



MAPPING THE POPULATION, CAREERS,
MOBILITIES AND IMPACTS OF ADVANCED DEGREE
GRADUATES IN THE SOCIAL SCIENCES AND
HUMANITIES (POCARIM)

Policy Report 13

The Role of Relationships in Knowledge
Mobilisation: Some Conclusions and Policy
Recommendations

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Introduction: The European Research Area and the ‘Fifth Freedom’ (Free Movement of Knowledge)

This concluding paper reflects on the role that scholarly networks and relationships play in the creation and mobilisation of knowledge in the social sciences and humanities (SSH). More specifically, it focuses on how inter-disciplinary, inter-sectoral and international relationships interconnect and the role that physical mobility (co-presence) plays in these processes.

The paper reflects on the kinds of knowledge combinations evident within the POCARIM sample and the innovation potential that these represent. Most importantly, it enhances our understanding of the contribution that SSH researchers make in the mobilisation of knowledge in response to key societal challenges.

The Commission Communication ‘Innovation Union’ (2010) identifies a perceived need for ‘easier mobility across sectors and countries’¹ in order to help universities to ‘modernise towards inter-disciplinarity, entrepreneurship and stronger business partnerships’ and build ‘Knowledge Alliances.’ In turn these alliances will strengthen evidence-based policy-making integrating ‘the 3 sides of the knowledge triangle (education, research and innovation)’ The Communication goes further arguing that achieving the ‘Fifth Freedom’ (described here as the free movement of innovative ideas), requires ‘brokerage’ and ‘competent intermediaries’ to facilitate mutual learning.’²

It is important to understand what these concepts of ‘mobility’ and ‘brokerage’ mean in contemporary European research cultures. Certainly research and policy has moved away from narrow conceptualisations of mobility as job-related-migrations (or longer stay relocations). And this applies both to geographical (international) and inter-sectoral mobilities. The European Science Foundation Report (Borchgrevink and Scholz, 2013) echoing a report by the European Commission Expert Group on the Research Profession (Ackers and Hynes *et al.*, 2012) emphasises the importance of adopting a more comprehensive (re-conceptualised) outcome-oriented approach to mobility.

On the one hand, ‘whatever the type of mobility (international, inter-sectoral, interdisciplinary or virtual) researcher mobility should never be seen as an end in itself’ (p.2). Whilst, on the other, the proposed reconceptualisation of mobility embraces both more flexible forms of physical mobility (including short stays and virtual relationships) and combined/part-time sector-spanning positions. This represents an important and symbolic departure from previous approaches (often embedded in metrics) which privileged mobilities involving employment relocations (job moves) particularly at international level - effectively migrations. Ackers has argued that this approach to mobility and metrics both fails to capture the dynamics and outcomes associated with mobilities but also has indirectly discriminatory consequences (2010: 2013a and b).

The relationships between these more complex and elusive (from a data capture perspective³) mobilities and knowledge mobilisation processes are described by Borchgrevink and Scholz as follows:

A researcher engaged in two institutions simultaneously will facilitate knowledge transfer between the institutes ‘in person’. Combined part-time researcher positions will allow mobility and direct knowledge transfer and cooperation and may link institutions, disciplines, countries and sectors (industry/academia/public) (Borchgrevink and Scholz, 2013:5).

¹ Para 2.1

² Para 4.2

³ Most secondary data sources on mobility capture only employment related ‘migrations’ (ie the physical relocation of one person as they leave one job/position to take up another in a different location).

Borchgrevink and Scholz refer to another important but often neglected feature of contemporary mobility in research careers – namely non-linearity (p.4). The emphasis on non-linearity reminds us of the importance of contextualising mobilities. Non-linearity is a feature of careers in certain disciplines more than others although it is increasingly present across the board. In many respects the assumption of linear careers derives from the dominance of the natural sciences both in terms of the volume of research funding they attract (and the respective volume of early career researcher positions) and the impact that this numerical domination has had on policy discourse. Perhaps unwittingly, (natural) science has become the template against which other disciplines are judged and (apparently) seen to under-perform. Non-linearity, in the context of SSH research, often implies engagement prior to doctoral research and at post-doctoral level with other sectors (rather than a vacuum). And these roles will frequently encompass research or research translation activities. In that respect periods spent outside of academia are not so much ‘gaps’ to be justified in CVs but highly relevant knowledge mobilisation experiences.

