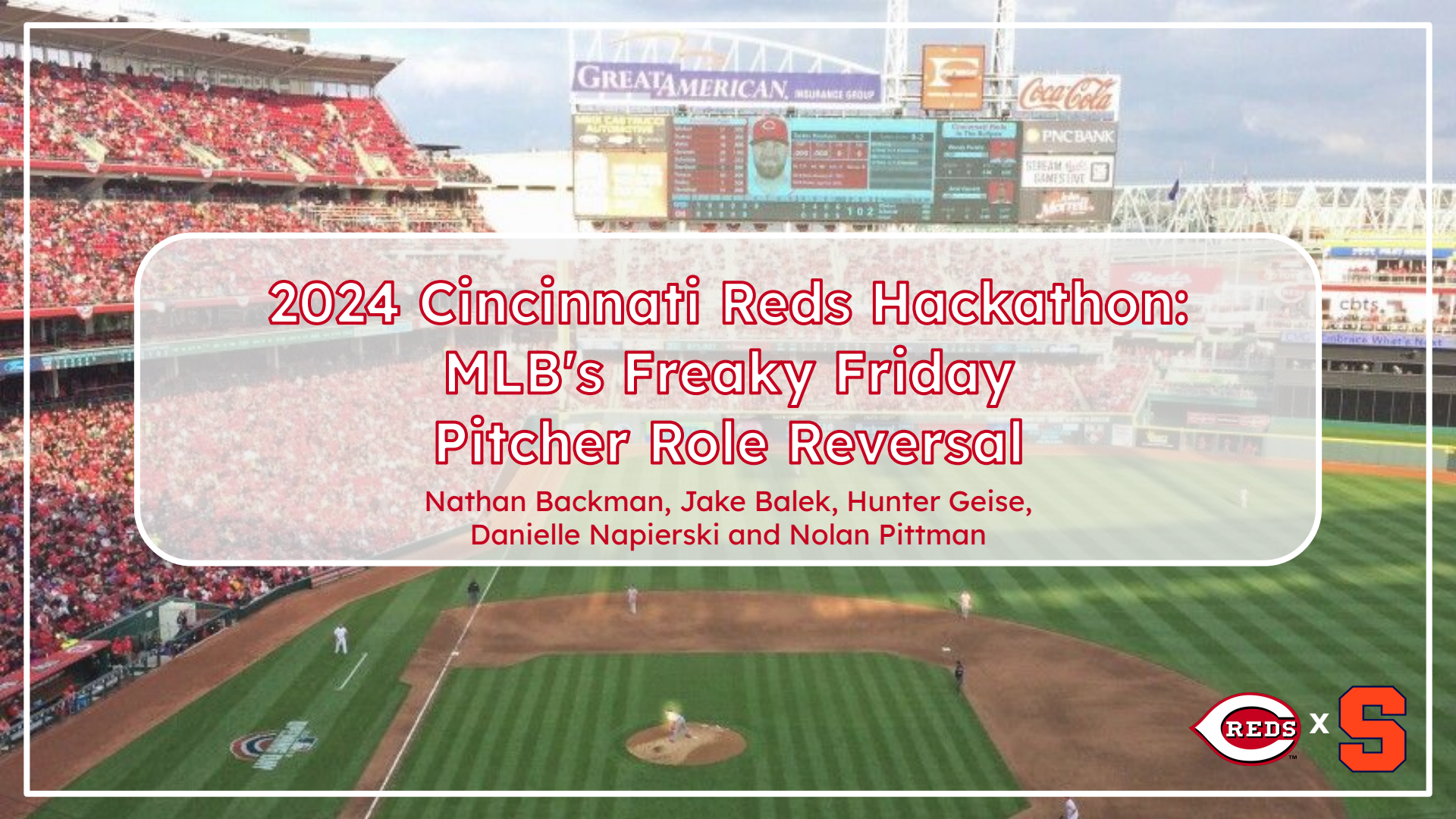


2024 Cincinnati Reds Hackathon: MLB's Freaky Friday Pitcher Role Reversal

Nathan Backman, Jake Balek, Hunter Geise,
Danielle Napierski and Nolan Pittman

Goal:

