

We Slow as We Age, but May Not Need to Slow Too Much

From the New York Times, by Gretchen Reynolds, Oct. 3, 2018

Although declines in running and other activities are unavoidable, they may be less steep than many of us fear.

Photo: Bernard Lagat crosses the finish line in Atlanta on July 4, 2018. Credit: Curtis Compton/Atlanta Journal-Constitution, via Associated Press



Most of us who are older competitive runners are not able to race at anywhere near the same speed as we did when we were 30.

But we can perhaps aim to slow down at the same pace as Bernard Lagat, Ed Whitlock and other greats of masters running, according to a timely new analysis by two professors from Yale University.

The new analysis, which refines famous past research by one of the scientists, finds that, although declines in running performance with age are ineluctable, they may be less steep than many of us fear.

And, perhaps most important, the new research updates a popular formula and calculator that runners past the age of 40 can use to determine how fast we can expect to slow down and provides us with reasonable, age-appropriate finishing-time targets for ourselves.

Scientists do not know precisely why, from a physiological standpoint, we are less able to maintain our old, swifter pace as we reach middle age.

There is evidence from past studies that even in lifelong athletes, hearts become a bit less efficient over time at pumping blood and delivering oxygen and muscles a bit less adept at creating sustained power.

Changes deep within our cells, particularly in the energy-producing mitochondria, are thought to contribute to these age-related performance declines, as are simpler explanations such as creeping weight gain and a drop-off in hard training.

But the upshot is that, after a certain point, we cannot keep up with the kids or with our own previous bests.

Professor Ray Fair, an economist at Yale who mainly analyzes and predicts election outcomes, is familiar with this tribulation, since, now in his mid-70s, he is also an experienced masters marathon runner whose times have been slowing year by year.

About a decade ago, he began to wonder whether his rate of performance decline was typical and, being a predictive statistical modeler, decided to find out.

He turned first to information about world records for runners by age group. These times represent what is possible by the best runners in the world as they age.

And cumulatively, he found, the records proved that champion runners slow like the rest of us.

But there was a pattern to the slowing, Dr. Fair realized. As he [reported in a 2007 study](#), the masters world record times rose in a linear fashion, with some hiccups, until about age 70, when they begin to soar at a much higher rate.

Using statistical modeling based on this pattern, Dr. Fair developed a formula that could predict how fast other, less-exceptional runners might expect to run as they grew older. He incorporated this formula into an influential calculator that he made available free on his website. (The calculator also predicts age-related performance declines in swimming and chess, using the same statistical techniques.)

The calculator soon became popular with runners, for whom it provided age-adjusted viable goal times, allowing them to swap despondency about their current plodding for gratification if they had managed to remain at or near their “regression line,” as Dr. Fair termed the age-adjusted predicted finishes.

But recently, Dr. Fair began to question whether his statistical model provided the best estimates of people’s likely race times and, for the new analysis, which was [published in print this month in *The Review of Economics and Statistics*](#), he approached a Yale colleague, Edward Kaplan.

Dr. Kaplan is an expert in a complex type of statistical analysis known as extreme value theory, which focuses on exceptional deviations from the norm.

By definition, world records are exceptional deviations from the norm.

Together, Dr. Fair and Dr. Kaplan reanalyzed data about world masters running records through 2016 for the 5K, 10K, half marathon and marathon events, up to age 95.

They used only men’s records, since the number of older female participants has been small, Dr. Fair says, making current women’s records statistically suspect.

They then ran the numbers, using several different models, and found that, over all, age-adjusted finishing times are slightly slower now than in the 2007 version, rising about 1 percent a year.

But runners seem to be maintaining that rate of decline longer, until they are about age 80, when slowness drastically intensifies.

But even for 90-year-olds, the decline is limited, Dr. Fair points out.

Nonagenarians can expect to be “about twice as slow as they were in their prime,” he says, “which I think is encouraging.”

Interestingly, the new study’s extreme-value analysis also suggests that older runners have not yet become as fast as they could be.

The complicated calculations indicate that current world records for older runners theoretically could drop by as much as 8 percent in the future, Dr. Kaplan says, providing all of us new benchmarks for our own aging performance.

Dr. Fair has now introduced an updated version of his calculator, incorporating the new models.

To use it, visit his endearingly austere website at fairmodel.econ.yale.edu/aging and click on the link entitled “[All other running \(2018 updated age factors\)](#).”

There, enter your best time for whichever event interests you and the age at which you set that time. If you were younger than 40, use age 40 anyway, since the calculator assumes you will not have slowed much before reaching that age, Dr. Fair says.

You then will see your predicted times for your chosen event at every age through 95.

These figures presume that you have continued to train and maintain high fitness over the years, which many of us have not.

They also assume that recreational runners age and slow at the same rate as world-class runners, which has not been proven experimentally.

But even with these limitations, Dr. Fair says, the predictions give us something to shoot for.

“Aim for your regression line,” he says.