The paper now turns to summarise some of the key findings from the POCARIM study with a particular focus on the relationships between different forms of mobilities in the careers and knowledge mobilisation practices of doctoral graduates in the social sciences and humanities.

International Mobilities

The POCARIM findings on international mobility⁴ highlight a number of key findings. Firstly, that researcher migrations (longer between-position relocations) are slightly less common in SSH than in the natural sciences. The MORE2 study suggested that about 15% researchers in EU27 are currently working outside their ‘home’ country.

In terms of moving abroad for the purposes of undertaking a doctorate, about 13% of POCARIM respondents received their doctorate from a country other than that of their nationality. Significant national differences are evident: 58% of respondents who gained their doctorate in the UK were not UK citizens compared to only 1.4% in Italy (for example). And, almost half of UK doctorate holders were working outside of the UK at the time of the survey. This figure was much lower for Norwegian doctorate holders (4.5%).

Understanding the international mobility of researchers in SSH demands attention to the research context and the quality (nature) of research in these disciplines. The place specificity of work in SSH (often requiring complex human interaction and much higher levels of linguistic and cultural competency) is quite different to that in those disciplines dealing with inanimate ‘objects’ (Ackers, 2013a).

One of the most significant findings of the POCARIM data on internationalisation is the light it throws on the relationship between mobility (as a geographical ‘fact’) and international collaboration (as an outcome). So, whilst Norwegian doctorate holders are less likely to leave (emigrate) post PhD they report a very high level of international collaboration: 56% reported collaborating at an international level ‘almost always or regularly’ and only 7% said they never did so.

The average rates of international collaboration suggested at least 37% SSH PhD holders collaborated internationally at least regularly. National differences were evident with German and

⁴ As reported in Policy Report 10 ‘Internationalisation of Careers in the Social Sciences and Humanities’ (Coey, 2014) and Policy Brief 5.

Swiss PhD holders reporting very high levels of international collaboration in comparison to Turkish respondents, for example (cf Policy Report 10 'Internationalisation of Careers' Table 2).

Figure 4 (same report) provides a breakdown of mobility by length of stay illustrating the prevalence of short stay mobilities followed by medium term and finally long term moves. The findings indicate a very high level of international engagement across all countries with over 82% respondents reporting short stay mobility and 62% doing so 'regularly or frequently'. Medium term stays (3-12 months) were less common (just under 40% on average) but not infrequent and tended to be used for fieldwork or teaching.

Reported obstacles to higher levels of international mobility included lack of funding. Gender emerged as an important variable although, unsurprisingly, its impact varied depending on the length of stay. High levels of short term mobility were reported by male and female survey respondents irrespective of the presence of children. Having said that, more in-depth analysis of the interview data suggested that frequent and unpredictable short term 'business' trips posed serious challenges especially to mothers (Ackers, 2007: 2013a).

Women with children were significantly less likely than men to engage in medium term stays (3-12 months) and the presence of children has a dramatic effect on women's ability to engage in long stays (Figure 8).

Temporality (length of stay) is by no means the only critical dynamic at play here. The 'obsession' in policy terms with mobility-as-migration (job related relocations) implies both longer stays (and possibly 'settlement') but also leaving a place (a country, organisation or sector). We have noted elsewhere the increasing importance of what Golyunker terms 'partial migrations' (cited in Ackers, 2013b). Coey's Policy Report uses the concept of 'portfolio working' (Grigg, 1997; Mellors-Bourne *et al.*, 2013) to describe the same phenomenon where researchers hold multiple positions simultaneously in different countries. In previous work on scientific mobility in the Bulgarian and Polish context we identified a very high incidence of 'retained positions' – effectively migrant researchers holding dual positions (Ackers and Gill, 2008). Borchgrevink and Scholz (above, 2013) identify what they term 'part-time' positions as critical opportunities for 'direct' forms of knowledge transfer. Put another way, they create opportunities for active co-presence⁵ or Face-2-Face knowledge mobilisation encounters.⁶

One of the advantages of multiple positions, which often plays a strategic role in researcher decision-making, is the ability to retain networks in home countries post migration which then play an essential role in facilitating return or continued collaboration. Long stay international moves often carry a high degree of risk, especially when they involve leaving countries where patronage continues to play a decisive role in recruitment processes. Dual or part-time positions are an important way of mitigating or managing that risk.

