

Does the 'Hot Hand' Exist in Basketball?

A New Study Says Yes—Sometimes Shooters Really Are 'Feeling It'

[Ben Cohen](#) Feb. 27, 2014 6:01 pm ET



Illustration by Orlando Arocena

It was a shooting performance so incredible, even veteran basketball experts had never seen anything like it.

In a game last month at then-No. 4-ranked Villanova, Creighton senior Ethan Wragge swished a three-pointer on his team's opening possession.

The next time down the court, he hit a deeper shot. At that point, Wragge wanted a third "because I feel like it's going in no matter what." He was right. Wragge's next four shots didn't miss, either. He scored 21 of his team's first 27 points in the Bluejays' 96-68 rout.

He also became the latest example of a phenomenon that many people say doesn't exist: the hot hand.

This sensation is familiar to anyone who has ever played or watched basketball. A player with the hot shooting hand seems to enter an ethereal zone, an inexplicably heightened state of ability in which he is unstoppable.

For years, though, academics have dismissed the hot-hand theory as basketball's version of Bigfoot. Almost everyone in the last three decades who had hunted for hard evidence of streakiness had come up empty. Instead, they say, belief in the hot hand is a case of people mistakenly seeing patterns in randomness.

But new research using previously unavailable data is heating up the debate. It turns out that popular intuition about the hot hand may have been right all along.

In a paper to be presented this week at the Sloan Sports Analytics Conference, an annual convention of sports eggheads hosted by the Massachusetts Institute of Technology, three recent Harvard students say they have discovered a "small yet significant hot-hand effect," overturning years of previous studies on the topic. The paper, which is pending peer review, was written by Andrew Bocskocsky, John Ezekowitz and Carolyn Stein, who all graduated from Harvard in the spring of 2013.

They devised a formula that, for the first time, controls for variables such as a shot's location and a defender's position to better understand its difficulty.

The hot-hand effect was masked in the past by the players themselves, the authors contend, since many attempted lower-percentage shots when they were "feeling it," as the announcer Marv Albert would say.

After analyzing shots in better detail—they surveyed more than 70,000 from the last NBA season and cross-referenced them against play-by-play summaries—the authors say a player can be more likely, not less likely, to make his next shot if he has made several in row. Their hot-hand estimate ranges from a 1.2 to a 2.4 percentage-point increase in likelihood.

The findings may have persuaded skeptics to reconsider their position. Cornell psychology professor Thomas Gilovich, the lead author on a 1985 paper that found no evidence of streak shooting, said this paper has intrigued him in a way that similar efforts haven't.

"It's opening up a new chapter in this 30-year-long tale," he said, "and it may be the most interesting chapter."

The twist in this long-running saga is the result of the complex data flooding sports these days. Gilovich's study with Robert Vallone and Amos Tversky was based on one season of shooting numbers provided by the Philadelphia 76ers, an examination of three years of Boston Celtics free throws and a controlled experiment with Cornell players. The reason the authors chose the 76ers as their guinea pigs was far from scientific. NBA statistics were so primitive at the time, Gilovich said, that the 76ers were the test subjects by default: They were the only team that kept useful records of their jump shots.

But statheads say they are now benefiting from a numbers glut. The data driving the latest hot-hand paper comes from the high-resolution, missile-tracking cameras recently installed in every NBA arena that log location coordinates of each player multiple times per second. This essentially turns

an ordinary game into a trove of data.

The information overload allowed the paper's authors to mine previously unexplored territory. Other recent studies have determined hot-hand effects among baseball hitters and free-throw shooters. But a player "heating up" or being "on fire" from the field represents the advance from the Harvard co-authors. In basketball, they say, all shots aren't created equally or independently. By separating easier shots like open layups from difficult shots like contested three-pointers, they say, they fixed a problem that may have skewed past studies.

Last year, Larry Summers, the former Treasury secretary and Harvard president, mentioned the hot-hand fallacy in a meeting with Crimson athletes. But in an interview this week, he said the new conclusion has implications broader than basketball.

"Better data plus better statistical techniques means we're going to understand the world much better," Summers said. "Statistics will be the science of the first half of the 21st century."

While the recent research focused on the NBA, the power of the hot hand may be greatest in the upcoming NCAA tournament.

College-basketball games are eight minutes shorter than NBA games, and the shot clock is 35 seconds instead of 24. This reduces the number of times each team has the ball, and thus increases the odds of an upset in the single-elimination NCAA tournament if an underdog team gets "hot." It also can help a postseason favorite like eighth-ranked Creighton, which is tops in the country in three-point percentage.

Wragge himself said he is a believer. "It's like the automatic, unconscious feeling," he said. "If I hit two in a row, I bet the third one almost always goes

in."

Yet the authors of the study still caution that the hot hand is a rare phenomenon—and that players might want to rethink forcing bad shots simply because they feel like they can't miss. "The reality of the hot hand," Stein said, "is still a lot smaller than the idea people have in their head."

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