The Three-batter Rule: Demise of the LOOGY?

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The length of games or "pace of play" has been a frequent topic for many years and Major League Baseball (MLB) has seen this as a serious enough issue to adopt several rules designed to remedy the perceived problem. The change which inspired this current presentation is the "three-batter rule", implemented in 2020. A reliever is now required to face a minimum of three batters or to pitch to the end of the inning he enters, with an exception for injury. However, if he completes an inning by facing fewer than 3 batters and returns for the next inning, then he is still required to face three total batters. The rationale is that mid-inning pitcher changes are especially time-consuming and therefore reducing their frequency should shorten games. There is in fact empirical support for this argument. Table 1 has the relevant data from my 2019 presentation at SABR49 in San Diego (https://retrosheet.org/Research/SmithD/Time%20Between%20Pitches.pdf).

Table 1. Time added by pitcher changes.

Mid-inning	2:18
Start of inning	0:14

My analysis will have two basic components:

1. Historical pattern of relief pitcher appearances.
2. Consequences of the new rule in terms of performance as well as game length.

The data for this study come from Retrosheet (www.retrosheet.org) where they are freely available. Table 2 summarizes the coverage.

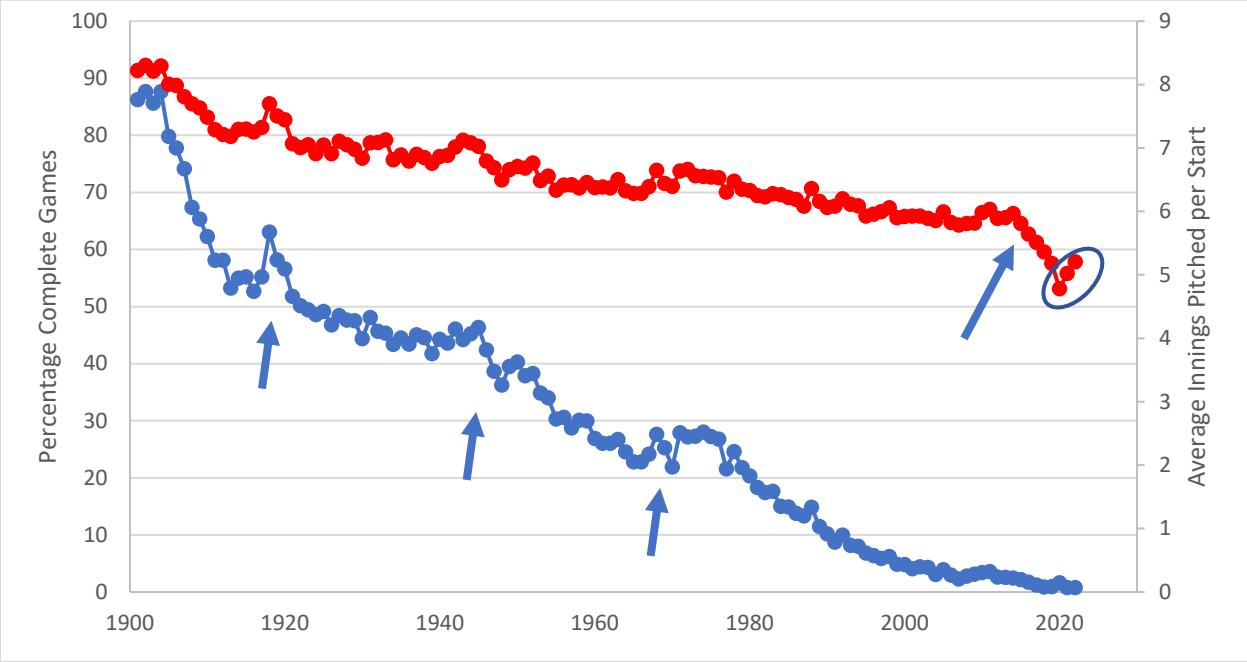
Table 2. Data used in present study.

Years	Play by play	Games	Plate Appearances
1920-2022	Full	181,431	13,925,810
1901-1919	Box score only	24,091	
Total		205,522	

The basic parameter which drives everything else about pitcher usage is the percentage of complete games, shown in the blue line in Figure 1 from 1901-2022. This pattern is familiar to anyone doing baseball analysis and there are lots of reasons for these results. Note that the overall decline from a high level of nearly 90% had three notable blips which came during the two World Wars and with the advent of the Designated Hitter in 1973. The downward trend resumed in 1976 and in fact the last two seasons have had 36 complete games each, the lowest totals for any complete season, a rate of 0.74

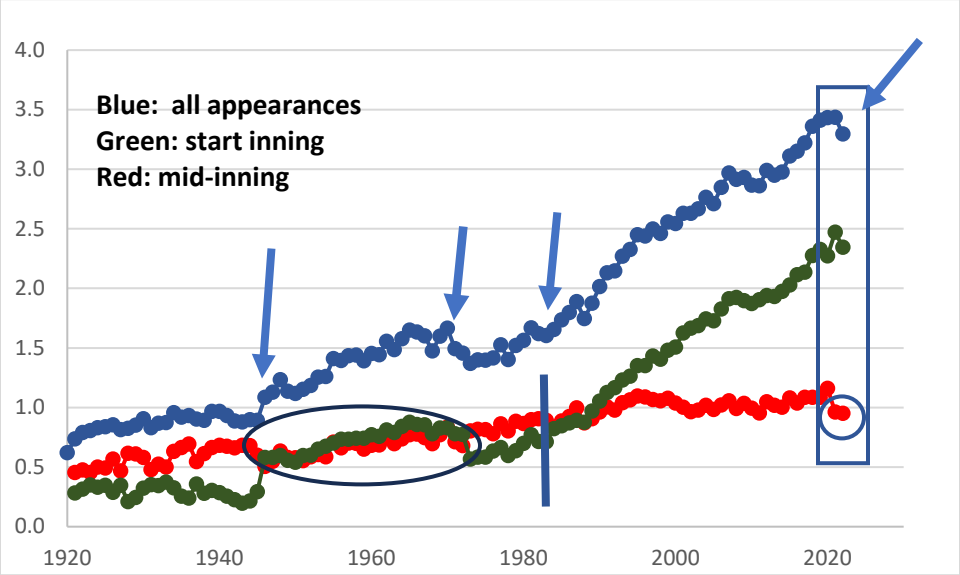
percent. The red line (using the right-side axis) measures starting pitcher usage in a different way, namely innings pitched per start. This value also shows an overall decline in the last 122 seasons, but at a much slower rate. The short-term upticks during the World Wars appear here as well, although the introduction of the DH had a much smaller impact. There are two other interesting features to the red line. First, the decline in innings pitched per start took a sharp downturn beginning in 2016, a date to which we shall return. Second, there is a definite increase in the last three seasons, the era of the three-batter rule.

Figure 1. **Percentage Complete Games and Average Innings per Start**



Obviously the percentage of games that had relievers is the mirror image of the blue line , but of more importance to the concern about game time is the number of relievers in each game. This information is in Figure 2.

Figure 2. **Relief Appearances per Team per Game.**

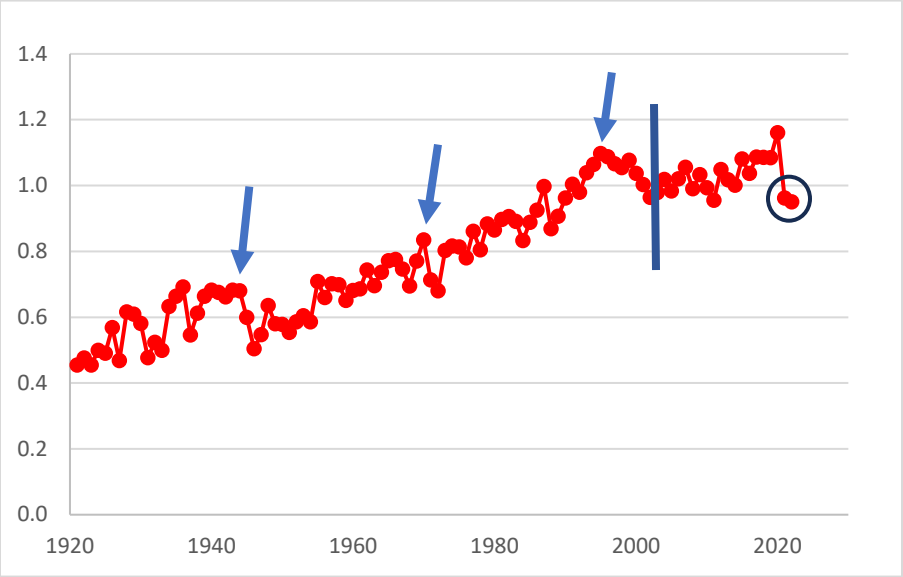


Relief pitcher usage was pretty constant with fewer than one reliever per team per game (blue line) until the end of World War II, crossing the value of 1 in 1946 and continuing up from there. The rate dipped two years before the DH started in 1973, but it resumed a fairly steady climb in 1983 which continued through 2021 and the average is now nearly seven relievers per game. There was a small, but discernible drop in 2022, the third year of the three-batter rule. Keep the early 1980s in mind as this era will continue to be important as we proceed.

The other two lines in this figure are interesting and possibly unexpected, showing that mid-inning entries predominated before 1946 and then both types of reliever entry were quite similar for over 25 years from the end of WWII until 1972, the year before the DH started. Since then, most of the increase is from relievers who started an inning. Although the three batter rule went into effect in 2020, that season is hard to analyze since it had so many 7-inning games: 102 of the 898 played, which is over 11%. In 2021, about 5% of games were 7 innings. The three-batter rule clearly did lead to fewer mid-inning changes in 2021 and 2022 with a decline of over 600 mid-inning appearances in 2022 bringing down the total reliever rate by over 4%.

As we will see, the mid-inning entries turn out to be the most interesting so I took that line from Figure 2 and present it by itself as Figure 3.

Figure 3. **Mid-inning Changes per Team per Game.**



These mid-inning appearances had the same oscillations along the way including the same multiyear drop in World War II and just before the start of the DH. There was also a noticeable decline from about 1997 to 2002. Interleague play began in 1997 and each team played an average of 16 such games in these six seasons. Perhaps the decrease in mid-inning changes reflects managers learning to adjust their strategy in games with the DH rule opposite to their prior experience. I note that the steady increase was greatly slowed after 2002 until the big drop in the last two years. Once again the 2020 season is an outlier. Therefore, it could be argued that the three-batter rule is rather misdirected since the targeted mid-inning changes are such a small part of the picture even though they do take much more time.