Analysis of the findings on the outcomes of international mobility suggest some quite interesting relationships:⁷

- Higher levels of international mobility are associated with higher levels of international collaboration;

⁵ Cf. Williams (2006)

⁶ The term 'F2F' is used by some authors as an equivalent to 'co-presence' (Taylor et al, 2013).

⁷ Policy Report 10 (Coey, 2014 p. 24).

- Higher levels of international mobility are associated with higher levels of impact across a range of indicators;
- And higher levels of international collaboration are associated with higher levels of impact across a range of indicators, to a greater extent than for international mobility.

Put simply, international collaboration has a stronger relationship with impact than mobility per se.

The correlation between the share of respondents who experienced short-term international trips and the share of those who collaborated with partners abroad is very strong. Furthermore, respondents who reported that they regularly or always worked in collaboration with international partners were 2.6 times more likely to report that they had developed innovative products, 2.3 times more likely to report that they had advised policy-actors on the local, regional, national or international level, and twice as likely to report that they had given interviews in media or worked with NGOs (Table 4).⁸

It is interesting to note here that the outcomes associated with international mobility include not only explicit skills (subject specific knowledge etc.) but also more tacit skills including inter-cultural awareness and ‘communication’. The transfer of this type of knowledge is often more dependent on co-presence or what one respondent calls ‘everyday embeddedness’.

A final point of note in the Internationalisation Policy Report concerns the rather different patterns of mobility reported by researchers working outside of academia. Here trips are often shorter and far more narrowly defined (following a business trip model).⁹ Jöns argues (Policy Report 11) that transnational mobility plays a rather different role in the non-academic sector, ‘as most career paths require local, regional and national expertise and networks that can only be built up by spending several years in one place’ (p.12).

Another form of ‘mobility’ contributing to the complex knowledge mobilisation process concerns moves between or relationships with other disciplines. To some extent international encounters often take on a multi or inter-disciplinary flavour as disciplines themselves are constituted and/or labelled rather differently in different national contexts.

Inter-Disciplinarity¹⁰

Coey argues that, ‘the intermingling of ideas and people from different disciplinary backgrounds is seen to be an important element in knowledge transfer and innovation in the context of new modes of knowledge production and the knowledge-based economy’.¹¹ He goes on to distinguish inter-, multi- and trans-disciplinarity citing Bushaway’s (2003) three-fold typology. According to this model, inter-disciplinary research is the only form that involves the genuine fusion of knowledge (creating new inter-disciplinary knowledge). However both trans- and multi-disciplinary approaches require important boundary spanning or brokerage activities to effect knowledge translation processes.

Interestingly Coey refers to the work of Latucca (2003), who suggests that cross- or inter-disciplinary work may not necessarily involve forms of ‘mobility’ as such but could be seen within the work of an individual scholar. This reinforces the importance of recognising and celebrating non-linearity; many SSH researchers move from one disciplinary environment to another as their training and career

⁸ The results are discussed in more detail in the Policy Report.

⁹ Beaverstock et al (2010)

¹⁰ Policy Report 8 ‘Interdisciplinarity in the social science and humanities’ (Coey, 2014).

¹¹ In such a context, interdisciplinarity becomes, in Peter Weingart’s (2000) view, ‘in effect, a discourse on innovation in knowledge production’ (p. 30).

progresses. This also places a real premium on approaches to doctoral training focused on exposing researchers to different knowledge combinations.

Pre-dating the 'Innovation Union' report, the Communication 'Delivering on the Modernisation Agenda for Universities' (2006) asserts the need for a shift in research from disciplinary organisation, practices and goals to a more problem-oriented, cross-disciplinary model, 'fostering interaction between students, researchers and research teams through greater mobility between disciplines, sectors and research settings'.

