

# Quantifying The Effect of Pitching Metrics

Max Brown

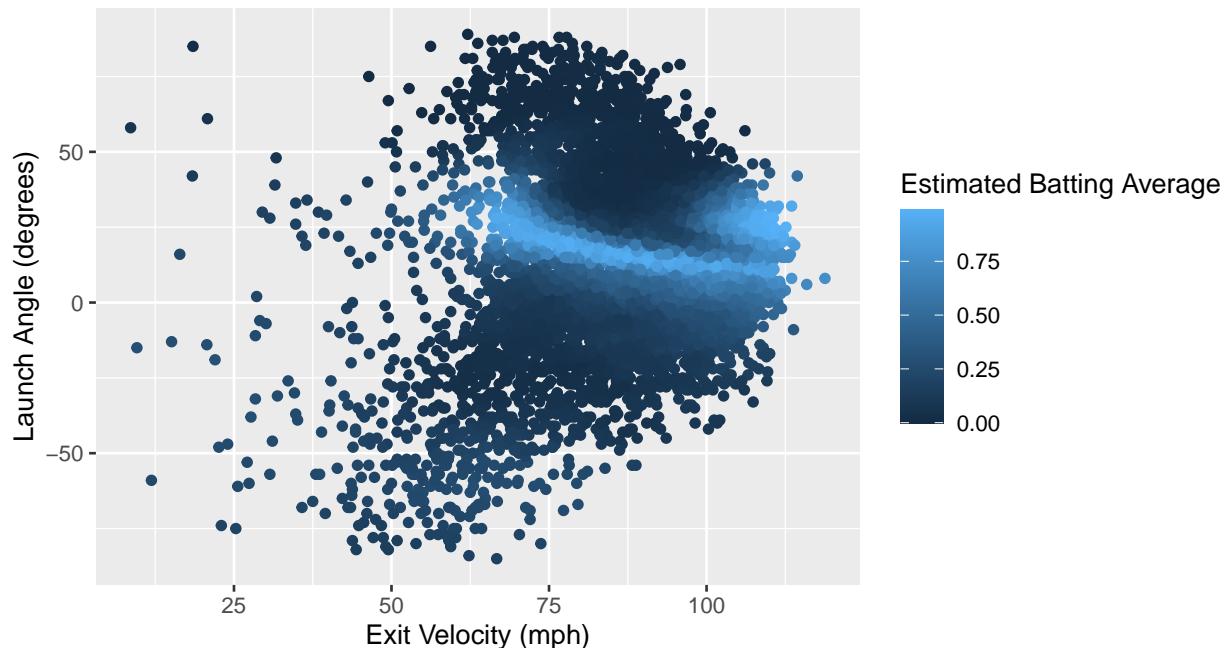
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## Introduction

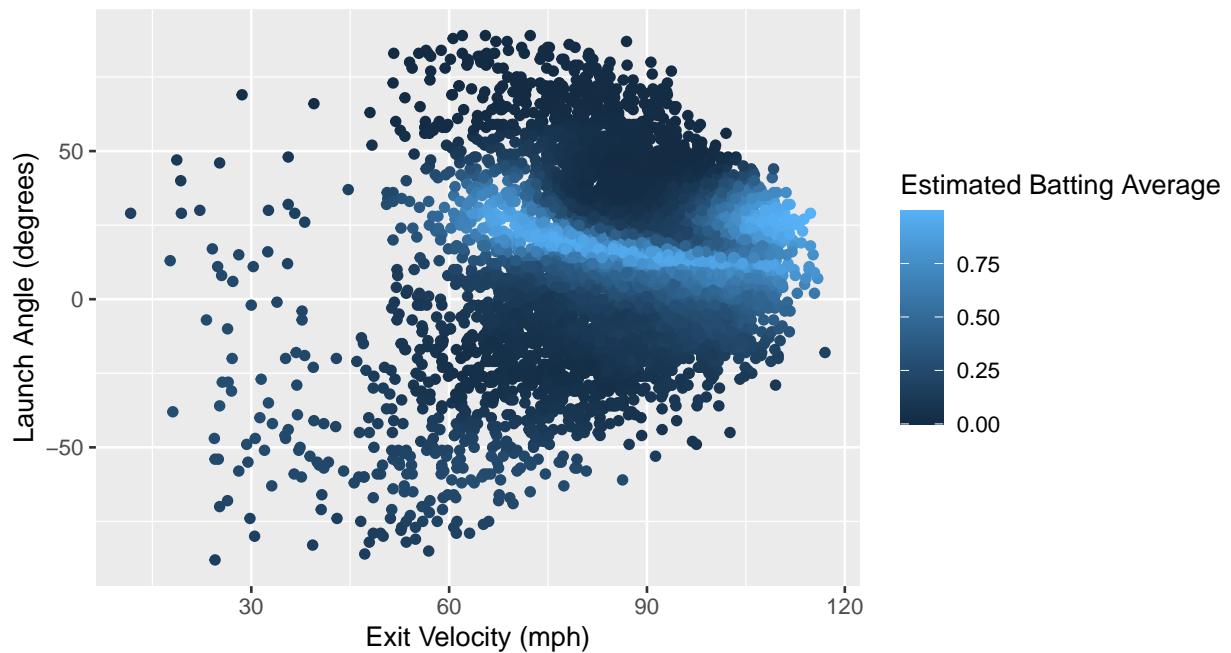
The methodology of analyzing the performance of pitchers has drastically changed over time. At the surface one can evaluate at pitcher's win-loss record to determine their impact on the teams' performance. It's a results-based model, but includes several factors far out of a pitcher's control, fundamentally the

