
# Blast Visualizations

Joshua Asuncion
Frank Bruni
Eric Herrmann
Kyle Kishimoto
Rohan Narain
Isaac Schmidt
Tyler VanderLey
Leonard Yang

# Contents

## Plane

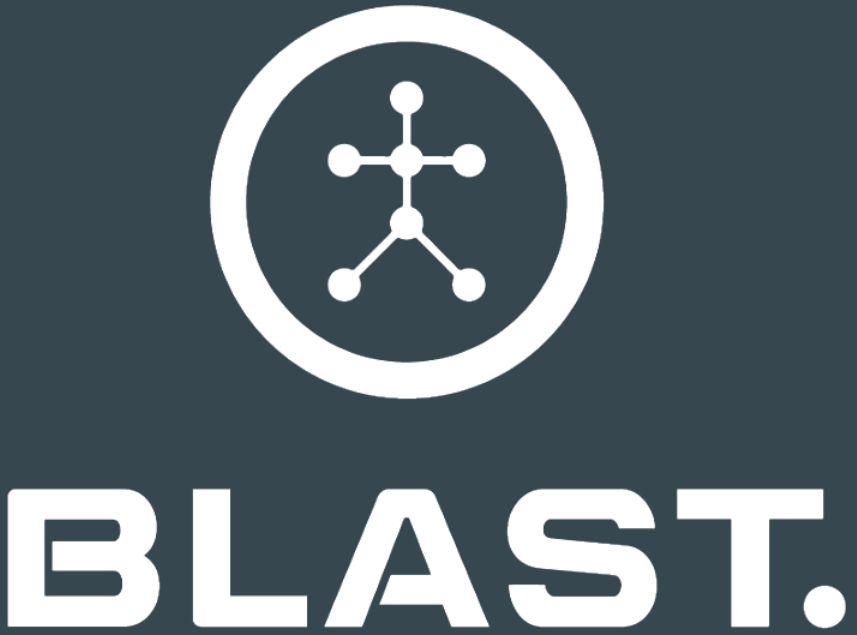
- Planar Efficiency
- Attack Angle

## Connection

- Early Connection vs. Impact

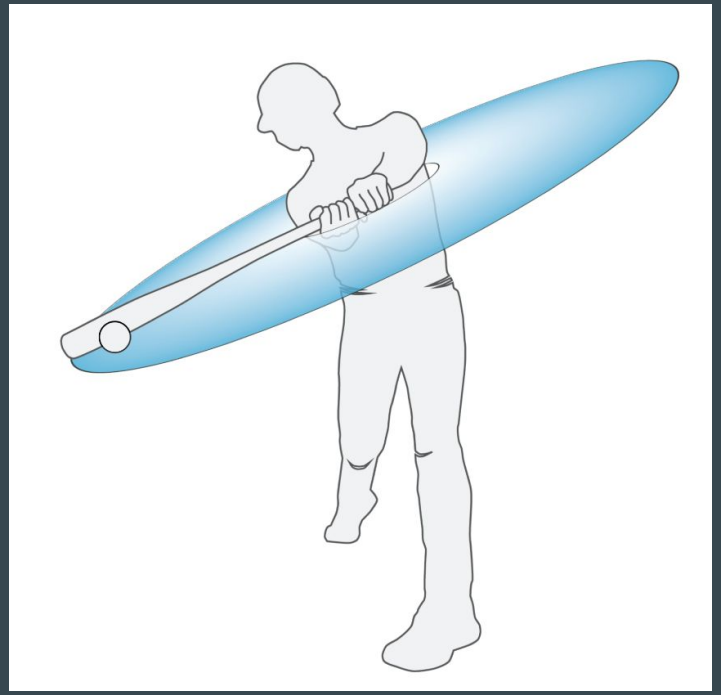
## Rotation

- Rotational Acceleration
- Bat Speed
- Time to Contact



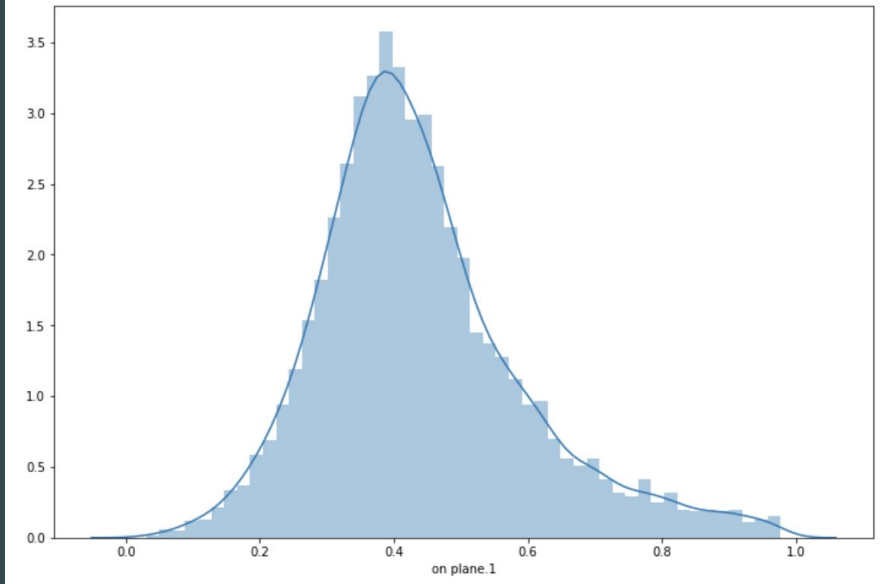
# Planar Efficiency

- Swing plane is an ellipse around your body that is defined by the vertical bat angle at impact
- **Planar efficiency** measures the percent of your swing that was on the swing plane
  - Efficient swings get on the plane early and stays on the plane through contact
  - Allows the batter to hit the ball hard more often
  - MLB average: 73%
  - Target > 70%

