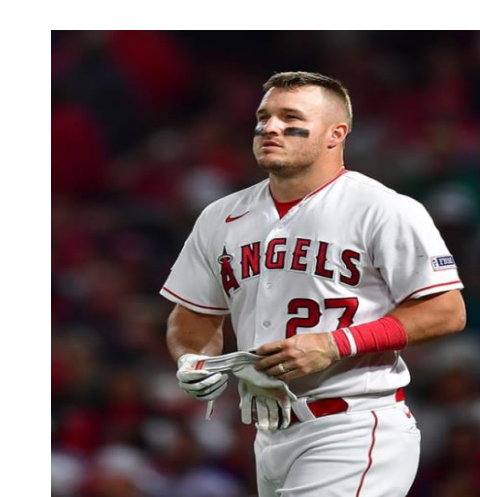
Top 10 Results 2019
- Only 4/Top 10 in BA, RBIs, HRs make Top 10 in ARC
- Bryce Harper, 89th in BA, is #9 in ARC
- Tim Anderson MLB batting champion not Top 10 ARC. His ARC is 11.01 (#72)
- Charlie Morton, 50th in WHIP, is 8th in ERP
- Only 2/Top 10 IP Relievers in Top 10 in ERP
- Several ERP and ARC leaders are not All-Stars. Only 4/10 Relief Pitchers are All-Stars.
- 8/Top 10 in ERA were Top 10 ERP, starters and relievers
- Many only shuffle a few ranks between standard stats and ARC or ERP, but fans and players care who is #1, #2, #3 .... being "the leader" matters
- OPS and OPS against correlated higher than other standard MLB stats to ARC and ERP for both batters and pitchers

2019 CROWNS
- ARC Batter– Mike Trout
- ERP Starter – Justin Verlander
- ERP Reliever – Aaron Bummer

Verlander   Trout   Bummer

Ask for the Handout QUIZ
Which is Better?
Which is Worse?

It's Settled by ARC and ERP!

Text me!

Notice similarities and differences between rankings in ARC, ERP, and standard MLB stats. Larger differences are circled

ARC Ranking (Batters), 2019 Season

Batter	ARC	rank ARC	Team	All-Star	OPS	rank OPS	k rank	RBI rank	HR rank
Mike Trout	67.6	1	LAA	★	1.083	2	32	18	5
Anthony Rendon	67.2	2	WSN		1.010	6	5	1	29
Cody Bellinger	62.9	3	LAD	★	1.035	3	16	10	4
Alex Bregman	60.8	4	HOU	★	1.015	4	23	13	7
Christian Yelich	60.0	5	MIL	★	1.100	1	2/3	25	6
Freddie Freeman	58.5	6	ATL	★	0.938	15	24	3	12
Anthony Rizzo	52.7	7	CHC		0.924	18	30	29	62
Nolan Arenado	51.6	8	COL	★	0.962	9	7	5	7
Bryce Harper	50.8	9	PHI		0.882	37	89	12	23
Ketel Marte	49.7	10	ARI		0.981	7	2/3	34	39

ERP Ranking (Starters), 2019 Season

Pitcher	ERP	rank ERP	Team	All-Star	ERA	rank	OPS agnst rank	WHIP rank	IP rank
Justin Verlander	54.1	1	HOU	★	2.58	4	1.5	16	1
Jacob deGrom	51.5	2	NYM	★	2.43	2	4	29	10
Gerrit Cole	47.1	3	HOU	★	2.50	3	1.5	3	4
Hyun-Jin Ryu	44.3	4	LAD	★	2.32	1	7	14	30
Zack Greinke	38.3	5	ARI/HOU	★	2.93	9	8	8	6
Jack Flaherty	38.2	6	STL		2.75	6	4	11	19
Mike Soroka	33.6	7	ATL	★	2.68	5	10	2	41
Charlie Morton	33.5	8	TBR	★	3.05	11	8	50	21
Max Scherzer	33.3	9	WSN	★	2.92	8	14	11	47
Stephen Strasburg	32.8	10	WSN		3.32	16	6	1	5

