Mathematical Internal Assessment: Professional Golf Statistical Analysis

By Jie-Hee Park

Introduction

Many people, including myself, are found to be playing an outrageous amount of golf throughout their lifetime. The sport is fun in itself but there are so many different components to the game all of which have important value and therefore golf is not just a sport which requires skill, it requires selective skills. Through watching many of the Professional Golfing Association (PGA) events, I have picked up on many of the different aspects that stand in the way of being a good golfer and being a great golfer. Through analyzing PGA tour events and looking closely at the statistics of the entire field compared to the champion, I will be able to determine what the optimal statistics are and which area of the game plays the most significant role in winning events.

Explanation of Golf

Golf is played by hitting a golf ball with a golf club from a certain marked area entitled the tee box (Figure 1). The goal is to get the golf ball into the hole/cup (Figure 1) in the least amount of strokes possible. There are three main types of shots that one could use to get the ball into the cup; drive, approach and putt. The drive is the first shot that is hit off of the tee box, it will typically carry the greatest distance compared to the rest of the shots in the hole, and will determine the location for the next shot which in most cases is in the fairway (Figure 1). The approach is usually the second, third and sometimes fourth shot that is played and is almost always played off of the fairway or the rough. These shots will have less distance and their aim will be to get to the green. Once at the green, the putt is used and within normally 1-3 strokes the ball will be drained into the hole. There are of course other rules to golf in regards to hazards and out of bounds locations but this investigation will look at professional golf statistics and therefore those rules are less important and less commonly used.
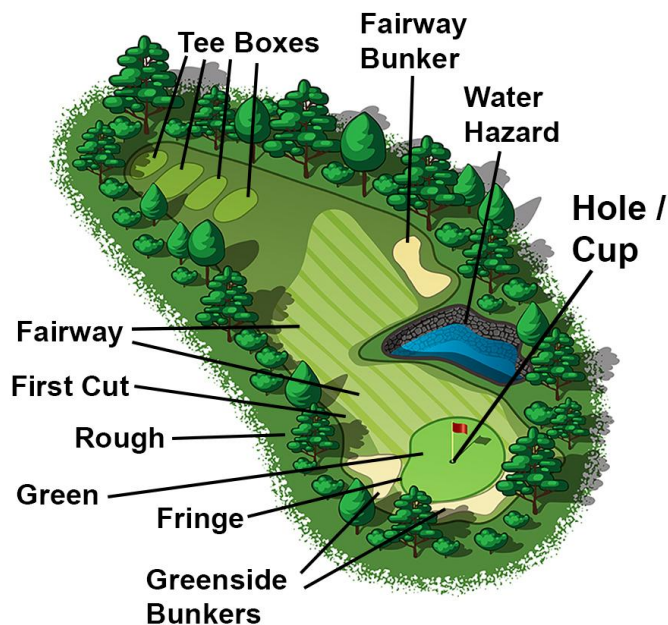
Figure 1: Overview of a golf hole with labeled parts. (https://golfbit.com/golf-terms)

Golf Scoring and Terminology

Golf is played using a net scoring system with players being able to be above or below par. Each hole depending on its distance and difficulty will be given a number for par. This is the expected number of strokes also known as shots in order to get the ball into the cup. If the par of a hole is 4 and the player takes 4 strokes to get to the hole, the player will have a net score of 0. Another common term that is used in golf is called Greens in regulation or GIR. This is calculated by taking the par of the hole and subtracting 2. This number represents the expected number of strokes in order to reach the green. For a Par 4, in order to reach the GIR, a golfer must take 2 strokes to get to the green. This does not influence the score but is a common statistic that is used to determine how well a player is playing. Golf will use yards and feet to measure distance from the hole and a typical statistic will be GIR from 100-150 yards. This percentage will show how many times the golfer was able to reach the GIR when they were 100-150 yards away from the hole. This percentage will often be lower as the yardage increases as the golfer must hit harder and therefore have less accuracy.

Professional Golf Applications

Many golfers emphasize the importance of a balance in their game, working evenly on their drives, approaches and putts as they are all worth the same amount of strokes on the scorecard. Some golfers will play an extreme style of play where they will focus heavily on drive distance such as Bryson DeChambeau or heavily on the shorter approaches and putting such as Patrick Cantlay. Players like Bryson will find themselves much closer to the hole after their drive, sometimes even on the green off of the drive instead of having to approach from the fairway. They do however sacrifice accuracy and will risk putting themselves in hazards or with a less than ideal view to the green (i.e. behind a tree). Players like Patrick will almost never find themselves on the green off of the tee but will have on average 1-2 less putts than the rest of the field. The downside of this strategy obviously being that it may take them 1-2 shots more to get to the green as he has shorter driving and approach yardages.

Significance of Data

In order to look at a large sample size of statistics, I looked at 4 different PGA tour events. These events were the BMW Championships, PGA Championships, US Open and the 3M Open. These events all had over 60 golfers make the Final Cut and therefore they all played 4 18 hole rounds. This abundance of statistics allowed for it to be possible to see trends. Since the statistics were found from different events, the courses and conditions that they played with were very different. The 3M championship took place in Minnesota where the conditions are dryer and the weather is cooler. These conditions in contrast to the humid and hot conditions of San Diego where the PGA championships took place influence the ball flight and distance drastically. Obviously the statistics that we will find cannot be perfect and applicable to all tournaments as the external conditions may require the appropriate adjustments but taking statistics from different tournaments allow for a more versatile data set that should remain consistent regardless of the course and weather conditions. It is also important to remember that just because Bryson DeChambeau is not a top ranked putter on the PGA tour, he still has strong statistics that make it possible for him to play professional golf. His putting is by far much better than the average golfer but he carries the greatest

disparity among the PGA golfers from Drive Distance Rank to Putting Percentage Rank and therefore attracted my interest as to why he focuses so much on his drives.

Data Collection

The different statistics were found from the PGA tour website and are from the following categories; Fairways Hit, GIR from 200+ Yards, GIR from 100-125 yards, Putting from 5'-10' and Putting inside 5'. Fairways hit is the statistic that will be looking at accuracy from the drive or the tee shot. This is found by taking the amount of tee shots that landed on the fairway and dividing it by the amount of tee shots that were hit throughout the tournament and multiplying it by 100 to get a percentage. GIR from 200+, 100-125 yards is looking at the accuracy of shots from that distance. Putting from 5'-10' and Inside 5' will look at how many putts are made from that appropriate distance and is found by taking the amount of putts made from that distance and dividing it by the total number of putts from that distance and multiplying by 100 to get a percentage.

In each respective tournament the average of each of the 5 different categories was found as well as the standard deviation for that set of data. The Z-score was calculated for the champion which indicates how many standard deviations the percentage of the champion was from the average and the same Z-score was calculated for the last place finisher. In each category the exact score of the champion was also recorded in order to provide perspective into the Z-score.

Table 1: Average Percentage of Fairways Hit, Standard Deviation, Z-Score of the Champion and Last place finisher and % of fairways hit by champion over all four competitions.

	Average % of Fairways Hit	Standard Deviation	Z-Score of the Champion	Z-Score of the Last Place Finisher	% of Fairways Hit by Champion
BMW Championships	66.05	8.22	0.003	-0.866	66.07
PGA Championships	60.16	8.08	-0.594	-0.152	55.36
3M Open	64.36	8.42	-0.645	-0.433	58.93
US Open	50.75	9.28	0.112	-1.236	51.79

When looking at the average percentage of fairways that were hit through all the tournaments it seems to range from approximately 50%-66% as shown in Table 1. At the US Open it was seen that the average fairway percentage (50.75%) was much lower than the BMW championship (66.05%) and this was likely due to the difficulty of the course. This can be supported by the standard deviation of all four tournaments being roughly the same, indicating that even though the US Open had an average fairway percentage of 50%, the highest percentage was only around 58% so the range of scores are all relative to its average in the same magnitude. When looking at the standard deviation, each tournament seems to have on average only a 16-18% range in the fairway percentages and because there isn't a large variation in the data, it is safe to say that it is not necessary to make a high percentage of fairways off of the tee as long as it is reasonably within the average range. By looking at the percentage scores of the champions, and how some of them are actually below the average, a good player would be able to make definitely over 50% of fairways off the tee and to be able to win a tournament, 50% may be sufficient but a score of 55%-58% would be optimal. When looking at the score relative to the rest of the field, as long as the percentage of fairways hit off the tee is within 1 standard deviations away from the average, the player would be able to keep up with the rest of the field and less than +/- 0.5 standard deviations would put the player in optimal position to win the tournament. Looking at Figure 2, Figure 3 and Figure 4, a more linear trendline can be shown representing small differences between the higher scoring players and the lower scoring players. In figure 5 a slightly more decreasing, linear trendline is shown, indicating that at more difficult courses, in order to shoot a lower score, it is important to maintain a high number of fairways hit off the tee.