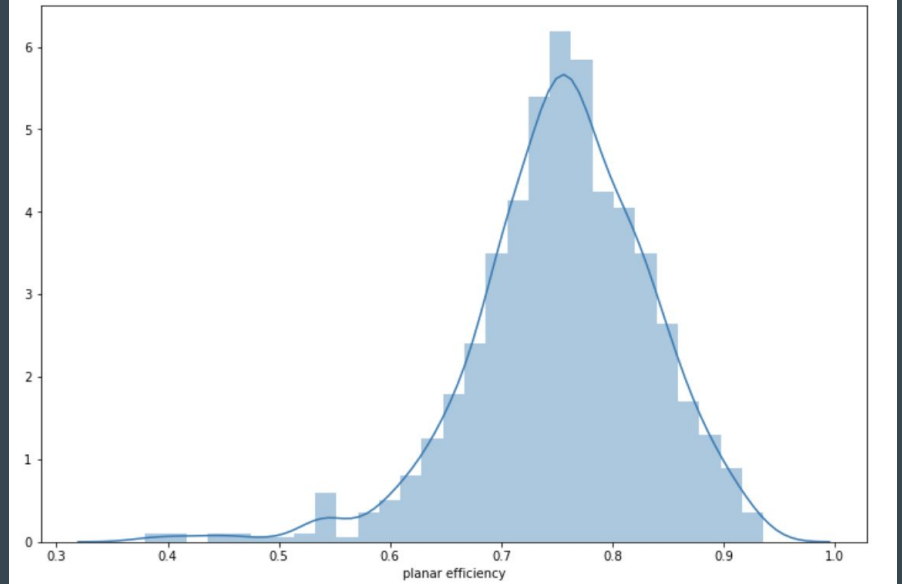


# Planar Efficiency: Working with the Data

```
Mean: 0.43882701634045607
0.25    0.339775
0.50    0.413925
0.75    0.512106
Name: on plane.1, dtype: float64
```

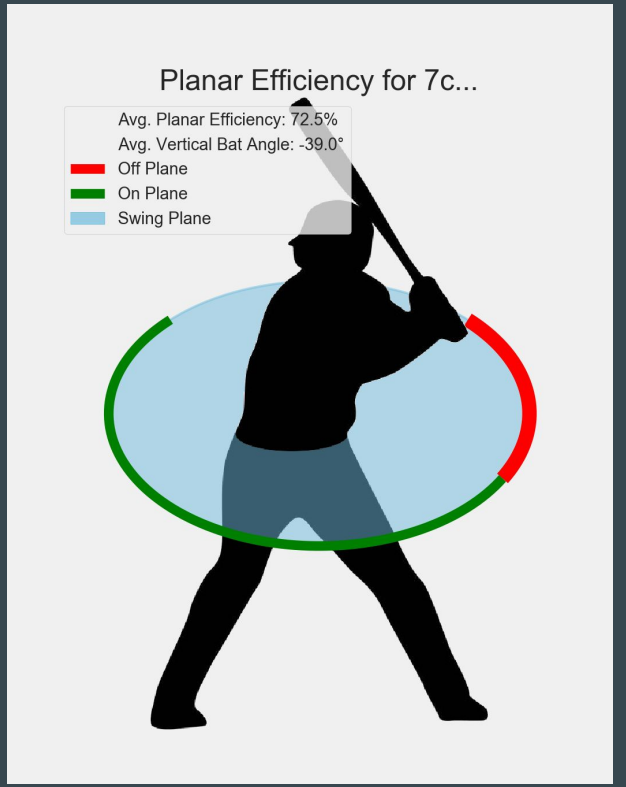



```
Mean: 0.7547198561840844
0.25    0.709060
0.50    0.757887
0.75    0.808018
Name: planar efficiency, dtype: float64
```

