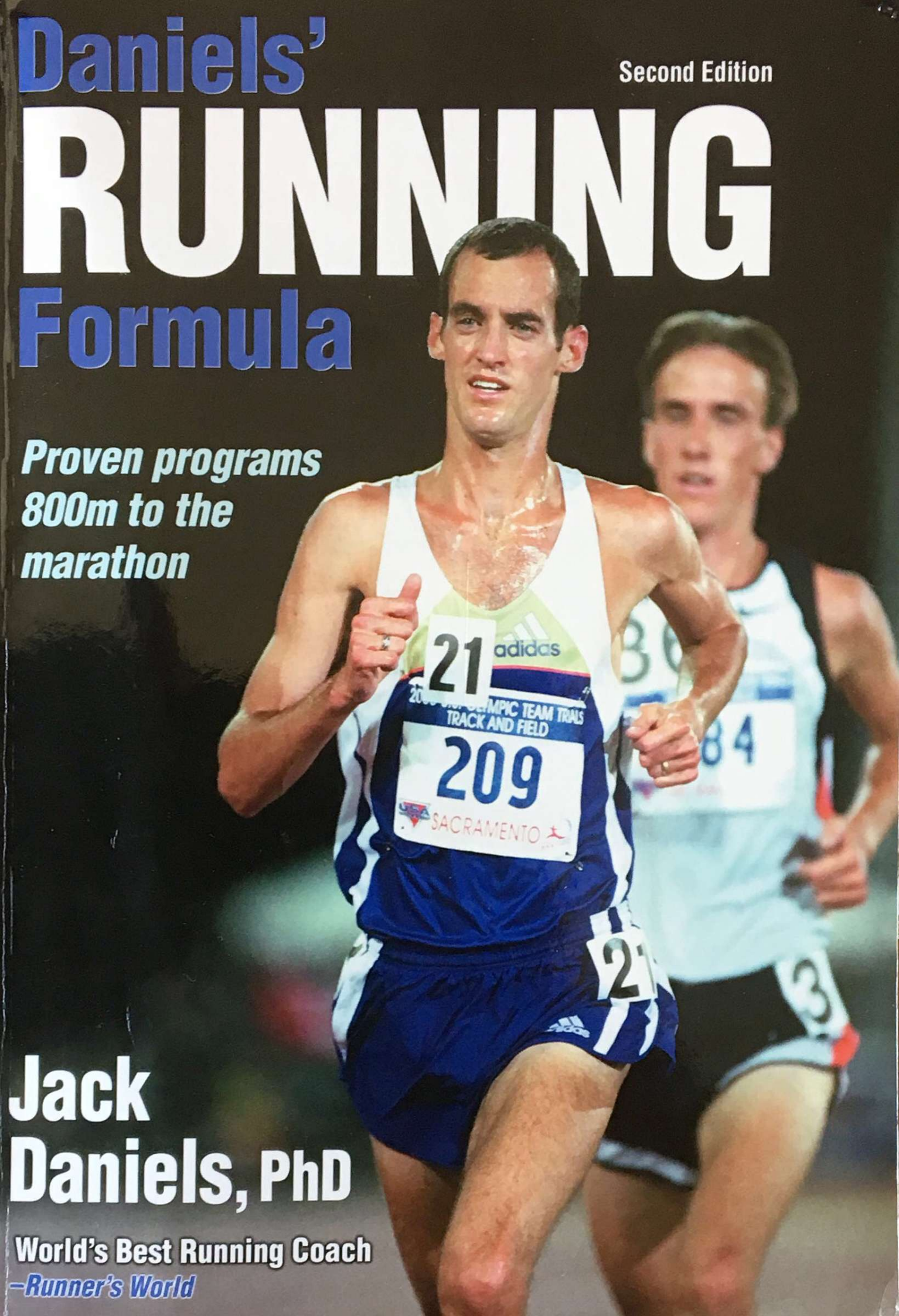
Daniels' RUNNING Formula

Second Edition

Proven programs 800m to the marathon



Jack Daniels, PhD

World's Best Running Coach
–Runner's World

STRIDE RATE: A STEP IN THE RIGHT DIRECTION

One of the first things I teach new runners is some basics about running cadence, or stride rate. Almost all elite distance runners (both men and women) tend to stride at about the same rate: 180 or more steps per minute. This means that they're taking 90 or more steps with each foot each minute, a rate that doesn't vary much even when they're not running fast. The main change that occurs as runners go faster is in stride length; the faster they go, the longer the stride becomes, with little change in rate of leg turnover.

The stride rate many beginning runners take is quite different from that of elite runners. When I have new runners count their own stride rates, I find that very few (sometimes none out of a class of 25 or 30) take as many as 180 steps per minute. In fact, some turn over as slowly as 160 times per minute. The main disadvantage of this slower turnover is that the slower you take steps, the longer you spend in the air, and the longer you're in the air, the higher you displace your body mass and the harder you hit the ground on landing. When you consider that many running injuries are the result of landing shock, it's not surprising that experienced runners tend to turn over faster than beginning runners do.