Identify different types of relief pitchers and analyze their impact in specific roles

Overview

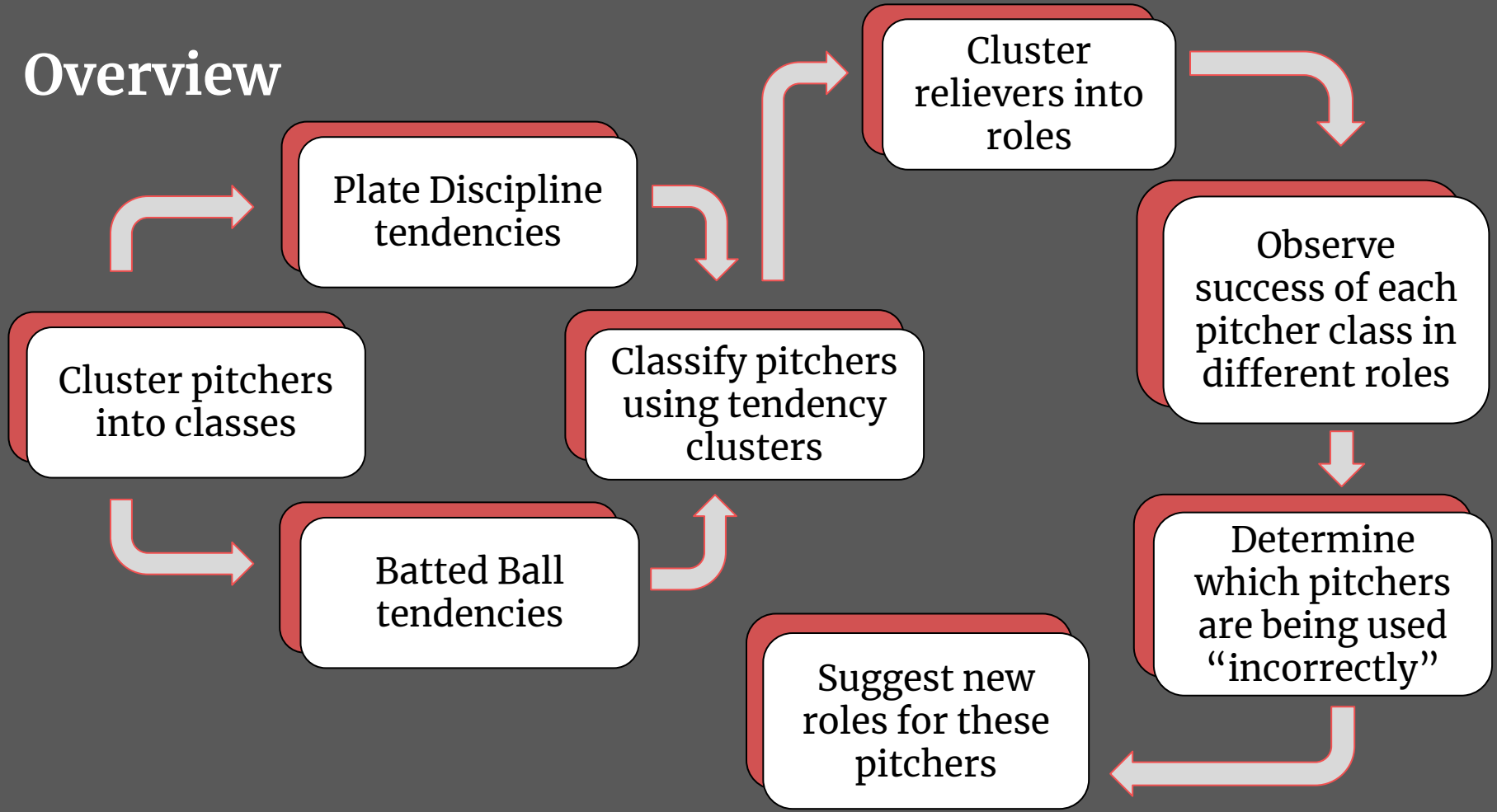


Plate Discipline tendencies
Batted Ball tendencies
Cluster pitchers into classes
Classify pitchers using tendency clusters
Cluster relievers into roles
Observe success of each pitcher class in different roles
Determine which pitchers are being used “incorrectly”
Suggest new roles for these pitchers

Data

Fangraphs Season Level

Savant Pitch Level

Research Methodology

- Agglomerative Hierarchical Clustering Model
- Filtered down to a minimum of 50 total batters faced
- Data converted to percentiles
- Clusters created for each of the following:

