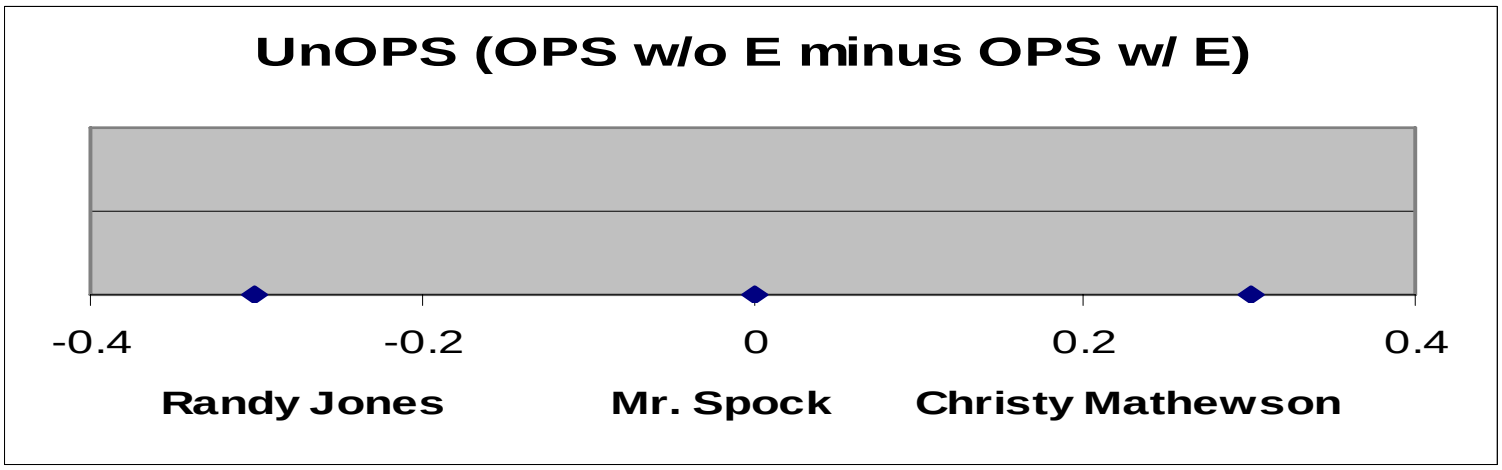
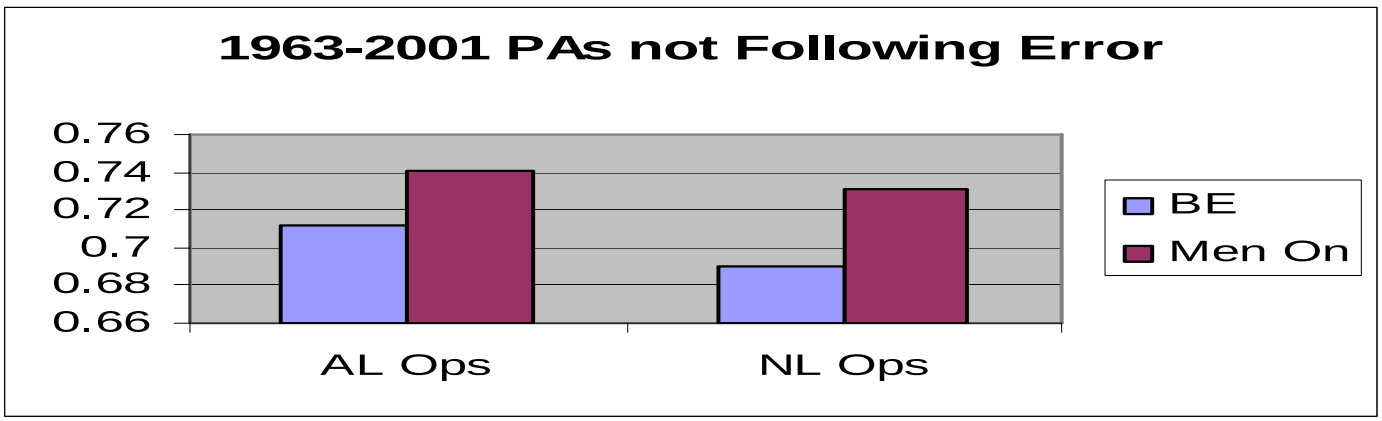
UnOPS by Clem Comly presented June 28, 2002 in Boston, MA for SABR national convention

