Work

Your story

Send your careers story to: naturecareerseditor@nature.com

HUGE CAREER ANALYSIS FINDS KEYS TO PRODUCTIVITY

Early publishing success, team size and international collaborations are some of the best predictors of future publication rates. **By Andy Tay**

Researchers hoping to find late-career success are in for bad news. A study that tracked the publishing output of hundreds of thousands of scientists has found that the most important predictor of being a top performer in the late-career stage is being a high achiever early on[1].

The paper, published in *Quantitative Science Studies*, analysed the publication record of 320,564 researchers from the 38 member nations of the Organisation for Economic Co-operation and Development (OECD). The study says that these researchers represent almost 80% of all 'late career' scientists – people who have at least 25 years of experience in publishing academic articles – in the world. It analysed up to 50 years' worth of bibliographic data per researcher and considered 1.8 billion citations. The authors also investigated how career histories differed across 16 broad disciplines, including agriculture, medicine, physics and psychology, and looked for trends after normalizing for variations in publishing habits between disciplines.

Lead author Marek Kwiek, a social scientist at the Adam Mickiewicz University in Poznań, Poland, had already looked at variations in the publication output of Polish researchers in a 2018 paper[2]. Kwiek had found that success breeds success: the top group of performers generally stayed consistently productive. He found that the top 10% of Polish researchers produced 45% of all Polish publications, and that the people in this subset produced 12 times as many internationally co-authored publications as the average Polish academic.

A study from 1974 reported a similar phenomenon of 'accumulative advantage': productive scientists are more likely to stay productive, whereas scientists who have low productivity experience a decline in output[3]. The article hypothesized that this might be because of individual motivation or a result of extra resources being provided to high achievers.

Although the latest study by Kwiek and his colleague Łukasz Szymula is not the first to observe this relationship between productivity and success, it is by far the largest of its kind. The findings from Poland motivated the pair to investigate whether the trend would also be observed in the global research community.

DEMAERRE/ISTOCK VIA GETTY

Researchers who publish a lot of papers early in their careers tend to keep up the momentum.

How to become productive

In the study, published in September last year, Kwiek and Szymula separated researchers into ten equal groups (deciles) according to the number of papers and book chapters they had produced – which the authors used as a proxy for research productivity. They also weighted papers on the basis of a journal 'prestige' score, which was calculated by looking at the number of citations that a journal received between 2020 and 2024.

The study also analysed the correlation between research productivity and various factors that might affect success. In 10 of 16 disciplines, being male correlated with membership in the top decile of productivity in late-career scientists, with the highest correlations in the fields of biology, immunology and neuroscience. However, gender did not seem to be linked with persistence – the likelihood of staying in the same decile across career stages.

The probability of being a high-performing researcher, as the paper defines it, also correlates with the rate at which authors collaborate internationally.

Moreover, across all fields, the larger a researcher's team, the better the odds of that person being in the highest decile. This is especially true for disciplines in which it is more common to have small teams or single-author studies, such as mathematics and economics. In these specific disciplines, having one extra co-author on a paper published in the

early-career stage increased the probability of a researcher going on to be in the top decile by an average of 25–40%.

Lessons from the outliers

Although most researchers remain in the productivity deciles that they start their careers in, there are exceptions – and perhaps lessons to learn from those outliers. In the sample the authors investigated, 1.4% of researchers are what Kwiek and Szymula call 'jumpers up' – people who moved from the bottom decile in the mid-career stage to the top decile in the late-career stage. This extreme mobility is highly variable across disciplines, with the rate of people reaching the top decile ranging from 0.4% in psychology to 1.8% in business studies. Of more than 300 immunologists, only one successfully made the leap.

Another group of outliers are what the study referred to as 'droppers down'. These researchers used to be in the top decile but have dropped to the bottom one.

There are a number of reasons for dropping down. For example, "when researchers move from a country such as the United States, where the research landscape is more advanced, to home countries with less-developed research infrastructure, their productivity is bound to suffer", says Kwiek. "As these are structural reasons beyond the control of an individual, researchers are stuck in a cycle of poor productivity. It could also be due to poor health or family commitments."

"We need to be careful not to rely only on published papers as a metric for productivity."

Limitations of the study

Mike Thelwall, a data scientist at the University of Sheffield, UK, who studies scientific publishing trends, says that he is not surprised by the findings of the paper, which reflect the hiring and promotion policies of most institutions. "This paper provides large-scale empirical data to support merit-based hiring, which is working well for science. However, we need to be careful not to rely only on published papers as a metric for productivity."

Vanja Cnops, a neuroscientist at the National University of Singapore, worries about how this and other similar studies often use publishing output in high-impact journals as a proxy for success. "As an early-career researcher, I understand why journal impact factor is often used as a marker of achievement, but scientific merit cannot be reduced to journal prestige alone," she says. "When hiring, funding and career advancement are linked to where research is published, incentives can drift away from rigorous work, towards results perceived as more 'publishable'."

She adds that many aspects of a researcher's achievements, such as innovation, transparency, replicability, long-term impact on scientific knowledge and the quality of mentoring provided to young researchers, are hard to quantify. "But research culture will only improve when these values are intentionally tracked."

Thelwall adds that some funders now request that researchers submit a 'narrative CV' alongside grant applications – describing their contributions to the development of new methodologies, teaching, commercially viable innovations and broader society – to help them look beyond numerical metrics. "This can be more informative on the holistic impact of research," he says.

In any case, for early-career researchers, it seems that publishing papers consistently might be an effective way to build a successful research career – so start early and keep going.

Andy Tay is a freelance writer in Singapore.

1. Kwiek, M. & Szymula, L. *Quant. Sci. Stud.* **6**, 1002–1038 (2025).
2. Kwiek, M. *Scientometrics* **115**, 415–462 (2018).
3. Allison, P. D. & Stewart, J. A. *Am. Sociol. Rev.* **39**, 596–606 (1974).

WILLIAM FORTUNE

In his artwork *The Weight of our Passports* (2025), Mayank Chugh explores mobility privilege.

LESSONS FROM A VISA DENIAL

A last-minute change of plans made me rethink my fieldwork course. **By Mayank Chugh**

In June 2025, I was meant to travel to Cape Town, South Africa. I was directing a study-abroad programme in which biology undergraduates would learn how biomedical research is affected by social policy and ethical considerations across borders and cultures. The course, called 'From Lab to Governance', would be the highlight of my teaching portfolio as a biologist with an interest in ethics and social inequalities: an opportunity to mentor students and to witness their curiosity unfold while they attended museums and spoke to representatives of biomedical organizations.

Then, two weeks before my scheduled departure from the United States, an e-mail