

Are We Really Born To Run?

There is evidence that debunks the popular running theory.

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According to a few well-respected paleoanthropologists, our ancient ancestors (specifically, *Homo erectus*) were so efficient at running they could chase prey for hours, eventually killing the exhausted animals by hand.

In an interesting paper that went on to create the barefoot running movement, Bramble and Lieberman (1) claim that the consumption of meat obtained by long distance running is the only way to explain the mystery of how *Homo erectus* was able to double its brain size in a relatively short time period about 2 million years ago. These authors propose that because the brain consumes 16 times the calories of an equivalent mass of muscle, and meat provides four times the calories of an equal sized serving of fruit, the only way *Homo erectus* could have fueled such rapid brain expansion was if they were able to obtain calorie-dense meat by running prey to exhaustion. Because *Homo erectus* lacked the ability to use even the simplest of weapons, it seemed logical that chasing prey for hours was their only option for obtaining the amount of meat necessary to fuel their rapidly expanding brains.

The Real Reason For Brain Expansion

While there was an increase in the number of animal bones found in early *Homo erectus* archaeological sites confirming that meat consumption did correlate with brain expansion, a paper recently published in Proceedings of the National Academy of Sciences suggests that it wasn't long distance running that allowed for brain expansion: it was the ability to cook (2). The authors of this paper prove that fire was discovered much earlier than previously believed and the ability to heat food was instrumental in brain expansion because heat softens tough fibers, speeding up the process of chewing and digestion.

Cooking food also allows for a greater percentage of food to be metabolized by the body: 100 percent of cooked food is metabolized while only 30 to 40 percent of the nutrients present in raw foods can be digested. These researchers claim that by incorporating fire to cook their food, our ancient ancestors could easily have obtained the calories necessary to fuel their expanding brains.

Other experts suggest that fire may also have indirectly allowed for brain expansion by keeping predators at bay throughout the night. The improved sleep provided by a primitive campfire would have allowed for the rapid eye movement sleep proven to accelerate brain development.

Not all paleoanthropologists believe the born to run theory. After studying the hunting and gathering habits of the sub-Saharan Hadza tribe (whose lifestyle and environment closely match that of our hominid ancestors), Pickering and Bunn (3) made the important observation that Hadza hunters rarely run, and when they do it is usually in an attempt to “avoid approaching rain showers, stinging bees, and marauding elephants.”

Pickering and Bunn emphasize that prior studies suggesting that running prey to exhaustion was an effective method of hunting are flawed because many of the long distance running hunts referred to were prompted by researchers attempting to film the hunts for television documentaries. In many situations, the long distance run-

ning hunts “were commenced from a vehicle and hunters refilled their water bottles during hunting.” Even with the aid of the television crew, only three out of the eight prompted persistence hunts were successful.

Ironically, in one of the few unsolicited persistence hunts witnessed by Bunn and a colleague, a tribal hunter identified the fresh footprints of a small deer and relentlessly walked after the animal for about three hours. The hunter kept forcing the deer away from the few shady areas available until the animal was exhausted and readily killed with a small club. Pickering and Bunn suggest that because running is metabolically expensive and greatly increases the risks of dehydration and heat exhaustion, it is unlikely that our ancient ancestors would have chosen such a risky and inefficient method of hunting.

In order to test the theory that long distance running played an important role in the development of our species, researchers from Harvard University compared muscle forces associated with walking and running and determined that the transition to running resulted in a 520 percent increase in quadriceps muscle activity (4). This massive increase in quadriceps activity would have presented a significant problem to our hominid ancestors, as they would have had difficulty gathering the calories necessary to fuel such an inefficient form of transportation. The Harvard researchers state that because of the inflated metabolic expense associated with conventional running, running efficiency was “unlikely a key selective factor favoring the evolution of erect bipedalism in humans.”

Does Barefoot Running Protect Us From Injury?

According to “Born To Run” enthusiasts, running with conventional running shoes weaken our feet, and cushioned running shoes are in part responsible for the more than 50 percent annual injury rate present in modern runners. In theory, minimalist shoes will strengthen our toes and arches, keeping us strong and injury-free.

Unfortunately, new research suggests that for the average athlete, wearing minimalist shoes may actually increase the risk of injury. In a 2012 study published in *Medicine and Science in Sports and Exercise*, researchers from Brigham Young University noted that 10 out of 19 runners transitioning into the minimalist Vibram FiveFingers shoes became injured (Fig. 2), compared to only one of the 17 runners in the control group wearing conventional running shoes (5). This is consistent research published in the December 2013 issue of the *British Journal of Sports Medicine*, in which 103 runners were randomly assigned to wear neutral running shoes (Nike Pegasus 28), partial minimalist (Nike Free 3.0 V2), or full minimalist shoes (Vibram FiveFingers Bikila).

At the end of a 12-week training program, the runners wearing the partial and full minimalist shoes were 2-3 times more likely to be injured than the runners wearing the neutral Nike Pegasus shoes (6).