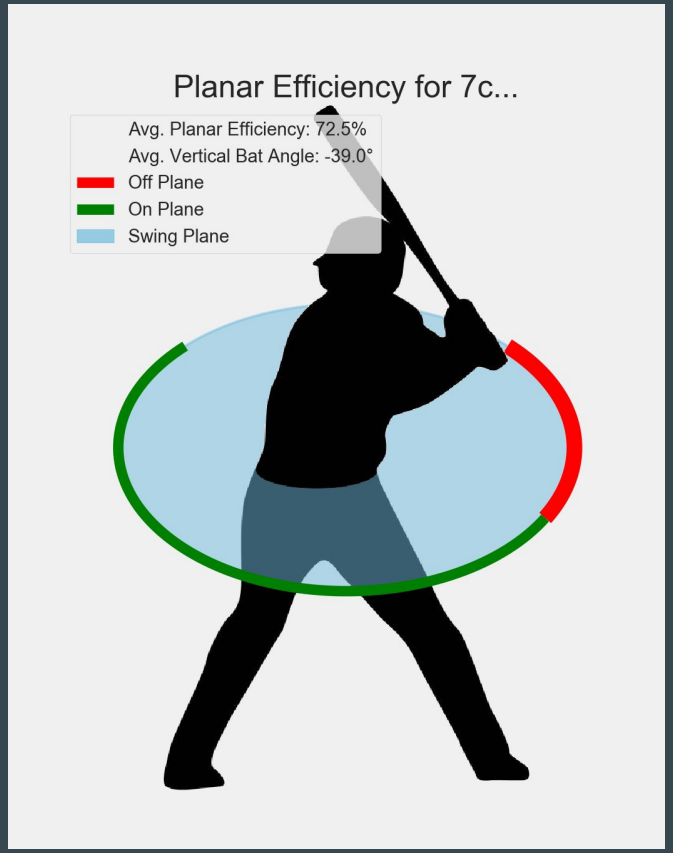


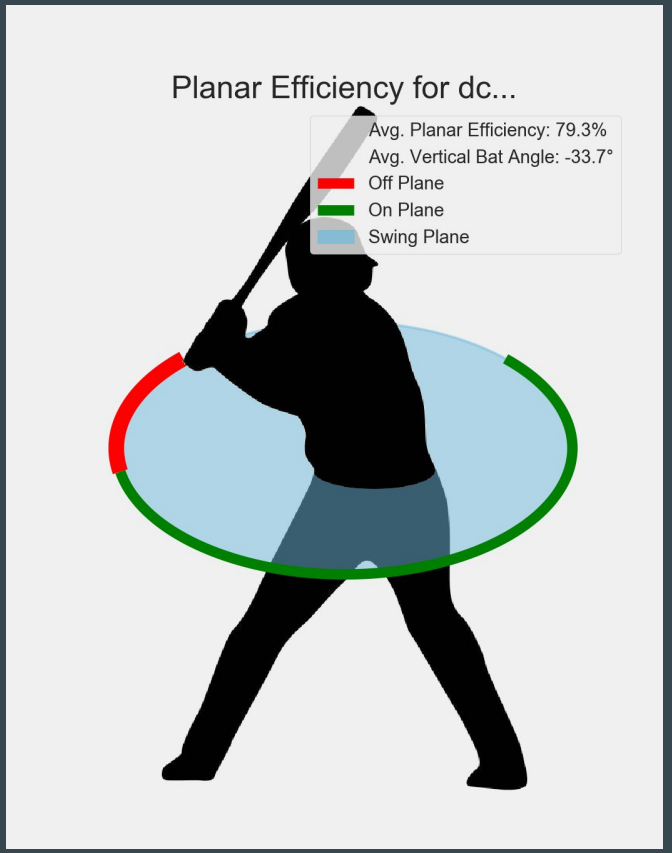
# Planar Efficiency: Comparing Players

# Planar Efficiency: Visualizing One Player

# Comparing Players

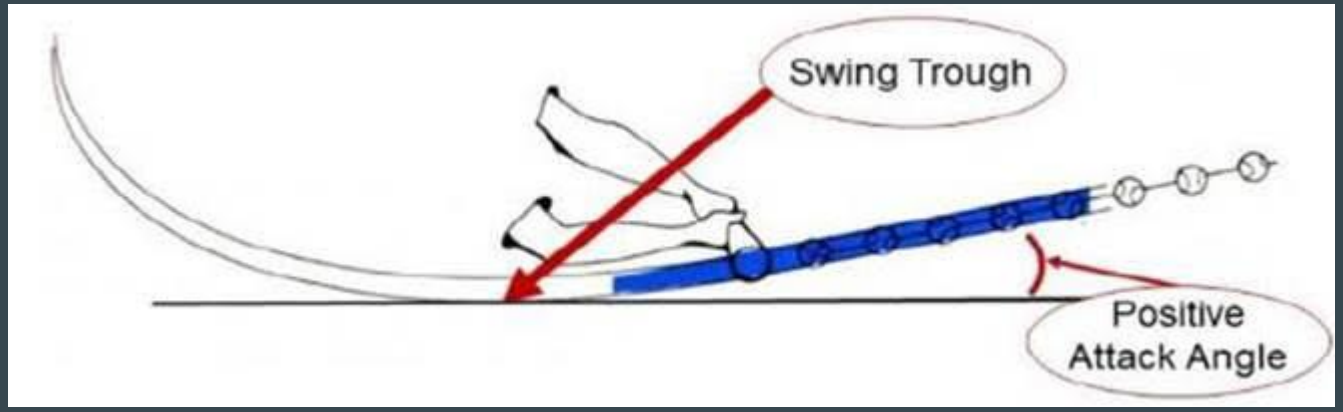


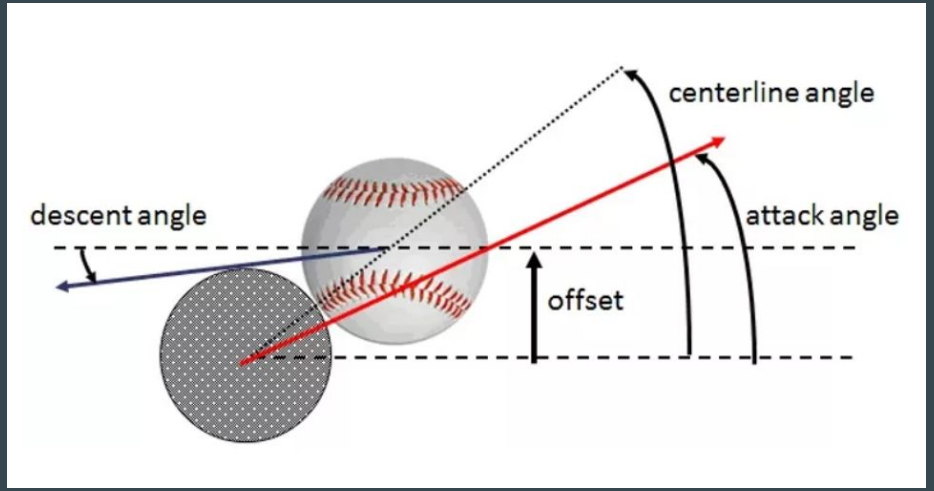



# Utilizing Planar Efficiency

- 70% or above
  - Repeatable swing
  - More hard contact
  - Work more on decision making as opposed to swing mechanics
- Below 70%
  - Less consistent contact
  - Launch angle and exit velocity may be inconsistent
  - Barrel manipulation with wrist and hands during the swing
  - Look at early position of the barrel during the swing

