

EARLY CAREER RESEARCHERS: THE HARBINGERS OF CHANGE?

Final report from CIBER

November 2016

Executive
Summary
Year one
(2016)

1.0 Executive summary

Context

Early career researchers are of great interest not just because they are the new wave, but because they are also the biggest wave – they are by far the largest group of researchers (Jones, 2014). Therefore, they merit long, detailed and continuous investigation. Towards this end this report provides the first year findings (the foundation stone) for a proposed, novel, three-year, longitudinal study of 116 science and social science early career researchers (ECRs), who have published nearly 1200 papers between them, come from seven countries (China, France, Malaysia, Poland, Spain, UK and US) and 81 universities.

The wide-ranging study, funded by the Publishing Research Consortium, focuses on the attitudes and behaviours of ECRs in respect to scholarly communications and the extent to which they are adopting such potentially disruptive technologies as social media, online communities and Open Science/Science 2.0 that might prove transformational. Uniquely, we believe, ECRs were interviewed in their own languages and by people who understood the national contexts, face-to-face, by Skype or telephone, with a structured schedule and typically lasting 90 minutes. This research is very timely as the last piece of research to look at this topic comprehensively, but from a largely UK perspective, was undertaken seven years ago by JISC in a very different scholarly world, one in which social media, online communities, reputational platforms and smartphones were very much in their infancy.

Qualitative methodologies, as those deployed by the project, are best at providing deep conversations and understanding and personal insights and context, rather than making robust generalizations and comparisons, which is the territory of the ubiquitous questionnaire. Nevertheless, there is still a need to offer summarization and quantification, albeit with qualification and to that end we have used a structured interview schedule and coded up the responses rigorously. Furthermore, our sample, despite our best efforts to obtain some balance in selection, because of funding restraints is only a tiny fraction of the total population and cannot be regarded as representative, more suggestive. For all these reasons we have used tables, percentages and statistical calculations selectively and, wherever possible, allowed the ‘voices’ of the ECRs to come through. [Sections 3-6 for detail]

Main findings

- **Career and motivation.** The vast majority of ECRs interviewed wanted to continue to do research and hoped to move to a position where they had a job (tenure) and, in the case of the sciences, usually in their own group, but in the US in particular there were some who were either providing a research function or (in the social sciences) were doing - and intended to continue doing - at least part of the time their own individual research. There was clear evidence, too, of tactical thinking connected with career planning and of looking ahead to what they might do in the future if they obtained tenure and were, for

instance, in a position to use social media to reach out to a wider audience. [Sections 8.1; 8.2.3.4; 8.14]

- **Followers or harbingers?** The answer to the main question driving the study is that ECRs do *not* invariably follow the scholarly practices of their mentors and seniors. True, in the crucially important area of publishing ECRs still have little choice but to abide by the established rules, at least until these are changed, which could happen yet, with a nudge from the funders (Nicholas and Herman, 2016). Indeed, it is hardly surprising to find that ECRs are even more driven to publish in highly ranked Journal Impact Factor journals because of their precarious positions and their belief that this leads to career advancement. However, in other areas of their scholarly undertakings they are plainly more adventurous, if not always in their practices, then at least in their attitudes. Thus, for example, they may not prefer publishing in a journal with innovative features, such as video articles, but they are aware of the concept or even excited by it. By the same token, quite a few of the ECRs use social media, if mostly for getting PDFs, connecting with their colleagues and, increasingly, encouraged by their institutions, to maximize research impact. Even those who do not tell us that they should make more use of the opportunities presented and might do so in the future, especially for building research collaborations. [Section 8.2]
- **Paper-driven behaviour.** The four functions of Oldenburg's journal – registration of new research, dissemination, peer review [certification] and archival record – are so fundamental to empirical scholarship that even in these digital times all the journals published conform to Oldenburg's model and the new wave of researchers (ECRs) are still fixated by them. Publishers today see themselves as investing in and organizing journals to provide these functions for researchers and we can find little evidence to suggest they are misguided. ECRs dance to the same reputational tune as researchers have done for a very long time. Some ECRs do ponder on novel research outputs and acknowledge the unfairness of the existing, unbalanced reward system, but not enough, or in sufficient numbers, to fundamentally challenge this traditional picture and thus to undermine the role of publication in peer reviewed journals in the short or medium term. However, we would be much more confident saying this after three years of longitudinal research.
- **Publishing practices.** ECRs are more productive than is sometimes assumed, having published around 10 papers each (and at least double that if conference proceedings and book chapters are included) and as mentioned they are very driven to publishing in highly ranked JIF journals. Publishing outlets in some countries tend to be very prescribed, with ECRs having to refer to lists of acceptable journals. In most cases, it is a proprietary list (normally, Web of Science), but sometimes it is a government list, as in the case of Poland, although these lists are built on the foundations of proprietary ones. China, in fact, operates both lists, with the Government list useful for fields where it is difficult for

