CONTRIBUTORS OPINION

Olympic sprint false start failed to get off the blocks

By **Jeffrey S. Rosenthal** Contributor

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The Tokyo Olympics have gotten the whole world talking about athletic achievements and medal counts — and false starts.

Gone are the days of second chances; any competitor deemed to start a race too soon is automatically disqualified, their Olympic dreams completely dashed.

The current false start rule catches not only those who push off before the starter gun is fired, but also those who push off within one tenth of a second *afterwards*.

That last part always puzzled me. If we encourage Olympic athletes to push the frontiers of human achievement, then shouldn't we reward them, not punish them, for starting as soon as possible after the starter gun is fired?

Just ask Linford Christie. He won gold for Britain in the 100-metre dash at the 1992 Olympics. But then, in 1996, he was disqualified for starting 0.086 seconds after the starter pistol was fired.

"I felt I reacted perfectly to the gun," he complained. As indeed he had. But that didn't save him from being escorted off the track and ending his career in disappointment.

Even Olympic officials seem uncomfortable with the rule. Last Saturday, British runner Reece Prescod started 0.093 seconds after the gun in his 100-metre heat. Commentators rightly described this as "just a good reaction," but it was still a clear violation of the rule.

And yet, after a lengthy review, he was mysteriously forgiven and allowed to compete after all. (When the heat was rerun, he qualified for the semifinals, at which he was disqualified for a *genuine* false start.)

Nevertheless, the rule persists, justified by the claim that no human could possibly react within one tenth of a second, so any athlete starting so quickly must have

"anticipated" the starter gun and hence deserves disqualification. Be fast, the competitors are told, but not *too* fast. Stick to typical human reaction times, not superhuman ones.

But aren't superhuman achievements what the Olympics are supposed to be all about?

As a statistician, I think there is a simpler solution to this conundrum. Let the athletes start as soon after the starter gun as they can, without any limitation. And to avoid the anticipation problem, arrange for the starter gun to be fired in a way which is *unanticipatable*.

How? With randomness! It's possible that an athlete could anticipate the behaviour of a human being controlling the starter gun. But a certain kind of random timing, called the "exponential distribution," gives no hint about when it will end, so it cannot be anticipated at all, by anyone, no matter what superhuman abilities they possess.

To understand how such randomness could work, imagine that after the runners are set, we could roll a fresh pair of dice every tenth of a second. We would then proceed as follows. If the dice come up snake eyes (a pair of ones), then we immediately fire the starter gun. If not, then we wait another tenth of second, and roll again. And so on.

Within a few seconds or so, snake eyes would finally be rolled. At that point, the gun would fire, and the race would begin. But there would be absolutely no way for anyone to anticipate when snake eyes will appear. Even if we've already waited several seconds, the next roll isn't any more or less likely to come up a pair of ones.

The exponential distribution is a continuous version of those dice rolls. It might delay the starter gun by a few seconds, or less, or not at all. We're not sure. But neither is anybody else. It is mathematically impossible for anyone to anticipate when the gun will actually fire.

Problem solved! Anticipation problem out! Superhuman reactions in!

So, to resolve false starts once and for all, I call upon future Olympic officials to eliminate the tenth-of-a-second rule, and instead create a simple device to automatically fire the starter gun after a random, exponential, unanticipatable amount of time. They could call it the Random Exponential Starting Timer. Then, the next time anyone complains about false starts, tell them to give it a REST.

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