Batted Ball

Pitcher's tendency to allow different types of contact

Plate Discipline

Pitcher's ability to control the zone

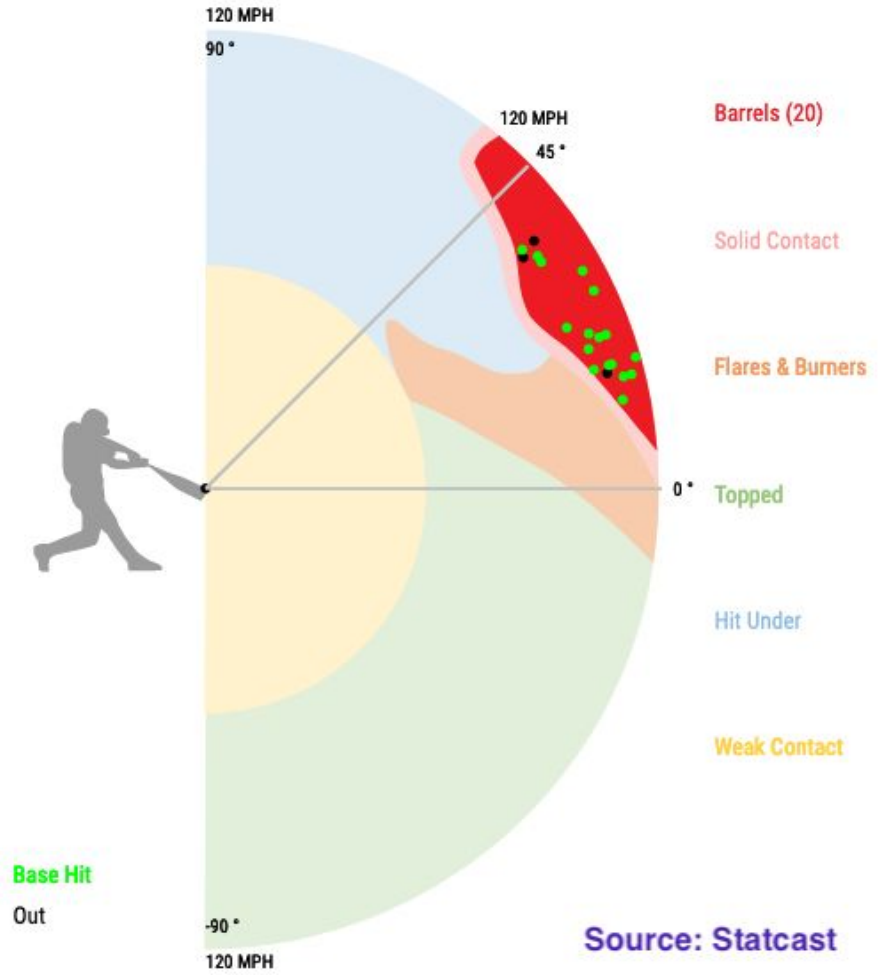
Reliever Role

Situation pitcher is given when they enter a game

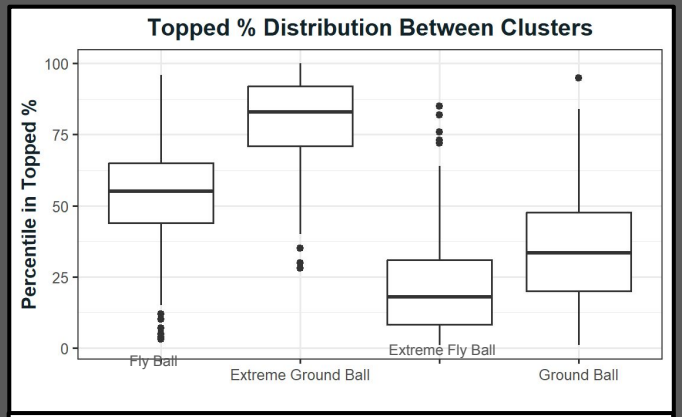
Batted Ball Cluster Model

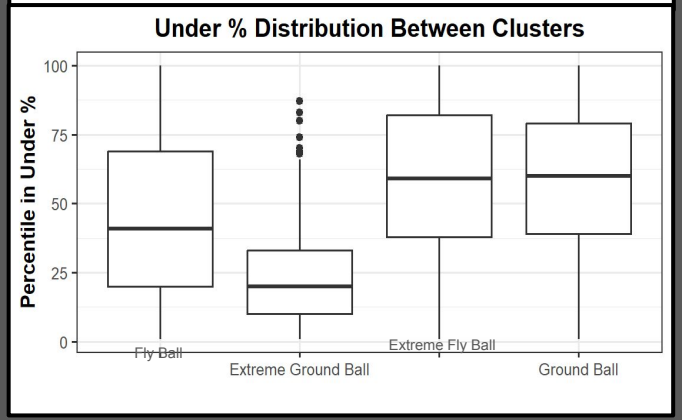
Variables Used:

- Weak Contact%
- Hit Under%
- Topped%
- Flare/Burner%
- Solid Contact%
- Barrel%
- Ground Ball%
- Fly Ball%
- Line Drive%
- Pop Up%



Batted Ball Model Clusters





Final Clusters

- Extreme Fly Ball
- Extreme Ground Ball
- Fly Ball
- Ground Ball

STARTERS		RELIEVERS	
Pitcher Class	*Pct*	*Pitcher Class*	*Pct*
Extreme Fly Ball	16.86%	Extreme Fly Ball	19.79%
Extreme Ground Ball	28.39%	Extreme Ground Ball	35.91%
Fly Ball	28.39%	Fly Ball	22.92%
Ground Ball	26.36%	Ground Ball	21.39%

Plate Discipline Cluster Model

Variables Used:

- Strikeout%
- Walk%
- Chase%
- Zone Swing%
- Chase Contact%
- Zone Contact%
- Swing%
- Zone%
- Shadow Zone%
- First Pitch Strike%
- Whiff%
- Swinging Strike%
- Called Strike%

