

Home Field Advantage Often Overestimated In College Football

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2008 Air Force-Navy game. Credit: Dave Ahlschwede, US Air Force

This year, many of college football's biggest rivalry games take place over Thanksgiving weekend. A win earns bragging rights for the year. Visiting teams are often thought to be at a considerable disadvantage, especially in the disruptive environment of a rival's home stadium.

In terms of points, however, that disadvantage is probably less than they think. Recent research claims that commonly accepted figures overestimate the home field advantage in major college football.

"If you go to Las Vegas or even on [the ESPN pregame program] "GameDay," they usually give about a field goal or a little more advantage to the home team," said John Kros, an operations researcher at East Carolina University in Greenville, N.C. His research computes the average advantage to be about 2.3 points.

Conducted with two collaborators, Kros' research focused on more than 100 rivalries dating back at least 30 years in the highest division of NCAA college football. Researchers discarded games played at neutral sites and any rivalries in which opponents did not meet each year.

"We [used] 30 years because statisticians give that the stamp of approval in terms of smoothing out assumptions," said Kros.

For each long-term rivalry, Kros calculated the average margin of victory over all of the games hosted by the first or "home" team. Then they did the same for games hosted by the second or "away" team. By subtracting these two averages and dividing by two, they computed an estimate of home field advantage for each rivalry.

Over all 100 rivalries, the advantage of playing at home tended to cluster around 2.3 points. Kros found a similar result when calculating the median (the mid-point of an ordered list from worst loss to largest margin of victory) instead of the average for each situation.

"Something's showing up, I can tell you that," said Kros. "It's definitively different from zero."

Attempting to find a universal number for home field advantage is difficult for a variety of reasons, including the yearly turnover of players and coaches, the differences in team quality and the structure of the schedule.

Compared to other popular sports, the data from college football is much less interconnected. There are 120 teams in the top division. Teams almost never meet twice in a year like NFL division foes, and nowhere near as many times as MLB or NBA teams.

Kros used 30 years of scores to bulk up his data. This approach may

make his findings more useful than broad approaches that consider every game, especially for long-established rivalries. However, his technique includes its own implicit assumptions.

"I worry a little bit about [this method] oversimplifying with just the game results and not including some measure of team strength in the calculations," said Rick Wilson, an operations researcher at Oklahoma State University in Stillwater. He published a paper about improving the major college football ranking methods, and although he hasn't included home field advantage, it is something he spends time thinking about.

Wilson suggested that including home field advantage is necessary to develop a "holy grail of objective measure" to describe the strength of a team, improving the rankings used to determine the competitors for the BCS championship game.

Like many fans, however, he would prefer a six or eight team playoff.

"There's been a little bit out there written on [home field advantage] and most people, they haven't taken some of the other biases out," said Kros. He thought it was critical to remove games in which teams from larger conferences invite clearly inferior teams to their stadiums without any intention of scheduling a corresponding away game, because those games tend to be blowouts and would skew his analysis.

Finding the home field advantage for every individual [college football](#) team or opponent may be impossible. "It's a dilemma because we think we know that [the advantage is] more in one place than others, but we don't have enough data to really, truly, by the laws of statistics validate that," said Wilson.

To refine his calculations, Kros is considering looking at the problem from a couple of new angles. He plans to investigate the impact of

basing the calculations on 20 years instead of 30, and whether or not the distance the visiting team traveled to the game makes a difference.

"Oftentimes as researchers there's conventional wisdom that something exists, but sometimes we either can't measure it, or we haven't gotten smart enough to know what to measure to try to figure out its impact," said Wilson.

"Deep down inside, subjectively, I think there's some home field advantage," said Kros. "The mathematics is not very difficult. You just have to keep everything straight."

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