researchers to publish in Web of Science journals and as a means to promote Chinese journals. The dominant influence of the Web of Science is particularly marked, but not with medical researchers where PubMed inclusion, arguably a lower bar, is important. For ECRs to be acknowledged as first author is, on the whole, not that difficult and they are typically first author in one-third to one-half of all the papers to which they contribute. Where to publish is generally a group decision and ECRs do have an influence with ECRs in the UK and US claiming to have considerable influence on the decision where to submit in, respectively, 25% and 30% of all instances. Of course, if the research cannot get published in a top journal - and there is always a tension between the wish to get into a very top journal and the wish to be more pragmatic for whatever reason - there have to be other criteria and these include submitting to journals: a) where the chances of acceptance are higher; b) where they have had good experiences in the past; c) which provide a rapid turnaround, referred to as 'quick journals'; d) that are thorough and efficient (and give lots of helpful feedback); e) which have the most appropriate audiences; and f) which cater for open access (see under the Open access Section 8.4 for more on this).

ECRs were asked whether they had a long term publishing strategy. Not surprisingly, for many this was publishing in high impact factor journals. US researchers have this pressure, but seemingly less so than their colleagues in other countries, although this might be partly explained by the fact that the US sample was more established and consequently were less driven to publish in high impact factor journals. There was a feeling in some countries that JIFs were going to be more rather than less important in the future. [Section 8.2.3]

- **Peer review.** Another interesting fact, surprising perhaps, is that there is no strong evidence to support the widely held belief, which is by now almost a truism, that the existing peer review system is 'a closed club', from which ECRs (inter alia) are locked out. Some have heard of such things, but not really experienced them. Indeed, unaware or perhaps simply unimpressed by the perceived shortcomings of the system, at least according to the literature, most express an overall, if hedged, satisfaction with peer review as it is. In fact, they blame its inadequacies (badly chosen, bad/biased reviewers) on the editors, who in any case are thought to have too much power. Nevertheless, ECRs are of two minds about open peer review as a possible alternative. They appreciate its transparency, but do not believe it can work in practice and worry about letting undesirable people into the system – something French ECRs are anxious about – as it was thought this it would make it more difficult to reject papers, which will be more detrimental for ECRs. [Section 8.3]
- **Social media and online communities.** As mentioned already, there are patches of social media and online community use and these patches are bigger than we have witnessed in our previous investigations. ResearchGate (possibly the fastest grower in the field),

LinkedIn and Twitter are the tools of choice. Finding information, communicating information, sharing, building a digital profile/presence, obtaining PDFs and engaging in outreach activities are the main uses to which these platforms are put. This constitutes quite a scholarly list, but active collaboration is a notable absentee. Social media have a firm foothold, especially in China and Malaysia. [Section 8.5]

- **Smartphones.** Given society's widespread use of smartphones, the fact that smartphones are the main platform for connecting to the Internet, and that, like the rest of the population, many ECRs themselves have smartphones, it might come as a surprise for our research to report to how little ECRs (admit) to utilizing them for scholarly purposes. Even when they are said to be used, it is mostly occasionally, for communicating while away from the office, travelling and at conferences or for alerts, rather than for reading and marking papers. Of course, social media and smartphones go hand in hand, so the increases in the former that we have already detected look likely to result in similar increases in the latter. Unsuitability for reading is claimed to be the main reason, and that of course is a valid reason, but the same was said about laptops and desktops. Resolution is getting better all the time and screens larger, and research published elsewhere indicates that academics now read more HTML web pages on their tablets, e-readers or smartphones compared to two years ago (Halevi et al., 2015). The Chinese seem to be leading the smartphone change/charge, will others follow? This is something to watch for the future. [Section 8.7]
- **Open access.** Gold open access (OA journals) is universally thought to be a good thing, but ECRs are well aware of the problems associated with open access journals. Open access (OA) is not really an issue, never mind a big issue, although there is some disquiet regarding article publication charges (APCs) which are thought to be too high and unfair because they are making the playing field uneven between those researchers with access to funds that can pay for APCs and those that do not. There is a lot less distrust of open access than was encountered in earlier studies on trust, but few ECRs are queuing up to be published in OA journals. Publishing in OA journals is generally not part of any publishing strategy, despite the mandates (mainly in the UK and US) that ECRs are (only vaguely) aware of. [Sections 8.2.3.3; 8.4]
- **Repositories.** Somewhat surprisingly, since ECRs might to be thought to be interested in taking every opportunity to showcase their achievements, they regard archiving their research work in repositories as a non-priority; if undertaken at all it is thought to be a matter for librarians or research administration. Archiving is done when obligatory, but without much enthusiasm; so much so, that there is a general absence of knowledge about and interest in repositories, to the extent that a significant number of ECRs do not even know that their institution has an institutional repository. This is unlikely to change quickly unless archiving in repositories obtains reputational credit. ECRs are however more likely to deposit to thematic repositories such as arXiv.org, which are supported by

the wider scientific community. The community is much more important than the institution in this regard. ECRs are also wise enough to know that researchers in general do not think of searching in repositories and that community networks such as ResearchGate offer an easier way of finding content, so why not deposit there? [Section 8.4]

