Unleashing the Power of Postdocs: Improving the postdoctoral experience to enable improvements in research culture

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Abstract

Postdoctoral researchers are at the heart of university research. This highly motivated and talented group are ambitious and passionate about research and keen to develop an academic career. Very few achieve this call and far too many end up suffering with mental health issues, feeling used by a system where others benefit most from their efforts and that by not becoming an academic they have somehow failed.

For the academy to thrive and diversify this culture has to change, and evidence is clear that investing in the training, culture and opportunities for postdoctoral researchers will yield extraordinary rewards, not only for those researchers, but for their academic managers, departments and institutions. Training, inclusion and the opportunity to develop independence are all highly valued by postdoctoral researchers but there is also a need for research funders to look at how they can be major facilitators of change.

Keywords: training; postdoctoral researchers; research culture; development

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The Power of Postdocs

Postdoctoral researchers (postdocs) are one of the most important and productive groups in universities. They are the major delivery mechanism of university-based research with metrics showing that they are the most frequent contributors as first author on peer reviewed articles (**Vogel, 1999, Robinson-Garcia 2020**). In addition to delivering research postdocs contribute significantly to the academic life of universities by taking on activities in order to increase their experience and employability, even when these activities are unpaid. With their increased availability and more junior status removing some of the barriers that may arise in interacting with a more senior academic, postdoctoral researchers often become a *de-facto* second supervisor, delivering much of the day to day training and support for the doctoral (PhD) students around them. When we also take into account how much teaching is delivered by those on postdoctoral contracts, be that those on teaching fellowships, sessional teaching contracts or teaching added to a research position as a career development opportunity, it is clear that postdocs are more than just highly skilled and capable researchers: they are very much at the heart of academic life. However, when it comes to career development and CVs (curriculum vitae/resumes) this contribution often goes unrecognised and undocumented as it often has no official status.

What is also clear is that most postdoctoral researchers are passionate about their research. In the most recent Nature Postdoctoral Survey (**Nordling, 2023**) the area that postdoctoral researchers were most satisfied with was their interest in their work with 75% of respondents highlighting this, the degree of independence they have and the opportunities to pursue interesting projects scoring very closely in second and third place. This was echoed in the Wellcome Trust report *What Researchers Think About the Culture They Work In* (**Wellcome Trust, 2020**) where 84% of researchers interviewed were proud to work in the research community and a survey of postdoctoral researchers in two Dutch universities which showed that 85% of them wanted to stay in academia (**van der Weijden et al., 2015**).

The literature reflects what most people who interact with postdoctoral researchers in universities will recognise: the highly motivated, highly skilled, passionate researcher who is excited by developing new scholarship and sees becoming an established academic as the preferred, if not only, career path for them. What this picture does not show is that being a postdoc can often be a very negative experience. The 2020 Nature Postdoctoral Survey showed that 49% of respondents wanted help for work related depression and anxiety and 51% had considered leaving science because of mental health concerns related to their work. When

gender and disability are taken into account these figures are even more stark with 55% of female postdocs and 66% of those with a reported disability having considered leaving research due to mental health related issues (**Nordling, 2023**).

Consequently, we have an ongoing culture of postdoctoral research where highly skilled and productive researchers who make significant contributions to university life become frustrated, disillusioned and prone to mental health concerns. This is something which clearly needs to change, to the benefit of not only postdocs but the wider academic community too. Supporting the next generation as they make the transition to an academic position will also be a vital tool for changing representation in the academy by making sure that the support provided targets and addresses the needs of those currently underrepresented in the academy.

The Postdoctoral Experience

The levels of stress and mental health concerns reported by postdocs reflect the reality of the modern postdoctoral experience. Additionally, the role of postdoctoral researchers has changed significantly over time. Originally seen as a short-term post in preparation for a permanent academic position, the modern postdoctoral experience is characterised by a short-term precarious nature, becoming members of an arguable '*research precariat*' (**Woolson, 2020**). Postdocs will usually have multiple short-term contracts which often require moving to a new location and the associated upheaval of starting a new life every few years. Alongside this, the transition to a permanent academic position has also become increasingly difficult, as these positions become less secure and more at risk as university finances become more squeezed and programmes are cut. This precarity and lack of progression is the major concern highlighted by postdocs across many different surveys. In the Wellcome Trust's research culture report (**2020**) 45% of researchers who had left academia cited job security as a key issue in making their decision. Notably of those still currently working in research only 29% felt secure in continuing to pursue a research career. Additionally, van der Weijden and colleagues' findings (**2015**) at two Netherland universities that whilst 85% of postdocs may want to stay in academia, less than 3% go on to secure a tenure track position are both likely to be highly indicative of the postdoctoral experience at the majority of universities.