The Policy Report on inter-disciplinarity opens with a review of research suggesting that SSH researchers are less likely to engage in inter-disciplinary activities than researchers in the natural sciences. These findings are immediately challenged by the POCARIM results which show, in direct contrast, that over half of POCARIM respondents indicated that inter-disciplinarity was important in their current position. The data also shows very high levels of interdisciplinary collaboration with an average of 48%. Some countries (notably Germany, Norway and Switzerland) reported over 57%. National and disciplinary differences emerged with social science reporting higher levels of interdisciplinarity than humanities and some disciplines (economics and law, for example) less likely to report interdisciplinary collaboration. Arguably law itself embraces inter-disciplinary approaches (as evident in the emergence of socio-legal studies for example).

'Measuring' interdisciplinarity is not and cannot be an exact science – not least because of the national and conceptual differences in defining it. An interesting example of this is business studies which in many ways represents an eclectic group of disciplines. However, in the UK at least, the system for ranking researchers' work has tended to privilege publication in very specific journals which are then ranked. This process tends to force a disciplinary straitjacket on what was previously a fantastic example of disciplinary fusion.

Some disciplines (and senior people within them) were identified by POCARIM respondents as behaving in an 'imperialist' manner (notably economics) punishing interdisciplinary endeavours and generating high levels of risk and insecurity for those involved. As with internationalisation – where researchers are both expected to spend time abroad but also required to retain national networks if they wish to return – researchers who build relationships with other disciplines need to take care to retain their own establishment within narrow disciplinary confines if they wish to progress. Respondents talked of the need to 'profile yourself' (within a mono-disciplinary frame) in order to achieve career progression. One Swiss respondent refers to this as a 'paradox' (p.20).

Coey's report makes the interesting distinction between 'collaborative interdisciplinarity' and 'individual interdisciplinarity'. Many interviewees referred to personal journeys through various disciplines during their training generating interdisciplinary profiles. This 'discipline shifting' behaviour increases their potential as boundary spanners or knowledge brokers. The growth in interdisciplinary doctoral training and research centres fosters this process.

Respondents identified the importance of encounters at conferences and events in the emergence of interdisciplinary networks. These 'planned moments' often stimulated 'chance' or 'serendipitous' meetings.

The interviews illustrated some of the motivations behind interdisciplinarity. These included an ethical predisposition towards 'problem-solving' or action orientated research. In the minds of many respondents, the complexity of contemporary societal challenges made interdisciplinarity a necessity.

The ability to demonstrate interdisciplinarity was also viewed as necessary in the light of the perceived priorities of funding bodies and employers. Interdisciplinary working ‘at the crossroads’ was associated with creativity and also heightened communication skills¹² supporting enhanced knowledge mobilisation. One respondent referred to their exposure to new ideas as a direct result of disciplinary ‘decentre-ing.’

POCARIM findings indicate a very strong relationship between interdisciplinary working and impact. Those researchers reporting that interdisciplinarity is an ‘important part of my current work’ were three times more likely to report that they had developed innovative products; over two and a half times more likely to be involved with third sector work and twice as likely to report media engagement.¹³

The POCARIM findings emphasise the importance that interdisciplinarity plays as a precursor to engagement. Developing interdisciplinary perspectives either through personal journeys or through collaboration encourages researchers to address communication challenges and develop and develop holistic ‘challenge-oriented’ approaches. Indeed, an ‘action orientation’ appears to stimulate interdisciplinary motivations.

Inter-Sectoral Moves

Policy Report 9 focuses on intersectoral mobilities in the social sciences and humanities. The section on internationalisation (above) has already problematised the tendency of both research and policy to distinguish ‘between-job-relocations’ and ‘within-position-mobilities’ and the tendency of metrics to privilege the former. In many ways this tendency is data-driven, supporting approaches designed to ‘measure the measurable’ rather than the meaningful (or inputs rather than processes).