When the three-batter rule was implemented, many analysts immediately asked what the effect would be on one-batter appearances and specifically on the LOOGY (Left-handed-One-Out-Guy) which is best seen as a Sabermetric term of art created by John Sickels in the late 1990s (https://www.minorleagueball.com/2015/6/25/8845329/history-of-the-term-loogy-john-sickels).

LOOGY
Left-handed One Out Guy

The basic observation to create the LOOGY term was an unexpected abundance of left-handed relief specialists facing a single batter. Handedness will be an important part of my analysis so I created two related terms:

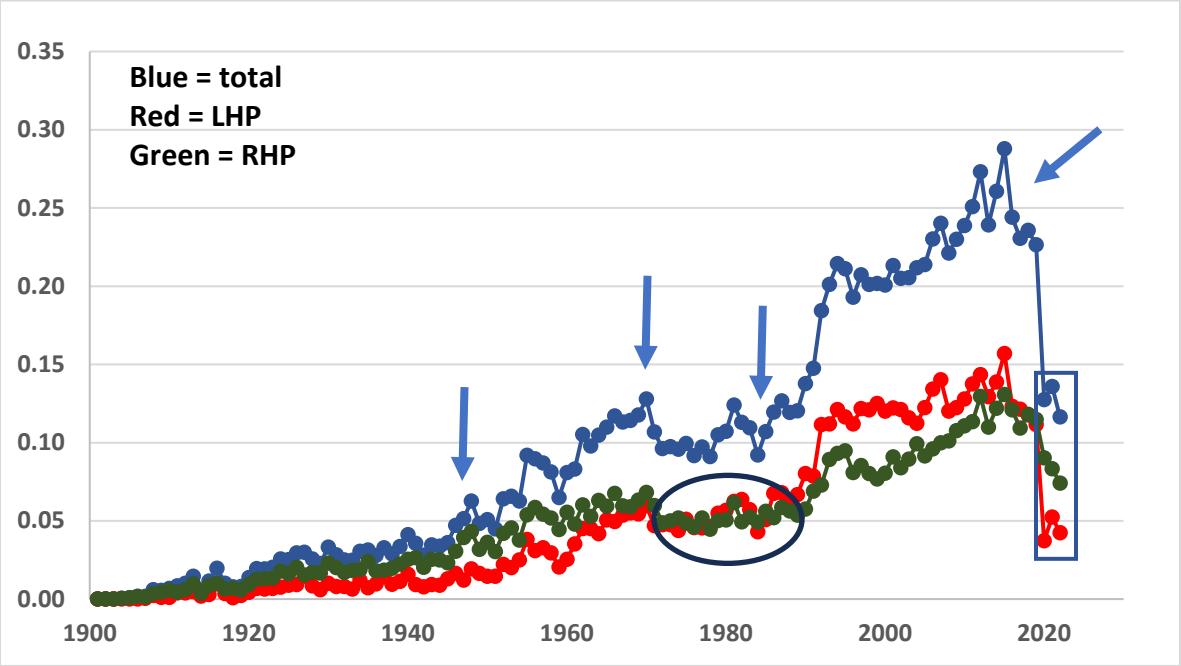
ROOGY
Right-handed One Out Guy

OOGY
One Out Guys (Both hands combined)

I must make a small digression to discuss an ambiguity in these terms that is potentially misleading. As created, the terms refer to "one-out guy", but as we shall see, in over 20% of their appearances these specialists failed to retire anyone. Therefore a more accurate term would be "one-batter guy" with the hope that the one batter would make an out. However, the LOOGY acronym is firmly established in baseball circles and I will continue to refer to these single batter pitchers that way. We must keep in mind that not all single-batter appearances were planned as such. An unknown portion may have been planned for longer, but were cut short by, for example, inning-ending double plays or game-ending plays (walkoffs). These "accidental LOOGYs" are impossible to identify in our data so I treat all single-batter appearances the same.

Figure 4 presents the rate of single-batter relief appearances since 1901, separated by pitcher handedness.

Figure 4. **Frequency of OOGYs per Team-game by handedness.**

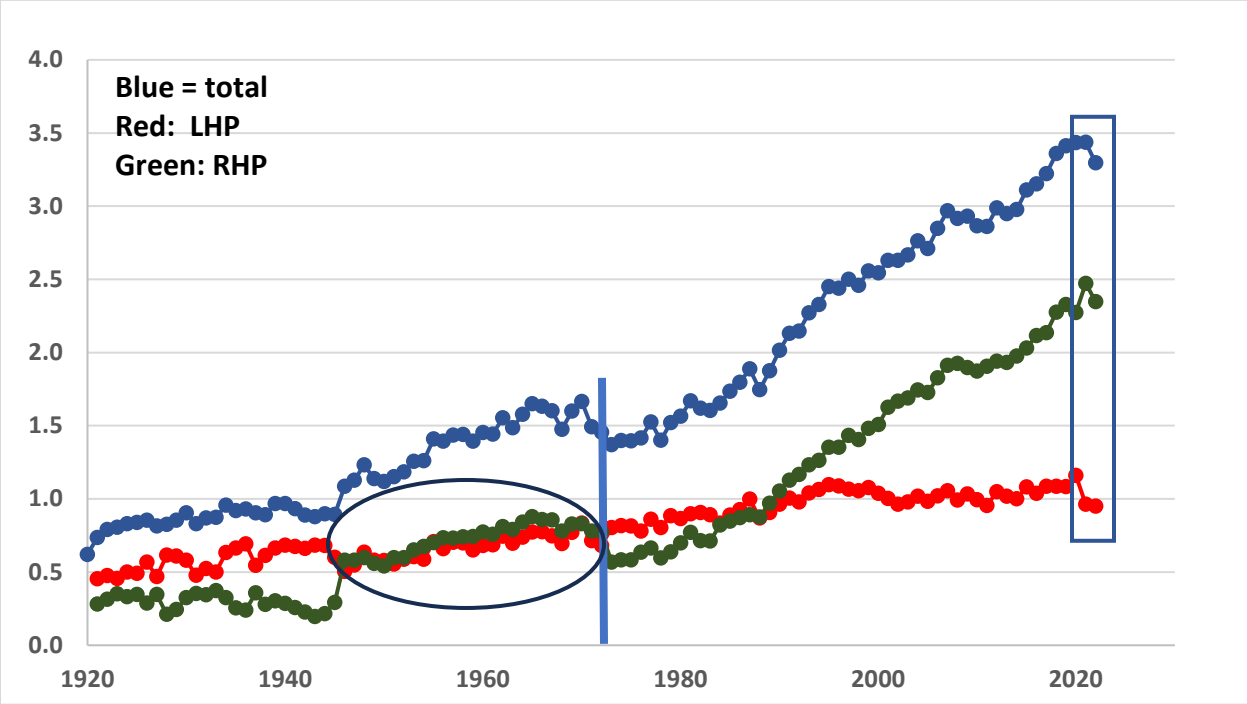


For much of the 20th century, single-batter appearances were extremely rare. They did not reach 0.05 per team per game until 1947. Consider the units here. A value of 0.05 translates to one such single-batter appearance for every 20 team-games or one every 10 games. They increased erratically until 1971 and then declined. There was fluctuation but little overall change from this point until the early 1980s when they began a sharp increase. As I showed in previous research (Figure 1 in https://retrosheet.org/Research/SmithD/MythOfTheCloser.pdf), 1983 is the year that began the rise in bringing in a new reliever in a save situation in the 9th inning. To me, this is clearly the beginning of the "closer era". Recall that the total number of relievers showed the same increase beginning in 1983 as we saw two slides ago. There will be more on this below.

As Figure 4 shows, prior to 1990 the rates for LOOGYs and ROOGYs were pretty similar, especially from 1970 to 1990. However, from 1990 to 2015 the LOOGY rate clearly surpassed that of the ROOGY, although both increased. It is not immediately obvious what caused the LOOGY rate to overtake that of the ROOGYs. I note that this is the era in which John Sickels coined the LOOGY term so the pattern was striking to more people than just me. Perhaps there began to be a greater interest in the handedness of key matchups which has been a consideration to some degree for many years. These matchups will be discussed in detail below. It is very interesting that all single-batter appearances began a noticeable decline in 2016, which I referred to above. This is four years before the implementation of the three batter rule. Of course, the rates of one-batter appearances have dropped by over 50% since the three-batter rule arrived in 2020.

In order to put the single-batter relievers into a broader context, Figure 5 has the appearances by all relievers separated by pitcher handedness. Figure 2 separated appearances by time of entry, namely mid-inning vs start of inning.

Figure 5. **Total Relief Appearances per Team-game by Handedness**



Right-handers account for about 75% of total innings pitched by all relievers (data not shown). The pattern here is different from the single-batter data. Left-handers were clearly more frequent than right-handers until after WWII. Following a period of nearly identical rates from 1946 to 1972, there has been a fairly steady increase in total relievers beginning in 1975. Of special note is that the clear driver of the increase in the last 40 or so years is the right-handed pitcher, which makes the above-noted ascendance of LOOGYs over ROOGYs beginning in 1990 even more remarkable. The three-batter rule has led to fewer relievers per game, although the pattern is less clear for right-handers than lefties.

These changes in usage pattern of total relievers are interesting but the most significant question about OOGYs is to ask how effective these pitchers have been. The answer turns out to be complicated and perhaps a bit unexpected.

The first comparison was to look at those facing only one batter vs other groups of pitchers from 1920 to 2022 as shown in Table 3. WHIP is walks plus hits per inning, a fairly common modern measure.

