Who can cross a busy road better, a varsity wrestler or a psychology major? That question, which seems to beg for a punch line, actually provided the motivation for an unusual and rather beguiling new experiment in which student athletes were pitted against regular collegians in a test of traffic-dodging skill. The results were revelatory.

For the study, published last week in The Journal of the American College of Sports Medicine, researchers at the Beckman Institute for Advanced Science and Technology at the University of Illinois at Urbana-Champaign recruited 36 male and female students, ages 18 to 22. Half were varsity athletes at the university, a Division I school, and they represented a wide variety of sports, including cross-country running, baseball, swimming, tennis, wrestling, soccer and gymnastics. Some possessed notable endurance; others, strength and power; and still others, precision and grace.

The rest of the volunteers were healthy young collegians but not athletes, from a variety of academic departments.
All showed up at various times to a specially appointed lab, where a manual treadmill was situated amid three 10-foot-square video screens. One screen stood in front of the treadmill, with the others at either side. Donning goggles that gave the video images on the screens depth and verisimilitude, the students were soon immersed in a busy virtual cityscape.

When the immersive video began, the students found themselves plopped into an alley between buildings. From there, they were instructed to walk toward a busy street and, once they’d arrived, gauge oncoming traffic. The virtual cars whizzed by in both directions at daunting speeds, between 40 and 55 miles per hour.

When it felt safe, the students were to cross the road. They were told to walk, not run, but had a limit of 30 seconds from the time they left the alley. In some attempts, they had no distractions. In others, they listened to music through headphones or, emulating a common campus practice, chatted on a cellphone with a friend. Each volunteer attempted 96 crossings.

Success varied. “Over all, there was an 85 percent completion rate,” in which students made it to the other side of the road without incident, said Laura Chaddock, a graduate student at the university and lead author of the study. Failure meant impact — thankfully virtual.

The student athletes completed more successful crossings than the nonathletes, by a significant margin, a result that might be expected of those in peak physical condition. But what was surprising — and thought-provoking — was that their success was not a result of their being quicker or more athletic. They walked no faster than the other students. They didn’t dash or weave gracefully between cars. What they did do was glance along the street a few more times than the nonathletes, each time gathering slightly more data and processing it more speedily and accurately than the other students.

“They didn’t move faster,” said Art Kramer, the director of the Beckman Institute and a leader in the study of exercise and cognition, who oversaw the research. “But it looks like they thought faster.”

René Marois, the director of the Human Information Processing Laboratory at Vanderbilt University, who was not involved with the experiment, said, “This is a very interesting study.” The fact that the athletes displayed no outsize physical coordination during the crossings “was surprising,” he wrote in an e-mail. Upon reflection, he added that the finding did have a certain intuitive logic. “To the extent that athletes, in their sport, must routinely make split-second decisions in often very complex environments (e.g., whether to pass or kick the incoming soccer ball), it would make sense to me that they would have superior skill sets in processing the fast-paced information to successfully cross the street.”

Interestingly, though, until this study, no experiment had looked at whether being adept at sports would translate into success at a real-world everyday task like crossing the street. Most studies have more narrowly examined whether and why expert athletes are good at athletic things. A study published last month by researchers in China, for instance, found that professional badminton players, when shown video clips of a match, could predict with uncanny accuracy where the shuttlecock would land. While watching the videos, they also displayed considerably more electrical activity in brain areas associated with attention and memory than recreational players did. Playing elite badminton had made them better able to anticipate what would happen during badminton play.

Would the badminton pros also be capable of navigating crowded city streets better than the amateurs? The new Beckman Institute study would suggest yes — and quite possibly because of similar brain responses. Although the Illinois researchers did not directly measure electrical activity in the volunteers’ brains, it seems likely, Ms. Chaddock says, that the constant multitasking and information processing demanded by athletics increases both the capacity of the athletes’ mental information processing systems and their speed.
Of course, it's also possible that sports didn't make the athletes better at information processing. Instead, they may have been blessed with naturally fine processing abilities and, as a result, became accomplished athletes. "I'd guess," Dr. Kramer said, "that to some degree it's both." But, he added, the athletes handled the crossings better than the nonathletes, regardless of whether their sport required exquisite timing and tactical thinking — which strongly suggests, he said, that physical training does reshape the brain.

The researchers hope at some point to study that issue in more depth, but even now, the takeaway seems clear. Practicing a sport, whether it's running, swimming, tennis or perfecting a back flip, may sharpen your concentration and increase your ability to dodge through a busy intersection without incident.

One caveat, though: keep cellphones pocketed. Listening to music didn't increase the number of accidents, but chatting on a phone did, even for athletes. No amount of sports training, Ms. Chaddock said, seems likely to make walking and talking in traffic a wise move.

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**Event-related potential effects of superior action anticipation in professional badminton players.**

Center for Studies of Psychological Application, South China Normal University, Guangzhou 510631, China; State Key Laboratory of Cognitive Neurosciences and Learning, Beijing Normal University, Beijing 100875, China.

**Abstract**

The ability to predict the trajectory of a ball based on the opponent's body kinematics has been shown to be critical to high-performing athletes in many sports. However, little is known about the neural correlates underlying such superior ability in action anticipation. The present event-related potential study compared brain responses from professional badminton players and non-player controls when they watched video clips of badminton games and predicted a ball's landing position. Replicating literature findings, the players made significantly more accurate judgments than the controls and showed better action anticipation. Correspondingly, they showed enlarged amplitudes of two ERP components, a P300 peaking around 350ms post-stimulus with a parietal scalp distribution and a P2 peaking around 250ms with a posterior-occipital distribution. The P300 effect was interpreted to reflect primed access and/or directing of attention to game-related memory representations in the players facilitating their online judgment of related actions. The P2 effect was suggested to reflect some generic learning effects. The results identify clear neural responses that differentiate between different levels of action anticipation associated with sports expertise.

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