

1. Enumerate the Distinct Skills You Would Want to Quantify to Measure Batter Talent

Batter talent can be measured through a combination of physical, mental, and situational factors. These factors can broadly be categorized into technical skills, situational awareness, and mental attributes.

a. Batting Mechanics / Physical Skills / Power

- **Bat Speed:** A faster bat speed correlates with better ability to handle different pitch types and react quickly. This is crucial for batting mechanics and power.
- **Launch Angle:** The angle at which the ball leaves the bat; contributes to understanding a batter's approach (e.g., ground ball vs. fly ball tendencies).
- **Exit Velocity:** Measures the speed of the ball off the bat. Higher exit velocities often correlate with greater power.
- **Barrel Accuracy:** How often a batter hits the ball on the "sweet spot" of the bat (i.e., the barrel).
- **Slugging Percentage (SLG):** Measures the batter's ability to hit for extra bases (doubles, triples, home runs)

b. Pitch Recognition and Reaction

- **Plate Discipline:** Ability to judge balls and strikes, especially the ability to avoid swinging at pitches outside the strike zone.
- **Swing Decision Making:** Measures how often a batter swings at the right pitches (ball/strike calls, pitch types).

c. Contact Quality

- **Contact Rate:** The percentage of swings that result in contact with the ball.
- **Hard Hit Rate:** The percentage of contact made with the ball at a higher exit velocity (typically over 95 mph).
- **Swing and Miss Rate (K% or whiff rate):** Percentage of swings that miss the pitch completely (useful to measure plate discipline and bat control).

f. Mental Attributes

- **Confidence and Composure:** How the player handles pressure situations, slumps, and feedback. Would need to be assessed on an interview or film basis.
 - **Work Ethic:** Can be quantified through training data (e.g., hours spent on improving specific skills, effort level in practice). Would need to be assessed on an interview basis.
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2. A Rough Idea of How You Would Quantify Each Skill

For each skill, the key is to use a mix of quantitative metrics (derived from player tracking systems, video analysis, and traditional stats) and qualitative assessments (observations and player interviews).

Batting Mechanics / Physical Skills / Power

- **Bat Speed:** Measured through radar guns or high-speed cameras (e.g., Zepp or Blast Motion sensors).
- **Launch Angle and Exit Velocity:** Statcast or TrackMan data directly provides these metrics.
- **Barrel Accuracy:** Statcast's "barrels" and average exit velocity on barreled balls.
- **Slugging Percentage (SLG):** Calculated from standard baseball statistics: $(1B + 2B*2 + 3B*3 + HR*4) / AB$.

Pitch Recognition and Reaction

- **Plate Discipline:** Traditional stats like BB%, K%, OBP, and Swing% for balls and strikes outside the zone.
- **Swing Decision Making:** Swing% on different pitch types (fastballs, breaking balls) and zones (high, low, inside, outside).

Contact Quality

- **Contact Rate:** Swing-to-contact ratio, available from traditional stats like contact rate (Swing% / Contact%).
- **Hard Hit Rate:** Statcast's "hard-hit rate" or "exit velocity" for above-average speed contact.
- **Swing and Miss Rate:** Whiff%, K%, Swing% outside the strike zone.

Situational Awareness

- **Clutch Performance:** Advanced splits data (e.g., clutch hitting stats from FanGraphs or Baseball Reference).
- **Baserunning and Speed:** Sprint speed (available through Statcast), stolen base success rate, and base running efficiency.
- **Defensive Adjustments:** Measuring oppo-field batting tendencies via spray charts and exit velocity by fielding zones.

Mental Attributes

- **Confidence and Composure:** Survey-based metrics, player interviews, and performance in "high-leverage" situations. Interview/Film as well.
- **Work Ethic:** Tracking hours spent in the batting cage, on-field drills, and player interviews on improvement focus. Interview/Film as well.

3. How You'd Categorize Each Skill as Strengths or Weaknesses

Categorization would be based on both **quantitative thresholds** and **comparative analysis** (how a player compares to the league average or positional benchmarks). This would vary for each player depending on the position, age, and salary.

Strengths:

- High launch angle with consistently high exit velocity.
- Low swing-and-miss rate (contact rate >85%).
- Power and on-base metrics above league average.
- Strong situational awareness (high clutch performance, effective baserunning).
- **Weaknesses:**
 - High strikeout rate ($K\% > 30\%$).
 - Poor plate discipline (Swing% outside the zone > 40%).
 - Low exit velocity or weak hard-hit rate.
 - Lack of baserunning efficiency or poor field awareness.

A batter might have a few strengths but need improvement in other areas (e.g., good power but poor plate discipline).

4. How You'd Prioritize Skills in Development

Prioritization should depend on the player's age, current skill set, and potential. Here's how I would prioritize development:

1. **Fundamentals** (First Priority)
 - **Pitch Recognition & Plate Discipline:** A batter must first understand the strike zone and recognize pitches. This includes refining their pitch recognition (e.g., fastball vs. breaking ball) and building plate discipline (i.e., not chasing balls outside the zone).
2. **Contact and Bat Control** (Second Priority)
 - **Bat Speed & Contact Rate:** Improving bat speed and contact rate is essential for a batter to handle a wider variety of pitches and generate power.
 - **Swing Path & Barrel Accuracy:** Ensure the batter is consistently making good contact with the ball, focusing on barrel accuracy and swing path consistency.
3. **Power Development** (Third Priority)
 - **Exit Velocity & Launch Angle:** Power is crucial for a batter's long-term success. Improving exit velocity and optimal launch angle will lead to increased hard-hit balls and home runs.
 - **Slugging:** Focus on improving extra-base hits, particularly for players projected to hit for power.

4. **Situational and Mental Development** (Fourth Priority)
 - **Work Ethic and Composure:** Reinforce mental toughness and a focus on consistent improvement. Focus on being coachable.
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5. How You'd Measure Whether a Batter Is Making Progress

Progress measurement should be holistic and continuous. Here's how I'd track development:

- **Quantitative Metrics:**
 - **Improvements in Exit Velocity and Launch Angle** (use tools like Statcast).
 - **Increased Bat Speed** measured via wearable devices or video analysis.
 - **Reduction in Strikeouts and improvement in Contact Rate.**
 - **Plate Discipline** improvements (e.g., reduction in Swing% outside the strike zone).
- **Consistency:**
 - Monitor **seasonal trends** rather than short-term fluctuations. A player should show consistent improvement across multiple months or seasons.
- **Player Feedback:** Regular interviews and feedback from coaches and analysts to assess mental growth (confidence, composure, work ethic). The player needs to be coachable!!
- **Player Development Tracking System:** Develop a centralized tracking system where key metrics and player assessments are stored over time, allowing for easy comparison.