Postdoctoral researcher development in the sciences: a Bourdieusian analysis

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Abstract

The purpose of this research was to explore how postdoctoral researchers and principal investigators (PIs) in scientific disciplines experience *researcher development,* following the implementation of the Roberts researcher development policies.

This doctoral research used a qualitative methodology with a dual approach of "at-home ethnography" (Alvesson, 2009, p. 174) and semi-structured interviewing to explore the experiences of being and developing as a postdoctoral researcher, as well as being an academic employing postdoctoral researchers, within the structural context of a research-intensive institution. Data from 9 Postdoctoral researchers and 12 Principal investigators (academics) interviewed between 2013-14 is presented in this analysis. The Bourdieusian concepts of *field, capital and habitus* (Bourdieu & Wacquant, 1992) have been used to frame the analysis of researcher development, as a practice within the field of postdoctoral research. An ethnographic exploration permitted to narrate the institutional implementation of researcher development policies; it also allowed to identify objective structures contributing to shaping the Postdoc habitus and the positioning of researchers within the institutional context.

From this small-scale explorative study emerged 6 domains of postdoctoral researcher positioning (*projecting, grafting, hopping, stepping, resisting and bobbling)* within the field of postdoctoral research. These domains were conceptualised on the basis of volumes and configuration of capital, particular habitus, modes of entry into the postdoctoral field and trajectory within the field. The study identifies instances of symbolic violence that pertain to the lack of capital afforded to postdoctoral researchers. An exploration of PIs' habitus highlights particular stances in approaching researcher development, that point to a reproduction of the field *doxa*. The findings bring to the fore that researcher development policies have had limited impact in reconfiguring the postdoctoral *field logic* and challenge researcher developers in their role within the postdoctoral field.

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Abbreviations and acronyms

Co-I   Co-investigator (term given to an academic who holds a research grant, but not as the main applicant)

CROS   Contract Researchers Online Survey

ECR(s) Early Career Researcher(s)

FoS   Faculty of Science

HE   Higher Education

HEI(s) Higher Education Institution(s)

HEFCE   Higher Education Funding Council for England

HR   Human Resources

L&T   Learning and Teaching

OECD   Organisation for Economic cooperation and Development

PI   Principal Investigator (term given to an academic who holds a research grant in their own name)

PGR   Postgraduate research student or postgraduate researcher

RCUK   Research Councils UK

REF   Research Excellence Framework

RIS   Research and Innovation Services

STEM   Science, Technology, Engineering and Mathematics

UK   United Kingdom

"As we read more, learn more, experience more, our confident hold on what we study lessens. Our interests broaden, our assumptions and conceits are challenged, our positions in the world change and we discover that things are always far more complicated and less stable than our early portraits or models would suggest. I now despair of ever tying things down – anything really – neatly and definitively."

(Van Maanen, 2015, p. 39)

Chapter 1

Introducing the research

1.1 General overview

This thesis presents an analysis of how postdoctoral researchers and academics in scientific disciplines see, think, and experience *researcher development* within a research-intensive academic environment. This work is set in the context of recent UK policy implementations related to the career development of postdoctoral researchers. This enquiry makes an original contribution to knowledge in three ways.

Firstly, it documents at the micro-level of an institution the unfolding of national UK policies concerned with researcher professional development. This provides focused insights into the field of postdoctoral research and reveals sites of struggle in this social space within Higher Education (HE).

Secondly, it offers an analysis of the experience of being an early career researcher negotiating career progression. The study aims to bring what Carrozza and Minucci (2014, p. 493) label the "flesh and blood" in studies about researchers. In addition, it contributes to a significant gap in the literature by offering perspectives from the academics employing postdoctoral researchers.

Thirdly, it demonstrates, through an empirical approach the continuing usefulness of Bourdieu's theoretical tools of *habitus, field and capital* (applied here to develop our understanding of researcher development), in decoding the rules of the game in the social world, here the *field* of postdoctoral research.

Postdoctoral positions are temporary research appointments held by researchers after the completion of a doctoral thesis; these appointments are funded via research funds obtained by academics (called Principal Investigators or PIs) on specific research proposals. For researchers from scientific disciplines within many different national research systems, a period of postdoctoral research is now a necessary transitional stage, but far from a guarantee to progress into longer-term university research careers or lectureship positions. A 2010 Royal Society report 'The Scientific Century: securing our future prosperity' suggests that in the UK, while 30% of PhD

graduates undertake postdoctoral research, only 3.5% of UK PhD graduates transit to permanent academic positions. Strong words are used to describe the situation: "the plight of young scientists" (Fox & Stephan, 2001, p. 110), "a generation at risk" (Daniels, 2015, p. 313) or "the postdoctoral glut" (Gould, 2000, p. 453). I have presented in figure 1 a number headlines from online magazines, a document cover (from a booklet developed by the University and College Union) and cartoons from blogs, selected for the powerful metaphors used to describe the contemporary research system. They depict stories of poor management, lack of transparency, misunderstanding about progression, false expectations, lack of recognition, exploitation, and survival in a ruthless and competitive environment. The literature based on quantitative and qualitative data on research staff has repeatedly described the same issues with career structure, uncertainties of employment, unfavorable employment conditions and limited institutional status (Åkerlind, 2005; Bryson, 1999; Campbell et al., 2003). Bourdieu (2004) in his analysis of the scientific field expressed concerns about this social space: "the world of science is threatened by a serious regression" (p. vii) losing its autonomy to the dominant economic power. Science policies have focused on the supply chain of the research workforce (Bray & Boon, 2011; Evans, 2011; Kent, 2005; Mellors-Bourne, 2012). To retain a dynamic research and innovation system, a key policy concern has been the imperious need to ensure that research careers are perceived as an *attractive career path* even within the restricted scope for academic career progression and the high probability for moves to careers outside of academia for many trained researchers (Ackers & Gill, 2005).

Highly trained knowledge workers such as postdoctoral researchers are told to acquire the flexibility and adaptability to move across the employment sector, and be better prepared to succeed within an extremely competitive academic environment (Concordat, 2008; Roberts, 2002). Science policy documents champion the idea that if the aspirations of the knowledge economy are to be realised, new approaches for the training and management of the scientific workforce will need to be explored (Roberts, 2002).

Fig. 1 Examples of headlines and illustrations representing the postdoctoral situation
Headlines from the Times Higher Education online magazine
(https://www.timeshighereducation.com/),
The Guardian online Higher Education Network, front cover of a booklet produced by the trade union University and College Union. Cartoons from Piled Higher and Deeper by Jorge Cham at www.phdcomics.com (permission for image usage obtained).

The motivational rhetoric from science policy documents about supporting the *best researchers* and fostering innovation (e.g. the 2007 Council for Science and Technology report, *Pathways to the future* or the BIS 2009 *Higher Ambition* paper) felt at odds with the disjunctions and status quo of postdoctoral researchers' experiences of *being and doing a postdoc* at a research-intensive institution. At the time I started the EdD, little work had been done on documenting the lives and work context of postdoctoral researchers but interest in the area has been emerging (Åkerlind, 2005, 2009; Scaffidi & Berman, 2011). Considering the vulnerability of this category of staff within HE with the majority of them on short-term contracts (Laudel & Gläser, 2007) and limited prospects of progressing to academic positions, I felt it was critical to document the realities of these experiences in the context of changing national and institutional policies regarding researchers' professional and career development.

1.2 Situating the self and motivation for the study

1.2.1 Becoming a professional of researcher development

In this section, I offer a narrative about my professional path to provide clarity and openness about my context in entering the emerging *profession*[1] of *researcher developer,* educational research and this study in particular. I aim to emulate the approach coined by Bourdieu (2004) as "*sketch for a self-analysis"*, a "reflexive analysis" or "objectification of my point of view" (p. 94), where my social and educational trajectories have become part of my ways of seeing and thinking, constitutive of a specific *habitus* that position me within a "space of possibles" (p. 97), within the field of educational research but also within the field under scrutiny, the field of postdoctoral research. Maton (2003) may reduce such attempts as being limited to an "autobiographical reflection" (p. 54)

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[1] I use the term *profession* loosely and will not delve into a discussion on whether researcher developer fit the definition of a 'profession' as it is beyond the scope of this thesis. However, it is worth mentioning the recent publication of a career framework for researcher developers and the burgeoning of conferences, symposia and networks of researcher developers, which are elements in structuring a new profession.
https://www.vitae.ac.uk/researchers-professional-development/practical-resources-for-researcher-developers-1/the-vitae-career-framework-for-researcher-developers-cfrd/introduction-to-the-vitae-career-framework-for-researcher-developers-cfrd

because "reflexive practice is paved with good intention. However theoretical intentions are one thing, research effects are another" (p. 56). Nevertheless, exploring my own positioning within the field felt an important element to present to the readers.

I had originally trained as a biologist in laboratories of the National Institutes of Health in the USA, while maintaining a French university registration. I had carved an unusual career path, which enabled me to do a PhD in a world-leading research institute where no PhD students were then being trained. I had gained permission from my university to undertake such an international exchange, at a time when none of my contemporaries had dared to ask. This was followed by several years of research in a laboratory in the UK, in a department of the faculty where I currently work. My research period as a postdoctoral researcher was a time of struggle, adjusting to a new research domain at the same time as adapting to life as a parent of young children. During the last 6 months of my postdoctoral research contract, I realised that I had lost the pleasure of doing experimental work. At the time, no structures were in place to support postdoctoral researchers manage their career transition and progression. Although I had published well during my PhD, I had not been able to publish during the three years of my Postdoc. I only had one manuscript being reviewed at the end of my contract. I made the decision, based on what I considered my *dry* publication record, that my academic progression in scientific research was compromised. I decided, without seeking any mentoring, that I would *leave the bench behind* at the end of my contract, not really knowing where I would take my career.

I became an actor in the implementation of researcher development policies when I took a position, in September 2006, as postgraduate training coordinator within another biology department in the same faculty as my previous Postdoc and started working with PhD students, with the remit to develop their *transferable skills*. Following the publication of a very significant report, *SET for success* also known as the Roberts report (2002), which had made a number of recommendations regarding the training, career and professional development

of researchers, large amounts of funding from RCUK went into Higher Education Institutions (HEIs). My position was supported with this funding.

1.2.2 Shift towards a need for scholarly exploration

Considerations started to emerge about the impact of the large investments made with the Roberts funding (Bromley, 2009; Bromley et al., 2008); it had enabled the creation of many researcher developers' positions across the UK[2], as well as many training and development programmes and initiatives. The funding had also contributed towards establishing a researcher development community, national policy leadership and good practice structures, through setting up a national organisation, Vitae, to promote the professional development of researchers. There was a need to build a picture about the impact of the Roberts funding. The Roberts implementation was followed at national level by the Roberts Policy Forum, which established, in 2005, a national, HE-wide task group, the Rugby group (which later became the Impact and Evaluation Group), to construct a methodology that could collate and construct evidence about the impact of researcher development activities developed with Roberts funding (Bromley & Metcalfe, 2012; Bromley et al., 2008).

The Research Councils were keen to see an integration of transferable skills and researcher development initiatives as core universities activities, and move away from a ring-fenced funding model (from which they did eventually). The Roberts funding stopped in 2011 (Wood & Denicolo, 2013), but the Research Councils continued to expect research organisations to deliver researcher development activities under a new funding regime (RCUK, 2011). Concerns were expressed about the impact of changed funding arrangements for researcher development activities (Hodge et al., 2010). There was a period of uncertainty (2008-2011) about Roberts funding, during which researcher developers' jobs felt contingent on demonstrating a positive impact of researcher development activities. I felt puzzled about the types of impact (*impacts of/on what, or on whom*) that researcher developers were being asked

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[2] By 2009, 359 staff had been recruited as co-ordinators or trainers for all "transferable skills" activities across the UK[2] (RCUK, 2010).

to identify and demonstrate. This posed, in my view, an ethical and research integrity issue with regard to the types of evidence we could offer. My concerns mirrored similar feelings of the struggles expressed by academic developers about clarity in defining the purpose of academic development, issues of evaluative practices and methodologies (McCulloch & Loeser, 2016), and consideration for practitioners' employment:

> a lack of coherence in the understood purpose of development and uncertainty of direction within the community of developers […] these issues are compounded by the lack of an agreed framework for evaluation of the impact, added value and effectiveness of academic development. (Stefani, 2011, p. 3 & 4)

Recently, Hoessler et al. (2015) have argued for a broadening of the use of multiple evaluative lenses in the evaluation of academic development, in order to capture the complexity of multiple influences, since "professional learning embodies a complex interplay between individuals and their environment" (p. 224). Whilst in other contexts, clarity about the purpose of researcher development programmes were in place, "expectation of an increase in publications and grant applications by this cohort of early career researchers, and contributing to developing an engaging research culture across the university" (Browning et al., 2014, p. 128), my own institutional context did not offer any defined scope for evaluating the impact of researcher development activities.

Within this context, I felt that the points of tension were numerous. I began to question how we should or could define what represented impact in researcher development. I also started to ask the basic question of what constituted researcher development: were we talking about workshops, coaching sessions, informal conversations or departmental culture? I wondered about the consequences one might face in setting an impact agenda regarding researcher development, with the awareness that when it comes to impact "what gets counted is not always what counts" (Molyneux-Hodgson, 2009, p. iii). The core question of what was meant by *researcher development* linked all my wanderings. This became the trigger, which lead to my decision to join the EdD and was part of starting to question HE policies.

In the next section, I introduce the purpose established for this study, the derived research questions I aim to answer and the focus of exploration.

1.3 Research purpose and questions

Evans (2011) was one the first scholars to discuss *researcher development* as "an emergent new field of research and scholarship" (p. 76). She laments the lack of precision, clarity and consensus in defining researcher development and describes the fuzziness in defining researcher development in the literature and policy documents of funders and learned organisations. There is ambiguity over what is meant by *researcher development*, as it seems to amalgamate many strands of issues, discourses, activities and policies articulated by different stakeholders and agents: career and professional development, training provision, career path of researchers, practices of *becoming* a researcher, socialisation to academic life, transferable/generic or employability skills, access to research funding, enhancement of publication record, as well as becoming a more collaborative researcher or a *better* researcher, enhancing technical skills and expertise, and developing more innovative and creative researchers. Evans (2011) forcefully advocates theory building in the area of researcher development that would be "universally applicable" and "context-independent" (p.93):

> But a conceptual analysis involves more than the presentation and explanation of a stipulative definition. It involves examining the very essence of the concept in question: what is conceived as its substance, or its quiddity. In communicating my conceptualisation of researcher development I find it impossible to choose between the terms *essence*, *substance* and *quiddity. (p. 82)*

To address the call of Evans (2011) for a conceptualisation of researcher development, but in contrast to her interest in the "*essence*, *substance* and *quiddity*" *(p.82)* of researcher development*,* this study is concerned with the sociological dimension of researcher development. My own understanding of researcher development is that of a practice embedded in context, shaped by actors, structures and policies, enacted and experienced in a multitude of ways.

This study aims to offer a scholarly focus on the particularities of postdoctoral researchers, an understudied population in the research system and HE (Cantwell, 2009), particularly when it comes to the development of evidence-based policies to support professional development (Scaffidi & Berman, 2011). This work is set in the context of a UK institution following the Roberts recommendations. This study intends to depict some of the tensions between desired environments articulated by policy makers, and the academics' and postdoctoral researchers' own understandings of researcher development derived from lived experiences.

I am asking the following question to frame this research project:

How do postdoctoral researchers and principal investigators from scientific disciplines experience researcher development, post-Roberts implementation?

The core research question is supported by four supplementary questions described below.

The study aims to provide a space of reflexivity for a practitioner of researcher development, reflecting on the structures within which I function as agent in interpreting, enacting, shaping and embedding policies, and considering the position of postdoctoral agents in the *field*.

RQ1- What was the institutional journey of researcher development policies and what does it tell us about the *field* of postdoctoral research in a research-intensive institution?

RQ2- How are researchers positioned in the *field* of postdoctoral research within a research-intensive institution?

In addition, the analysis I propose is about documenting what it is like to be a postdoctoral researcher in a research-intensive institution, in the context of developing as a researcher, and how PIs think about the development of their postdoctoral researchers.

RQ3- How do postdoctoral researchers develop *a feel for the game* to transit through the field of postdoctoral research?

RQ4- How do PIs approach postdoctoral researcher development?

Explorations of policy enactments at the micro-level of individual researchers and academics matter as perceptions vary greatly between individuals as well as across disciplinary fields and institutional structures (Bryson, 2004b). Academics attempt to maintain academic values while engaging in new practices (e.g. academic capitalism) and are torn between different value sets (Ylijoki, 2003).

While I battled with the construction of the object under study, I could hear the warnings from sociologists against the "narcissistic complacency" (Bourdieu in Bourdieu & Wacquant, 1992, p. 231). This is particularly salient when the researcher has an interest or first-hand experience in the object, and is somehow tied by "affective attachments, positive or negative, produced by my prior investments" (Bourdieu in Bourdieu & Wacquant, 1992, p. 232). My challenge in this research was to practise "a radical doubt" in the analysis of the construction of researcher development (Bourdieu & Wacquant, 1992, p. 235). It required "a break from common sense" (Bourdieu & Wacquant, 1992, p. 235) and a consideration of how researcher development has been shaped. I am compelled to work towards better sociological understandings of HE and the "need to be more reflexive about the social processes within HE" (Lucas, 2006, p. 4).

1.4 Chapter outline

Following this introduction (**chapter 1**), which has explored the origins of my motivation for this study, my positionality and an articulation of the research questions, I now provide a description of the chapters which follow.

Chapter 2 offers an overview of the contemporary research systems and a description of the policy context for the study with the inception of researcher development policies in the UK, against the backdrop of broader European policies.

Chapter 3 provides the literature review, considering key issues and methodologies to studying HE and the academic profession. It presents current understanding of postdoctoral researchers' lives and careers, and highlights gaps and limitations justifying the purpose and approach for this enquiry.

Chapters 4 and 5 provide the theoretical framing and methodological approaches of this study. They explain in a somewhat candid way the turbulences of the research path that led to my choice of Bourdieusian concepts as analytical tools.

The findings are presented in chapters 6 to 9.

In **chapter 6**, I narrate the policy journey of the Roberts agenda through an ethnographic account of its implementation in my institution. This contributes to a conceptualisation of policy as a "sociocultural practice" (Gerrard & Farrell, 2013, p. 2), where:

> policy practice comes to refer to the diverse ways in which people in local settings come to produce, read, interpret, act upon, ignore, dismiss, adapt, co-opt, reject, disseminate and perform formal policy directives. (Gerrard & Farrell, 2013, p. 2)

In **chapter 7**, I explore how postdoctoral researchers as agents are positioned in the institutional context. An analysis of structures, sites of practices, and enactments permits an exploration of the *structuring structures* (Bourdieu, 1984) shaping agents' dispositions and understandings of researcher development.

Taken together, chapters 6 and 7 contribute to an analysis of the *field* of postdoctoral research within a local context, encompassed by national discourses about skills, mobility, and innovation.

In **chapters 8 and 9**, I explore researcher development, by considering the *habitus* of postdoctoral researchers and academics within the field of research.

In **chapter 10**, I provide a conclusion for this study, encapsulating evidence gathered to respond to the research questions, and consider the limitations of the study and potentials for further research.

Chapter 2

Policy context: skills and researcher development agendas

2.1 Introduction

I situate my study in the contemporary research system, during the emergence of UK policies aimed at researchers' professional development. Researcher development policies sit at the intersection of policies related to science and innovation and policies about skills and employment. In addition, UK policies cannot be seen in isolation from the European policy context that sought to develop the mobility of the research workforce across Europe with the creation of the European Research Area, perceived as a motor for research innovation. Policies impacting postdoctoral researchers have tagged along policies on more formal doctoral research training; such origin may have influenced perceptions about postdoctoral researcher development. In this chapter, I introduce policy elements at the national, European and international levels relevant to an exploration of postdoctoral researcher development.

2.2 Emergence of the skills agenda

Scholars describe many ideological, political and economic discourses that circulate within institutions and influence HE (Barnett, 1990, 2011). Changes are a constant in descriptions of the HE environment (Enders & De Weert, 2004; Trowler, 1996, 1998; Trowler et al., 2012). HEIs negotiate their structures, values and strategies in the context of neoliberal discourses with multiple impacts, from policy changes on academic cultures, attitudes and identities (Billot, 2010; Deem & Lucas, 2007; Trowler, 1998). Shifts in management (Deem, 1998), funding regimes (Liefner, 2003), research assessment (Lucas, 2006) and employment practices (Bryson, 2004b; Bryson & Barnes, 2000) have created an academic space of supercomplexities (Barnett, 2000) and "multi-level competition" (Müller, 2014, p. 330). These contribute to changes and challenges for innovation systems, reshaping meanings about knowledge production (Barnett, 2000), conceptions of research or being a researcher (Åkerlind, 2008a, 2008b; Brew et al., 2016). Rhoades and Slaughter (1997) label the range of changes seen in HE, affecting ways of working and individuals, as "academic capitalism". Academic capitalism entails practices linked to an economic model for knowledge production. Academics

are pressured to diversify the sources of income to fund research and to increase linkage with industry and the third sector.

It is no surprise that within the context of the contemporary research system, the professional development of early career researchers has faced reorientation, starting with transformation in the purpose and processes of postgraduate education (Austin & Wulff, 2004; Delamont et al., 1997a; Enders & De Weert, 2004). In the 80s, policy concerns placed an emphasis on submission rates, and increasing the balance between different skills sets to be acquired by doctoral students (Delamont et al., 1997a). Epistemological questions have been asked about the role played by postgraduate training and education (McAlpine & Norton, 2006); the very nature of the doctorate and "doctorateness" (Wellington, 2013) are contested. Postgraduate education is described as not fit for purpose: "it is no longer adequate or appropriate for current faculty members to prepare graduate students as *clones* of themselves" (Austin & Wulff, 2004, p. 11). Common trends in the restructuring of research training have been observed across very different national systems (Austin & Wulff, 2004; Bleiklie & Høstaker, 2004; Enders, 2004). However, these changes have been implemented and experienced differently in countries with various levels of national coordination of HE policies, but also across different disciplinary environments (McAlpine et al., 2011).

