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Villanova Math Professor's Study Finds That Higher Batting Averages Don't Always Mean Better Hitting Ability

"It's all about playing time," says author in ASA's *The American Statistician* journal article

CITY, STATE, MONTH XX, 2007 – Using a once-controversial statistical method called Bayesian analysis, a Villanova University professor has determined that a lower batting average can indicate better hitting ability than a higher batting average. Jesse Frey, assistant professor of mathematical sciences at Villanova, recently completed a study that uses Bayesian analysis to determine which batting averages in major league baseball are the best indicators of ability.

Frey's study finds that a .334 average is the best indicator, while higher batting averages - .800, for example - can lead to low estimates of a player's ability. This is mainly because, Frey says, they suggest that the player is only a part-time player.

"Playing time is really the key," said Frey, a lifelong baseball fan. "If a high batting average can be achieved in just a few at-bats, then many of the players with that average will be part-timers who had a few lucky at-bats. Since 287 at-bats is the minimum needed to earn a .334 average, players with .334 averages tend to be legitimately good hitters.

"To long-time baseball fans, the finding that a .334 hitter is probably better than a .800 hitter may seem like common sense," Frey said, "but the less experienced fan is inclined to take a player's batting average at face value, as the best indicator of ability. Also, statistics courses taught in colleges and universities nationwide will tell you that the best estimate of a player's ability is their batting average."

Standard statistical methods, however, can be inadequate, according to Frey. Bayesian analysis, a statistical technique for updating known probabilistic information on the basis of new information, has gained increasing acceptance over the past 20 years. In a paper appearing in the journal [\[what issue?\]](#) *The American Statistician*, a publication of the American Statistical Association, Frey describes his method for deciding which batting averages are the best in terms of hitting ability.

For purposes of the article, Frey used at-bat and hit totals for all non-pitchers in the 2003 and 2004 major league baseball seasons. He first developed a statistical model for hitting ability, playing time, and batting average, which produced collections of player statistics that are almost indistinguishable from those that have occurred in recent major league baseball seasons. This model represents a best guess about a major league player's ability, playing time, and batting average given that nothing is known about him. Frey updates the original best guess via Bayesian analysis to take the batting average into account. He then finds an optimal estimate of the hitting ability for a player with a given batting average.

Further support for Frey's conclusions is available from a look at baseball history. Only five players have ever had a .800 season average. Of the five, only four played again after that season, and their combined career average was .250. On the other hand, there have been 40 players who have batted .334 for a season, including Hall-of-Fame inductees Ty Cobb, Ed

Delahanty, Jimmie Foxx, Lou Gehrig, and Honus Wagner. The 40 players had a combined career average of .309.

The complete paper can be downloaded (?) from *The American Statistician* journal web site at [URL].

About the American Statistical Association

The American Statistical Association (ASA), a scientific and educational society founded in Boston in 1839, is the second oldest professional society in the United States. For more than 160 years, ASA has been providing its 18,000 members serving in academia, government, and industry and the public with up-to-date, useful information about statistics. The ASA has a proud tradition of service to statisticians, quantitative scientists, and users of statistics across a wealth of academic areas and applications. For additional information about the American Statistical Association, please visit the association's web site at <http://www.amstat.org> or call 703.684.1221.

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