

A Case Study in Measuring How Well Each Course Fit the Players Who Played It

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If we accept that a course "fits" a player if:

The player does not score too low or too high, and

The course offers a variety of scores,

then we can quantify "fit".

The measure used here is based on the Bhattacharyya distance between the scoring distribution experienced by the players and the ideal as shown in the bar charts below. (Derivation of this ideal is in another paper. Other ideal distributions could be used in the same way.)

The measure of "fit" is actually:

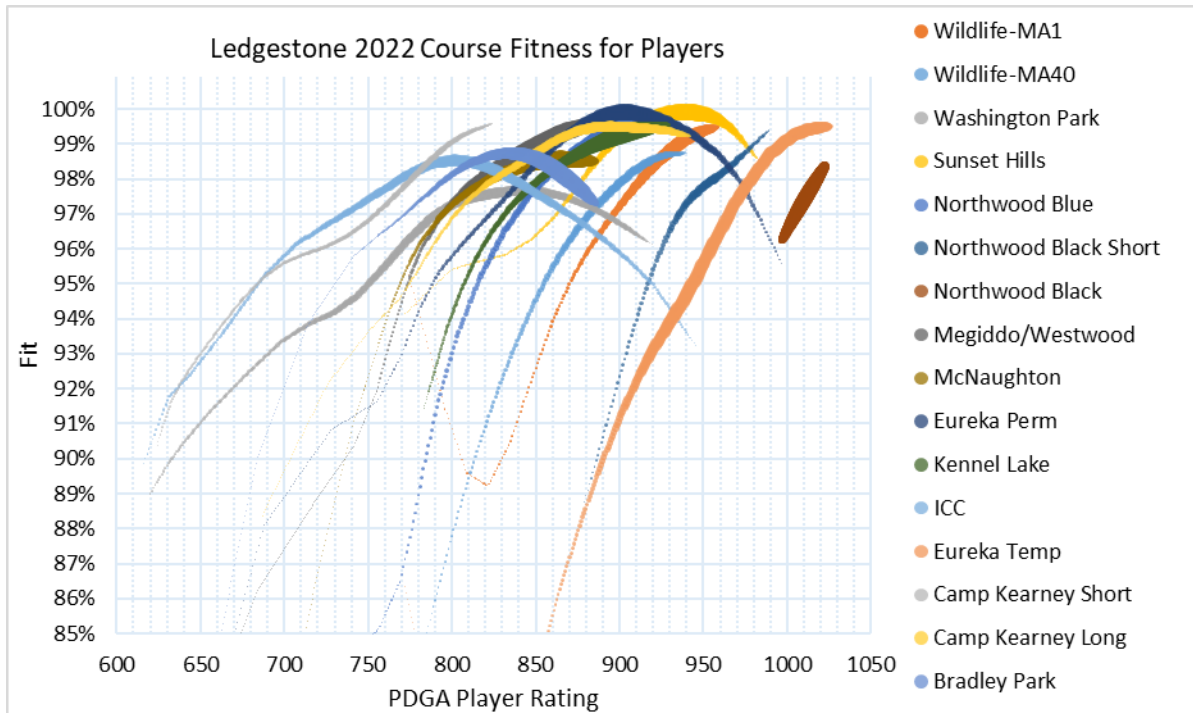
1 - Bhattacharyya distance.

So a perfect fit would be 100%.

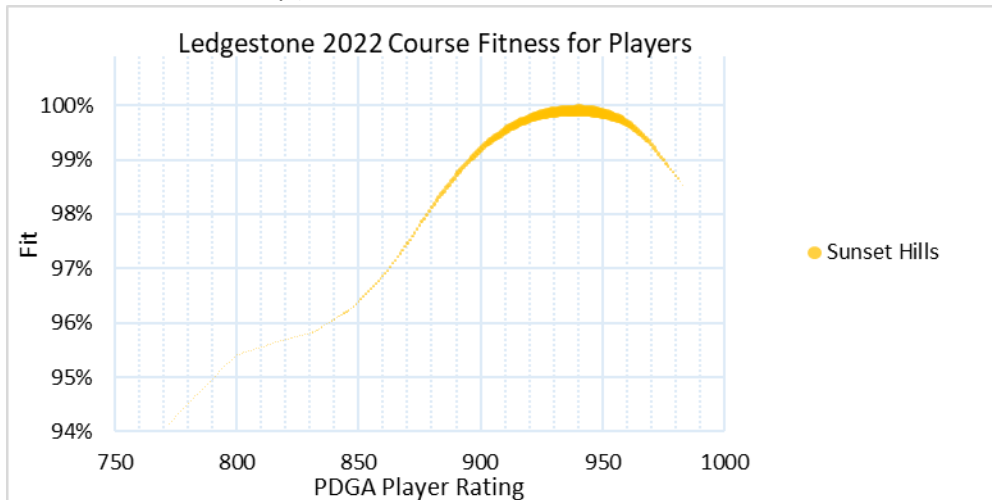
While this fit could be applied to any group of players, in this case study we will look at the fit across the spectrum of player ratings for all the courses used in the 2022 Discraft's Ledgestone Open.