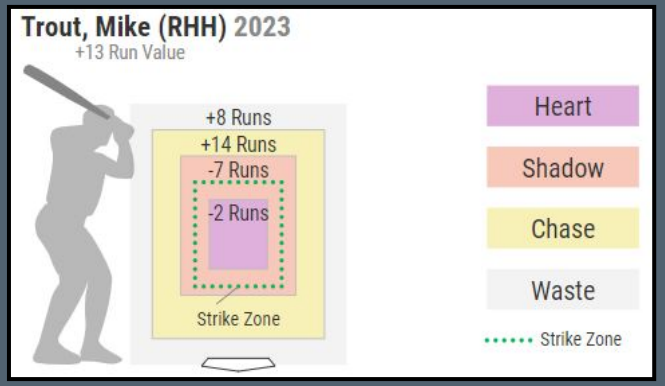
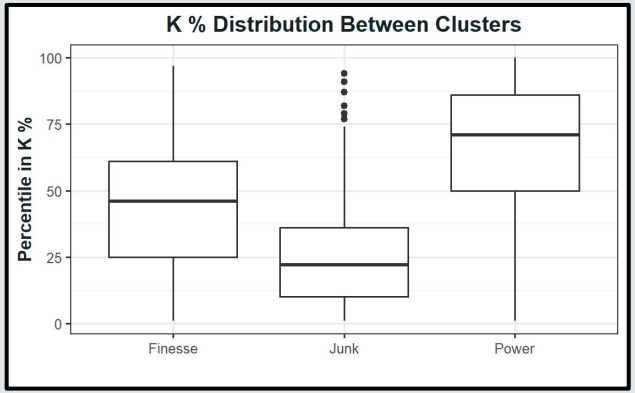
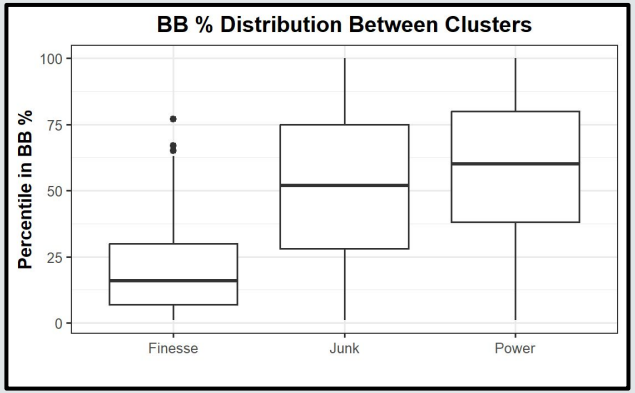


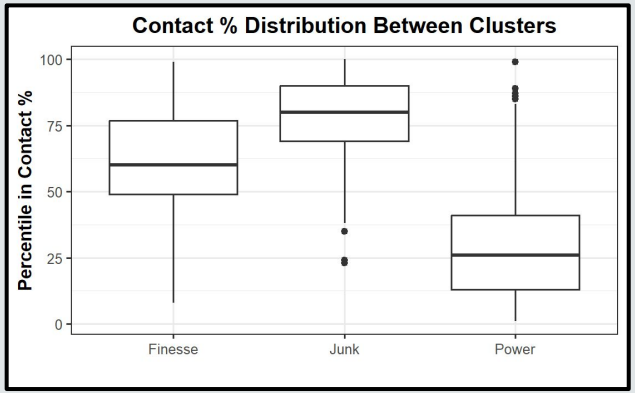
Plate Discipline Model Clusters





Final Clusters

- Power
- Junk
- Finesse



STARTERS		RELIEVERS	
Pitcher Class	*Pct*	*Pitcher Class*	*Pct*
Finesse	21.42%	Finesse	12.30%
Junk	40.68%	Junk	26.89%
Power	37.90%	Power	60.81%