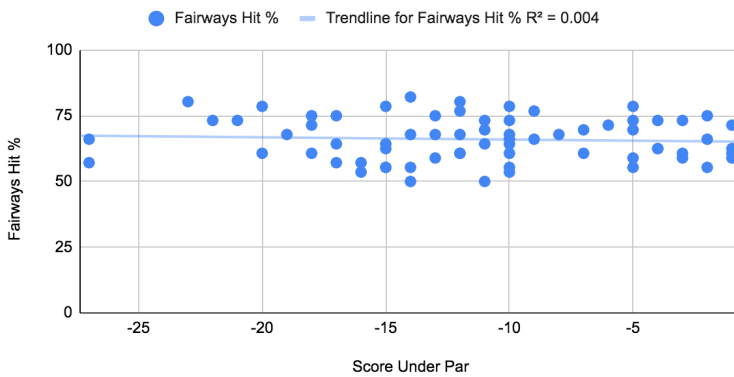**Figure 2: Fairways Hit % vs. Score Under Par at BMW Championship**

- Fairways Hit %
- Trendline for Fairways Hit % R² = 0.004

(scatter plot, y-axis: Fairways Hit % from 0 to 100, x-axis: Score Under Par from -25 to -5)

Figure 3: Fairways Hit % vs. Score Under Par at PGA Championships

- 55.36
- Trendline for 55.36 R² = 0.037

(scatter plot, y-axis: Fairways Hit % from 0 to 100, x-axis: Score Under Par from -5 to 15)
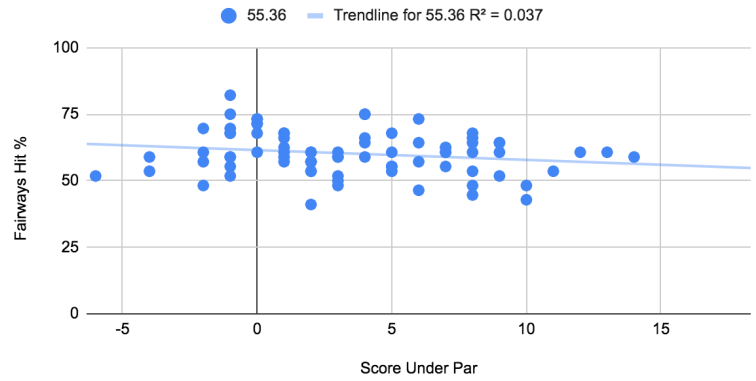
Figure 4: Fairways Hit % vs. Score Under Par at 3M Open

- Fairways Hit
- Trendline for Fairways Hit R² = 0.075

(scatter plot, y-axis: Fairways Hit % from 0 to 100, x-axis: Score Under Par from -15 to 5)
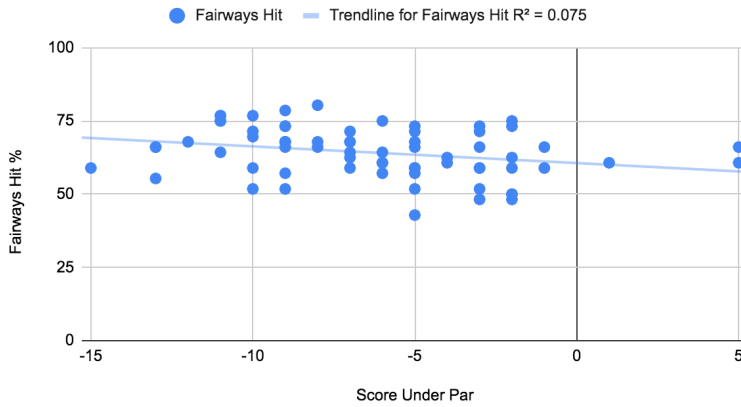
Figure 5: Fairways Hit % vs. Score Under Par at US Open

- Fairways Hit
- Trendline for Fairways Hit R² = 0.07

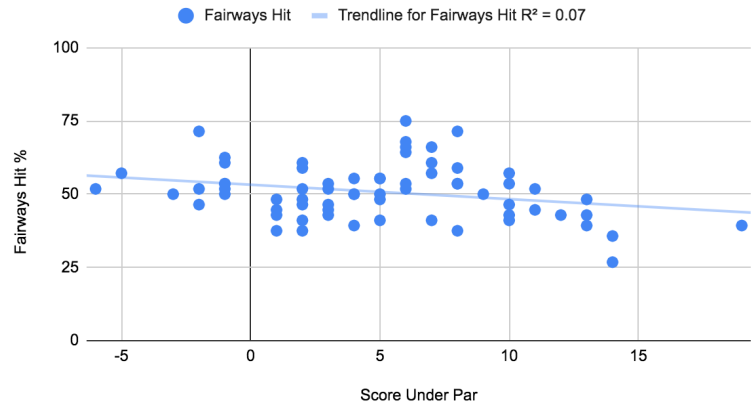*(scatter plot, y-axis: Fairways Hit % from 0 to 100, x-axis: Score Under Par from -5 to 15)*

Table 2: Average Percentage of GIR from 200+ yards, Standard Deviation, Z-Score of the Champion and Last place finisher and % of GIR from 200+ yards hit by champion over all four competitions.

	Average % of GIR from 200+ yards	Standard Deviation	Z-Score of the Champion	Z-Score of the Last Place Finisher	% of GIR from 200+ yards Hit by Champion
BMW Championships	59.67	15.40	0.848	-0.878	72.73
PGA Championships	40.27	12.12	-0.149	-0.453	38.46
3M Open	54.26	16.12	0.081	0.356	55.56
US Open	41.40	12.53	0.021	-0.311	41.67

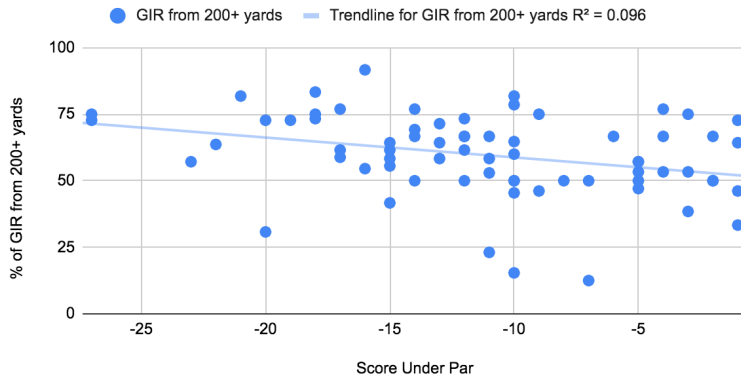**Figure 6: % of GIR from 200 yards + vs. Score Under Par at the BMW Championship**

- GIR from 200+ yards
- Trendline for GIR from 200+ yards $R^2 = 0.096$

% of GIR from 200+ yards (y-axis: 0, 25, 50, 75, 100)
Score Under Par (x-axis: -25, -20, -15, -10, -5)

