

HW 6: NFL expected pts

Stats and sports class

Fall 2019

2. Read *It sucks to kick in the cold*.

- Assume Kicker A kicks in Chicago, where the wind chill is often cold, while Kicker B kicks in Detroit, which plays indoors, where there is never any wind. In the model we fit in class, assume Kicker A and Kicker B appeared identical. Describe which kicker you think is actually better, now knowing that your model did not include wind chill.

Solutions: Kicker A. He's had more difficult kicks to connect on.

4. Identify the expected point totals from all two-point shots and three-point shots in the 2014-15 season. Which one was preferred?

Solutions: expected point total of 1.08 on 3-pt shots, and 0.974 on 2-pt shots

5. For Curry and Garnett, calculate their expected point totals on two and three-point shots. What does that suggest about their optimal choices?

Solutions: Curry has an expected point total of 1.36 on 3-pt shots, and 1.07 on 2-pt shots. Garnett has an expected point total of 0.75 on 3-pt shots, and 0.95 on 2-pt shots. The suggestion is Curry's optimal shot is from 3-pt, while Garnett is better with 2-pt shots.

6. Estimate the increased odds of a made shot taken with 1 more second left on the shot clock. Then, estimate the increased odds of a made shot with 10 more seconds on the shot clock.

Solutions

- 1 second yields to an increased odds of $\exp(0.016) = 1.016$ of making the shot. A 10-second bump equates to increased odds of $\exp(0.016 \cdot 10) = 1.17$ of making the shot.

8. Looking at six *easy* shots above - can you tell where and why our logistic regression model went wrong?

Solutions One shot has a touch time of -192, which is impossible. The others have closest defenders 25-feet away which while possible, involves some extrapolation. A defender 25-feet away is no different than a defender 10 feet away. In all, assuming linear associations between defender distance/touch time and log odds of a made basket is likely incorrect.