

Walking Backward Boosts Your Memory

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Researchers from London's University of Roehampton suggest people who walk backward perform better on memory tests than those who stand still or walk forward. If you are looking to inject new energy into your exercise routine, you might want to try walking or running backward. Beyond the physical benefits to your body, exercising backward may boost your brain power, balance and more.

Walking Backward Shown to Boost Your Memory

In a study published in the journal *Cognition*,¹ researchers from the University of Roehampton (UR) in London have found walking backward can boost your memory. After inviting 114 volunteers to watch a video featuring a woman having her handbag stolen, participants were asked questions about what they saw. Upon completion of the video:

- One subset of the group was asked to walk forward 30 feet (9.1 meters)
- A second subset was told to walk the same distance backward
- People assigned to the control group were told to stand still

Based on their responses to 20 questions about the events in the video, the group that walked backward answered, on average, 10% more of the questions correctly than the control group and those who walked forward. All five variations of the experiment, including one in which the forward or backward movement was simulated, yielded similar effects.

In each scenario, the participants walking backward consistently got the most answers right. These outcomes resulted in the team of researchers, led by Aleksandar Aksentijevic, Ph.D., senior lecturer in psychology at UR, suggesting the experiment is “an indication that a link between the concepts of 'time' and 'space' are essential to the way our minds form memories.”²

“It's a partial vindication of this idea that time is really expressed via space,” Aksentijevic told the Daily Mail.³ That said, he suggests more studies are needed to unravel the mysteries of why motion, real or imagined, has the potential to improve our memory.

“I am sure that some of this work could be useful in helping people remember things, but how [that will be possible] is a question [needing] more research,” he noted.⁴

Walking Backward Shown to Improve Cognitive Control, Balance

A 2009 body of research published in the journal Psychological Science asserts walking backward benefits your brain by sharpening your thinking skills and enhancing cognitive control.⁵

The analysis was based on outcomes from a group of 38 Dutch university students who completed eight blocks of a Stroop task immediately after taking several steps in a forward (approach), backward (avoidance) or sideways (control) direction.

A Stroop task, by the way, requires participants to name the color of words while ignoring their semantic meaning, which the human brain processes more automatically. An example of this type of test would be presenting the word “green” in red lettering.

The researchers suggest cognitive control is required to override the tendency to respond with the meaning of the word (green) and instead respond based on its color (red). About the results, the researchers stated:⁶

“Cognitive control is required to override the tendency to respond to the semantic meaning and instead respond to the color. Stepping backward significantly improved performance on this task compared to stepping forward

or sideways, such that response speed to words that required the inhibition of automatic response tendencies were significantly enhanced.

[B]ackward locomotion appears to be a powerful trigger to mobilize cognitive resources. Thus, whenever you encounter a difficult situation, stepping backward may boost your capability to deal with it effectively."

A small 2011 study focused on school-aged boys who took part in a backward-walking training program for 12 weeks suggests backward walking may also help improve your balance.⁷

Based on balance assessments performed before, during and after the training, researchers concluded, "Backward walking training in school-aged boys can improve balance." They also noted this form of walking "may be a potential intervention for [the] prevention of falls."⁸

Other Benefits of Walking Backward

As mentioned in the featured video, backward walking, also known as retro walking, is said to have originated in ancient China, where it continues to be practiced for health and well-being. Beyond China, retro walking has caught on in Japan and parts of Europe, where people use it to build muscle, improve sports performance, promote balance and more.

For starters, when you walk backward, it puts less strain on and requires less range of motion (ROM) from your knee joints, making it ideal for people who have knee problems or injuries. Also, because backward walking eliminates the typical heel-strike to the ground, it can lead to changes in pelvis alignment that may potentially alleviate pressure associated with low back pain.⁹

Authors of a study involving physically active college students and student athletes noted hip extension and knee flexion are greater with backward walking, while low back ROM is also improved.¹⁰

Beyond that, walking backward gives you a chance to work out all of those muscles in your legs, such as your quadriceps and calves, which take a backseat to your hamstrings and glutes during forward walking. Furthermore, one study suggests walking backward for just 10 to 15 minutes four days a week for four weeks can increase your hamstring flexibility.¹¹

Backward Walking Can Help You Change Up Your Fitness Routine

One of the biggest challenges you face in trying to remain fit is your body's ability to adapt to new routines. Even if you exercise regularly, you need to be on the lookout for "plateaus" that can occur when your muscles adapt to your workouts.

Performing the same type of exercise over a long period of time is likely to cause your fitness gains to level off. With respect to changing up your workout program, American Council on Exercise chief science officer Cedric Bryant, Ph.D., says:¹²

"Varying your exercise routine can also help you stay physically challenged. Many of the body's physiological systems (e.g., the muscular system) adapt to an exercise program within approximately six to eight weeks.

If you do not modify your exercise routine, you [will] reach a plateau because your body has adapted to the repetitive training stimulus."

If you're at a loss for a new activity to try or are not sure how to modify your existing workout, consider incorporating backward walking. Though it will take some time to adjust to going in the opposite direction, backward walking (or running) can be incredibly beneficial.

When you walk backward, your heart rate tends to rise more than it does when you are forward walking at the same pace. As such, it may be that you can achieve greater cardiovascular and calorie-burning benefits in a shorter period of time with backward exercise. There are other benefits, too.

