

# Do NFL Referees Affect Games?

Memphis Lau

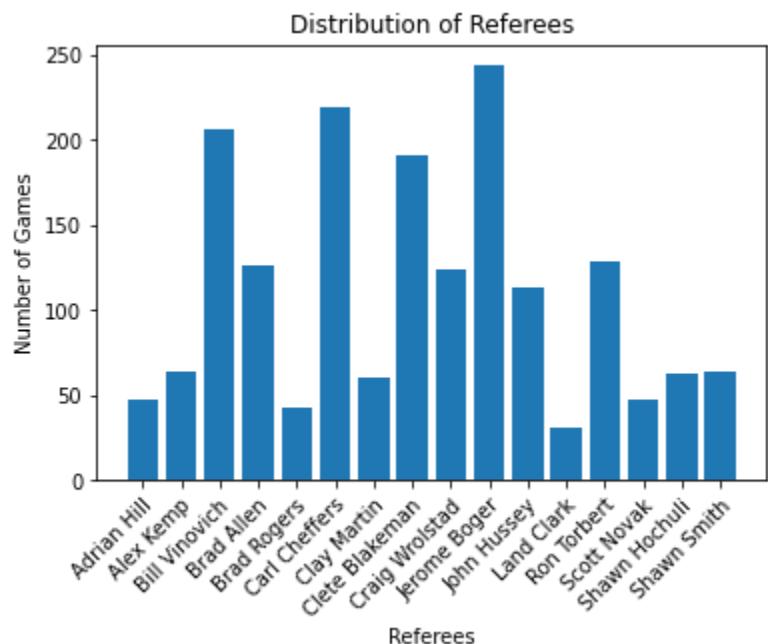


Referee Carl Cheffers, source:  
<https://www.sharpfootballanalysis.com/wp-content/uploads/2023/01/Carl-Cheffers-ref-Super-Bowl.jpg>

Seemingly every game, fans of a losing team will blame the referees. But, how true can that statement really be? The role referees play in any sport, and especially the sport of American football, is crucial. A single call, whether correct or incorrect, can change an entire game, shifting momentum or even deciding the outcome. Just in the most recent SuperBowl this February, in the most important third down of the game, the refs called a pass-interference on Eagles CB James Bradberry. As a result, the Chiefs extended their drive and were able to win the game. Referees have the power to influence so much in the sport. This article explores referees of the National Football League: all that were active for the most recent 2022-2023 season. We examine all of the games ever reffed by them, finding patterns and giving betting tips.