Table 3. **Data vs Different Groups of Pitchers, 1920-2022.**

	BA	OA	SA	OPS	ERA	WHIP
All Games	.261	.329	.396	**.725**	**4.02**	**1.37**
Starters	.264	.326	.400	**.726**	**4.07**	**1.36**
Relievers	.254	.331	.384	**.715**	**3.91**	**1.38**
Non-OOGY	.255	.333	.388	**.721**	**3.92**	**1.39**
OOGY	.152	.221	.242	**.463**	**1.93**	**0.75**

These are average values and mask the fact that some eras had much higher offense than others, but this information here provides a valuable baseline. Relievers do well overall, but the superior performance of the OOGYs is striking. However, not all OOGY appearances are equally effective. Table 4 separates these games by innings pitched (outs obtained) by the OOGY in each appearance):

Table 4. **OOGY Performance by Outs obtained.**

	Games	**BA**	**OA**	**SA**	**OPS**
Total	48228 (100 %)	.152	.221	.242	.463
One out	34076 (70.7%)	.015	.017	.017	.034
Two outs	3734 (7.7%)	.003	.004	.004	.008
Zero outs	10395 (21.6%)	**.952**	**.969**	**1.543**	**2.512**

Zero out totals:
6131 hits
3563 walks
940 doubles
137 triples
865 home runs

The top line in Table 4 is the same as the bottom line in Table 3, minus ERA and WHIP. Over 70% of OOGY appearances result in one out with a .034 OPS. In 7.7% of these games, the OOGY got two outs due to various types of double play and the OPS is .008. These miniscule OPS values are not zero because occasionally a runner would reach base and the pitcher got an out from a non-batter event such as a pickoff or caught stealing. The “Zero outs” line shows that over 21% of the time the OOGY retired no one – not a runner or a batter. The OPS of 2.512 is breathtaking, as are the totals for hits, walks, doubles, triples, and home runs. Remember that slugging average has a maximum value of 4.000 and therefore OPS could be as high as 5.000 which would be every batter hitting a home run. The batting average and on-base average are not 1.000 because some batters reached on errors which are not counted in the on-base calculation. We can conclude that the OOGY failures are as spectacular as their successes, but the overall performance is still extremely good. There were also 23 OOGY appearances that resulted in three outs. Eleven triple plays were in this group and the other 12 cases were combinations of pickoff or caught stealing plus a double play.

Let us look now at OOGY performance in the era of the three-batter rule. This information is in Table 5.

Table 5.**OOGY Data in Era of 3-batter Rule**

	OOGYs	BA	OA	SA	OPS	ERA	WHIP
Pre-2020	46776	.156	.226	.246	**.473**	**1.98**	**0.76**
2020	229	.057	.057	.141	**.198**	**0.96**	**0.17**
2021	657	.055	.068	.127	**.195**	**0.77**	**0.20**
2022	566	.034	.041	.073	**.114**	**0.37**	**0.11**

The huge improvement by OOGYs in the last three years is stunning. Remember from Figure 4 that the use of a pitcher for a single batter has fallen by about 50% in the last three years, which is the era of the three batter rule, and that it had dropped some 25% in the four years before that. Therefore, although these single batter appearances are becoming rarer, they are increasingly effective to a degree I had not expected. This increase is not the continuation of a long-term trend and is in fact confined to the last three seasons.

My title mentions the LOOGY specifically and we have already seen some differences related to handedness so we need to look at the last three years in more detail. This comparison of results for LOOGYs to those vs ROOGYs is in Table 6.

Table 6. **OOGY Data in Era of 3-Batter Rule Separated by Hand.**

LOOGY	Games	BA	OA	SA	OPS	ERA	WHIP
Pre-2020	24280	.190	.280	.279	**.559**	**2.55**	**1.03**
2020	67	.030	.030	.075	**.105**	**0.39**	**0.09**
2021	255	.024	.035	.024	**.059**	**0.00**	**0.10**
2022	206	.010	.019	.010	**.029**	**0.00**	**0.06**
2020-2022	528	.019	.028	.025	**.053**	**0.05**	**0.08**
ROOGY	Games	BA	OA	SA	OPS	ERA	
Pre-2020	22496	.122	.169	.213	**.382**	**1.45**	**0.52**
2020	162	.069	.068	.169	**.237**	**1.20**	**0.21**
2021	402	.074	.090	.192	**.282**	**1.29**	**0.27**
2022	360	.047	.053	.109	**.162**	**0.57**	**0.14**
2020-2022	924	.063	.071	.155	**.226**	**0.99**	**0.21**

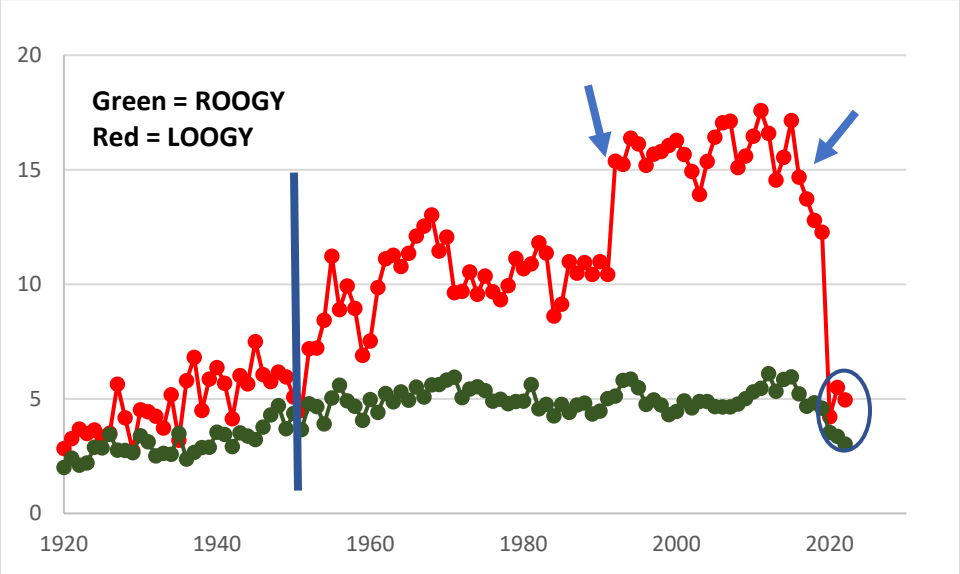
It is interesting that the ROOGY performance was clearly superior to LOOGY prior to 2020. In the last three seasons, there are more ROOGY appearances, but the LOOGY success has become dominant. Those ERA values of 0.00 for the LOOGY in 2021 and 2022 are not typos; they really have allowed no

earned runs in the last two seasons! In the last three years, the LOOGY has pitched 184.1 innings and allowed exactly one earned run. The ROOGY had 310.2 innings during this time, allowing 34 earned runs. This large reversal of LOOGY and ROOGY effectiveness is unexpected, at least by me. For the sake of completeness I note that the one earned run allowed by a LOOGY occurred on July 24, 2020 in Oakland when Hoby Milner of the Angel allowed a three-run walkoff homer to Matt Olson.

It must be noted that ERA and WHIP are not very good parameters for evaluating OOGYs, especially in the era of the three-batter rule. As we will see below, their entries now occur with two outs around 85% of the time. Therefore, inning-based calculations such as ERA and WHIP have much less meaning. OPS remains a good measure for their effectiveness.

We have addressed how often LOOGYs and ROOGYs enter, but another question to ask is what percentage of total relief appearances by these specialists is for a single batter. Figure 6 presents these single-batter stints as a percentage of their total games in relief, separated by hand.

Figure 6. **LOOGY and ROOGY as percentage of Appearance.**



For every one of the last 103 seasons, left-handed pitchers have had a higher percentage of their appearances as LOOGYs than right-handers have as ROOGYs and in most years since 1950 by very wide margins. The LOOGY percentage jumped dramatically in 1993 although I have no explanation for what happened that year. This was the year of the NL expansion to add Colorado and Miami although that should not affect pitcher usage so significantly. All OOGY usage has dropped a lot since the three-batter rule went into effect and these percentages reflect that change. Once again we see a big effect beginning in 2016 with a sharp decline in the percentage of OOGY appearances. In the last three years, the 'three-batter" era, the percentages fell by almost a factor of three. Recall that in Figure 5 we saw total relief appearances showed no such decline until 2020. This dramatic decline in LOOGY percentage therefore reflects a change in how pitchers were used well before the introduction of the three-batter rule. What happened in 2016 that could explain this drop? I looked at rule changes for 2016 and there were two:

Restrictions on takeout slides at second base (the “Utley rule”)
Time limits on mound visits and breaks between innings.

I fail to see how either of these would affect OOGY usage. Perhaps this is the start of widespread usage of “openers” or “bullpen games”. Although some teams had employed data analysts or sabermetricians before this, by 2016 the focus on analytics was such that essentially all teams had such specialists and that could have led to changes in pitcher usage. This is also the year that MLB launched Statcast, which gathers extremely detailed data on pitches and every play, so there may have been an effect from the greater abundance of information. In any event, it is clear that something happened across all of MLB in 2016, well before the implementation of the three-batter rule.

Since 2016 is such an interesting turning point, I must digress briefly to return to my 2016 presentation which, of course, used data through 2015. Figure 7 has the key data from that study and figure 8 has the same measures, but updated through 2022. The fundamental point of the original figure was that the increased use of closers rose dramatically beginning in 1983, but there was no detectable effect on the chance of winning the game. That was why the title I chose was “The myth of the closer”.

