

Body

Vision Training to Boost Sports Performance

By KATE MURPHY

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The baseball hurtles toward the batter, and he must decide from its rotation whether it's a fastball worth a swing or a slider about to drop out of the strike zone.

Running full speed, the wide receiver tracks both the football flying through the air and the defensive back on his heels. Golfers must rapidly shift visual focus in order to drive the ball at their feet toward a green in the distance.

Many athletes need excellent vision to perform well in their sports, and now many are adding something new to their practice regimens: vision training. The idea has been around for years, but only recently have studies hinted that it might really work — that it might be possible to train yourself to see better without resorting to glasses or surgery.

“Vision training has been out there for a long time,” said Mark Blumenkranz, a professor of ophthalmology at Stanford University Medical School. “But it's being made more respectable lately thanks to the attention it's been getting from psychophysicists, vision scientists, neurologists and optometrists.”

Vision training actually has little to do with improving eyesight. The techniques, a form of perceptual learning, are intended to improve the ability to process what is seen. The idea is that if visual sensory neurons are repeatedly activated, they increase their ability to send electrical signals from one cell to

another across connecting synapses.

If neurons are not used, over time these transmissions are weakened. “With sensory neurons, just like muscles, it’s use or lose it,” said Dr. Bernhard Sabel, a neuroscientist at Otto von Guericke University in Magdeburg, Germany, who studies plasticity in the brain. “This applies both to athletes and the partially blind.”

Vision training may involve simple strategies — for instance, focusing sequentially on beads knotted at intervals on a length of string with one end held at the tip of the nose. This is said to improve convergence (inward turning of the eye to maintain binocular vision) and the ability to focus near and far.

Companies like Dynavision and Vision Coach make light boards said to strengthen peripheral vision by engaging users in a sort of game of whack-a-mole; they smack at bulbs as they flash on and off, while keeping their gaze fixed straight ahead. Increasingly, though, vision training means playing something akin to a point-and-shoot video game in which the targets get progressively harder to discern.

A study by a team of psychologists and published in February in Current Biology showed that baseball players at the University of California, Riverside, were able to improve by 30 percent their reading of eye charts — as well as their batting averages — after completing more than two dozen 25-minute vision training sessions using a computer program. Players who didn’t receive the training did not show similar improvement.

A study of the University of Cincinnati baseball team found marked improvement in the batting averages of players following six weeks of various kinds of vision training. The team batting average went up 34 points from the previous season, exceeding improvements of other N.C.A.A. teams. Errors decreased by 15 percent, while fielding assists increased 8 percent. (One author of the study was Johnny Bench, the Hall of Fame catcher.)

In earlier studies, vision training has been found to boost the performance of

table tennis players, golfers and field hockey players. But generally the sample sizes were small and variables difficult to control. (Athletes have been known to perform better just by not changing their underwear.)

Still, they build on decades of work with stroke, brain injury and glaucoma patients whose vision has been significantly improved with training. Dr. Sabel's most recent research appeared in the February issue of JAMA Ophthalmology and showed that computer-based vision training improved glaucoma patients' peripheral vision by 19 percent.

"Vision, like other sensory systems, can be improved with practice," Dr. Sabel said. "The improvements occur not in the optics of the eye, but in the central processing centers of the brain."

Dr. Blumenkranz of Stanford and other vision experts suspect that to be successful, vision training must be tailored to the individual, like physical training.

"A little discomfort is expected," as when you exert yourself lifting weights, said Al Wile, the director of sports vision at the United States Air Force Academy in Colorado Springs, and a longtime proponent of vision training.

In addition to improving the performance of athletes, he said he had been able to help cadets pass pilot vision proficiency tests after they had failed.

Professional teams, including the Indiana Pacers, the Brooklyn Nets, the St. Louis Rams and the Pittsburgh Steelers, also are experimenting with vision training. Shawn Windle, the head strength coach for the N.B.A.'s Pacers, said he uses the Dynavision device to improve his players' visual abilities, as well as to assess the vision of prospective draft picks.

"It's a great way for me to identify who can get their hands on the ball," he said.

Players who are already on the team tell him it has made their vision sharper. "I don't have a way of measuring that," Mr. Windle said. "But if they

think it's helping, that's good enough for me.”

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