Do Base Stealers Help the Next Batters?

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Introduction

- SB threat helps batter by
  - "pressuring" defense
  - distracting pitcher
  - more fastballs, pitchouts
- But batter may have to take or swing
- Analysis of play-by-play data should reveal effects on hitting of SB threat

Pressuring the defense likely means forcing the middle infielder with coverage responsibility to lean toward or play closer to 2nd and be aware that the runner may well try to steal

Analytical Approach

- Define definite SB situations if runner is a threat to steal
- Compare batting performances:
  - SB threat vs. non-threat on base
  - SB situations vs. overall
- Consider batter ability, batter and pitcher hand, league, batting order position

Data Used

- In general, MLB 1980-2001
- Further back for specific base stealers
- Sources (with many thanks)
  - Retrosheet/Dave Smith
  - Gary Gillette
  - Pete Palmer

SB Situations Analyzed

- Runner on first only
- First five innings
- Score difference 3 runs or less
- Excludes some SB situations
- Provides good sample to analyze
- Batting data shown result from these situations except for “overall”

Decided that it would be not worth the effort to try to define potential SB situations for later innings in a way that leaves no doubt. Also complexities due to possibility of pitching changes, pinch hitters, double switches in later innings.

Change in SB strategy in recent years--more HR, so less likely to want to steal--may have an effect on frequency and pitchers’ attitudes. However, best best stealers are still a threat, and would require attention of pitcher and defense.

R. Henderson/Dw. Murphy

- Both played with Oakland 1979-84:
- Murphy #2 behind Rickey in 480 games, #3 in 91 games, #4 in 27 games

Murphy performance	Plays	PA	AB	BA	OBP	SA	K%	BB%
Overall 79-84		3490	2924	0.251	0.360	0.409	17.7%	14.6%
Rickey on 1st (79-84)	326	145	123	0.325	0.376	0.496	10.5%	7.5%
other on 1st (79-86)	158	125	104	0.356	0.464	0.606	15.2%	16.8%

- Murphy much better with runner on first, but did even better with others on first
- Small numbers of AB
- Henderson 154 SB+CS while Murphy up
- Lower K%, BB% (from swinging to help Rickey?)

* Illustrates type of analysis with more general data to come

* Small number of AB in each case (1 to 1.5 months equivalent) may mean results are not meaningful.

* Murphy was a LHB who apparently could take advantage of the hole on the right side

* One possible reason for higher with others on 1st: may have been weaker #8 and #9 hitters, so pitcher who lets those hitter on is not doing well.

* Hard to find good combinations that yield many plays to analyze. Some others:

W. Wilson/G. Brett (usually hit #3) with KC

V. Coleman/O. Smith (usually hit #2) with St. Louis

M. Wills/J. Gilliam (#2) or W. Davis (#3) with LA

Henderson/Murphy (2)

- What if Rickey steals 2nd while Murphy up?

Murphy performance (79-84)	PA	AB	BA	OBP	SA	K%	BB%
Rickey to 2nd while Murphy up	105	86	0.291	0.419	0.500	23.8%	18.1%
Runner on 2nd before (all)	110	90	0.289	0.418	0.422	15.5%	18.2%
Rickey on 2nd before	49	43	0.326	0.408	0.442	18.4%	12.2%

Note: all data from first five innings with score difference <4 runs

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- Higher K% when Rickey to 2nd while Murphy up
- Small numbers of AB
- Higher BA, lower BB% when Rickey on 2nd before Murphy bats (small number of AB problem?)

Even smaller numbers of AB here, but the pattern is consistent with the general one (discussed later).

Possibly a some IBB after Rickey SB if pitcher behind in count (did not tabulate).

Not enough PA after Rickey (or anyone else) out while Murphy batting to analyze

SB Threat Classification

- Based on season (SB+CS)/(1B+BB+HP)
- Divide into approximate thirds
- From highest third split out:
  - 40+ SB in year (roughly top 5%)
  - 30-39 SB in year (next 5%)
  - Adjust for 1981, 1994, 1995
- Five groups of distinct SB threats

Goal is not to produce exact ratings of players but to get large enough groups of players with distinct SB abilities to enable the analysis

If runner had <50 PA, then his occurrences are not included in the data analyzed

Dividing points are 4.8% and 14.1% (based on 84-92)

Focus: #2 hitters in lineup

- Lineup position likely to be important
- Best stealers usually lead off
- #2 hitters have most SB situation plays
  - #3, #4 also have many except for finer breakdowns of data
  - Their effects are similar to those for #2
  - Very few plays with best SB threats otherwise

Pitchers will pitch according to how dangerous the next hitters are, so lineup position is an important control. Since #3 hitters are usually the best or nearly so on their teams, restricting to #2 hitters makes sense.

