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Good Swing Decision Percentage: Explanation and Applications

The stat I chose to create and implement is called Good Swing Decision Percentage, or GSD%. The idea of the statistic is to judge how a hitter's approach and pitch recognition skills. Statistics like walk-rate or chase rate are decent statistics that already exist for a similar purpose, but each of those has their drawbacks that GSD% attempts to address. One drawback of walk-rate specifically is how binary it is. While walking is a good thing, it certainly is not the most desirable outcome in baseball. As a coach, I would much rather a player swing at pitches they can handle than be passive until two strikes and put themselves in a bad position. Similarly, chase rate ignores the context of the at-bat. Is chasing at a slider 1 inch off the plate with 2 strikes really that bad? From the perspective of a coach, you would want your player swinging at a pitch that close to being a strike than leaving it up to the umpire to make such a precise call. While GSD% attempts to answer similar questions to these statistics, it does it in a way that involves more context and rewards hitters in a fairer way.

Defining a "Good Swing" was perhaps the most technically challenging part of this statistic. It began with the idea that early in counts, hitters should only swing at pitches in their hot zones. Later in counts, hitters should expand the zone ever so slightly to put an emphasis on contact. With this idea in mind, the most important part of this process was defining a player's hot zone. To determine hot zones, I divided the strike zone into nine equal-sized zones. Zones where a player consistently produced high-quality contact were flagged as "hot." Specifically, any zone in the top 30% of that player's xwOBA distribution (with at least fifteen swings to ensure stability) was labeled a hot zone. These zones represent the areas where a hitter should be most aggressive when making swing decisions.

Now that the hot zones were created for every player, it was possible to define a "good swing deicison". Connecting back to the idea of a hitter's approach, I defined a good swing decision as any swing at a pitch within the hot zone, or conversely taken outside of the hot zone, before two strikes. This means that even swinging at a pitch in the zone would be punished if it were not in the hot zone. With two strikes, the definition changed to any pitch in the strike zone + one inch. This allows some leeway to players who expand the zone with two strikes, not punishing them for swinging at borderline pitches. The GSD% would then be calculated by taking the quantity of good decision over the total number of pitches seen by a player.

The beauty of this statistic is that the parameters can easily be changed by a coaching staff to fit what they teach. For example, you could loosen the hot zone parameters after one strike or increase them on 3-0 counts, etc. While the framework of the statistic would remain the same, the outputs may be more accurate to what a specific coaching staff is looking for.

To put my statistic to use, I gathered the 50 hitters who saw the most pitches in the 2025 season. I merged every single pitch seen by them into one .csv file, and applied the GSD% logic

accordingly. Of the hitters I selected, Gleyber Torres led the way with a whopping 91.29 GSD%, while Jarren Durran finished at the bottom of the group with an 80.83 GSD%. The figure below shows the full ranking, along its relationship with BB% and Swing%.