Postdoctoral research positions differ greatly by discipline and can be a very different experience in STEM (science, technology engineering and medicine) compared to the social sciences, arts and humanities. In STEM disciplines, the majority of postdocs will be working to deliver research for which the funding was secured by a senior academic (principal investigator

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or PI), and, although many advertisements for such positions appear each week, competition for these positions is still fierce. In the arts and humanities such positions are rare, and postdoctoral research positions are typically the result of the postdoc securing their own position through an individual fellowship award. The postdoctoral experience in arts and humanities is typically characterised by trying to secure a succession of highly competitive and transient teaching positions which will allow the continued access to the libraries and other scholarly resources needed to continue a research career unpaid and in their own time.

Regardless of discipline, all postdocs face significant challenges in developing their own independent research ideas and the academic track record necessary to secure a funded fellowship or academic position. In the 2023 Nature Postdoctoral Survey, (**Nordling, 2023**) 97% of postdocs reported working at weekends and other personal time, with 52% of respondents contributing more than 6 hours a week above their contracted hours. For those in teaching positions the workload, preparation and marking also contributed to consuming significant amounts of additional time beyond contracted employment hours. It is worth remembering too how securing funding to develop their own research remains exceptionally difficult for postdocs. Look through the eligibility criteria of the major researcher funders in the UK and it is common to see eligibility for standard grant schemes restricted to those with a permanent academic contract. Where those without permanent contracts can apply, they will likely be competing against established academics with significantly stronger track records. Looking at research fellowships which are aimed at postdoctoral researchers, there much less funding available in these schemes. For example, of the £3.1bn awarded through the major state funder of research in the UK (UKRI) in 2022/23, only 9% of this (£256M) was awarded for fellowships across all career stages.[i] Alongside this relative lack of funding in fellowships, there is also a large population of postdocs looking to apply for them so it is not uncommon to see success rates of 5-10%. Securing funding is also very dependent on researchers having a sufficiently advanced record of publications and other academic outputs. This leaves postdocs often at the mercy of lengthy review processes and coupled with the long delays between acceptance and publication means their publications often do not appear publicly until several years after the completion of the research work. Under such conditions, evidencing the excellence of your research before the eligibility window of postdoctoral fellowship schemes closes can be extremely hard.

These systemic challenges may be more universal for postdocs, but there are also important issues that can define the postdoctoral experience which are rooted in the relationship with their line manager and host

department. One of the most common themes that has emerged in surveys of postdoctoral researchers is the variability in career development support, not only between different universities but also between different departments within the same institution. Postdocs often speak of feeling excluded from the academic life of the department and that their skills and talents are not valued beyond being a 'useful pair of hands' for the jobs academics need doing. Specific support for postdocs and their development is rare in academic departments and often when this does exist it is organised through groups set up by postdocs themselves. Without an academic lead for postdocs these groups struggle to flourish and generally sit outside the core activity of a department. Whilst they can be very successful, they are often dependent on the enthusiasm and commitment of one or two postdocs, and when their contracts end these groups can quickly disappear.

The relationship between a postdoc and their manager is perhaps the key factor in whether the postdoc experience is positive or not. For every positive and supportive supervisor, there is a postdoc with a very different story with bullying and controlling behaviour too commonly part of the narrative. Not all negative behaviours are so overt and extreme. Often a busy academic themselves, who will inevitably be under huge pressure, given the workload and expectations placed on them, who may unintentionally create pressure on the postdoc as a consequence of the demands of delivering their own successful research project within a funder's strict timeframe. The endless cycle of publishing to secure the next grant, to deliver the next project, to produce the next publication thus creates an environment where postdocs all too easily become a tool of delivery whose individual needs and ambitions are lost within the bigger picture of delivering a successful research project on time.

What is clear is that the disconnect between the talents and ambitions of postdocs and the reality of the modern postdoctoral experience is creating a calamitous situation. It is one where postdocs find themselves chasing contract after contract and are unable to settle down in one location. Additionally, this is a scenario within which they will likely also be working exceedingly long hours, diminishing their work-life balance, even as they deliver significant amounts of unpaid labour. All of which is in pursuit of a goal which may never even have been achievable in the first place. Is it then a surprise that this leads to anxiety, depression and a disillusionment with the research that had previously been a passion? What it also does is skew the selection for future academics towards 'more of the same'. Hence, those who don't have the extra challenges of caring responsibilities, gaps in publishing records for maternity leave, disabilities or indeed any other factor which contributes to underrepresentation in the academy, can focus exclusively on securing the outputs giving them a

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significant academic career advantage. Given that the future of academia is represented by the current generation of postdocs, improving their experience and creating more diversity in the pipeline is an important mechanism in delivering future beneficial changes in research culture.

