Aug. 22, 2006 -- Baseball purists, especially those of Yankee allegiance, might argue that St. Louis Cardinals homerun-hitting superstar Albert Pujols is simply not in the same league as legendary New York Yankees slugger Babe Ruth.

It's an argument that science may never fully resolve, but researchers at Washington University in St. Louis can now offer at least some hard numbers on how Pujols compares to the Babe in terms of the perceptual and motor skills necessary to consistently hit balls out of the park.

Pujols visited Washington University in April to take part in a series of laboratory tests similar to those conducted on Babe Ruth on a summer afternoon in 1921 by a couple of graduate students at Columbia University. Results of the Pujols testing, conducted at the request of a reporter from GQ magazine, are detailed in a story that appears in the magazine's September issue.

"This spring, GQ persuaded Albert Pujols, reigning National League MVP and the game's most dominant slugger, to take time off from an epic home-run tear and reenact, at Washington University in St. Louis, the 1921 Babe Ruth tests," writes Nate Penn, author of the GQ article, which is titled "Performance: How To Build The Perfect Batter."

The Pujols tests were conducted by faculty in the University's Department of Psychology in Arts & Sciences and in the School of Medicine, including Richard Abrams, Ph.D., professor of psychology; Desiree White, Ph.D., associate professor of psychology in physical therapy; and Catherine Lang, assistant professor in physical therapy.
professor of psychology; David Balota, Ph.D., professor of psychology; and Catherine Lang, Ph.D., assistant professor of physical therapy, neurology and occupational therapy.

Pujols, like Ruth, was asked to demonstrate his hitting form while hooked up to various machines that monitored the strength and speed of his swing. Pujols, complaining of a strained back, may have "held himself back a bit" on some of the tests, but his results compared favorably with those of Ruth.

In terms of sheer batting speed, Pujols swung his preferred 31.5-ounce bat at a speed of 86.99 miles per hour. Ruth, on the other hand, using a 54-ounce bat, swung at an estimated speed of 75 miles an hour.

"Making exact comparisons between the Pujols and Ruth test results is difficult because the tests given to Ruth were not very well normed," suggests White. "But it's clear that both Ruth and Pujols performed well above average on a number of tests that are very similar in nature."

The New York Times covered the Ruth testing on Sept. 11, 1921, with a front-page headline: "RUTH SUPERNORMAL, SO HE HITS HOMERUNS." The test results were described in a 1921 issue of "Popular Science" magazine as a "revelation" that showed Ruth's "coordination of eye, brain, nerve system, and muscle [to be] practically perfect."

Looking back on the 1921 Popular Science article, which is available, online, WUSTL's Richard Abrams suggests that the author of the magazine article was clearly a big fan of Ruth's and that this may have colored his description of the test results.

"Re-reading the 1921 article today I found that Babe Ruth really was not 'off the charts' on most of the tasks studied - instead it was reported merely that he was some amount faster or better than average," Abrams said.

"In only one case in the 1921 article were percentiles reported. As a result, we really don't know how great Babe was at these tasks. It is clear, though, that the author of the 1921 article was strongly biased to suggest that Babe achieved extreme scores on most of the tasks."

While the media may have exaggerated Ruth's results, few modern psychologists would find fault with the array of tests Columbia used to probe Ruth's talents with a bat, many of which are still used today. The science behind Ruth's 1921 tests is examined in great detail in an article titled "Psychology and 'The Babe'" published in a 1998 issue of the Journal of the History of the Behavioral Sciences, also available online.

Both Ruth and Pujols participated in a number of standard psychological lab tests, such as pegboard and finger tapping exercises, designed to gauge motor skills and cognitive performance.

White, who administers these tests frequently as part of her research and clinical work, was especially surprised by Pujols' performance on two tests in particular, a finger-tapping exercise that measures gross motor performance and a letter cancellation task that measures ability to conduct rapid searches of the environment to locate a specific target.

Asked to place a mark through a specific letter each time it appeared on a page of randomly positioned letters, Pujols used a search strategy that White had never witnessed in 18 years of administering the test.

"What was remarkable about Mr. Pujols' performance was not his speed but his unique visual search strategy," White said. "Most people search for targets on a page from left to right, much as they would when reading. In observing Mr. Pujols' performance, I initially thought he was searching randomly. As I watched, however, I realized that he was searching as if the page were divided into sectors. After locating a single target within a sector, he moved to another sector. Only after locating a single target within each sector, did he return to
Previously searched sectors and continue his scan for additional targets.

Asked to depress a tapper with his index finger as many times as possible in 10 seconds, Pujols scored in the 99th percentile, a score almost identical to one earned by Ruth on a similar test of movement speed and endurance. White was impressed not only by Pujols' tapping speed (2.4 standard deviations faster than normal), but also by the fact that his performance kept improving after repeated trials.

"It was interesting that he actually tapped faster in later trials of the task, suggesting considerable stamina at a high level of performance," White noted. "Most people tap somewhat slower as the test progresses because their fingers and hands begin to fatigue."

Pujols tapped with such force, in fact, that, at one point, he actually knocked the tapping key out of alignment. Pujols then helped White repair the finger tapper, tightening a loosened screw with his fingernail, she said.

Pujols' ability to make split-second modifications in a planned response, such as checking his swing at the last moment when a pitch strays outside the strike zone, was tested using a standard psychological test known as a go/no-go task. Pujols was given a visual "go" signal requiring him to respond as quickly as possible by pushing a button; occasionally, the initial signal would be followed by a "stop" signal requiring him to inhibit the response, if possible.

The Pujols tests, researchers suggest, represent just a small sampling of what secrets modern science might be able to uncover regarding the mysteries of superior performance in homerun hitting, and sports in general.

Yogi Berra, a St. Louis native who starred for many years as a catcher on the New York Yankees, has been quoted as saying that "baseball is 90 percent mental. The other half is physical."

Perhaps, like this and other "Yogisms", the mysteries of baseball will defy the reason and logic of science. But researchers at Washington University are willing to take that challenge.

"We already know that Albert Pujols is a great baseball player -- we can see that every day on the field," Abrams said. "What we don't know is whether laboratory measures of cognitive, perceptual, and motor abilities will help us predict who the next Pujols or Ruth will be. It sure could be fun to find out."

Editors' Note: Broadcast quality video and still images of the Pujols testing are available on request from GQ magazine; contact Lauren Starke at (212) 286-2419.
St. Louis Cardinals slugger Pujols gets Babe Ruth test at Washington University