Critics of this research state that the studies weren’t long enough for the feet to adapt to the stresses of running in minimalist shoes. The fact is that many runners may be unable to adapt to the stresses of minimalist shoes, no matter how long the training time is. As noted by the paleoanthropologists Trinkaus and Shang (7), the toes of our early ancestors were significantly wider than the toes of modern humans (Fig. 2). Because strong toes protect our forefeet from trauma by distributing pressure over a broader area, the narrow toes present in most modern humans are less able to protect us from impact forces associated with prolonged barefoot activity. No amount of training will make the bones in your toes wider.

Another factor to consider is that because most of us grew up wearing shoes, we are more likely to possess narrow forefeet. Studies of lifelong barefoot populations prove that the forefeet of lifelong barefoot populations are 16 percent wider than the forefeet of lifelong shod populations (8). Apparently, the stresses associated with barefoot activity cause the forefoot to develop with wider, stronger bones. Because the overwhelming majority of us grew up wearing shoes, we need to protect our narrower forefeet with cushioned midsoles.

Although the notion that we developed our huge brains because of our ability to run long distance in the hot savannah sun makes for an interesting story, current research suggests that rather than being born to run, we were really born to walk. Instead of exposing our feet to the dangerous forces associated with barefoot running, we should protect our naturally narrow forefeet and thin toes with protective running shoes possessing adequate midsole cushioning. It doesn't take a lot of cushioning because even 10 millimeters of midsole cushioning has been shown to increase the storage and return of energy (9), and reduce the potential for injury (5, 6).

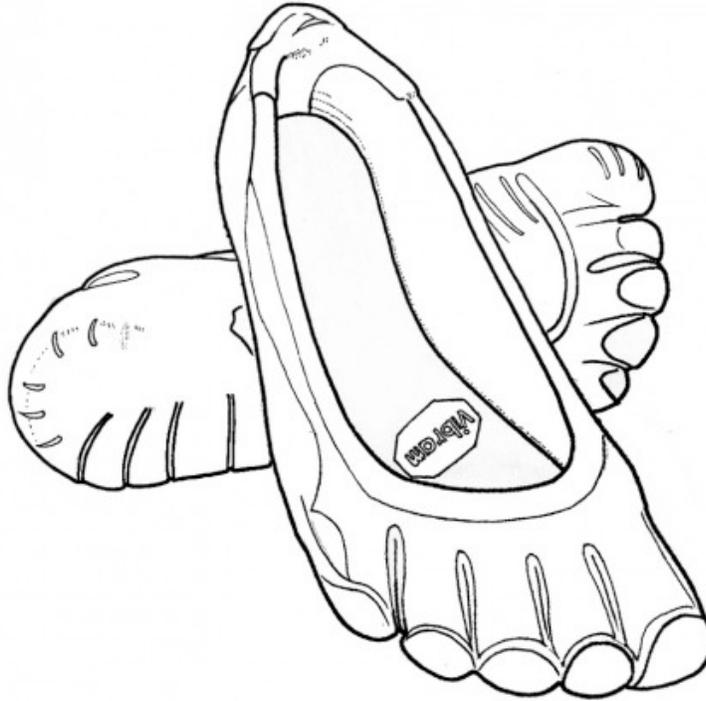


Fig. 2. Vibram FiveFingers running shoes are designed to mimic barefoot activity.

References

1. Bramble D, Lieberman D. Endurance running and the evolution of Homo. *Nature*. 2004;432:345-352.
2. Berna F, Goldberg P, Horwitz L, et al. Microstratigraphic evidence of in situ fire in the Acheulean strata of Wonderwerk Cave, Northern Cape province, South Africa. *Proceedings of the National Academy of Sciences*. April 2, 2012.
3. Pickering T, Bunn H. The endurance running hypothesis and hunting and scavenging in savanna woodlands. *J Human Evolution*. 2007;53:434-438.
4. Biewener A, Farley C, Roberts T, Temaner M. Muscle mechanical advantage of human walking and running: implications for energy cost. *J Appl Physiol*. 2004;97:2266-2274.
5. Ridge S, Johnson A, Mitchell U, et al. Foot bone marrow edema after 10-week transition to minimalist running shoes. *Med Sci Sports & Exerc*, 2013. Published Ahead of Print. DOI: 10.1249/MSS.0b013e3182874769.
6. Ryan M, Elashi M, Newsham-West R, Taunton J. Examining injury risk and pain perception in runners using minimalist footwear. *Br J Sports Med*; Published Online First 19 December 2013.
7. Trinkaus E, Shang H. Anatomical evidence for the antiquity of human footwear: Tianyuan and Sunghir. *J Archeol Sci*. 2008;35:1928-1933.
8. D'Aout K, Pataky T, DeClerq D, Aerts P. The effects of habitual footwear use: foot shape and function in native barefoot walkers. *Footwear Science*. 2009;Vol. 1, No. 2, June, 81-94.
9. Tung K, Franz J, Kram R. A test of the metabolic cost of cushioning hypothesis in barefoot and shod running. American Society of Biomechanics Annual Meeting. Gainesville, FL. August 2012.