Figure 7. **Closer Usage in Relation to Winning, 1920-2015**

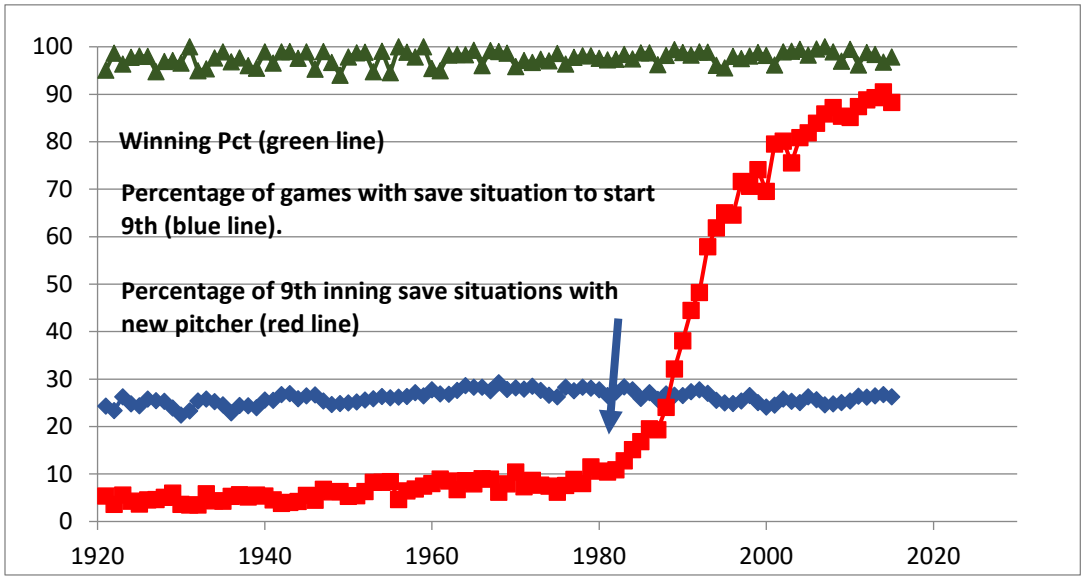
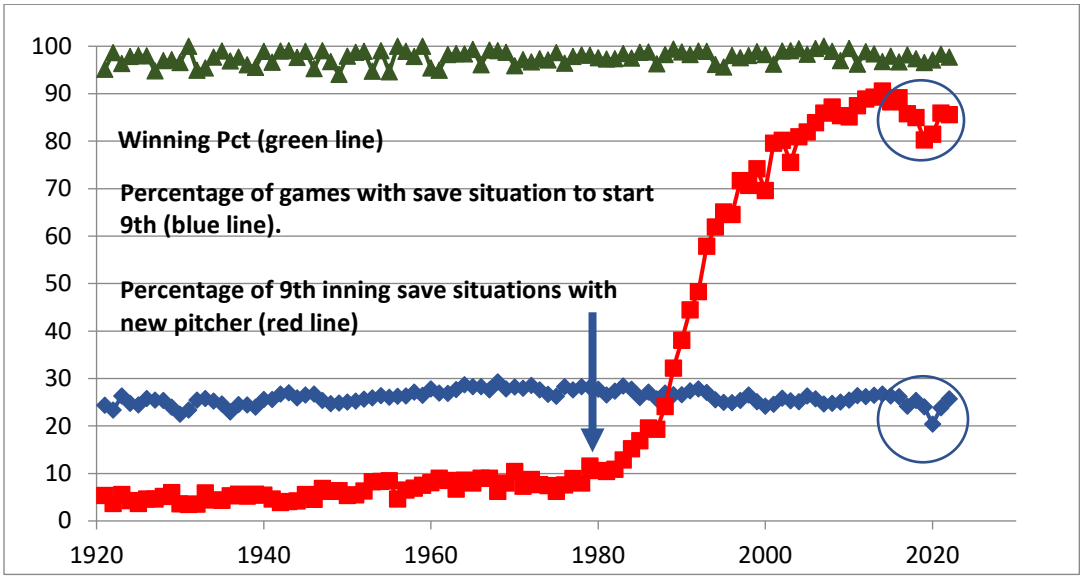


Figure 8. **Closer Usage in Relation to Winning Updated Through 2022.**



The added data from the last seven seasons show that the chance of winning these games that have a save situation to start the 9th inning has not changed (green line). However, the pattern of pitcher substitution has varied in an interesting way as once again there was a decline in the entry of a new pitcher beginning in 2016. There was also a decline in the percentage of games that had a save situation at the start of the 9th. From 2020 to the present, that decline was reversed as the three-batter rule was implemented. The diminished usage of OOGYs overall may explain the recent reversal since these specialists will no longer used to start an inning.

Conventional wisdom is that pitchers have an advantage when batters face them for the first time in a game. By definition every OOGY appearance is a "first time faced". How do these results compare to pitchers who faced more than one batter, especially other relievers? That answer is in Table 7 which has the results for 'first batters" from 1920-2022.

Table 7. **Batting Data of First Batters faced, 1920-2022**

	BA	OA	SA	OPS
Total	.254	.325	.383	**.708**
Starters	.266	.371	.382	**.753**
All Relievers	.248	.319	.383	**.702**
Non-OOGYs	.255	.327	.393	**.720**
OOGYs	.152	.221	.242	**.463**

There are some really interesting points in this table. First of all, the overall first batter totals are somewhat lower than the values for all appearances which had an OPS of .725, in line with the

presumption that initial matchups favor the pitcher. Starting pitchers do worse than relievers with their first batters, but of course their first batters are always leadoff men who are generally above-average hitters. The increase for the starters comes from more singles and walks since slugging average is virtually unchanged from the total. Relievers do consistently better against their first batters, but their difference is also mostly in walks and singles. OOGYs are extremely effective against their first batters in all categories, indicating that this has been a successful strategy over the last 103 seasons.

We must consider pinch-hitters as well since offensive changes are certainly common occurrences when there is a pitching change. Table 8 presents the offensive results for all pinch-hitters.

Table 8. **Pinch-hitter performance, 1920-2022.**

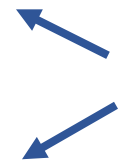
	BA	OA	SA	OPS
Total	.228	.310	.332	**.642**
Vs Starters	.223	.295	.317	**.612**
Vs All Relievers	.230	.318	.341	**.659**
Vs Non-OOGYs	.232	.321	.344	**.665**
Vs OOGYs	.160	.255	.237	**.492**

Offensive performance by pinch-hitters is substantially lower than overall offense (.642 OPS vs .725), but Table 8 shows again that OOGYs stand out in their effectiveness.

A key factor in LOOGY or ROOGY use is the handedness matchup. For context, table 9 has the complete handedness data for the nearly 14 million plate appearances that occurred from 1920-2022.

Table 9. **Handedness Matchups for all Plate Appearances, 1920-2022.**

		BA	OA	SA	OPS
Total		.261	.329	.396	**.725**
LHP	All	.262	.330	.395	**.725**
LHP	LHB	.250	.319	.367	**.686**
LHP	RHB	.266	.334	.406	**.740**
RHP	All	.261	.328	.397	**.725**
RHP	LHB	.271	.345	.415	**.760**
RHP	RHB	.253	.315	.382	**.697**



The first really interesting point here is that the overall performance of pitchers has almost no difference between righthanders and lefthanders. It is common baseball knowledge that the most favorable matchup for the offense occurs when the batter and pitcher are opposite hands, but even those differences are less than might be expected. The strongest offensive performance occurs when left-

handed batters face right-handed pitchers. Both of the "same side" matchups favor the pitcher, with a slightly stronger effect when both are left-handed. However, none of these splits shows a very big difference from the overall averages. The handedness effect for the first batter faced shows exactly the same pattern (data not shown) with somewhat lower offensive performance, as expected.

Let's continue the examination of handedness by focusing on the OOGYs. We already saw that overall offensive performance was greatly reduced by these single-batter relievers and Table 10 subdivides the results by matchup.

Table 10. **Handedness Matchups for OOGYs, 1920-2022**

	BA	OA	SA	OPS	WHIP
Total	.152	.221	.242	**.463**	**.074**
LOOGY All	.186	.275	.273	**.548**	**1.00**
LOOGY LHB	.188	.274	.272	**.546**	**1.01**
LOOGY RHB	.179	.277	.277	**.554**	**0.99**
ROOGY All	.119	.165	.210	**.375**	**0.51**
ROOGY LHB	.125	.176	.241	**.417**	**0.56**
ROOGY RHB	.118	.162	.201	**.363**	**0.49**

There are some definite surprises here. ROOGYs have considerably better performance than LOOGYs in all matchups, which is certainly not what conventional wisdom predicted and definitely not in line with the observations that led to the creation of the LOOGY term. As we saw in Table 6, the relative effectiveness of LOOGYs and ROOGYs has reversed dramatically in the last three years. In addition, perhaps surprisingly, there are rather small differences for either OOGY based on the handedness of the batter.

I then checked to see how often the OOGYs get the handedness advantage. This question requires the consideration of pinch-hitters facing these single-batter pitchers. The results are in Table 11.

Table 11. **Pinch-hitters and Handedness advantage for OOGYs, 1920-2022.**

	Frequency of Occurrence	
	no PH	PH
LOOGY	79.9%	20.1%
ROOGY	87.2%	12.8%
	Percentage Handedness Advantage	
	no PH	PH
LOOGY	86.9%	23.7%
ROOGY	81.6%	47.2%

There are many interesting points here and they lead to a weakness in our data. First of all, the very large majority of OOGY entries did not involve a pinch-hitter (79.9% for LOOGYs and 87.2% for ROOGYs). In these cases, the OOGY had the handedness advantage over 80% of the time (86.9% and 81.6%). The presence of a pinch-hitter caused a large decrease in the handedness advantage, especially for LOOGYs. This is perhaps not surprising, since there is no limit on pinch-hitters while pitchers must face at least one batter, thereby giving the offensive team greater control of the matchup.

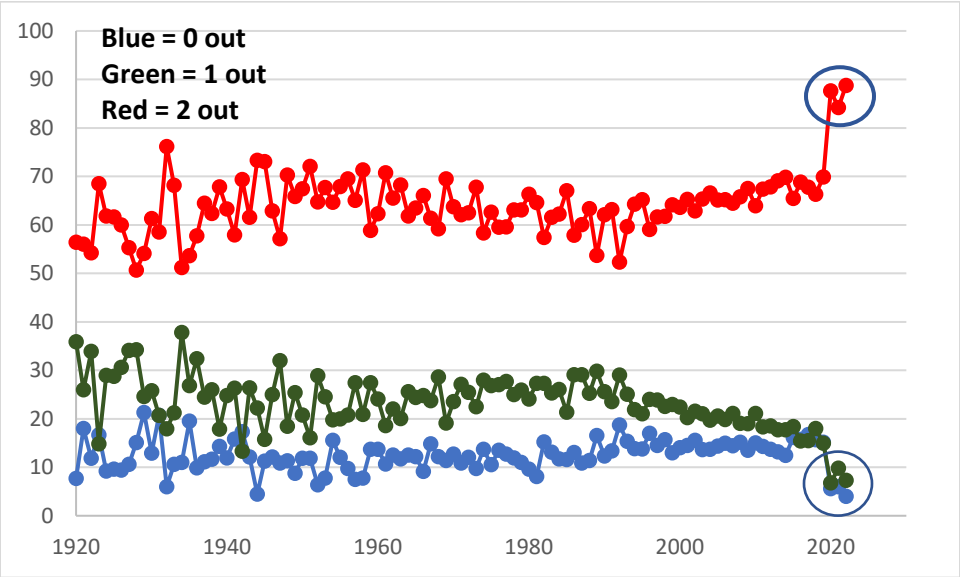
Here is the data weakness. When a new pitcher and a pinch-hitter appear at the same time, our system does not distinguish which change happened first. In other words, when the LOOGY handedness advantage dropped to less than one fourth of the time, does this mean a left-handed pinch-hitter entered and was met with a change to a LOOGY, or does it mean that a LOOGY entered and was met with a left-handed pinch-hitter? I suspect the second of these two scenarios is pretty unlikely, but we just don't know. Even for modern games which are covered in extreme detail, this may not be clear, but for historical games lacking video evidence, it is impossible to know for certain. Therefore, it seems likely that the decrease in OOGY handedness advantage reflects a pinch-hitter entering after the pitcher change.

