

*The Baseball Group Presents*

# Pitch Perfect

Exploring Major League Baseball Pitcher Data - *What Can We Discover?*

# What are the research questions?

Are there certain factors  
that lead to success  
more often than others?

What should a team be  
looking for when  
analyzing a pitcher?

Each question will be answered for  
each type of pitcher →



**Starters**  
Innings 1-5

**Relievers**  
Innings 6-8

**Closers**  
Inning 9

# *Starting things off*

*Some terms to know before we get going*

- Batting average against
  - Hits / ABs
- Pitch velocity
  - How fast the pitcher throws the ball
- Exit velocity
  - How fast the hitter hits the ball
- Whiffs
  - When the batter swings and misses the ball
- Horizontal release point
  - How far from center the pitcher releases the ball
- Release extension
  - How much closer a pitcher releases the ball to home plate

# So what are our analysis categories?

- 1 Release extension and batting average against
- 2 Horizontal release point and exit velocity
- 3 Pitch velocity and whiffs



**1**

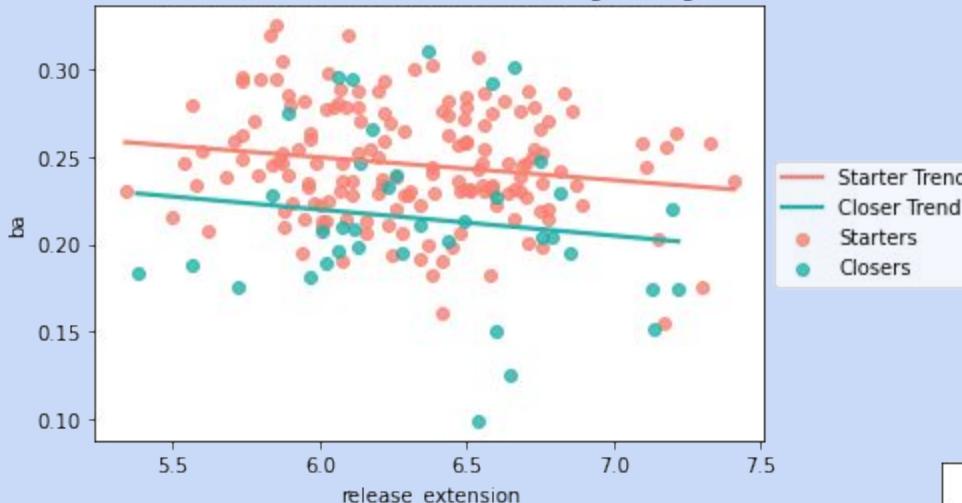
**Release extension  
and batting  
average against**

# Why is release extension even important?



- Being closer to home plate upon release makes the ball appear faster
- Thus, one would think longer release point = lower batting average against

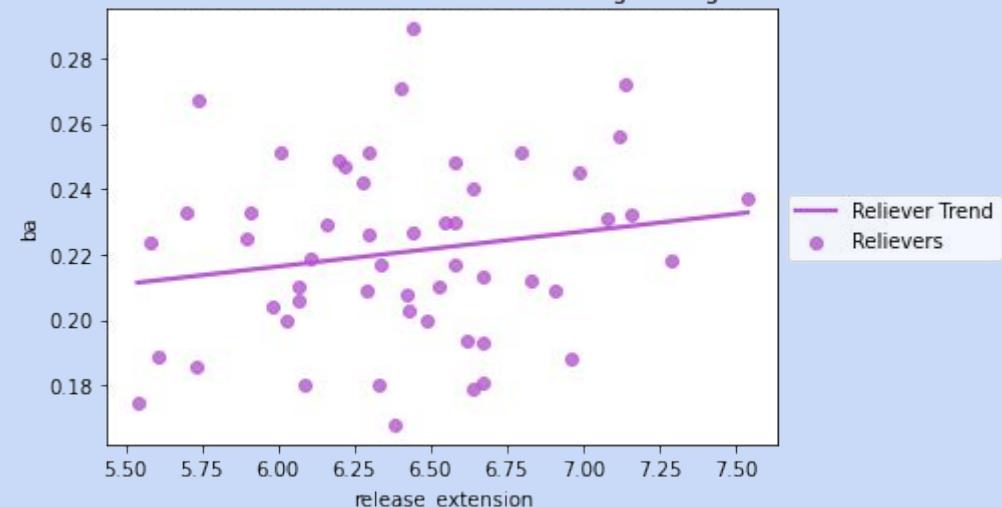
Closers: Release Extension vs Batting Average



Surprisingly, we see the opposite for relievers. As release extension increases, batting average actually *increases*.

For starters and closers, it is exactly what we would expect: as release extension increases, batting average decreases.

