

# Race starts could give some athletes an unfair advantage

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Champion sprinter Linford Christie once said that he started races 'on the B of the bang', but research from Oxford and Utrecht universities says the pause before the bang could also make the difference between success and failure. Their results are published on 28 October in the open access journal *Frontiers in Psychology*.

Typical race starts involve the starter telling racers 'ready' before firing a starting gun. However, the gap between the initial cue and the starting signal can vary, as athletes take different amounts of time to assume a starting position, and some regulations enforce a variable delay.

A human trait called the 'alerting effect' makes this variation crucial. When we are cued to expect something to happen, as with the 'ready' signal, we experience a burst of arousal which should enable us to respond faster when the expected event then happens - in this case, the gun firing. A half-second interval is the optimum time, but as that interval gets longer we become less responsive.

Oxford psychology researcher Edwin Dalmaijer explained: 'In events with heats, like running and swimming, results are compared across heats and the fastest finishers overall progress in the competition, so those who experience longer ready-start intervals are disadvantaged. This is worse in a sport like speed skating. In two weeks, at the start of the Speed Skating World Cup in Calgary, Canada, pairs of skaters will compete head to head over several races. Their times from all those races will be added together and the lowest total time will win. In these

events, the variation in starts between races could add up to enough to knock a skater out of the medal positions.'

The team knew that there can be a gap between the laboratory and the sports arena environments, so they tested their hypothesis by analysing TV coverage of the 2010 Winter Olympics' 500m speed skating event. By carefully measuring the gap between the R of the ready and the B of the bang on the soundtrack, they got millisecond accurate timings of the ready-start intervals.

Utrecht researcher Beorn Nijenhuis, a former Olympic speed skater for the Netherlands, said: 'What we found was that an extra second of interval before the gun made a difference in finishing times of 672 milliseconds in women's races and 299 milliseconds in men's races. While those times sound pretty short, in the context of elite speed skating, that can be the difference between first and fifth place.'

The researchers propose a change to starting procedures where an extra step is introduced to warn athletes to get ready. The ready signal would then be given only when everyone has assumed the start position and the starting gun would sound after a fixed half-second interval.

Stefan Van der Stigchel, associate professor in Utrecht, adds: 'In the optimal scenario, the starting procedure would be computerised: A referee would only have to push a button to sound the ready cue, automatically followed by a fixed pause and the starting shot.'

A fixed ready-start interval would, the team say, be a fairer way to begin each race.

**More information:** Edwin S. Dalmaijer et al. Life is unfair, and so are racing sports: some athletes can randomly benefit from alerting effects due to inconsistent starting procedures, *Frontiers in Psychology* (2015).

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