<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5307448/>

Here, we examined data from Major League Baseball (MLB) where players frequently travel long distances in the east–west direction. Overall, our findings demonstrate how circadian misalignment can impact specific features of human performance in natural settings.

N of 20 seasons.

**Jet lag was determined by the number of time zones crossed and the number of days since travel, following the general rule of thumb that human circadian clocks resynchronize toward their destination time at a rate of ∼1 h/d. Jet lag group defined as 2+ hours of jet lag.**

We also considered jet-lag effects as a function of eastward or westward direction of travel.

In our analysis, we analyzed home- and away-team jet-lag effects separately.

We performed a multivariate linear regression analysis, including home- and away-team jet-lag variables considering travel direction (greater than or equal to two or more time zones with one time zone/day adjustment) and home- and away-team variables, to determine whether away- or home-team jet lag contributed to performance independent of each other and team

A screenshot of a cell phone

Description automatically generated

<https://www.nature.com/articles/377583a0.pdf>

One-page short correspondence from 1995, but good read.

<https://journals.sagepub.com/doi/pdf/10.1177/1527002515588136>

Research has found that, controlling for team quality, National Basketball Association visiting teams win more often when playing to the east of their home time zones and less often when playing to the west. We reaffirm this finding for 1991-2002. We find that only these seasons’ day games, and not their far more frequent night games, featured a significant relationship between time zone and visiting team win probability. We hypothesize that some of these day-game effects were biological in origin. The 2002-2013 seasons featured no significant relationship between time zones and visiting team win probability for either day or night games.

Day games vs night games.

We estimate versions of the regression equation

VISITWINijkt = rTIMEZONEijkt + alphajt + gammakt + epsilonjhvt;

where i is the game, j is the home team, k is the visiting team, and t is the season. The dependent variable is an indicator for whether the visiting team wins. Our key variables of interest are in TIMEZONE, a vector measuring how many time zones the visiting team is playing away from its home time zone. TIMEZONE contains two variables, one capturing the number of time zones to the east a visiting team is playing from home and the other capturing the number of time zones to the west it is playing from home. Both variables are lower bounded at zero, for example, a Pacific Time Zone team playing in the Central Time Zone is defined as playing two time zones to the east and zero time zones to the west of its home time zone. The coefficients on both of these variables are based on comparisons to the omitted group where the TIMEZONE variables are both equal to zero, and where the visiting team plays an opponent from its own time zone. ajt and gkt are separate team-year fixed effects that control for quality of the home and away teams. That the fixed effects are separate for home teams, and road teams allows each team, within the same season, to have different average qualities when playing at home versus playing on the road. That the fixed effects vary by year accounts for differences in team quality across different seasons, including differences associated with changes in home arena (Quinn, Bursik, Borick, & Raethz, 2003). All of our estimates are based on linear probability models instead of probit or logit estimations to provide more easily interpretable coefficients. Standard errors are robust to heteroskedasticity.

These controls include, for each team, covariates representing the number of days and miles traveled since the most recent game, plus the number of games played and miles traveled from 1 days to 3 days ago, from 4 days to 7 days ago, from 8 days to 14 days ago, from 15 days to 28 days ago, and more than 28 days ago. Each time a team plays consecutive games in different arenas, it is assumed to have traveled between those arenas. Miles traveled are calculated by as-the-crow-flies distances between zip codes of each arena that account for curvature of the earth. Teams are assumed to travel home during the all-star break.

These controls include the number of consecutive games and days a team has played at home (on the road), the number of games and days it will spend at home (on the road) before its next road trip (home stand), and the number of miles the visiting team has traveled and has yet to travel on its current road trip.

The Panel A coefficients of Table 1 were all robust to these inclusions and the significant TIMEZONE coefficients in Columns 1 and 4 actually increased in intensity. This suggests that playing in different time zones, not crossing time zones in the recent past, drove the significant effects observed in Panel A.