# Attack Angle



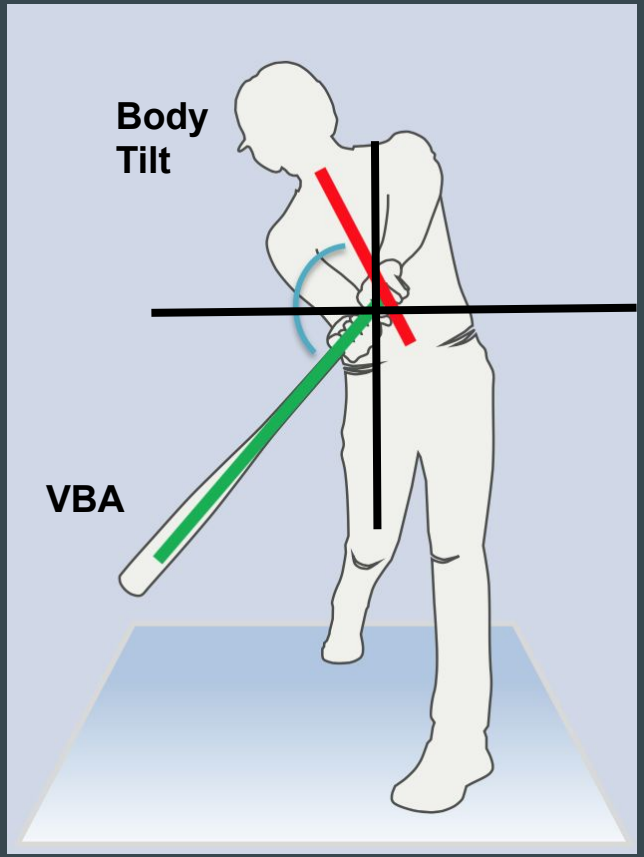



# Attack Angle

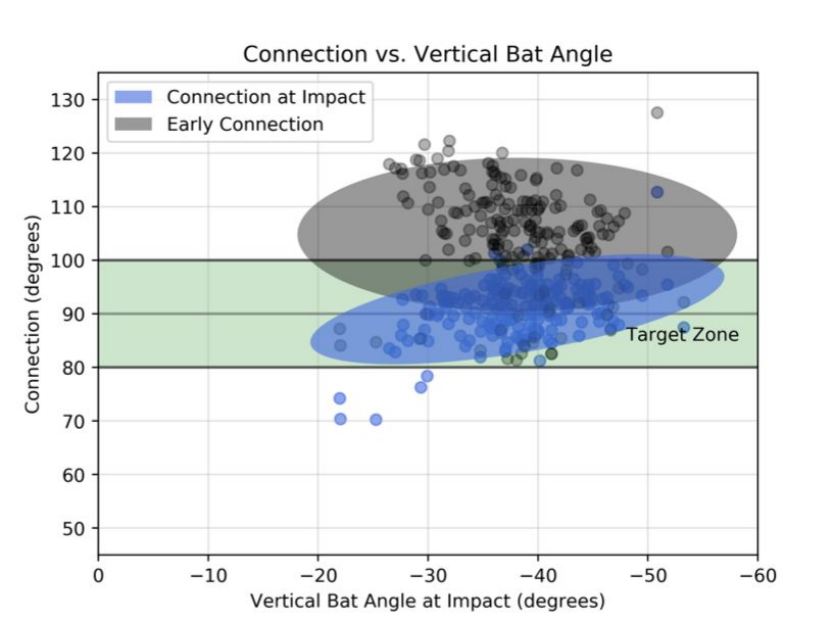
# Connection

- Connection at Impact (angle between VBA and Body Tilt) should be 90°

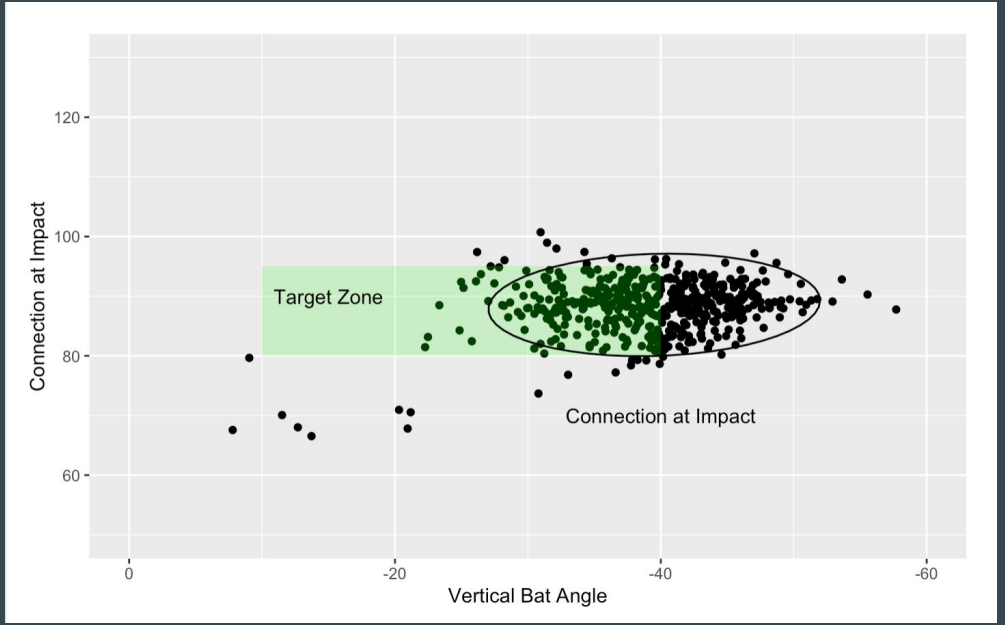
1. Hitters want to get connected and stay connected throughout the swing.
2. Hitters want to maintain their connection for all pitch locations.
3. Hitters want to adjust to different pitch locations with their body and posture as opposed to keeping their posture the same and using their hands to manipulate the barrel.