Changing the Research Culture to Better Support the Wellbeing and Careers of Postdoctoral Researchers

Changing the way postdocs are treated will not only benefit university research culture and the long-term development of the academy. Beyond the duty of care towards postdocs as individuals and the need to prevent so many of them suffering mental health issues, burn-out and disillusionment, the academy and wider society will also benefit from improvements in the postdoc experience. Based on our many years of supporting postdoctoral researchers in the Institute of Advanced Study (IAS) and recent focus groups held with the wider postdoc community at Warwick and beyond, I would suggest the following points as important to consider in achieving such change.

Skills and career development activity should be an integral and expected part of a postdoctoral role

The completion of a PhD should not be seen as the end of training and development. The skills to thrive in a research career go beyond the specific knowledge and technical skills that are acquired during doctoral studies and continue to be developed through participating in postdoctoral research projects. What postdocs want, and benefit enormously from, are the skills and knowledge that open the 'black box' of career development; the skills and knowledge that some people 'just seem to know' or, more likely, have acquired though the mentoring of a supportive manager.

Training for postdocs needs to include the broadly applicable transferable skills that all jobs will need, such as writing effective CVs and cover letters, interview techniques and communicating with a range of audiences. But they also need to acquire those specific sectoral knowledge which will open the possibility of an academic career to all postdocs. Creating a broad understanding of what an academic role involves and developing the skills to support it - such as how to write a successful grant, how fellowships are important stepping stones to an academic career, innovative teaching practices, etc., - gives postdocs far more ownership of their career development. It also serves to allow them to plan ahead and build a track record from which they are more likely to land an academic position, rather than just completing sequential postdoc roles in the assumption that career progression simply requires racking up enough publications and sufficient time served.

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Delivering postdoctoral training effectively can be challenging. Institutional level provision is an effective way of delivering the skills that all postdocs needs but our experience at the IAS also shows that there is a need to blend this with more disciplinary specific knowledge at a departmental or faculty level. This more local provision has the benefit of allowing those already established in a field to share what has been important in their career success, but it also has the benefit of making postdocs feel more valued and included within a department. The sense of being valued and invested in by their institution and home departments is important for postdocs and when training provision is seen as an important part of the department's activities, engagement with it will also be higher. This further benefits postdocs through the creation of a community of peers who come together regularly. Such spaces, and the presence of a supportive peer group, can be important ways of tackling the feelings of isolation and anxiety that can lead to mental health issues developing.

However good the training provision is though, it still requires postdocs to see its value in order to turn up and engage with it. Hence, institutions need to find mechanisms to ensure postdocs who want to engage with training and development are protected from any overt or implied discouragement or sanction by mentors or managers. Institutional level inductions for all newly employed postdocs offer an opportunity for training opportunities to be signposted and to set the expectation amongst postdocs that they are expected, and have a right, to participate in training activities. Following this up with an annual audit of what training postdocs have actually participated in can also highlight areas of concern where departments may wish to intervene.

Training isn't everything – community, inclusion and independence

One message that came across very clearly in our conversations with postdocs is how much they value being part of a bigger postdoctoral community and being fully included in the academic life of their department. What this meant to them was to be supported by and encouraged to come together with other postdocs at regular, scheduled times to undertake a range of activities including training, research presentations and socialising. The opportunity to present their work to an interdisciplinary audience of their peers was seen as an important way to develop their own independent research ideas. It also provides a space in which to workshop and refine those new ideas before presenting them to more senior academics and potential convert them into fellowship proposals. Opportunities to present their work within their department and to visitors were also valued, as was the presence of an academic lead for postdocs. This helps to ensure continuity and that postdoc support is

not dependent on a regularly changing group of researchers on short term contracts.

Where postdocs often experience difficulties is in fitting the activities that will personally benefit them and their career into delivering the project their academic manager has secured funding for. Both sides of this relationship are under pressure and the perception that future employment and career prospects are dependent of the goodwill of the academic whose project they are employed on can push postdocs towards neglecting their personal development. What can mitigate this an open and honest conversation at the start of the project to set goals and expectations around both the research project and the training and development activities that are available to the postdoc and the expectation that they should engage with these. Formalising this into a written plan that is reviewed at regular intervals is highly valuable for both the postdoc and the manager and studies have shown that postdocs who undertake this process are significantly more productive, submitting 23% more publications to peer-reviewed journals, 30% more first author publications and 25% more grant and fellowship applications than those without a plan (**Davis, 2009**).

