

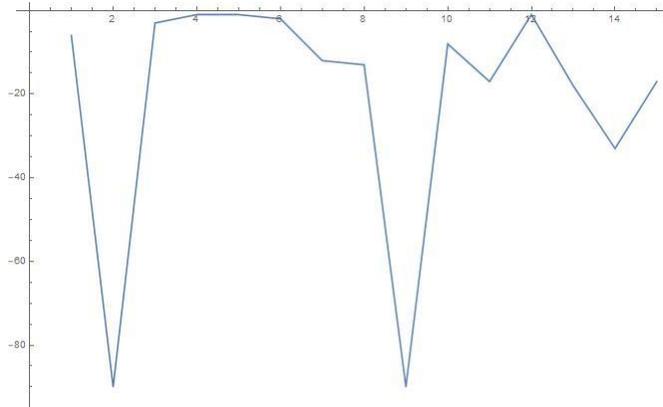
The PGA Tour: Playing To Your Strengths

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Golf By the Numbers, roanoke.edu/mcsp/minton/ShotLink.html

Main question: What causes the ups and downs in golfers' performances?

Dustin Johnson's finishes (rank) in 2017:



Data from ShotLink (courtesy PGA Tour): every shot on PGA Tour with distances measured to the inch. Strokes Gained is the new PGA standard, which measures the effect of each shot on score. Take expected score after the shot minus expected score before the shot. This is done for each shot, then combined into ratings for different categories of shots. My (21) categories are:

Putting, Fringe, Bunker, Fairway shots 0-50 yards, 50-100 yards, ..., 200-250 yards; primary rough 0-50 yards and 50-200 yards; intermediate rough 0-50, 50-200, 200-250 yards; miscellaneous lies 0-50, 50-200 yards; recovery shots, layup shots, penalty strokes, par 3 tee shots, par 4 tee shots, par 5 tee shots. Ratings are corrected for each round to account for hard courses, pin placements, bad weather, ...

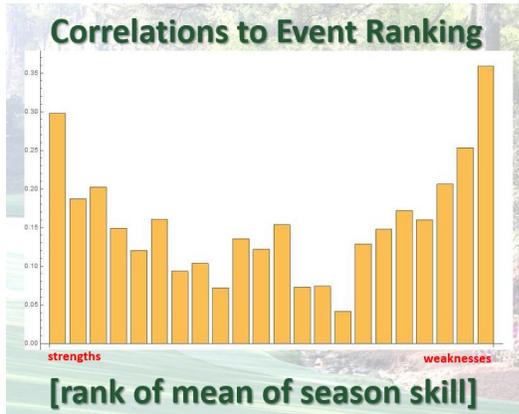
At the website you can see how dominant Tiger Woods was in the 2000s.

My concept for identifying strengths and weaknesses was to a season average as a baseline, with values better than average being strengths. I initially used the previous season ratings, but this is complicated by there being little correlation (for skills other than driving) between golfers' performances one year versus the next. So I also compared Strokes Gained in a 2017 event to the golfers' averages in all 2017 events except that event.

Correlations of season averages and event averages for the skills were small, with driving having the highest correlations (about .2 for the event, .08 for the season). To use all events, I recorded a missed cut as a 90th place finish. This is probably not a good idea. Looking only at made cuts (with meaningful ranks) the correlations were higher, topped by putting at .26 (and overall Strokes Gained for the event at .56).

Looking at means for the 21 skills for golfers who made the cut versus those who missed the cut, by far the largest difference is for putting, a difference of about 2 strokes for the tournament.

I took each player-event, ordered the skills by season average, then looked at the correlation of event ratings to event result. Extreme strengths and extreme weaknesses had the highest correlations.



This does not exactly answer the original question, because of the distribution of skills. For more than 2/3 of the player-events, putting was either the number 1 strength or the number 1 weakness. Driving was in the top two strengths or weaknesses for 2/3 of the player-events. So this graph is really showing the large effects of putting and driving.

Looking at the main skills, we get a better answer to the original question. The following chart shows average differences between for event and season averages for putting for players who win, finish in the top ten, make the cut but finish worse than 10th, miss the cut, and then all events. The first bar shows averages for players for whom putting is a strength, and the second bar for players who are weak putters. The last pair of bars shows that there is a regression to the mean effect, the “cut” bars show that players who miss the cut and normally are strong putters have a bad decline in putting.



Graphs for driving, short irons and long irons show the same trend. Missing a cut is associated with a strength falling apart. There is not a large difference between strengths and weaknesses for winning or finishing in the top 10. However, more than ¾ of the winners had driving as a strength, and more than ¾ of the winners had long irons as a strength, and long iron performance improved by more than 2 shots for winners. As seen above, all winners had good putting weeks, but poor putters improved by a very large amount.

Below are sums, adjusted for a small “regression to the mean” bias, of changes in the four major skills.



Putting is the most volatile and the most important skill. Driving is second, not that far behind, and iron play follows that. You can win by improving bad putting, but you must be a good driver and long iron player to start with. If one of your strengths falls apart, you are in danger of missing the cut.