Figure 7: % of GIR from 200 yards + vs. Score Under Par at PGA Championships

- GIR from 100-125 yards
- Trendline $R^2 = 0.037$

% of GIR from 200 yards+ (y-axis: 0, 25, 50, 75, 100)
Score Under Par (x-axis: -5, 0, 5, 10, 15)
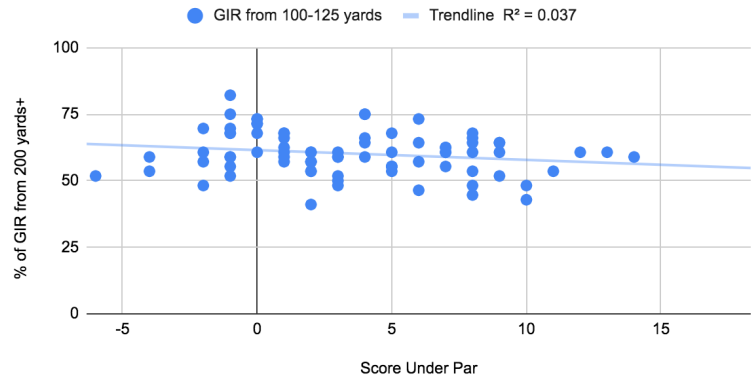
Figure 8: % of GIR from 200+ yards vs. Score Under Par at the 3M Open

- GIR from 200+ yards
- Trendline for Fairways Hit $R^2 = 0.012$

GIR from 200 yards + (y-axis: 0, 25, 50, 75, 100)
Score Under Par (x-axis: -15, -10, -5, 0, 5)
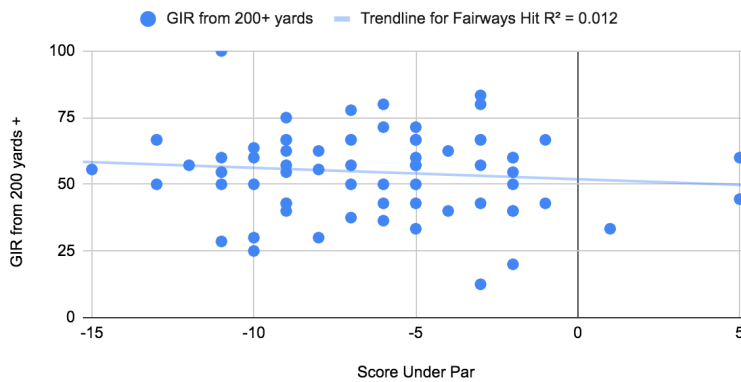
Figure 9: % of GIR putting from 200+ yards vs. Score Under Par at US Open

- GIR from 200+ yards
- Trendline for Fairways Hit $R^2 = 0.07$

GIR from 200 yards + (y-axis: 0, 25, 50, 75, 100)
Score Under Par (x-axis: -5, 0, 5, 10, 15)
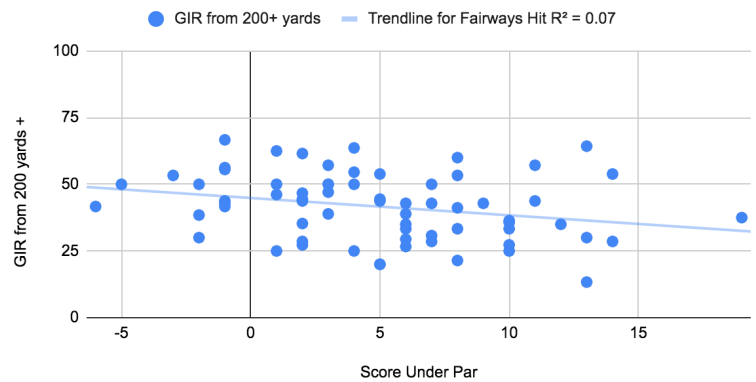
The percentage of GIR from 200+ yards is an important statistic to look at as it puts players in better positions for the longer par 5s that have greater distance. These types of holes are usually the only type that can result in an eagle, which is two under the par and can make a huge difference in the scoreboard. This statistic had a much larger standard deviation across the field and it shows that there is a large variation in what percentage of players are able to make GIR from 200+ yards. From this data it can be concluded that making GIR from 200+ yards is of course an asset to one's game but also is not essential in making top scores in PGA tournaments. The Z-score values from the champions of the 3M Open and the US Open are very small standing at 0.081 and 0.021 and the Z-score values of the champion of the

PGA tournament is actually a negative value. This shows that the players that won these tournaments were not scoring above average or highly above average GIR percentages from 200+ yards compared to the rest of the field. This indicates that it is not an essential percentage to have and being able to score just around the average in terms of relative to the other players in the field, will result in being put in an optimal position to win. By looking at the values of what percentage of GIR the champions hit from 200+ yards, it can be estimated that hitting 40%-50% of the shots from 200+ yards in GIR would be ideal and it would result in good performance. As always we could say that playing 100% of the shots in GIR would be ideal, but we have to remember that even professionals do not have unlimited time and their time would be best spent in other areas of the game seeing that this statistic is not extremely important in optimizing their odds of winning. When looking at Figure 6 and 7 there is a slight, linear, decreasing correlation showing that the champions of the BMW Championship and the PGA Championship had higher percentages than the lower scoring players. Although this seems to be the trend, the highest scoring players do not have the highest scoring percentages as it does not seem essential to be a top scorer in this category. It is also shown in Figure 6 that there are many players who do well in this category and still place much lower, devaluing the importance of the statistic in the probability of winning. This seems to be the case in Figure 6,7,8 and 9 where the trendline may be decreasing but it is clear that there are still many players that placed lower have high percentage scores.

Table 3: Average Percentage of GIR from 100-125 yards, Standard Deviation, Z-Score of the Champion and Last place finisher and % of GIR from 100-125 yards hit by champion over all four competitions.

	Average % of GIR from 100-125 yards	Standard Deviation	Z-Score of the Champion	Z-Score of the Last Place Finisher	% of GIR from 100-125 yards Hit by Champion
BMW Championships	80.38	15.61	0.723	-4.082	91.67
PGA Championships	68.51	17.62	0.841	0.368	83.33
3M Open	73.87	15.00	-0.480	1.742	66.67
US Open	77.43	18.99	0.662	-1.444	90.00

Figure 10: % of GIR from 100-125 yards vs. Score Under Par at the BMW Championship
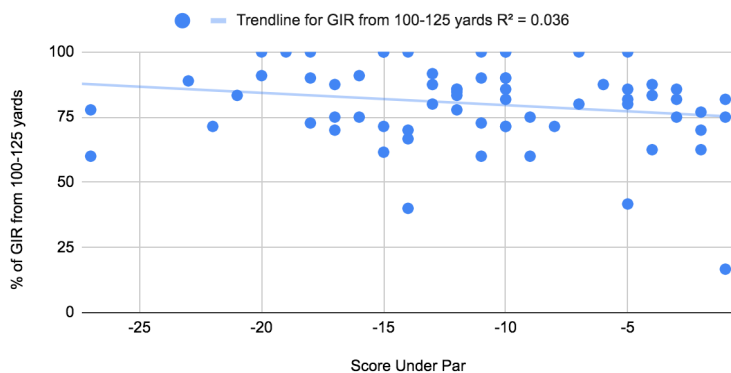
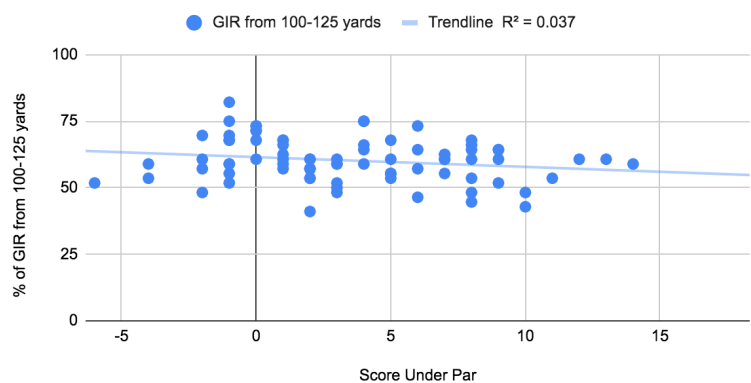Figure 11: % of GIR from 100-125 yards vs. Score Under Par at PGA Championships