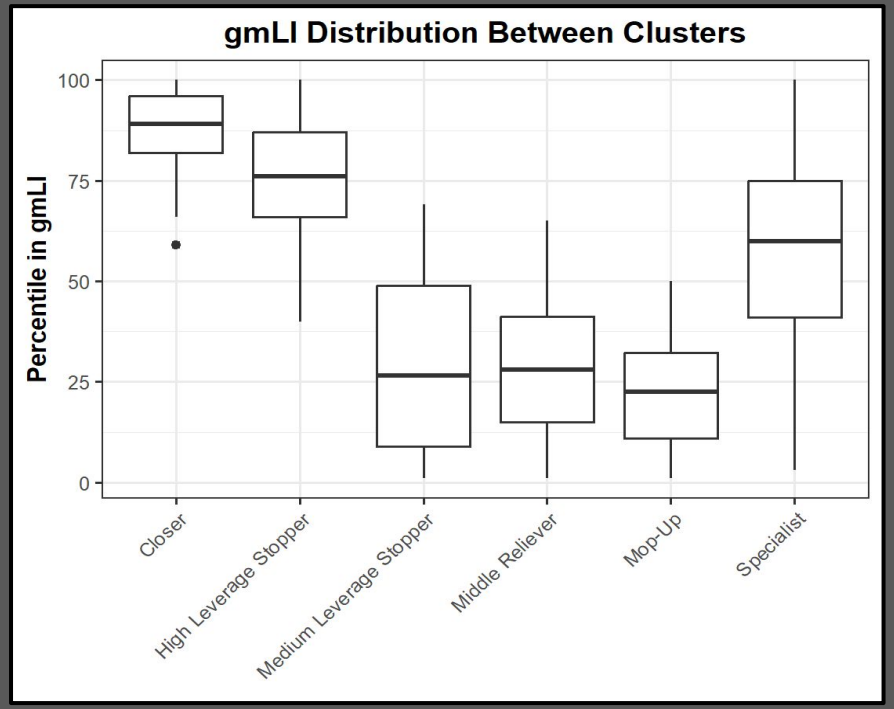
Reliever Role Cluster Model

Variables Used:

- Entrance Leverage Index
- % Time Entering the Game with RISP
- % Time Entering the Game with No One On and No Outs
- # of Batters Faced per Appearance

Reliever Role Results

Final Clusters



Kenley Jansen

Year	Team	Role	Pitcher Class
