CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J0401

Project Title
Do You Believe in Home Field Advantage?

Abstract

Objectives/Goals
I wanted to determine if teams benefit from a home field advantage in the four major professional sports (basketball, baseball, ice hockey, and football).

Methods/Materials
I went to several websites (e.g., espn.com) to gather data (regular season and playoffs) for the four sports across ten years. I, therefore, had 36 game-years of data for the regular season and 40 game-years for the playoffs. After I gathered this data, I calculated the mean of the win rate at home and the mean of the win rate on the road and used the Student#s t-test (in Excel) to statistically determine if the two means were different. Next, I charted my data to visually share my results.

Results
From my data, I determined that home field advantage is present during the regular season. The difference between the win rate at home and on the road was 21% for basketball, 13.6% for football, 10.6% for ice hockey, and 8.8% for baseball - all statistically significant with $p < 0.01$. In contrast, the benefit during the playoffs was not statistically significant except for basketball ($p < 0.07$).

Conclusions/Discussion
Home teams, very reliably, win during the regular season - in agreement with my hypothesis. However, home teams do not always win during the playoffs, except for basketball.

Regular season: The reason I think basketball had a higher difference in win rates is because the fans make a difference. In ice hockey, there is a glass wall separating the fans from the players. But in basketball there is no separation; so the away players feel the tension and miss shots causing them to lose. The reason I think baseball had a low win rate is because of the game pattern which is where a team plays another team 2, 3, or 4 times in a row and the familiarity eliminates the home field advantage.

Playoffs: The playoff format (e.g., knockout), the fact that the teams are more evenly matched, and the fact that a lot depends on the outcome might explain the larger variability in the results.

Summary Statement
I used historical data to statistically determine if professional sports teams benefit from a home field advantage.

Help Received
Dad and my cousin Anjaney helped me understand how to use statistics; dad helped me with the analysis and poster; Mom with my poster and presentation