Relievers: Release Extension vs Batting Average



So our next step is to subset for those pitchers — all six of them — with short release extensions, but still incredibly low batting average against scores. They are outliers.



Boxberger,  
Brad

Gallegos,  
Giovanny

Treinen,  
Blake

Hand, Brad

Castillo,  
Diego

Gallegos,  
Giovanny



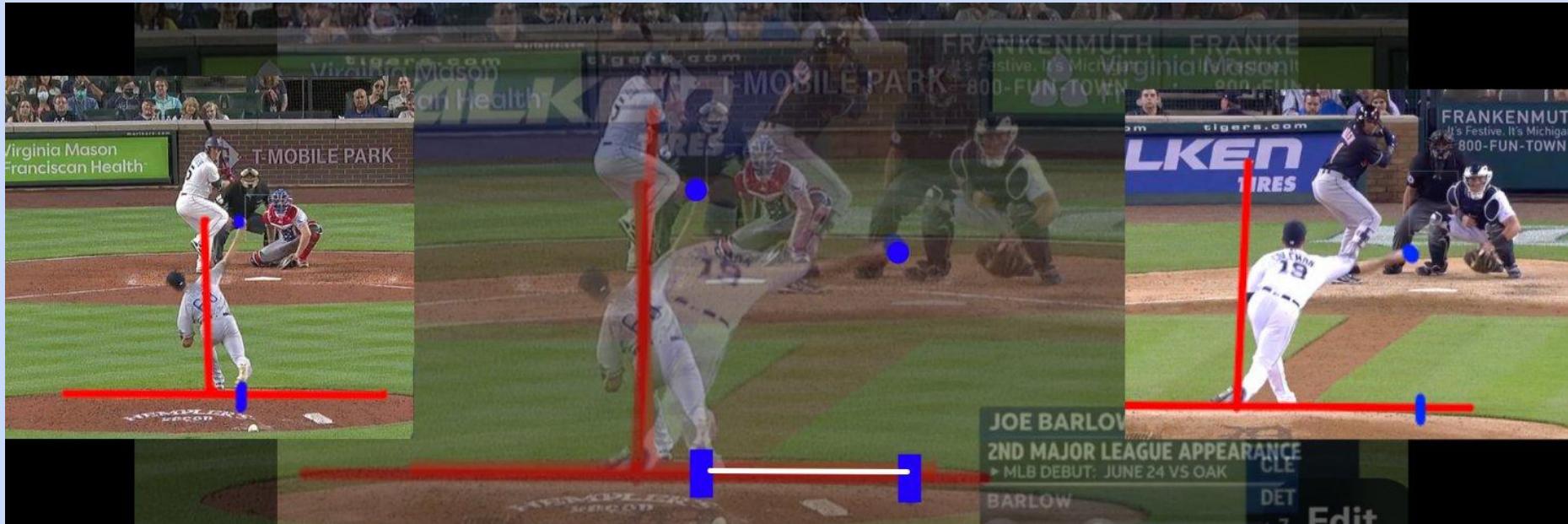
→ .175 batting average  
against, the lowest  
among all “T-rexes”



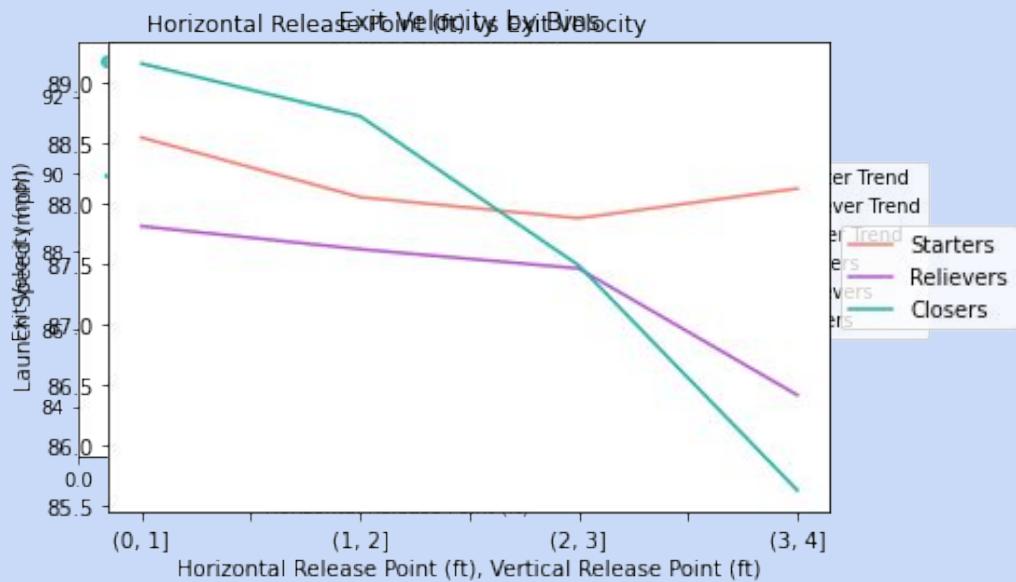
**2**

**Horizontal  
release point and  
exit velocity**

# Why is horizontal release point even important?



- Having a more outside release point makes it more confusing for a hitter to see the ball as it comes in
- Thus, one would think that a larger horizontal release point = lower exit velocity