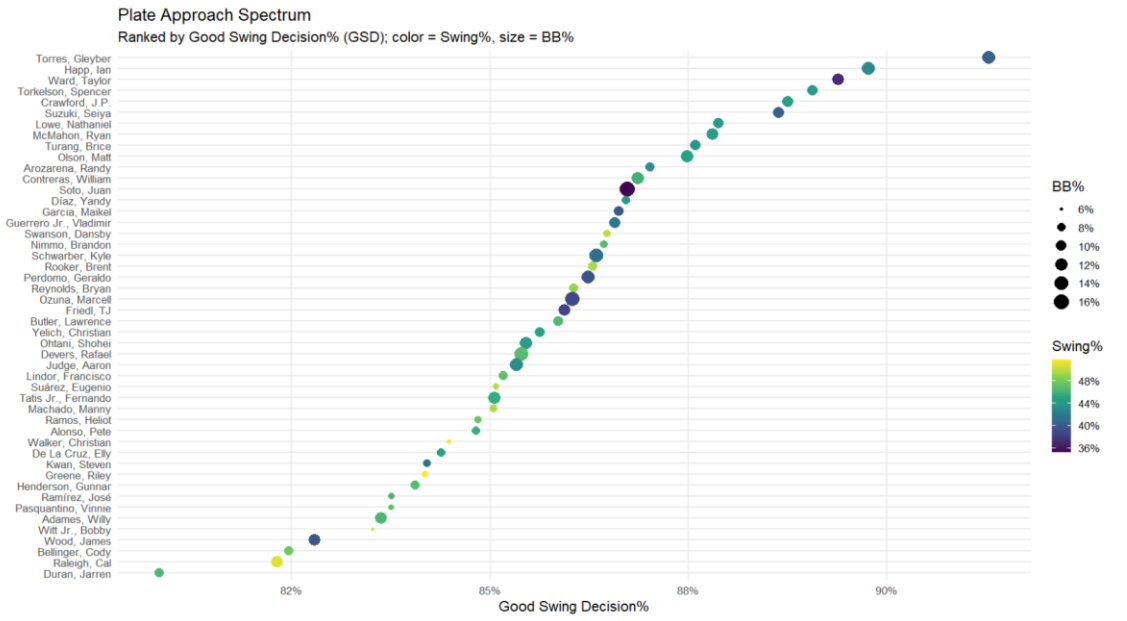

Fig. 1: Compares GSD% to BB% and Swing%.

GSD%, as seen above, generally relates to BB% and Swing%. As the points approach the top left corner, they roughly get bigger and darker. This is not a bad thing in my eyes. GSD% is meant to quantify plate discipline, as are those other statistics, so naturally there will be some overlap. In fact, some correlation between these stats proves the effectiveness of GSD%, as a more robust statistic that involves more context. Below is a figure meant to highlight the correlation between GDS% and some other statistics associated with positive plate discipline. Each of these models had strong, positive relationships and significant p-values.

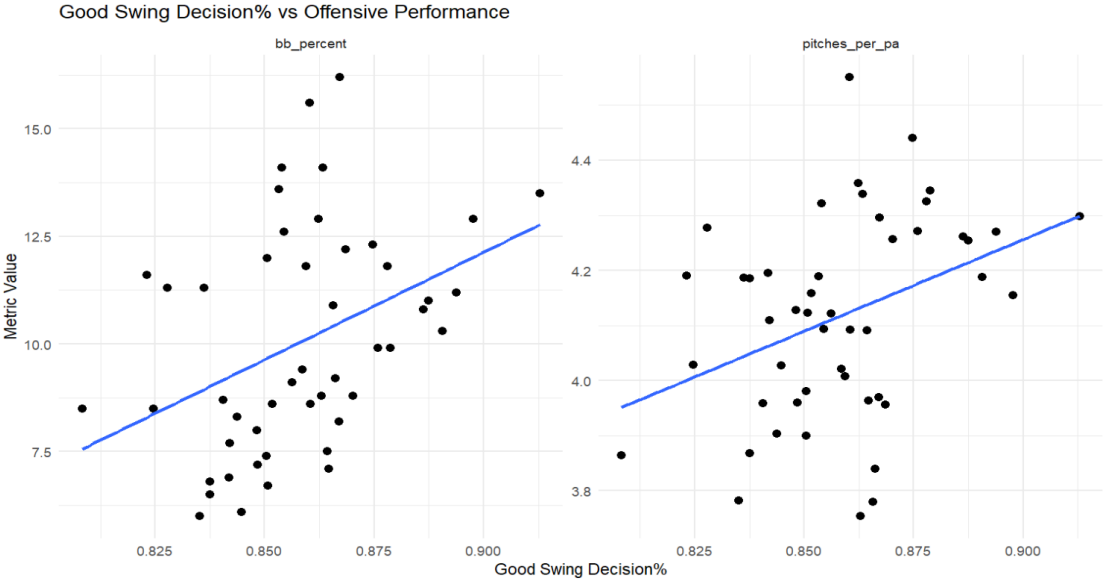

Fig. 2: GSD% measured against bb% and pitches per plate appearance.

I also ran monte carlo simulations to observe the reproducibility of the statistic. Because of the nature of this statistic, taking in thousands of data points, the 95% confidence intervals were very small. The mean of the simulations were all within a percentage point of the observed data, and the intervals were all plus-minus 1.5% or smaller.

As alluded to earlier, the broader applications of this statistic extend to player evaluation and development in a way that expands how plate discipline is viewed. When evaluating free agents or trade destinations, a coaching staff could assess how well that player's current approach fits with their internal philosophy. When assessing players currently on the roster, a coaching staff would be able to assess which players are sticking to their hitting philosophy and which players are struggling. It also has applications in pitch recognition, where a player's ability to determine the location of a pitch can be quantified, assuming they are following the intended hitting philosophy.

It is said that pitch/swing selection is one of the most difficult things to coach. GSD% gives coaches a helpful tool to do just that. By putting into one number a player's ability to recognize pitch locations, pitch types, and follow an approach, coaches would have the opportunity to address exactly what a player needs to do to have more competitive at-bats. It also allows them to identify how well a player matches the philosophy from outside of the organization, which may be projective of how seamlessly they will fit into the lineup.