ERP Ranking (Relievers) 2019 Season

Pitcher	ERP	rank ERP	Team	All-Star	ERA	rank	OPS agnst rank	WHIP rank	SV	rank	IP rank
Aaron Bummer	29.1	1	CHW		2.13	8	3	14	1		67 44
Brandon Workman	26.8	2	BOS		1.88	5	1	21	16	20	71 24
Giovanny Gallegos	26.0	3	STL		2.31	10	7	3	1		74 14
Liam Hendriks	23.3	4	OAK	★	1.80	4	10	13	25	13	85 3
Kirby Yates	22.4	5	SDP	★	1.19	1	2	8	41	1	60 76
Will Harris	22.2	6	HOU		1.50	2	4	10/11	4		60 76
Yusmeiro Petit	22.0	7	OAK		2.71	18	12	2	0		83 4
Zack Britton	21.4	8	NYY		1.91	7	6	36	3		61 70
Felipe Vazquez	21.2	9	PIT	★	1.65	3	11	10/11	28	11	60 76
Josh Hader	19.4	10	MIL	★	2.62	15	15	1	37	3	75 13

Who Had the Better Season, 2019?
Which ones surprise you?

		ANSWER
Christian Yelich or Mike Trout	BA .329; OPS 1.100; HR 44 / BA .291; OPS 1.083; HR 45	Trout. Mike Trout, with lower BA and OPS is #1 in ARC
Tim Anderson or Bryce Harper	BA .335; OPS .865; HR 18 / BA .260; OPS .882; HR 35	Harper. Tim Anderson, MLB batting champion, has ARC of 11.01, (#72), While Harper is #9 in ARC
Justin Verlander or Jacob deGrom	ERA 2.58; OPS-agnst .579 / ERA 2.43; OPS-agnst .580	Verlander. Of the two Cy Young winners, Verlander edges out deGrom with ERP of 54.1, to 51.5
Kirby Yates or Aaron Bummer	ERA 1.19; OPS-agnst .515; Saves 41 / ERA 2.13; OPS-agnst .520; Saves 1	Bummer. Despite higher ERA, higher OPS agnst and fewer Saves, Bummer is #1 for Relievers in ERP
Zack Britton or Emilio Pagan	WHIP 1.141; Saves 3 / WHIP .829; Saves 20	Britton. Despite higher WHIP and fewer Saves, Britton is #8 in ERP for Relievers while Pagan is #17

AUTHOR
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TEXT me!
I'm keen to discuss ARC and ERP with you!

My goal – ARC and ERP be as well known as any current stats and used by fans, writers, players and announcers!

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Flowchart (Logic for ARC and ERP)

Start (Event occurs) → Is Plate appearance over? → Sacrifice bunt? → Double Play assisted by outfield? → Out on base paths? → Error on Play? → No adjustment Play result stands → Compute ARC and ERP from ending expected runs minus starting expected runs (adjusted as necessary)

- Wild Pitch? → Pitcher charged with base advance, batter gets 0
- Foul Error? → Pitcher and batter get credit for 1 out, runners hold → 0 credited to pitcher and batter
- Pitcher: no adjustment. Batter awarded 0 if actual result would be negative
- Runner moved back to last safe base. Batter and Pitcher charged with 1 out, not 2
- Runner moved back to last safe base. Batter and Pitcher not charged with out
- Official Scorer Rules "Safe on Error" → This is a "complex play" (Examples: Hit+Error, Sac+Error, FC+Error)
- Batter and Pitcher get credit for 1 out, no base advance.
- Was Batter Awarded RBI(s)? → Batter and Pitcher credited with runs for RBIs. All advances and outs on play adjusted to "what would have happened without an error" → Batter and runner advances, and outs on play, are adjusted to "what would have happened without an error". Neither batter nor pitcher credited for runs scored
- NEXT BATTER UP