## I. About the Data

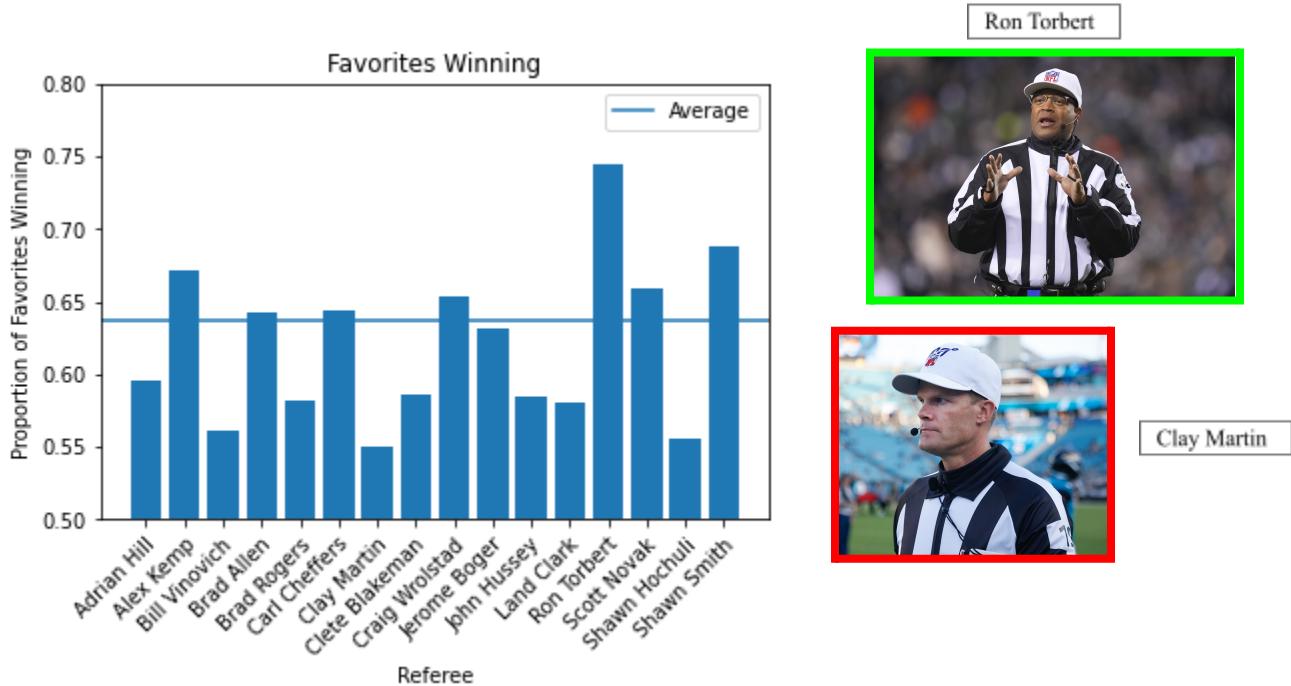
This dataset has the games of 16 different referees from 18 seasons— from 2004 to 2022: Adrian Hill, Alex Kemp, Bill Vinovich, Brad Allen, Brad Rogers, Carl Cheffers, Clay Martin, Clete Blakeman, Craig Wrolstad, Jerome Boger, John Husey, Land Clark, Ron Torbert, Scott Novak, Shawn Hochuli, and Shawn Smith.



This dataset has games across 18 seasons, with 73 playoff games. In approximately 50% of the games, the favorite has covered the spread (more on this later), and in 50% of the games, the total score went over the projected total.

## II. Referees and Favorites Winning

Do certain refs favor the underdog? Do some happen to ref in a lot of games with the favorite winning? The following plot shows my findings:



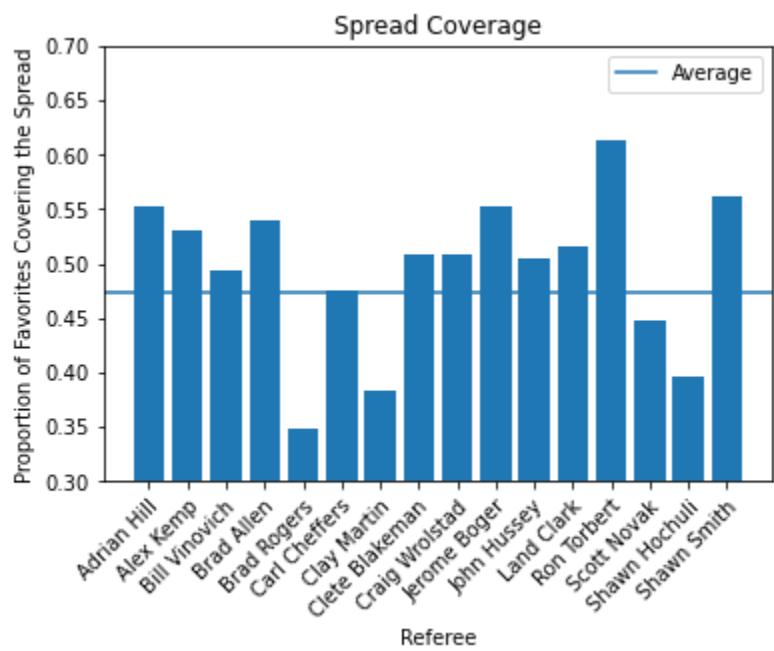
The results show that on average, ~64% of the games in our dataset result in favorites winning outright, a reasonable percentage. Ron Torbert deviates far from this line, as about 75% of the games in which he referees end with the favored team winning. Referees like Clay Martin, Bill Vinovich, and Shawn Hochuli have lower percentages, as all of them see underdogs winning at least 43% of the time. Of course, there is no evidence of these referees “liking” underdogs more: this is just what the data says. Overall, each referee’s games have the favorites winning at least 55% of the time, so there are no real alarming numbers here.