The same situation applies when it comes to evaluating the impacts or outcomes associated with research. The terms ‘impact’ and ‘outcome’ immediately suggest amenability to (quantitative) measurement. ‘Engagement’ on the other hand is processual and necessarily more elusive.

Nevertheless inter-sectoral mobility (defined as moving between sectors for positions) is regarded as playing an important role in knowledge mobilisation processes (Fritsch and Krabel, 2012; Jansson *et al.*, 2010). Millard outlines the importance attached to intersectoral moves in the natural sciences and the perceived contribution to ‘university-academic links’ and commercialisation (p4.). Recent research suggests that moves between sectors (for the purpose of employment) are less common in the SSH than in the natural sciences. This may reflect greater recognition of the doctorate as a pre-entry qualification for scientific research in the private sector (in comparison to SSH where a doctorate is still rarely required outside of academia and may indeed be regarded as ‘over-qualification’ or an indicator of over-specialisation).¹⁴ On a more positive note, lower levels of intersectoral mobility reflect a very strong desire among SSH doctoral graduates to remain in academic research. Indeed, much of the mobility that is reported in POCARIM concerns moves post-doctorate to the academic sector for those individuals who previously worked in other sectors (representing moves INTO academic research).

That said, marked national differences emerge with the majority of SSH researchers in some countries working in business (France and Germany for example) compared to Portugal and the UK (where over 60% work in higher education). Disciplinary differences are also strong – in the UK 78%

¹² This includes managing linguistic boundaries as well as communicating to non-specialists.

¹³ Table 1, p.21.

¹⁴ This situation is slowly changing especially in some areas of public employment and some countries (notably the UK). POCARIM respondents reported less favourable attitudes in France and Poland, for example.

of doctoral graduates in the arts and humanities work in the higher education sector compared to less than 60% in the social sciences (p. 7).

Where intersectoral mobilities are evident in the SSH they are more likely to involve moves between higher education and third sector or public sector organisations than industry or business. Respondents suggest that this in some ways reflected greater similarities in working cultures facilitating these kinds of moves in comparison with the business sector where highly pressured time frames (and a degree of short term thinking) and limited personal autonomy, less opportunity for flexible working hours, coupled with overriding pressures for income generation made such positions less attractive.

Millard identifies several 'types' of intersectoral moves from the POCARIM interview data. These include:

- Moves out of academic research into other sectors directly after PhD completion (the 'traditional' move in the sciences)
- Mid-career 'switching' into HE for the purposes of doctoral research
- Several or multiple moves
- 'Partial' inter-sectoral moves

As noted above, the life-course of a SSH graduate may vary markedly from the typical science graduate. Non-linearity is common and actively encouraged in the SSH. This can be evidenced by the quite different demographic structure of SSH doctorates. SSH (in common perhaps with engineering) lends itself to and has been receptive to the entry of mature 'returners' who have spent often many years working outside of the academic sector (Mellors-Bourne et al., 2013). These individuals (in the second type identified above) bring with them important relationships and experience that create the potential for unique forms of knowledge brokerage. In many cases these people were pursuing a doctorate in an area directly linked to their previous employment.

The Policy Report provides illustrative examples of the kinds of positions held including senior advisory positions in science policy, in government think-tanks and international NGOs.

The reference to 'partial' intersectoral moves here is interesting sparking an immediate resonance with the concept of partial migrations in the context of international mobility (above). Millard is using the concept here to refer to simultaneous employment across more than one sector. This includes 'sector spanning' activities such as committee work, teaching/training, consultancy work (including evaluation research) and legal advice. Added to this is a whole variety of 'pro bono' (unpaid) work with the third sector organisations which is very difficult to capture statistically.

Case UK23 illustrates some of the complexity of these situations. In this case the person had worked for many years in the public sector before taking a position as a research assistant in a university. He then moved to take a position in a Trades Union and started a PhD (on a part-time basis) continuing his professional role and in an area directly linked to it and supporting evidence-based policy-making.

One of the main barriers to intersectoral moves concerned the divergence in career progression systems and, most notably, the lack of opportunity to publish outside of the University sector (which would make it more or less impossible to re-enter).