Enders (2004) proposes that these policy changes towards a shift from the traditional model of doctoral education, often referred to as the German "Humboldtian apprenticeship model" (p. 428), towards more structured training programmes, are part of a set of four different trends. These are: expansion[3] and diversification of the student population (e.g. doubling of PhD graduates in the UK during the 90s), changes in modes of knowledge production, "internationalisation of the PhD factory" (p. 420) and centralisation of decisions related to research training, with increased governmental control aimed at rationalising the production of knowledge workers. Changes seen in postgraduate education and research training have implications on the

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[3] In the European Union, the overall student population increased by 13.2% between 2003-2012, while the number on PhD programmes increased by 40% between 2006-2012 (Afonso, 2016)

organisation of research cultures and the socialisation of researchers (Delamont et al., 1997a).

Delamont et al. (1997a) has argued that changes in postgraduate education are part of a "*dirigiste*"[4] and "imposed system of structural and cultural changes" (p. 320) that favoured the science model of critical mass in the research environment. The rise in structured and formalised research education across many countries is perceived as being associated with an increase in national research assessment mechanisms and the need to enhance research performativity (Browning et al., 2016; Delamont et al., 1997a). In contrast, Rip (2004) proposes that these changes towards "a regime of strategic science" (p. 154) might help to produce "T-shaped people" (p. 154) (depth of specialist, technical knowledge while maintaining broad scope and flexibility) or what he refers to as "*homo universalis*" (p.159), individuals able to be effective knowledge producers within new forms of knowledge production (e.g. mode 2). For example, the "Triple helix" model – deployed to describe a desired connectivity between government, academia and industry for effective innovation within the knowledge economy (Etzkowitz & Leydesdorff, 2000) – has impacted on how research funders set requirements and expectations on research training programmes, as this stage of socialisation shapes scientists' identity and professional practice (Thune, 2010), and indeed can:

> Represent a necessary precondition for the further expansion of triple helix interactions since it will be dependent on people with transferable competencies […] The government plays an important role in adapting doctoral education to a triple helix framework by stimulating the development of new types of researcher training and by promoting policies that focus on a broader set of skills for researcher training and multiple career tracks for people with doctoral level qualifications. (p. 465-466)

Changes proposed for postgraduate and research education have mostly been framed by the notion of "learning as skills acquisition" (Hopwood, 2010, p. 829), with the terms *transferable, employability or generic skills development* as core concepts in this policy area. The skills *agenda or debate*, although "contested and continuously evolving" (Cumming, 2010, p. 406), has become dominant in

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[4] Spelt in French in the text by Delamont

the policy discourse of UK HE institutions (Mellors-Bourne, 2012; Payne, 2000; Roberts, 2002); it has raised tensions within academic circles (Gilbert et al., 2004). Cumming (2010) regrets that the skills debate is mostly conceived in terms of a deficit model of the skills perceived as deficient in researchers, but demanded by employers (mostly non-academic employers). Hopwood (2010), on the other hand, points to flawed conceptions of doctoral training that fail to consider the social and agentic process of learning.

Following this overview of the context of changes in research education, I now provide a perspective on the key policy developments that led to establishing researcher development programmes in UK institutions.

2.3 Introducing the Roberts Researcher Development Agenda

An historical perspective on the researcher development agenda in the UK traces its origin to the 1996 White paper 'Realising Our Potential: A Strategy for Science, Engineering and Technology'[5], published under a conservative government (Åkerlind, 2005). The White paper is described as having an "emphatically utilitarian emphasis" (Kent, 2005, p. 4), but it initiates substantial work on researchers' career management (Åkerlind, 2005). From this period, governmental science policies portray science as an economic driver, and the intersection between government, industry and universities becomes the recurring feature of subsequent science strategies. Scientists in universities become the actors of economic growth, the highly skilled workers of the knowledge economy. From this is born a discursive prose about the need to consider the attractiveness of researchers' careers, and the retention and development of researchers within STEM careers. An initial framework to support the career management of contract research staff was set in motion with the 1996 Concordat, followed by the Research Careers Initiative (RCI) set up in 1997 to monitor the implementation of this first Concordat. However, Bryson (1999) was highly critical of the limited impact of this early period of

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[5] https://www.gov.uk/government/publications/realising-our-potential-a-strategy-for-science-engineering-and-technology

national policy development and perceived these national initiatives as having "failed to address the real issues" (p. 29).

The turning point for UK researcher development policies came with the recommendations made in the 2002 Roberts report "SET for success". In his report, Sir Gareth Roberts reviewed the supply of people with science and engineering skills needed for the knowledge economy, from school to academia and industry. As part of the report, 40 recommendations were made, and among these, clear recommendations for the need to enhance the skills training of researchers (PhD students and Postdocs). Recommendation 5.3, presented in figure 2, set a "vision for postdoctoral researchers". It advocates for a conception of "individual career path" (p.154) and the need for a "career development plan" (p.154), supported by access to further professional development and training. Although discussions abound about the types of skills researchers should develop, Roberts recommendation 5.3 is particularly significant, as it makes a strong case towards dissociating the postdoctoral period from being the default stage prior to transition to an academic career, moving towards a conception of this period as entry towards "different career destinations". While the Roberts report (2002) hosted a rhetoric about "improving the attractiveness of postdoctoral research" (p. 17) and, as such, aimed to sustain the scientific pipeline, the intentions of Sir Gareth Roberts went beyond the discourse the government was keen to hear about the linkage between innovation, research and economic impact. Sir Gareth Roberts was very committed to supporting an agenda that would have an impact on the lives of young researchers but he also saw its broader impact on the knowledge economy as a whole. In the foreword of a cross institutional report (Campbell et al., 2003), Roberts advocates:

> The research staff in our universities are a very precious asset. We must do all that we can to support their personal and career development. This is not only in their own interests and those of their universities, but it is also in the interests of the nation as a whole since such support capitalises on and further develops the enormous intellectual and human capital vested in them. (p. 1)

Figure 2. Roberts Recommendation 5.3: A vision for postdoctoral researchers

"It is important for postdoctoral researchers to be able to develop <u>individual career paths</u>, reflecting the different career destinations – Industrial, Academic and Research Associate– open to them, and that funding arrangements reflect the development of these career paths. The Review believes that enabling the individual to <u>establish a clear career path</u>, and a <u>development plan</u> to take them along it, is critical to improving the attractiveness of postdoctoral research. The Review therefore recommends that HEIs take responsibility for ensuring that all their postdoctoral researchers have a clear career development plan and have <u>access to appropriate training opportunities</u> – for example, of at least two weeks per year. The Review further recommends that all relevant funding from HEFCE and the Research Councils be made conditional on HEIs implementing these recommendations." (Roberts, 2002, p. 154)

Following the report, the government committed (in the July 2002 Spending Review and Strategy for Science) to invest considerable targeted funding around 3 core areas: funding to increase researchers' salaries, funding for professional development and an increase in funding for fellowships. Interestingly, shortly after these commitments were made, the Science and Technology Committee of the House of Commons reviewed evidence and published the report "Short-term research contracts in science and engineering" (2002), regarding the situation of contract researchers in the UK. This committee challenged the government, funders and institutions regarding the upheaval faced by early career researchers within the UK research system. The tone of the report is bold and abrupt; it conveys a sense of frustration about the lack of progress made in supporting the employment and career management of researchers, considering that knowledge of the problems faced by contract researchers is not new. The report critiques previous approaches where the focus has been on "managing the problem rather than solving it" (recommendation 4) and the lack of accountability of HEIs in their strategies to

manage researchers. It makes aspirational recommendations aiming to shake the UK research system, which it accuses of having failed to take responsibility for its research workforce.

The term *skills* established itself as the buzz word of new Labour governmental policy documents; strategies for economic success are perceived as directly linked to the concept of skills:

> at the heart of this strategy are skills, which are represented as the central formula for both economic and social success… the highest-ranking keyword in this period, occurring 1473 times. Indeed, in so far as skills represent a key element of Labour power in a knowledge-based economy. (Mulderrig, 2011, p. 574)

Between 2002 and 2010, around £120 million was allocated to UK HEIs. This became known as the Roberts funding. In a review about the impact of this investment, the legacy of the Roberts funding regarding researcher development is described as follows: "The UK is perceived to be leading the world, other nations are attempting to emulate what is being done." (Hodge et al., 2010, p. 37).

In the years following the Roberts report, an ongoing wave of reports concerned with research careers have been published (around 100 reports cited by the reports of the Funders' Forum *Researchers: what is the situation?* (RCUK, 2006, 2007)*)* but few capture as vividly as the 2002 House of Common Science and Technology Committee the experiences of postdoctoral researchers (House of Commons & Science and Technology Committee, 2002). In my view, this report remains one of the best documented and evidenced accounts of the situation and experiences of researchers in the UK. Explorations of researchers' experiences, career aspirations and development following the UK Roberts policy developments, have mostly been framed by normative and evaluative national surveys organised by Vitae: The Career in Research Online survey (CROS 2009, 2011, 2013, 2015) and the Principal Investigators and Research Leaders Surveys (PIRL 2011, 2013 and 2015).

2.4 Influence of the European context

The European Research Area (a space for the free movement of researchers, knowledge and innovation across the European Union) was constructed as the instrument to realise the ambition of a knowledge economy. The UK researcher development policies arose alongside European policy developments. In March 2005, the European Commission approved the *European charter for researchers and Code of conduct for their recruitment*[6], with a view to homogenising conditions of employment, rights, responsibilities and support for researchers, and facilitating uptake of research careers and mobility across Europe. The charter and code did not represent legislative engagements but provided best practice guidelines and principles aimed at fostering further national and institutional policy commitments. A UK HE sector working group responded to the European Commission by providing a mapping of the recommendations made in the Charter and Code with UK policies, legislations and guidelines (RCUK, 2008). The gap analysis, made through this enquiry, established that the UK had already instituted a close alignment with the Charter and the Code. In June 2008, a new Concordat[7] was launched and signed by all major UK funders. The 2008 Concordat to support the Career Development of researchers established 7 key principles, presented in Appendix 1, to address support for the career development of researchers. Its target audience and aims were diverse: "to provide an unambiguous statement of the expectations and responsibilities of researchers and their managers, employers and funders" (Mellors-Bourne, 2012, p. 7). However, the implementation of its principles has varied greatly between institutions (Mellors-Bourne, 2012). In addition, while national and institutional policies may be in place and the implementation of a number of practices enhanced through the work of Human Resources teams, it does not guarantee cultural changes in individuals and departmental academic practices; Dear (2010) queries whether the application of the Concordat principles is even feasible, considering the contradictions between the needs of the knowledge economy and those of the transient research population.

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[6] http://ec.europa.eu/euraxess/index.cfm/rights/europeanCharter
[7] https://www.vitae.ac.uk/policy/vitae-concordat-vitae-2011.pdf

The Charter and Code implementation tool, set by the European Commission, was addressed through the Human strategy for Researchers[8], with the establishment of the HR Excellence in Research Award, as a recognition mechanism for implementation. The UK manages the accreditation system for the HR Excellence in Research Award via Vitae, with linkage to the Concordat principles and QAA[9]. The award requires institutions to make public their action plans for the implementation of the Concordat. As of 2016, the UK is the European country with the largest number of institutions in receipt of the award, with 95 institutions awarded. Institutions are also required to review the implementation plan 2 years after recognition through an internal audit, and then 4 years after through an external one. Institutions are now using the award as a marketing tool in their aspirations to attract the 'best' researchers, but also within their funding applications as proof of commitment towards a supportive environment for researchers.

The role played by the European Charter and Code in addressing the professional development of researchers seems quite variable across European countries, with researchers' career management and researcher development remaining new concepts for many European research organisations (Bromley & Metcalfe, 2012; ESF, 2012a). For example, in a survey of the European Science Foundation, only 8 member organisations out of 20 had policies related to researcher professional development and only 4 countries (including the UK) had national strategies or initiatives (ESF, 2012b).

During the same period, other countries (USA, Canada and Australia) started reviewing their own approaches to researchers' training and management, although these do not follow the same path or timeframe in all national contexts (Åkerlind, 2005). In the UK, the drive for implementation of change in practices, related to the career management and professional development of researchers, came from the government and were linked to reinforcing European policies. The situation appears quite different in North America,

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[8] http://ec.europa.eu/euraxess/index.cfm/rights/strategy4Researcher
[9] http://www.qaa.ac.uk/

where grassroots organisations, such as the National Postdoctoral Association, have been described as driving forces for change (McDowell et al., 2015; Scaffidi & Berman, 2011). While a number of early reports had been published and knowledge about the increasing challenges (e.g. terms and conditions of employment, lack of professional development and reduced opportunities in transiting to academic positions) faced by Postdocs in the US were available, limited policy developments seemed to have challenged practices at institutional, federal or national level (Davis, 2005; National Academy of Science et al., 2014). By 2009, 50 postdoctoral associations were reported in the US, with 40 US institutions having created administrative postdoctoral hubs aimed at addressing postdoc issues (Davis, 2009). It appears that a major focus of the work of these offices related to the great diversity of employment conditions of postdoctoral researchers (Davis, 2009), and with a lesser focus on researchers professional development. More recently, some focus has been placed on the issues of scientific careers in the US[10], but as yet there is no umbrella programme envisaged for the national coordination of policies to support the career and professional development of researchers.

2.5 Conclusion

In this chapter, I have presented an overview of the policy landscape in which my study came to be. It posits that the UK researcher development agenda originated from policy concerns linked to aspirations of establishing a knowledge economy, with issues surrounding skills training and shortage, attracting, recruiting and maintaining the *best* researchers, and displaying a research environment, intended to motivate the commitment of young researchers, even within a hyper competitive environment. I propose that this study may consider, at the micro level, how these policies were enacted and perceived. So, while the institution may have in place policies for researcher development, researcher development practices and enactments by agents in the field may differ. In the next chapter, I review the literature on postdoctoral researchers and the methodological approaches which have been used to explore researchers' lives.

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[10] 2012 - www.pathwaysreport.org

Chapter 3

Literature review: researching researchers

3.1 Introduction

In this literature review chapter, I present the situation of postdoctoral researchers with regard to their demography, employment conditions and experiences of working in a *hypercompetitive* research environment (Alberts et al., 2014). I offer an overview of previous studies and methodological approaches that have explored the particularities of postdoctoral researchers' experiences. Furthermore, I illustrate the gap in considering the role of academics as principal investigators in the context of postdoctoral research. I present the knowledge gaps that justify the approach and focus of this empirical study.

3.2 Studying higher education: a sociological approach

This study intends to contribute to a tradition of sociology of HE, as superbly accomplished by Clark (1987, 1997, 2008), who has been one of its prolific contributors. (Clark, 2007) describes the "study of the academic man" (p. 8), of the academic profession and of HE institutions, as units of study working in parallel to other more popular foci of enquiry. Clark (2008) advocates for an increase in comparative studies of national university systems and for the complementarity of micro and meso research approaches, but also for the inclusion of historical perspectives of organisational systems. He zealously encouraged researchers to reduce the "large chasm between researchers and practitioners" (Clark, 2008, p. 540), and perceived the approach of case studies narratives, as well as comparative approaches, as powerful methodological approaches. Studies in the sociology of HE have been dominated by the American context (for a review of this literature, see: Clark, 2008; Gumport, 2007). The progression of the sociology of HE in the UK has been hampered by conflicted relationships between different disciplinary perspectives and boundaries between education and sociology (Deem, 2004).

3.3 Demography of the research workforce

Kent (2005) traces the origin of UK postdoctoral research-type contracts to 1916, with the establishment of the Department of Scientific and Industrial Research, which started to provide funding for specific research projects. From an initial system aimed at bringing complementary funding, we now have a system, where temporary research staff are responsible for the bulk of the research being done in research organisations. Research staff started to be categorised within a specific HE staff category from the mid- 70s (Bryson, 1999; Campbell et al., 2003). The challenge in accessing consistent data about postdoctoral researchers is complicated by the use of multiple definitions of what constitutes postdoctoral roles and positions, appointments with a diversity of job titles, types of appointment (academics, academic-related, technical), and also the types of contracts (fixed-term versus open-ended) (Ackers & Oliver, 2007; Åkerlind, 2005, 2009; Coey, 2013). The number of HE research staff has continued to increase over the last forty years (Table 1), with increases in research funding. Postdoctoral researchers constitute a sub-category of the research-only HE staff group, but national statistical data offer scarce information between these categories. The 2013-15 HESA data bring the number of research-only staff in the UK up to 45,580, with a gender split of 47% female and 53% male researchers (HESA, 2015). UK research-only HE employees represent 23% of the academic population and 11.5% of the overall HEIs' staff population. The increase of the research staff demography is observed in numerous other countries. For example, in the US, the postdoctoral research workforce has shot from 18,101 Postdocs in 1980 to 57,805 Postdocs in 2009 (Cantwell & Taylor, 2013), and estimations of around 60,000 to 100,000 in 2014 (Gibbs et al., 2015).

There is a reliance on fixed-term contracts for the employment of research staff (Ackers & Oliver, 2007) [11]. Differences are observed between disciplines, with higher numbers of fixed-term contracts for staff in the biomedical sciences (Ackers & Oliver, 2007). Concerns have been raised about the potential impact of casualisation of the scientific workforce on loss of career attractiveness and

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[11] This paper refers to 2002-3 HESA data reporting that 93.2% of fixed-term contracts are research-only staff.

commitment to science (Ackers & Gill, 2005; Adams, J. et al., 2005). Some studies seem to indicate that this is not the case, with researchers on fixed-term contract remaining as committed to their research careers as permanent contract holders (Adams, J. et al., 2005; Kidd & Green, 2006). In addition, Khattab and Fenton (2015) report, that between 2001-2010, there was an increase of the non-UK research workforce with a reduction of the home-grown workforce. The trend in the increase of non-UK academics is observed in all types of contracts, but most prominently for research-only posts (41% of research-only positions are held by non-UK researchers). Essentially, non-UK HE staff are postdoctoral researchers (Smetherham et al., 2010). Research-only positions are concentrated in research intensive universities, which benefit from the largest proportion of research incomes (Ackers & Oliver, 2007; Khattab & Fenton, 2015). Khattab and Fenton (2015) describe these non-UK researchers, mostly originating from European countries, as "global movers" (p. 13). Khattab and Fenton (2015) argue, that while these researchers are perceiving their move to the UK, as a career development opportunity, they are used by research organisations as "a replacement labour" (p. 13) for the decreasing UK research workforce. Rising internationalisation of the research workforce is also observed in the US (since 2000, foreign Postdocs represent 56-60% of US research labour) (Cantwell & Taylor, 2013).

Table 1. Demographic data of UK research staff

Time period	Number of researchers	Source of data
1978-1997 1995- 1997	5,886- 32,290 (pre-92 universities) 30,167- 35,532 (all HEIs)	(Bryson, 1999)
2001-2003 2003 2006-2005	20,294- 22,093 30,000- 40,000 37,000	(Ackers & Gill, 2005) (Campbell et al., 2003) (Campbell et al., 2003)
2013-15	45,580	HESA

Little data exist about the progression of postdoctoral researchers into other types of positions – academic posts or other forms of employments – within and outside of HEIs, in contrast to the systematic data collection about the

progression of PhD graduates into different occupational positions (e.g. HEFCE destination of leavers from HE survey or Vitae surveys[12] *"What do researchers do?"*).

3.4 Studying postdoctoral researchers

A systematic focus on the experiences, career transitions and issues of postdoctoral researchers remains limited (Miller, 2011; van der Weijden et al., 2016). Some studies amalgamate all academic groups, and Postdocs may only represent a subset of the populations being investigated (Delamont et al., 1997b; Wohrer, 2014). Other studies may use the term *faculty* (Austin & Wulff, 2004; Earle Reybold & Alamia, 2008) or early career academics (Archer, 2008; Dwyer et al., 2012; Hemmings et al., 2013; Matthews et al., 2014; Remmik et al., 2011); these studies may not include postdoctoral researchers, although the term *researcher* may be used. In studies concerned with preparation and socialisation of the next generation of academics, the focus has remained on postgraduate education, with little consideration of the particularities of the postdoc period (Wulff & Austin, 2004). In contrast, some authors suggest that exploring postdoctoral narratives provides "rich accounts of perceptions of the relationship between contemporary career rationales and the social structures" of laboratory life (Müller, 2012, p. 295), offering particularly attuned accounts of the contemporary academic system and mechanisms of knowledge production (Felt et al., 2012; Müller, 2012). In what follows, I offer an overview of approaches used in studies of postdoctoral researchers

3.4.1 Ethnographic studies of scientific communities in the laboratory

Knowledge on researchers' communities has come from a long tradition in the sociology of science, of studying scientific work through ethnographic laboratory studies. These approaches, usually referred to as "scientific practice", have addressed "what scientists *do*, rather than what they say they do" (Mody, 2015, p. 1026). Some examples of these ethnographic studies of scientific communities include early studies by Latour and Woolgar (1979), studies of physics (Sormani, 2014) and physicists (Traweek, 2009), as well as studies about the development of particular technologies (Rabinow, 1996,

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[12] https://www.vitae.ac.uk/impact-and-evaluation/what-do-researchers-do

1999). These studies acknowledge the "social conditioning of scientific knowledge" (Knorr-Cetina, 1983, p. 117), and make the practice of knowledge production visible and a more transparent human endeavour, fuelled by human emotions. Some authors advocate for long-term embeddedness in a research environment, permitted through ethnographic studies of laboratory work (Benninghoff & Sormani, 2008), to investigate the permutations of academic identities within a changing policy landscape.

However, accounts in these ethnographic studies rarely differentiate the specific roles of postdoctoral researchers, within academic research communities. A rare exception is the ethnography of physicists in the US by Traweek (2009), who dedicates a number of pages specifically to Postdocs. Traweek's account of Postdocs' experiences in Physics paints a picture of struggle and survival, of those *who make it* and others who could not. Traweek (2009) describes an environment where Postdocs develop as researchers through an "oral tradition", seen as a "subtle tool" (p. 86), where their technical skills are "taken for granted" (p. 87), part of the mundane. Transition from this "long apprenticeship" (p. 85) requires Postdocs to exhibit confidence, bolshiness, "a careful form of insubordination" (p. 88) in developing independent projects. Barriers are erected and unarticulated expectations are in place; only those able to surpass these obstacles will be able to join the core of the physicist community. Novice physicists are kept in the dark about the game at play and may only discover it too late. Group leaders expect the novice physicists to exhibit the same behavioral traits as themselves: "The immortal heroes of science in the margins of the undergraduate textbook define the posture one must display and the genealogy one must acquire." (Traweek, 2009, p. 93).

