

For professional baseball players, faster hand-eye coordination linked to batting performance

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Professional baseball players who score higher on a test of hand-eye coordination have better batting performance - particularly in drawing walks and other measures of "plate discipline," reports a study in the July issue of *Optometry and Vision Science*, the official journal of the American Academy of Optometry.

"Batters with better eye-hand visual motor reaction time [EH-VMRT] appear to be more discerning in deciding to swing at pitches as compared [to those with] poorer visual-motor reaction time," according to the study, led by Daniel M. Laby, MD, of the Sports and Performance Vision Center, State University of New York College of Optometry.

The results suggest that measuring hand-eye coordination might be helpful in player selection, and raise the possibility that EH-VMRT training might lead to improved batting performance. Dr. Laby's coauthors were David G. Kirschen, OD, Ph.D., of Southern California College of Optometry, Fullerton; Usha Govindarajulu, Ph.D., of SUNY College of Optometry; and Paul DeLand, Ph.D., of California State University, Fullerton.

Players with Faster Hand-Eye Coordination May Be More Selective at Bat

Using a portable testing system, the researchers measured EH-VMRT in

450 professional baseball players during three Major League Baseball spring training seasons. The participants played for six MLB teams and their affiliated minor league teams; 105 were classified as major-league players and 435 as minor-leaguers.

The relationship between EH-VMRT and statistical measures of batting performance was analyzed. The study focused on measures of "plate discipline—for example, how often the players drew walks (bases on balls) or swung at pitchers in the strike zone. In contrast to traditional statistics like batting average, these measures are more dependent on the batter's own ability, with little if any influence by the abilities of the defensive players.

One of three test EH-VMRT modes, called the Proactive score, was chosen as the best single descriptor of hand-eye coordination. The players' average Proactive score was 9.28 seconds, with a range from about 5.80 to 15.75 seconds.

The Proactive score was significantly correlated with measures of plate discipline. For players in the top versus bottom one-fifth (quintile) of Proactive scores, there was a 22 percent difference in the walk rate. Players with the fastest hand-eye coordination drew a walk every 10.1 times at bat (on average), compared to every 13.1 times for those with the slowest hand-eye coordination.

Players in the top quintile also swung at better pitches: they were six to seven percent more likely to swing at pitches in the strike zone and to swing at fastballs (rather than curveballs or other "off-speed" pitches) in the strike zone. "One could hypothesize that faster EH-VMRT allows the batter an opportunity to be selective in which pitches he ultimately decides to swing at," Dr. Laby and coauthors write. "These timing differences may result in higher rates of swinging at pitches and a lower likelihood to gain a base on balls."

Faster EH-VRMT values were also associated with more years playing in the major leagues. Further analysis suggested that the differences in plate discipline were related to hand-eye coordination, rather than major league experience.

While there was a large difference between the fastest and slowest EH-VRMT groups, there was comparatively little difference within the middle quintiles. For players, moving from this middle group into the top quintile would make little difference in terms of plate discipline, but moving out of the bottom quintile could have a major impact. A few studies have addressed the ability to improve EH-VRMT by training—however, more research is needed to see if hand-eye [coordination](#) training can have a lasting effect on batting ability.

The researchers note that the statistical correlations between EH-VRMT and batting performance are low—likely reflecting the many other factors contributing to batting success. Yet they point out "the very large and statistically significant difference" between the top and bottom EH-VRMT groups and their plate discipline abilities. Dr. Laby and colleagues conclude: "These findings may be important in player selection as well as identification of players who may possibly benefit from an intervention to improve eye-hand visual-motor reaction time."

More information: Daniel M. Laby et al. The Hand-eye Coordination of Professional Baseball Players, *Optometry and Vision Science* (2018). [DOI: 10.1097/OPX.0000000000001239](https://doi.org/10.1097/OPX.0000000000001239)

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