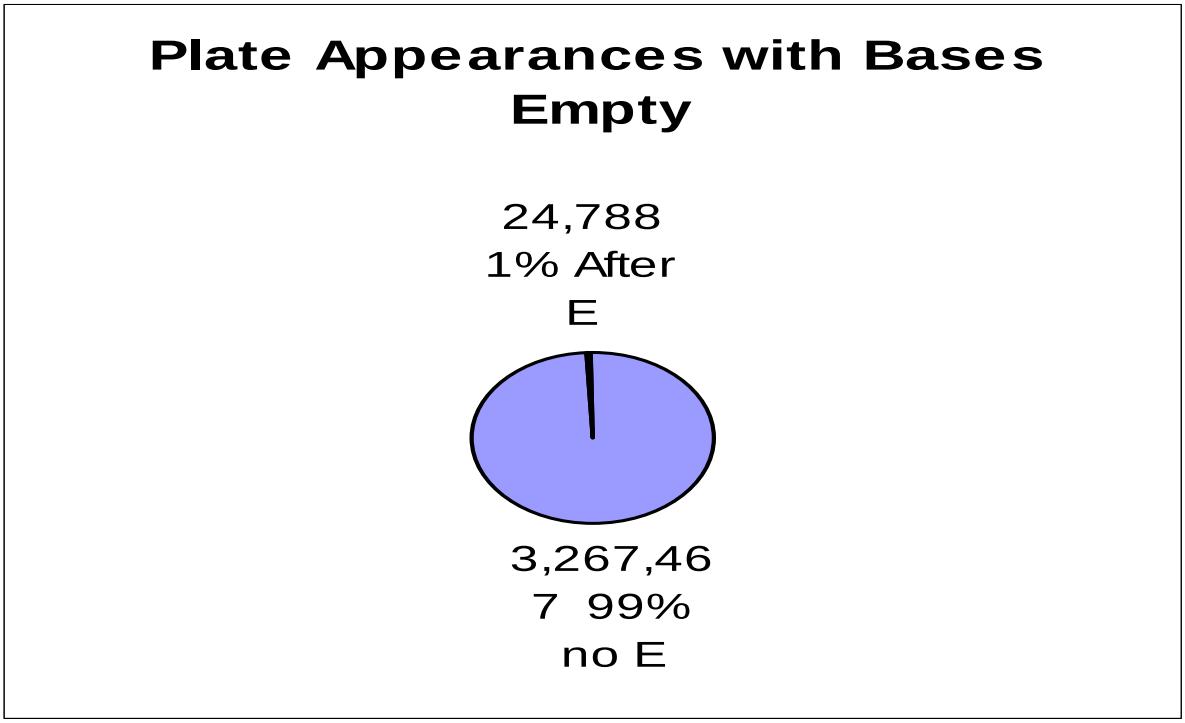
UnOPS is to OPS as unearned runs are to earned runs. The question I wanted to answer was “Are pitchers performances affected by errors?”. Using Retrosheet play –by-play data for 1963-1973 (incomplete) and 1974-1990 (complete) and more recent play-by-play courtesy of the Baseball Workshop (through 2001), I divided each plate appearance (PA) into either the pitcher had not suffered from an error by any of the nine members of the defense earlier in the inning or he has. UnOPS is the OPS of those PAs before an error minus the OPS of those PAs after an error. A positive number means the pitcher was more effective than usual in these situations, a negative number less effective. While some runs scored after an error may be earned instead of unearned, all PAs after an error until either the inning ends or the pitcher is relieved are considered after the error. My initial hypothesis was that pitchers would either clump or spread evenly along a scale (see figure).