The visualization shows the previous notion even more clearly. We see here that for closers and relievers it is even more important to have wider release points, something we will explore further.

Interestingly, there are a few great outliers for starters.

We see  
large  
the e



Bumgarner  
**88.6 mph**

ed, as the  
t, the lower

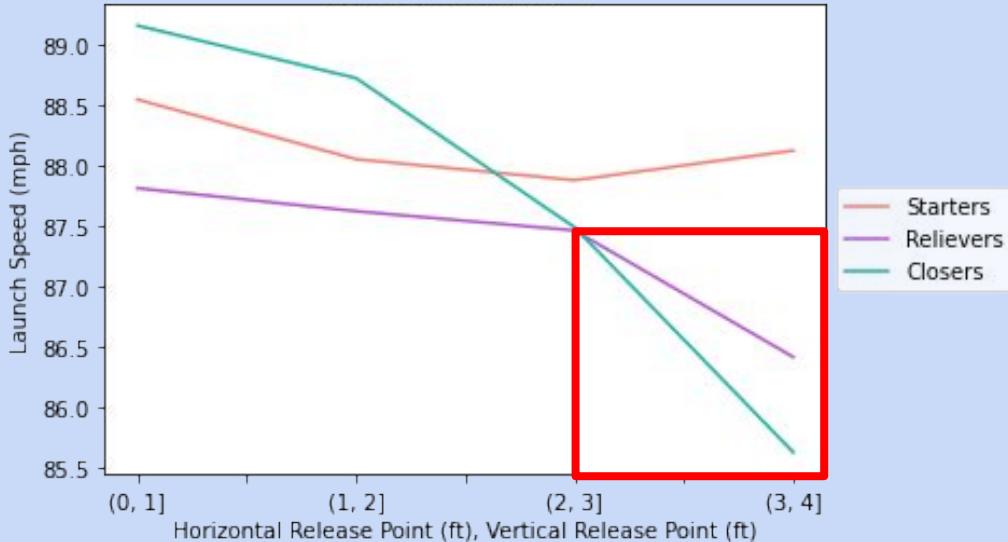
Manaea  
**88.9 mph**



Heaney  
**88.9 mph**



### Exit Velocity by Bins



What we're really interested in here are the relievers and closers with these wide horizontal release points, and low exit velocities. Here, we picked out the lowest for each category for further analysis.



