# Athletes' winning streaks may not be all in our -- or their -- heads 

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When an athlete consistently does well, sports commentators may describe them as being "hot" or "on fire." Scientists have debunked these streaks as being in the eye of the beholder, but a new study by Yale School of Medicine researchers supports the "hot hand" phenomenon: that a streak of positive outcomes is likely to continue.

Published online today in the journal PLoS ONE, the study analyzed five years of NBA free throws that support the "hot hand" phenomenon. Gur Yaari, postdoctoral associate in the Department of Pathology at Yale School of Medicine, and colleague Shmuel Eisenmann, investigated the common belief among basketball players and fans that players' probabilities of hitting a shot are greater following a hit than following a miss on the previous shot. Past studies found that the data does not support this phenomenon and concluded that human subjects misperceive random sequences and tend to attribute non-random patterns to completely random data.

Yaari and Eisenmann used a large data set of more than 300,000 free throws to show strong support for the "hot hand" phenomenon at the individual level. They analyzed all free throws taken during five regular seasons NBA seasons from 2005 to 2010. They found that there was a significant increase in players' probabilities of hitting the second shot in a two-shot series compared to the first one. They also found that in a set of two consecutive shots, the probability of hitting the second shot is greater following a hit than following a miss on the previous one.

According to Yaari, the presence of the "hot hand" phenomenon in basketball data is due to better and worse periods of the players. These periods are possibly determined by other factors rather than a causal connection between the result of the previous shot and the result of the current one. Yaari said that since the number of free throws taken by one player in one game is low, in order to decide between these two options, further research from other setups is needed.
"Our results set the stage for further physiological and psychological investigations of the origin of this phenomenon," said Yaari. "While the example we studied came from the sporting world, the implications are much more far reaching."

## More information: PLoS ONE

http://www.plosone.org/article/info\%3Adoi\%2F10.1371\%2Fjournal.pon e. 0024532

## Provided by Yale University

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