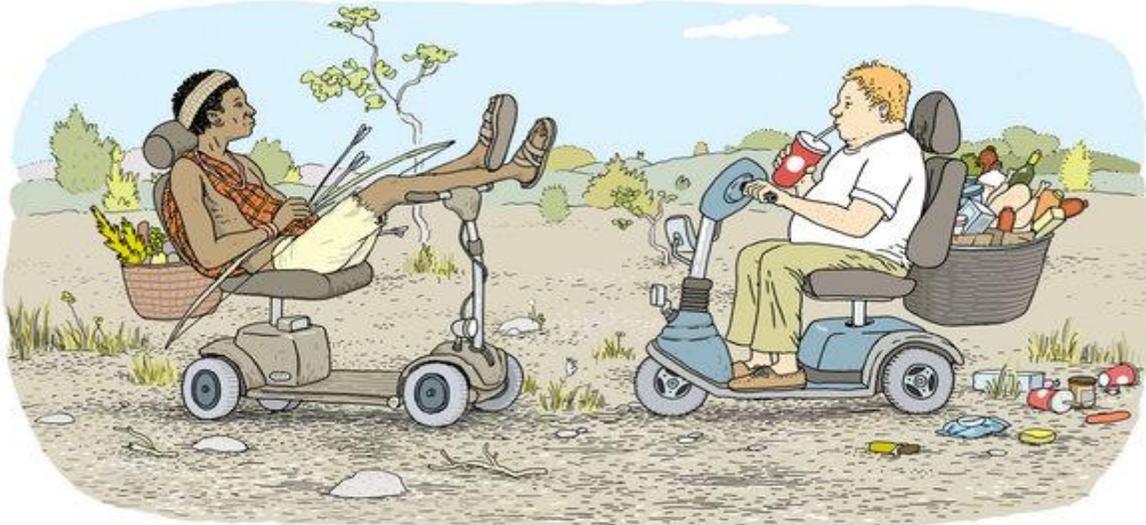


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Debunking the Hunter-Gatherer Workout

By HERMAN PONTZER

DARWIN isn't required reading for public health officials, but he should be. One reason that heart disease, diabetes and obesity have reached epidemic levels in the developed world is that our modern way of life is radically different from the hunter-gatherer environments in which our bodies evolved. But which modern changes are causing the most harm?

Many in public health believe that a major culprit is our sedentary lifestyle. Faced with relatively few physical demands today, our bodies burn fewer calories than they evolved to consume — and those unspent calories pile up over time as fat. The World Health Organization, in discussing the root causes of obesity, has cited a “decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation and increasing urbanization.”

This is a nice theory. But is it true? To find out, my colleagues and I recently measured daily energy expenditure among the Hadza people of Tanzania, one of the few remaining populations of traditional hunter-gatherers. Would the Hadza, whose basic way of life is so similar to that of our distant ancestors, expend more energy than we do?

Our findings, published last month in the journal [PLoS ONE](#), indicate that they don't, suggesting that inactivity is *not* the source of modern obesity.

Previous attempts to quantify daily energy expenditure among hunter-gatherers have relied entirely on estimation. By contrast, our study used a technique that calculates the body's rate of carbon dioxide production — and hence the calories burned per day — by tracking the depletion of two isotopes (deuterium and oxygen-18) in an individual's urine over a two-week period.

It was a testament to the Hadza's graciousness, and their years of friendship with several of my colleagues, that they welcomed us into their camps and participated in the study. As we sat back and observed, the Hadza went about their normal routines.

The Hadza live in simple grass huts in the middle of a dry East African savanna. They have no guns, vehicles, crops or livestock. Each day the women comb miles of hilly terrain, foraging for tubers, berries and other wild plant foods, often while carrying infants, firewood and water. Men set out alone most days to collect honey or hunt for game using handmade bows and poison-tipped arrows, often covering 15 to 20 miles.

We found that despite all this physical activity, the number of calories that the Hadza burned per day was indistinguishable from that of typical adults in Europe and the United States. We ran a number of statistical tests, accounting for body mass, lean body mass, age, sex and fat mass, and still found no difference in daily energy expenditure between the Hadza and their Western counterparts.

How can the Hadza be more active than we are without burning more calories? It's not that their bodies are more efficient, allowing them to do more with less: separate measurements showed that the Hadza burn just as many calories while walking or resting as Westerners do.

We think that the Hadzas' bodies have adjusted to the higher activity levels required for hunting and gathering by spending less energy elsewhere. Even for very active people, physical activity accounts for only a small portion of daily energy expenditure; most energy is spent behind the scenes on the myriad unseen tasks that keep our cells humming and our support systems working. If the Hadza's bodies somehow manage to spend less energy in those areas, they could easily accommodate the elevated energy demands of hunting and gathering. And indeed, studies reporting differences in metabolic-hormone profiles between traditional and Western populations support this idea (though more work is needed).

Our findings add to a growing body of evidence suggesting that energy expenditure is consistent across a broad range of lifestyles and cultures. Of course, if we push our bodies hard enough, we can increase our energy expenditure, at least in the short term. But our bodies are complex, dynamic machines, shaped over millions of years of evolution in environments where resources were usually limited; our bodies adapt to our daily routines and find ways to keep overall energy expenditure in check.

All of this means that if we want to end obesity, we need to focus on our diet and reduce the number of calories we eat, particularly the sugars our primate brains have evolved to love. We're getting fat because we eat too much, not because we're sedentary. Physical activity is very important for maintaining physical and mental health, but we aren't going to Jazzercise our way out of the obesity epidemic.

We have a lot more to learn from groups like the Hadza, among whom obesity and heart disease are unheard of and 80-year-old grandmothers are strong and vital. Finding new approaches to public health problems will require further research into other cultures and our evolutionary past.

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