## General EDA

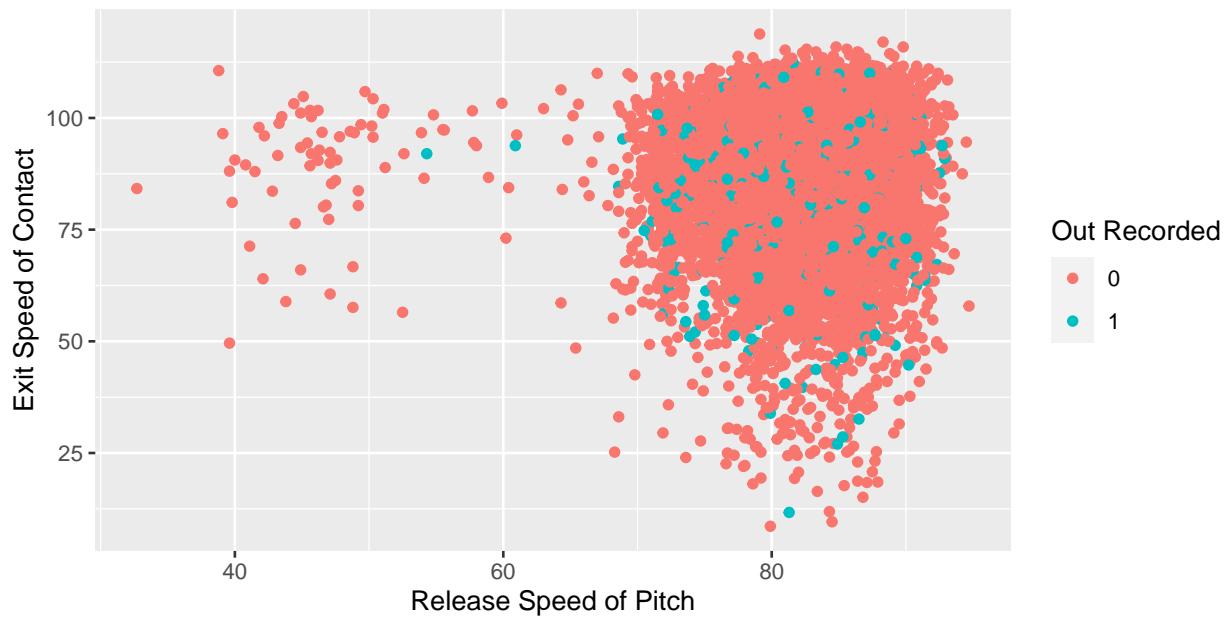
Right-Handed Speed/Angle Breakdown



### Left-Handed Speed/Angle Breakdown



### No Relationship For Release Speed and Launch Speed/Out Made



## Righty EDA

### Right-Handed Breakdown

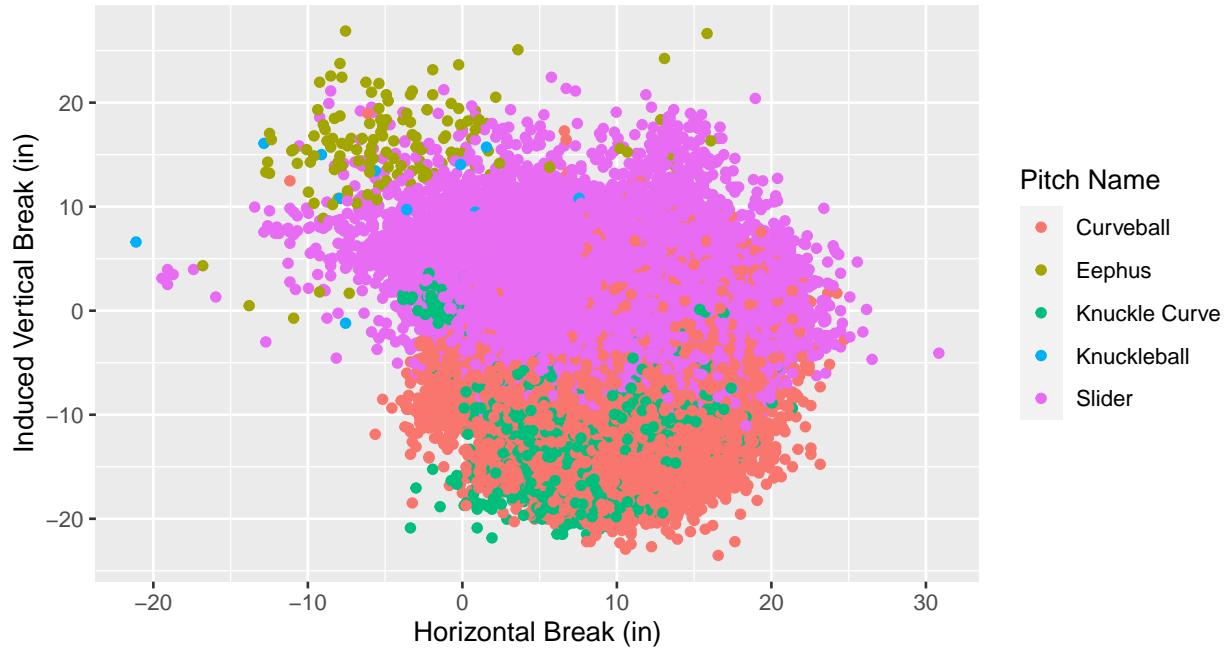


Table 1: Average RH Pitch Type Metrics

pitch_name	release_speed	release_spin	hor_break	vert_break	tilt
Curveball	79.37	2565.31	9.61	-9.55	44.17
Eephus	50.76	1203.93	-3.91	15.81	212.69
Knuckle Curve	81.55	2571.51	8.04	-10.67	47.75