Rogers  
84.4 mph



Treinen  
83.2 mph



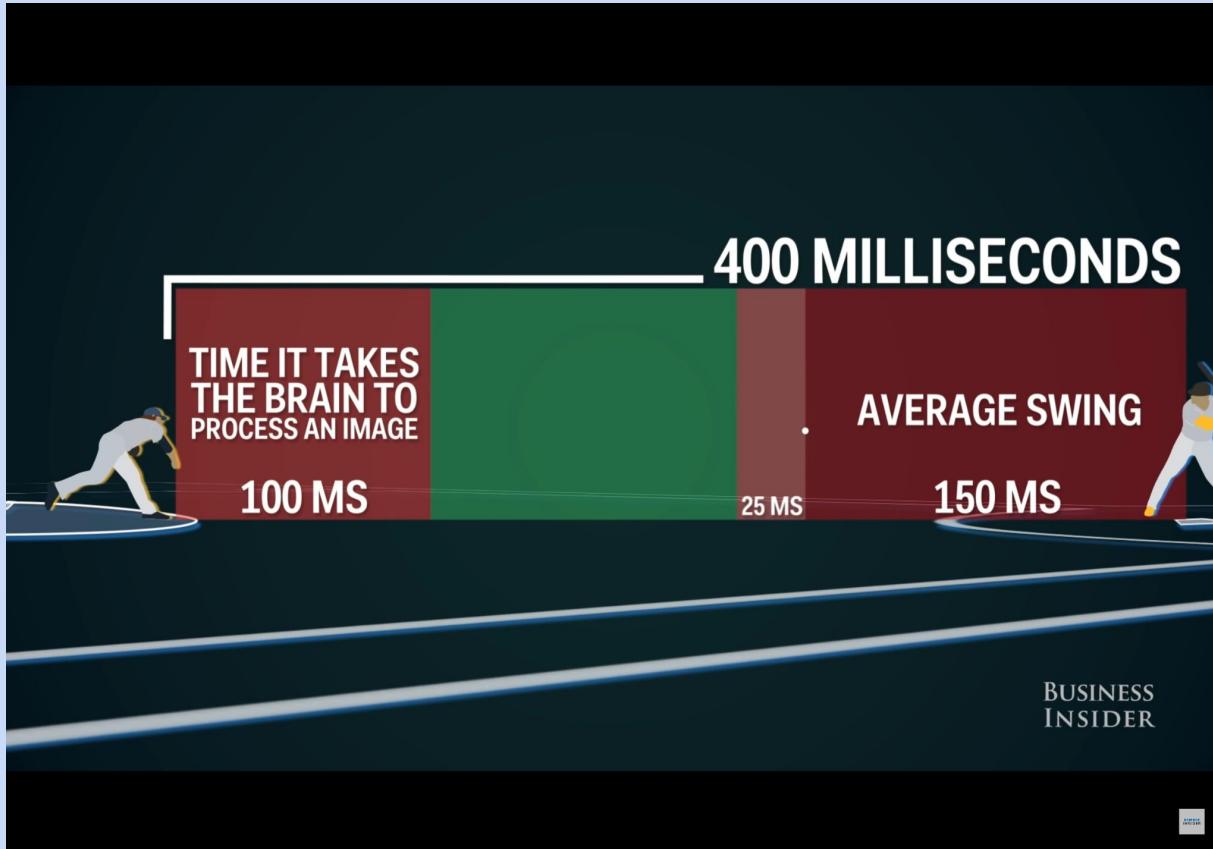
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# Pitch velocity and whiffs

# Why is pitch velocity even important?

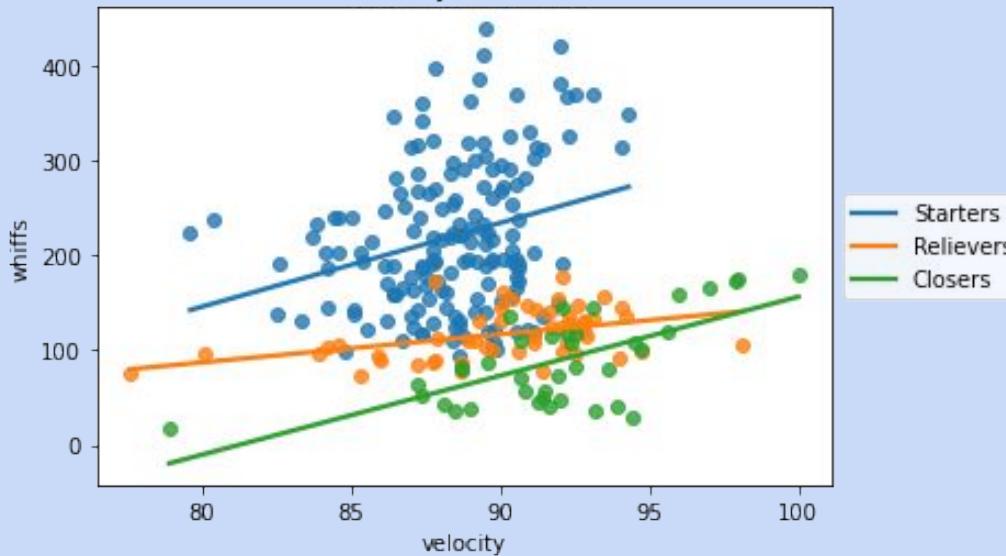


# Why is pitch velocity even important?



- Hitting a baseball is insanely hard. But for a professional hitter, it is somewhat easier so the extra mph or two makes a big difference
- Thus, one would think higher pitch velocity = greater number of whiffs

Velocity vs Whiffs



We see starters producing the most whiffs total, but we notice that closers actually have the steepest slope when it comes to the relationship between whiffs and pitch velocity.

More important, however, is looking at whiff percentage. Here, we see the importance of whiffs for closers.

Starters – Whiff Percentage (out of total throws):  
1.48  
Relievers – Whiff Percentage (out of total throws):  
7.36  
Closers – Whiff Percentage (out of total throws):  
15.66

	player_name	velocity	whiffs
5	Chapman, Aroldis	100.0	180
20	Hendriks, Liam	98.0	175
9	Clase, Emmanuel	97.9	172
23	Iglesias, Raisel	97.0	167
4	Smith, Will	96.0	160





**Where do we  
take the analysis  
from here?**

Now that we know the larger trends, we will look at specific players as case studies.





**Thank you!  
Questions?**