2021	LAD	Closer	Extreme FB Power
2022	LAD	Closer	Extreme FB Finesse
2023	BOS	Closer	Extreme FB Finesse

Wandy Peralta

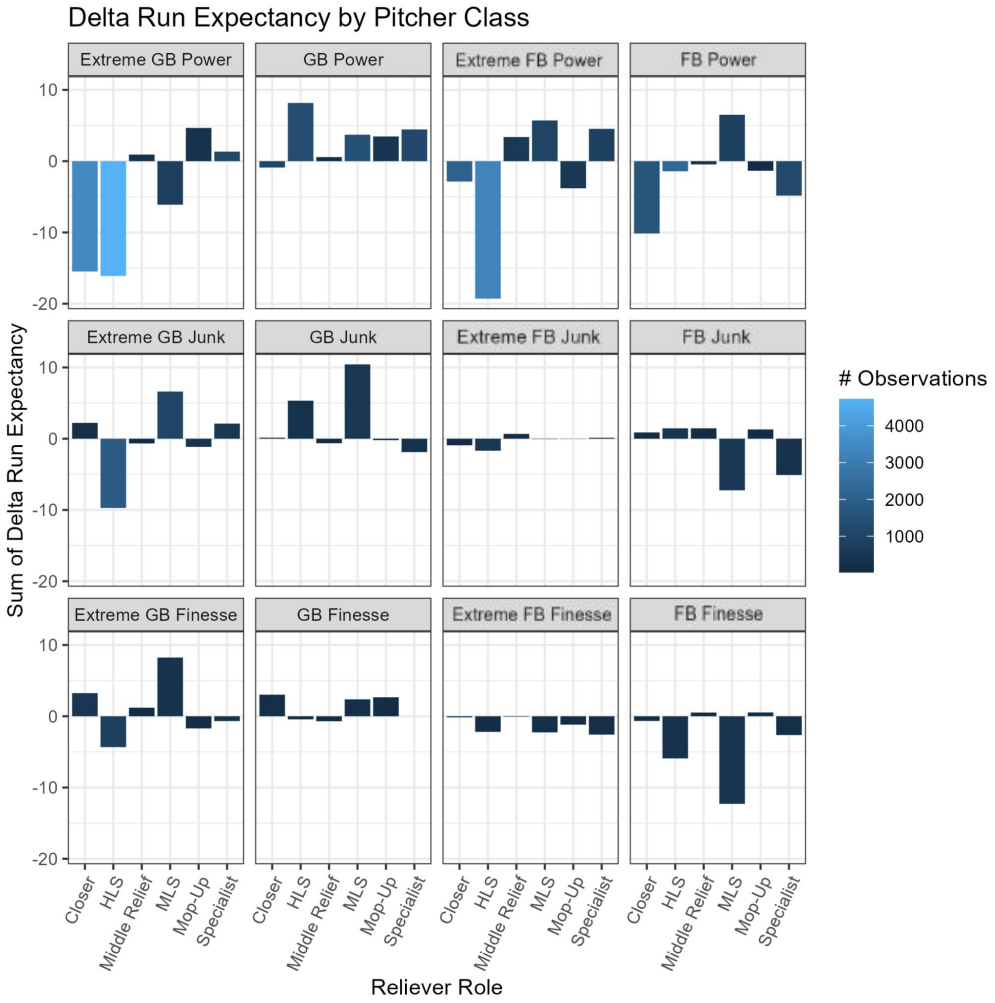
Year	Team	Role	Pitcher Class
2021	NYY	High Leverage Stopper	Extreme GB Power
2022	NYY	High Leverage Stopper	Extreme GB Power
2023	NYY	High Leverage Stopper	Extreme GB Power