3.4.2 Survey research on postdoctoral researchers

Many studies exploring postdoctoral researchers' experiences of research, careers, motivations, expectations, working environments or influential career factors are based on quantitative survey data (van der Weijden et al., 2016; Wohrer, 2014). These have been useful in providing overall perspectives about

the postdoctoral situation across national systems (Åkerlind, 2009; Bryson, 1999; Dany & Mangematin, 2004; Davis, 2005; Gibbs et al., 2015; Nerad, 1999), or in attempting correlation analysis between multiple variants of postdoctoral experiences (Davis, 2005). In the Sigma survey[13], the experience of postdoctoral researchers was measured using four metrics of success: overall assessment of experience, relationship with adviser/ manager, absence of conflict or misconduct and productivity (Davis, 2005). However, identifying key components influencing the experiences of postdoctoral researchers is difficult because multiple elements are at play and while correlations may be identified, they are not causal. Furthermore, agreeing how to measure the quality of postdoctoral experiences may differ depending on who is addressing the question. Research funders may measure different outcomes of postdoctoral periods than a postdoctoral association.

In the Sigma survey, among all the factors influencing these measures of success, structured oversight[14] and professional development were the variants with the greatest impact (Davis, 2009). This contrasts with a Dutch study of *talented* academics (Van Balen et al., 2012), where no specific factor seemed to influence the outcome of academic progression. In this study, the combination of multiple factors, either advantageous or disadvantageous, as well as what the authors called "coincidences", influenced the career outcomes of talented academics. Another survey has identified that increase in knowledge of career options between PhD entry and Postdoc did not increase clarity of career goals for American biomedical postdoctoral researchers (Gibbs et al., 2015), illustrating the challenging career terrain navigated by researchers.

Nevertheless, awareness of important factors does not provide an understanding of the *how* of their contribution to the experience of Postdocs. Only by attending to the complexities of individuals' lives will we make sense of the connections and interactions of factors contributing to these experiences.

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[13] Large scale US survey that examined around 40% of the US Postdoc population between 2003-2005.
[14] Described as having "postdoc-specific policies" and "such practices as individual development plans, regular reviews" (Davis, 2009, p. 101)

3.4.3 Qualitative approaches

Åkerlind (2005, 2009) started exploring the experiences of researchers using a qualitative phenomenographic perspective, which focused on the variation of individuals' experiences, to address the nature of postdoctoral roles (Åkerlind, 2005, 2009), or the experience of being a researcher (Åkerlind, 2008a).

Some narrative studies have applied a longitudinal frame to early research careers (Chen et al., 2015; Wohrer, 2014). For example, McAlpine and collaborators (e.g. Chen et al., 2015; McAlpine & Amundsen, 2014; McAlpine & Emmioğlu, 2014), have gathered data from a small number of researchers at different periods of their research lives, using different types of qualitative data collection such as biographic, year review questionnaires, weekly activity log and interviews. These approaches document the experiences of researchers in depth:

> Collecting and analyzing different forms of narrative (through varied protocols) at multiple points provides successive accounts of how individuals construct their identities in response to shifting circumstances. This approach enables us to document changes in intention and challenges as they occur as well as in retrospect. (McAlpine & Amundsen, 2014, p. 5)

While early on these studies initially focused on PhD students, or researchers from social sciences (McAlpine & Lucas, 2011), more recent works (Chen et al., 2015; McAlpine, 2014) have incorporated postdoctoral researchers from scientific disciplines. These studies have contributed to developing the concept of 'identity-trajectory', where attentiveness to individual agency and variation across time is part of deciphering academics practices: "how distinct past *personal* and academic experiences, affect and intentions, contribute to distinct present motivations and imagined futures." (McAlpine & Lucas, 2011, p. 706). Using this concept, researchers' experiences are understood through interconnected strands: "intellectual, networking and institutional." (McAlpine & Lucas, 2011, p. 696). The lives of researchers are approached through the wholeness and complexity of careers and personal lives.

Hermanowicz (2009) had also approached longitudinally the fluctuations of academic career ambitions and professional identity during a 10-year study of

American physicists. While Hermanowicz's work did not include postdoctoral researchers, it is relevant here as it illustrated how different institutional structures and context may be involved in shaping and shifting academics' ambitions and career progression. Hermanowicz (2009) argues: " Occupation and individual, structure and self, institution and identity are created by the reciprocal interplay between macro and meso forces" (p.5); such interplay is not just one dimensional or unidirectional, as "individuals and institutions are reciprocally constituted by interaction" (p. 6). The tenet of scientific careers is anchored in a process of stratification that leads inherently to inequality (Hermanowicz, 2009). Hermanowicz (2009) identifies that:

> Much remains to be discovered about how academics (and other professionals) experience work over a span of time, how they view their careers progressing (or failing to progress), and how institutional environment facilitate (or impede) such development. (p. 3)

While some studies concerning academics' lives have considered the role played by different institutional (Lucas, 2006) and national contexts (Deem & Lucas, 2007), the explorations of early career researchers' experiences have tended to omit any characterisation of specific institutional contexts. More recently, explorations into the lives of early career life scientists in Austria (Felt et al., 2012; Müller, 2014), and several other European countries (Felt, 2009), have started to consider the interplay of organisational structures and research "normative regimes" (Felt et al., 2012, p. 9), with what it means to do research and what it is like to be a life scientist. These authors have developed and used the concept of *epistemic living space,* described as:

> researchers' individual or collective perceptions and narrative re-constructions of the structures, contexts, rationales, actors and values which mould, guide and delimit their potential actions, both in what they aim to know as well as how they act in social contexts in science and beyond (Felt et al., 2012, p. 4).

In these studies (Felt, 2009; Felt et al., 2012), postdoctoral interviewees describe that normative expectations about transitions from one stage to another (from Postdoc to group leader) frame the experience of being a postdoctoral researcher. Felt et al. (2012) describe as "teleological" (p. 10) the view of the basic, linear career model for scientists. The role of specific institutional contexts in understanding particular concepts about researchers' careers is also advocated in studies about researchers' mobility, rather than

aiming for a "universal concept" that may be applied to all researchers irrespective of their institutional and national contexts (Carrozza & Minucci, 2014, p. 493).

Postdoctoral researchers were shown to be agentive in very different ways depending on context, through their engagement in multiple strands of day-to-day activities perceived as furthering their desired career future (Chen et al., 2015; McAlpine, 2014). Teaching and supervision were additional elements contributing to their academic identity and institutional membership; variable access to teaching opportunities and informality of their supervisory contributions reflected the limits of their roles (McAlpine, 2014). The developmental needs of researchers are described by McAlpine (2010) as not well understood. While some authors (Bhakta & Boeren, 2016) explore the training needs of researchers using online questionnaires based on the Researcher Development Framework[15] (Vitae, 2011), it tells very little about the processes of development of researchers. To account for the complexities of researchers' experiences, McAlpine and Norton (2006), in the context of doctoral education, but of value for postdoctoral research, have proposed the use of an "integrative framework" with nested contexts to consider the diversity and complexity of interactions, elements and relationships shaping the experience of research periods. The practices of researchers in being researchers and doing research are linked to their socialisation into research and to the value assigned to different practices. Fochler et al. (2016) have identified, in the context of life scientists in Austria, that the scope of what is valuable or "evaluative principles" narrows down from the doctoral to the postdoctoral period. For postdoctoral researchers, worth becomes entrenched in a singular, dominant valuation regime, which researchers accept as "a quasi-natural order without alternative" (p.197):

> worth of individuals is defined by their ability to succeed in competition based on productivity in terms of acquiring internationally accepted and transferable tokens of academic quality, that is, indexed publications, grant money and recorded citations. Other evaluative principles were hardly mentioned…(Fochler et al., 2016, p. 196)

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[15] The Researcher Development Framework is a framework of skills, attributes, behaviours and competencies deemed important for successful research careers. It was developed by Vitae through extensive consultation with HEIs and various stakeholders. It replaced the RCUK Joint Skills Statement.

3.5 Studies on principal investigators

There is an extensive literature on academics' lives and experiences (for example, Clark, 1987; Cownie, 2004; Lucas, 2006; Trowler et al., 2012). For instance, the role of academics as university teachers (ÅKerlind, 2003), their practices and identities as academic-managers in the context of New Managerialism (Deem et al., 2007), and the dynamics of relationships between supervisors and PhD students (Johnson et al., 2000; Lee, A., 2008; Wisker et al., 2007), have been explored. In contrast, studies with a focus on the role of principal investigators and their interactions with postdoctoral researchers are extremely limited. Postdoctoral researchers have been surveyed on the mentoring interactions with their PIs (Davis, 2009; Scaffidi & Berman, 2011), but the perspective of the interaction from the academics' viewpoint has not been explored. A rare case, where PIs were queried on postdoctoral researchers was part of an Australian survey (Åkerlind, 2009), but no further in depth analysis has been reported about the perceptions held by principal investigators regarding the career and professional development of the postdoctoral researchers they employ. In the Åkerlind (2009) study, the PIs seemed fairly unaware or failed to mention the great diversity of academic roles that Postdocs described as part of their responsibilities.

Drawing on previous work on academic leadership, Browning et al. (2011) have explored the career path and contributing factors towards research leadership of PIs; a number of key elements were reported:

> "(1) having a research doctorate; (2) being mentored; (3) attending conferences; (4) supervising post-graduate students; (5) being part of an active research group; (6) receiving assistance to develop grant applications; and (7) financial "start-up" funds to help staff establish their research careers…come from active and supportive research cultures…participate in collaborative research and have good international connections and networks. They are passionate about their research and highly motivated." (Browning et al., 2014, p. 126)

The transition from postdoctoral role to being a PI, as a move "from doing to managing research", was recently reported in a narrative study of UK and European PIs in the sciences, with a particular consideration of the emotional journey (McAlpine, 2016). Negative emotions were expressed by PIs in the

need to disengage from *doing research* to shifting towards managing projects and others. However, neither of these last two studies considered how PIs themselves pass on their understanding of research leadership to their postdoctoral researchers or develop a group/ departmental culture fostering embedded research leadership. The period of transition from PhD graduation to PI role varies greatly between different studies of PIs, likely to reflect disciplinary and national contexts; on average, a first grant was achieved within one year and a half after PhD and to start setting up a research group took four and a half years as reported by Browning et al. (2014), and five to seven years in a study by McAlpine (2016). PIs did not seem to perceived themselves as leaders or still fewer as managers (McAlpine, 2016). In a study of PIs as group leaders, the research group appears as the key locus of responsibility and scientific practice (Davies & Horst, 2015). The research group can be both the site of tensions (Hackett, 2005) and the location of apprenticeship and *caring craftwork* (Davies & Horst, 2015). In this study, PIs framed caring for the group as "taking care of science" (p. 377). Davies and Horst (2015) acknowledge that the narrative of care in looking after their group does not imply a practice of care, nor indicate how it is perceived by lab members, such as postdoctoral researchers.

3.6 Summary

I have outlined in this literature review that our knowledge about different aspects of researchers' experiences and development remains limited. The perception of principal investigators on the postdoctoral period, and their role and engagement with postdoctoral researchers, is also an underexplored domain of the literature. The interaction between PIs and Postdocs could be explored across a number of dualities: master- apprentice or novice, employer-employee, team leader- team member, supervisor- supervisee. Other frames may describe the interaction as collaboration, knowledge exchange, or practice sharing. When Bourdieu (1996, p. 97) talks about HE and its ends, he makes reference to the purpose of HE regarding academic teaching as "outwardly appears in all its modalities of operation and in the demands which it makes,

not as a system of vocational training, but as an education in culture". Although this was articulated in the context of undergraduate teaching, addressing the experience of the interaction between Postdocs and PIs, and as part of a process of socialisation to research culture should represent an important contribution to knowledge. Elements of the literature presented here emphasised the importance of placing such a study under a broad sociological frame. In the next chapter, I present the theoretical frame of this enquiry.

Chapter 4

Theoretical framework

You must put the essence of what you want to say into a painting. The rest is arbitrary. Chosen with discernment, but chosen, and choice involves elimination. Once the drawing is established and composed, you compose the other values in the same way

A painting must not be a battlefield it must be a statement. Set out with something to say and not with the vague desire to say something. Things never simplify themselves they always complicate themselves on the way from the brain to the canvas. Set out, taking your precautions.

Louise Bourgeois

4.1 Introduction

I place these quotes from Louise Bourgeois[16] as a preamble, to illustrate that a chapter on theoretical underpinnings is geared towards providing the reader with a path to understanding, delineating the construction of the argument proposed and the evidence gathered. On the other hand, choices are messy and circumvoluted, and sharing them is uncomfortable. The methodological battles between social science researchers, feel quite frustrating, even if some scholars consider them as core strengths (Burke, 2015).The plea of Silverman (1997), "to extricate us a little from such battles by appealing to a kind of aesthetics of research" (p. 1), was a starting point in regaining a sense of perspective from the estrangement of these conflicts. The metaphor used by Suzuki et al. (2007, p. 295), "the pond you fish in determines the fish you can catch", describes in simple terms the impact that context, methodological choices, analytical processes and data collection will have on the meanings produced and knowledge claims made by the researcher.

4.2 Analytical meanders

Without a sociology background, the picking of an appropriate theoretical framework felt extremely daunting. I was amused by the comment of Van Maanen (2011): "In practice, theory choices (the rabbits we pull out of our hats) rest as much on taste as on fit" (p. 223), but still had to make a decision on the theoretical underpinning of my study. Admittedly, theoretical choices and clarity in theoretical approaches are concerns that spread well beyond my own apprehension (Ashwin, 2012b; Ashwin & Case, 2012).

HE research remains a fairly recent addition to broader domains of study. Because of its nascence, this is a research arena, which, although growing, still remains unstructured (Lucas, 2006) and fairly a-theoretical. Theory is either not used, not made explicit, or not part of a research dialogue with empirical data

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[16] Quote taken from the blog, https://www.brainpickings.org/2015/08/17/louise-bourgeois-letters-diaries-art/. Accessed 25th August 2015.

(Ashwin, 2012b; Tight, 2004, 2012). Tight (2008) describes HE research as a "partially explored territory through which a variety of tribes traverse" (p. 596); this metaphor describes the diversity in disciplinary background, and approaches of researchers in this area (Tight, 2004). HE research lacks an established theoretical and analytical corpus, making the identification of analytical role models a challenge for educational researchers. Theoretical grounding was significantly absent in much of the literature on postdoctoral researchers when I started this study. As scholars, we need to consider the *extent*, the *type* and the *way* we use or develop theoretical work (Ashwin, 2012b, p. 942). Ashwin (2012b) is concerned with the interrelationship between theory and data; he particularly warns researchers that theories in HE scholarship often risk to "over-determine the outcomes of empirical research" (p. 942).

When I started analysing my first interviews (Appendix 8), identifying themes about the experience of being and developing as a researcher, and how researchers and academics talked about *researcher development*, I experienced what Bourdieu had called the "fermenting confusion" or "the false starts, the wavering, the impasses, the renunciations" in the research process (Bourdieu & Wacquant, 1992, p. 219 and 220). In order to answer my research questions, I needed to identify "a way of seeing" and constructing my object of research (Ashwin, 2012b, p. 943). Scholars agree that the process of conceptualising the research object is a critical element of the research process: "The fundamental scientific act is the construction of the object" (Bourdieu et al. (1991) in Ashwin, 2012b, p. 943). How could I then characterise my research object: *researcher development*? Ashwin (2012b, p. 943), following Bernstein, talks about this process as identifying "the internal language of description", that is the language of concepts.

Constructing my research object meant bringing together the perceptions, emotions, actions, strategies and practices of researchers and academics, as well as perspectives related to the research environment. It needed to facilitate sense-making about researchers and academics' work within the context of new policy discourses on researcher development. In the first interviews and

analysis of secondary data, the concepts of structure and agency emerged quite strongly, but my analysis stalled in constructing such a dichotomy. Ashwin (2008) queries "how to account for structure and agency in HE" (p.156), and asks us to consider "what it means to account for structure and agency" (p.153). He describes the relationship as "situationally contingent" (p.152), requiring the relational use of different units of analysis: perceptions, social practices, discourses and systems. I needed to identify theoretical tools that would bring together these two concepts to make sense of *researcher development*. Jones et al. (2011), in their review of social theories, describe that some social science practices do not bound these concepts in separate territories, but conceptualised a "more dynamic and fluid co-mingling" (p. 148) of actors and structures. Different theoretical frameworks can be used in the analysis of the interplay between structure and agency. For example, Ashwin (2012a) compares the application of four different theoretical approaches (Activity theory, Symbolic-Interactionist, Bernsteinian and Bourdeusian approaches) to explore the interplay between structure-agency in the context of teaching-learning interactions.

The scholar repeatedly quoted for having defied the dichotomy of these concepts, and who instead *mediated* structure and agency, is Bourdieu. I had initially been quite reluctant, like other researchers, to engage with Bourdieu's work, because of the complexity of his writing (Mckenzie, 2015). Also, I had attended a number of seminars during the EdD, where many presenters were referring to Bourdieu's concepts without creating much clarity in their application. I was wary of being caught in such "mass adoption" and "smattering of Bourdieusian concepts" (Grenfell, 2014, p. x), a trend described by others as "intellectual hair spray" (Hey, 2003 in Reay, 2004b, p. 432). A French sociologist, Pierre Bourdieu had appeared on the public sphere in France in the mid-90s, during a period of general strikes in the public service (Mounier, 2001). As a scientist living abroad at the time, I had never encountered Bourdieu until starting on the EdD. I felt that academics on the programme made assumptions about students *knowing something of Bourdieu*. Because of being French, I experienced a sense of inadequacy, as I knew nothing about this sociologist. I did not belong to the *club* of those who were

knowledgeable. This frustrated me and acted for a long time as a further barrier to exploring his writing. There is, here, a paradox, considering the political and intellectual positioning of Bourdieu regarding the reproduction of elites (Bourdieu, 1996b). I greatly valued the work of other scholars in creating entry points to the work of Bourdieu (Costa & Murphy, 2015; Grenfell, 2014; Lucas, 2006). I felt drawn to his commitment towards civic engagement and the role of the sociologist in society[17]: "to make social relations less arbitrary, institutions less unjust, distributions of resources and opportunities less unbalanced and recognition less scarce" (Hillier & Rooksby, 2005, p. 6). I was moved in the reading of *La misère du monde* (Bourdieu et al., 1993), by the power of making the voices of the less powerful heard, in their rawness, powerlessness and humanity. These aspects contributed to the start of my engagement with this scholar.

4.3 Theoretical underpinning for analysis

4.3.1 Justifying the approach

I describe, in this section, some of the *thinking tools* borrowed from Bourdieu (Jenkins, 2002), which I came to utilise. I offer some examples of the contributions these theoretical concepts have made in studying HE and how they have helped shape and characterise my object of study (Ashwin, 2012b). My purpose in using these thinking tools is *to see with,* but also because:

> Bourdieu's ideas provide us with a set of literacies that enable us to read various scenarios within the educational field and negotiate them effectively. (Webb et al., 2002, p. 141)

For Thomson (2005), these tools provide "a particular way of theorizing the rules, narratives and self-held truths of social phenomena" (p. 741). I concur with Grenfell (2014) that: "the potential of Bourdieu's insight into working of social systems is both inspiring and daunting" (p. ix). However, Wacquant (in Bourdieu & Wacquant, 1992) is quite critical of other scholars' lack of sophistication in the use of Bourdieu's work and suggest that "Bourdieu remains something of an intellectual enigma" (p. 5).

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[17] See 'La sociology est un sport de combat' in 2002:
https://www.youtube.com/watch?v=aukfnAfFZ7A

Bourdieu's contribution to the understanding of diverse sociological phenomena is vast, including research interests in the HE system[18] (e.g. Bourdieu, 1988, 1996b; Bourdieu et al., 1996). In multiple spheres of sociological life, such as academia, he intends to uncover mechanisms of social reproduction that preserve hierarchy, inequalities and classification (Naidoo, 2004; Reay, 2004a). Marginson (2008) assesses as critical the sustained work of Bourdieu, and its relevance to the more recent context of the globalised research system.

Bourdieu's overall contribution to sociological theoretical development comes under the banner of a *theory of practice*. He elaborates theoretical developments and "relational concepts" as part of an active, interactive interplay with the empirical research process (Costa & Murphy, 2015, p. 3). The starting point of analysis should be the empirical data, the actual context or phenomenon (Grenfell, 2014). Theory is not the intrinsic motive of the research process. Grenfell (2014) emphasises that Bourdieu's theory of practice was socially purposeful and goes on to quote Bourdieu advocating that sociological works should aim "to restore to men and women the meaning of their action", in the "real world" (Grenfell, 2014, p. xi and 15). Theories are not to be placed prominently on pedestals; they are thinking tools, working and temporary constructs, influenced, shaped, reformulated with "shifts, turns and breaks", and reviewed by empirical work (Bourdieu & Wacquant, 1992, p. 6). The research motion is a wave of on-going reformulation, "constantly looking to break with the pre-given or the pre-constructed" (Grenfell, 2014, p. 215). Jenkins (2002) disagrees with the notion that Bourdieu's concepts are temporary constructs, but sees his research endeavour as "longstanding, relatively coherent and cumulative" (p. 67). Maton (2005) vehemently advocates for the use of Bourdieu's "sophisticated, empirically applicable" theoretical tools in studying "the social structure of HE" (p. 688). Bourdieu developed and used conceptual tools throughout his career in the analysis of diverse social phenomena and contexts, but these concepts have evolved with him and beyond him.

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[18] His extensive contributions "with utter disregard for disciplinary boundaries" (Wacquant in Bourdieu & Wacquant, 1992, p. 3) and productive *oeuvre* covering many social phenomena have greatly influenced social sciences in reconsidering many of its assumed dichotomies (e.g. subjectivity versus objectivity, symbolic vs. materiality, theory vs. empiric, structure and agency, micro versus micro-analysis)

Bourdieu (1988) seminal work on the academic profession, in *Homo Academicus* explores the academic *field* of the French HE system in the 60s. Although Bourdieu's own empirical enquiries were limited to the French HE system, scholars of other national HE systems have made use of his theoretical developments, often in studies concerned with the impacts of policy changes, developments and implementations. For example, studies within the pre- or post- apartheid system in South Africa have explored institutional strategies and changes (Kloot 2009; Naidoo, 2004), and historical accounts of academic development (Kloot, 2014). It has been used in studies of specific institutional contexts exploring evaluation and assessment regimes, such as the "pernicious feature of academic life", embodied in the Research Assessment Exercise (Lucas, 2006, p. 1). Other examples include studies on student participation in HE and widening participation (Bathmaker, 2015; Kelly-Blakeney 2014), workforce development (Hordern 2014) and pedagogical development associated with the acquisition of generic and employability skills (Kalfa & Taksa, 2015). The fields of global HE itself and academic capitalism have been explored through Bourdieusian analysis (Leahy, 2012; Marginson, 2008; Mendoza et al., 2012).