Some variation among #2, #3, #4, which may due to sparser data for #3, #4

Batting: SB situations vs. overall

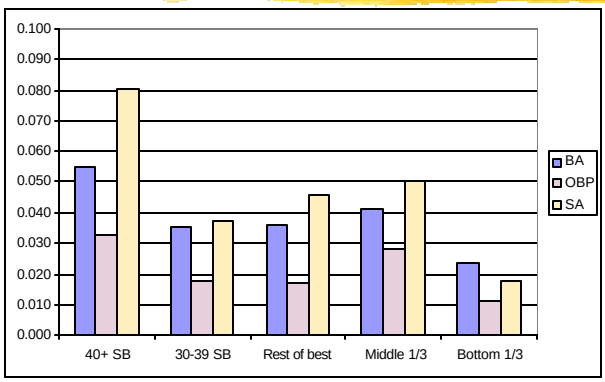
- 1980-2001, first five innings, close games
- Weighted overall average based on season averages weighted by number of AB or PA

#2 Hitter Performance in SB situations by SB threat (runner on 1st for whole PA)								
			Weighted overall avg.			Runner on first only		
SB threat	PA	AB	BA	OBP	SA	BA	OBP	SA
40+ SB	6824	6377	0.274	0.340	0.393	0.329	0.373	0.474
30-39 SB	4739	4410	0.275	0.341	0.398	0.311	0.359	0.436
Rest of best	12776	11923	0.275	0.340	0.397	0.311	0.357	0.444
Middle 1/3	9051	8350	0.278	0.344	0.411	0.320	0.372	0.462
Bottom 1/3	3767	3466	0.279	0.347	0.403	0.303	0.358	0.421

- Similar overall performance for all SB levels
- Increases with runner on greatest for 40+

Note: OBP excludes SH but not failed sacrifice attempts

Increases in BA, OBP, SA (Runner on 1st - Overall), #2 hitters



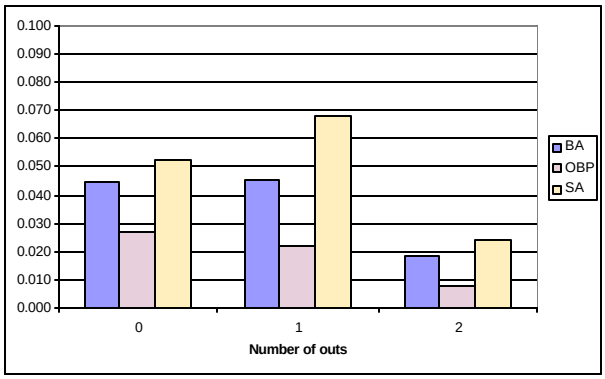
Runner stays on 1st for whole PA

- Greatest gains for 40+, least for bottom 1/3
- Especially for SA (more fastballs with 40+?)

Also, gains in OBP less than BA. That could be due to

1) reluctance of pitcher to walk a man into scoring position
2) hit & run plays or hitters trying to take advantage of hole on right side
3) either of above could result in or be result of more fastballs
4) failed sacrifice bunt attempts

Increases in BA, OBP, SA by Outs (Runner on 1st - Overall), #2s



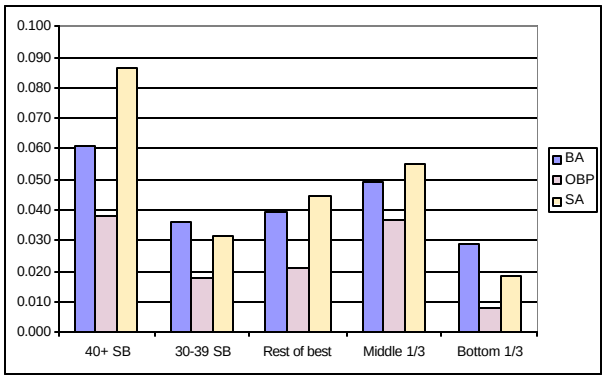
Runner stays on 1st for whole PA

- Much less with two outs (2B, SS not in DP depth)

Two out effects much less than 0,1, Shows that a lot of the benefit may be due to the middle infielders playing shallower