Networks and relationships were seen as critical to mobility out of the academic sector and also to securing returns and ensuring that mobility is not a one-way (high-risk) phenomenon. The findings on networks underline the importance of establishing relationships at an early stage in a career and

especially during undergraduate study and the doctorate. In common with the findings on internationalisation, doctoral supervisors and the wider research team and, eventually, examination panels play a critical role in building (and sharing) social capital. Structured doctoral programs with an explicit focus on inter-sectoral engagement play a very important role in the training of researchers as knowledge brokers.

Societal Impact in the Social Sciences and Humanities

Policy Report 5 focuses on societal impact in SSH. Millard opens by describing the emphasis, in policy work (and associated metrics) on commercialisation as the primary form of engagement. In practice engagement involves many other activities, including collaboration with non-academics in research projects, consultancy and advising policymakers which may be far more common than commercialisation (D'Este and Patel 2007, Perkmann et al. 2013).

Millard cites other research confirming the importance of public and third sector relationships in the SSH. Olmos-Peñuela *et al.* (2011) argued above that most relationships between SSH research groups and non-academic entities take place with governmental agencies and non-profit-organisations. Based on a survey by Abreu *et al.* (2008) around 40% of social science and around 30% of humanities scholars had activities with private sector companies, whereas more had activities with government (just over 60% of social sciences and just under 50% of humanities scholars) and the third sector, just under 50% of both social science and humanities scholars.

The POCARIM survey supports these findings. Over 67% of respondents reported having taken part in knowledge transfer activities: 62% had participated in policy relevant conferences and events and over 52% had given interviews in the media. 37.1% were involved in advising policy actors at international, national or local level and 34.7% held committee positions. 28% reported involvement with a third sector organisation. In comparison 'only' 22.9% reported involvement in the development of innovative products and 11.3% had positions on company boards. Whilst these suggest higher levels of engagement with public and third sector organisations the involvement in commercial activity is by no means insignificant.

Marked differences could be seen between countries, with Norwegian respondents reporting higher levels of engagement than those in Switzerland and France, for example.

Although we noted above some of the 'risks' associated with leaving academia in terms of the ability to generate peer-reviewed publications that is so central to accessing and progressing in academic careers, it is also important to recognise the role that publication behaviour plays as impact activity in itself. Ackers *et al.* (2010) identified the role that 'hybrid' publications play in generating impact referring to the large number of peer-reviewed journals that address a wider audience including stakeholders and policy makers. Furthermore, some respondents referred to the importance of establishing a reputation via publication in high status peer-reviewed publications as a critical platform for impact-related work – offering credibility to boundary spanning roles.

The study also drew attention to a very obvious but oft-neglected form of impact – namely through teaching the next generation of undergraduates who then become knowledge intermediaries.

In his report on the career mobilities of the POCARIM population (Policy Report 4, 'Working outside Academia'), Vinck argues that traditional distinctions between 'fundamental' and 'applied' research no longer hold (if they ever did). Engagement activities and relationships are normal in the social sciences and humanities with most research groups and individuals engaging in some respect with non-academic actors through activities such as joint research, professional training, personal mobilities and informal contacts.

The relatively lower levels of job-to-job intersectoral mobility reported above should not be taken as indicators of lower levels of intersectoral engagement. Indeed, on the contrary, Knight and Lyall (2013) report over 60% of SSH researchers reporting inter-sectoral relationships and collaborations. This finding is confirmed in the study on public policy impact (Ackers and Millard, 2010).

Reale *et al.* (Policy Report 6) explain how research groups themselves are complex structures which, although based in universities, engage actively with non-academic actors through joint research, consultancy, professional training, student placement supervision, personnel mobility and informal contacts. The emphasis on identifying relationships between such centres and non-academic organisations is therefore in many respects at odds with the reality of deeply integrated impact-related activity. This, coupled with the often informal and pro bono quality of relationships renders many engagement activities in the SSH 'invisible'.