Knuckleball	55.37	582.53	-2.23	7.79	209.95
Slider	84.91	2450.96	6.89	1.97	108.48

pitch_name	n
Curveball	9604
Eephus	138
Knuckle Curve	2646
Knuckleball	19
Slider	27526

## Lefty EDA

### Left-Handed Breakdown

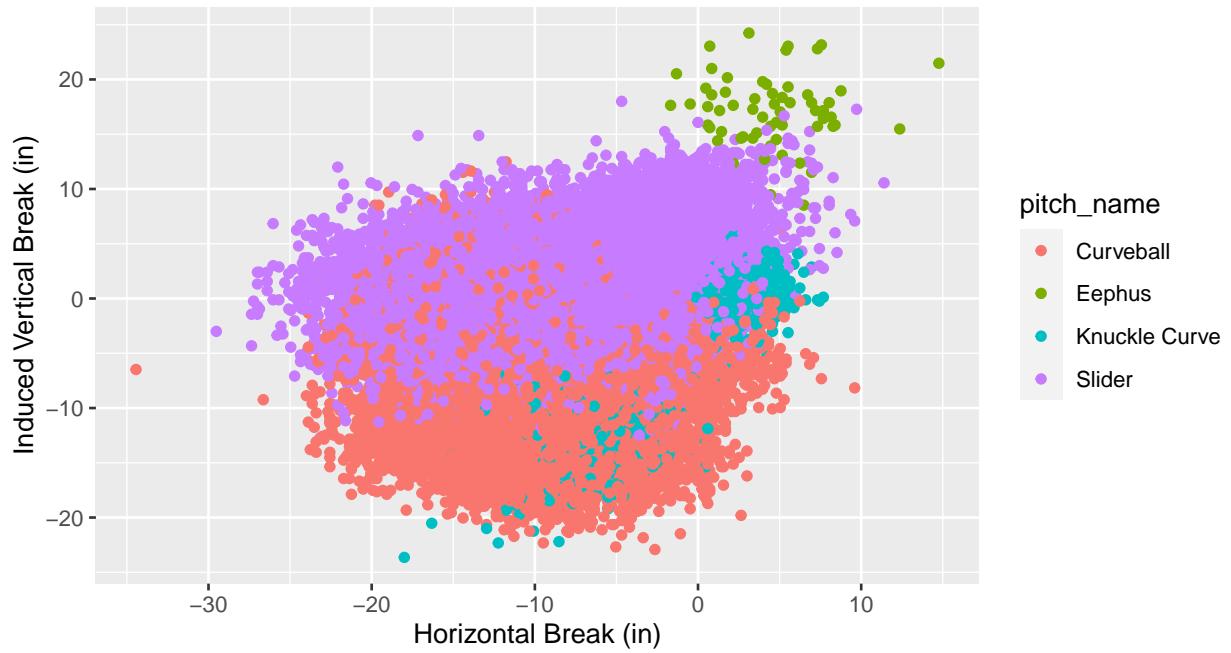


Table 3: Average LH Pitch Type Metrics

pitch_name	release_speed	release_spin	hor_break	vert_break	tilt
Curveball	78.24	2467.73	-9.13	-8.63	314.16
Eephus	45.14	1224.42	4.53	17.15	157.29
Knuckle Curve	78.94	2289.64	-3.17	-7.70	249.31
Slider	84.00	2365.35	-6.48	1.76	245.80