For each course we compute the scoring distribution for every rating, calculate the fit, and plot the results. In the charts below, the thickness of the line indicates how many players were represented at each rating.

Here are all the results on the same plot.



Let's look at the course which best fit the players who played it. (Note the scales will be changing from chart to chart for clarity.)

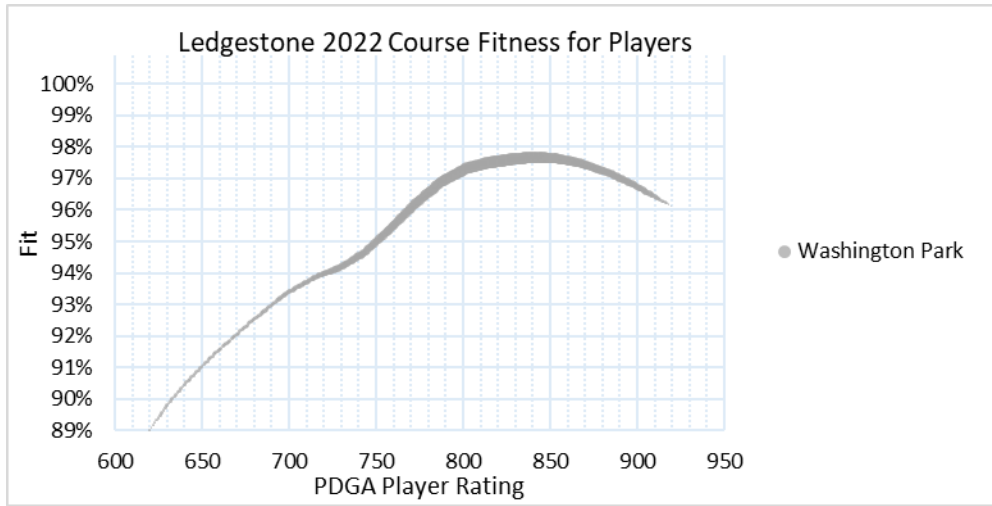


Notice that the fit is very good at the ratings where the bulk of the players were.

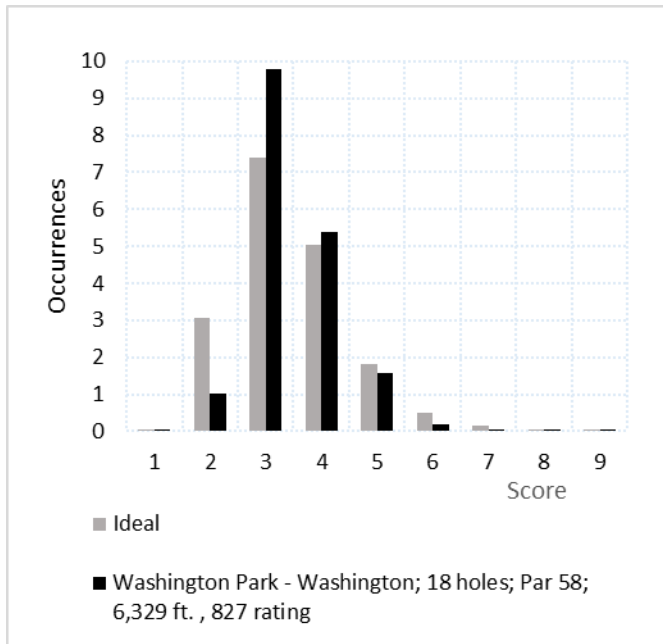
The fit to the lower rated players was not as good. When the tail goes down to the left it indicates the course was increasingly too hard for these lower rated players.

The fit to the highest rated players was also not as good. Then the tail goes down to the right it indicates the course was increasingly too easy for these higher rated players.

Here is a different course where the fit was best near the bulk of the players. The fit was best at ratings around 850. However, the fit was not great for any players.