Reale *et al.* also point to another dimension of 'invisibility' making it very difficult to quantify impacts in the SSH – namely the issue of time-lag and the difficulty in attribution. SSH researchers may contribute significant inputs into policy processes but will not necessarily ever know the outcomes associated with these. Cause and effect in the SSH is never as simple as it is in some areas of science and the contribution of one source of knowledge will necessarily combine with others and be filtered by political processes. Knowledge may lay dormant for some time until political agendas stimulate debate or, may be silenced by political agendas.

Vinck also points to the importance of a rather different emphasis (from that encouraging academics to link with the outside world) to support those researchers who have left the academic sector to retain relationships with it. His analysis reports significant activity amongst this group of researchers who maintain contact with academic research through teaching, doctoral supervision and publishing.

As noted above many doctoral researchers in the SSH come into academic research from other sectors (as opposed to directly from study). And the process of undertaking doctoral research builds a strong desire to work within the university environment or, if that is not possible due to the lack of positions or the relative unattractiveness of positions, they remain keen to retain active links.

In terms of post-doctoral career outcomes Vinck reports some very interesting examples of discipline switching before, during and post PhD including people working in 'hybrid environments'.

Vinck suggests that the quality of knowledge and the skills gained during the process of gaining a doctorate in the SSH plays a key, if invisible, role generating a community of boundary spanners. The process of doing a doctorate in the SSH develops not only substantive (explicit) knowledge but also, 'a capacity to connect with people and organisations.' Empirical work in SSH research often involves direct engagement with individuals and organisations, perhaps through interviews or using participatory methods in a primarily human interaction. In that respect SSH researchers' engagement with non-academic sectors is an integral part of the research process. And a high proportion of SSH research could be defined as applied.

Interestingly, Reale *et al.* point to three obstacles to impact in the SSH – namely unemployment, having children and staying abroad for periods of more than one year. Insecurity of employment especially in the academic sector extinguishes opportunities for impact. Greater employment security coupled with greater support for SSH graduates with children would increase the impact of SSH research. The fact that long stays abroad are negative predictors of impact is perhaps related to the importance of building trust relationships – often at the local level – with stakeholders in order to support knowledge mobilisation.

The Importance of Networking to Careers, Mobilities and Impacts

The qualitative data (Policy report 7) reinforce the findings of other research emphasising the importance of the early career stage to the formation of social capital through critical networks and the pivotal role that doctoral supervisors play in this process. Although individual doctoral supervisors play a particularly important role, respondents referred to a slightly broader group of key actors encompassing the wider doctoral committee including examiners, members of collaborating research teams and also the research environment and general 'milieu' including peer friendships.

The data also highlight the value of conferencing and business travel both as a mechanism to facilitate network generation and an outcome of social capital. Interestingly, the data also point to the role that 'serendipity' or 'happenstance' plays in critical network formation, indicating the value of facilitative and creative environments conducive to 'chance' encounters.

Whilst such chance encounters create critical 'knowledge collisions' respondents also referred to the importance of organised inter-institutional relationships (planned exchange schemes and joint programs, etc.) in creating opportunities for networking at early career stage.

Mobility – in all its forms – plays a central role in building critical relationships that will go on to shape career paths and impacts. The POCARIM study underlines the importance of face-to-face contact in stimulating relationships: co-presence continues to play a very important role but this may be achieved – and indeed may best be achieved – through multiple short stays. Once established, relationships can be maintained through virtual communication. They may also 'stretch' and deepen in interesting ways to encompass new locations when the individuals concerned move to other disciplines, sectors or countries. But investment in network management enhances these processes.

Inter-sectoral moves can, in some circumstances, result in network decay or obsolescence especially if a move outside of academic research results in less research activity and inability to publish or travel for dissemination purposes. But in many cases individuals who leave the academic sector maintain an active relationships through supervision, consultancy or training.

SSH careers are less characterised in linear terms when compared to the natural science. Many researchers come into academia from other sectors at mid-career level, perhaps after having a family. These more complex patterns are more conducive to relationship-building and maintenance.

Perhaps one of the most striking features of the POCARIM study is the role that researchers in the social sciences and humanities play as 'boundary spanners' bridging disciplines, countries and sectors to create important knowledge fusions and translations. Policy Report 7 on Networks provides excellent examples of boundary spanning activity (Ackers, 2014).