Number of AB: 0 outs: 21,080, 1 out: 6,618, 2 outs: 6,828

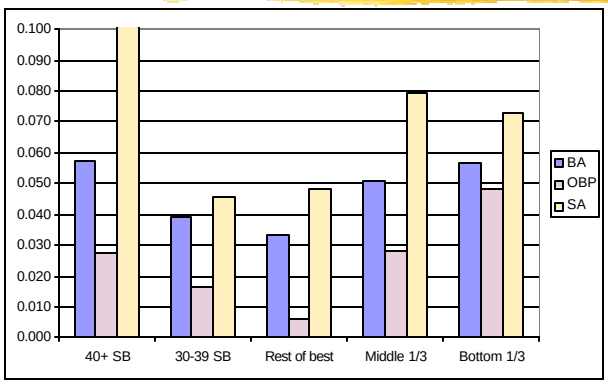
Increases in BA, OBP, SA by SB Threat: No Outs, #2 hitters



Runner stays on 1st for whole PA

- Similar to overall pattern (40+, bottom 1/3; effects greatest for SA, least for OBP)

Increases in BA, OBP, SA by SB Threat: 1 Out, #2 hitters

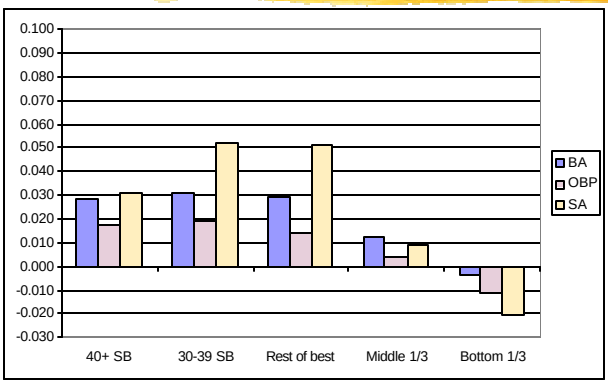


Runner stays on 1st for whole PA

- 40+ still have strongest effects, but middle and bottom 1/3s also have large effects

Not fully consistent with general, 2 outs

Increases in BA, OBP, SA by SB Threat: 2 Outs, #2 hitters



Runner stays on 1st for whole PA

- 40+ no longer strongest effects
- Bottom 1/3 has negative effect

Top 1/3, three leftmost groups clearly have a stronger effect than the lower 2/3

Why should bottom 1/3 show a negative effect? Possible reasons:

* Pitchers really concentrate on #2 hitter to avoid pitching to #3 with men on when do not have to worry about runner? (Based on 1311 AB, 1432 PA, so small numbers should not be the problem)

* Easier to get a force at 2nd if slower runner on first

* Faster runner may be running with the pitch when ball is put in play, and some of those may lead to additional hits due to not being able to get the force at 2nd or because SS or 2B has moved over to cover 2nd

* First baseman may play off the bag to some extent with non-threat on first

Batter Strength Classification

- Divide into approximate thirds based on season OBP, SA
- Rank 1 (lowest) to 3 (best) in each
- Add together the two rankings
- Five groups of distinct batter strengths (2 to 6)

Goal is not to produce exact ratings of players but to get large enough groups of players with batting abilities to enable the analysis

If runner had <200 PA, then his occurrences are not included in the data analyzed

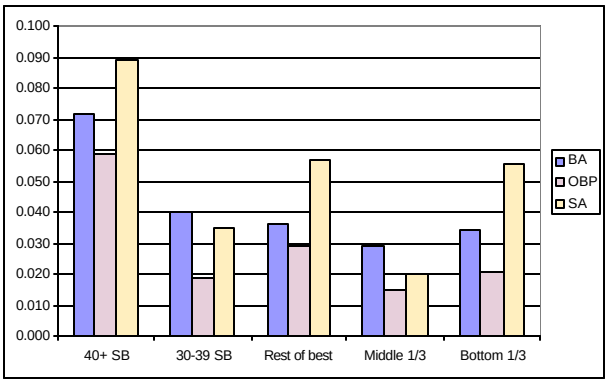
Dividing points (based on 84-92):

OBP: 0.313, 0.346

SA: 0.367, 0.427

AB by batter strength: 2: 4848, 3: 6344, 4: 7647, 5: 7644, 6: 8043; some batter/SB combos less than 386-630 AB