However, having a favored team win is somewhat variable, as sometimes a team may be much better than another and expected to blow the opponent out, while other times a team may be favored only by a little. A much better metric to look at (especially for sports bettors) is the spread.

### III. Referees and the Spread

The spread is a mechanism used by sportsbooks to leverage the skill levels of two opposing teams. Assume two completely evenly skilled teams match up. Then it will be a 50/50 chance that either one wins, and it makes sense that betting on either team to win will be of equal risk and reward. However, this situation of evenly matched teams is very rare. A team may actually have a 75% chance to win a game against a worse opponent. To make up for this and maintain the 50/50 bet that we all know makes sense intuitively, sportsbooks use the "spread". They declare a point total that the favored team must win by. This is calculated as a new 50/50 chance to happen. For example, if the spread is 3.0, then the favorite must win by more than 3 points to cover the spread. For a betting person, if they bet that the favorite would cover the spread, then they can only make money if the favorite wins AND wins by more than the spread.

For the sake of this project, we will not be considering when a spread is pushed. This is when a spread is, for example, 3.0, and the favored team wins by exactly three points. In this case, the bettor would receive his or her money back as a refund. This happens in only 40 of the 1732 games in the dataset, and hence will not be considered.



The proportions of spread coverage amongst the different referees in this dataset are not significantly different. The highest proportion is Ron Torbert at 61.24% of his officiated games having the favorite cover. The second highest is Shawn Smith at 56.25%. Both of these numbers are not too far from the expected 50%. However, when Brad Rogers is officiating, history shows you may want to bet the underdog, as they cover over 65% of the time.

#### IV. Alarming Team Win Rates

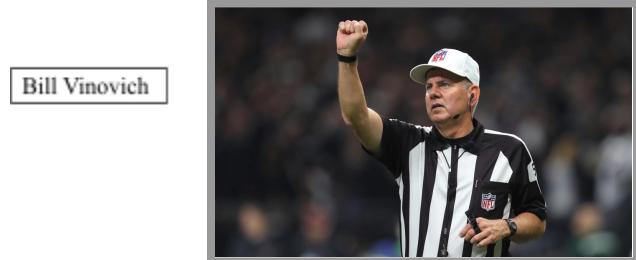
With the chart above, we can see which referees have higher percentages of favorites covering the spread. But, how about their patterns with certain teams? Again, for this section, we will be looking at teams' rate of covering the spread, since this is a more even metric. Note: these statistics are NOT a reflection of whether any ref has any true biases.

Below are all of the referee-team pairings in which the team has played at least 10 games under the ref and has covered the spread at least 70% of the time.

Name	Team	Total Games	Wins	Percentage
Bill Vinovich	lv	10	7	0.7
Bill Vinovich	ne	14	10	0.714286
Bill Vinovich	ten	10	7	0.7
Clete Blakeman	atl	10	7	0.7
Craig Wrolstad	dal	10.0	7	0.7
Jerome Boger	bal	16	12	0.75
Jerome Boger	dal	16	12	0.75
Jerome Boger	ind	10	8	0.8
John Hussey	no	10	7	0.7
Ron Torbert	car	10.0	7	0.7
Ron Torbert	pit	11.0	8	0.727273



Jerome Boger



Bill Vinovich

Considering that the expected probability of a team covering the spread is 50%, any pattern over 70% is alarming. The Raiders, Patriots, and Titans tend to win more often when Bill Vinovich is reffing. It's a good bet to support the Ravens, Cowboys, and Colts when Jerome Roger is a ref.

Now, let's look at the opposite: ref-team pairings where the team has only covered the spread 30% or less.



