Professional factors affecting career and engagement success for Early Career Researchers

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Abstract submitted to the third Research Evaluation in the SSH conference, Valencia, Spain, 19th-20th September 2019

Introduction

There has been in the last two decades a surge of public investment into scientific activities, primarily driven by a belief in the wider social benefits that such investments can bring (Muhonen *et al.*, 2019). This massification of public resources has stimulated a shift in the way that scientists are expected to account for themselves and their behaviours in return for these rewards. There is a growing emphasis placed on evaluation through the research process, from the awarding of funding to excellent proposals, ongoing reviews of research centres and departments, and of individuals progressing through their careers. This evaluation helps to ensure that academics continually attune themselves to societal expectations and therefore are ultimately accountable for the public resources they receive.

But there is a growing body of literature suggesting that this evaluation culture is having a negative effect on academics but also on the productivity of the overall science system (Martin, 2011). One often cited example here is the United Kingdom's Research Excellence Framework, the REF, which in its 2014 iteration was estimated to have cost around £250m when the opportunity cost of participants' time was included (Farla & Simmons, 2015). But there is also a concern on the effects that this evaluation has on the strength of the academic workforce through the segmentation of the academic labour force. Certain evaluation practices serve to magnify the well-known distortion in scientific evaluation where success breeds success, what Merton termed the Matthew effect, where early success in accessing resources shapes future later success (Bol et al., 2018).

If evaluations allocating resources for future activities take account of past track records, then it becomes hard for junior researchers (or early career researchers, ECR) to access those resources, which hinders them from themselves developing their track records. In the absence of these resources, junior academics have to be highly selective and instrumental in deciding which activities to prioritise, selecting only those activities which contribute to building their track records (Fanelli et al., 2015). And with the current emphasis on allocating resources on the basis of research excellence, this can create a situation where, despite a lip-service being paid to creating impact from research and working with societal partners, the real emphasis is placed by researchers in producing articles (Watermeyer, 2015).

The risk for science systems is that this then has a long-term effect on researcher behaviour because of path-impregnation, where researchers' Ph.D. experiences shape their attitudes to research (Knorr-Cetina, 1981) and their future research practices. This situation is intensified in the case of social sciences and humanities (SSH), where evaluation processes typically follow procedures that have been developed for other fields, most notably science, technology, engineering and maths (STEM) (Benneworth et al., 2016). We therefore argue that if there are tensions emerging for research evaluation and societal impact, these would be most evident in SSH. In this paper, we address the issue of the effects of increasingly intense research evaluation systems on early career SSH researchers' willingness to engage with societal partners. To do this we ask the specific operational research question of which are the professional factors leading to ECR's engagement success?

Methodology

Research approach

To address this question, we construct a model for early career researcher willingness to engage with societal partners as being shaped by the following conditions, namely, the training they have had in engagement, the institutional environments in which they are

operating (university environment) the extent to which being involved in engagement practices creates problems for them. We also contend that their engagement will be affected by the quality of the environment, and in particular the generalised demand for their knowledge coming from society.

Data

Data was gathered from a pan-European study of SSH ERC, whose (anticipated) Ph.D. date is after 2008, within the framework of the ENRESSH European Cost Action. Specifically, we draw on a survey of SSH ECR drawn from across Europe (30 countries, 111 respondents) in which they provide qualitative and quantitative responses to the effects that research evaluation and demands to create impact have on their career development. Data analysed in this study comes from the quantitative responses, even if eventually the qualitative information has been used to better interpret the findings. We analysed a final sample of 100 valid surveys, i.e., without missing data in all over key conditions (variables) for the study. Additional information was gathered from secondary data, the democracy index, that was used to split the sample between ERC from full democracy countries (N=40) and ERC from flawed or hybrid (not-fully) democracy countries (N=60) (Economist Intelligence Unit, 2019).

Analytical approach

We performed two fuzzy-set qualitative comparative analysis (fsQCA), one for each group of countries (encouraging (high-demand) and discouraging (low-demand) national environmental contexts) according to the Democracy Index. A QCA is a "comparative case-oriented research approach and collection of techniques based on set theory and Boolean algebra, which aims to combine some of the strengths of qualitative and quantitative research methods" (Marx et al., 2014, p. 115). This type of analysis allows to analyse the necessary and sufficient conditions for the existents of a particular outcome (such as success in creating societal impact). A condition is necessary when it is always present for the existence a particular outcome. Conversely, a sufficient condition is a combination of conditions that generate a particular outcome although the outcome can be achieved through other combinations of conditions (principle of equifinality). Using the fsQCA version 3.0, and following the recommendations proposed in the literature for this techniques (Eng and Woodside, 2012; Giménez-Espert & Prado-Gascó, 2018; Ragin, 2008), we explore the necessary and sufficient conditions of SSH ECR success/not success in creating research impact, and we perform this analysis for the two subsamples: ERC working within encouraging (high-demand) and discouraging (low-demand) national environmental contexts.

Preliminary results and implications

In terms of the factors associated with success, we found that in both kinds of environment, being in a dynamic environment, with training and encountering no problems was associated with success. In encouraging environments with supportive universities, then training or "dynamism, no problems" were associated with success; in discouraging environments with universities and training, then either no problems or dynamism were associated with success. In terms of the factors associated with the absence of success, three combinations were found in encouraging environments ("no dynamism & no university support", "no university support & problems", and "no dynamism & no training & no problem"). In discouraging environments, the absence of training coupled with either university support or "no dynamism & no problems", was associated with the absence of success.

Reflecting on these findings, we are able to contend that insufficient is currently known about the effects of evaluation systems on SSH ECRs' academic formation processes, and that this

represents a serious problem in transforming science systems to be more open and attuned to user interests and needs. We identify a number of key tensions and bottlenecks for impact generation that emerge for early career researchers when confronted by the demands of impact. We argue that improving openness of science and the inclusion of users in scientific practices needs better resources, particularly better training and recognition for early career researchers that successfully engage with users. We likewise contend that it is also necessary to temper some of the pressure that intense research evaluation creates for early career researchers' capacities to create societal added value.

Acknowledgements

This research was funded by the COST Action *European Network on Research Evaluation of the Social Sciences and Humanities* (CA15137). COST (European Cooperation in Science and Technology) is a pan-European intergovernmental framework. Its mission is to enable break-through scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities.

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