

Length vs. Trouble – Which is more effective?

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The Standardized Contribution to Scoring Spread Width of Tournament Totals is a measure of how much impact a particular hole had on the final standings of all players. Let's call it the "Power" of a hole.

We can find how the Power varies as a function of Average Score. The range of Power for the 90 holes that were played by Advanced Players over five rounds at the 2014 PDGA Amateur World was 1.27% to 8.52%.

The linear fit is that every one-throw increase in a hole's average score adds to its Power by 1.5% ( $R^2=54\%$ ). For example, 1.27% would go to 2.77% if the weakest hole was one throw more difficult.

To translate that into concrete terms, let's look at what it would take to increase the Power of the least powerful hole from 1.27% up to the average for all holes of 3.33%.

The least powerful hole would need to increase its average score by about 1.4 throws to become as powerful as the average hole.

We can further break it down to how Power varies by the part of the score attributable to Effective Length, and the part attributable to Trouble. For the part attributable to Effective Length for each hole I used the Hole Forecaster to find the expected average score for a 920-rated player (the average of the Advanced players) with a Foliage Factor of "none".

Trouble is the difference between the actual average score and this no-foliage expected score.

Every one-throw increase in a hole's average score caused by lengthening the hole increases its Power by 1.5% ( $R^2=22\%$ ). The least powerful hole would need to increase its length by 440 feet to become as powerful as the average hole.

Every one-throw increase in a hole's average score caused by introducing Trouble increases its Power by 2.3% ( $R^2=49\%$ ). The least powerful hole would need to introduce Trouble worth 0.9 throws to become as powerful as the average hole.

So, it is about 55% more effective to introduce Trouble instead of extra length. This only applies to these holes for these players.

It may be true that the effectiveness of Trouble depends on how the designer introduces it. All these holes were designed or selected by Chuck Kennedy, so perhaps it is Chuck's skill at introducing effective Trouble which is being measured here. (The effectiveness of length ought to be the same no matter who the designer is.) So, we might say Chuck's skill at introducing Trouble is rated at 1.55. Other designers may tend to introduce trouble that is more or less effective.

At this tournament, 91% of the throws were attributable to the effective lengths. Only 9% came from net Trouble. (Yes, there was negative trouble, which probably increased the effectiveness of Trouble by stretching the "baseline".) One might speculate whether 9% is optimal. Perhaps, with Trouble being more effective, a higher percent of scores should come from Trouble. Or, perhaps as more Trouble is introduced, it becomes more random and therefore less effective at sorting out players.