

# Olympic False Start Rule May be Unfair

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In international sprinting, false starts are automatically called if an athlete's foot leaves the blocks before a threshold of 100 milliseconds (1/10th of a second) after the firing of the gun. Automatic pressure sensors in the blocks make this determination. The IAAF decided upon this threshold in the belief that humans cannot react to an auditory stimulus in less than 1/10th of a second.

However, new research by Ian Franks at the University of British Columbia and David Collins at the University of Alberta, suggests that humans can indeed react more quickly than 1/10th of a second and that this threshold may be unfair.

## THE RESEARCH

Non-athletic subjects were strapped into a chair and told to move an arm after the commands, "Ready, set, go!" Under such conditions, a normal reaction time is about 200 milliseconds (2/10's of a second).

Then, the same students were startled by a loud noise at the moment the "Go" command was given. Reaction times improved dramatically. In fact, some times clocked in at under 60 milliseconds - well below the IAAF threshold of 100 milliseconds.

In addition, a study performed by David Collins at the University of Alberta in Edmonton, found that 21% of his participants exhibited reaction times faster than the Olympic threshold of 100 milliseconds.

## EXPLANATION

It is believed that the startle response bypasses normal processing in the cortex of the brain. Since subjects were told to move their arm in response to a sound, these arm-movement instructions were pre-programmed in the subcortex of the brain. The researchers theorize that the startle sound automatically triggered these pre-programmed signals - a survival instinct that we all possess.

It takes an extra 10 milliseconds for the body's electrical signals to reach distant limbs like the legs. As a result, the researchers believe that 70 milliseconds is the limit at which sprinters can react to auditory signals. And it is 70 milliseconds that Franks believes should be the false start threshold.

It is plausible that highly trained sprinters can tap into this fast-reaction potential that we all possess.

This research lends a different perspective to incidents such as the 1996 Olympic 100m final, in which British sprinter Linford Christie became the first athlete to be disqualified from an Olympic 100m final. Christie was so convinced that he had not jumped the gun that he refused to leave the track for several minutes. His reaction time had been recorded at 86 milliseconds.

In view of this new research, it is possible that Christie truly didn't anticipate the gun and had reacted fairly.

Frank's next step is to determine whether athletes can be trained to take advantage of the startle response to increase their reaction time.

References:

1. Brown, A. M. et al. Med. Sci. Sports Exerc. 40, 1142-1148 (2008)

2. Peter Calamai, False starts fail to clock true reaction time: study. The Toronto Star, August 20, 2004.

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