In studies concerned with research staff, while some of Bourdieu's concepts have been previously mentioned (e.g. symbolic violence), their active and systematic use throughout the analysis remains limited (Khattab & Fenton, 2015). Particular feminist frames have been used (Reay, 2004a), often based on personal experiences of educational researchers (Reay, 2000, 2004a) and not scientists. Recently, Sidhu et al. (2015) have explored how foreign scientists mobilise a capital portfolio and develop their "transnational scientific habitus" (p. 81), in the particular context of mobility to Singapore, learning to function in a very different cultural research context.

When Bourdieu talks about studying the academic world in *Homo Academicus*, he reminds the readers that "the subject of the objectivation himself is being objectivized" (Bourdieu & Wacquant, 1992, p. 63). So for me, using theoretical tools from Bourdieu felt particularly pertinent when asking: 'what is this thing

researcher development?'. Offering a *voice* to researchers and academics in considering researcher development was purposeful, in order to provide a space for reflexivity about its meaning within the contexts, discourses and practices associated with it. This idea about the research process also being about a socio-analysis of the self was important for me in the shifting of my understanding. I came to view myself as researcher developer, as part of the social actors shaping discourse and practices of researcher development within the *field* of postdoctoral research. The following section explains some of the key concepts used in my analysis.

4.3.2 Using the concepts of field and capital

One of the central theoretical concepts, developed in the Bourdeusian theory of practice, is the concept of field (Maton, 2005). Bourdieu's concept of field is akin to a *bounded* social space, in which agents interact and are positioned in relation to each other. The configuration of structured relations based on hierarchies of "power and status" (Maton, 2005, p. 689), creates the field. The social space is organised with multiple patterns of fields (i.e. politics, education, academia, science, business, religion), which are hierarchised and positioned in relation to each other, by the holding of different types of power. Fields and sub-fields may be defined, including, excluding or superposing each other. The key commonality in defining all fields is that they represent an "arena of struggle" (Jones et al., 2011, p. 151). The position of agents within a field relates to possession and acquisition of capital; agents are engaged in an on-going struggle to better their positions within the field (Maton, 2005). Different types of capital have been described:

> economic (money and assets); cultural (e.g. forms of knowledge; taste, aesthetic and cultural preferences; language, narrative and voice); social (e.g. affiliations and networks; family, religious and cultural heritage); symbolic (things which stand for all of the other forms of capital, including credentials). (Thomson, 2005, p. 742)

Bourdieu (1975) describes the scientific field as "a social field like any other, with its distribution of power and its monopolies, its struggles and strategies, interests and profits" (p.19). Fields are defined by "specific logics" where "the hierarchy of the different species of capital…varies across fields…their relative

value…is determined by each field" (Bourdieu & Wacquant, 1992, pp. 97-98). The *field* is compared to a game, which "follows rules or better, regularities, that are not explicit and codified" (Bourdieu & Wacquant, 1992, pp. 97-98). The idea of learning the "rules of the game" (Bourdieu & Wacquant, 1992, p. 99) relates to the approach agents take to develop capital and negotiate their position within the field.

Bathmaker (2015) applies the concept of field to the study of the changes faced during the expansion and massification of HE in the UK; by analysing admissions processes, she explores the impact on students' diversification and the structures of the field of tertiary education, in particular in relation to the position of Further Education colleges. Thompson (2005) also applies the concept of *field* to analyse shifts in educational policies between different governments, and argues that policy works as "a means of codification, as a doxa[19] of misrecognition and as currency exchange within and across fields" (p. 741). Gopaul (2011, 2015, 2016), through the use of the concepts of field and capital, has started to shift the conceptualisation of doctoral education and socialisation towards identifying issues of power and subtle "instances and contexts of inequality" (Gopaul, 2015, p. 74), and describes doctoral education as a *field*.

I position this study in what I call the field of postdoctoral research, a sub-field of HE or of the scientific field (Bourdieu, 2004). With the concept of field, one parts with the Mertonian norms of a scientific community, in other words "with the idea that scientists form a unified, even homogeneous group…a world of generous exchanges in which all scientists collaborate towards the same end" (Bourdieu, 2004, p. 45). Bourdieu (2004) refutes this "idealist vision" (p. 45) and, instead, describes the scientific field as a space filled with "struggles, sometimes ferocious ones, and competitions within structures of domination" (p. 45). In figure 3, I present a diagram schematising my understanding of the sub-field of postdoctoral research with its agents and relation to other fields. Agents in the field of postdoctoral research will include postdoctoral

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[19] The concept of *doxa* in Bourdieu's theory of practice refers to our un-challenged, arbitrary, un-articulated internalised believes. It is the taken for granted; "it determines the stability of the objective social structures through the way these are reproduced and reproduce themselves in the agents' perceptions and practices; in other words their habitus" (Deer, 2014, p. 113)

researchers, principal investigators, research groups, departments, faculties, and research and innovation services (RIS). In addition, a number of institutional committees or even postdoctoral societies, constitute themselves agents in the field. Agents in fields of power will belong to macro or meso-levels of power. The meso-level includes the research funders (e.g. Research Councils, HEFCE, Learned Organisations, research charities), but also industrial partners who make substantial investments in university-led research and other organisations, which influence the field of postdoctoral research. Many of these organisations function through the role of academics themselves and other HE agents (e.g. grant review panels, review panels of Athena Swan[20] applications). At the macro-level, agents from the field of power shape the field of postdoctoral research through science policies and strategies that shape national and international research investments (e.g. Governmental departments, European Commission, international organisations such as OECD). Until fairly recently, the field of HE was relatively autonomous, establishing its own rules and values (Naidoo, 2004). However, the contemporary political discourses of neo-liberal economies and new managerialism have re-patterned the hierarchy in which HE is positioned. This study aims to explore and unearth the rules of the game in the field of postdoctoral research within the context of policy changes.

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[20] The Athena Swan charter is an external accreditation mechanism (linked to departmental action plans) coordinated by the Equality unit to review departmental data and culture facilitating or hindering female academic progression.

Field of postdoctoral research

Principal investigators
Academics/ Fellows/ University teachers
Postdoctoral researchers
Research Staff
PhD students
Other researchers (Research assistant, Technicians)

Postdoctoral societies and
Research staff associations

Institutional Actors:
Directors of Research and Innovation
Head of departments
Head of Faculties
Research and Innovation Services
Researcher Developers
Institutional committees:
Researcher Development Committees
(at faculty and institutional level)
Athena Swan/ Equality and Diversity committees

Research funders:
RCUK, HEFCE
Research charities
Industry

National Organisations:
Vitae
Athena Swan Charter
HR Excellence in research
Learned Societies
UK Research Staff Association

Fields of power

Government
(Department for business, innovation and skills)
European Commission
e.g. European Research Area
OECD

Figure 3. Agents in or contributing to the field of postdoctoral research

4.3.3 Using the concept of habitus

The concept of habitus comes from a long history of philosophical thinking (Nash, 1999; Wacquant, 2016). Bourdieu (2005) defines habitus as:

> a system of *dispositions*, that is of permanent manners of being, seeing, acting and thinking, or a system of *long-lasting* (rather than permanent) schemes or schemata or structures of perception, conception and action. (p.43)

Maton (2014) explains that:

> one's practice results from relations between one's dispositions (habitus) and one's position in the field (capital), within the current state of play of that social arena (field). (p. 50)

and presents the relational nature of the concepts, in a formulation previously developed by Bourdieu:

$$[(\text{habitus}) (\text{capital}) + \text{field}] = \text{practice}$$

Habitus is defined as "a property of actors (whether individuals, groups or institutions) that comprises a structured and structuring structure" (Maton, 2014, p. 49) or "a set of acquired characteristics which are the product of social condition" (Bourdieu, 2005, p. 45). These dispositions may include predispositions, tendencies, or inclinations that lead to particular perceptions, beliefs, conceptions and practices. It is a sort of "conditioning" or internalisation. Habitus is described as "a deep, interior, epicentre containing many matrices" (Reay, 1995, p. 354); it is embodied as ways of "standing, speaking, walking, and thereby of feeling and thinking" (Bourdieu, 1990 in Reay, 1995, p. 354).

What is structured is a system of *dispositions* that encompasses previous and on-going experiences (historical and biographical) of the agent in the social environment (e.g. education, family background, previous jobs and employers), and these dispositions are *structuring* because they shape within the agent, present and futures views, perceptions, and practices of situation and of the world (Maton, 2014). Jones et al. (2011) describe habitus as:

> an acquired way of seeing the social world and is dependent on one's position and upbringing in that world…habitus is something that belongs to the individual or resides in the self, but which also reflects shared and common understandings about the social world. (p. 150)

The responses of an agent to different situations may seem unrelated, but there is something systematic, "not a logical systematicity; it is a practical systematicity" (Bourdieu, 2005, p. 44) in their generation and, to the sociologist's eye, these responses may appear interrelated (Hillier & Rooksby, 2005). Habitus is also described as: "more than accumulated experience; it is a complex social process in which individual and collective ever-structuring dispositions develop in practice to justify individuals' perspectives, values, actions and social positions." (Costa & Murphy, 2015, p. 4). Habitus represents the incorporation of all these experiences, and their integration in shaping and influencing perception, actions, ways of thinking about self and the social world. Agents function within particular structures in relation to their habitus. Habitus represent a storage of knowledge, memories, perceptions, and imprint on the agent on how to behave, how to act, how to view things. Agents are not continuously aware of how their habitus is shaping their actions and perceptions. Criticisms of Bourdieu's concept of habitus imply determinism and prediction (Jenkins, 1982, 2002), although Bourdieu does not see the habitus as deterministic (Bourdieu & Wacquant, 1992); agents actions are not rigidly determined by their habitus, in other words, habitus is not something immutable (Jones et al., 2011). Our habitus is shaped by our experiences and our experiences are shaping our habitus. Although habitus is difficult to change, it has the potential to be transformed by new experiences, training and awareness-raising. Finally, because the "habitus is primarily a method for analysing the dominance of dominant groups in society and the domination of subordinate groups" (Reay, 2004b, p. 436), it has the potential to deepen an analysis aimed at meaning-making of researcher development in the field of postdoctoral research.

From the initial focus on social class in the exploration of habitus by Bourdieu, some authors have expanded the boundaries towards considering the role of gender and race in shaping individuals' habitus (Reay, 2004a, 2004b). An extensive corpus of studies, using the concept of habitus, exist across disciplinary interests (e.g. Costa & Murphy, 2015; Hillier & Rooksby, 2005). Bourdieusian scholars warn of focusing on single concepts from his toolbox, and advise maintaining the broad scope of his epistemology (Emirbayer & Johnson, 2008; Grenfell, 2014), which is the intention in this study.

4.4 Summary

In this chapter, I have described my engagement in theoretical considerations, which have helped construct my object of study: *researcher development.*

Using Bourdieusian concepts, I construct this study on *researcher development* as an exploration of practices within the field of postdoctoral research, that contribute to the position of agents in the field. Understanding researcher development pertains to:

- establishing what is at stake in the field of postdoctoral research, what the forms of capital are, or, more precisely, "the various species of power that are efficient in this universe" (Bourdieu & Wacquant, 1992, p. 67).
- exploring the habitus of agents through the experiences of postdoctoral researchers and principal investigators, to identify systems of dispositions that agents have acquired, their "feel for the game" (Bourdieu, 1990, p. 63).

The introduction of new policies concerned with researcher development may attempt to challenge the rules of the games in postdoctoral research, but, since "educational institutions ensure the profitability of the dominant class" (Stahl, 2015, p. 22), Bourdieu's concepts were congruent in exploring such context.

Passionate accounts in favour or against Bourdieu's concepts abound. The conceptualization of *habitus* in particular has received many criticisms and re-evaluations. These critical analyses appear to result from a resistance to accepting fluidity in concepts' definitions, considering these variations as inconsistencies (Lau, 2004), instead of focusing on the use of the concepts themselves as tools for empirical data analysis. Among the critics, Mouzelis (2007) argues that Bourdieu's attempt to "transcend the objectivist-subjectivist divide" (p.1) is not satisfactory in accounting for individuals' ongoing conscious strategizing, reflexivity and the "interactive dimension of social games"(p. 2); on this basis, Mouzelis (2007) identifies the concept of habitus as problematic.

For Bourdieu, reflexivity may surface primarily at times of crisis between habitus and field; its scope remains within limits: "individuals make choices, as

long as we do not forget that they do not choose the principle of these choices" (Wacquant, 1989 in Decoteau, 2016). Sweetman (2003) in contrast, argues that in the context of contemporary modernity, a flexible and reflexive habitus is becoming widespread particularly in professional lives. Sweetman (2003) further suggests that a reflexive habitus could contribute to how individuals navigate occupational shifts; this has implications for our consideration of researcher development and the habitus of researchers and academics.

Furthermore, Adams, M. (2006) in an attempt to pull together multiple stands around habitus, voluntarism, determinism, agency, identity and reflexivity proposes the concept of a reflexive/ habitus hybrid. In this case, reflexive agents are still faced with post-reflexive choices, but outcomes remain dependent on their habitus and position within the field. Reflexivity does not necessarily pull agents out from the drift of social reproduction. Other scholars such as Elder-Vass (2007) and Decoteau (2016) have continued to extend the reconciliation between Archer "reflexive deliberations" and Bourdieu's *habitus.*

Only the intimate use of these concepts in the particular context of an empirical study could permit an appraisal of their usefulness. The "ensemble of Bourdieu's thinking" with "all three of Bourdieu's master concepts – habitus, capital, and field" (Swartz, 2008, p. 45) are put to work in the analysis undertaken.

Chapter 5

Research methodology, data collection and analysis

5.1 Introduction

Having established the analytical framework (chapter 4), I now present the methodological approach for this empirical study: the ontological and epistemological stance, the strategy for data collection and approach to data analysis.

5.2 Reflection on early methodological intentions

This research project started with an interest in the experiences of postdoctoral scientists (*of being and developing as a Postdoc*), and the academics employing them (*of being a PI employing Postdocs*), in order to understand researcher development within a changing UK policy context. I bounded the exploration of researcher development to researchers and academics within scientific disciplines; this felt congruent, as research practices, even if dispersed, were likely to be related. Alvesson (2009) describes his conceptualisation of universities and departments as a set of "multiple cultural configurations" (p.162). Starting this exploration within one cultural configuration, that of scientific disciplines, seemed to offer an appropriate scope for this study.

From the outset, I aimed to draw from and contribute to the sociology of scientific careers, using a "person- approach" methodology (Hermanowicz, 2007, p. 625) to offer a contrasting viewpoint to the bulk of studies on postdoctoral researchers that have used "variable-orientated" quantitative approaches (see chapter 3). The chosen methodology, anchored in the qualitative paradigm, focuses on an in-depth approach to individuals' experiences, in the complexity of their spatial and temporal context, while bringing to the fore understandings of broader social processes (Felt, 2009).

At the start of this study, I had envisaged and gained ethical approval to explore researcher development in the science departments of three UK institutional sites, and intended to interview academics and postdoctoral researchers in these different institutions (see Appendix 2). These three research-intensive

institutions had all benefitted from extensive Roberts funding and developed researcher development programmes; they were perceived as providing sites with relatively similar research cultures. While previous studies of scientific careers have illustrated substantial differences in the accounts of scientists' experiences in different institutions (Hermanowicz, 2009), my intention was neither about comparing the implementation of the Roberts agenda in different institutions, nor the potential impact on researcher development across different institutions. My initial choice of three institutions was purposeful from a sampling perspective and intended to enable the capture of a diversity of understanding of researcher development, drawing from a broader population of researchers and academics. Although this may appear tainted by positivist notions of representativeness, this preliminary research strategy was guided by ethical considerations regarding participants' anonymity, as well as my own position as researcher developer within my institution.

As the study progressed, my research methodology evolved and I needed to acknowledge "being open to radical changes" (Neyland, 2008, p. 39). When I came to identify an appropriate theoretical framework and decided to use Bourdieu's concepts, I felt compelled to include more ethnographic data from my institution, regarding the positioning of researchers in the field of postdoctoral research and the local implementation of policies related to researcher development, based on my experience as an agent. The institutional context regarding researcher development came to contribute to an analysis of the field of postdoctoral research during a period of policy change. Kelly-Blakeney (2014) suggests that seeing the site of study as an integral part of the empirical work and "field mapping" has the potential to offer: "more nuanced understanding of the habitus" (p. 49) of agents in the field.

Since the study was part of a professional doctorate, the choice of a refocus on my own institution was congruent with the view that professional doctorates offer practitioners a space for reflexivity about practices, and discourses regarding the phenomenon studied. Following this shift, I became less concerned with broadening the scope of perspectives on researcher development, but more interested in exploring in depth the perspectives I had

come across through the interviews already conducted. Prior to identifying my theoretical framework, I had already started to interview and analyse transcripts from researchers and academics in two institutions. Because of my methodological shift, I did not continue with interviews in the other institutions. I present interview data with a focus on interviews within my institution. However, I have incorporated analysis of three postdoc interviews from another institution, as these brought additional perspectives than those observed in participants from my institution; these reflected variations worth documenting, although the analysis is not intended in any way as a comparative exploration.

5.3 Developing the methodological approach

With the view of approaching data analysis using the Bourdieusian concepts of field, capital and habitus, I am positioning this study as an approach labelled by Alvesson as: "self-ethnography" (2003, p. 174) or "at-home ethnography" (2009, p. 156). This is a particular take on ethnographic approaches, where the researcher is located within his/her own professional setting, "the researcher-author describes a cultural setting to which s/he has a *natural access*" (Alvesson, 2003, p. 174). It aims to go beyond an over-reliance on interview data and relies on a diversity of research methods and data. The methodological intention is to build layers of descriptions and meanings and undertake what Trowler (1998) describes as studying HE "close up", where:

> fine-grained understanding of academics' values and attitudes, of cultural context in which they operate, is important for the understanding of policy implementation and policy change. (p. 2).

The adopted ontological and epistemological stances, constructivist and interpretative, are close to those of many organisational researchers, seeing:

> organizational and other social realities as socially– collectively, intersubjectively– constructed in an ongoing interplay between individual agency and social structure, in and through which individuals and structures mutually constitute each other. (Ybema et al., 2009, p. 8)

Some studies do not label themselves as following ethnographic approaches, while being close to approaches that do (Anderson, 2006); and those that do, may look very different in practice (Lucas, 2006; Nathan, 2006; Trowler, 1996). Ethnographic methodologies have a long and culturally-rich tradition with

origins in anthropology, but the characteristics, aims, principles and "flavour" (Trowler, 2013, p. 19) constituting ethnographic approaches are much debated (Atkinson, 2015; Atkinson et al., 2001; Lucas, 2012; Trowler, 2013; Van Maanen, 1988).

The position I take towards an ethnographic approach is well defined in the following quote:

> I offer a definition of practice-focused ethnography specifically. That flavour involves: . . . fine-grained, usually immersive, multi-method research into particular social activities aimed at developing 'thick description' (Geertz, 1983) of the structured behavioural dispositions, social relations, sets of discourses, ways of thinking, procedures, emotional responses and motivations in play. Beyond that descriptive agenda the approach seeks to uncover broader reservoirs of ways of thinking and practising which are being differently instantiated locally. (Trowler, 2013, p. 19)

The methodological stance I take is also akin to the case study approach advocated by Clark (2008), that "commits to local context" (p. 549), because:

> When we want to know what has happened –and what is happening- to universities in their natural setting, we clearly need case studies that produce grounded understanding. (Clark, 2008, p. 549)

Because ethnographic approaches exploring "the lived realities of their own organizations" are rare (Alvesson, 2009, p. 156), particularly in HE settings (Lucas, 2012; Pabian, 2014), I assert that addressing my research questions under such a methodological approach can make a useful contribution to HE research. Indeed, Lucas (2012), in a review of ethnographic-type research on HE, argues that the uptake of such an approach is increasing and that it offers a dynamic potential for exploring the complex world of HE. I contend that paying close attention to the experiences of researchers and academics can contribute to theoretical understandings of these experiences within the research environment (Clegg, 2008).

5.4 Challenging insiderness

While Alvesson (2009) articulates *at home- ethnography* in the context of organisational research, other scholars, such as Brannick and Coghlan (2007),

may label the approach as a form of insider research, a research project done by a complete member of the organisation in and on the organisation. It utilises:

> the position one is in for another, secondary purpose, that is, doing research on the setting of which one is a part…draws attention to one's own cultural context, what goes on around oneself rather than putting oneself and one's experiences in the centre…the aim is to carry out cultural analysis more than introspection. (Alvesson, 2009, p. 160)

While discussions on insiderness are often confined to overly rehearsed arguments and tend to suffer polarities of views, Trowler (2012a) asserts that "insiderness is not a fixed value" (Trowler, 2012, l[21]. 122), but depends on the positionality stated by the researcher. Debates abound about the need to separate insider and outsider research, or whether this is even possible. Some authors prefer to take an in-between stance and suggest that there is no need to separate the two, encouraging *insiderness* to be viewed on a continuum (Carter, 2004) instead of as a dichotomy.

For Clegg and Stevenson (2013), researching HE is intrinsically a form of insider research: "our insider status is phenomenologically as well as theoretically inescapable" (p. 7), because "academics who, by virtue of their position, have insider knowledge of the systems they are researching […] we are, as it were, studying ourselves." (p. 7). In the approach chosen for this study, I am positioned as an insider researcher on several levels. Firstly, because I have myself the experience of having being a postdoctoral researcher within the institution and the faculty where the research took place, prior to the rise of the researcher development agenda. Secondly, I was a local actor in the implementation of policies detailed in this work. Thirdly, the researchers and academics I have interviewed are based within the faculty where I work, and fourthly I am the spouse of a principal investigator employing postdoctoral researchers in the Faculty.

The critical difficulty for an insider researcher is:

> the question of the difference between practical knowledge and scholarly knowledge, and particularly to the special difficulties involved first in breaking with inside experience and then reconstituting the knowledge that has been obtained by the means of this break. (Bourdieu, 1988, p. 1)

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[21] This e-book does not provide page number, only *location.*

Bourdieu (1988) suggests that if the sociologist is to study his own world, he ought to "exotise the domestic, through a break with his initial relation of intimacy with modes of life and thought which remain opaque to him because they are too familiar" (p. xi).