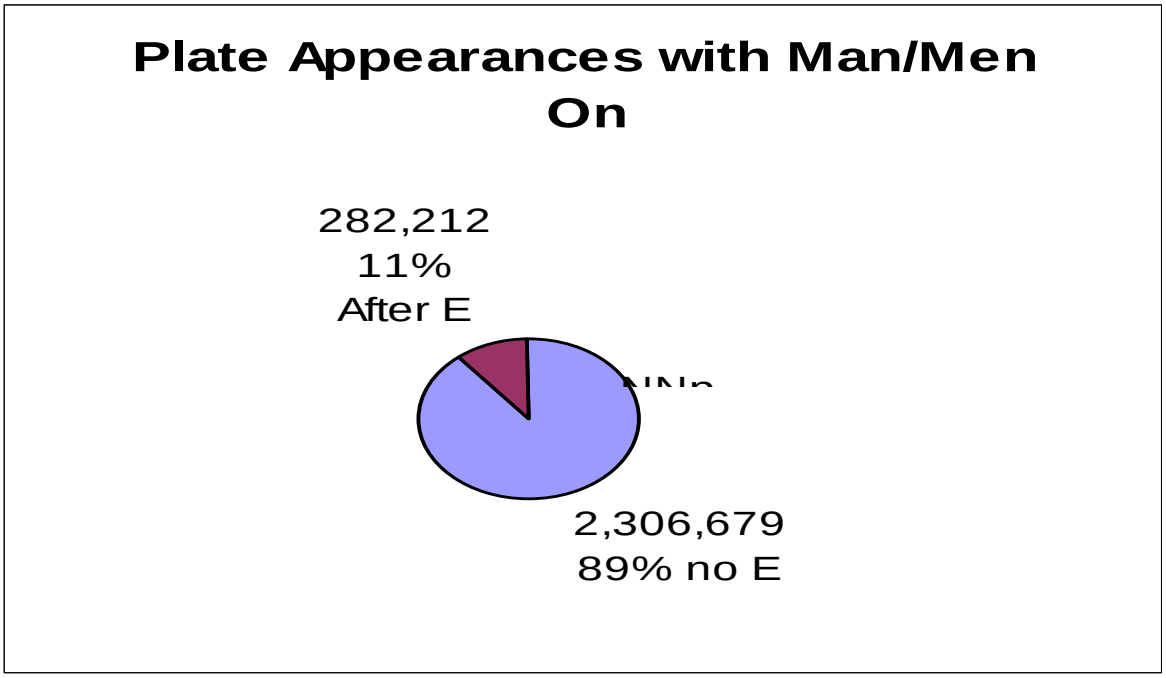


If the pitcher were unaffected like Mr. Spock would be, the UnOPS would be 0. If the pitcher is bothered and performs less well, I call him Randy Jones. If the pitcher buckles down and pitches better, I call him Christy Mathewson. It is possible all pitchers react the same way and will all have UnOPS around the same point somewhere on this continuum. Before I even ran the data, I realized I might have a problem. After error PAs probably occur with men on base much more than with the bases empty. Is OPS affected by the presence of base runners? Looking at all the pre error data divided by league, I found:

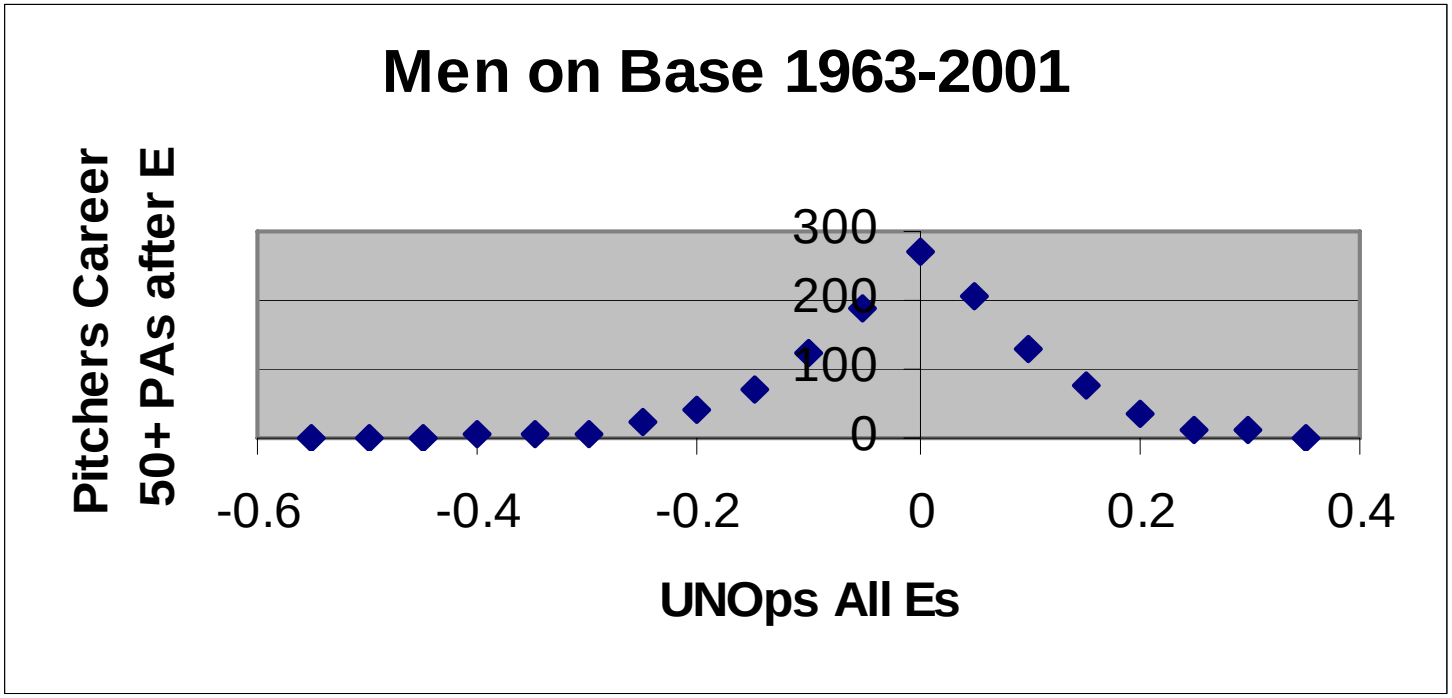


As you can see, there is a significant difference in the OPS. If the ratio of PAs before vs. after errors were the same for the bases empty and men on, there could still not be a problem. The data breaks down like so:



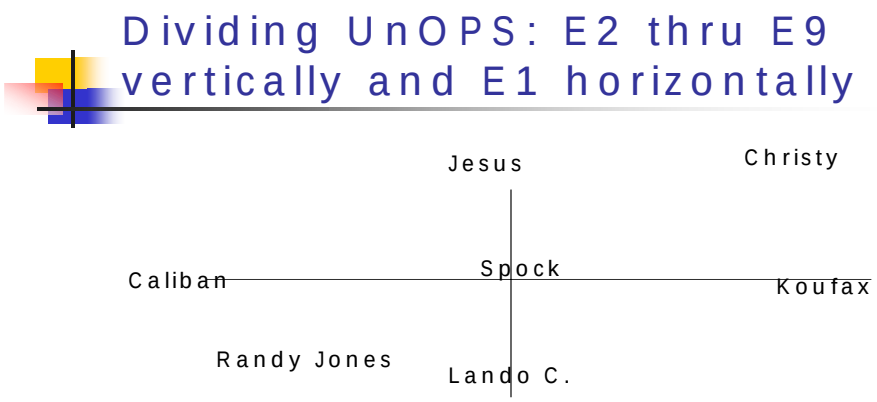


As one can plainly see, there is an order of magnitude difference. So, from here on, I will only use men on base OPS to try to compare apples to apples. Looking at the career UnOPS for all pitchers with at least 50 PAs after error, I calculated the following histogram:

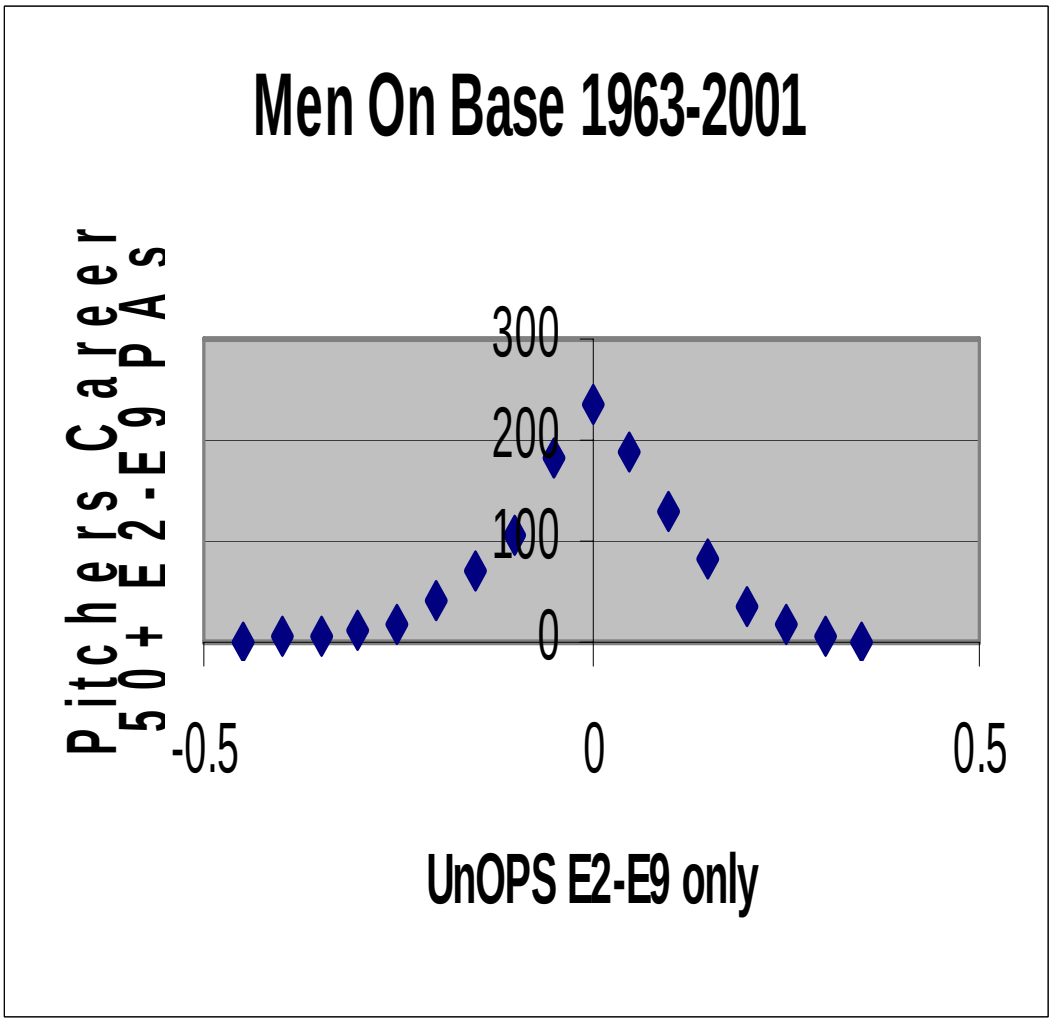


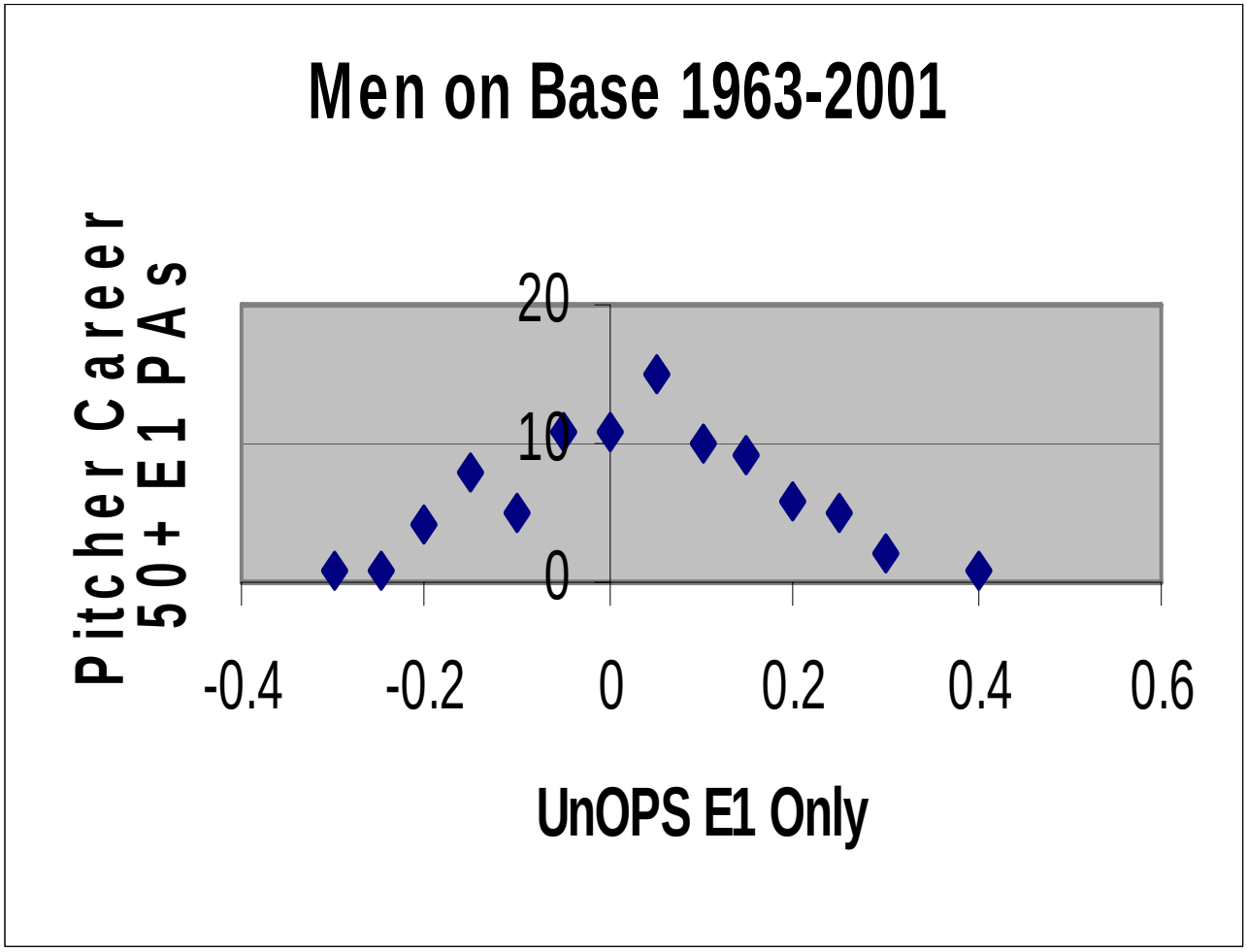
There are 1204 pitchers above. The mean is 0.0013, so on average they are Mr. Spock, but the standard deviation is .0364 (each UnOPS was weighted by the number of after error PAs in that pitcher's career). A few pitchers are at -0.4 or worse. A –0.4 would be roughly the equivalent of letting the batters bat .200 higher than normal. Turning a .250 hitter into a .450 hitter (with no change in isolated power or walk rate) is pretty brutal.

