Work

Your story

Send your careers story to: naturecareerseditor@nature.com

THOMAS BARWICK/GETTY

A team leader might work late in the laboratory, but it doesn't mean that everyone should.

IT PAYS TO LEARN FROM LEAVERS

Avoid 'survivorship bias'. By Dave Hemprich-Bennett, Dani Rabaiotti and Emma Kennedy

A major flaw in much scientific and academic career advice is survivorship bias. This is a common logical error, involving drawing conclusions based on those who have 'survived' a process – and are thus more visible than those who did not. In the case of science careers advice, the bias arises because those who manage to stick to their chosen career path are there to advise the next generation of researchers on how to stay in their field.

As two postdoctoral researchers in ecology (D.H.-B., D.R.) and a lecturer in learning and teaching (E.K.), we have seen many examples of worthy but 'unsuccessful' colleagues who left their research field against their wishes. On the flipside, the positions we hold in our respective fields are, to some extent, the result of many chance events that we experienced.

Some of our success came from hard work, grit and good judgement. But much of it came from decisions, luck and circumstances that never make it into careers advice. For example, job opportunities for D.R. and her friends have come about through having drinks with senior scientists, and D.R. was invited to publish her first book, *Does It Fart?*, thanks to a completely unplanned Twitter hashtag. Chance or serendipitous experiences such as these are impossible to replicate, yet are key to many people's ability to stay in their chosen career.

"Bias arises because those who manage to stick to their chosen career path are there to advise."

Conversely, E.K. had to leave her original field, English literature, because she could not afford to stay in the insecure, low-paid teaching roles that were available. It is therefore important to know not only why some people 'succeeded', but also what pushed many more away. Assuming that all aspiring scientists and academics enjoy similar circumstances to those of their colleagues who have 'survived' can only damage the prospects of the next generation, and will lead to professions with much less diverse staff than could have been the case.

Over the years, numerous senior researchers have assumed that we would be able to go without pay for an extended period during our research, even while living in one of the world's most expensive cities. Sometimes we've had to argue our case and explain why we couldn't afford to do so; sometimes we've simply had to find other jobs. Anyone who is able to work without pay is not only financially secure but is also unlikely to have other demands such as caring responsibilities – and those who think unpaid work is straightforward are likely to share these circumstances.

For these reasons, survivorship bias in career advice becomes self-perpetuating. Those who survived and thrived because of privilege assume that those hoping to follow in their footsteps are in similar financial and social situations; conversely, those who lack that privilege are less likely to make it to a position from which they can give less biased advice.

As the coronavirus pandemic has blurred the boundaries between 'work' and 'life', the issue of balance has become even more prominent (see *Nature* **591**, 489–491; 2021). The closest many senior researchers come to fostering work–life balance is offering the common advice to 'take a break': perhaps between contracts, over holiday periods, or even by simply not working at weekends. Survivorship bias plays out here as well, because this advice assumes that recipients can afford to take time off despite the pressure to publish or to keep their head above water financially. D.R. took a six-month break between handing in her PhD and beginning her postdoc, but this was feasible only because she had savings, thanks to publishing that book about farts – a privileged position that most PhD students cannot easily replicate.

Although survivorship bias makes intuitive sense to most academics, its influence in careers advice is rarely considered. Studies that look at career outcomes of current scientists

© 2021 Springer Nature Limited. All rights reserved.

might even conclude that career setbacks are beneficial, without acknowledging that those setbacks lead many others to leave their field altogether[1]. Some researchers will encounter barriers and setbacks beyond anything we have experienced — for example active discrimination, harassment (see go.nature.com/3dkxz1k) or severe financial distress — and leave their fields as a result. It is important to understand what the advice that our communities pass on is rooted in, and that none of us can be truly representative of all aspiring scientists. Every scientist has their own barriers to overcome, but let's beware of extrapolating that, because something was not an issue for us, it is therefore not seriously problematic for those around us.