Figure 12: % of GIR from 100-125 yards vs. Score Under Par
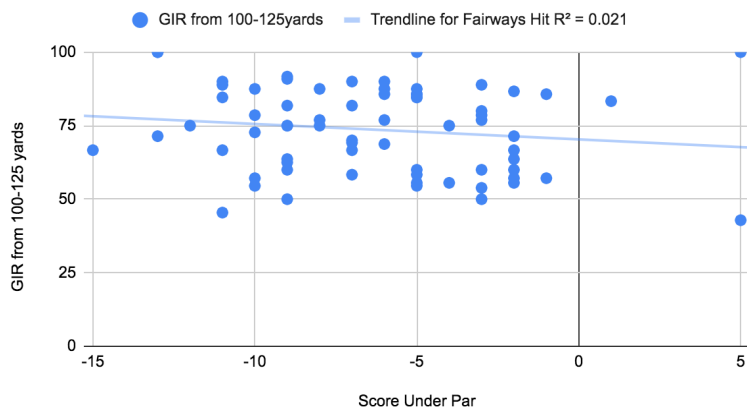
Figure 13: % of GIR from 100-125 yards vs. Score Under Par at US Open
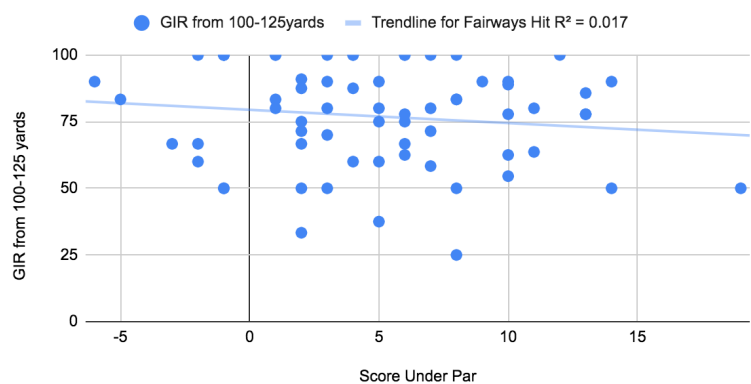
Looking at the statistics from the percentage of GIR from 100 yards -125 yards, the average from all four tournaments is significantly higher than the average from 200+ yards. There is still a high standard deviation showing a great range of scores both above and below the average. A statistic that stands out is the Z-score of the last place finisher from the 3M Open. This particular player was 1.742 Standard deviations above the average which actually represents scoring 100% of their shots in GIR from 100 yards -125 yards. Although they were playing a perfect game in this area, they still came in last place, likely due to their putting. It is known that all parts of a golfer's game must come in balance and a 100% in one area means nothing if they are unable to score well in all the other areas of the game. This shows

that having a perfect score is not essential as it will often give up other areas of the game. The champions had a range of 66.67% of GIR from 100 yards - 125 yards to 91.67%. The champion from the 3M Open seemed to be an outlier as they had a negative z-score and compared to the other champions, had quite a low percentage. Although it is not essential to have 100%, it seems that scoring 85%-87% produces low scores and seems to be attainable as the three other champions were approximately in this range. This is a category where the champions have a significantly higher percentage than the rest of the field and it seems that scoring 0.6-0.7 standard deviations above the average will put them in optimal position to win. The Z-scores seen in table 3 from the last place finishers are actually quite significantly high as seen in the BMW Championships and the US Open, indicating that this category can separate the top performing golfers and the worst performing golfers and doing well is important in being able to win. Figure 10,11,12 and 13 again all show linear, decreasing correlation between scores and % of GIR from 100-125 yards but it can especially be seen in Figure 10 that there are many players that had near perfect percentages but still only made it to the middle of the scores. This shows that although it is important to be in the top half of the scores and be above average, it is always important to not let this take away from the other categories as it does not pay off to have extremely high scores solely in one category.

Table 4: Average Percentage of putts made from 5'-10', Standard Deviation, Z-Score of the Champion and Last place finisher and % putts from 5'-10' made by the champion over all four competitions.

	Average % of putts made from 5'-10'	Standard Deviation	Z-Score of the Champion	Z-Score of the Last Place Finisher	% of putts made from 5'-10' by Champion
BMW Championships	59.21	12.45	0.264	0.264	62.50
PGA Championships	58.49	12.46	-0.013	0.971	58.33
3M Open	61.47	12.27	0.230	-1.614	64.29
US Open	57.96	10.47	0.999	-0.078	68.42

Putting is always a controversial topic on the PGA tour as it is often under-practiced and only mastered by pros that have been playing on tour for many years. From 5'-10' is an important distance as many pros are able to hit their approach shots on to the green within 5'-10' of the hole, making these putts their birdie opportunities. The statistics from all four tournaments seem to be very similar to each other with small differences in the average and the standard deviations. The average of all four tournaments is approximately 60%, meaning that almost 1 in every 3 chances, the pros will make birdie, seeing that their approach shot was a GIR. Putting is a particular skill with less influence from the difficulty of the course and also a skill that cannot be practiced enough when it comes to professional golf. These statistics are very general and provide the general conclusion that from 5'-10', it is important to make at least 60% of putts to stay in the top group and in order to have a strong chance of winning, making 66% of 1 in 3 putts is favourable. There are variable trends that are seen in all four different graphs as Figure 14 and 16 both show decreasing, linear trends while figure 15 and 17 are linear or slightly increasing. The graphs show that even through the trends there is very little variability in the putting percentages and that once again the champions are not the highest scoring players but more just close to the average or the trend line.

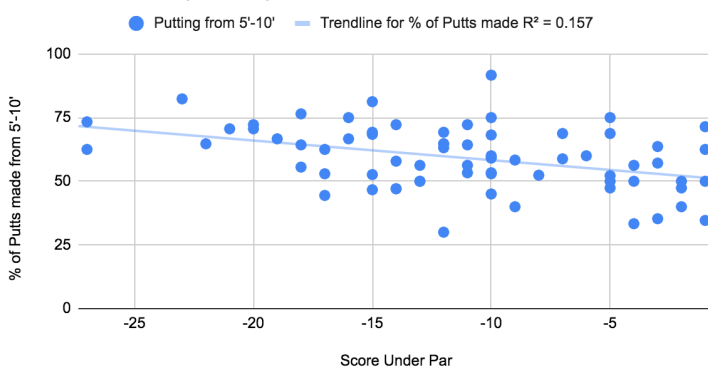Figure 14: % of Putts made from 5'-10' vs. Score Under Par at the BMW Championship

Figure 15: % of Putts made from 5'-10' vs. Score Under Par at the PGA Championship
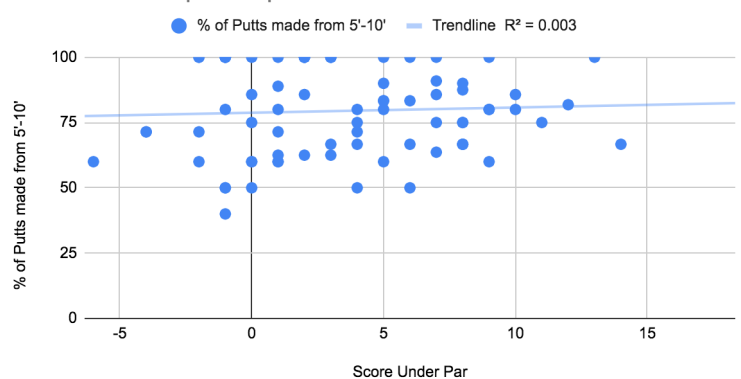
Figure 16: % of Putts made from 5'-10' vs. Score Under Par at the 3M Open

Figure 17: % of Putts made from 5'-10' vs. Score Under Par at the PGA Championship
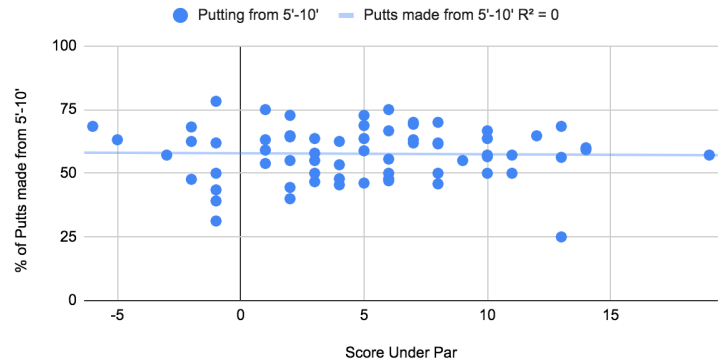
Table 5: Average Percentage of putts made from inside 5', Standard Deviation, Z-Score of the Champion and Last place finisher and % putts from inside 5' made by the champion over all four competitions.

