Mariners 2021 R&D Analyst Problem Set - Question 2

In order to gain insight about a player’s swing decisions upon being promoted to a new level, we will focus on four different metrics to evaluate a player’s approach at the plate. We will then compare these metrics in their first 10 days after promotion to the Major Leagues compare to their tenure in the Minor Leagues. These four metrics are: swing rate, whiff rate, Z-Swing rate, and O-Swing rate. Swing rate is simply the percent of pitches seen that a player swings at, which gives us a general idea of how aggressive a hitter is and allows us to see if this changes upon promotion. Whiff rate is the percent of pitches that a player swings at that he doesn’t make contact with. This can help us see if a hitter is making significantly less contact after promotion, which may be a reflection of them making different swing decisions. Z-Swing rate is the percent of pitches in the defined strike zone that a player swings at. This allows us to see if a batter is swinging at more or less good pitches in the major leagues compared to the minor leagues. O-Swing rate is the percent of pitches outside of the defined strike zone that a player swings at, which can help us see if a batter is chasing more or less bad pitches after promotion. The average values for each of these metrics in the Minor Leagues compared to a player’s first 10 days in the Major Leagues can be seen below:

|  |  |  |
| --- | --- | --- |
|  | Minor Leagues | Major Leagues |
| Swing Rate | 45.92 | 47.31 |
| Whiff Rate | 24.12 | 30.15 |
| Z-Swing Rate | 69.65 | 68.88 |
| O-Swing Rate | 31.37 | 34.67 |

Looking at these numbers, we see that on average a player’s swing rate is marginally higher (1.39%) shortly after promotion, and that their Z-Swing rate is marginally lower (.77%). Conversely, on average a player’s whiff rate and O-Swing rate are notably higher (6.03% and 3.3% respectively). Performing tests of the significance of these differences, we find that the differences seen between the Minor Leagues and early time in the Major Leagues for swing rates and Z-Swing rates are not significant. Meaning, we can’t be sure that there is a real effect of promotion on these metrics, and the small differences seen are mostly due to random variation. However, we see that the differences in whiff rate and O-Swing rate are significant. This means that we can be confident that most players will in fact have a notably higher whiff rate and O-Swing rate shortly after being promoted to the Major Leagues.

While these factors may point to the presence of an adjustment period in which a player makes different swing decisions after being promoted, in this case whiffing more and chasing more pitches out of the zone, we have to consider other factors. Primarily, we must consider that these players are now seeing a new caliber of pitching. Major league arms are there for a reason, and the pitches will be much more effective, which could explain the increased whiffs and chased pitches more so than the player having a different approach at the plate. To further examine this, we found that the average whiff rate at the Major League level for this data (regardless of tenure) is 26.13% and the average O-Swing rate is 34.13%. What this means is that as players get more experience at the Major League level against high caliber pitching, we see them whiff less, but they don’t necessarily chase fewer pitches out of the zone.

Ultimately, it would seem that the data does not support the idea of an adjustment period, or a batter making significantly different swing decisions after being promoted. What we see is that the difference in swing decision metrics are more of a reflection of the quality of pitching in the Major Leagues, and less of a recency effect of promotion.