

New study shows that varying walking pace burns more calories

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By conducting walking experiments in Ohio State's Movement Lab (pictured), researchers Manoj Srinivasan (left) and Nidhi Seethapathi found that walking at varying speeds can burn up to 20 percent more calories versus maintaining a steady pace. Credit: Matt Schutte, The Ohio State University

Looking for a simple way to burn more calories while walking? Change up your pace.

In a study published in the September 2015 issue of the journal *Biology Letters*, engineering researchers at The Ohio State University found that walking at varying speeds can burn up to 20 percent more calories compared to maintaining a steady pace.

The study is one of the first to measure the metabolic cost, or calories burned, of changing walking speeds.

"Most of the existing literature has been on constant-speed walking. This study is a big missing piece," said Manoj Srinivasan, co-author of the study and professor of mechanical and aerospace engineering. "Measuring the metabolic cost of changing speeds is very important because people

don't live their lives on treadmills and do not walk at constant speeds. We found that changing speeds can increase the cost of walking substantially."

Their results show that by using traditional methods, people may be underestimating the number of calories burned while walking in daily life or playing sports. The very act of changing speeds burns energy, Srinivasan explained, but that cost is not generally accounted for in calorie-burning estimations. The researchers found that up to eight percent of the energy we use during normal daily walking could be due to the energy needed to start and stop walking.

"Walking at any speed costs some energy, but when you're changing the speed, you're pressing the gas pedal, so to speak. Changing the kinetic energy of the person requires more work from the legs and that process certainly burns more energy," explained Nidhi Seethapathi, first author of the study and doctoral fellow in mechanical engineering.

The researchers measured the cost of changing walking speeds by having people change their walking pace on a treadmill while its speed remained steady. Participants alternated between walking quickly to move to the front of the treadmill belt, or slowly to move to the back of the treadmill (watch a video demonstration). Prior experiments by other researchers changed the treadmill speed directly, which, it turns out, makes such experiments not applicable to real-world walking, Srinivasan explained. When the treadmill speed is changing, the treadmill itself is doing some of the work, instead of the person walking.

The study also confirmed the researchers' prediction that people walk slower when covering shorter distances and increase their pace as distance increases. This finding could have implications for the field of physical therapy and rehabilitation, where measuring the speed it takes

to cover a certain distance is used as an indicator of a patient's progress.

"What we've shown is the distance over which you make them walk matters," said Seethapathi. "You'll get different walking speeds for different distances. Some people have been measuring these speeds with relatively short distances, which our results suggest, might be systematically underestimating progress."

For more tips on how to burn more [calories](#) when [walking](#), Srinivasan, who leads the Movement Lab at Ohio State, offers some simple advice: walk in a way that feels unnatural.

"How do you walk in a manner that burns more [energy](#)? Just do weird things. Walk with a backpack, walk with weights on your legs. Walk for a while, then stop and repeat that. Walk in a curve as opposed to a straight line," he said.

Provided by The Ohio State University

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