	Average % of putts made from inside 5'	Standard Deviation	Z-Score of the Champion	Z-Score of the Last Place Finisher	% of putts made from inside 5' by Champion
BMW Championships	97.29	2.21	1.223	1.223	100.00
PGA Championships	79.57	16.74	0.557	-0.771	88.89
3M Open	79.18	22.78	0.182	0.914	83.33
US Open	81.74	16.43	-0.106	0.410	80.00

Putting from inside 5' is one of the most underrated skills of a golfer as it seems quite simple and the professionals do make a lot of these putts, but they are also prone to making mistakes while under pressure and this stroke seems to be the first to break down. These statistics will show the greatest number of players with 100% scores and also the lowest variability. Expectedly all 4 of the champions were able to make at least 80% of their putts inside 5'. The champion of the US Open was making 80% of their putts which led to a negative Z-score since this was below the average. In order to be placing within the top half of the field, it is likely that one would need to have a putting percentage of 85%-87% and in order to be a strong competitor, a putting percentage of 90%+ would be optimal. These are statistics that can be obtained without compromising other aspects of one's game.

Figure 18: % of putts made from inside 5' vs. Score Under Par at the BMW Championship
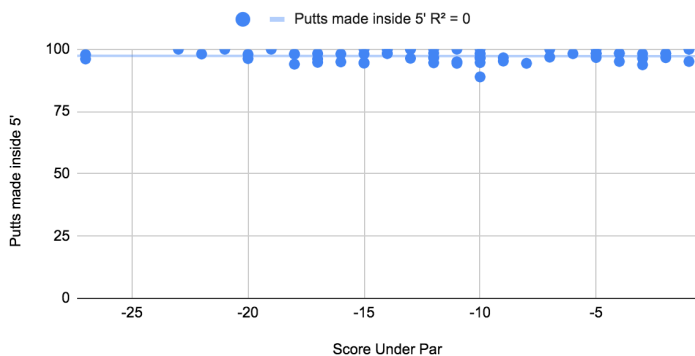
Figure 19: % of Putts made from inside 5' vs. Score Under Par at the PGA Championship

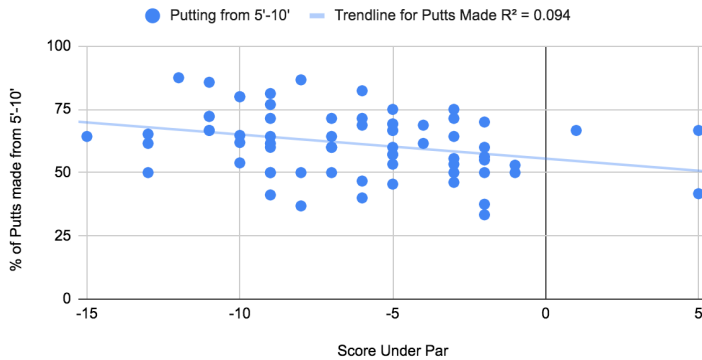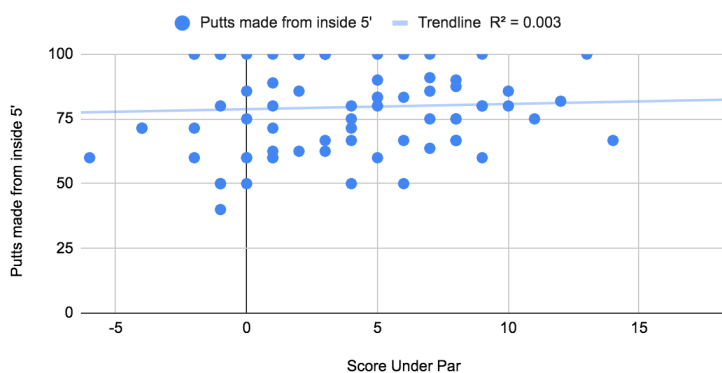Figure 20: % of putts made from inside 5' vs. Score Under Par at the 3M Open
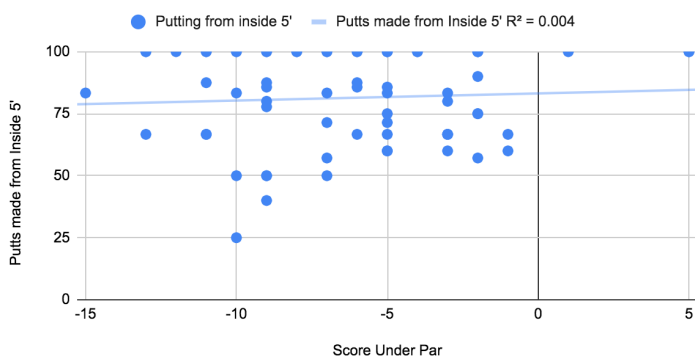
Figure 21: % of putting from inside the 5' vs. Score Under Par at US Open
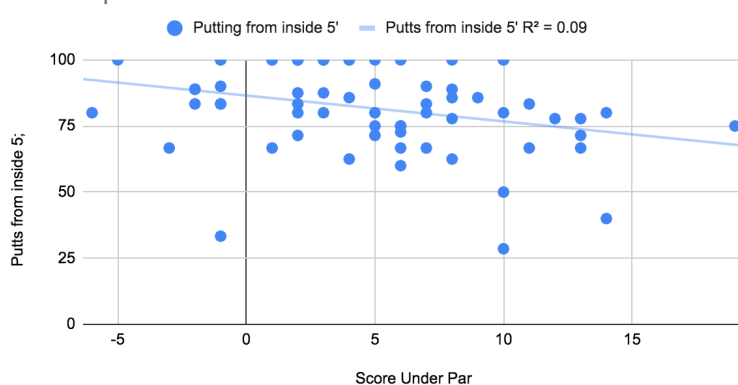
Applications to the PGA Tour

Table 6: Final Statistics for the Optimal Player

	Fairways Hit %	% of GIR from 200+ yards	% of GIR from 100-125yards	Putting % from 5'-10'	Putting % from inside 5'
Sufficient	50	40	85	60	85-87
Optimal	55-58	50	87	66.67	90+

Balance is always an important factor in sports, especially when looking at a sport as complex as golf. Of course having perfect statistics would result in a perfect and unbeatable player but even the professionals are only human and they must be able to properly allocate their resources in order to achieve overall success. Table 6 shows the sufficient and optimal statistics that a golfer on the PGA tour may have to produce success. When looking at tournaments throughout the year the champions of the tournaments will often closely emulate these statistics. Some categories such as % of GIR from 200+ yards are less important than others and therefore should be less focused on during practices. For a professional this would mean that they would focus on the high irons and wedges (which are the clubs used inside 200 yards) compared to low irons and hybrids as even if they are not playing well with them, they can still see success. In order to be competitive in an 18 hole round of golf, you have to play 50% of your 18 tee shots into the fairway. Therefore it is unnecessary to go and practice the accuracy of one's tee shots to 20-30 yards in width and being able to hit a tee shot within 40-50 yards of the target would be sufficient in making the fairway at least 50% of the time. One's time would better be focused on making close to or more than 90% of their putts inside 5'.

