 

*mean = 14.033 feet/sec. mean = 14.058 feet/sec.*

 

*mean = 24.135 feet/sec. mean = 24.769 feet/sec.*

Mike Trout and José Altuve are known to be two of the better baserunners in baseball. Between the two of them, they have 399 stolen bases over the course of their young careers. Despite being very different sizes and shapes, any fan would agree that both Altuve and Trout are very fast, but today’s ball and player tracking technology allows for incredible specificity in tracking just how fast they move around the bases.

For this analysis, I considered several strategies to measure speed, but I ended up pursuing an all-inclusive study, using every movement to count equally. I considered using only home-to-first (running through the bag) data to measure speed, but that is when baserunners often loaf the most. Superstars like Trout and Altuve are not going to dead sprint when they have hit a ground ball that is fielded by the pitcher. I considered using only the events where they hit a triple and where they scored from first base (three-base advancement), but I knew that I would be trashing most of the data if I did this. The sample size could have been too small to derive meaningful conclusions. So, in the end, I used the Pythagorean Theorem to measure movement distance and then calculated average speed and maximum speed for each pitch in the data set based on the change in player positioning and change in the offset time from one row to the next. I wanted to look at both average and maximum speed because being safe is a combination of both being able to move quickly and sustaining the high velocity for a long enough time to beat the ball. After all, a “fast” runner could get thrown out at the plate if his lack of endurance caused him to decelerate.

So, to evaluate Trout and Altuve as completely and accurately as possible, I used R to manipulate the data and come up with the following calculations: average speed per pitch, maximum speed per pitch, overall average speed, and average of the maximum speeds. I primarily used the dplyr package due to its usefulness in manipulating and transforming data. As for the results of what R told me, interestingly enough, Trout led in both of the two cumulative evaluative measurements: overall average speed (14.058 ft./sec. vs. 14.033 ft./sec.) and average of the maximum speeds (24.769 ft./sec. vs. 24.135 ft. sec.). The box-and-whisker plots show the distribution of average speeds per pitch and maximum speeds per pitch for each player. Based on the calculations, Trout would certainly appear to be the faster baserunner. However, speed is a measurement that emphasizes the “peak” values. José Altuve’s maximum speed in the entire dataset was 37.765 feet per second, which was recorded on July 6, 2016 against the Seattle Mariners. Mike Trout’s top speed was calculated to be 35.347. Perhaps Trout has a tendency to hustle harder than Altuve, while José has a more impressive top gear that he saves for the most crucial moments. One luxury that the data does not afford us in this situation is to tell us whether or not the player was running at 100% effort or not. A way to estimate would be to delete the recorded speeds that appear to be jogging, walking, or standing from the dataset. Nonetheless, it seems very difficult to me to say that Mike Trout is a faster baserunner than José Altuve when Altuve has the faster top velocity capability by a decent margin. While a race between these two would likely be neck and neck, based on this study, I believe that José Altuve will reach the fastest speed, while Mike Trout’s ability to sustain high speeds (as seen by his higher average speed) may give him a chance to win. However, speed is defined to be “the rate at which someone or something is able to move or operate”. José Altuve is undeniably able to move at a faster rate than Mike Trout, even if it is only for a fraction of a moment in time, so he must be considered faster in this scenario.