Since it is clear that OOGYs are very effective, the next step is to ask what situations OOGYs encounter when entering a game. I considered four parameters:

1. Number of outs
2. Score difference
3. Inning
4. Baserunner situation and inherited runners

Figure 9 presents the data for how many times OOGYs entered with each number of outs.

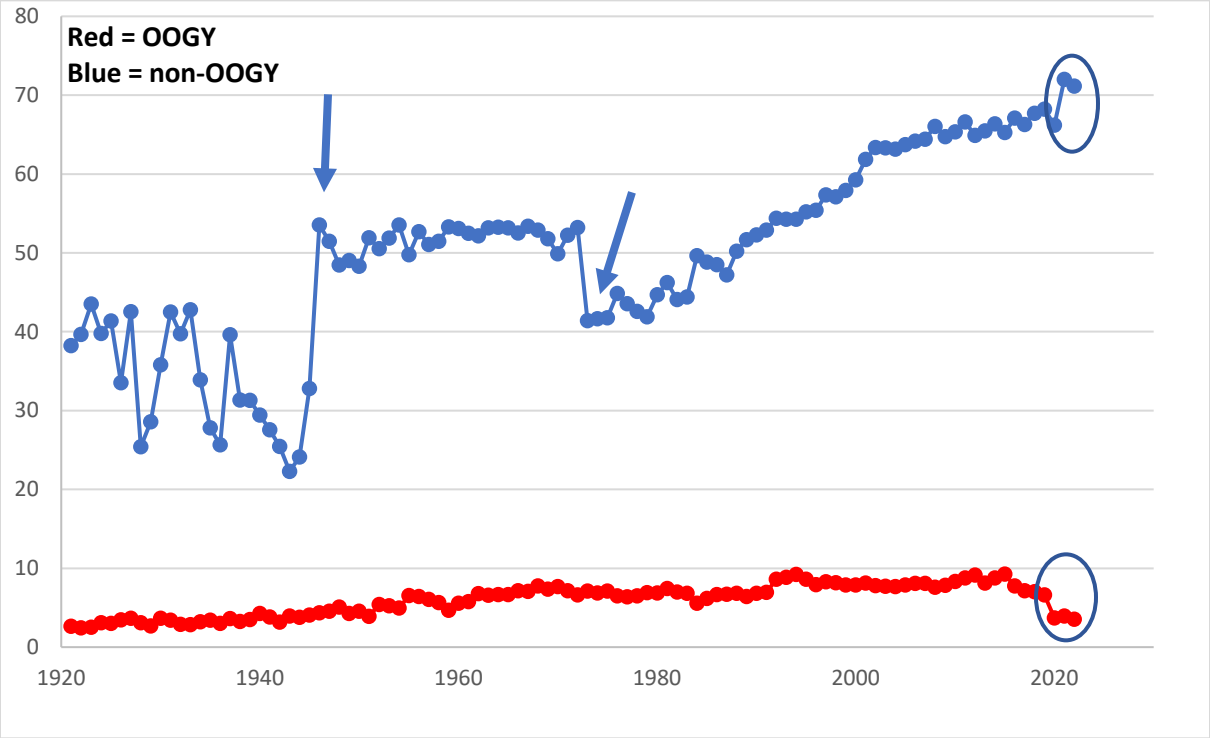
Figure 9. **OOGY Entrances by Out.**



Around 64% of these entrances over the last 103 seasons have occurred with two outs, suggesting the mindset of managers to close out an inning with these specialists. The percentages for 0-out and 1-out OOGY appearances average just under 13% and 24%, respectively. However, the last three seasons, the era of the three-batter rule, show big changes. OOGY entries now happen with two outs almost 87% of the time and the 0-out and 1-out percentages have dropped to less than 10% so the emphasis on using an OOGY to finish an inning has been intensified. This suggests to me that most OOGY appearances now are intended as single batter events.

Consider the case of a reliever entering to start an inning. What changes have there been in the number of outs when they enter? Figure 10 addresses the specific situation of a reliever entering to start an inning.

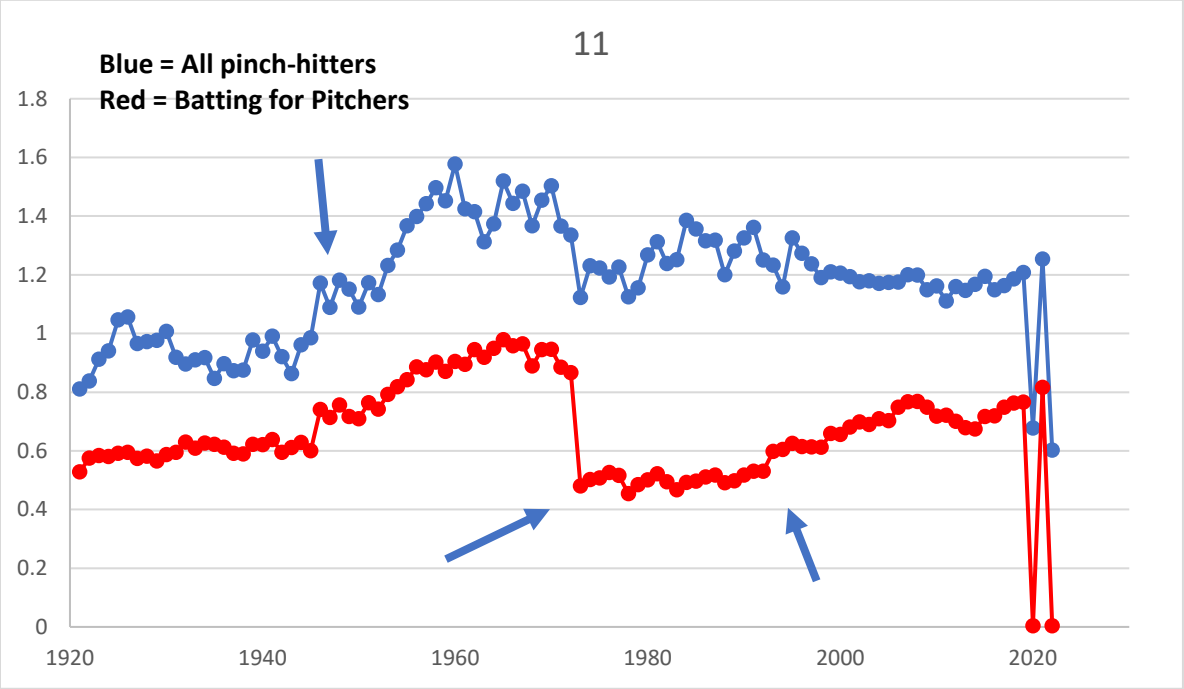
Figure 10. **Percentage of Relief Appearances to Start Inning.**



The red line in this figure is for OOGYs and is consistent with the previous data showing that that they predominantly enter with two outs, even before the new rule. The blue line is the result for all non-OOGYs and there are three fairly distinct portions to it. From 1920 through 1945 the percentage oscillated pretty widely around an average of just over 30%. There was a big jump in 1946 which is extremely hard to explain and then the values were quite steady for the next 27 years until the advent of the DH which caused an immediate sharp decline. Then it began a rather steady increase up to the present day with values now over 70%. The last two seasons show a jump just as the percentage for the OOGYS declined, consistent with the data in the Figure 9.

The increase in the DH era is related to pinch-hitters since the easiest explanation for a reliever to enter at the start of an inning is that he replaced a pitcher who left for a pinch-hitter and these substitutions fell to near zero in the AL in 1973. Figure 11 is a summary of pinch-hitter usage since 1920.

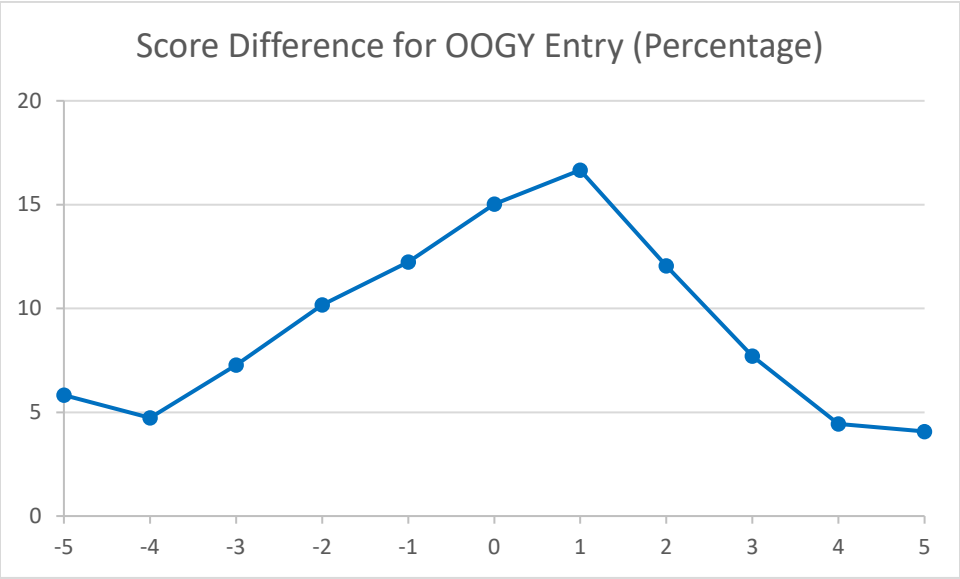
Figure 11. **Pinch-hitters per Team-game, Total and for Pitcher.**



The patterns here are interesting but not entirely unexpected. Prior to 1946, the total rate of pinch-hitters oscillated with a mean of about .9 per team per game whereas the rate of pinch-hitters for pitchers was quite stable at .6 per team per game. Therefore, for this whole era, pinch-hitters for pitchers were about two thirds of the total. There was a distinct increase in all pinch-hitters beginning in 1946 up to the introduction of the DH in 1973. At that point, pinch-hitting for pitchers in the AL essentially ended and both lines show the expected dramatic drop. The pinch-hit rate for pitchers was quite steady until the early 1990s when it began a definite increase as we were well into the closer era. Surprisingly, pinch-hitters for non-pitchers since 1990 actually declined as the overall total remained fairly constant. The last three seasons had the DH in the NL in 2020, which was dropped in 2021, and reinstated in 2022, presumably permanently.