Kevin Ginkel

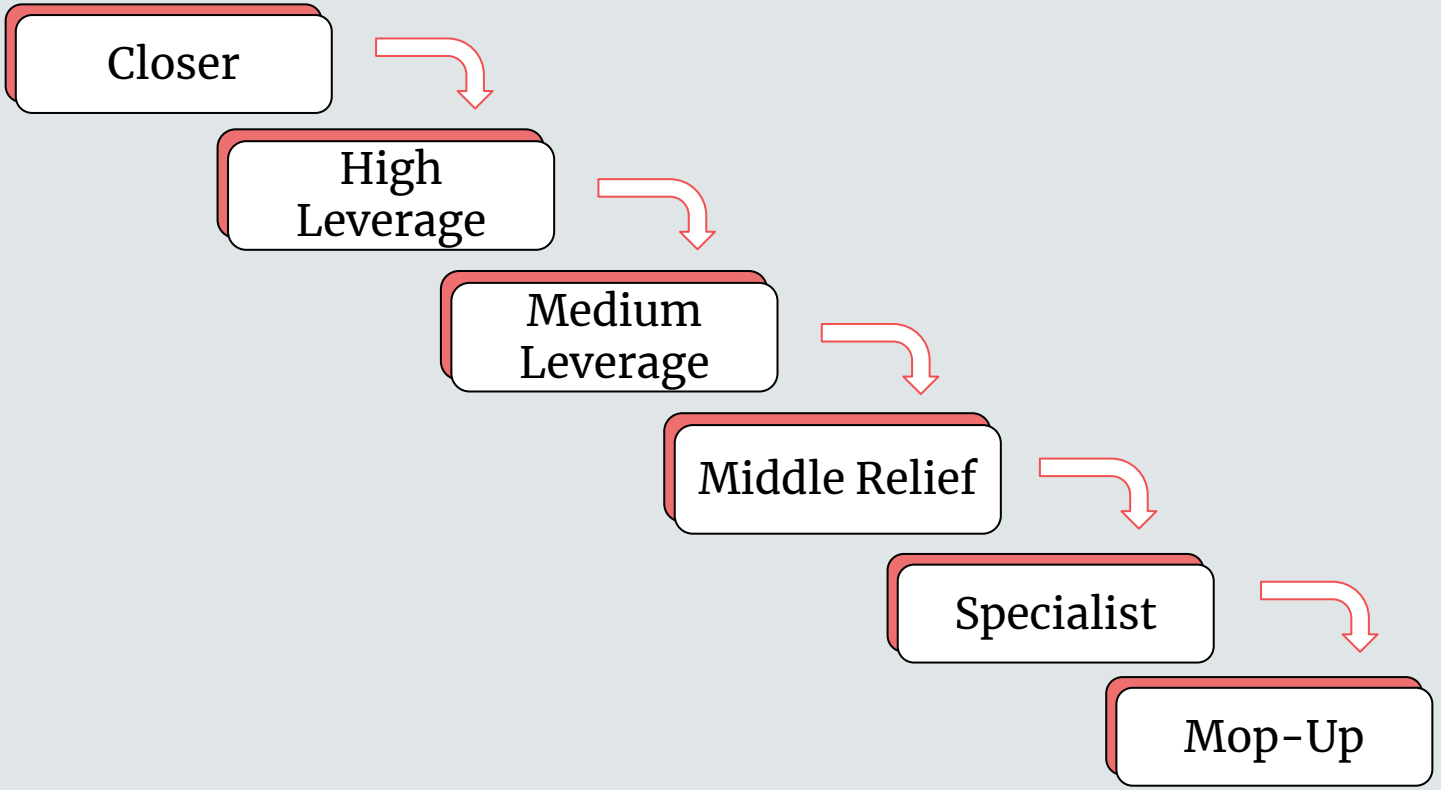
Year	Team	Role	Pitcher Class
2021	ARI	Middle Reliever	FB Power
2022	ARI	Specialist	Extreme GB Power
2023	ARI	Specialist	Extreme GB Power