Different paths

During the pandemic and its aftermath, relying on conventional thinking and others' biased experience is more dangerous than ever, especially because of the documented ethnic-, class- and gender-based disparities of COVID-19's impact in our communities[2–4].

Those of us who are senior enough to be giving advice and setting expectations can enhance the quality and inclusivity of our working environments by asking our students and colleagues about the barriers they face, with a view to understanding the factors that might exclude people from career progression. Those around you might well have had to deal with hardships and circumstances that are different from yours; so, when involved in mentoring conversations, make time to ask which ways forward would work for them, rather than just recommending your own path. The fact that you overcame a barrier does not preclude it unfairly excluding many others.

Seeking further mentorship and support from others whose background is similar to yours, and who have faced similar barriers in their career, can be particularly helpful in this regard. Frank but sensitive conversations around these issues might feel awkward, but in helping us to better understand how to support one another, they could be key to reducing inequities in scientific careers.

Dave Hemprich-Bennett is a postdoctoral research assistant in molecular ecology at the University of Oxford, UK. **Dani Rabaiotti** is a postdoctoral research assistant in conservation science at the Zoological Society of London. **Emma Kennedy** researches staff development at the University of Greenwich, London.

1. Wang, Y., Jones, B. F. & Wang, D. *Nature Commun.* **10**, 4331 (2019).
2. Blundell, R., Dias, M. C., Joyce, R. & Xu, X. *Fiscal Stud.* **41**, 291–319 (2020).
3. Gemelas, J., Davison, J., Keltner, C. & Ing, S. *J. Racial Ethn. Health Disparities* https://doi.org/10.1007/s40615-021-00963-3 (2021).
4. Malisch, J. L. *et al. Proc. Natl Acad. Sci. USA* **117**, 15378–15381 (2020).

CAROLINA S. GUTSTEIN

Ana Valenzuela-Toro examines the fossil of a seal.

LATIN AMERICAN CHALLENGES

Cumulative barriers can hold researchers back.

By Ana M. Valenzuela-Toro and Mariana Viglino

As female researchers from Latin American countries (one of us now works in the United States, the other in Argentina), we're used to career obstacles. These range from limited funding to language barriers and the 'tax', in terms of time (*Nature* **583**, 479–481; 2020) and emotional energy, incurred when people from groups under-represented in science participate in diversity initiatives. These barriers knit together to create problems beyond the obvious.

The current focus on diversity, equity and inclusion in science is welcome, but efforts to combat biases can lack nuance. Researchers from under-represented communities often experience the intersection of sexism, racism, and colonialism. In other words, the career barriers we face have a cumulative effect.

Our academic journeys illustrate these obstacles. Many of these are also encountered by other early-career researchers from Latin America, especially women and scientists who are LGBTQIA+, people of marginalized sexual orientations and gender identities.

Funding barriers

Latin American countries invest significantly less in science, technology, engineering and mathematics (STEM) than do high-income countries, so the continent's researchers have less access to funding opportunities and smaller budgets than they might elsewhere[1].

This has an impact on performance in the laboratory and in the field, not only affecting the scope of the research we can do, but also limiting our attendance at international conferences, which are important opportunities for networking and creating collaborations. For both of us, the first international meetings we attended, after securing funding from the conference, became a pivotal step in our academic journey, allowing us to meet people who became mentors and long-term collaborators.

In addition, we must deal with the invisible burden of the visa application. For researchers from countries without 'passport privileges', attending international conferences in the global north means coping with endless paperwork that can be more time-consuming and emotionally overwhelming than overcoming the financial constraints.

Visa applications can be especially difficult considering that acceptance of an abstract for a paper or poster can be slow. And there is no guarantee that the application will be approved, or that a visa-holder will actually be granted entry when they arrive at their destination.

The two of us have had similar experiences with visa applications. We have been asked awkward questions, such as whether we have any intention of carrying out illicit activities, and been asked to disclose private information

© 2021 Springer Nature Limited. All rights reserved.