- **Open science.** There is much talk about the open agenda in the professional press and at conferences; however, ECRs display little understanding of or interest in Open Science, Web 2.0 et al. and its technologies as possible agents for change in scholarly practice. Indeed, French researchers are antagonistic to the concept, seeing it as a further restraint on their scholarly freedoms. But related questions about open data and software (components of Open Science) did stir some interest among a few UK and US researchers. The sort of "pain free publishing" (<https://elifesciences.org/about>) that *eLife* promises also merited some interest, because of the preoccupation of ECRs with publication. They are not so interested in sharing data (an important element of Open Science) because many want to exploit the data they have gathered to the full (for their publications), and not give it away. The Open agenda includes blogs as non-traditional scholarly outputs, but no one, certainly in the UK/US, is really interested in blogs as an alternative to publications. Again, the game changer might be giving ECRs reputational credit for such activities. Tenure and promotion committees have as much, if not more, influence on researcher practices than funder mandates. [Section 8.8]
- **Sharing and collaboration.** Sharing is easier to do than ever since the emergence of social media and online scholarly community platforms such as ResearchGate, and sharing is thought to be a reputation accruing activity, which might be expected to take science to greater heights (Nicholas et al., 2015). While the large majority of ECRs share ideas and interim data, much of this actually takes place at the research group level, at internal meetings and within local networks. While sharing is much mentioned by ECRs as central to the way they want to live their scholarly lives, and, perhaps, they are a little conflicted when they have to act by the academic 'rules', the sharing of ideas and interim results using social media is little undertaken. Sharing research outputs 'after publication' via ResearchGate in particular is a different matter and is a popular activity, especially among UK researchers.

Collaboration is clearly a weightier issue and the key hypothesis we tested was: *Early career researchers share and collaborate extensively even at the risk of losing their competitive edge.* In fact, there was no country consensus here with just one country, France, fully confirming that this is the case and three other countries partially confirming it. For French ECRs, despite eschewing social media for this purpose, collaboration is clearly king. Besides publications, collaboration is a constant objective. The strategies of ECRs for getting a job and publishing more and better papers rely on collaboration. Conferences and meetings are key moments, dedicated to searching for collaborations. ECRs believe that they can be hired for their CV, but also for the

potential of their collaborations. A different picture emerges from the UK and US where ECRs have their networks with whom they interact outside their groups, but there does not seem to be much evidence of formal research collaboration. It tends to be rather basic and piecemeal, providing help among friends, giving feedback, links and advice. Nevertheless, while there is no broad consensus as to the (presumed) value of social media in building research collaborations, there is still activity and interest. This is an area where things are a little confused and unclear, and possibly waters are getting muddier as a consequence of social media and scholarly collaboration platforms. This landscape will need close monitoring over the next two years. [Section 8.9]

- **Metrics.** Despite the importance accorded to metrics as a (future) fundamental element of reputational assessments, ECRs demonstrate little interest in usage metrics (known as 'altmetrics'), although some do check their publication downloads. This is only to be expected, of course, for altmetrics are not yet widely used and accepted either by researchers or by the university system. However, some ECRs, but not in the UK/US, tend to agree that altmetrics is a potential new method to evaluate researchers' output and influence. Nevertheless, our study shows that the hype associated with altmetrics is not matched by ECR interest. It is still very early days for altmetrics and this is another landscape to watch. [Section 8.11]
- **Impact.** Most ECRs see that conducting good research and getting it published in prestigious journals is the way to influence others and to have an impact, but UK ECRs, undoubtedly influenced by the metrics of the Research Excellence Framework used by HEFCE to assess priorities for dispersing funds, demonstrate a wider interest in reaching out to the general public and using innovative means (including social media) to do so. [Section 8.12]
- **Publishers and libraries.** There are mixed messages for publishers and bad news for libraries, the two main pillars of the traditional scholarly communication system. Despite possession of the reputational diamonds in the mine, the highly ranked journals, most ECR views about "commercial" publishers are negative, although not many ECRs had views on particular publishers, and in general they demonstrated a lack of understanding of what publishers (or libraries) do. This, taken together with the fact that ECRs do not choose to publish on the basis of the publisher but of their journal, and do not appear to use publisher websites (often preferring free and open services, such as arXiv.org and ResearchGate) there is the challenge for publishers of looking worryingly anonymous and unpopular in transitional times. On the positive side, ECRs are comfortable, but not necessarily happy, with publishers managing the peer review process and nor are they happy with learned societies doing it, largely because societies are thought not to be sufficiently independent. Perceived independence seems to be a real positive for publishers. [Section 8.13]

