Disentangling success in baseball with ball-tracking technologies

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Skill vs. luck: disentangling success in complex systems
February 11, 2011
Example: Jonathan Sanchez

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<th>Year</th>
<th>IP</th>
<th>ERA</th>
<th>SO Rate</th>
<th>BB Rate</th>
<th>GB Rate</th>
<th>BABIP</th>
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<tbody>
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<td>2006-2009</td>
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Was Sanchez’s low ERA in 2010 the result of improved skill or just good luck? What should we expect in 2011?
Strikeouts

$r^2 = 0.63$
Walks

$R^2 = 0.48$

Year $t+1$ Walk Rate

Year $t$ Walk Rate
Ground Balls

\[ r^2 = 0.72 \]
Batting Average on Balls in Play

$r^2 = 0.04$
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Fielding-Independent Pitching Evaluation

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- Led to new way to evaluate pitchers based solely on strikeouts, walks and ground balls (or home runs). Called fielding- or defense-independent pitching evaluation.
- New metrics created (FIP, xFIP, SEIRA, ...) that gave the expected ERA of a pitcher based on these three rates. Better measure of pitcher skill than ERA.
But is getting field-able balls in play a skill?

- Even though there is low year-to-year correlation in BABIP, some pitchers have career BABIPs far below the league average of around 0.300.
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- Tim Wakefield has a career BABIP of 0.274 over 3071 innings mostly in a home ballpark that has a higher than average BABIP.
- Mariano Rivera has a BABIP of 0.261 over 1150 inning.
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- Are we throwing the baby out with the bathwater by saying BABIP is completely driven by defense and luck, and not by the pitcher at all?
- Can we identify pitchers who legitimately ‘deserve’ a low BABIP before they accumulation a thousand innings?
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With these data it is possible to answer a host of questions. Here we will just consider BABIP.
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BABIP is location dependent.
BABIP by pitch location
Mariano Rivera pitch locations
Jonathan Sanchez pitch locations
Other ball-tracking technologies

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- More importantly, better assess the skill of fielders. This assessment would be greatly improved with ball-in-play data.
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- Ball in play data should make fielding evaluation much better.