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In science, 1905 is known as the annus mirabilis, or “miracle year,” the period when Albert Einstein, at the age of 26, published several discoveries that changed physics forever. By the summer of that year he’d explained Brownian motion, discovered the photoelectric effect (for which he won a Nobel Prize), and developed the theory of special relativity; then, before the year ended, he wrote the world’s most famous equation: $E = mc^2$.

What happened for Einstein in 1905 can be described as a “hot streak,” or burst of seemingly miraculous success and impact. Our understanding of creative careers to date has suggested they’re unlikely to include hot streaks. For example, my [earlier co-authored work](#) found that a scientist’s biggest research hit occurred completely randomly in their sequence of published works: It could be, with equal likelihood, the very first work, the last, or any one in between. We called this phenomenon the “random impact rule.”

While intriguing by itself, the random impact rule raises puzzling implications: What happens after we finally produce a breakthrough? Indeed, if every work in a career is like a random lottery draw, then one’s next work after a hit may be more mediocre than spectacular, reflecting regression toward the mean.

But this is hard to believe. Most of us — including me — would like to believe that if we produced a big hit, it would help us produce more hits afterwards. After all, we know that winning begets more winning. So are we really regressing toward mediocrity after we break through? To answer these questions my student Lu Liu and I along with other collaborators studied the careers of about 30,000 scientists, artists, and film directors. We used a given work’s number of citations (as provided by the [Web of Science](#)), auction price, and [IMDB](#) rating, respectively, as measures of quality and impact. [We find](#) that across these diverse careers, the random impact rule holds firm.

In fact, it’s not just the biggest hit that occurs at random: The second-biggest and third-biggest also hit randomly. This finding paints an unpredictable view of creativity, with an outsized role of chance in individual success. If our careers are indeed like lotteries, should we just keep drawing and hope for the best?

This, thankfully, is an incomplete reading of the data, as we found upon examining the relative timing of hit works. Specifically, we asked: Given when someone produced their best work, when would their second-best work be? We find that knowing the timing of one’s best work points to when their next best works will arrive: They’re just around the corner. So, while the timing of most-successful works in a career is random, their relative timing is very predictable. In other words, creative careers are characterized by bursts of high-impact works clustered together in sequence. The result begs a key question: Why?

We found that the most compelling explanation is the existence of hot streaks: across all creative domains we studied, individuals enjoy specific periods of outsized relative impact that occur randomly in any one person’s career. Hot streaks are ubiquitous: for each domain we studied, about 90 percent of individuals had at least one hot streak.

So it wasn’t just Einstein’s miracle year of productivity, but *The Lord of the Rings* series for director Peter Jackson, the “drip period” for painter Jackson Pollock, or the time Vincent Van Gogh spent in South France in 1888, a year in which he produced renowned works including *The Yellow House*, *Van Gogh’s Chair*, *Bedroom in Arles*, *The Night Café*, *Starry Night Over the Rhone*, *Still Life: Vase with Twelve Sunflowers*, and others.

We also found that hot streaks usually last for short periods: For artists and film directors, it's about five years; for scientists, four. Moreover, the timing of the hot streak is random. Hence while periods of relative success were common, there was no way to predict when these would emerge in a given career, in line with the random impact rule uncovered earlier. Unexpectedly, hot streaks were not associated with greater productivity. Thus we don't produce more during hot streaks than we typically would, but what we create is substantially better than our remaining body of our work.

What do our findings mean for professionals and the ecosystems they inhabit? In the scientific community, for example, projected impact is critical for hiring, advancement, grant-making, and other decisions. But the same is true of most domains, including business. Our research suggests that decision-makers should consider incorporating the notion of hot streaks into their calculus, if policies are to identify and nurture individuals more likely to have lasting impact.

But perhaps the most important — and uplifting — implication is for the individual innovators out there striving to make their mark on the world. The conventional view is that an individual's best work will likely happen in their 30s or 40s, when they have a solid base of experience, along with the energy and enthusiasm to sustain high productivity; once we pass the mid-career point, hopes for breakthroughs start to dim. Our findings indicate that the hot streak may emerge with any work you put out, resulting in a near-term cluster of relative successes. Your big break, it appears, may arrive at any time in your career.

In other words, there is hope: Each new gray hair, literal or figurative, does not by itself make us obsolete. As long as you keep putting work out into the world, one project after another, your hot streak could be just around the corner.

Bear in mind, however, that while the hot streak phenomenon seems universal in the domains we studied, we don't yet know why it happens in a given career, or what triggers it. Indeed, the only certainty is this: The fate of your career rests largely in your own hands, because one sure way to prevent a hot streak is to stop producing altogether. While it may be true that older people are less likely to break through than their younger counterparts, we found that this is not because age and creativity are intertwined. It's simply because we try less in later life-stages.

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