# Connection Scatter Plots



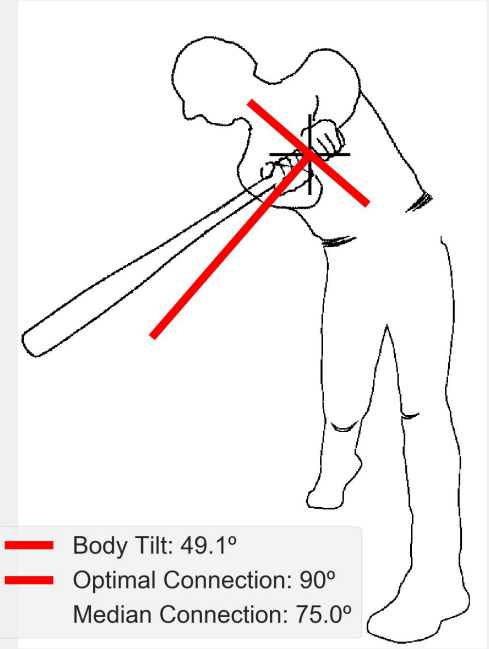

Blast Version




Our Version

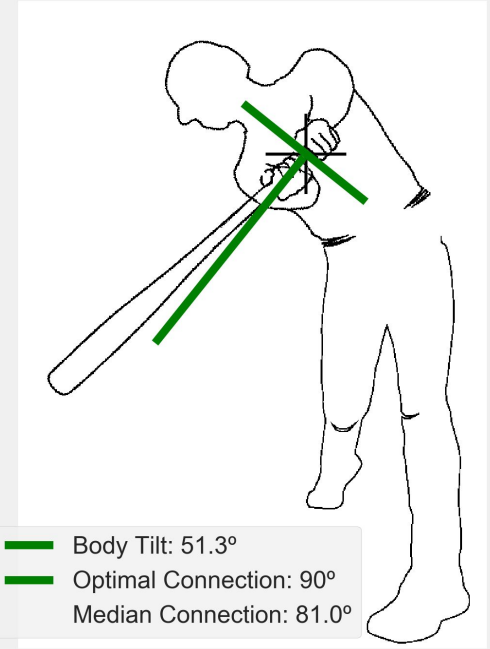
# Connection at Impact

Impact dc...



Body Tilt: 49.1º
Optimal Connection: 90º
Median Connection: 75.0º

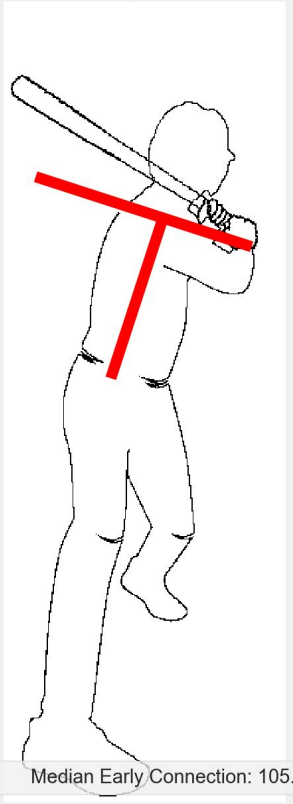
Impact 1a...



Body Tilt: 51.3º
Optimal Connection: 90º
Median Connection: 81.0º

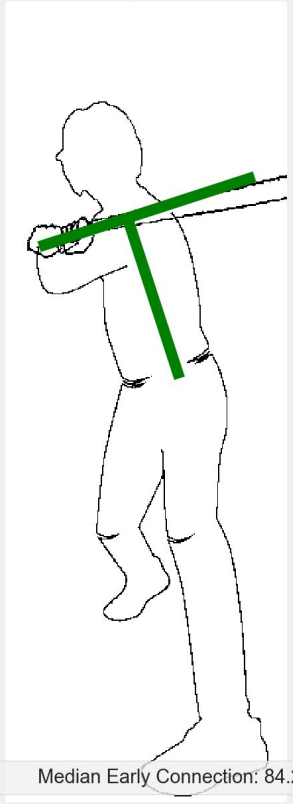
# Early Connection

Early 7c...



Median Early Connection: 105.4º

Early dc...