Application to the BMW Championship

Bryson DeChambeau and Patrick Cantlay went head to head in the 2021 BMW Championship playing a total of 72 holes before finishing tied at 27 under par. This type of tie is usually resolved with a playoff hole to determine the champion. If they tie the hole, they will keep playing until a winner is determined. This tournament was special in that there was a tight 6-hole playing that showed each individual player's strategy in contrast to one another. Bryson played a very aggressive match while Cantlay let his putting takeover. Shown in Table 7, both players had great statistics that put them at the top of their field. The biggest disparity lied in how many GIR Bryson had from 100-125yards which was only 60% compared to Patrick's 91.7%. Although Bryson made more putts from 5'-10', Patrick still maintained a sufficient amount in order to keep up with the rest of the field and it is likely that his statistic is lower as he had more putts from 5'-10' as he would make more GIR than Bryson. This example shows that even it is much better to be within the "sufficient" range of many categories than being significantly lower in one

and being in the "optimal" category for multiple. If Bryson was able to make more GIR from 100-125 yards, he would have played a much more competitive match against Patrick and it is likely that they would not have even gone into a 6-hole play off.

Table 7: Comparison of Golfing Statistics between Calculated Sufficient and Optimal Numbers and Bryson DeChambeau and Patrick Cantlay from the 202 BMW Championship.

	Fairways Hit %	% of GIR from 200+ yards	% of GIR from 100-125yards	Putting % from 5'-10'	Putting % from inside 5'
Sufficient	50.0	40.0	85.0	60.0	85-87
Optimal	55-58	50.0	87.0	66.7	90.0
Bryson DeChambeau	57.1	75.0	60.0	73.3	97.8
Patrick Cantlay	66.1	72.7	91.7	62.5	100.0

Reflection

The PGA tour shows a lot of different aspects of math and statistics and emphasizes the importance of evaluating risk and reward. Unlike many other sports there are no dominating forces and all the players have a very equal chance of winning. From this investigation I hope that many golfers such as myself can see how having one skill does not reflect well on the golf course and it is the compilation of multiple skills that produce champions. Analyzing this data is meaningful because of the individualistic nature of golf and it is often difficult to take away lessons from these big tournaments. Stepping back and evaluating trends will show what really makes a PGA tour champion. An important takeaway from looking at the data is that none of the champions have perfect scores in more than one category and that reveals how unrealistic that is as well as how unnecessary it is.

A big limitation of this data is of course the variability of application as every single golf course has different approaches that will work well. As well as the fact that achieving these statistics are much easier said than done. Though there are many influencing factors in golf, including distance of club, these 5

main factors seem to show a trend between the highest scoring players and the lowest scoring players and therefore produces sufficient patterns in order to predict which players have the best chance of winning.

Appendix

BMW Championship

	Score Under Par	Fairways Hit %	GIR from 200+ yards	GIR from 100-125yards	Putting from 5'-10'	Putting from inside 5'
Patrick Cantlay	-27	66.07	72.73	91.67	62.5	100
Bryson DeChambeau	-27	57.14	75	60	73.33	97.83
Sungjae Im	-23	80.36	57.14	77.78	82.35	96.08
Rory McIlroy	-22	73.21	63.64	88.89	64.71	100
Erik van Rooyen	-21	73.21	81.82	71.43	70.59	98.08
Dustin Johnson	-20	60.71	30.77	83.33	70.59	100
Sergio Garcia	-20	78.57	72.73	90.91	72.22	97.96
Sam Burns	-19	67.86	72.73	100	66.67	96.23
Jon Rahm	-18	60.71	75	100	64.29	100
Abraham Ancer	-18	75	73.33	100	76.47	94
Alex Noren	-18	71.43	83.33	72.73	55.56	98
Webb Simpson	-17	57.14	58.82	90	52.94	98.11
K.H. Lee	-17	75	76.92	87.5	62.5	94.74
Harold Varner III	-17	64.29	61.54	70	44.44	98.25
Jason Kokrak	-16	53.57	91.67	75	75	96.08
Tony Finau	-16	57.14	54.55	90.91	66.67	98.08
Charl Schwartzel	-15	55.36	58.33	75	46.67	94.92
Kevin Na	-15	62.5	55.56	71.43	52.63	94.44
Hudson Swafford	-15	55.36	64.29	100	69.23	98.08
Viktor Hovland	-15	78.57	41.67	100	68.42	94.55
Aaron Wise	-15	64.29	61.54	100	81.25	94.55
Corey Conners	-14	82.14	50	61.54	47.06	100
Scottie Scheffler	-14	50	69.23	100	72.22	100
Justin Thomas	-14	55.36	66.67	66.67	57.89	98.25
Brooks Koepka	-14	67.86	76.92	70	47.06	100
Harris English	-13	58.93	64.29	40	50	98.31
Daniel Berger	-13	75	71.43	80	50	100
Shane Lowry	-13	67.86	58.33	91.67	56.25	100
Brian Harman	-12	80.36	73.33	87.5	64.71	96.36
Cam Davis	-12	60.71	50	83.33	69.23	96.49
Joaquin Niemann	-12	67.86	61.54	85.71	30	98.41

Si Woo Kim	-12	76.79	66.67	85.71	64.71	96.61
Sebastián Muñoz	-12	60.71	66.67	77.78	63.16	94.55
Cameron Smith	-11	69.64	52.94	84.62	56.25	100
Jordan Spieth	-11	50	58.33	60	64.29	94.92
Lee Westwood	-11	73.21	66.67	90	53.33	94.83
Patton Kizzire	-11	64.29	23.08	72.73	72.22	94.34
Paul Casey	-10	64.29	81.82	100	60	100
Charley Hoffman	-10	55.36	78.57	85.71	91.67	94.64
Stewart Cink	-10	53.57	50	71.43	75	100
Lucas Glover	-10	78.57	64.71	90	68.18	88.89
Matt Jones	-10	66.07	45.45	71.43	53.33	96.61
Louis Oosthuizen	-10	67.86	60	100	45	96.49
Jhonattan Vegas	-10	60.71	50	100	52.94	98.25
Harry Higgs	-10	73.21	15.38	81.82	59.09	96.36
Emiliano Grillo	-9	76.79	46.15	90	40	98.15
Hideki Matsuyama	-9	66.07	75	75	58.33	95.24
Chris Kirk	-8	67.86	50	60	52.38	96.55
Tom Hoge	-7	69.64	12.5	71.43	68.75	94.34
Xander Schauffele	-7	60.71	50	80	58.82	100
Marc Leishman	-6	71.43	66.67	100	60	96.83
Kevin Streelman	-5	73.21	50	87.5	47.37	98.21
Branden Grace	-5	58.93	47.06	85.71	52.17	98.25
Billy Horschel	-5	78.57	53.33	81.82	75	96.67
Cameron Tringale	-5	69.64	57.14	41.67	50	98.33
Mackenzie Hughes	-5	55.36	57.14	80	68.75	100
Keith Mitchell	-4	62.5	76.92	100	56.25	98.28
Talor Gooch	-4	62.5	66.67	83.33	50	98.31
Ryan Palmer	-4	73.21	53.33	87.5	33.33	98.36
Keegan Bradley	-3	58.93	75	62.5	35.29	95.08
Robert Streb	-3	60.71	38.46	75	57.14	98.15
Russell Henley	-3	73.21	53.33	81.82	63.64	96.3
Max Homa	-2	66.07	50	85.71	40	93.75
Maverick McNealy	-2	55.36	66.67	62.5	47.37	98.25
Collin Morikawa	-2	75	50	76.92	50	98.28
Cameron Champ	-1	60.71	72.73	70	71.43	96.61
Carlos Ortiz	-1	62.5	64.29	75	34.62	100
Kevin Kisner	-1	71.43	33.33	81.82	50	95.08