The Impact of Partnering and Parenting and Caring Responsibilities

Policy Report 12 on the Impact of Partnering and Parenting and Caring Responsibilities on Mobilities and Careers in the SSH (Perista and Perista, 2015) emphasises some of the points already raised within the individual reports. The strong 'expectation of mobility' in the natural sciences (Ackers, 2003) is also present in the SSH especially in some national contexts. This continues to shape career decision-making and career progression. Researchers with caring and family responsibilities – and partners - may have to confine their employment search to a narrower radius restricting the opportunities to show international activity on CVs and their ability to access available positions.

The constraints on international mobility are felt most strongly when it comes to longer and medium term stays. In general shorter stays are more possible but still pose obstacles if they are either very frequent or very unpredictable.

The issue of mobility intersects with another major problem facing researchers with family and caring responsibilities - namely time. Time is important in a wide range of respects from working patterns over a normal working day (with meetings organised at night often posing serious problems); over the working week (with travel over weekends presenting problems) and over the year and life-course. International travel involves not only distance but also unusual use of time often extending into the night and over weekends, creating challenges for people with partners and caring responsibilities.

As Perista and Perista suggest, these challenges may inhibit career entry and progression or even bring an end to academic careers. As we have seen in Ackers' paper on networks, the restrictions on mobilities also have an important effect on the social capital of researchers and this effects access to supervision/mentoring, research collaborations, dissemination opportunities and professional profiles. The reduction in opportunities for face-to-face 'co-presence' has serious implications for those affected.

Where researchers were able to negotiate and manage mobility during the time when their children are young they are often able to engage in more active or intense forms of mobility later on effectively postponing this aspect of their work. Re-engaging later in the life course is generally easier in the SSH than it is in the natural sciences as career re-entry is much more common and culturally accepted.

A very high proportion of mobility in research careers can be described as a facet of 'constrained' opportunities rather than explicit choice. Unemployment and the dominance of fixed term contracts force researchers to seek positions in other regions, sectors and countries. Whilst this affects all researchers, instability has a particularly profound impact on women, who are under greater pressure to achieve a level of stability at a relatively early age (in order to stabilise family situations and benefit from maternity leave, etc.). Stable work is an absolute priority for many women perhaps over and above progression.

Conclusions

The POCARIM study has established the importance that the social sciences and humanities play in creating boundary spanning knowledge and actors. SSH doctoral graduates are playing an active role as boundary spanners in the European Research Area supporting the emergence of knowledge combinations that lie at the heart of innovation processes.

Current metrics fail to grasp the reality of these processes many of which are deeply embedded in SSH research processes and ambitions. In many respects the extent of this embeddedness renders them invisible.

The POCARIM findings evidence to the reality of very high levels of international mobility – and even higher levels of international collaboration. The key obstacles to international engagement remain lack of funding to support visits and the need to achieve effective work-life balance. Many SSH researchers are actively working in interdisciplinary contexts either within the SSH themselves often moving fluidly between disciplinary families but also engaging very actively with non SSH disciplines. Many social science disciplines are themselves inherently interdisciplinary or permeable (social policy; business studies or human geography for example).

Factors inhibiting greater interdisciplinary exchange focus on the metrics of research excellence – especially with regard to publications - which positively favour narrow disciplinary specialism. On the other hand the metrics associated with grant income place an emphasis in the opposite direction on high levels of inter disciplinary, international and intersectoral engagement. This leaves researchers feeling like they are jumping through hoops.

The evidence presented here is testimony to very high levels of engagement with non-academic partners including industry but with a special emphasis on public and third sector organisations. This behaviour is normalised in the SSH. Many SSH researchers engage actively through their empirical work with organisations and the public and have high levels skills in communicating with non-academic actors.

The POCARIM findings indicate a powerful preference amongst doctoral graduates to work in the academic sector even for those who have moved into this sector after years working outside of it. This reflects the dynamism of research in the university sector and the level of autonomy associated with this sector. Nevertheless high levels of unemployment, under employment and poor quality positions (particular insecurity) restrict opportunities to utilise their knowledge mobilisation skills.

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