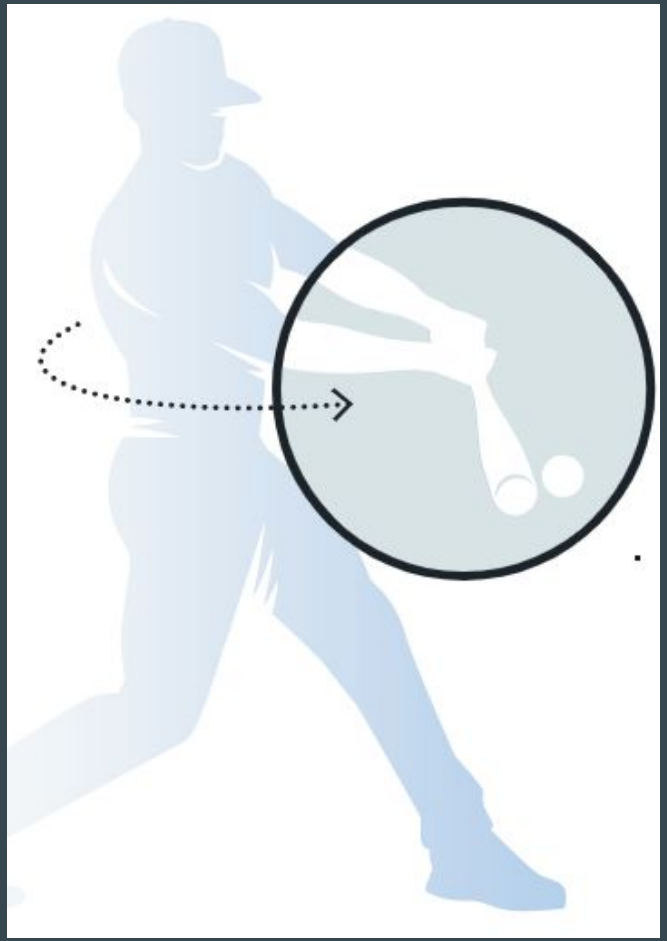
Median Early Connection: 84.2º

# Rotation

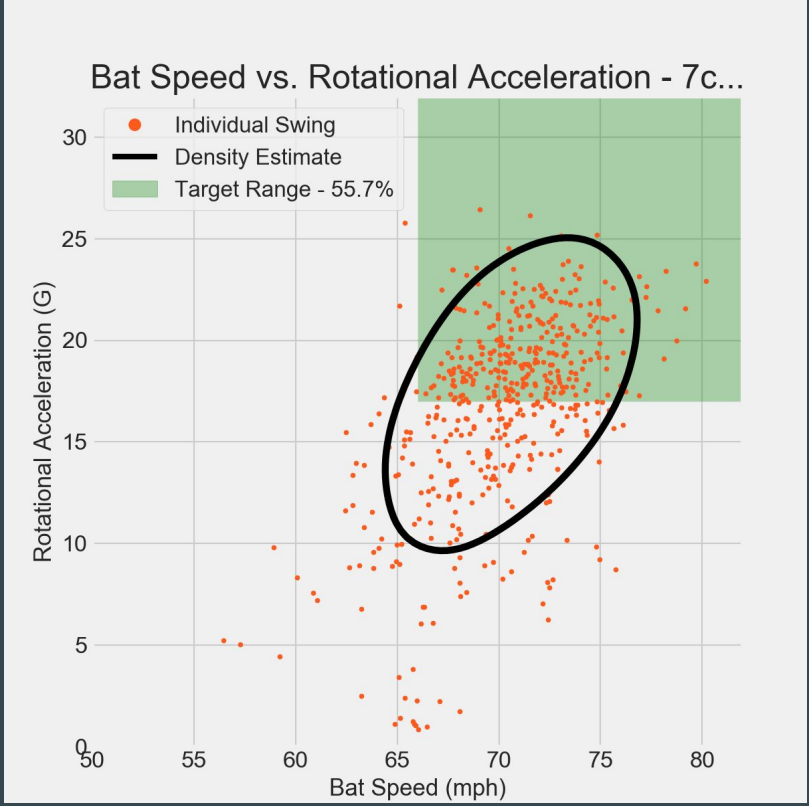
Biggest factor influencing power

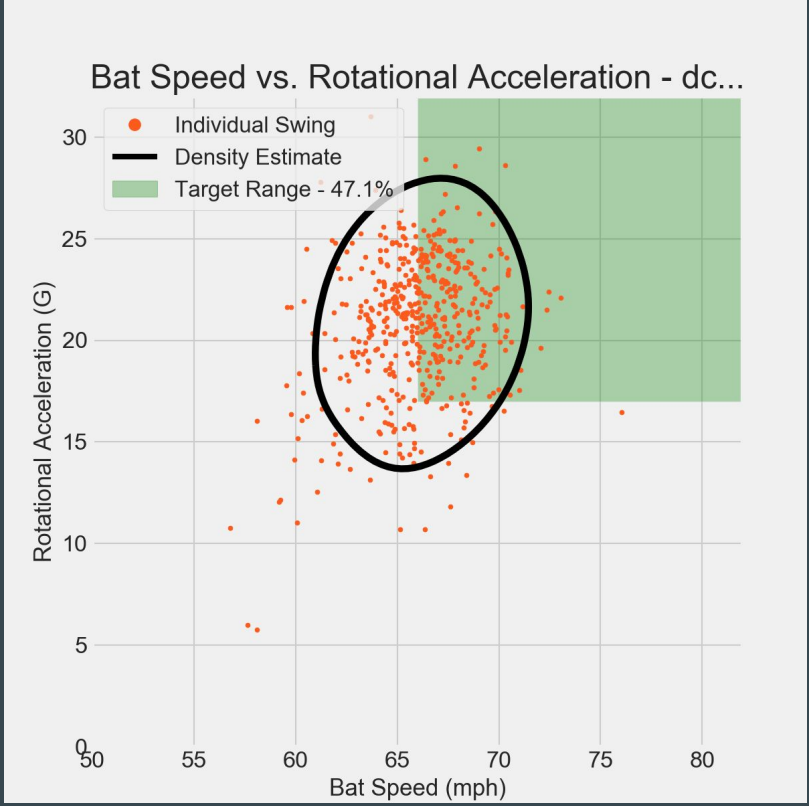
Measured through...