Phil Mickelson	-1	58.93	46.15	16.67	62.5	100

PGA Championships

	Score Under Par	Fairways Hit %	GIR from 200+ yards	GIR from 100-125yards	Putting from 5'-10'	Putting from inside 5'
Phil Mickelson	-6	55.36	38.46	83.33	58.33	88.89
Louis Oosthuizen	-4	51.79	44.44	87.5	73.33	60
Brooks Koepka	-4	53.57	52.63	90	64.29	71.43
Paul Casey	-2	58.93	47.37	55.56	64.29	71.43
Padraig Harrington	-2	57.14	33.33	50	58.82	60
Shane Lowry	-2	69.64	53.33	100	42.86	71.43
Harry Higgs	-2	48.21	69.23	100	69.57	100
Rickie Fowler	-1	60.71	30.43	42.86	75	100
Tony Finau	-1	58.93	41.18	75	60	80
Justin Rose	-1	69.64	29.41	50	80	100
Kevin Streelman	-1	67.86	27.78	83.33	66.67	100
Abraham Ancer	-1	82.14	31.25	83.33	52.94	100
Scottie Scheffler	-1	51.79	50	25	56.25	100
Will Zalatoris	-1	67.86	44.44	57.14	54.55	50
Jon Rahm	-1	55.36	33.33	90.91	50	100
Collin Morikawa	-1	75	37.5	77.78	66.67	40
Aaron Wise	0	58.93	33.33	83.33	61.11	50
Sungjae Im	0	73.21	52.94	50	50	50
Corey Conners	0	73.21	60	66.67	37.5	60
Keegan Bradley	0	71.43	56.25	83.33	38.89	85.71
Patrick Reed	0	60.71	46.67	75	55.56	100
Charley Hoffman	0	67.86	38.89	85.71	42.86	60
Martin Laird	1	71.43	57.89	80	45.45	75
Jason Scrivener	1	67.86	40	55.56	70.83	60
Billy Horschel	1	67.86	35	50	85.71	100
Hideki Matsuyama	1	62.5	53.33	50	68.42	88.89
Chan Kim	1	58.93	40	75	66.67	60
Patrick Cantlay	1	57.14	38.46	75	61.11	62.5
Matt Fitzpatrick	1	66.07	43.75	100	61.11	71.43
Joaquin Niemann	2	60.71	68.75	62.5	75	80
Christiaan Bezuidenhout	2	57.14	23.81	66.67	61.11	85.71

Viktor Hovland	2	53.57	64.29	87.5	71.43	100
Jordan Spieth	2	60.71	25	71.43	72.73	62.5
Matt Jones	2	57.14	17.65	57.14	66.67	100
Webb Simpson	2	60.71	30	75	70.59	100
Ian Poulter	2	57.14	50	54.55	60	100
Stewart Cink	2	53.57	42.11	33.33	64.29	
Emiliano Grillo	3	41.07	55.56	69.23	47.06	100
Branden Grace	3	51.79	33.33	71.43	72.22	100
Gary Woodland	3	50	45	100	50	62.5
Tyrrell Hatton	3	58.93	46.67	66.67	53.33	100
Richy Werenski	3	60.71	47.06	75	66.67	100
Bryson DeChambeau	3	48.21	50	42.86	46.15	66.67
Talor Gooch	4	58.93	38.1	37.5	62.5	100
Daniel van Tonder	4	66.07	58.82	80	33.33	50
Steve Stricker	4	75	40	66.67	50	66.67
Jason Day	4	75	66.67	60	69.23	80
Ben Cook	4	64.29	41.18	81.82	68.42	71.43
Robert MacIntyre	5	58.93	50	85.71	41.18	75
Rory McIlroy	5	55.36	43.75	57.14	31.58	90
Jason Kokrak	5	55.36	47.37	55.56	66.67	80
Harold Varner III	5	60.71	43.75	50	42.86	83.33
Byeong Hun An	5	55.36	25	44.44	50	100
Sam Horsfield	5	53.57	42.86	50	61.54	60
Matt Wallace	6	67.86	23.53	100	53.33	83.33
Joel Dahmen	6	64.29	16.67	66.67	55.17	66.67
Carlos Ortiz	6	57.14	25	75	63.64	50
Alex Noren	6	73.21	45	80	52.94	83.33
Dean Burmester	7	46.43	41.18	80	50	100
Robert Streb	7	60.71	26.67	60	73.68	75
Cameron Smith	7	62.5	31.25	33.33	58.82	85.71
Denny McCarthy	7	62.5	20	80	85	100
Cam Davis	7	55.36	29.41	100	50	90.91
Tom Hoge	8	60.71	36.36	75	50	63.64
Harris English	8	53.57	47.06	83.33	35.29	75
Jimmy Walker	8	44.64	31.58	60	70.59	90
Henrik Stenson	8	66.07	50	40	57.14	75
Adam Hadwin	8	64.29	36.36	83.33	61.11	87.5
Danny Willett	8	60.71	28.57	50	23.08	66.67

Garrick Higgo	8	48.21	40	77.78	62.5	66.67
Lee Westwood	9	67.86	28.57	70	70	66.67
Russell Henley	9	60.71	42.11	66.67	68.42	100
Tom Lewis	9	64.29	33.33	85.71	46.67	60
Lucas Herbert	9	51.79	47.06	66.67	68.42	80
Daniel Berger	10	64.29	41.18	57.14	46.15	80
Wyndham Clark	10	48.21	18.75	60	46.15	85.71
Brendan Steele	11	42.86	31.58	50	50	80
Brad Marek	12	53.57	45.83	50	66.67	75
Rasmus Hojgaard	13	60.71	40	57.14	64.29	81.82
Bubba Watson	14	60.71	12.5	83.33	45	100
Brian Gay	18	58.93	34.78	75	70.59	66.67

3M Open

	Score Under Par	Fairways Hit	GIR from 200+ yards	GIR from 100-125yards	Putting from 5'-10'	Putting from inside 5'
Cameron Champ	**-15**	58.93	55.56	66.67	64.29	83.33
Louis Oosthuizen	**-13**	66.07	66.67	100	50	100
Charl Schwartzel	**-13**	66.07	50	71.43	61.54	100
Jhonattan Vegas	**-13**	55.36	66.67	100	65.22	66.67
Keith Mitchell	**-12**	67.86	57.14	75	87.5	100
Ryan Armour	**-11**	76.79	60	45.45	72.22	100
Adam Hadwin	**-11**	75	50	88.89	66.67	87.5
K.H. Lee	**-11**	75	28.57	84.62	85.71	100
Mito Pereira	**-11**	64.29	100	90	66.67	66.67
Brian Stuard	**-11**	76.79	54.55	66.67	72.22	66.67
Pat Perez	**-10**	71.43	60	54.55	53.85	83.33
Chez Reavie	**-10**	76.79	63.64	57.14	61.9	25
Brandt Snedeker	**-10**	69.64	30	72.73	80	100
Jimmy Walker	**-10**	51.79	25	78.57	80	50
Gary Woodland	**-10**	58.93	50	87.5	64.71	100
Luke Donald	**-9**	51.79	40	81.82	76.92	50
Austin Eckroat	**-9**	57.14	57.14	63.64	61.54	100
Brice Garnett	**-9**	78.57	75	60	50	80