Much more worryingly, libraries seem to have lost all their visibility. Lots of ECRs have not gone to the library for years. Libraries are mainly considered as places for undergraduates to sit and work. Their discovery systems have been bypassed by Google to a large extent and to make matters worse their institutional repositories are not popular either. Libraries appear to have little to offer to the big new wave of researchers, so down the line there have to be worries for their long term future as resources for postdocs. And this, of course, poses some challenges for publishers as they have long worked hand in glove with libraries. [Section 8.14]

- **Diversity.** Clearly we have to be careful in making comparisons at such an early stage in the project's life and in dealing with quite a heterogeneous dataset. However, it is possible to point to areas that need to be monitored:
 - a. *Country.* The fact that the project is organized by country means that there is a premise that there would be national differences. In fact, we found real differences and similarities. There is clearly a UK/US special relationship, EU countries sort-of cluster, but there is no 'Asian' cluster, with China closer to EU than to Malaysia. Malaysia, in fact, seems to be a contrarian. Some of these differences could be put down to the different make-up of the national ECR samples.
 - b. *Scholarly communication experience.* ECRs who have reviewing experience hold different scholarly views from those who do not, perhaps because they are more familiar with the system and can talk about it more fully. They are also more defensive of a system of which they feel they are a part.
 - c. *Lone researchers.* There is a difference between those who work more or less on their own, usually doing a doctorate after preliminary experience, and those who are embedded in groups. The former tend to be social scientists and as a generalization they provided fewer answers to the questions asked and are less productive. Indeed, most of them (though not all) are basically uninterested in scholarly communication and more of them are probably not going to continue in academic life.
 - d. *Prestigious research groups.* Those who work in prestigious research groups feel more secure about their prospects and tend to be happier with the academic communication process, perhaps, just because they are more optimistic about their future.
 - e. *Subject of research.* Some research topics can be more or less 'bankable' than others. Some topics are more transient. The consequence is that those who have 'bankable' research subjects are more visible, their results are more likely to be published, are more contacted by colleagues in their countries and abroad. It is a kind of 'Matthew' effect (Merton, 1968).
 - f. *Age and experience* are clearly correlated and are added values for ECRs, which contribute towards a deeper understanding of the system and knowing how to behave and what to do in many situations and contexts.
 - g. *Gender.* Generally, there is little evidence of differences between genders in the way

ECRs see career progression (or anything else for that matter), which might be surprising given the views of some commentators about the problems of women (not) breaking through the glass ceiling. Thus, Sugimoto et al. (2013) find gender imbalances persist in research output worldwide: men dominate scientific production in nearly every country; globally, women account for fewer than 30% of authorships of collaborative papers, whereas men represent slightly more than 70%; for every article with a female first author, there are nearly two articles first-authored by men; and, arguably most importantly, when a woman was in the prominent author position (sole, first or last authorship), the paper attracted fewer citations than in cases in which a man was in one of these roles. Given all this, it is quite surprising to find that Chinese women are the only ones to admit to at least some gender disparity among ECRs, saying that they are driven more by pure subject interest than their male, promotion-driven counterparts.

h. *Service and applied researchers.* Those researchers who work in a service capacity, usually in medicine, offer expertise in techniques and methods. Their attitudes show differences with those whose research is purer and less applied. Those ECRs who work either in industry or in government or medical laboratories where the nature of research is different are cut off from some of the concerns of the Academy: their attitudes are inevitably different, too. [Sections 8.15; 8.16]

- **Transformations and transitions.** On the broad front, independent of discipline or nationality, our results show clearly the tensions that occur in a world in transition. In this transition, there are signs that scholarly ‘things’ (practices, behaviours, representations, wishes, objectives) are moving in many directions while the formal frame of evaluation and competition is strengthening, almost unbending. Some of the apparent contradictory results we see in the research are down to these tensions. ECRs see the opportunities to change, but do not take the opportunity to do so because they just do not have the time and space in an insecure and busy environment. They of course also have limited scope to change as they (and their tenured colleagues) are constrained by a reputational system that promotes, above all else, publication record and citation scores.

Nevertheless, we seem to have moved on from the situation we found in a previous research (Watkinson et al., 2015), where no one had any ideas at all about change, never mind transformation, and those who disliked the present situation just railed against it. Three years on we do find ideas for change and even some for transformation, mainly moving away from the current preoccupation with published papers. Researchers, who happen to be ECRs, are thinking about change and transformation and these are top young researchers. Some even accept the idea that they might change things when in a position to do something about it. Social media use is clearly up and, if not quite at the tipping point, it is creating waves. [Section 8.14]