- Rotational Acceleration
- Bat Speed
- Time to Contact



# Rotational Acceleration and Bat Speed



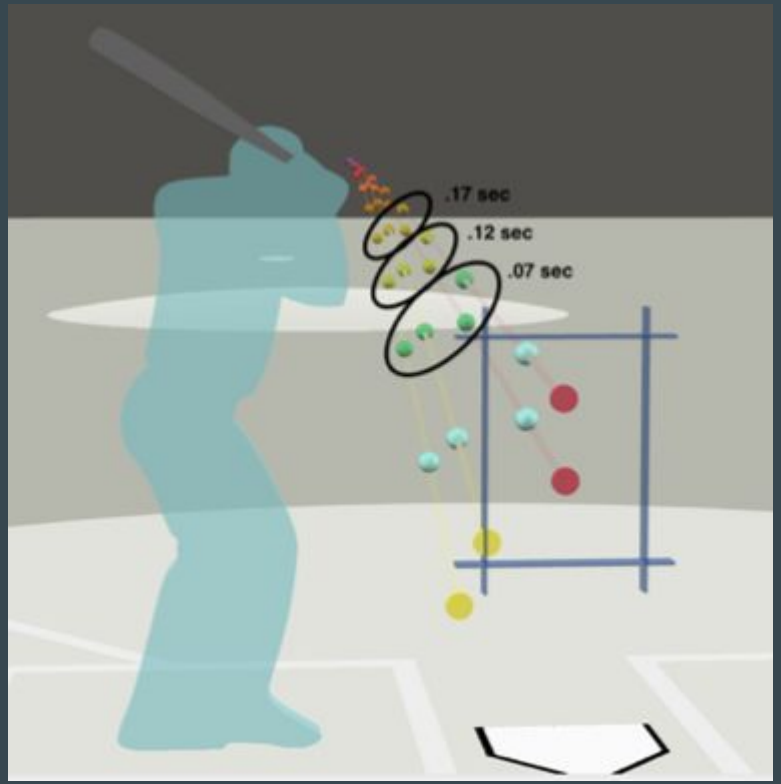



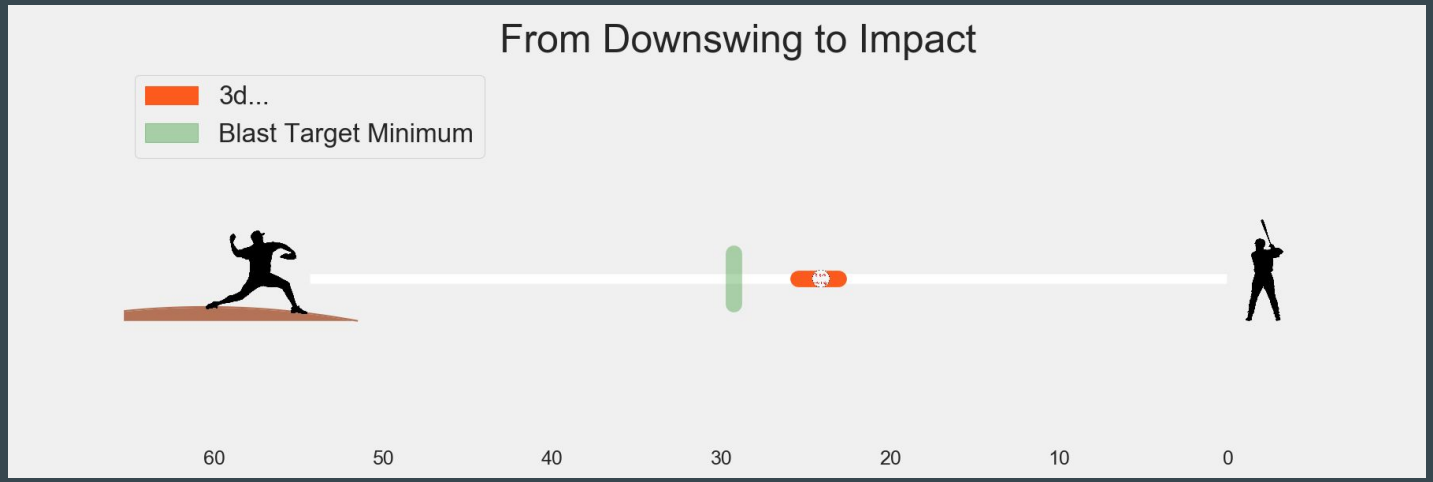
# Utilizing Rotational Acceleration

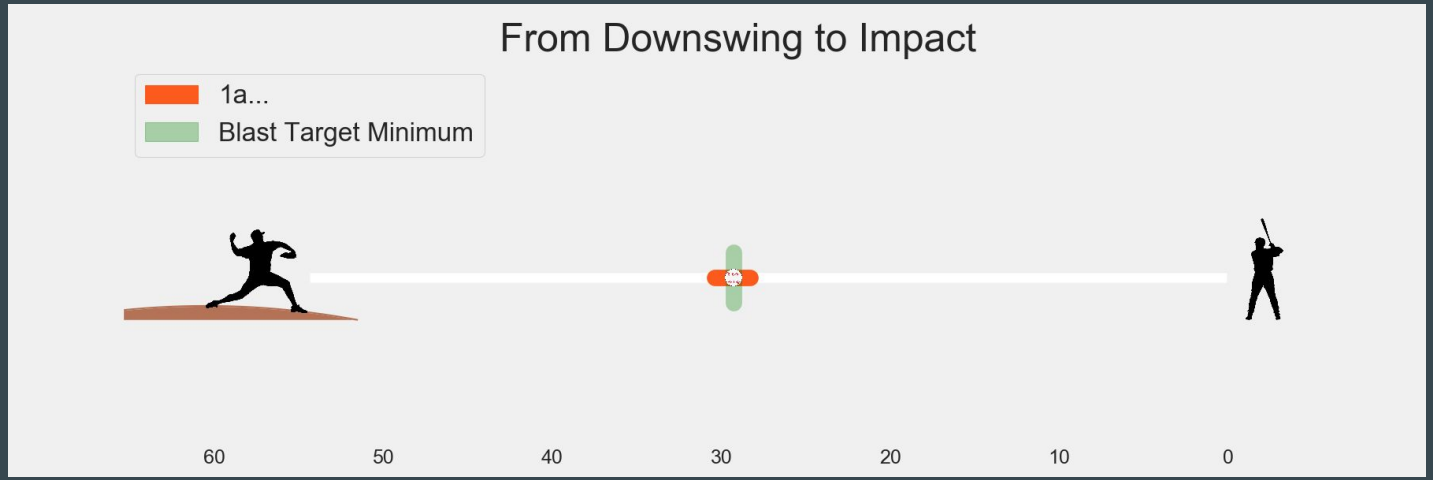
- Above 13 G's
  - Good rotational acceleration
  - Focus on increasing acceleration towards major league level
- Below 13 G's
  - Swinging too much with hands
  - Focus on:
    - Loading core