Women Lose Body Fat More Readily When Walking Backward

A 2005 study published in the International Journal of Sports Medicine, demonstrated the female-friendly health benefits of a six-week run/walk training program. In a group of healthy university students, as compared to the control group, the women taking part in the training group:¹³

- Experienced a 2.4% decrease in body fat
- Realized a 19.7% decrease in the sum of their skinfolds
- Evidenced an average 31% decrease in oxygen consumption when doing both forward and backward exercise on a treadmill
- Significantly improved VO2 max (5.2%), which is the maximum rate of oxygen consumption measured during incremental exercise, in a forward 20-meter (22-yard) shuttle run test

About the outcomes, the study authors commented, “The findings suggest that backward walk/run training improves cardiorespiratory fitness for both forward and backward exercise and causes significant changes in body composition in young women.”¹⁴

Up for a Challenge? You May Want to Try Backward Running

While you may find it hard to believe anyone can comfortably run backward, you’d be surprised at how good it can feel. While the benefits you achieve with backward walking extend to backward running, you’ll achieve even greater gains from the latter.

For example, research from 2011, published in the Proceedings of the Royal Society B: Biological Sciences, asserts backward running burns more calories given the fact it takes close to 30% more energy than running forward at the same pace.¹⁵

Part of the reason for the extra calorie burn, note the study authors, is the simple reality backward running reverses the typical "soft takeoff" (when muscle-tendon units

shorten) and "hard landing" (when muscle-tendon units are stretched) that is the case with forward running. As such, running backward requires greater step frequency and a higher energy expenditure.

Authors of a 2001 study involving fit males who ran backward and forward under controlled conditions at eight treadmill speeds noted "metabolic rates and estimated rates of ground force application were greater for backward than for forward running."¹⁶

You may appreciate backward running because it is well-known for putting less stress on your knees. If you routinely have knee pain when you run, try reversing the activity. Some researchers have called backward running a safer form of physical training that may actually improve your forward running skills. Authors of a 2012 study said:¹⁷

"Step frequency and energy expenditure are greater in backward running than in forward running. As in a catapult, muscle-tendon units are stretched more slowly during the brake at the beginning of stance and shorten more rapidly during the push at the end of stance.

We suggest that the catapult-like mechanism of backward running, although requiring greater energy expenditure and not providing a smoother ride, may allow a safer stretch-shorten cycle of muscle-tendon units."

Safety Tips for Walking or Running Backward

As you may know, I was a runner for 43 years before I gave it up completely in favor of a more balanced exercise routine that is focused on more than just cardio workouts.

In 1982, at my prime, I ran a marathon in 2:50. One of the workout strategies I used back then was backward running, so I have some experience with it. That said, if you decide to try this form of exercise, I offer two safety tips:

- **Watch out for obstacles** – As you may imagine, walking or running backward puts you at immediate risk of tripping and falling backward. You also face the possibility of running into someone coming from the opposite direction. The last thing you

want to do is be twisting your head or body in ways that will cause structural problems.

For that reason, I suggest you find a safe, obstacle-free space to do this exercise. To avoid twisting an ankle, be sure to choose a location that has a flat surface. An indoor or outdoor track or paved walking path is best.

- **Change your shoes regularly** – If you plan to walk or run backward, keep in mind that most athletic shoes are not designed to take high amounts of wear in the areas that will be making regular contact with the ground or pavement.

As you would with forward running or walking, keep an eye on your shoe wear and change or rotate your shoes on a regular basis.

Be Inspired: Woman Runs NYC Marathon Backward

No longer able to run forward after completing 10 marathons, 30-something New Jersey native Justine Galloway completed the entire 2017 New York City (NYC) marathon while running backward. As reported by Runner's World¹⁸ and TONIC,¹⁹ this was a big deal for Galloway, who had to drop out of the Boston Marathon in 2011 around mile 18 because her body felt weak and stiff.

Later, after falling and hitting her head, Galloway noticed her left leg seemed to be having trouble taking cues from her brain. After consulting with several doctors and receiving a number of diagnoses that did not address her concerns, Galloway was told she had runner's dystonia – a type of movement disorder known to cause uncontrollable muscle contractions during long-distance runs.

Because Galloway was not willing to take medication to manage the pain she experienced when running forward, she decided to switch to backward running. She'd been introduced to the technique by a physical therapist who evaluated her on a treadmill while running forward, backward and sideways.

Although Galloway found running forward to be nearly impossible, running sideways and backward, she noted, felt “weirdly natural.”²⁰ She began her backward runs on sand and quickly switched to road running because the divots on the beach were difficult to navigate.

Later, she set a goal to run a half-marathon, even seeking to beat the Guinness World Record for the fastest backward half-marathon by a woman, which was then 2:49. In 2015, Galloway set a new record for backward running by a woman in a half-marathon by logging a time of 2:46.

Because running backward stressed her calves and feet more than running forward, Galloway suffered fractures in her sesamoid bones, which are located in the ball of the foot. When competing, Galloway uses a running guide to act as her eyes. Her guide helps her navigate around other runners and potholes, as well as water stations.

About the NYC Marathon, Galloway says she was happy she was able to finish the entire race without any forward-facing walking breaks. “I took a lot of stretch breaks, but finished the whole thing backwards,” she said.²¹ She crossed the finish line just under 6:07.

The NYC Marathon holds special memories for Galloway, who remembers her dad running it when she was a little girl, as well as her own experience of completing the race after graduating from college. Now she is known as an inspiring backward marathon runner. “Six or seven years ago, I didn’t think I was going to run anything longer than 5 miles. Now I’m running marathons, so I’m happy,” said Galloway.²²

Maybe Galloway’s testimony will encourage you to see the potential in running (or walking) backward (although I no longer recommend long-distance running). Most certainly if you have suffered an injury that prohibits you from comfortably performing forward-facing exercise, it just might be time to reverse your routine and try walking or running backward.

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