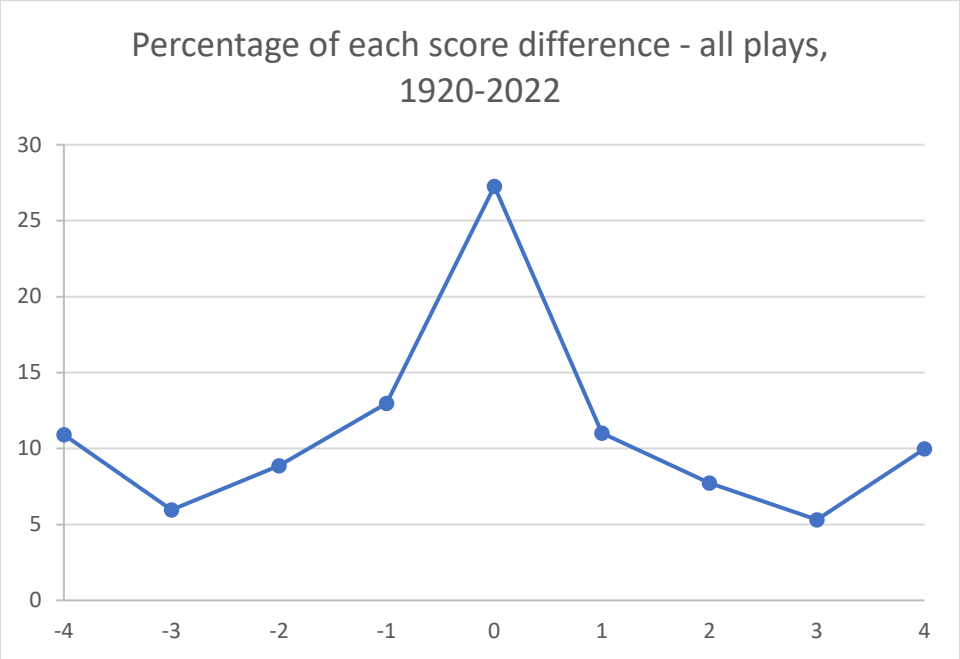
Now let's consider the score difference when OOGYs enter, which is presented in Figure 12.

Figure 12.



The -5 category is all deficits of 5 or more runs and the 5 category is all leads of 5 or more runs. It is clear that most OOGY entries occur in close games, with 2/3 when the score difference is 2 or less. Again for context, Figure 13 has this information for the nearly 14 million plays from 1920-2022.

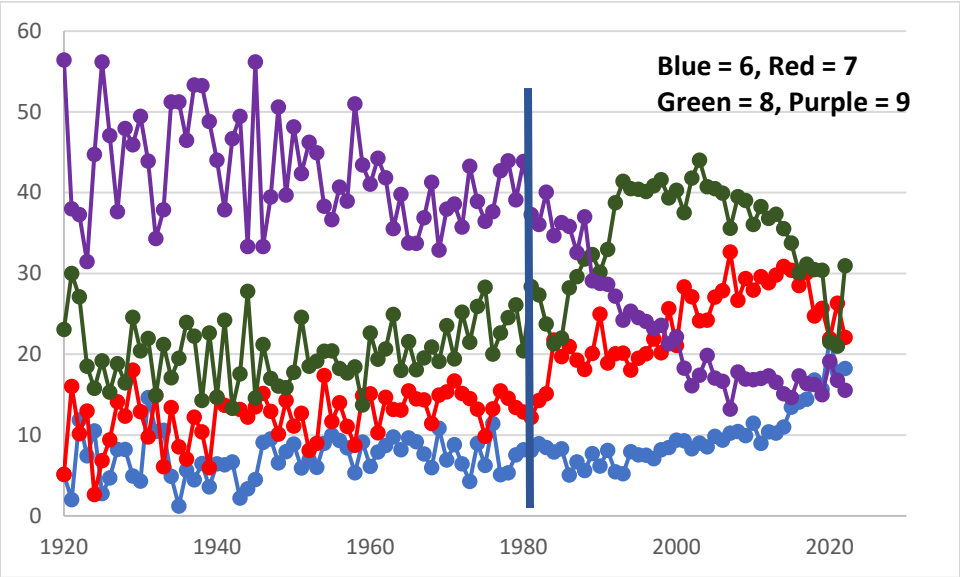
Figure 13.



This pattern is interestingly different and is nearly symmetrical around events that happen when the score is tied which are the clear plurality. I interpret these last two figures to indicate that OOGYs are primarily used in close games, especially with the lead.

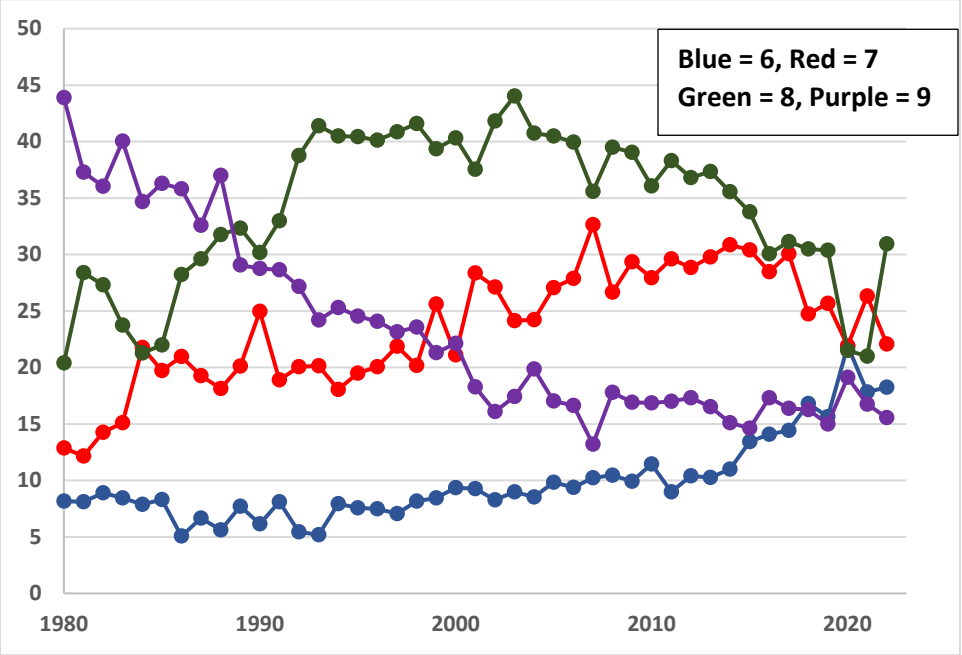
The entry of OOGYs by inning is shown in figures 14 and 15 which allow the focus on different aspects of the historical record.

Figure 14. **Percentage of OOGY Entries by Inning.**



Extra-inning games are not included, since the OOGY entry percentage was consistently below 10% (data not shown). This is a messy graph but it shows two points of importance. First, prior to 1990, the relative order did not change, with 9th inning by far the most common and 6th inning the least. Second, beginning in the early 1980s, that is, around the start of the closer era, the 9th inning entry rate (purple line) began a steady decline. This change is shown more clearly in Figure 15, which extracts the data from Figure 14 beginning in 1980.

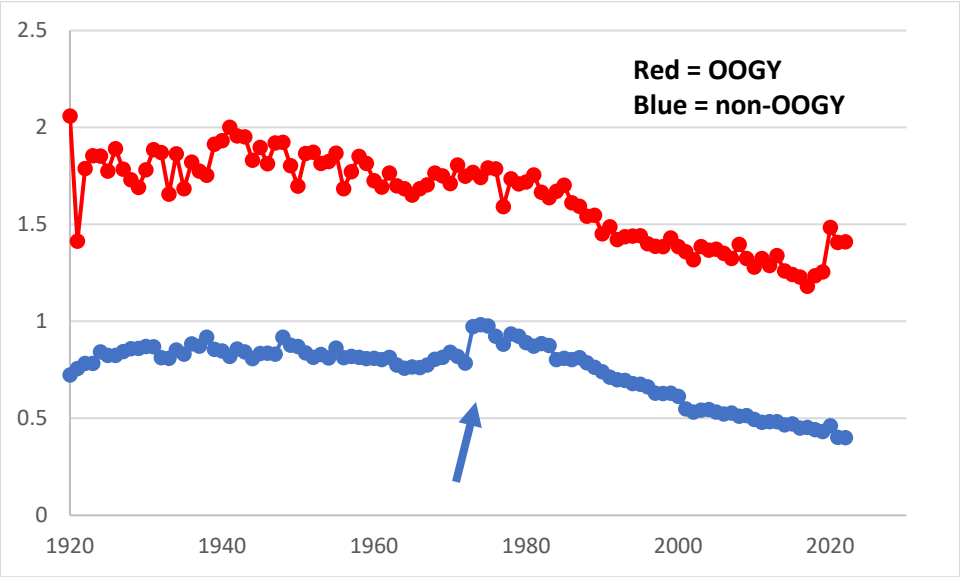
Figure 15. **Percentage of OOGY Entries by Inning, 1980-2022.**



The decline of 9th inning entries is clear as the rates for the 6th, 7th, and 8th innings all increased. In the last four seasons, the rates for innings 6 through 8 have now all have surpassed the 9th inning, which is now the lowest, even behind the 6th inning. Entries in the 8th inning are now the most common, at over 30%. This pattern change could very well reflect the increased realization that crucial moments arise before the last inning and that the fixation on using a closer that began in 1983 has been reconsidered to at least some degree.

There are many ways to address the baserunner situation at the time of entry, but I will start with inherited runners. Figure 16 has that information.