While the leitmotiv by Delamont et al. (2010) to "fight familiarity" with "self-conscious strategies" (p.5) is a useful reminder for methodological considerations, the strategies generally offered in the educational literature felt of little help to remediate the methodological anxieties (Marcus, 1995, p. 95) of insiderness. In his *at-home ethnographic* approach, Alvesson (2003, 2009) proposes a number of strategies for "creating breakdown" (p. 184), among them: "embrace positions of irony and self-irony" (p. 185), apply theoretical frameworks to challenge perspectives, or "change level of interpretation" (Alvesson, 2009, p. 169). The most useful tool for me, in breaking with practical knowledge during the course of this study, was the decision to use Bourdieu's concepts in order to understand researcher development.

5.5 Enquiry design

The analysis in this thesis makes use of different types of data: ethnographic data generated by being in the field[22] during the course of my work as researcher developer, interviews and secondary data. I present in this section my approach to data collection.

5.5.1 Writing fieldnotes

During the course of this study and while involved in my daily work, I nurtured an *awaken awareness* of my position in the field, "a sensitivity for and preparedness" (Alvesson, 2009, p. 165). I geared my gaze towards situations, interactions and discussions between agents in the *field* in order to address my research questions. My observations of interactions with researchers and academics during meetings, events or individual interactions shifted towards a

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[22] The use of the term 'field' in this section refers to the ethnographic notion of field and not the sociological Bourdieusian concept of *field* used in the study.

more focused attention. Instead of just being in the situation, I kept repeating to myself: What is this really about? What is the meaning of this? What could I be missing here?'

The process of taking, analysing and representing fieldnotes is extremely diverse in qualitative research, as it reflects the paradigmatic assumptions of the researcher (Corwin & Clemens, 2012; Emerson et al., 2011; Sanjek, 1990). My approach to fieldnotes was a troublesome one. I initially started a research journal noting reflections on observations, interactions and discussions, but found it difficult to establish a sustained habit. The dual role of being in the field as researcher and working as researcher developer meant that many observations could become fieldnotes; choosing what was worth capturing was difficult. I made the choice to focus on documenting instances where I felt puzzled or challenged. My unstructured and irregular note-taking may not have followed the ideal and systematic path suggested by Emerson et al. (2011), but this issue is not unusual, as many researchers using ethnographic approaches comment on the challenges of fieldnote writing (Sanjek, 1990). I have used a mixture of scratch notes and headnotes (Ottenberg, 1990) to inform my writing and analysis. In the findings presented in chapter 6, I have used memory work and reflection on past events (in which I was embedded myself). The ethnographic and historical account presented, results from my analysis of the historical journey of researcher development policies, as I experienced and perceived them. It is documented through my encounters with events, institutional structures and policy documents.

I made the choice to focus my notes and analysis on documenting interactions and/or observations when they felt particularly challenging. For example, if an interaction with an academic provided a situation where perceptions about researcher development appeared problematic or conflicted with policy intentions, I documented the situation through field notes. These instances, which constituted what I would call *critical incidents* forced me to reflect on my professional and research context. Data from these critical incidents were important in the analysis of the sites of struggle within the field. Some examples are provided through vignettes in chapter 6.

Of course, the choice of critical incidents can vary between researchers. There is always a possibility that researchers, particularly in the context of *at-home ethnograpy*, may be blind to certain instances. Research findings only display a partial representation of what a particular researcher, with a particular perspective and at a particular moment in time has perceived as worthy of documenting. These findings represent a process of reflexivity on my own professional context and the development of my understanding of the *field* structures which I inhabit as a researcher developer.

Furthermore, I present findings in chapter 7 resulting from my observation and analysis of particular institutional practices (e.g. induction practices, researchers' representation and visibility) as well as institutional data sets (e.g. researchers' demographics, researchers' job titles), which taken together help assess the institutional positioning of researchers. My engagement in analysing institutional practices and data sets, and the choices made of what to select for discussion, was the result of considering my research context under the concept of the *field* of postdoctoral research. This became part of fostering the dialogue between theoretical concepts and data collection.

5.5.2 Approaching the interview process

In order to explore the habitus of postdoctoral researchers and academics, with regard to researcher development, I have employed qualitative interviewing as one method of data collection. In my choice of moving from a 3- institutions study to a more immersive ethnographic approach with data from one institution, I am attempting to move beyond seeing the interview as the master site for knowledge claims:

> Rarely then, if ever, are our data simply the 'interview', but we contrive to pretend they are by making our knowledge of the field invisible. It could be argued that context just remains 'noise' if we do not constitute it as data…The other way of considering this is by taking our human immersion as a necessary condition of knowing…everyday knowledge and a better way of viewing the interview, then, is as an always-already-situated practice. Such a move would entail attempting to scrutinise the ways our insider knowing impacts on the interpretation of what are usually disembodied transcribed materials and by taking great care in descriptions of the context and in how the context is constituted. This would entail a more careful situating of the field and of both the internal

and external relations we are studying. (Clegg & Stevenson, 2013, p. 8)

I view interview data as narratives constructed about experiences. They are not windows to the soul and interviewees are not a passive "vessel of answers"' to be tapped into (Holstein & Gubrium, 2004, p. 8). Interviewees are active participants.

> Rarely, if ever, then, is the research interview the only source of data and interpretative meaning making. The purpose of the interview, in most of our research, is to explicitly explore the understandings, reflexivity and potential agency that participants experience in relation to the practice under investigation. (Clegg & Stevenson, 2013, p. 12)

The interview data presented in this study is seen as an element of data collection from a range of approaches, aiming to generate evidence in answering the research questions. In addition, while interviews are used in a research project as a method for data collection, it is also worth considering their role as "agential conversations" (Muller & Kenney, 2014, p. 1), spaces and pauses in time where individuals can reflect on their individual circumstances and identity (Clegg & Stevenson, 2013; Muller & Kenney, 2014). Clearly, when a researcher developer asks questions about researcher development to researchers and academics, the narratives given will be a product of the context of the interaction and inevitably marked by indelible "imprints" (Alvesson, 2009, p. 157).

5.5.3 Accessing, choosing and interviewing participants

To access and choose participants, I used the list of Postdocs working within my faculty, to which I have access via the department of Human Resources, and the list of academics was available on the university website. I chose participants on the principle of attempting to access a range of experiences (Åkerlind, 2005). Ethical considerations were paramount in the recruitment of participants, so I decided not to recruit researchers and academics from one department in my faculty, as my husband was, at the time, head of this department. Issues of power in interviews have been previously documented (Roberts, 1981 in Clegg & Stevenson, 2013) and I considered that it would

have been inappropriate to interview researchers and academics in this context.

The research participants were asked by email whether they would be prepared to contribute to a study on researcher development; the information sheet (Appendix 3) was shared at the same time. Once participants had agreed, I also sent the consent form (Appendix 4) by email. Prior to starting the interview, I asked participants whether they had any additional questions, wished to receive the interview transcript or wanted to choose a pseudonym. Only one of the interviewees asked for the transcript and none of my interviewees felt the need to choose pseudonyms. I have assigned pseudonyms to all participants.

I conducted semi-structured interviews with all participants using interview schedules (Appendix 5 and 6), which were used as guidelines (Seidman, 2006) to maintain the flow of the discussion. The interview schedule was dense, as I found it difficult to limit the number of questions, but was used loosely around a set of 5 broad themes. It first elicited an overview of an individual's career path, before moving into an exploration of researcher development (experiences, influencing factors and policy environment). For the interviews with academics, I asked participants about their own experiences of being early career researchers, and then followed with an exploration of their approaches to working with postdoctoral researchers. All interviews were performed face-to-face and audio recorded. The interviews were conducted over the course of one year between 2013 and 2014. Each interview lasted on average one hour and up to one hour and a half. I met the interviewees either in their offices, in meeting rooms or in some cases in my office (postdoctoral researchers do not have individual offices and meeting rooms were not always available). If my office had to be used, I checked with individuals whether they deemed this appropriate before finalising location. The only exception was one interview with a researcher who is a family friend and invited me to interview her in her home office.

5.5.4 Academic participants

I started the study with a pilot interview with an academic who had been one of the first academics I interacted with when establishing the researcher

development programme. The other academics were chosen on the basis of being professors and from a range of departments. One academic was not a professor but I knew he was employing Postdocs who had been involved in the faculty researcher development programme. Choosing to interview professors meant that they would be more likely to have the experience of employing postdoctoral researchers on research grants. I had reviewed the university webpages to check whether the academics I was inviting had postdoctoral researchers within their group. Information on webpages is not always up-to-date. In some instances, it can be challenging to know whether an academic has employed postdoctoral researchers or not. For example, one of the academics interviewed had a professorship but had never directly employed a postdoctoral researcher, as she had never held an individual grant as a PI. She had collaborated with many postdoctoral researchers funded via large consortium grants and had just started to line-manage a researcher employed on a short fellowship he had written, but she had never been the sole PI on a grant employing a Postdoc. So, very senior academic positions, such as a Professorship, do not systematically indicate whether an academic has previously employed a postdoctoral researcher, while more junior academics may have. Having worked in the institution for many years, some of the academics already knew me, having interacted with me in different contexts, but none of them were direct and regular colleagues.

Considering the time pressures experienced by the academic community, I had originally contacted by email 23 academics in my faculty, expecting no more than 5 individuals to respond. The willingness of academics to be interviewed surprised me. In total, I interviewed 12 academics from my faculty. These participants came from 6 different scientific disciplines (3 from Physical Sciences and Mathematics, 4 from Chemistry, 4 from Biological and Environmental sciences, and 1 from Psychology). The female proportion of academic respondents (16.6%) was aligned with the proportion of female professors[23] (12.2%) in the Faculty of Science (FoS) (Personal communication from HR & Faculty Equality and Diversity committee-data 2015). There is a gender gap or "vertical segregation" (Bryson, 2004a) in academic positions in

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[23] This compares to an overall faculty proportion of 19.8% of academic women.

most UK HEI. It is worth noting that I invited more women to interview than their proportional representation across the academic community. The reason for this was that I had come across a study providing evidence that women in STEM are less likely to accept an invitation to give a talk (Schroeder et al., 2013); I had considered that a similar pattern may apply to invitation to be interviewed. Indeed, in my study, male academics were more likely to accept invitations to be interviewed (60%) than female academics (44%). While the analysis did not intend to produce a quantitative representative account, nor offer a comparison between genders, but aimed to consider a range of perspectives about research development, I, however, wanted to ensure women's voices among my participants. The validity of findings in such an approach is based on analytical thoroughness and not representativeness.

5.5.5 Postdoctoral researcher participants

The postdoc participants were chosen on the basis of a balance between inviting postdoctoral researchers, whom I had never met and who were not involved in any of the activities hosted by the researcher development programme, while inviting others who had being involved in the programme or whom I knew or was acquainted with in the faculty. This choice was based on the assumption that, by recruiting participants from these different groups, this may highlight different researcher development practices. To ensure that researchers would not feel coerced into participating, I only sent one invitation to potential participants and did not repeat the invitation if the recipient did not respond.

The recruitment of postdoctoral researchers proved more challenging than the recruitment of academic staff. In total, I interviewed 9 postdoctoral researchers (3 men and 6 women), who came from 5 different countries (UK, Spain, France, USA and Israel). Out of the 9 postdoctoral researchers, 6 of them came from my institution. I originally contacted by email 16 postdoctoral researchers across 6 departments in my faculty and only 5 accepted the invitation. However, practical matters meant that only 3 out of these 5 were interviewed. Among these three interviewees, two of them were female researchers, whom I had met on the Springboard programme, which I run in the institution. Their

participation in a series of 4 workshops over three months meant that they knew me as a workshop facilitator. The trust built with these researchers over the course of this programme may have contributed to their willingness to be interviewed. The third researcher to accept, among those initially contacted, was someone I had never come across during the course of my work with Postdocs.

To access a diversity of experiences, I also purposefully invited additional researchers whom I knew via other routes: one researcher had been very actively engaged in trying to gain a fellowship, one was a research fellow recently recruited by the university and whom I had met via a development programme about cross-disciplinary practices, and another one had done a PhD as a mature student (was also a family friend). Another three participants were recruited from another institution as explained earlier (4 invitations sent, 2 responded positively and 1 able to do the interview; in addition, 2 recruited via researcher development colleague). I was not provided with information about their levels of participation in researcher development programmes. Among the 6 Postdocs from my institution who were interviewed, 4 had taken part in some researcher development activities within the programme I manage. My recruitment resulted in a higher proportion of female Postdoc respondents (66.6%) than the gender differential within the faculty (36.6%).

The postdoctoral researchers I interviewed came from diverse disciplinary backgrounds (2 Physical sciences, 7 Biological and environmental sciences) across the sciences, with an emphasis on researchers from biological sciences (broadly defined). I am not claiming to have collected a representative sample, but participants represented a broad range of experiences and disciplinary contexts. The disciplinary distribution of postdoctoral participants is congruent with a larger national and local contingent of postdoctoral researchers based in biological sciences (60% of Postdoc -grade 7 in my faculty -data from 2015). However, being situated within a department is not indicative of disciplinary background, as many funded projects are framed as interdisciplinary projects and researchers move between departments. Among the participants, only one Postdoc defined herself as an interdisciplinary researcher, while another was

from an undergraduate physical science background, but had spent her research career within biological sciences. Although disciplinary cultures and belonging to particular academic tribes may influence researcher development approaches (Becher & Trowler, 2001), I have not focused my analysis on disciplinary differentials within the scope of this study.

5.6 Secondary data

Because of my role as researcher development manager within the FoS, I had access to institutional documents (e.g. reports and institutional 2013 CROS data) that has informed my analysis. Additional data collected from postdoctoral researchers and academics (described in Appendix 7) was not part of the analysis, but as it was collected and examined within the same timeframe as the EdD study, and is linked to researcher development, it has influenced my thinking during the analysis.

5.7 Strategies for data analysis and representation

This section aims to create clarity about the path between data collection and the writing up of findings, a process described by ethnographers as bringing things together or doing "contraption" work (Neyland, 2008). In Table 2, I summarise the types of data used to answer my research questions and the links to the theoretical tools used for analysis.

Interviews were professionally transcribed (because of time constraints). They were transcribed in full and only captured spoken words and pauses. Transcripts did not record non-word elements that may be of use in conversation analysis (Brinkman & Kvale, 2015), such as "intonation, pitch, amplitude and pace of talk" (Hammersley, 2012, p. 440), or other aspects related to physical or emotional responses. While many aspects of an encounter are lost during the production of a transcript (Suzuki et al., 2007), the accounts, as captured in the transcripts, were enriched by my recollection of the discussions. There is much debate about the role played by the transcription process, whether researchers should transcribe themselves, but also what and how to transcribe. Transcription is often described as "a process

of construction", generating texts that we should not consider as "unmediated" or "sacred and infallible" (Hammersley, 2012, p. 439 and 442). It is a process of transformation, of interpretation, a shift between modes of communication (Brinkman & Kvale, 2015).

Table 2. Linking research questions to data collection and analysis

How do postdoctoral researchers and principal investigators from scientific disciplines experience researcher development, post-Roberts implementation?		
Research questions	**Data source**	**Link to theoretical concepts**
Chapter 6 & 7 RQ1- What was the institutional journey of researcher development policies and what does it tell us about the *field* of postdoctoral research in a research-intensive institution? RQ2- How are researchers positioned in the *field* of postdoctoral research within a research-intensive institution?	Ethnographic data and institutional and national secondary data	Field and capital
Chapter 8 RQ3- How do postdoctoral researchers develop *a feel for the game* to transit through the field of postdoctoral research?	Interviews with postdoctoral researchers Ethnographic & secondary data	Habitus, capital and field position
Chapter 9 RQ4- How do PIs approach postdoctoral researcher development?	Interviews with Principal investigators Ethnographic & secondary data	Habitus and position-taking

Throughout the analysis, I placed great emphasis on the listening to the audio recordings, listening while reading the transcripts, listening without the transcripts, drawing concept maps based on my listening of the interviews, and remembering the interview context, in order to draw meanings from multiple angles. This provided a richness of information appropriate under the scope and purpose of this project. I generated cameos summarising individuals' narratives, based on my reading of the transcripts and listening of audio recordings. Both transcripts and cameos were annotated with a view to identifying significant themes. Some interviews were also coded using the NVivo software to experiment with diverse approaches to data analysis. After careful consideration, I made the decision not to undertake NVivo coding with all the interviews, as I felt that detailed coding using NVivo was making me lose sight of the big picture of the research question by "fragmenting and decontextualizing" the accounts (Forsey, 2012, p. 374). Overall, the thematic analysis generated around 5 different themes with a range of clusters (Table 3) across the sample of researchers and academics interviewed. In order to explore researcher development, the themes drawn from interview analysis were analysed through their contribution to the construction of the habitus, acquisition and/or ownership of different types of capital and positioning in the field.

When reporting research findings, based on an ethnographic institutional exploration and presenting accounts of individuals still present in an institution, great care needs to be taken, particularly to maintain individuals' anonymity. Exposing institutional practices can never be unproblematic (Alvesson, 2003; Bourdieu, 1988). My preference would have been to maintain the biographical narrative integrity of participants' accounts in a fashion similar to other scholars (Chen et al., 2015; Kelly-Blakeney 2014; McAlpine & Lucas, 2011), in order to "avoid wrenching people out of their social milieu, butchering their often existing stories into atomistic quotes and isolated variables" (Forsey, 2012, p. 365). If brave enough, I might have attempted impressionist tales of the type movingly written by Sparkes (2007). I was aware that there could be a risk in maintaining the anonymity of my participants by staying very close to individuals' full descriptive biographical narrative.

Table 3. Themes from analysis of interview transcripts

Themes from interview analysis	Clusters
Constructing strategies	Postdocs and choice Postdocs and change Postdocs and actions Postdocs and time-space
Social dynamics	Postdocs and PIs Postdocs and others Formative doctoral years
Transition of the self	Postdocs and self Postdocs and power Postdocs and desire
Transition towards research independence	Ways of researching Understanding of the academic environment Postdocs and work structures Postdocs and research ownership
Career and development	Postdocs and jobs-career Postdocs and learning-developing-training

Other authors also report the care taken, regarding the identity of institutions and individuals, when researching HEIs, the need to occasionally aggregate data, limit descriptions of institutional sites, delay reporting of results or disguise some responses to maintain anonymity, particularly when presenting ethnographic evidence (Lucas, 2006; Ylijoki, 2013). This was a particularly salient aspect in the presentation of this study. I have worked carefully in withdrawing identifiable details (to avoid revealing information easily traceable to particular individuals) and in presenting disaggregated demographic data, while attempting to preserve the *authenticity* of the narratives. For this reason, and following Rapoport and Lomsky-Feder (2002)'s approach to data

presentation in a study on Russian Jews' *Ethnic Habitus*, I will not assign demographic details and other recognisable information to each participant within a formal table, but will introduce my participants using pseudonyms during the course of the analysis.

5.8 Summary

In this chapter I have exposed the methodological approach developed, the strategies for data collection and analysis, and laid bare the *messiness* and *wickedity* in the research process (Ashwin & Case, 2012; Trowler, 2012b). The next four chapters present the findings, starting with chapter 6, which discusses how researcher development policies came into being in my institution and the sites of struggles they highlighted in the field of postdoctoral research.

Chapter 6

Researcher development: sites of struggle in the field of postdoctoral research

6.1 Introduction

The last two chapters have presented the theoretical framework underpinning this analysis and the methodological choices. I continue with 4 chapters of findings. The first of these initiates the analysis of sites of struggle around *researcher development* in the field of postdoctoral research. I develop an ethnographic and historical account of the entry of researcher development policies into my institution, and how they became enacted at the local level. In developing this analysis, I am keeping in mind Bourdieu's warning:

> Each of the protagonists develops a vision of this history consistent with the interests linked to the position he occupies within the history; the different historical accounts are orientated according to the position of their producer and cannot claim the status of indisputable truth. (Bourdieu, 2004, p. 9)

To address this call for caution, I propose this account as a process of reflexivity on the landscape of the field and my own position within the field. As part of this analysis, I present the institutional context of my practice as researcher developer and consider the policy drivers that have shaped the implementation of researcher development policies. I examine how agents may contribute to the structuring of researcher development within the field across institutional and national policies. The analysis presented identifies, that perceptions about researcher development are contested.

6.2 Local implementation of researcher development policies

6.2.1 Early-stage in the implementation of the Roberts recommendations

The institutional context in which I work is that of a UK Russell group[24] university, with a highly rated research output (2014 Research Excellence Framework). The 2002 Roberts report (as described in chapter 2) intended to address issues related to the training and development of the scientific

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[24] The Russell group is a membership organisation of 24 HEIs established in 2006. It aims "to help ensure that our universities have the optimum conditions in which to flourish and continue to make social, economic and cultural impacts through their world-leading research and teaching." Accessed August 2015 http://russellgroup.ac.uk/about/

workforce at both doctoral and postdoctoral levels. However, the majority of institutions, including mine, focused initially on the delivery of activities targeted at PGR students (Hodge et al., 2010). The Careers Service in my institution was one of the early stakeholders in the implementation of the Roberts recommendations, mediated by the Research Councils through the provision of new funding (which became known as the Roberts monies). As early as 2003, a Roberts-funded careers adviser post had been created to provide specific support to PGR students. This support was later extended to research staff and a second post was also created (McCarthy & Simm, 2006). For nearly 10 years, the career advisers supporting research staff and PhD students were seconded via Roberts funding.

In the early years of the Roberts implementation, the Graduate Research Office was responsible for the delivery of this agenda and was offering a number of training activities for PhD students; however, these did not involve research staff. The 2005 RCUK report mentions that 23 different *transferable skills and career management practices* within the institution had been uploaded to a web-database, managed by UKGRAD[25] (3rd highest entry from 66 institutions who had entered Roberts-related practices in this database). These practices, uploaded by RIS and displayed externally through this database, served to externalise compliance with Roberts recommendations. However, at the time, these practices held limited symbolic capital (Bourdieu, 2004, p. 55; Bourdieu & Wacquant, 1992, p. 119); indeed, there was a lack of awareness and visibility of these activities across the institution.

