

Batting Averages, redux

Previously, we considered Ted Williams' batting average of .406 in 1941, which is unmatched in 80 years and counting. In 1994, Tony Gwynn of the San Diego Padres hit .394, but a strike by the player's union shortened the season after only 116 games. Thus, Gwynn accumulated 165 hits in 419 at-bats, whereas Williams had 185 hits in 456 at-bats. Let's assume that Gwynn had an unknown, fixed true batting average of p in 1994.

1. The league average batting average in 1994 was .277. Use the normal approximation to test—at the 5% level—the hypothesis that Gwynn was a league-average hitter. Do you reject or fail to reject? (*Hint: If you don't have a computer to compute the p -value, find the z -score and approximate using the Empirical Rule*)
2. Use the normal approximation to find a 95% confidence interval for Gwynn's true batting average p . (*Hint: Be sure to use \hat{p} when computing the standard error! (see page 125)*)
3. Does the confidence interval that you found contain the hypothesized proportion of .277? Does it contain .400?
4. A sportswriter claims that Gwynn does not deserve to be mentioned in the same breath as Williams, because Williams hit .400, but Gwynn did not. Does your analysis refute or support this claim?

