

## Rays Research & Development Analysis Report

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Objective: Project the “true” average speed-off-bat (on the scale of system A, or system B, or some combination of the two systems) for each batter in the following season.

All analysis performed on the dataset was taken by JMP. In addition, there was also 8432 missing data points when calculating, so the missing data did not conflict with anything else.

Part 1 (General SOB): I performed a Oneway analysis between every batter and their speed-off-bat for every at-bat. This could give me an understanding of their performance last season and what their true SOB could be. The graph in the analysis illustrates every at-bat SOB average, and the table below details the quantile points for every batter. Once I acquired the quantiles, I was able to acquire another table that could give the average for every at-bat SOB for that particular batter. The mean would represent their “true” average speed-off-bat on average potentially for next season (assuming no other outside factors).

Part 2 (Taking Pitch Type Into Consideration): I performed a Contingency analysis between batter and pitch type. The graph and table details how often each batter hits a certain type of pitch. From this table, I was able to acquire an expected percentage of hit-type for each batter; this indicates how often they would be projected to hit a certain type of ball based off last season. The type of hit would affect “true” average SOB because certain hits (such as pop-ups) would not have slower SOB results than other pitches on average.

Part 3 (Taking Certain Pitcher Into Consideration): I performed another Contingency analysis between pitcher and batter, but there may be some complications when taking a pitcher into consideration. First,

a batter will go against a pitcher a handful of times throughout the season, so it's hard to determine any significance. A pitcher could be also performing well against one batter, but not another. Moreover, the pitch type makes a more significant impact on the batter rather than the pitcher (due to common reoccurrence), so finding "true" average SOB based off just the pitcher alone causes many inconsistencies.

Part 4 (Taking Batting Angle Into Consideration): I performed a Bivariate analysis between the predicted average batting angle for all batters with the predicted average SOB for all batters. However, there does not seem to be an obvious correlation between these values. Because of this, factors such as hit type, type of pitch, etc. could probably paint a better picture for the impact of batting angle on "true" average SOB.

Conclusion: Overall, the "true" average SOB could range depending on many outside factors and given factors within the raw data. There can be specific scenarios where many could be taken into consideration, but "true" average SOB would considering little to no factors because it would not be as significant if a very large sample amount is taken. Therefore, I would say that the "true" average speed-off-bat for each batter is predicted value on average found in the Oneway analysis.