Promoting, supporting and valuing non-academic careers

The number of postdocs who successfully make the transition to an academic or tenure track position is shockingly low. A study of Dutch postdocs showed that less than 3% of postdocs achieve this goal (**van der Weijden et al., 2015**), a figure that is likely to be indicative of success rates across academia. Why then, when so many postdocs will end up in non-academic positions, is the language around alternative positions so likely to be phrased in terms of failure? The toxic narrative about 'going to the dark side' and that leaving academia is somehow a second-best option needs to be eradicated, as does the assertion that to secure an academic role 'you just have to want it enough' or that 'you just have to grind through it'. The simple truth is that there are far more postdocs than there will ever be academic positions and training programmes, development plans and career conversations with postdocs and postgraduate students need to be open and honest about this and place equal value and effort into supporting the development of a non-academic careers.

Research funders need to get involved

Research funders have huge influence on the policies and activities of universities and as a result can drive effective changes in the postdoctoral experience. In the UK the majority of research funders are signatories to the Concordat to Support the Career Development of Researchers, (**2019**) which requires them to '*Include requirements which support the improvement of working conditions for researchers, in relevant funding*

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calls, terms and conditions, grant reporting, and policies' (**Ibid: 2**). Staff development plans are now being seen as part of as part of grant applications (e.g., Wellcome Trust), but it is unclear how the delivery of these is assessed at the end of a grant. If funders were to give postdocs employed on research grants the opportunity to independently report back on their experience at the end of the grant it would allow them to build a picture of how postdocs are faring at an institutional and departmental level and share this with institutions as a guide for improvements. Universities in the UK are assessed and ranked in many ways, but if this postdoctoral experience data were presented in league tables or comprise part of formal research assessment exercises it would serve to heavily incentivise action in order to recruit and retain the best postdocs by institutions themselves.

Additionally, funders could mandate a minimum level of training and development for postdocs employed on grants. In the IAS our postdocs, and those who opt in from the wider Warwick postdoctoral community, have access to an extensive, bespoke training programme that delivers 1-2 hours of weekly term-time training. This may sound like a lot, but in terms of their working hours, the 60 hours participants commit to this programme only represents about 3% of their contractual hours so will actually take a minimum amount of time away from research. Alternatively, if there are concerns about the impact on research project delivery, why not extend grants to create this necessary developmental time within the project. Again, this may sound excessive, but looking at the salary costs of a postdoc here at Warwick, 60 hours per year would only come to about £1.6K of additional spend and an additional month at the end of the project for the postdoc, which would allow time for developing publications and independent ideas only about £4.2K. In the budget of a typical grant these are quite small amounts and if funding for postdoc support and training was made an allowed cost on grants, departments could deliver substantial support programmes with only a small amount of additional funding on their portfolio of grants.

Something else for funders to consider is how the eligibility and assessment criteria impact on postdocs. Accessing most research funding schemes is not possible for those without a permanent position. Opening schemes to postdocs to submit applications in collaboration with more established colleagues would allow them to develop independent ideas in a mentored environment which should give funders more confidence that the project will be successfully completed. In those fellowship schemes accessible to postdocs, the emphasis on track record is understandable but, given the challenges early career researchers face in getting publications in press would a heavier weighting towards the new research idea being presented not be fairer?

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Funders also have a role to play when it comes to diversity in the academy. Issues with diversity and underrepresented communities in academia and other research careers are well known and well documented. In 2014 the situation in the United Kingdom was highlighted in a report by the Royal Society (**2014**). Focussing on STEM subjects, the report showed how diversity in the three assessed categories - Gender, Disability & Ethnicity - dropped dramatically across the academic career profile with the biggest selections taking place in the doctoral studies and postdoctoral space. No doubt there are many factors at play here, but I would suggest that an emphasis on recent publications in the assessment and the overt or implied need for mobility make it much harder for those who will find it difficult to move or have had career breaks for caring reasons to secure fellowships. A review of the way fellowships are assessed and awarded and how certain groups are disadvantaged is needed to increase the diversity in the academy. Certainly, hearing comments such as 'I feel like I have to choose between a baby and a career' and 'academia isn't set up for people like me' as we have in the IAS does not suggest the current system is working for all.

Conclusion

Postdoctoral researchers are at the heart of research, but too often this highly skilled and motivated group encounter a very negative experience leaving them disillusioned, cynical and with their mental health suffering. A change in this aspect of research culture is urgently needed and will benefit both postdocs and their employers as clearly postdocs who feel valued and supported will deliver extraordinary results, and be more likely to remain working within the sector. That institutions and their research departments alongside key sectoral actors such as research funding bodies have a key role to play in effecting such change is unmistakable. Nevertheless, there is also a need for a corpus of willing, engaged and influential individuals within each research organisation to permit such beneficial changes to not only occur, but to become embedded within a more effective postdoctoral research culture.

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Endnotes

[i] Data taken from https://www.ukri.org/what-we-do/what-we-have-funded/.

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