

Researcher finds sports events are surprisingly predictable

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November 1 marked the end of Major League Baseball in 2015, as NBA basketball launched its 2015-2016 regular season on October 27. If you're following the games this year, you may want to watch for patterns predicted by recent SFI research. For example— if your NBA team's up 18 points at the half, chances are pretty good they're going to win. In fact, their lead is 90 percent safe. What's more, if they blow such a comfortable lead, they'll probably do it late in the fourth quarter.

Those are some of the findings of research by SFI Professor Sid Redner, External Professor Aaron Clauset (CU Boulder), and Boulder graduate student Marina Kogan. But the really incredible insight, Redner says, "is that apart from some technical details, basketball scoring conforms to a randomwalk process" – essentially, it's a series of coin flips, with a few

modifications to account for alternating possession and the teams' relative strengths.

Redner and Clauset each has a history of slightly offbeat research. In recent years, Redner has studied such topics as the role of Luddism on innovation diffusion, sperm search dynamics (see story on this page), and the best strategy for capturing skittish lambs. Clauset has worked on everything from friendship networks in the online combat game Halo to academic hiring biases.

Relying on the wealth of data generated by professional sports, Clauset, Kogan, and Redner recently turned their attention to the dynamics of scoring in sports. As a starting point, they studied scoring in basketball and other sports as a random walk.

Remarkably, they found, all of these follow the same probability distribution: the total amount of time a team holds the [lead](#), when during a game the leading team is up by the most points, and the time of the last lead change. The last lead change is by far most likely to happen very early or very late in a game, and with high probability, teams post the biggest leads either near the start of a game or near the end of a game. Similarly, chances are a team will be up for either most of the game or very little of it.

Those results line up well with scoring data from the NBA and from the NFL, MLB, and NHL, which might not be a good thing for fans. Leads, the researchers conclude, are far safer than sports experts and aficionados might think, and following anything but the start and end of a game is a little like watching ten players flip coins for 45 minutes.

More information: A. Clauset et al. Safe leads and lead changes in competitive team sports, *Physical Review E* (2015). [DOI: 10.1103/PhysRevE.91.062815](https://doi.org/10.1103/PhysRevE.91.062815)

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