Name	Score					
Michael Gellerman	-9	67.86	54.55	62.5	41.18	77.78
Bo Hoag	-9	73.21	62.5	90.91	60	87.5
Mark Hubbard	-9	73.21	66.67	75	64.29	100
Maverick McNealy	-9	66.07	66.67	91.67	50	50
Roger Sloan	-9	67.86	42.86	75	71.43	85.71
Cameron Tringale	-9	67.86	42.86	50	81.25	40
Sergio Garcia	-8	67.86	62.5	76.92	36.84	
Adam Long	-8	80.36	55.56	87.5	50	100
Sam Ryder	-8	66.07	30	75	86.67	100
Cam Davis	-7	64.29	66.67	70	71.43	57.14
Jason Dufner	-7	67.86	57.14	58.33	64.29	71.43
Tony Finau	-7	67.86	66.67	69.23	60	100
David Lingmerth	-7	71.43	50	90	60	83.33
J.T. Poston	-7	58.93	77.78	66.67	50	100
Bo Van Pelt	-7	62.5	37.5	81.82	60	50
Jonathan Byrd	-6	60.71	80	68.75	68.75	85.71
Rickie Fowler	-6	64.29	50	76.92	82.35	100
Cameron Percy	-6	75	71.43	85.71	46.67	66.67
Patrick Reed	-6	57.14	36.36	87.5	71.43	100
Nick Watney	-6	60.71	42.86	90	40	87.5
Kiradech Aphibarnrat	-5	66.07	42.86	85.71	45.45	75
Keegan Bradley	-5	57.14	66.67	87.5	53.33	66.67
Charles Howell III	-5	58.93	71.43	100	75	60
Michael Kim	-5	42.86	60	85.71	69.23	100
Patton Kizzire	-5	67.86	33.33	84.62	57.14	60
Troy Merritt	-5	71.43	57.14	58.33	60	85.71
Patrick Rodgers	-5	58.93	57.14	55.56	66.67	71.43
Scott Stallings	-5	58.93	66.67	84.62	57.14	83.33
Michael Thompson	-5	73.21	50	54.55	69.23	100
Matthew Wolff	-5	51.79	66.67	60	66.67	100
Michael Gligic	-4	60.71	62.5	55.56	61.54	100
Beau Hossler	-4	62.5	40	75	68.75	100

Aaron Baddeley	**-3**	73.21	57.14	60	46.15	83.33
Chris Baker	**-3**	71.43	42.86	80	55.56	66.67
Ryan Brehm	**-3**	48.21	80	50	50	66.67
MJ Daffue	**-3**	58.93	83.33	88.89	75	60
Adam Schenk	**-3**	66.07	66.67	78.57	53.33	80
Camilo Villegas	**-3**	58.93	12.5	76.92	64.29	
Bubba Watson	**-3**	51.79	66.67	53.85	71.43	66.67
Rafa Cabrera Bello	**-2**	62.5	40	66.67	56.25	75
Chesson Hadley	**-2**	48.21	50	55.56	60	100
David Hearn	**-2**	58.93	54.55	60	50	75
Luke List	**-2**	50	60	86.67	37.5	90
Chase Seiffert	**-2**	75	20	57.14	55	57.14
Martin Trainer	**-2**	50	60	63.64	70	100
Erik van Rooyen	**-2**	73.21	40	71.43	33.33	100
Joseph Bramlett	**-1**	58.93	42.86	85.71	50	60
Josh Teater	**-1**	66.07	66.67	57.14	52.94	66.67
Joel Dahmen	**E**	78.57	53.85	88.89	52.94	66.67
Tom Lewis	**E**	57.14	66.67	50	66.67	83.33
Denny McCarthy	**E**	69.64	20	100	62.5	100
Sung Kang	**1**	60.71	33.33	83.33	66.67	100
Scott Brown	**5**	66.07	44.44	42.86	66.67	100
Scott Piercy	**5**	60.71	60	100	41.67	100

US Open

	Score Under Par	Fairways Hit	GIR from 200+ yards	GIR from 100-125yards	Putting from 5'-10'	Putting from inside 5'
Jon Rahm	-6	51.79	41.67	90	68.42	80
Louis Oosthuizen	-5	57.14	50	83.33	63.16	100
Harris English	-3	50	53.33	66.67	57.14	66.67
Guido Migliozzi	-2	46.43	38.46	60	47.62	83.33
Brooks Koepka	-2	51.79	30	100	62.5	88.89
Collin Morikawa	-2	71.43	50	66.67	68.18	88.89

Branden Grace	-1	50	42.86	100	39.13	83.33
Daniel Berger	-1	60.71	56.25	100	50	33.33
Paul Casey	-1	53.57	41.67	100	43.48	100
Xander Schauffele	-1	62.5	66.67	100	61.9	100
Scottie Scheffler	-1	53.57	43.75	50	78.26	83.33
Rory McIlroy	-1	51.79	55.56	50	31.25	90
Francesco Molinari	E	46.43	18.75	85.71	71.43	71.43
Russell Henley	E	51.79	46.67	100	64.71	100
Patrick Cantlay	1	44.64	50	80	63.16	100
Kevin Streelman	1	48.21	25	100	53.85	
Matthew Wolff	1	37.5	62.5	83.33	59.09	66.67
Mackenzie Hughes	1	42.86	46.15	100	75	100
Patrick Reed	2	60.71	28.57	50	72.73	71.43
Sergio Garcia	2	51.79	61.54	33.33	55	100
Charl Schwartzel	2	46.43	35.29	75	44.44	83.33
Brian Harman	2	58.93	43.75	66.67	64.29	80
Jordan Spieth	2	48.21	46.67	90.91	40	100
Justin Thomas	2	41.07	27.27	87.5	64.71	100
Dustin Johnson	2	37.5	44.44	71.43	64.71	87.5
Hideki Matsuyama	3	53.57	50	80	46.67	80
Rikuya Hoshino	3	51.79	50	50	57.89	100
Chris Baker	3	46.43	38.89	70	50	87.5
Martin Kaymer	3	44.64	47.06	100	55	100
Bryson DeChambeau	3	42.86	57.14	90	63.64	100
Patrick Rodgers	4	50	63.64	87.5	45.45	100
Dylan Wu	4	39.29	25	100	53.33	85.71
Joaquin Niemann	4	50	54.55	100	47.83	62.5
Christiaan Bezuidenhout	4	55.36	50	60	62.5	100

Edoardo Molinari	5	55.36	43.75	90	46.15	71.43
Robert MacIntyre	5	50	20	60	63.64	80
Adam Scott	5	41.07	53.85	75	58.82	100
Lanto Griffin	5	48.21	20	80	68.75	90.91
Sungjae Im	5	55.36	44.44	37.5	72.73	75
Wade Ormsby	6	67.86	33.33	100	66.67	60
Adam Hadwin	6	53.57	26.67	77.78	75	66.67
Chez Reavie	6	75	35	100	47.06	72.73
J.T. Poston	6	51.79	42.86	75	50	100
Si Woo Kim	6	66.07	29.41	62.5	47.83	75
Ian Poulter	6	64.29	38.89	66.67	55.56	75
Rick Lamb	7	57.14	30.77	100	69.23	80
Tom Hoge	7	66.07	50	71.43	63.16	66.67
Dylan Frittelli	7	41.07	42.86	80	70	90
Lee Westwood	7	60.71	28.57	58.33	61.9	83.33
Tommy Fleetwood	8	37.5	53.33	25	50	100
Gary Woodland	8	58.93	21.43	100	45.83	85.71
Rafa Cabrera Bello	8	53.57	60	83.33	70	77.78
Bubba Watson	8	53.57	33.33	83.33	61.9	62.5
Richard Bland	8	71.43	41.18	50	61.54	88.89
Kevin Kisner	9	50	42.86	90	55	85.71
Taylor Montgomery	10	57.14	36.36	62.5	66.67	100
Akshay Bhatia	10	53.57	35.71	54.55	57.14	50
Stewart Cink	10	41.07	25	77.78	56.52	100
Charley Hoffman	10	42.86	33.33	88.89	50	80
Jhonattan Vegas	10	46.43	27.27	90	63.64	28.57
Phil Mickelson	11	51.79	43.75	80	57.14	66.67
Greyson Sigg	11	44.64	57.14	63.64	50	83.33
Marc Leishman	12	42.86	35	100	64.71	77.78
Matt Jones	13	39.29	13.33	77.78	56.25	71.43
Troy Merritt	13	48.21	30	85.71	68.42	66.67
Shane Lowry	13	42.86	64.29	77.78	25	77.78

Wilco Nienaber	14	35.71	28.57	90	59.26	40
Kyle Westmoreland	14	26.79	53.85	50	60	80
Jimmy Walker	19	39.29	37.5	50	57.14	75