Figure 16. **Average Inherited Runners per Appearance.**

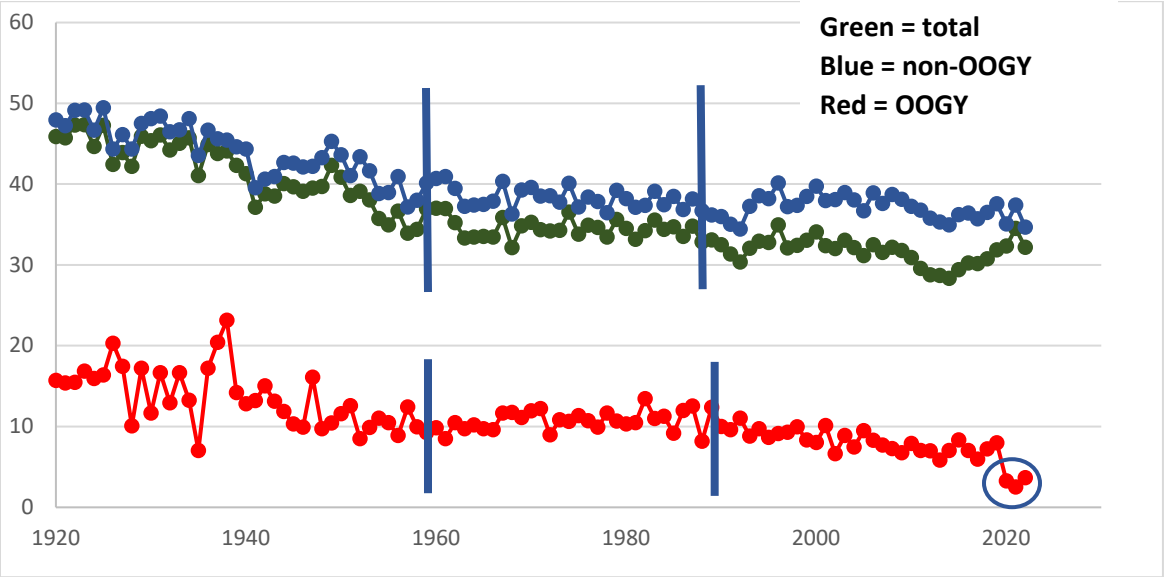


We need to remember that OOGYs are used much less frequently than non-OOGYs. In fact, in round numbers there were 670,000 non-OOGYs and only some 48,000 OOGYs in the last 103 seasons, so the OOGYs are less than 7% of total relief appearances. Nonetheless, the average number of baserunners when OOGYs enter from 1920 through 2019 is over twice as high as for the non-OOGYs, once again indicating that these specialists are used in more demanding situations. For the era of the three-batter rule, the ratio is nearly four to one. With the onset of the DH, the number of inherited runners jumped up noticeably although the total rate of relievers dropped, as shown in Figure 5. This change was due entirely to the AL and therefore the DH. Since pitchers were no longer being removed for pinch-hitters, they were clearly being relieved in more critical situations, that is, with more runners on base. However, a steady decline in the number of inherited runners began immediately after that and continues to the present day. This pattern fits well with the data in Figure 10 that showed the beginning of the increase in pitchers to start the inning at this time.

There should in fact be a third line on this graph, which is the total for all relief pitchers. However, that line is essentially identical to that of the non-OOGYS and would be nearly invisible, so I left it out. This emphasizes the fact once again that OOGYs are much rarer than non-OOGYs.

The next question is to address the rate of success in keeping these inherited runners from scoring. The answer is in Figure 17.

Figure 17. **Percentage of Inherited Runners Scoring.**

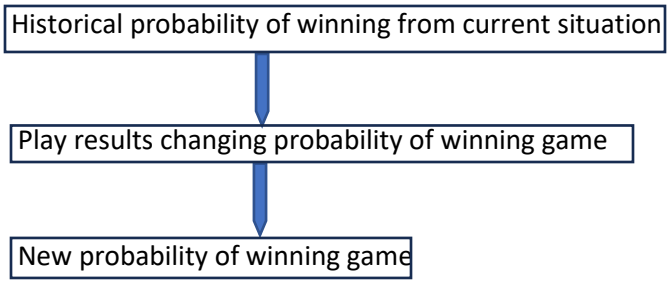


Over the last 103 seasons, the overall percentage of inherited runners who scored (green line) dropped from just under 50% to around 35%, indicating improved overall effectiveness of relievers. This decline was not steady, showing almost no change from about 1960 to 1990. OOGYs have always been better than other relievers at preventing inherited runners from scoring for all 103 seasons studied (lower percentage of runners scoring). The OOGYs improved slightly but steadily through 2019. In the last three years, the OOGYs have improved dramatically and now allow less than 5% to score. The non-OOGYs had a brief decrease in performance in 2020 followed by improvement in the last two years. The differences in these patterns are even more striking when we recall that the OOGYs inherit over twice as many runners per appearance. These numbers are not additive, since there are so many fewer OOGYs.

The next area I examined was the importance of the situations that relievers encounter. Thanks to the work of Tom Tango, it is now possible to quantify the potential impact of a given situation in a single variable termed “leverage”. The importance of any given situation is evaluated in terms of the probability that the result of that particular plate appearance will affect the outcome of the game. First I will present a quick summary of the procedure in Figure 18, followed by three examples.

Each combination of inning, men on, outs, and score difference has a precise probability of a team winning in that situation. These values have been computed by many researchers using Retrosheet data. The leverage calculation considers all possible outcomes of the current plate appearance and the new probability of winning after each of these possibilities.

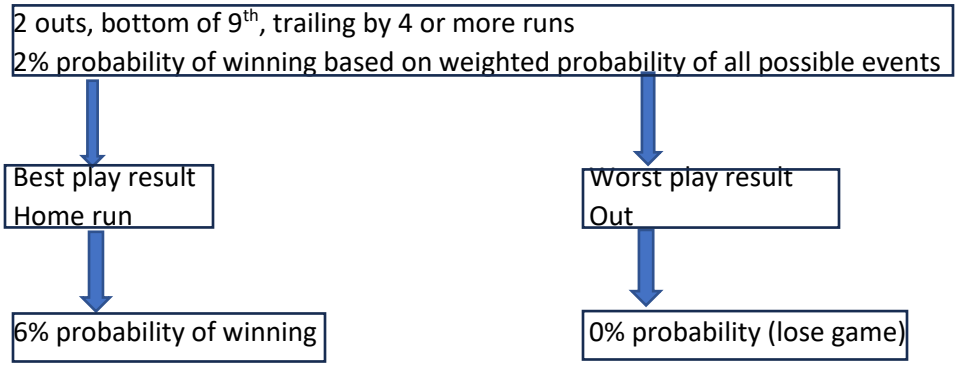
Figure 18. **Calculating Leverage Index**



There are 480 different combinations of inning, batting team, baserunner situation and outs, with separate values for nine score differentials from trailing by 4 to leading by 4, for a total of 4320 possible leverage values. An average situation is set to a leverage index of 1. Therefore a leverage index of 2 means the situation has twice the impact of the average, etc.

The calculation for the first, low leverage scenario is in Figure 19.

Figure 19. **Low Leverage Scenario**

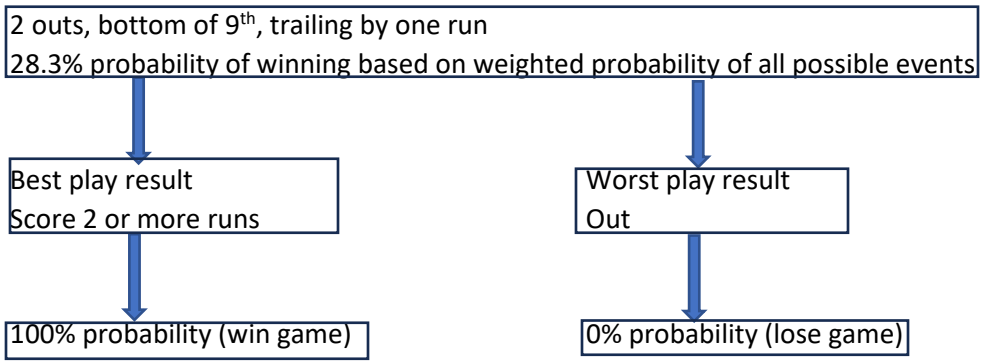


Leverage Index = 0.1

The low leverage index indicates that there is a very small chance that any particular event will have a meaningful impact on the chance of winning the game in this situation.

The calculation for a high leverage scenario is in Figure 20.

Figure 20. **High Leverage Scenario**

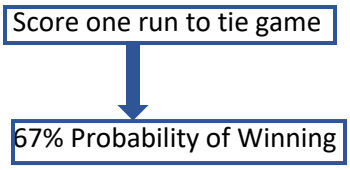


Leverage Index = 10.9

This second scenario is quite different. Almost any batting result in this situation will have a major impact on the final result, ranging from a game-ending score that wins the game to an out that gives the home team a loss. Both results are obviously quite possible. so this is a high leverage situation. Tom created tables of leverage values in all situations in all innings, one through nine. The values of 0.1 and 10.9 from the two scenarios above are the lowest and highest of all calculated leverage values.

There is another possibility in this second scenario and that is the scoring of a single run to tie the game as shown in Figure 21.

Figure 21. Intermediate Play Result in High Leverage Scenario



New Leverage Index = 6.4

This new value in the now-tied game is still very high as the home team remains in a very favorable position to win the game. I note that the leverage concept is gaining favor in Major League circles. Dodger manager Dave Roberts recently commented on his team's bullpen woes by noting that he did not have enough "high leverage" relievers available

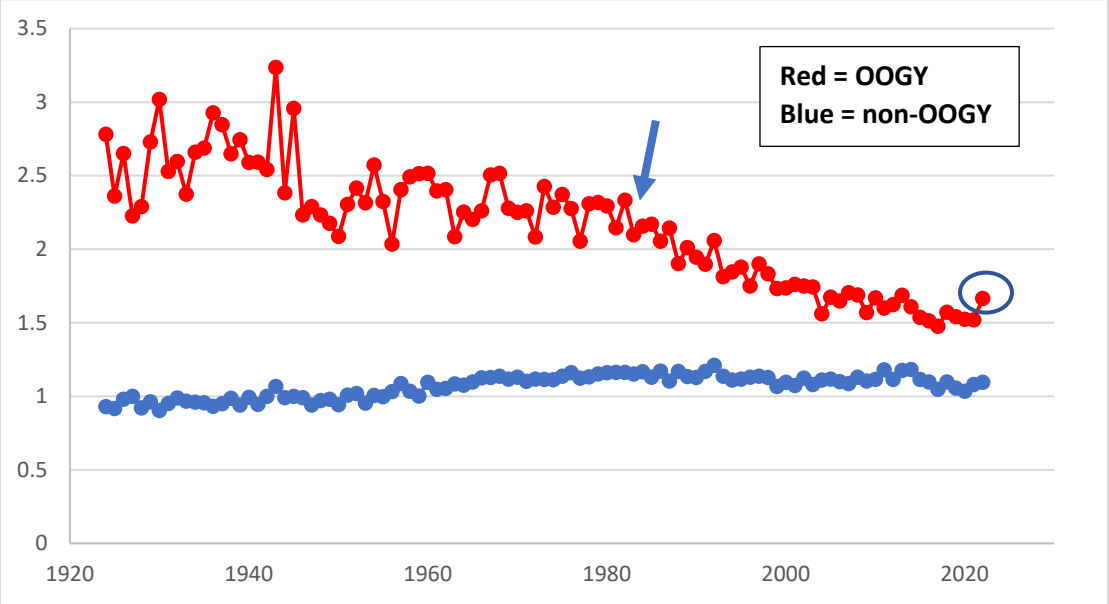
Evaluating the leverage of situations faced by relievers requires proper context. The calculated leverage index values across the 103 seasons under study are in Table 12.