In the 2005 RCUK report on career development and transferable skills, mention is made that 62% of the £20 million Roberts monies received each year by institutions across the UK was focused on PGR activities. While 70-80% of research organisations had developed extensive transferable skills training provision for PhD students by 2009, still only 30-35% had structured and tailored programmes for research staff (Hodge et al., 2010).

This initial focus on PGR was understandable since many policy developments had already taken place prior to the *SET for Success* report (Roberts, 2002), in

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[25] UKGRAD was the precursor of Vitae.

reshaping PhD training and incorporating the provision of transferable skills training with the setting up of quality assurance and standards through the QAA[26]. For example, in 2001, the Research Councils had developed a Joint Skills Statement[27] (JSS) that articulated the skills all doctoral research students "would be expected to develop during their research training" and stated:

> The Research Councils would also want to re-emphasise their belief that training in research skills and techniques is the key element in the development of a research student […]. The development of wider employment-related <u>skills should not detract from that core objective</u>[28]. (RCUK, 2001)

We can identify in this statement that, prior to the Roberts report, the emphasis on broad "employment-related skills" was understated within the JSS; these were not seen as integrated within the core practice of doing research but perceived as something on the margin, a parallel stream of ancillary activities.

Following the Roberts report, there was a slight shift in the symbolic capital afforded to notions around generic and employability skills when funders' expectations changed. The RCUK started to insist that academic departments should develop much more structured PhD training with the inclusion of substantial *generic and employability skills* elements as core, compulsory components in programmes. The funders held power over the field of research by setting application criteria that demanded the inclusion of transferable skills training, in order to successfully access funding for PhD studentships.

This led one of the science departments in my faculty to create the position of postgraduate training coordinator, into which I was recruited in September 2006. At the time, the department had just gained funding from the BBSRC[29] for PhD studentships. The department, once made aware of the availability of internal funding (Roberts funding was being advertised to departments[30]), had

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[26] The QAA is the Quality Assurance Agency for Higher Education, http://www.qaa.ac.uk

[27] http://www.uel.ac.uk/wwwmedia/schools/graduate/documents/RCUK-Joint-Skills-Statement-2001.pdf

[28] I have underlined the text to emphasise the key element in the quotation.

[29] The BBSRC is the Biotechnology and Biological Sciences Research Council.

[30] The Roberts funding allocated by RCUK to institutions on the basis of the number of PhD studentships and research staff funded via the Research Councils had been allocated centrally as a block grant without institutions needing to bid for it. The funds were advertised to departments which could bid for different projects.

applied to create a post to help develop some of the activities under the banner of *transferable skills*. My job description framed my role in just two sentences:

- A crucial component is the provision of a high-quality training programme designed to develop and enhance the generic and transferable skills of our post-graduates.
- Develop materials for practical and theoretical workshops to support the development of transferable skills for post-graduates <u>as required by external sponsors</u>.

It is puzzling that the department made visible in the job advert itself that the impetus of such development was a requirement, or I would go as far as to say a demand, made by the funders. The vagueness in articulating the transferable skills agenda within this job description indicates that it did not belong to intrinsic beliefs that such things were needed, but felt more like an inconvenient requirement placed upon departments and academics. The power held by the funders over academic departments and the field of doctoral research was also visible in a report written by my head of department, when we re-applied to access Roberts funding for the continuation of my position for 2007-8:

> to provide a more rigorous and professional generic skills programme to address the aspirations raised in the postgraduate body by the Roberts report […] The maintenance of our programme of skills development is a <u>key driver for the continuation of the high level of our postgraduate award</u> from BBSRC. [internal document]

Having to reshape the training of PhD students and demonstrate to the funder that it was not just about research training but incorporated broader skills and career elements had become a necessary compliance to access funding for PhD studentships, but was not an academic driver nor resulted from a radical change in academics' perception on how young researchers should be trained and developed.

I was given a huge amount of autonomy by the heads of departments, under which I consequently worked to develop activities that I felt mattered, to interpret the notion of *transferable skills* and to develop a programme as I saw fit. It could be argued that this autonomy was a by-product of a superficial engagement with the developing external policies and an illustration of a mode of *procedural compliance* by academics with external requirements (Bryman et

al., 1994). I was to be the instrumental tool to respond to these external demands. I became an interpreter of these policies; a local actor in the framing of researcher development, while the academics remained distant.

Institutions varied greatly in how they structured the implementation of the Roberts recommendations (Hodge et al., 2010). While some institutions created large graduate schools, coordinating Roberts delivery for all researchers, other organisations had teams within Human Resources departments or skills coordinators within departments or faculties. In my case, I worked in relative isolation within one department with limited interactions with administrators from the Graduate School or Research & Innovation Services. I mostly interacted with academics and PhD students within my department, with the exception of collaborations with the Careers Service. In my own institution, the Human Resource department did not apply for internal Roberts funds and did not get involved in shaping and delivering the Roberts agenda. While their remit was not PGR, HR might still have been expected to get involved in leading the implementation of the Roberts recommendations associated with contract researchers, as part of staff professional development, but they did not. In discussions with HR colleagues, it transpired that, when the Roberts funding became available, the HR Staff Development Unit was experiencing some restructuring with specialist staff being dispatched across different professional service units. Although a new HR team was put in place, with responsibility for staff development, this did not encompass researcher development, which was perceived as a *research* issue and, as such, the responsibility of RIS. Internal politics between professional services departments may also have played a role and meant that HR did not to get involved. Some positions had been created centrally in RIS to coordinate Roberts activities across the institution. Potential programmes for research staff were being discussed and pilot programmes run (e.g. research leader programme) then stopped; mappings of researchers' careers proposed and changed, but by 2006, no clear programme or institutional strategy had emerged.

Ways of accessing Roberts funding was not always made clear in the institution. The lack of clarity about what this funding aimed to achieve was problematic and an illustration of the uncertainty in defining what the Roberts

agenda was really about. Academics, administrators and departments developed their own and individual interpretations of what constituted Roberts activities. At the time, the institution did not make public who held funded projects and for what activities.

It is surprising that support for postdoctoral researchers took much longer to get off the ground in the institution, particularly since Sir Gareth Roberts himself had worked closely with members of the institution on a report that focused on research staff: "Supporting research staff: making a difference" (Campbell et al., 2003). Commentators on this early period seem to admit that not much change appeared to have taken place in UK institutions and that changes were mostly "cosmetic." (Kent, 2005, p. 6).

The struggle in the institutional construction of the Roberts agenda is visible through the problem of situating this agenda in the structure of the institution, the melting pot of delivery approaches, the lack of institutional ownership and strategy of the agenda. This impended the onset of a system of professional development for postdoctoral researchers. Institutional actors faced great challenges in understanding what the agenda was about, which purpose it served, who was responsible for it and which strategies it entailed. I suggest that this was not just the result of institutional structural diversity, but is indicative of the limited capital held by the agenda within the field of postdoctoral research and is compounded by the lack of drivers at the time.

6.2.2 Position-taking of actors in the field

Knowledge about the issue of postdoctoral career and development has been reported in numerous reports and projects (Adams, J. et al., 2005; Bryson, 1999; Campbell et al., 2003). Policy-makers saw this as a risk to the innovation system, with concerns about a potential decline in the supply chain (e.g. House of Commons Science and Technology Committee 2002 report) (Ackers & Gill, 2005).

Around 2006, some academics from another faculty started to acknowledge

that the Postdoc community experienced a lot of negative feelings regarding their career progression, access to professional development and issues of research contract:

> contract research staff population [that] had become de-motivated, had poor self-awareness, lacked career planning and structure and had limited involvement in the School and University. (Lee, L. J. et al., 2010, p. 269).

This perception shifted institutional discussions about the Roberts agenda from a narrow focus on *transferable skills* and, as such, an agenda with limited symbolic capital, dissociated from the research process, to something much broader. Discussions started to encompass broader development, considering the research, social and academic capital of postdoctoral researchers and their hierarchical position within the institution.

One head of department in the Medical School decided to call an open meeting of the Postdoc community, to review the issues they faced and discuss what could be done to improve the situation. From these facilitated discussions emerged the desire to give a formal voice to the Postdoc community within the Medical School. This led to an agreement that a Postdoctoral society[31] would be established. In addition, a dedicated Roberts-funded position was created to lead the development of a local, tailored programme of professional development for postdoctoral researchers. A committee was also set up with an academic lead, departmental academic and postdoctoral representatives, as well as members from professional services. The committee established a programme based on the evaluation of skills perception, research outputs, aspiration and perception of the research environment. The intention was to set a baseline to benchmark any development and anchor the researcher development strategy within a research-based framework (Lee, L. J. et al., 2010). This was a cutting-edge approach, as very few institutions reported establishing such a baseline. This became problematic later on, as institutions were challenged to measure the impact of the Roberts funding and most lacked early benchmarking data (Bromley, 2009; Hodge et al., 2010).

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[31] Group of Postdocs working together through formal or unformal entity in order to have a voice at departmental, faculty or universiy levels, in addition to offering social opportunities between researchers.

While initiatives for postdoctoral researchers were being initiated and led by senior academics in the Medical School, a grass-roots *postdoctoral voice* seemed to emerge in a couple of departments within my faculty, expressing a craving to see some change happen regarding professional and career development. In 2007, the first Postdoc society (based in a biology department) was established in my faculty. It described itself as:

> proactive in helping Postdocs make the most of their time in the X department. The society primarily aims to provide a resource for the interaction (social & scientific), training, education and support of postdoctoral staff. [described on webpage]

Throughout the course of its existence, the society has had a very strong focus on social events to provide opportunities for postdoctoral researchers to spend time together. Within my department, a Postdoc career development committee was set up in 2007, working with the departmental Postdoc society, which was just emerging. Although this committee was short-lived, suggestions were made to combine forces with the career development programme in place in the Medical School, to make the programme available to researchers from both departments. In order to address the interest and needs expressed by researchers, I started working closely with the colleague appointed in the Medical School, initially just by disseminating information and making the Medical School programme available to researchers in my department, then from 2009 by organising workshops for researchers across the two faculties.

The Roberts activities were initially approached from the perspective of a *deficit model* about skills (e.g. we ran questionnaires asking researchers which skills they felt they were lacking and needed to acquire). At the time, the experience that postdoctoral researchers had of professional development was mostly based on generic training, delivered by the department of Human Resources to all university staff. Postdocs explained that they were looking for professional development framed within the research context, but also expressed that time constraints inhibited their possible engagement in professional development.

As an institutional agent, inspired by the work done in the Medical school and with Vitae initiatives helping support my own professional development, I took position in the field of postdoctoral research (without a formal institutional

mandate nor faculty/institutional strategy driving my endeavour). I initiated a faculty-wide researcher development programme in 2010, as I felt a real sense of connection to the Postdoc community, having experienced this type of position myself. While some HE commentators may want to believe that the 2008 Concordat influenced practices and policies in institutions, it did not at this stage, at least not within my faculty, but the availability of Roberts funding did, as it allowed me to initiate a programme for postdoctoral researchers. I took at face value that *training* and *development* interventions for postdoctoral researchers mattered in supporting young researchers to navigate the turbulent waters of academic progression or negotiate transition to other pastures. I replicated the model set in the Medical School of having a faculty-wide committee with academic and postdoctoral researcher representatives. It took time and effort to recruit representatives from all departments. The first meeting of this committee took place in February 2011. The Researcher Development Programme expanded over the years, continuing the collaboration with the Medical School coordinator and offering aspects of the programme to researchers (not only Research Staff but also PhD students) from the 3 STEM faculties. The programme from the Medical School had extended to the entire faculty and developed a brand and a logo, incorporating elements developed and delivered across both faculties. The branded programme had been shortlisted for the Times Higher Education award. While these programmes were being developed across two faculties, three other faculties remained without dedicated coordinators. Colleagues from RIS had provided some input on focused projects, but no overall strategy and coordination had been realised. Postdocs from one of these faculties established, in 2011, a faculty-wide Researcher Society.

By 2011, a national review on the implementation of the Roberts recommendations had taken place and considered:

> The activities funded have come to represent a programme of major cultural change in the level of provision of skills and career support for researchers in UK Higher Education Institutions. (Hodge et al., 2010, p. 1)

While this report of the national picture depicts a cultural change, such a shift still had to be embedded across the institution, instead of the localised

provision at the time within two faculties. Researcher development remained outside of institutional strategies, and points of reporting were unclear, illustrating the lack of positioning of the researcher development agenda within the institutional structure. The researcher development programme seemed to exist in an institutional vacuum.

The Hodge report (2010) offers "fewer drivers for change" (p. 25) as an explanation for the lag in the uptake of the agenda, with regard to postdoctoral researchers. Indeed, while access to funding for PhD studentships had required the doctoral field to comply with new demands from the funders (regarding integration of additional training programmes), research grants were still not tied with formal requirements forcing institutions to offer professional developments for research staff. Hodge (2010), strangely, also places the responsibility on the side of the researchers:

> the motivation for research staff to engage in skills training may be lower than that of PhD students; they are no longer students, and their priorities tend to be on developing their deep specialism, achieving their project goals, publishing, teaching, finding further contracts and grants etc. (p. 25).

In this quote, researcher development, labelled as skills training, continues to appear somehow separate from research and academic activities and seems to portray the process of research socialisation as finalised at the end of the PhD. Furthermore, assumptions are made about the willingness and interest of researchers to engage.

It took the forthcoming end of the Roberts funding to embed researcher development activities across the institution. In 2012, a university review took place to address the legacy of Roberts initiatives, in view of the end of Roberts funding, and evaluate continuation of activities. It considered as *essential* the ring-fencing of institutional resources, in order to offer support to Research Staff and PhD students. Decisions were finally made by the university to formalise an institutional structure for the delivery of "good quality career development and training provision" [internal memo]. Although concerns had surfaced about the risk of losing positions and programmes with the end of Roberts funding provided by RCUK, the university, drawing on the work that had been shaped

by two science faculties, extended the model to the remaining faculties. While the Roberts positions had relied on soft Roberts funds, the new structure and positions were established as core positions, funded via PGR fees. By creating an institutional researcher development team with positions across all faculties, the Careers Service and RIS, an institutional researcher development agenda began to be formalised. It meant that the researcher development agenda started to belong to a diversity of stakeholders across the institution and had to be shaped by all actors. As agents shaping the institutional discourse, researcher developers started to avoid the *transferable skills labelling* of programmes, aware of the lack of capital it held within the academic community and enculturing the language used to describe activities to become more salient.

6.3 Researcher development agenda: does it have any currency?

Institutional oversight concerned with researcher development, the HR Excellence in Research Award, only appeared once a European policy leaver was instigated. The first institutional application to this award dates from June 2012. Colleagues from different sections of professional services (HR, RIS), the committee of campus unions, as well as a small number of academics, were involved in the submission process. Contract researchers were encouraged to contribute to the submission by responding to an internal survey. The process of writing such an application is an exercise in framing an appropriate rhetoric, by matching an action plan (based on a gap analysis) to the principles of the Concordat. While this application was important as part of establishing an external label, it felt remote, framed through the lens of telling a success story in the institutional embedding of researcher development policies. The limited number of academics involved in the process was reflected through a sort of disconnect displayed in the document. Research environment and researcher development seemed to appear as two separate parts, connected but not symbiotic. Later applications and reviews have remained fairly extrinsic to the academics and postdoctoral researchers, as these documents continue to be

written through professional services, surrendering them to forms of administrative compliances.

In contrast, the Athena Swan policy initiative was, in my view, the first time that intense discussions about postdoctoral researchers took place at departmental level, engaging a larger number of academics. The Medical Chief officer had announced that Medical Schools would not be allowed to apply for funding without being awarded an Athena Swan Award. Departments started to be concerned that a similar approach might be taken by other funders, creating a great push for departmental uptake of Athena Swan reviews. While Athena Swan was an initiative with a focus on female academic progression in STEM careers, it permitted local but formal conversations about postdoctoral researchers. Departmental committees and an overarching faculty committee were set up and required the participation of individuals from all levels of the academic career ladder. It forced departments to consider career progression at all levels with departmental data. In my faculty, all departments started to apply for the Athena Swan award from 2013. These committees provided a space for academics, postdoctoral researchers and other staff to consider departmental culture and how to improve the environment. More departmental conversations took place about postdoctoral researchers through the Athena Swan applications than I had observed since 2006. The application process required the drafting of a departmental action plan, which, like the HR Excellence in Research Award, is part of a game about external perceptions. However, the departmental locus meant that actions could not be delegated to central services, but required the engagement of departmental agents. It forced departments and academics to consider their own roles in researchers' progression and professional development.

Researchers and academics have a limited awareness of national policy initiatives related to researchers. For example, the 2013 CROS national survey[32] showed that, apart from awareness of the Research Excellence Framework and the Athena Swan agenda, research staff had limited

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[32] CROS is the Career in Research Online Survey.

knowledge of any other policy initiatives[33] related to researchers. In my institution, researchers had better awareness of the 2008 Concordat[34] compared to similar institutions, but still only under half of them knew about a policy directly linked to their own career and professional development. More than 10 years earlier, Bryson (1999) had already identified that contract researchers were highly unaware of their own employability rights. I observed a similar lack of awareness of policies related to researcher development among the postdoctoral researchers and academics I interviewed as part of this project. Academics were vaguely aware of the 2008 Concordat but acknowledged their ignorance of its details, for some almost embarrassingly; its purpose was occasionally misconstrued. Some academics' perceptions about the Concordat were more about changing institutional structures related to researchers' employment, rather than a consideration of research careers being broader than academic careers, or a reflection on how to approach the development of researchers towards broad employability and careers beyond academia. Policies were referred to as extrinsic or "lengthy", documents with "empty words" [Murray] sent by central services, but rarely read. One academic [Jeff] felt that he did not need to see these policies written down, as he assessed that his approach to developing researchers would align well enough to the funder's aspirations. Postdoctoral researchers felt that these policies were not of much use to them. One researcher explained that he had looked at the policies but that, for him, these were less useful than an actual understanding of the politics of research.

These policies were not perceived as attempts to change practices within the research environment. Some academics 'connected' *researcher development* to the programme I run, and which they know about via emails, but not to their own practice of interacting with Postdocs, nor to considerations of research career structures. Two academic interviewees made reference, during our discussion on researcher development policies, to their involvement in the

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[33] Researchers were asked to rate their knowledge and understanding of Athena Swan, three Concordats (Concordat to support the career development of researchers, Concordat for engaging the public with research, Concordat to support research integrity), the European HR Excellence in Research Award, RCUK pathways to impact, the Research Excellence Framework, Vitae and the Vitae Research Development Framework.
[34] When I refer to the Concordat in the text, it applies to the 2008 Concordat to support the career development of researchers not any of the other Concordats mentioned.

researcher mentoring programme (where academics mentor Postdocs from other departments), which had been set up as part of the researcher development programme. Although sceptical at the start, they felt they were gaining, through the training and experience provided through the scheme, some news ways of approaching the mentoring of their own Postdocs.

Even funders had reacted differently in framing their commitments towards researcher development. For example, the 2011-15 BBSRC Delivery plan[35] asserted its commitment to the principles of the Concordat and its aims to "improve the attractiveness and sustainability of research careers within and outside of academia" (p.16). It stated its intent to identify ways of funding researcher development activities post-Roberts funding, but also to "embed researcher development in the peer review of its grant awards, to underline their role as investments in highly-skilled people" (p.16). The stage was set by the funders to give *researcher development* more capital at the point of research grant funding. It took until 2015 for the BBSRC to embed the principles of the Concordat in a specific document: "Vision for Postdoctoral researchers", showing that even the funders were unsure on how to proceed to shift logic of practice in the field.

While European, national and institutional researcher development policies have developed over the years, their roles in shaping local cultures, practices, and individual approaches towards researcher development vary greatly. Researcher development is not a given, even with policies in place; it is culturally embedded at research-group, departmental, institutional and national level. For example, in a report from the European Science Foundation (2012a) considering the development of research careers and, in particular, the possible use of the Researcher Development Framework (Vitae, 2011) across Europe, the unease regarding researcher development is expressed as follows: "some countries have a longer journey to travel than others in terms of the cultural and political recognition of the professional development of researchers" (p. 12).

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[35] http://www.bbsrc.ac.uk/documents/delivery-plan-2011-2015-pdf/

6.4 Perceptible sites of tension regarding researcher development

In order to capture some of the uneasiness about researcher development, I provide some examples of situations and exchanges[36] with academics, as part of my role as researcher developer, as well as comments arising from the interviews with academics during the study. I have also written 2 reflective vignettes based on my recollection of face-to-face conversations, interactions through email, and field notes (Emerson et al., 2011; Sanjek, 1990). I want to emulate Anderson's (2006) suggestion to: "illustrate analytic insights through recounting their own experiences and thoughts as well as those of others" (p. 384). These examples illustrate surprises, misunderstandings and frustrations, and are indicative of *researcher development* as a disputed practice within the field of postdoctoral research.

6.4.1 Postdoctoral time

One of the key tensions in discussions about researcher development relates to time and how postdoctoral time should be spent. In vignette 1, although the academic tries to be supportive in suggesting that Postdocs should be informed directly about opportunities, she does, however, displays a very normative view of the purpose of postdoctoral research, that of solely delivering someone else's research. It gives the impression that activities beyond the delivery of the funded research project onto which a postdoc is employed are *additional* or *side* activities, and in some cases, detrimental to research outputs, a waste of research funding. I have observed many cases when the involvement of postdoctoral researchers in academic activities, such as teaching activities, is construed as wasting research funding: "they are paid to do research, not teach and do our job" [male academic].

The developmental programme, referred to in vignette 1, offers researchers the experience of writing and submitting a small grant, of having it peer-reviewed, of accessing independent research funding and of supervising the training of a student. All of these activities constitute academic activities that could increase

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[36] The examples reported here are based on 2014-2015 interactions.

the research and academic capital of a Postdoc, but somehow are constructed here as potentially having a negative impact for the PI. This recurring theme of postdoctoral time is a key illustration of the struggle of researcher development within the field.

Vignette 1. *Postdocs are employed to work full time on their PI's grant*

I have just advertised by email a scheme that allows Postdocs and PhD students to act as PI on a research project for an undergraduate student. The researchers write short, independent research projects; the applications are reviewed within the faculty with some previous postdoc recipients contributing as panel reviewers. Selected applicants access funding for consumables and our team support researchers in preparing them to shortlist, interview, and recruit undergraduate students. We support their external applications to access a summer stipend for the student. I have forwarded the email to academics so they can encourage their researchers to consider the opportunity.