Increases in BA, OBP, SA by SB Threat: lowest ranked #2 hitters



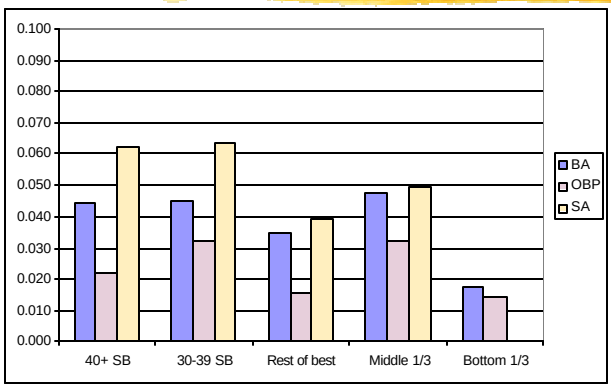
Runner stays on 1st for whole PA

- 40+ has strongest effects
- Others are inconsistent

These hitters are in the bottom 1/3 of both OBP, SA

Next weakest group of hitters (bottom 1/3 in OBP or SA, middle 1/3 in other) show a similar pattern to the above

Increases in BA, OBP, SA by SB Threat: middle ranked #2 hitters



Runner stays on 1st for whole PA

- 30+ has strongest effects
- Bottom 1/3 has weakest

These hitters are in the middle 1/3s of both OBP, SA -or- in top 1/3 of one and the bottom 1/3 of the other

Next group of hitters up (top 1/3 in OBP or SA, middle 1/3 in other) show a similar pattern to the above

Increases in BA, OBP, SA by SB Threat: highest ranked #2 hitters

Runner stays on 1st for whole PA

- 40+ has strongest effects
- Rest seem to defy explanation

No idea why this crazy pattern. At least 900 AB and 995 PA for all five cases (30-39, bottom 1/3 have the fewest, in the range above, but it should not be a small numbers problem)

Runner to 2nd during Plate Appearance (PA)

- Includes SB, WP, PB, Balk, PO errors
- Top 1/3 SB threats

Batting Performance (1980-2001) with Top 1/3 SB stolen base threat on 2nd							
#2 hitters, all batting levels	PA	AB	BA	OBP	SA	K%	BB%
Runner to 2nd during PA	6544	5405	0.245	0.377	0.330	15.6%	17.4%
Runner to 2nd before PA	6797	6113	0.279	0.351	0.393	12.1%	10.1%
Note: all data from first five innings with score difference <4 runs							

- Higher K%, BB%, OBP; lower BA, SA when runner to 2nd during PA
- Differences are significant
- Same effects when batting ability level considered

Did not distinguish 40+ and 30-39 SB men from the top 1/3 group because should not affect batting with a runner on 2nd. However, might have been good to do so in case hitters tend to take more pitches in those cases.

Note that the number of AB is fairly close for both cases

SA significance is determined by t-test on paired averages for each outs, batter ability combination (15 pairs), but significance is marginal (8.5%)

Runner on 1st out during Plate Appearance (PA)

- Includes CS, PO, any other reason
- All SB threat levels

Batting Performance (1980-2001) with 1 or 2 out, no one on							
#2 hitters, all batting levels	PA	AB	BA	OBP	SA	K%	BB%
Runner on first out during PA	3239	2742	0.250	0.365	0.371	16.7%	15.3%
No runner on before PA	90412	82464	0.264	0.329	0.385	13.2%	8.8%
Note: all data from first five innings with score difference <4 runs							

- Higher K%, BB%, OBP; lower BA, SA when runner out during PA
- K%, BB%, OBP very significant, BA less so, SA not
- Same effects when batting ability level considered

Many more AB when runner already on first, which is not surprising

BA significance is between 5-10%, other under 1%.

SA significance is determined by t-test on paired averages for each outs, batter ability combination (10 pairs)

Other Effects

- AL, NL: similar for the most part
  - Greater frequency of SB attempts in NL
- Batter, pitcher hand, platoon advantage
  - LHB and platoon+ have some greater effects
  - Greater frequency of SB tries w/LHB, RHP
  - General pattern of effects similar to overall
- SB tries influenced by outs, batter ability
  - up with more outs, down with better hitters

Many of these determined by t-tests on paired averages for 15-25 break outs

Influence of outs and batter strength on SB tries is what would be expected

Conclusion

- Best base stealers (40+ a year) help hitter more than lesser threats when on first
- Effects inconsistent among lesser threats
- Effects are much less with 2 outs
- BA, SA hurt when runner leaves first (effect of taking pitches?), but OBP higher
- www.pankin.com/sabr32.pdf

Plan to post this presentation and a more detailed write up on my web site. Target: end of August

May expand and try to publish (web site at least)

Answer to basic question: Best base stealers help the following #2 hitters 10-30 BA points, 30-60 SA points, and 0-20 OBP points based on all plays (combined # outs, batter ability). Breaking things down too finely results in some cases with small numbers of plays

Also K%, BB% (related to OBP) higher when runner play occurs