

# Do Name Brand Golf Balls Differ In Spin Rate & Carry Distance?

## **Abstract**

Golf has evolved to a game of ever changing technology with new balls and clubs being released every few months. As a professional sport, technology has pushed the game of golf to new heights with clubs and balls providing more distance and forgiveness than ever before. However, for the amateur and even the professional golfer, finding the best golf ball is not an easy task. As consumers of the game of golf, people are faced with many decisions when it comes to selecting the ball they play. Many of the top brands advertise claims about their balls; however, with every golfer having a different swing and needs from the golf ball they play it becomes hard to see if these claims hold. In our experiment, we set out to find if there are significant differences in carry distance or spin rate among three of the most popular brands of golf balls.

## Background

In our experiment, we set out to test and see if there are differences between three of the most popular golf balls: Taylormade TP5, Titleist Pro V1, and Callaway Chromesoft. As you reach higher levels of golf every inch counts, and understanding key differences in spin rate and carry distance can play a big influence on a players' score. Golf balls are designed with subtle differences that cause differences in distance and spin. In addition, a player's swing might make it more or less beneficial to add more or take away some spin or distance. We set out to analyze these subtle differences to further investigate some of the claims made by golf ball brands regarding their balls distance or spin. All three of these brands market their balls as having low driver spin to increase distance while maintaining a soft feel that has high spin around the greens on wedge shots. We set out to determine if these claims are true, and if the brands have significant differences in overall carry distance and/or spin rate.

In previous research, a company called MyGolfSpy performed a study on 37 different golf balls by using a robot that could simulate golf shots at different speeds. In total the robot hit over 4,500 shots and it took over 60 hours to accumulate the data. Some key takeaways from the data that was collected is that different swing speeds can influence which ball might be a better fit for different golfers. In addition, they came to the conclusion that the spin between a driver and wedge are usually the same. They said this regarding their claim, "While ball manufacturers often differentiate between driver and iron/wedge spin, the reality is that, if a ball spins off a driver, it's going to spin off irons and full (and even partial) wedge shots, too. For this year's test, we switched from a 7-iron to an 8-iron and moved our wedge distance to 55 yards. Our hope was that with the higher-lofted clubs and shorter wedge shots, we'd see greater spin differentiation through the bag. We didn't." This is a very interesting study that takes a deeper dive into similar research. Studies like this helped spark our research question to research a small part of the golf ball market.

## Methods

### *Data Preparation*

We started by recruiting 6 participants (3 male and 3 female) who each had at least some golfing experience. We had each participant hit 54 shots with the following breakdown:

- 18 Driver (6 Titleist Pro V1, 6 TaylorMade TP5, 6 Callaway Chromesoft)
- 18 7-iron (6 Titleist Pro V1, 6 TaylorMade TP5, 6 Callaway Chromesoft)
- 18 Pitching Wedge (6 Titleist Pro V1, 6 TaylorMade TP5, 6 Callaway Chromesoft)

We made sure to randomize the order of each club and ball pairing by assigning a number to each grouping of 6 shots and generating a random order for each different participant. In order to gather the data, we used a trackman device which is a golf simulator that can track a wide variety of stats including our focus of carry distance and spin rate.

### *Variables*

To start, the variables we are using as our response variables are carry distance and spin rate. Carry distance is the distance the ball travels in the air before hitting the ground. Spin rate is the number of rpm (rotations per minute) that the ball rotates in the air after being struck. The

clubs we used here were a driver, 7-iron, and pitching wedge which are all designed to go a different distance and produce a different spin. The three major brands we used golf balls from are Titleist, TaylorMade, and Callaway with their premier golf balls being Pro V1, TP5, and Chromesoft respectively.

### *Statistical Analysis*

We performed two different ANOVA tests, one to test each of the different response variables. In the first, using carry distance as a response variable, we tested to see if there was a significant difference across the three golf balls or if there was any interaction between the ball and the different clubs used. In the second test, we analyzed the same factors to find differences in spin rate. We designed this experiment using factorial design testing for the effects of Ball, Club, and their interaction all blocking upon the golfer to account for differences in ability and/or other factors between each participant.

## **Results**

### *ANOVA Assumptions*

In both the ANOVA tests we performed, we checked the residual vs. predicted value plot to ensure that our groups had a similar within group variance as well as checked the qq plot to ensure that our residuals had normality. In the appendix C, we can see these two graphs. In the top graph we can see that the within group variance is fairly similar throughout all observations which satisfies that assumption. In addition, in the qq plot we can see that it is a nearly linear line showing normality in our residuals.