Success of Each Class in Different Roles

- Power pitchers are more effective in high leverage roles
- Extreme GB pitchers are more effective in the High Leverage Stopper role



Reliever Role Hierarchy



Trevor Williams

2021 Class: Extreme GB Finesse
2022 Class: GB Finesse

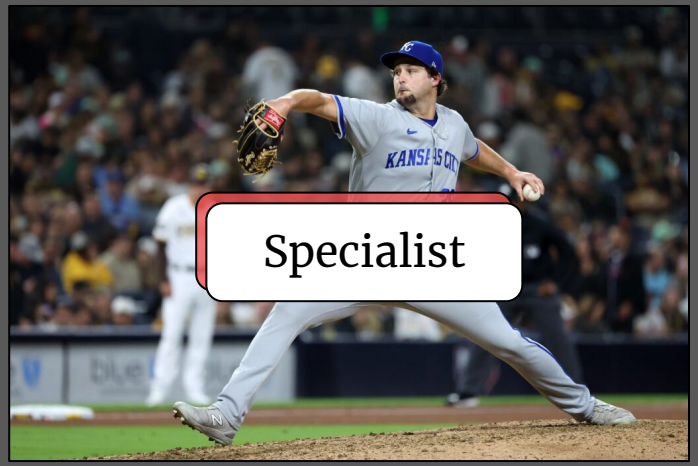
- 4.53 ERA, -0.2 bWAR w/ Cubs in 2021
- -0.317 DRE as Mop-Up w/ Cubs
- +0.924 DRE as Mop-Up w/ Mets
- -0.179 DRE in “stopper” situations w/ Mets
- 2.71 ERA, 0.5 bWAR w/ Mets in 2021
- 3.88 ERA, 1.4 bWAR w/ Mets in 2022

Josh Taylor

2023 Class: Extreme GB Power

- +0.158 DRE in Mop-Up w/ Royals in 2023
- 8.15 ERA and -0.5 bWAR

- Mop-Up Extreme GB Power: +4.664 DRE
- Specialist Extreme GB Power: +1.340 DRE



Lucas Sims

2023 Class: Extreme FB Power

- +4.747 DRE as HLS w/ Reds in 2023
- 3.10 ERA and 1.8 bWAR
- 12 Meltdowns

- +4.382 DRE in “stopper” situations
- MR Extreme FB Power: -4.831 DRE

Shortcomings

- Black box approach
- Analysis was only on relievers
- Impact of relievers only accounted for first at bat
- Delta Run Expectancy as our analysis metric
- New role suggestions assume consistent pitcher class

Thank You for Your Time

Questions?