    - Starting swing with whole body rotation, not hand movement

# Time to Contact

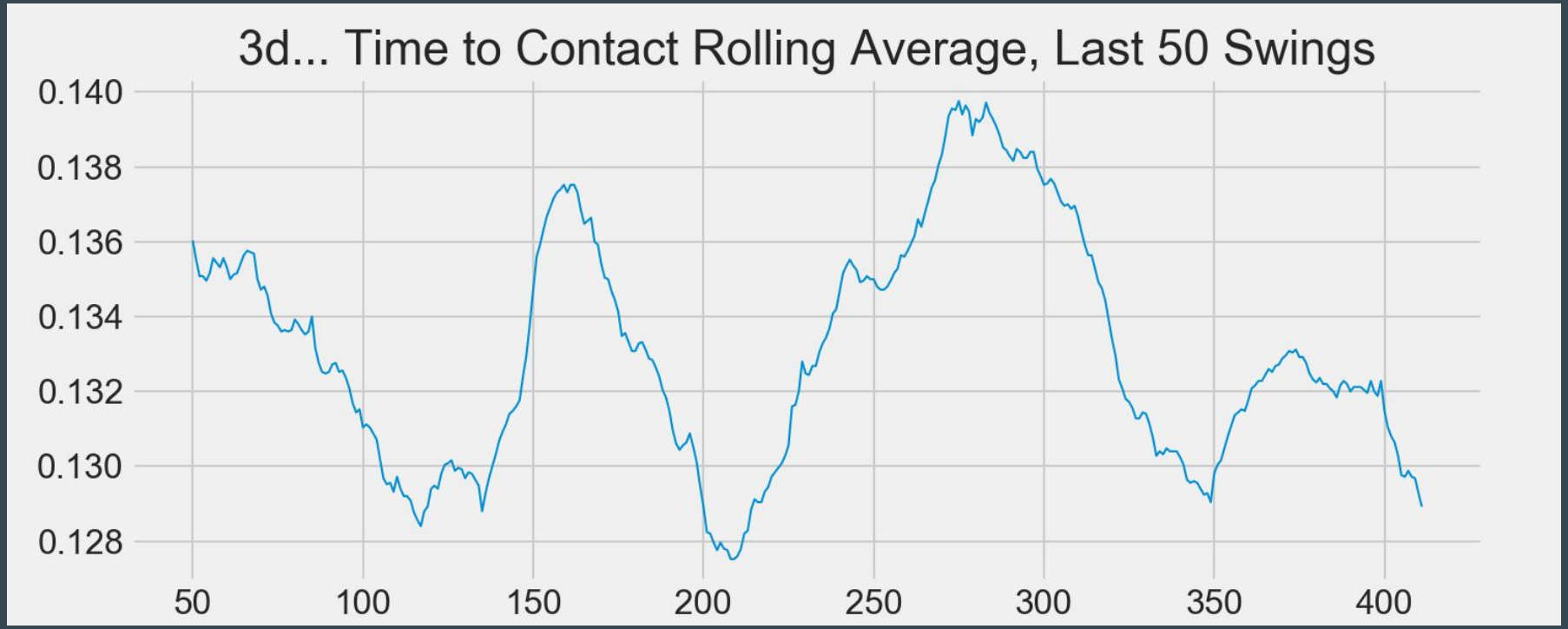
- Measured from beginning of downswing to impact
- Bat speed, quickness of hands
- Batter can commit later with a shorter time to contact, thus having more time to recognize a pitch




From Downswing to Impact
3d...
Blast Target Minimum
60
50
40
30
20
10
0


From Downswing to Impact
1a...
Blast Target Minimum
60
50
40
30
20
10
0

# Rolling Averages



# Thank You!