### *ANOVA Test: Carry Distance*

As you can see in appendix A Figure A, we found significance in both club and golfer which was expected as clubs are designed to hit the ball different distances. However, in our variable of interest (ball), we did not see a significant difference between balls' carry distance (P-value = 0.1563). This means that across the three different balls, one did not travel significantly further or shorter than any of the others. We also did not see a significance in the interaction term. Meaning that across the different clubs there was no significant difference in the balls. This is an interesting result as it shows that across these three similar balls they travel similar distances in general but also across the different clubs we used in the study.

In the appendix B figure A, we performed a multiple comparison test where the brand of ball has no significant impact on the carry distance of golf shots. Each of the brands tested provided very similar distance numbers, showing that players looking to increase distance should experiment with swing changes or different clubs.

### *ANOVA Test: Spin Rate*

In our second test using spin rate as a response, we found significance in all three variables (club, golfer, and ball) but not the interaction between ball and club. An important takeaway being that we found a significant difference between the spin rate when you changed the brand of ball. However, we did almost find significance in the interaction here but it did not satisfy the arbitrary threshold of .05. See appendix A figure B Furthermore, this interaction

relates largely to the claims made by these large golf brands. Many of these brands advertise their ball as “Low spinning with a driver and high spinning with a wedge”. However, we cannot support the claim that any of these balls fulfill that claim significantly better than any of the other balls. It was interesting though that the spin rate is different across these three different balls. Furthermore, a multiple comparison test shows that the Callaway Chrome Soft created significantly more spin than the Titleist and Taylormade flagship golf balls. This is shown in the Appendix B figure B.

## **Discussion**

### *Conclusions*

Ultimately, we are unable to say that any one of these golf balls is superior to the other two that we tested. In terms of distance, we found that all three were very close in their carry distance. In spin rate, our big conclusion here is that the Callaway ChromeSoft had significantly more spin than the other two balls. So, if a golfer was not getting enough spin on their ball this study would suggest that they could switch from using a Pro V1 or TP5 and could get more spin. On the other hand, if a golfer was putting too much spin on their ball and potentially losing distance they might be able to use a Pro V1 or TP5 to spin it a little less.

Another interesting conclusion of our research is that there is not a significant interaction between spin rate and club. With each brand advertising “elite” spin control (high spin wedge shots and low spin drives) meaning that the brands did not distinguish themselves in the discussion of spin control. Perhaps the brands tested provided this control equally well, as this would not come as a surprise as they are all top tier golf balls for their companies. The importance of this spin control is very important to professionals, and lets us know that it is likely that these three balls offer similar enough spin control. With that, players can worry less about the quality of the ball when choosing a sponsorship or partnership deal with a brand and focus on other factors.

### *Further Research*

Going forward, research should examine the differences of different models of golf balls within brands (ex. ProV-1/ProV-1X/AVX) for differences in similar metrics. It is less surprising that the top line balls of each brand are similar in the attributes we measured as they are similar in price (which likely reflects quality). Moving forward, it would be interesting to research balls across many different price ranges as well as different models of golf balls from the same brand to see how technology evolves. On the same hand, if we had more time and participants we could have tested more golf balls across many different levels of golfers which would be an interesting research idea in the future.

Another, interesting idea for research in the future would involve testing brand of club with brand of ball to analyze whether an interaction exists there. Essentially, we would be looking to see if brands design their products such that they have network externalities, meaning that a Titleist ball hit with a Titleist club will go further or have better spin control than the same ball hit with a different brand of club. Obviously, this would take more time and investment, but could be applicable to advise amateur golfers (those most likely to mix and match brands) on what products they should be purchasing.