If a group of beginners were required to start running 100 miles a week, two things would probably occur: Many runners would hurt themselves, and many who didn't get hurt would adjust to taking quicker, lighter steps. I try to save runners a lot of grief by encouraging them to convert to a stride rate associated with less landing shock and more efficient use of energy.

Several studies have been conducted on the energy demands of different stride frequencies, and it turns out that experienced runners are most efficient at their chosen rate of turnover; longer or shorter strides (which mean slower or faster stride rates) result in greater energy demands. However, when working with less-experienced runners, running economy can often be improved by converting slow-turnover runners into runners who use a faster rate.

My wife and I spent most of our time at the 1984 Olympics counting and measuring stride rates and stride lengths of male and female runners competing in distance events from 800 meters up to the marathon. The results were convincing—the fastest turnover rates were among the 800-meter specialists, and next fastest were the 1,500-meter runners, but from the 3,000-meter distance on up to the marathon there was little variation in turnover rate. In fact, the women took only a few steps more per minute than did the larger men, who were often running considerably faster as a result of longer stride length.

Next time you watch a marathon race on television, count how many times the right arm of one of the runners swings forward in 20 or 30 seconds. Use the recorded number to calculate a one-minute rate (of course you're accepting the probability that the runner is swinging his or her right arm as often as he or she is taking steps). Try counting steps of the same runner at various stages

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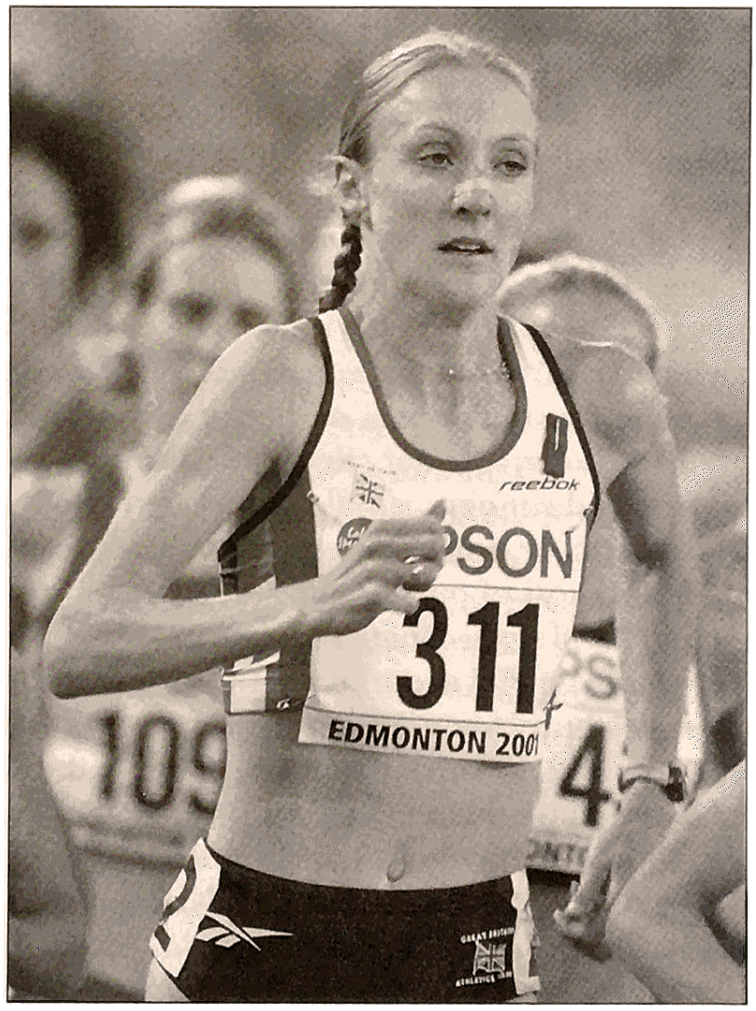
of the race. Chances are good that strong runners won't lose the cadence they began with. We often talk about getting into a good running rhythm, and the one you want to get into is one that involves 180 or more steps per minute.

If you count your own stride rate and find it's considerably slower than what I'm suggesting, try to work on a shorter, lighter stride. Imagine that you're running over a field of raw eggs and you don't want to break any of them—run *over* the ground, not into it. Try to get the feeling that your legs are part of a wheel that just rolls along, not two pogo sticks that bounce along.

If you feel that you need practice improving your stride rate, focus on this during easy runs. Rate usually goes up for slower-turnover people when they race shorter distances, so you may not need to think about it during faster quality training. When practicing turning over faster on easy training runs, don't let the fact that you're taking quicker steps force you to run faster. Try to run at your normal training speed, but do it with a shorter, quicker stride rate. With practice, you'll find it becomes quite natural and comfortable.



The number of right-arm swings, and thus the number of steps, taken by elite marathoners such as Paula Radcliffe varies little over the duration of a race.