An early career female academic has just contacted me and asked whether I had advertised this to Postdocs. She is concerned that PIs may not make Postdocs aware of the scheme. She says in her message that it strikes her that as Postdocs are <u>employed to work full-time on their PIs' grants</u>, schemes like this would take time away from the work they are employed to do. I was a bit shocked when she suggested that she expected some PIs would not be inclined to encourage their Postdocs to do this, unless they are particularly keen on supporting the future career of their Postdocs to the detriment of their own research. She continued by saying that for Postdocs to apply, they would need the agreement of their PIs and of their funding body.

6.4.2 Researcher development on the fringe

Vignette 2 captures my unease and surprise when encountering the perception of a senior academic colleague about a symposium I was organising in the summer of 2015. For several years, I had led the researcher development programme without any direct input, steer or strategic direction from my faculty. My approach had been about attempting to develop communities of practice (Wenger, 2000), programmes to share knowledge about academic practice, career progression and transitions; empowering researchers to acquire various forms of academic, social and research capital, in order to better position themselves within the field of postdoctoral research or transition to other fields.

My purpose focused on enabling researchers gain a sense of control over their next career stage. My intent was not dissimilar to that of some educational developers described by Kloot (2014) in post-Apartheid South Africa, as "intentions were to shift the structure of the field in an attempt to disrupt the process of social reproduction that the education system facilitates" (p. 10).

I felt confused that an event aiming to articulate some of the rules of the game faced such strong resistance from a senior academic. I was perplexed about the reasons why the faculty hierarchy would suddenly decide to take control and steer an agenda in which they had had no direct input up to that point.

This academic's viewpoint was that the lead in encouraging researchers to apply for fellowship should come from the PI, who should identify potential applicants. What transpired from these exchanges was that he conceived that fellowship support ought to be led and directed further up the institutional ladder and be part of faculty strategies. I struggled with his conception, where star researchers would be picked by academics and supported selectively. This is not dissimilar to some perceptions about excellence on other issues in HE:

> growing hegemonic discourse in England that clear divisions between those with outstanding talent and the rest of the population are how things should be. (Bathmaker, 2015, p. 64)

Although we still ran the symposium, which might have been construed as an *act of resistance* (Grenfell, 2014), I still felt the need to understand this academic's reluctance towards such symposium.

Vignette 2. *The Faculty is not supportive of this initiative*

In January, I started organising with colleagues from central services and from another faculty, a symposium about fellowships, targeted at PhD students and Postdocs. During our preparations, we invited a senior academic (previously research fellow) with leadership responsibilities, to open the fellowship symposium. We wanted the opening to provide an overall explanation of what a fellowship is and to inspire researchers in their academic progression. We received a less than warm response from this academic regarding our preparation for this symposium. He conceded that there is value in doing something to stimulate fellowship application. However, he said that, from their point of view, the major problems was getting PIs to identify potential applicants and encourage them, and of attracting high quality fellowship applicants from outside the university. He commented that the proportion of Postdocs and PhD who are competitive is very small, and that the success rate for fellowships is very low (7%), so the faculty wants to identify individuals who might have a chance and work with them, rather than encouraging all to consider fellowships. This academic told a colleague that if we followed our current line in the organisation of the event, we were not going to give the right steer for the Faculty of Science. He thought that we needed to broaden the scope of the event. We acknowledged his comments and broadened the scope, entitling the event "Steps towards research independence" to minimise a too narrow focus on fellowships. I met with him to explain our strategy for the programme and our view about empowering researchers to take actions for their transition towards research independence. None of the conversations we had with him convinced him of the value of our programme. I am quite aware that very few Postdocs may have a chance at getting a fellowship but it does not mean we should not encourage them. I feel that, at the very least, they need to know what this is about and what you need to do to be on a path leading there. Felt quite deflated. Another academic colleague also commented that we should not give false expectations that people can't reach. I managed to identify another senior academic colleague who was supportive and accepted the role of introducing the event.

I discovered that the trigger for his reticence might have been an institutional post-REF 2014 analysis. The REF score for the *research environment* placed the institution in the lower half of the top scores. This steered the institution, via RIS, to consider the strategies that would be needed to improve the future REF *research environment* statements. While the institutional REF statements mentioned the researcher development programmes and offered general statements about supporting the career of researchers, they seem to not have sufficiently emphasised the contribution of academics in this process (compared to institutions which had better ratings for their research environment statements). This is ironic, since many activities within the researcher development programme, are delivered in partnership with academics. Here was an instance where researcher development held symbolic capital in fostering a narrative for excellence in research environment. This academic's disinclination to the event proposed was probably linked to his considerations at the time of the need for a faculty strategy regarding researcher development, within the context of the REF research environment statements, using researcher development to serve a performative function.

6.4.3 Academics' perceptions about researcher development initiatives

Some academics felt quite refractory to the idea of external interventions via policies and programmes contributing to researcher development:

> *I think it's largely because of probably the way I grew up…however I ended up, I think I've always been going to be a researcher since I was 10 or younger, I mean somehow this has been in my mind ever…. And so I've got in my….and as I said, I lived in a lab, I did all these things, I did them – no-one told me to do them, and so I guess my approach always is "why does anyone need any of this explanation", and so I tend to downplay it. And so when I see all this stuff I tend to ignore it to be honest. Now it's probably wrong but it's just kind of where I come from. I sort of come back to the notion that somehow for someone to be a researcher is an innate thing, and either they do it or they don't and it's something they do personally. [Paul]*

In some cases, academics felt that researcher development initiatives were a way of cosseting adults, who ought to find things out for themselves, by making mistakes or asking others. Academics felt that researcher development

programmes were probably useful for researchers who needed to transfer to other careers, but risked being a distraction to those on an academic trajectory, not seeing these initiatives as possible elements facilitating trajectory within the field.

One academic was concerned that researcher development should not be forced on people; even for people who were very unclear about career direction and may be drifting. Another in a senior role had recently welcomed more professional development input for herself in order to function well in the institution, but she did not feel that researcher development for Postdocs needed to include these elements, as she felt that focusing on the research would be much more impactful on careers.

The *employability* strand of research development policies was mostly absent in conversations with PIs. There was a reluctance to consider researcher development as a stance for broadening the professional career scope of researchers towards careers outside of academia, or the consideration of capital accumulation of value in other fields. Conversations about non-academic careers with their Postdocs seemed challenging for some academics:

> *So I've had lots of conversations about development, but not outside academia. I mean partly I try and maybe shut those conversations down because I don't think I'm in a position to advise… just never left university, and so I don't think I'm the right person to ask, so maybe I close down these conversations. [Theo]*

Also the tension of striking a balance between developing individuals and progressing projects was expressed by Theo, as follows:

> *It's a real tension to be honest, because obviously my main priority is the success of the project but equally part of my role, especially at the university, is to ensure that I develop people and serve as a mentor for them and help them to get on to the next stage of their career. And those two things are at odds with each other. [Theo]*

Only one academic [Daniel] made reference to researcher development initiatives/policies as supporting postdoctoral researchers develop a sense of belonging to the institution. He perceived that researchers might not be able to

appreciate their own worth for the department. He understood that they may feel "caught" in an in-between space, between being students and academics, but "they're sort of like neither one nor the other". He also proposed that researcher development initiatives created a space of collegiality for the Postdoc community across the institution, getting researchers to meet a broader spectrum of Postdocs through such forum, allowing them to receive messages about development and careers through additional voices than just via interaction with the PI. However, his stance was fairly unusual among the academics interviewed.

6.5 Conclusion

In this chapter, I have provided an ethnographic account of my experience in the local implementation of the Roberts agenda. I have offered a number of examples that indicate that practices and understandings of researcher development are diverse and problematic. While the impact of some policies has been limited on some of the local practices, other initiatives taking place at departmental level such as the Athena Swan review process, have facilitated more conversations about practices related to researcher development. In the following chapter, I position the agents, postdoctoral researchers, within the field of postdoctoral researchers in the context of my faculty. I provide evidence and construct an argument to illustrate the role of institutional practices in structuring the field.

Chapter 7

Locating researchers in the

fabric of the institution

7.1 Introduction

In the previous chapter, I have provided an historical and ethnographic narrative about the entry of researcher development policies into my institution and faculty. I have illustrated some of the challenges in understanding the meanings of researcher development, exposing sites of struggle in the field of postdoctoral research. In chapter 7, I analyse how postdoctoral researchers are institutionally located in the field of postdoctoral research. I explore a number of practices, such as induction rituals, Postdoc job descriptions, physical space and institutional representation. Researcher development is constructed and performed through diverse interactions, modes of operating and a spectrum of social practices. The analysis in this chapter contributes to mapping "structured structures predisposed to function as structuring structures" (Bourdieu, 1977, p. 72), that are shaped by or shaping the habitus of agents in the field of postdoctoral research. My analysis will evaluate the symbolic capital generated or restrained through researchers' institutional positioning and practices.

7.2 The populations of researchers

My institution has five faculties, three of which have a STEM focus. I am situated within the Faculty of Science (FoS), which comprises seven departments. The University employs 7802 staff, with 13% of the staff working in the FoS (HR data July 2015). "Research-only" staff have represented on average 18% of the university staff population and 33% of the FoS over the last 5 years (2011-15) (2015 HR data).

In 2015, academics constituted 25% and postdoctoral researchers (grade 7) 23% of total staff in the FoS. The overall number of university staff increased by 37% between 2011-15[37] and, while the increase in research staff across the institution has followed a similar trend (31%), this contrasts with a limited increase in academic staff numbers (16%). In comparison, the FoS has had smaller increases in staff number (28%) and research staff (11%) over the last

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[37] This is a very significant increase compared to the overall increase in UK HEI. The only comparator that I was able to identify was an increase of 2.2% staff over 5 years between 2008/2009 and 2013/14 across all UK HEIs (HESA data).

5 years. The faculty increase in academic staff (18%) has followed the university trend and the overall faculty increase in staff numbers is mostly due to recruitment of *other staff* not included in academic and research (e.g. administrators, technical staff).

The internal transition of research staff to academic positions within the faculty is rarely seen. Research staff face an extremely high level of international competition to gain academic appointments. During one of the recent rounds of lectureship recruitment within the FoS, 238 applications were received, 15 candidates shortlisted (among them 8 postdoctoral researchers and 4 fellows). Two appointments were made to researchers who already held research fellowships. Within my institution (as in other Russell group institutions), the vast majority of researchers (80.1%) aspire to a long-term research career (teaching and research, or primarily research) [institutional CROS 2013 data]. Müller (2014) describes this as a perplexing constituent of postdoctoral socialisation, where, "despite the odds" (p. 338), researchers become entrenched and fixated on pursuing academic research careers.

Demographic data about researchers' employment demonstrate the transience of the research population in the institution. Although within my faculty, the longest time a researcher had been working at the institution was 22 years, only 7% of researchers had worked for more than 10 years, 11% between 6-10 years and the vast majority (82%) had been employed for 5 years or less. This indicates that less than a fifth of the research population from my faculty has remained in long-term employment (more than 5 years) within the institution[38]. In figure 4, I have presented the percentage of research-only staff who started their employment between 1993 and March 2015. This visual representation is a reminder of the reduced scope for long-term employment in research careers within one institution.

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[38] I do not have overall institutional data, but secondary data based on the 2013 CROS survey shows similar patterns of repartition. One third of respondents had been research staff for more than 5 years, with 17.5% having been research staff within the institution for more than 10 years, 12.9% between 6-9 years and 69.6% between 0-5 years. These proportions are only indicative, as the survey respondents only represented a proportion of all research staff in the institution.
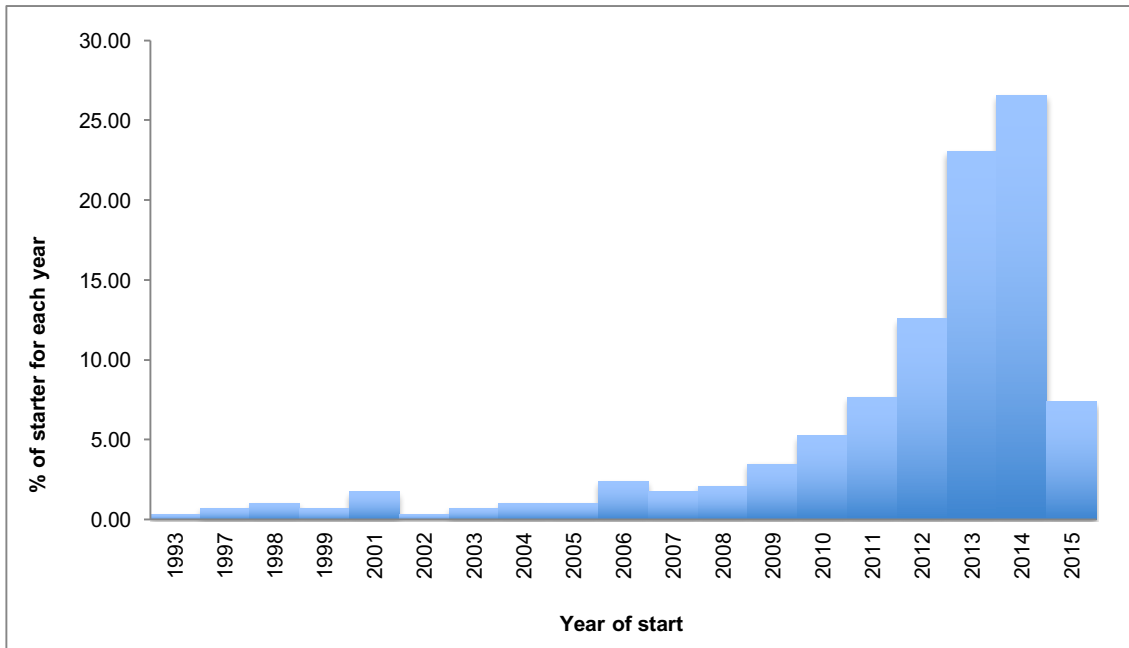
Figure 4. Percentage of FoS research-only staff who started their employment within the University between 1993- 2015 (data from March 2015)

The number of researchers working in the FoS is dynamic; the fluidity being based on the availability of research funding. For my faculty, the number of employees labelled as *research-only* in the HR database has varied from 232 in June 2014, 286 in March 2015 to 313 in December 2015. The number of researchers in each department varies (e.g. between 12-73 individuals per department in December 2015), and is entirely linked to the external research funding gained by the academics. The size and composition of each research group is also variable, with groups having no research staff (only PhD students) and large groups with up to 10 postdoctoral researchers.

This flow of researchers in and out of the institution has become internalised by agents and the institution itself. A *flux habitus* – meaning an internalisation of the limited temporality of postdoctoral positions – within the field of postdoctoral research is being played out through the types of contracts drawn up for researchers. The majority are employed on fixed-term contracts, with only 11% of postdoctoral researchers employed with an open-ended contract (data from 2015; compared to 17.5% for all research-only staff, which includes research fellows). While an open-ended contract does not guarantee continuation of

employment, as it is always dependent on the availability of external research funding (even with such contracts, employees can still be made redundant if no additional research funding is obtained), the institution, departments and academics have been reluctant to transfer research-only staff onto open-ended contracts. The structural choice of fixed-term over open-ended contracts anchors short-termism in the field of postdoctoral research, shifting into agents' habitus. In 2015 data, 12% of research staff in work since 2011 were still on fixed-term contracts, 7% for those employed prior to 2011. Similar reluctance to offer open-ended contracts is observed across the UK (Mellors-Bourne & Metcalfe, 2016). The structures of fixed-term contracts, chosen by institutions as a mode of postdoctoral employment, are objective structures (Bourdieu, 1977) contributing to the positioning of Postdocs in the field and establishing a system of dispositions with transience at its core.

7.3 Subtleties of researchers' job titles

Researchers in universities are labelled with different job titles, with no agreed definition, making it a challenge when studying this community or exploring the literature (Åkerlind, 2008a; Cantwell & Taylor, 2013; Felisberti & Sear, 2014). Studies exploring the demographics of HE staff labelled as "research-only", rarely engage in the subtleties and intricacies of the different categories of individuals under such a banner (Coey, 2013).

The disparity in the terms used for the job titles of positions held by researchers uncovers the murky terrain of the postdoctoral field and the difficulties in assessing field positions of researchers on the basis of job titles. Variations in job titles may contribute to differential positioning of researchers in particular loci of the field, enhancing or limiting the afforded capital. The confusion is not aided by the widespread use of terms, such as Early Career Researchers, Contract Researchers, or Research Staff. Based on the 2015 December HR data, among the 313 members of staff classified as *research-only* in my faculty, 71.5% of research staff were on grade 7, 16% were on grade 8 or 9 (these would represent different categories of researchers, such as fellows, who would usually have their own research funding, but also some scientists delivering

specific scientific or expert services), 6.7 % were on grade 6 (usually research assistants funded on research grants; some are PhD graduates) and the rest of the research-only staff represent clinical researchers (0.95%) and lecturers with senior external fellowship funding (0.95%). Also included in *research-only staff,* without a defined university grade provided within the HR data, are Marie Curie[39]-funded PhD students considered as staff because of European legislation (while PhD students funded via other sources are not included), Knowledge Transfer Partnership fellows and some types of Marie Curie fellowships (all representing 4% of the total research-only category).

Between June 2014 and December 2015 within my faculty, I calculated that under the staff category *research-only*, up to 50 variations of job titles were assigned to the research-only staff. While some variations are only grammatical (e.g. positions either called Post-doctoral or Postdoctoral research associates), other variations hinder the understanding of the particular roles played by individuals. For example, both Research Associate and Research Assistant can be abbreviated as RA, term often used in conversations with academics. On occasion, PhD holders may move into Research Assistant positions (grade 6), even after having held a higher grade Postdoc role. In December 2015, researchers on grade 7[40] could be known by 30 slightly different terms, with Post-doctoral/ Postdoctoral Research Associate and Research Associates most frequently used. Figure 5 illustrates the percentage of the different job titles used across the FoS for researchers at grade 7, and Appendix 9 gives an overview of the additional job titles used for grade 7 researchers across the faculty.

Within the *research-only* staff category, the term *fellow* is also used in job titles. While it is often perceived as a term used for individuals who have accessed their own funding, in fact it incorporates individuals at very different levels on the academic career ladder. Some fellows will be senior academics with readerships or even professorships; the term fellow may also be used for researchers with independent funding setting up their research groups, researchers with independent funding but no research group and line

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[39] The European Commission funds European training networks enabling the recruitment of PhD students from across Europe.
[40] Grading may differ in each institution but this is generally the grade assigned to researchers with a PhD working on a project funded and awarded to a PI. Those are the researchers generally called *Postdocs.*

management from an academic. In addition, the term is also used as part of specific schemes aimed at facilitating academic transitions and as a recruitment strategy to recruit 'excellent researchers' (e.g. Vice Chancellor fellowships or EPSRC doctoral fellowship), where researchers are providing time to develop research funding applications. However, in some other UK HEIs, the term fellow is also used to advertise postdoctoral positions linked to specific projects. These would not represent the same level of research independence compared to individuals having accessed funding themselves.
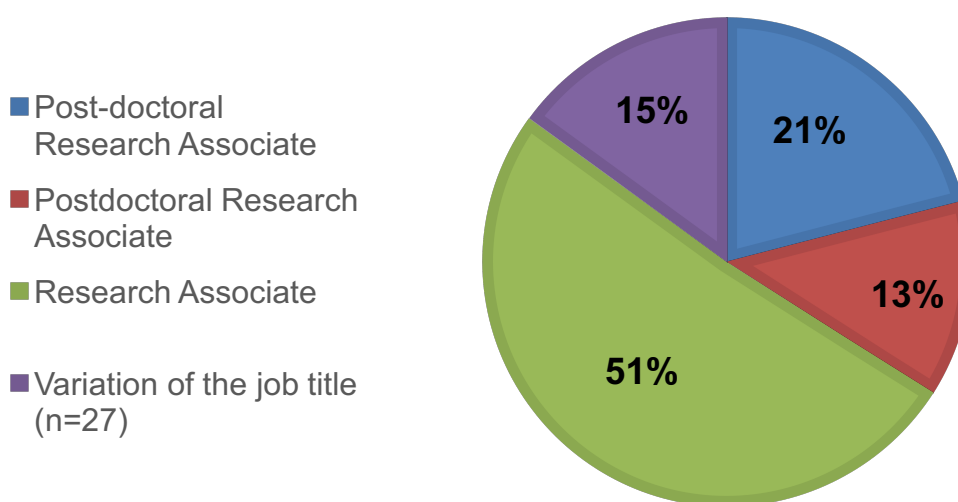
Figure 5. Proportion of different job titles used for researchers at grade 7

The haphazardness and inconsistency in the choice of terms used to describe researchers' positions increases the complexity of any attempt to understand researchers' populations, their field position and the capital they may hold on the basis of job titles. The umbrella term *research-only* staff is in itself a misnomer, as the roles undertaken by researchers go far beyond the restricted scope of research-only tasks. The overall use of the term *researcher* produces field structures giving the *impression* of a flat hierarchy where all researchers are *just* researchers but, in reality, hiding the more complex and subtle positioning of individuals in the field of postdoctoral research.

7.4 Induction practices

Induction rituals could provide symbolic entry into the 'profession' of *being a postdoctoral researcher*, with a clear articulation of moving to a different locus within the field of research, from the sub-field of doctoral research to that of the sub-field of postdoctoral research. In practice, induction rituals for postdoctoral researchers vary greatly across departments, research groups and individual PIs. When a Postdoc starts in a new position, coming from outside the university or from another department, the first point of entry into the institution is by meeting the PI who has recruited him/her. The first spaces encountered may be the PI's office, the Postdoc/ PhD student offices, as well as the lab and the allocated work space, such as the *bench* for experimental scientists. PIs or research group members may give researchers a departmental tour showing them the various research spaces and resources (e.g. centrifuges room, radioactivity room or fly room), and possibly the tearoom (although I had one Postdoc tell me that it took him two years to realise that there was a common room in his department, and that he had never met some of the Postdocs on a different floor). Postdocs may meet the departmental manager, who will be their contact for all administrative matters.

Notably, the induction process is focused on practical issues (e.g. access card, health and safety documents, out-of-hours and fire training). The PI will introduce researchers to colleagues within the research group and researchers sharing laboratory space. The PI will start discussing the project and may share the grant application the Postdoc is paid from. However, researchers almost never get formally introduced to the whole department, the head of department, and to all of the academics and researchers within the department. While it can happen, it remains *ad hoc*. Occasionally, a department may send department-wide emails, when new researchers take a position, but this is an unusual practice. Postdoctoral researchers tend to remain positioned within the confines of the research group, and are not institutionally positioned as departmental staff members, even if contractually they are. Induction rituals matter as they convey, or not, access to various forms of capital and are part of constructing early positioning within the postdoctoral field.