Table 12. **Average Leverage Index Values.**

All Pitchers	1.0
Starters	1.0
Non-OOGY Relievers	1.1
OOGYs	2.2

The average leverage encountered by non-OOGY relievers over the last 103 seasons is 10% higher than that seen by starters. However, OOGYS have entered in situations with twice the average leverage as that which greets other relievers, which is pretty extreme. Figure 22 shows how this value has changed since 1920.

Figure 22. **Leverage Values for Reliever Entry.**



It is interesting that for much of the last century the average leverage facing an OOGY was over 2.0, but that began a slow and steady decline in 1983 which I have dubbed the "closer era" since so many more entries came at the start of an inning with no runners. The 2022 season had a distinct uptick, but is still down to about three fourths of the historical average.

The five most frequently encountered situations for OOGYs are shown in Table 13.

Table 13. **Most frequent situations for OOGY entry.**

Men on	Outs	Inning	Number
1st and 2nd	2	9	2562 (5.3 %)
1st only	2	8	2402 (5.0 %)
1st and 2nd	2	8	2053 (4.2 %)
1st only	2	9	1912 (4.0 %)
1st only	2	7	1690 (3.5 %)

These five situations add up to 22% of all OOGY appearances. Each of these leads to a pretty high leverage index, with the exact value depending on the score difference. These leverage results fit well with our earlier measurements showing OOGY entry occurring at key moments since all of these are with 2 outs.

Some pitchers are used as OOGYs much more than others. Table 14 lists the 10 pitchers with the highest number of OOGY appearances and the percentage of their relief appearances that were single batters.

Table 14. **Leading OOGYs, 1920-2022.**

Pitcher	OOGY	Games	Starts	Percentage
Myers,Mike	314	883	0	35.6
Lopez,Javier	280	839	0	33.4
Choate,Randy	276	672	0	41.1
Orosco,Jesse	235	1252	4	18.8
Plesac,Dan	175	1064	14	16.4
Miller,Trever	172	694	5	24.8
Groom,Buddy	166	786	15	21.1
Fossas,Tony	165	567	0	29.1
Stanton,Mike	154	1178	1	13.1
Assenmacher,Paul	152	884	1	17.2

All 10 of these were lefthanded. In fact the first ROOGY on this all-time list is Joe Smith, in 43rd position with 92 OOGY appearances which were 10.6% of his total games. Joe has pitched for eight different teams from 2007 to 2022. Table 15 puts the OOGY handedness in a larger context.

Table 15. **Total OOGYs and Appearances by Hand.**

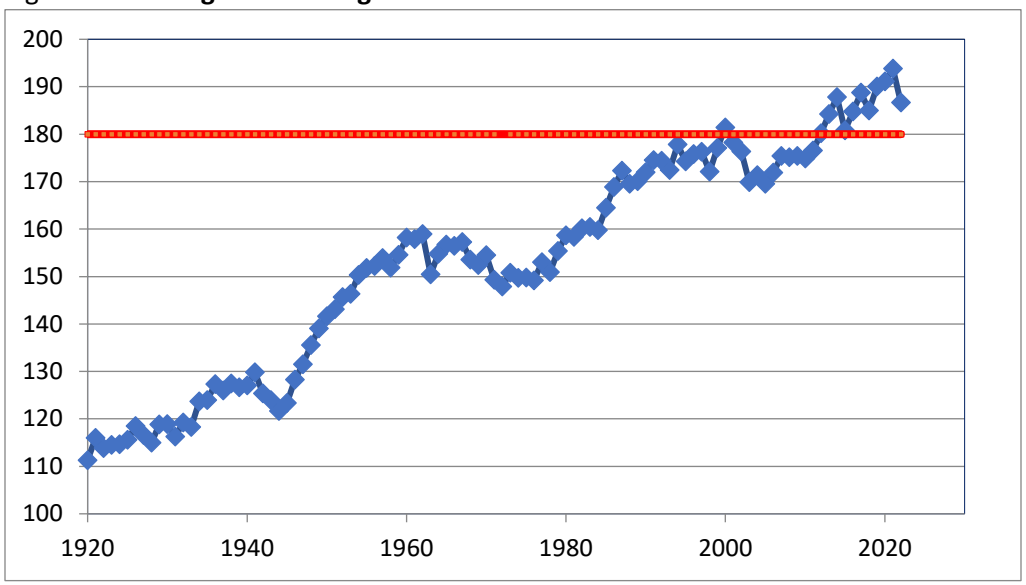
4937 different pitchers OOGYs with 48,228 total appearances

	Total OOGYs	
LOOGY	1542	(31.2 %)
ROOGY	3395	(68.8 %)
	Appearances	
LOOGY	24808	(51.4 %)
ROOGY	23420	(48.6 %)

There were over twice as many ROOGY pitchers as LOOGY, which is a good match for the proportion for all pitchers, which has 65% of all appearances by right-handers. In spite of this preponderance of right-handed pitchers, LOOGYs are over 50% of single-batter appearances, once again demonstrating their significance in the eyes of managers.

One of the stated purposes of the three-batter rule was to shorten game times. Figure 23 presents the average game length from 1920 through 2022. The times for 2020 and 2021 have had the 7-inning games in those seasons removed. The red line marks the three hour mark.

Figure 23. **Average Game Length in Minutes.**



Although there is an increase in the average of about 80 minutes over this past century, there were some periods that had more rapid changes and some that actually had decreases. To address these patterns I calculated the change from one year to the next and those results are in Figure 24.
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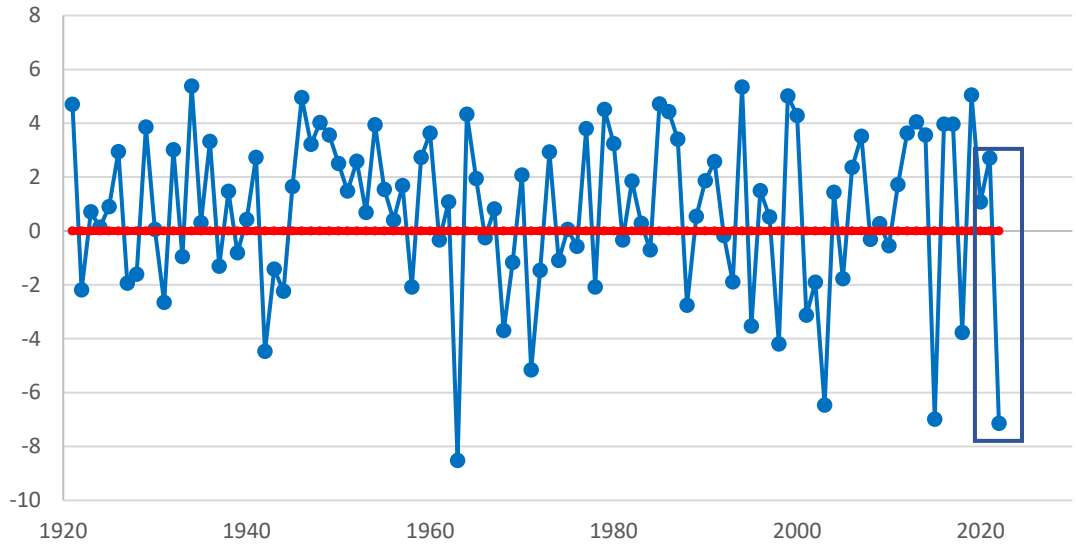
Figure 24. **Yearly Change in Time of Game in Minutes.**



The horizontal red line is at 0 which would mean no change from the previous year. As expected, the number of seasons with increased game time is greater since the overall change has been an increase, although there were some instances of significant decreases. The drop of more than 8.5 minutes in 1963 is remarkable. The average game time was 2 hours and 30 minutes. This was the first season of the higher mound and expanded strike zone. There were fewer walks and more strikeouts in 1963, but the changes were small. This was a low point in pinch-hitter rate, but that was a continuation of a several year decline.

There are three other seasons with time decreases of more than 6 minutes per game: 2003, 2015, and 2022. The decline in 2022 was over 7 minutes. Is this explainable by the 3-batter rule? It would appear not since the first two seasons with this rule, namely 2020 and 2021, show increases. Given the large number of rules changes implemented for 2023, especially the pitch clock, it will become extremely difficult to separate the impact of the 3-batter rule in 2023.

Summary:

OOGYs are historically much more effective than other relievers.
LOOGYs are majority of all OOGY appearances.
OOGY entry occurs in high leverage situations.
ROOGYs more effective than LOOGYs before 2020, now reversed.
OOGY use has declined in last three seasons, the “three-batter” era.
OOGY effectiveness has increased in three-batter era.
Effect of three-batter rule on time of game has been minimal.

Unanswered questions remain. Even though I supplied many details about changing relief pitcher usage since 1920, there are still two dates that need better explanation:

1946

And most especially

2016

Suggestions are welcomed!

My title had a question about the status of the LOOGY, specifically whether the three-batter rule had eliminated the use of this specialist. Usage patterns have clearly changed, but the enhanced effectiveness means the answer is:

The LOOGY has **NOT** met his demise.

Acknowledgements:

Tom Shieber of the Hall of Fame for raising the OOGY question to me several years ago.

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Consultant
Editor
Muse