It was at this point that I realized not all errors are created equal. Some errors are the pitcher's own and he might feel more guilty and thus buckle down more for those than for his teammates. So I created a two-dimensional plot with E2-E9 OPS vertically and E1 OPS horizontally:

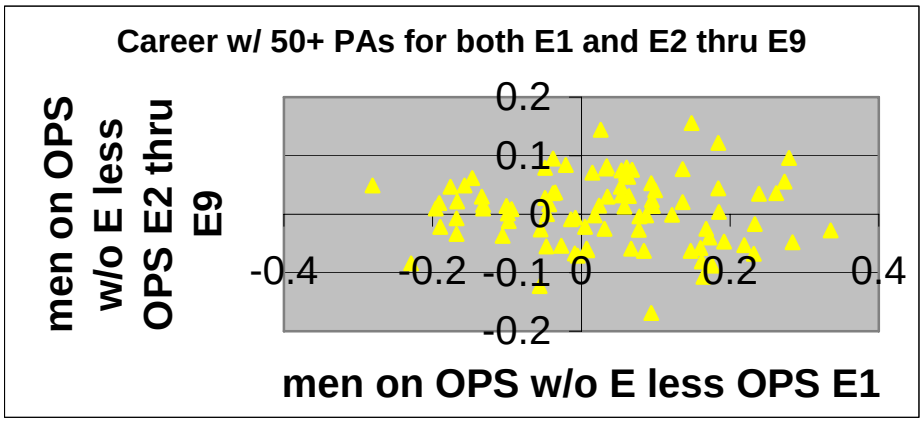


If the pitcher treats all errors the same, he would fall on the diagonal from Jones to Mr. Spock to Christy Mathewson. If he loses his effectiveness after teammates' errors but is as effective before his own errors as after, he is a Lando Calrissian (remember Star Wars V? "It's not my fault"). If he loses his effectiveness after his own errors but is as effective before teammates' errors as after, he is like Shakespeare's self-loathing Caliban. For the pitchers much better after their own errors but at status quo for teammates, I will use the eponym Koufax for such guilt; while I will use Jesus for those who save their teammates but not themselves. First let me show the 50 PA histograms for teammates error UnOPS then pitcher E UnOPS.





As one can see, the E1 UnOPS no longer has the nice bell shape peaking at 0. The E2-9 UnOPS mean is .0020 vs. .0187 for E1 UnOPS and the standard deviations are .0960 and .1389, respectively. The E1 has shorter tails but a higher standard deviation. The population of 50+ PA career pitchers is 1135 (which means 69 pitchers had just over 50 PAs in their careers after all Es and removing their E1's dropped them under 50) to 89. Since all 89 E1 pitchers are in the E2-E9 group, we will now plot one versus the other:



Now that is pretty scattered. It doesn't seem with the limited sample of 50+ PAs that much clumping occurs. Still it is interesting that the UnOPS values get as high as they do. I hope someone else can see any pattern that is there. For fun, here are the pitchers closest to my icons:

UnOPS (PAs)	E1	E2-E9
Caliban:Mickey Lolich	-.196(76)	+.010(560)
Randy Jones:Chuck Finley	-.229(80)	-.084(387)
Lando C.: Frank Viola	+.094(56)	-.169(394)
Jesus: Doug Drabek	.026(54)	.144(316)
Koufax: Kenny Rogers.	335(51)	-.028(328)
Mr. Spock: Bobby Witt	.018(63)	-.002(324)
Christy's:Orel Hershiser	.184 (96)	.122 (490)
Ken Holtzman	.279 (57)	.096 (512)
Bill Bonham	.148 (57)	.156 (259)