



Baseball and jet lag: Correlation does not imply causation

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My attention was drawn to the recent article by Song et al. entitled “How jet lag impairs Major League Baseball performance” (1), not only by its slightly unusual subject but more importantly because I wondered how one could ever actually prove the effect of jet lag on baseball performance.

In this paper, Song et al. (1) manage to refine the results obtained by Recht et al. as early as 1995 (2), showing that eastward travel correlates with decreased performance. Specifically, by making use of elaborate statistics on the very large amount of Major League Baseball record databases available online, Song et al. (1) found statistically significant correlations of eastward travel with several variables related to home-team offensive performance, as well as with “home runs allowed” for both home and away teams.

Although I do not dispute the large amount of work involved and would be well-nigh incapable of judging the validity of the analyses performed, I must admit that I was taken aback by the way Song et al. (1) systematically present the correlations they identify as direct proof of causality between jet lag and the affected variables. It is actually quite remarkable to me that the word “correlation” does not appear even once in the paper, when this is actually what the authors have been looking at and, in my opinion, to be scientifically accurate, the title of the article should

really read: “How jet lag correlates with impairments in Major League Baseball performance.”

Given the very large amount of literature on correlations between jet lag and decreased athletic performance in a whole variety of sports, I am of course not disputing that jet lag is the most likely cause for the effects recorded. And looking at the title of the articles in the reference list of the Song et al. (1) report, this tendency to amalgamate correlation with causality is apparently extremely frequent in this field of investigation. But given the broad readership of PNAS and the subject of this article, I feel that it is likely to be relayed by the press and to attract the attention of many people, both scientists and nonscientists.

Considering the current tendency to misinterpret scientific data, via the misuse of statistics in particular, I feel that a journal such as PNAS should aim to educate by example, and thus ought to enforce more rigor in the presentation of scientific articles regarding the difference between correlations and proven causality.

For anyone needing to be convinced that strong correlations do not necessarily prove causality, and to finish on a more light-hearted note, I invite them to visit the website of Tyler Vigen, which provides some pretty interesting examples of spurious correlations (www.tylervigen.com/spurious-correlations).

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- 1 Song A, Severini T, Allada R (2017) How jet lag impairs Major League Baseball performance. *Proc Natl Acad Sci USA* 114:1407–1412.
2 Recht LD, Lew RA, Schwartz WJ (1995) Baseball teams beaten by jet lag. *Nature* 377:583.

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