pitch_name	n
Curveball	11448
Eephus	62
Knuckle Curve	1423
Slider	23553

## Methodology

### Creating Right Handed Models

#### Curveball

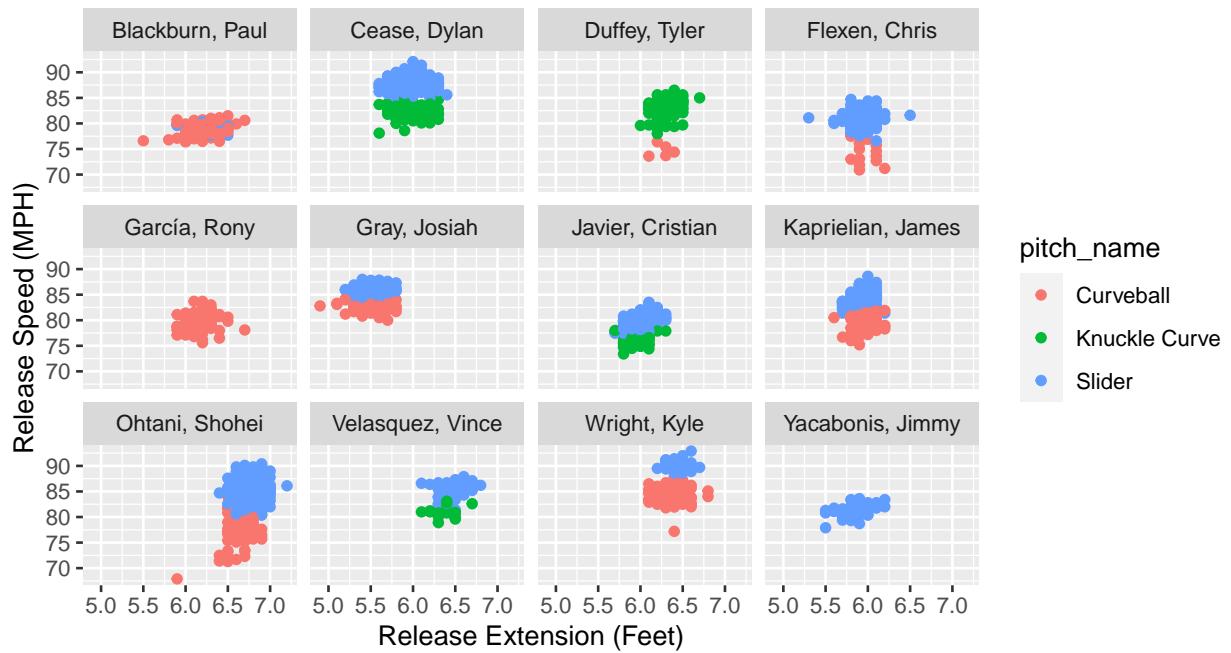
effect	group	term	estimate	std.error	statistic	p.value
fixed	NA	(Intercept)	0.6644	0.5997	1.1080	0.2679
fixed	NA	release_speed	-0.0080	0.0072	-1.1198	0.2628
fixed	NA	hor_break	0.0102	0.0054	1.8837	0.0596

effect	group	term	estimate	std.error	statistic	p.value
fixed	NA	ind_vert_break	-0.0023	0.0049	-0.4812	0.6304
fixed	NA	mean_centered_spinrate	0.0004	0.0002	2.2713	0.0231
ran_pars	player_name	sd_(Intercept)	0.2026	NA	NA	NA

effect	group	term	estimate	std.error	statistic	p.value
fixed	NA	(Intercept)	0.0311	0.0552	0.5635	0.5731
fixed	NA	hor_break	0.0121	0.0051	2.3607	0.0182
fixed	NA	mean_centered_spinrate	0.0004	0.0002	2.4484	0.0143
ran_pars	player_name	sd_(Intercept)	0.2021	NA	NA	NA

## Appendix

### Inconclusive Evidence of Righty Extension/Speed Relationship



## Inconclusive Evidence of Lefty Extension/Speed Relationship