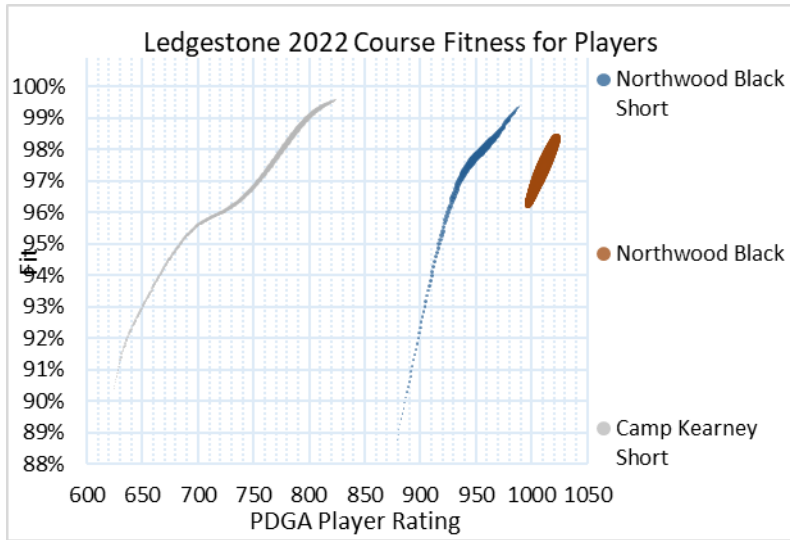


To see why, we can look at the distribution of scores for an 850-rated player, compared to the ideal distribution.



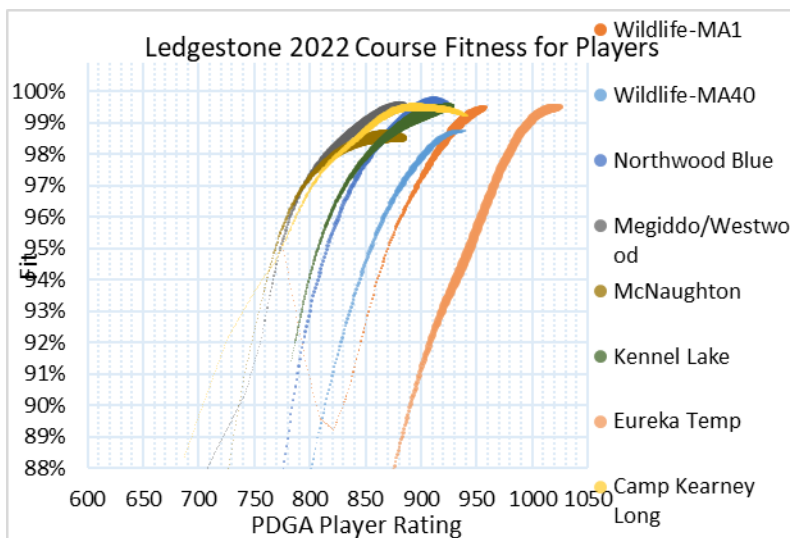
As we can see, the course gives out too many scores of 3. With so many scores being equal, the course does not do a good job of separating players by how well they are playing that day. Giving these Recreational players more chances to get a score of 2 instead of 3 would make the course fit better.

When the fit of the course continues to be upward-sloping for the highest-rated players who played it, that means the course was too hard for everyone who played it. These three courses fit that description.

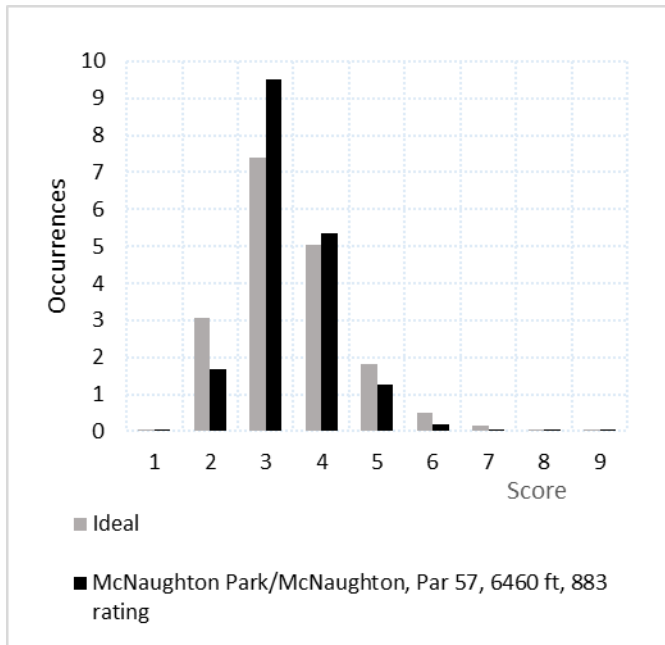


(If the fit of the course were to continue sloping upward toward the lower-ratings, that would mean the course was too easy for everyone. None of the courses at Ledgestone were like that.)

The following courses have the best fit at or near the ratings of the best players on the course. These are suited to the best of the group. One way to improve the fit would be to keep the lower-rated players off the course.



Another way would be to adjust the scoring distribution to better fit the best of the players. For example, the following chart compares the ideal set of scores to McNaughton's for the highest-rated group of players who played the course; about 883-rated.



The course suffers from the most common flaw of giving out too many 3s (and 4s) - or, equivalently - not enough 2s, 5s, and 6s.

Following are the charts for all the courses where the fit is best somewhere in the middle of the pack of players. The fit could be improved by narrowing the range of skills who play there.