## References

*Best golf balls 2021*. MyGolfSpy. (2022, May 9). Retrieved May 18, 2022, from [www.mygolfspy.com/best-golf-balls-2021/](http://www.mygolfspy.com/best-golf-balls-2021/)

## Appendix A

### ANOVA Tables

Figure A: Carry Distance

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Club	2	472362.1171	236181.0585	1373.89	<.0001
Ball	2	642.0249	321.0124	1.87	0.1563
Golfer	5	156899.9576	31379.9915	182.54	<.0001
Club*Ball	4	605.1086	151.2772	0.88	0.4761

Figure B: Spin Rate

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Club	2	1817657051	908828526	1022.76	<.0001
Ball	2	10444204	5222102	5.88	0.0031
Golfer	5	150410942	30082188	33.85	<.0001
Club*Ball	4	7141554	1785389	2.01	0.0931

## Appendix B

### Multiple Comparisons using Tukey

Figure A: Carry Distance

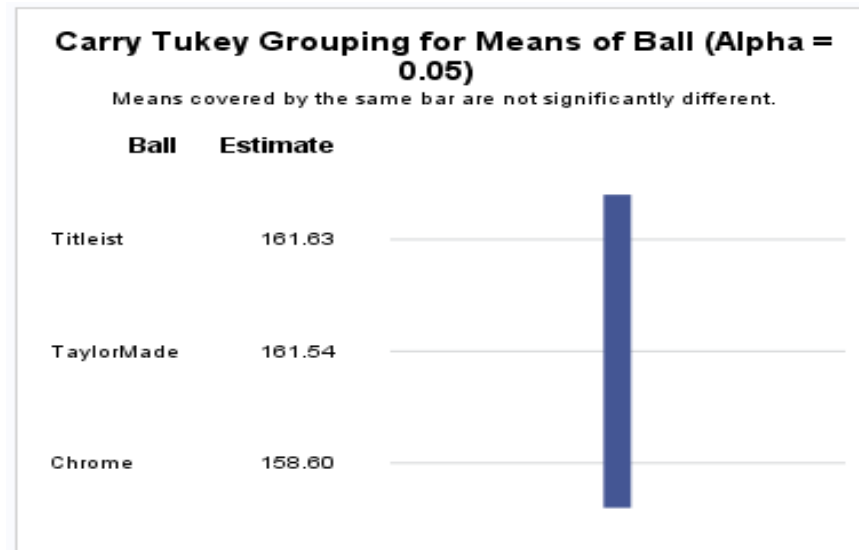
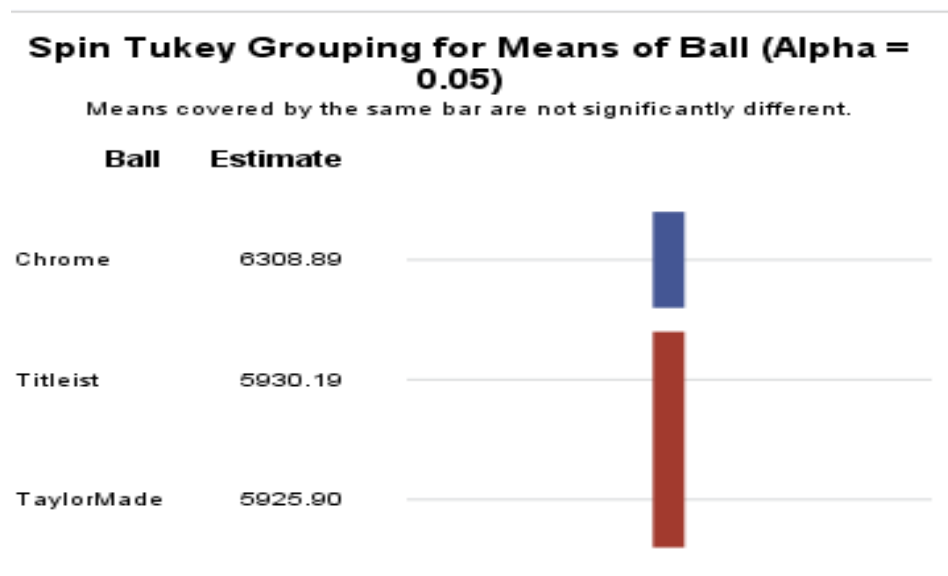


Figure B: Spin Rate



## Appendix C

Figure A: Carry Distance Assumptions

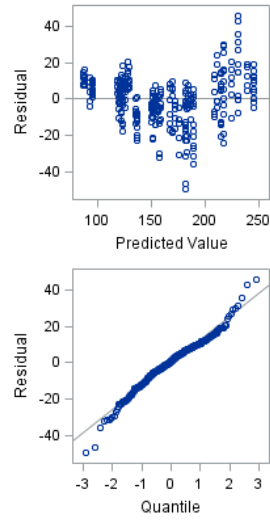


Figure B: Spin Rate Assumptions

