

Sprinters closest to starter pistol have advantage over those further away, says study

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Researchers at the University of Alberta in Edmonton studying the connection between loud sounds and reaction time are reporting findings that may have sprinters thinking twice about lane assignments at the upcoming Olympics.

Led by Dave Collins, professor of physical education and recreation, and student Alex Brown, researchers have discovered that the closer the proximity to the starter's pistol, the more likely the sprinter will have a lower reaction time, which translates to a faster start from the block. They originally hypothesized that the loud starter's pistol at the Olympic Games would allow racers closer to the starter to react sooner and stronger than runners farther away and, by sorting by lane number and analyzing reaction time for the 100/110m athletics events at the 2004 Olympics, they found that runners closest to the starter had significantly lower reaction time than those further away.

"Whether you're a competitive athlete or just a pedestrian trying to cross a busy street, reaction time can be critical," said Collins. "Past research has shown loud sounds can decrease reaction time, and when those sounds evoke a startle response, reaction time is decreased even further, which is a good thing."

Collins and Brown, along with Brian Maraj and Zoltan Kenwell, both of the Faculty of Physical Education and Recreation, had four trained

sprinters and 12 untrained participants perform sprint starts from starting blocks modified to measure horizontal force. Using a recorded gunshot as the "go" signal, they randomly presented the signal to test subjects at various decibel levels, from a low of 80 dB to a high of 120 dB. The louder the gunshot, the faster the reaction time of the test subjects and the faster their start from the block.

"In sprint events, where hundredths of a second can make the difference between a gold medal and a silver [one], minimizing reaction time can be the key to an athlete's success," said Brown. "We suggest that procedures presently used to start the Olympic sprint events give runners closer to the starter the advantage of hearing the "go" signal louder; consequently, they react sooner than their competitors."

The applications of this research, published in the June 2008 issue of *Medicine & Science in Sports & Exercise*, could even go beyond competitive athletics. "Our findings might also be helpful for research in Parkinson's disease," said Collins. "People suffering from Parkinson's typically experience episodes of 'freezing', where they want to move but cannot because of impaired processing in certain parts of the brain.

"By introducing a loud sound during a freezing episode we might be able to startle patients into moving as we know that faster reaction times induced by a startle response are due in part to bypassing the cortical circuits that are damaged in Parkinson's disease."

Source: University of Alberta

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