Craig Wrolstad



Brad Allen

Name	Team	Total Games	Wins	Percentage
Bill Vinovich	buf	11	3	0.272727
Bill Vinovich	jax	10	3	0.3
Bill Vinovich	lar	18	4	0.222222
Bill Vinovich	mia	11	3	0.272727
Brad Allen	atl	11.0	3	0.272727
Carl Cheffers	cle	11	3	0.272727
Carl Cheffers	det	10	3	0.3
Craig Wrolstad	den	11.0	3	0.272727
Craig Wrolstad	lar	10.0	3	0.3
Craig Wrolstad	mia	10.0	2	0.2
Jerome Boger	cin	14	4	0.285714
Jerome Boger	ten	20	6	0.3

Use the above table to know when to bet underdogs when certain teams are playing and certain referees are on duty.

John Hussey



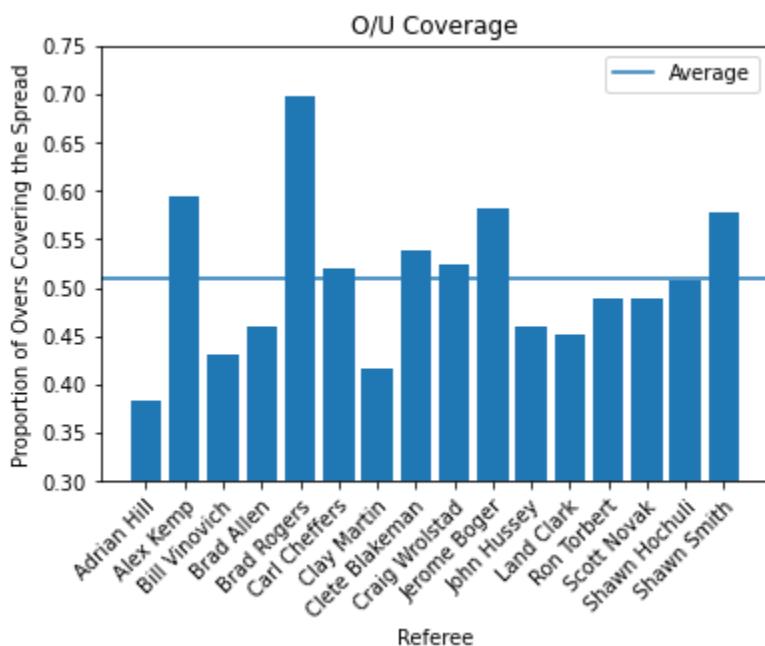
Some other notable findings: In the 8 games in which the Chicago Bears have played with Bill Vinovich as a ref, they have failed to cover the spread every single time, as a favorite and an underdog. In all 5 games the Carolina Panthers have played under officiating from John Hussey, they have also not been able to cover the spread.

However, with John Hussey as the ref, the Philadelphia Eagles are five for five in covering the spread. Similarly, in the five games in which Shawn Hochuli was officiating the New England Patriots, the Pats have covered each time.

## V. Referees and the Over/Under

The other most popular line to bet is the over/under line. Based on teams' offenses, teams' defenses, weather, injuries, and more, sportsbooks calculate a number to represent the total number of points scored between two teams in a game. Bettors then choose whether the total will be over or under this number.

As imagined, referees can have a huge impact on this number. By throwing more penalties, they extend games and increase opportunities to score. By missing calls, they can influence a game to go under the projected total. Below is a graph of how often each referee's games go over.



Brad Rogers' numbers scream out at you first. His games go over the projection 70% of the time. Betting this may be profitable.

On the other hand, Adrian Hill's games go under the total 62% of the time.

## **VI. Conclusion**

So, while referees are supposed to be as fair as possible, our data has shown that some can deviate from the mean and probably affect games more than they should. All of our findings are strictly based on correlation, NOT causation. Thus, we have no evidence that any referee is actively rigging any games, purposely forcing games to be over the projected line, or favoring the underdog.

These are simply interesting patterns to look out for when betting games or just watching them. I hope this article encourages you to look up a game's referee lineup before the coin flip and see if these patterns hold.