While institutional and departmental procedures can change over the years, researchers have expressed on-going frustrations with induction practices [data from CROS surveys and secondary data from institutional focus groups during 2013 Athena Swan reviews]. The site of such discontentment has been the reliance on PIs' engagement in their role as manager to deliver an induction ritual. Interestingly, when groups of researchers have worked with their departments to improve induction practices, it has remained focused on the practical, administrative aspects (e.g. induction pack, departmental induction officer). Completely omitted from any induction rituals, is the consideration of inducting individuals into the field of postdoctoral research, into their new role within the culture of the department and the institution.

To compensate for such a deficit, in March 2011, I established as part of the *researcher development programme*, a dedicated induction day for Postdocs. During the session, postdoctoral researchers are informed about the institutional structures and support staff, have an opportunity to meet other researchers further ahead in their careers, and are provided with time and space to consider the rules of the game (Bourdieu & Wacquant, 1992, p. 99) about being a researcher. Interestingly, while all new researchers are invited to participate and PIs are reminded about these induction sessions, not all new researchers join the induction day. The reluctance to participate in these formalised induction sessions, of Postdocs or due to the limited encouragement of PIs, could be understood as resulting from a disposition where researchers and PIs consider that the apprenticeship takes place by being in the lab, doing the research, modelling practices on PIs, perhaps what we may call an *osmosis habitus*, and not *talking* about it through an induction session.

In considering their role when starting a postdoctoral contract, some Postdocs may use their job description as framing their positioning in the field. Field structures contribute to the un-noticed field positioning of postdoctoral researchers by institutional agents; this can be observed through the framing of researchers' job descriptions. For example, their role towards learning and teaching activities appears to have very limited scope in the framing of the job

description. In a review of 28 job descriptions for postdoctoral research positions in the Faculty of Science, 60% included 1-2 duties related to learning and teaching (L&T) activities (14% included 2 duties, 46% included 1 duty), and 40% included none, out of an average of 12 duties per job description. Considering the vast array of teaching responsibilities known to be informally assigned to postdoctoral researchers for the functioning of research groups (e.g. PhD and undergraduate project supervision), it is puzzling that such contributions are not inscribed in more formal and detailed fashion within job descriptions. This leads to great confusion and tension for Postdocs, as the capital value associated to their involvement in learning and teaching activities seems uncertain and variable. Researchers can be funded from a great diversity of sources[41], and the expectations of funders regarding engagement in learning and teaching activities will vary. However, these expectations tend to be communicated to researchers by PIs (who may be unaware themselves about the expectations of the funders regarding the non-research activities of Postdocs funded via particular sources).

In some circumstances, PIs may want to have different rules of engagement regarding non-research activities, leaving researchers confused about their position, role and place (Reay, 2004a). In this case, the views of some PIs, with regard to L&T activities, may be skewed towards perceiving a limited value of the academic capital of L&T activities, and may discourage researchers from engaging in such activities, although they may still expect Postdocs to supervise younger colleagues in the laboratory. No mechanism currently exists for monitoring the extent and diversity of the L&T involvements of postdoctoral researchers at faculty-level. While PhD students' involvement is known, as PhD researchers are paid for teaching involvements, Postdocs are not paid anything in addition to their usual salary for teaching. This means that there is no structural process for knowing what actually takes place. This gives the impression of flexibility, where opportunities may be given and taken without forcing Postdocs to be involved if they do not wish to be. Postdocs

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[41] Within my faculty, the research funding for the employment of 65% of research staff (between 2010-2016) came primarily from 6 funders[41]: European Research Councils/ European Commission, Leverhulme, Wellcome trust, Royal Society and Research Councils (MRC, NERC, STFC, EPSRC and BBSRC). The data obtained from RIS included 69 unlabelled funders out of 370 research funding awards in addition to another 34 funding sources.

involvements remains under the radar, neither accounted for, nor acknowledged or recognised. PIs appear much more reluctant to see postdoctoral researchers engage in a diversity of teaching and other scholarly activities beyond research, than they are for their PhD students.

In limiting the scope of induction practices within departments to a purely functional level, instead of a process of socialisation to a new field, a limit to the potential capital accumulation of some researchers could be construed. This is particularly salient in the context of the internationalisation of research, as the field of postdoctoral research may be differently structured across countries. In my view, this induction day aims to spell out some of the *unwritten rules of the game* about transiting through the field of postdoctoral research, articulating the complexities of different types of capital, valued or less so, enabling researchers to consider how they are positioned within the field of research and how they may acquire different types of capital in order to better position themselves. The lack of participation of some researchers to these induction sessions (which I have described earlier as resulting from an osmosis habitus) is often attributed by researchers and academics to a lack of time and busyness. In contrast, I would like to posit this lack of engagement as a process of *misrecognition*, where entry into the new field is not acknowledged and the new rules are not spelt out. The Bourdieusian understanding of *misrecognition* relates to:

> everyday and dynamic social process where one thing (say, a situation, process, or action) is not recognised for what it is… the thing is attributed to another realm of meaning, and, in the process, interests, inequities or other effects may be maintained whilst they remain concealed. (James, 2015, p. 100)

Not formally acknowledging that entry into postdoctoral research is entry into a new field allows the maintaining of strong structures of academic reproduction, as those with sufficient capital at entry will already have a feel for transition in this social space, and so "symbolic capital flows to symbolic capital. The scientific field gives credit to those who already have it" (Bourdieu, 2004, p. 56), while for others it may take much longer and impede effective transition.

7.5 The curious case of the invisible researcher

Among the structural features that characterised the dynamics of differential positioning within the field of postdoctoral research, the notion of *invisibility* is an important contributor to "modes of domination" (Bourdieu, 1998) within the field. Invisibility was depicted through a number of instances described in what follows. Feelings of invisibility were captured in a postcard, produced in 2015, by a group of researchers from non-STEM faculties within my institution, as an act of defiance against such positioning within the field. The card entitled: '*The curious case of the invisible researcher'* resulted from a project called *'Tuning in to the value of research staff'*. The project had enabled researchers to talk to each other about their research, but also to verbalise the challenges they faced in the contemporary research system. As the card parallels observations made in my own faculty, I have included it in figure 7. I perceive it as an evocative plea of researchers to their PIs and the university, towards acknowledging their existence and value in the institution, a consideration of Postdocs as valuable and valued human capital.

7.5.1 Through information confinement

In one case, invisibility could be observed through the lack of information communicated to Postdocs within one department, when some departmental lectureship positions had been advertised externally and no communication was made to the postdoctoral researchers within the department itself. Researchers perceived the lack of communication of these upcoming job opportunities as a form of dismissal; they felt undervalued, by not being at least informed. These researchers were not stopped from applying; if they had been monitoring the university website, they would have known about the job openings. Yet, the lack of internal communication felt different to them. For some, it articulated the low value placed on them by the department, and positioned them within the field as *undesirable* academic colleagues when their transition to academic posts was not even considered.

How to get the best from your Researcher

THE CURIOUS CASE OF THE INVISIBLE RESEARCHER

Primary Investigators (PIs) dream up, create and disseminate excellent research, which in many cases could not happen without the Research Staff. Researchers, usually employed on fixed term contracts, are key to The University of [   ]'s continued success. They bring intellectual commitment, creativity and a thirst for knowledge. When they are 'visible' – invited to meetings, introduced to others in the department and considered as academic members of staff, researchers are at their best and most motivated.

Ensure your researcher has a permanent workspace

Talk openly about how you and your researcher can work creatively together, especially in publishing work together

Familiarise yourself and your researcher with the University policy on research staff employment

Introduce your research staff to other staff in the department

Encourage your department and faculty to establish mechanisms for researcher progression and promotion

Urge others to see the value of research staff

These 'top tips' are distilled from a programme of discussions, workshops and events run by 5 researchers across the Faculty of Arts and Humanities and the Faculty of Social Sciences. These workshops developed useful research skills around storytelling, communication and creative methods of thinking and working; the sessions also revealed the joys of research alongside the more challenging experience of being employed as a fixed term researcher.

Fig 6. The curious case of the invisible researcher.
The two sides of a Postcard produced by a group of researchers from non-STEM faculties following a series of workshops where researchers considered their role in the institution.

7.5.2 *Within institutional strategies and processes*

Invisibility was featured in institutional strategies. Research growth strategies are not framed in relation to the researchers' population. The growth in researcher numbers in academic departments is contingent upon accessing external research funding. Institutional capital is not *processed* through research staff, but the research income or "material capital" (Lucas, 2006, p. 167) brought by academics. In a 2016 document prepared for the faculty by the Strategy, Planning and Governance department, as part of a planning information pack, while projections of academics numbers were considered, postdoctoral researchers were absent, only research income was considered. The unit of power in determining the number of research staff in a department is based on the ability of individual academics to be successful when applying for external funding. The power structure related to the employment of researchers is not held at the departmental or institutional level, but in the very localised site of the research group. The PI as grant holder is, in effect, the employer, not the department or the institution. As researchers come and go with the flux of research funding in departments, rare are those in departments, who know how many Postdocs are employed at any one time. I have encountered many occasions during committee meetings, where academics asked the question: "so, how many Postdocs do we have in the department at the moment?" It is also an indication that departments do not define themselves by the capital that research staff may bring. The capital valued by institutional, faculty and departmental agents comes from the economic capital defined by research income and student numbers.

In addition, there is limited institutional data monitoring of researcher numbers and employment details, length of contracts or even total number of successive contracts. While faculties may keep track of the overall number of research-staff groups, neither departments nor the faculty systematically monitor the demography of different groups of researchers entering and exiting the institution, transfer between departments or other faculties, moves to other institutions, types of organisations or career destinations. During the course of this study, I contacted one of the UK Research Councils funding significant

scientific research, which admitted not capturing and compiling destination data of postdoctoral researchers employed through their research grants.

In another case, invisibility manifested itself through the lack of engagement of PIs with the institutional rewards system[42] to the detriment of Postdocs. A review on the introduction by HR, in 2016, of institutional reward mechanisms enabling non-salary based rewards, identified that nominations for postdoctoral researchers on grade 7 represented just 4.9% of all rewards in the faculty, with 63% nominations awarded to individuals and 37% to teams. Considering they represent a fifth of staff in the faculty, it may be useful to question the meanings of this underrepresentation in institutional rewards for this staff category, and the impact of such denegation. For PIs, rewards equate with scientific capital and publication outputs. A consideration of rewarding their Postdocs with small institutional rewards does not sit within their own logic of practice.

Invisibility is also played out in institutional ceremonials, such as graduation. Postdoctoral researchers who teach the art and manner of doing research to undergraduates, Master students and postgraduate students daily in the research space of the laboratory, are not afforded the recognition of a proper member of staff, by not being invited to participate in graduation. Postdocs themselves are again likely to say that this oversight does not really matter, that this is not what will help their career. If Postdocs were invited to such an event, they may even dismiss the invitation, feeling that this is not what will help them get data and publish. However, by maintaining postdoctoral researchers on the margin of the academic institution, their invisibility aims to maintain the status quo of the transitory nature of their positions. In a similar fashion, Reay (2004a) concurs:

> prevalent objectification of contract researchers and the dominant image that they are not proper 'academics' neatly encapsulate the lack of recognition and undervaluation of contract researchers which permeates both policy and practice within academia. (p. 37)

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[42] There are different types of rewards: individual, team-base and thank you notes

7.5.3 In physical and digital space

Invisibility reveals itself through physical and digital space, reinforcing the transitory nature of researchers' residency within the institution. This invisibility starts with the lack of effort made by departments to put the names of postdoctoral researchers on the doors of the offices or laboratories they occupy. The names of the PIs will be on the doors, but those of the Postdocs only occasionally. While postdoctoral researchers may just print themselves a list of names and pin it on the doors, the trivial act of acknowledging *who is here* does not feel an important matter and is rarely afforded any consideration at departmental levels, since researchers are transient populations in departments. The same goes with updating physical display of departmental staff photos; researchers may spend their entire contract without having been added to these displays. Invisibility is played out within the digital space as well. Online institutional information about individual postdoctoral researchers is often very limited, usually restricted to name and contact details, and mostly embedded hierarchically under the PIs' group webpages. While departmental webpages offer individual pages to academics, this is not the case for postdoctoral researchers, who rarely have their own webpages embedded within departmental sites. In some departments, webpages display staff under 3 categories: academics and independent research fellows, outreach/ support staff and emeritus/retired academics, but Postdocs do not come under any visible staff marker, except within the departmental phone book.

7.5.4 Embodied invisibility

The structures that institute *invisibility are "*structuring structures" (Bourdieu, 1977), constructing an embodied *invisibility habitus*. The structures of the social space become incorporated into the wholeness of the individualised body, shaping thinking and behaviour: "habitus as embodiment" (Reay, 2004b, p. 432). For example, to remediate to digital invisibility[43], an academic, member of the Faculty Researcher Development Group was attempting to set up individual webpages for Postdocs to display their research interests, career history,

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[43] Such requests have been fostered through the work of the Faculty Researcher Development Group and researchers' representatives challenging departments about such oversights.

technical skills and publication records; however, the uptake by researchers was very slow [case from one biology department], almost accepting that their invisibility did not matter.

An invisibility habitus may be observed in the way researchers introduce themselves, by giving the research group/ name of the PI to which they belong, instead of positioning themselves as individual agents (this can be observed in face-to-face interactions, but also through the types of information displayed by researchers in email signatures). For example, some researchers will say: *"I am X and I am in Dr Y's laboratory"* instead of considering saying, *"I am Dr X and I work on Z"*. Some Postdocs even go as far as to say that naming the lab: "it defines us" [Athena Swan discussion]. The structures of invisibility may undermine individuals' capital. Alternatively, naming the PI when introducing oneself, or including the name of the lab/ PI in an email signature, could be perceived as a way of displaying symbolic capital if a researcher works with a renowned academic. Harmon-Jones et al. (2009) conceptualise display of capital in email signatures of academics, "to communicate their accomplishments to others" as a form of *symbolic self-completion*, although they comment that "groups and individuals with fewer indicators of success in the academic realm were more likely to display other indicators or symbols of success on webpages or in email signature files." (p. 311 and 312).

In other ethnographic observations, researcher *invisibility habitus* is encountered in researchers' way of being and talking. For example, Benninghoff and Sormani (2008) described instances where researchers make themselves invisible, by dismissing the importance of their own name while emphasising the PI' s name, or diminishing the importance of their own contribution by saying that their work is just part of a much bigger project led by the laboratory director. Together, these practices contribute to "indicating the restricted scope of [his] entitled expertise" (p. 15).

7.6 Corporeal space of Postdoc work

Our imagining of innovative and creative scientific spaces seems to see congruence in having spaces where all involved in research are together, *in the same boat*, with spaces for exchange of ideas, technical and scientific support, or discussion of results. In the scientific field, such spaces may be envisioned as the laboratory space or the shared offices where everyone from a *lab* is together, from research assistants to postdoctoral researchers. Occasionally, Postdocs may have separate offices from PhD students, but this is not systematic.

I was struck by a symbolic feature in the organisational space of offices in one of the departments of the faculty. The separateness of field positions between academics and researchers was made visible through a long, silent corridor, which separated the academics' single occupancy offices on the right when entering the corridor and the mixed offices for PhD students and Postdocs on the left. This long and narrow corridor between the two sets of offices felt like a metaphorical representation of the possible boundaries between field positions. I visualised this corridor in my mind as a river with a strong current, flowing wildly; researchers trying to cross the stream using improvised floatation devices, or building makeshift constructions. Physical spaces construct meanings. While postdoctoral researchers may not find it problematic to inhabit the same office space as PhD students, and such close proximity is useful for the experimental socialisation of new PhD students, I suggest that this could act as a *fuzzying* of the field boundaries between doctoral and postdoctoral fields. One of the researchers interviewed described her transition from PhD to Postdoc as a "subtle transition", where she didn't "even realise that I'm not a PhD student any more". Postdoctoral researchers are not afforded any further symbolic capital for being a Postdoc compared to being PhD researchers. This contributes to Postdoc positioning within the field of research. Researchers may continue to work in the same way they have as PhD students, acquiring new knowledge and technical expertise of course, but inhabiting the same physical space and being *on the other side of the corridor*, not shifting their gaze to new forms of capital required for transition within the field.

For many experimental researchers, a large proportion of the day is spent in the laboratory, and little time during each workday will be spent in the office. The locus of work is not the office, but the lab. This means that *being seen as working,* for Postdocs, is to be seen in the lab. Many researchers do their reading, writing, analysing and thinking not during the work day, but late at night, at home. The research environment positions postdoctoral researchers as the *busy bees* doing the experimental work, keeping some of the intellectual engagement separate that may further their volumes of capital. Reay (2004a) goes as far as talking about contract researchers' positions as "academia's domestics" (p. 34). This is a site of struggle, as Postdocs will need to *steal* time to do their writing and thinking. Some researchers are able to subvert this dichotomy and take control of their time, in order to advance their careers. But the saga of academic success stories constructs a rhetoric that, to succeed, Postdocs mostly need to be in the lab; that without actually doing the research nothing will be possible. The symbolism expressed in the physical separation of *office* and *lab* frames the work of the postdoctoral researcher in two separate spheres, establishing a 2-tier hierarchy of academic situatedness.

7.7 Integration of postdoctoral researchers into institutional structures

Postdoctoral researchers are rarely involved in institutional decision-making structures and processes. Across the university, there is a formal governance structure with numerous committees and sub-committees (around 40), as well as various departmental committees. The commonality between these committees across the institution is the absence of a membership drawn from the postdoctoral research staff population. Postdoctoral researchers do not get invited (or only very occasionally) onto these committees. This is particularly striking, considering the proportions between academics and research staff are equivalent across the institution (both academics and research staff represent 17% of staff) and the faculty (25% of academics, 31% overall research staff with 22.6% of grade 7 Postdocs) [2015 data]. What is important to consider

here goes beyond an issue of fair representation, but the meanings of such institutional structures.

In response to the researcher development initiatives, a number of university-wide committees and sub-committees have been appointed, since 2010, to address issues, strategies and policies related to both doctoral students and research staff. However, the combined initial terms of reference seemed to have been to the detriment of research staff. Only in June 2014, 12 years after the Roberts recommendations, did the institution establish a formal institutional committee[44] (reporting to the University Research and Innovation Committee, which itself directly reports to Senate), dedicated solely to research staff: the Research Staff Development Committee. Notably, the equitable representation of the Postdoc/ research staff community on this supposedly research staff-focused committee had been minimal. While one academic per faculty was recruited, only one research staff member represented the interests of researchers from 5 faculties. The Chair was reluctant to increase the size of the committee and considered the membership adequate. We were told that if Postdocs really wanted to have a larger representation, they should contact the chair directly to make the request. The majority of Postdocs having never been involved in formal university-wide committees, I felt that expecting them to place such a request seemed to disregard the limited institutional capital held by Postdocs and mask the positioning of researchers within the field. Eventually, the committee accepted the recruitment of 2 representatives (STEM and non- STEM faculties). It took several rounds of discussions and a change in committee chair to finally obtain equitable representation of one researcher representative per faculty.

Similarly, at departmental level, there is often confusion about the participation of Postdocs in staff committees and staff meetings. In one department, for example, only one Postdoc representative is invited to the staff meeting. In another department, Postdocs are invited, but no standard agenda item is set for postdoctoral researchers and very few attend. In some instances, Postdocs

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[44] It is interesting to note that, as of December 2016, this committee, while visible in the pages of RIS, is still not included in the map of formal university committee structures on the university governance webpage.

may receive emails about staff meetings, but are unsure whether they are allowed to take part. When Postdocs are formally invited to attend, but do not participate, academics are quick to conclude that this indicates Postdocs are not interested, and that they know they have better things to do. When asked about the position of Postdocs in relation to the rest of the department, one Postdoc commented: "Postdocs are very insular- they just go into the lab and have no reason to engage". Similar withdrawal from institutional functions is seen in the difficulties faced in the recruitment of Postdoc volunteers to be part of committees for the Postdoc researcher societies.

When challenged on the issue, academics argue that Postdocs are *not academics* and not employed for dealing with administrative responsibilities. Postdocs themselves see their time better invested in research, and say that participation in such activities is of no value to academic progression. At face value, academics do not consider committee memberships as an academic socialisation process that could be of any benefit to postdoctoral researchers. Different logics of practice seem to apply here. Membership of such committees is considered when reviewing academics' CVs for promotion, but, in contrast, academics will repeat that committee memberships do not contribute to decisive selection criteria in lectureship recruitment. However, no consideration is given to the cultural and social capital accrued through participation in such committees, nor of the organisational contribution Postdocs could make, in addition to research outputs. Arguably, committee work may be of limited use to transit within the field of postdoctoral research, but may be of substantial relevance in other professional fields (which researchers are likely to move into).

7.8 Summary

In this chapter, I have described how the structures of the field of postdoctoral research can be observed through a number of practices that contribute to positioning Postdocs within the field. These structures are structuring a Postdoc habitus that has embodied flux, osmosis, and invisibility. The doxa or "misrecognition of forms of social arbitrariness" (Deer, 2014, p. 114) of the

postdoctoral field becomes constituted through these structures and practices, establishing a valuation of practices (Fochler et al., 2016) in academic work. Postdoctoral researchers become socialised to the valuation of scientific capital above all other capital, by *being removed* from institutional practices. This constructs a future academic habitus, where the logic (Bourdieu & Wacquant, 1992) of academic work is about research, entrenching a "hierarchical ordering" of all academic activities (Lucas, 2006, p. 61).

Symbolic capital is denied postdoctoral researchers, by their not being afforded the status of active contributors to institutional functions, structuring their position as invisible knowledge workers in the field of postdoctoral research. Postdocs start to deny themselves possibilities for integration and a voice within the institution; they incorporate within their habitus the structure of the institutional space that limits their integration, with the intent of focusing their efforts on knowledge production. Postdocs may indeed follow the expectations set by the institution and academics of not being interested in contributing to institutional structures and activities, renouncing the scope to reach broader capital.

Chapter 8
The habitus of Postdoctoral researchers

8.1 Introduction

In chapter 8, I have analysed the experiences of being and developing as researchers, to contribute towards answering the research question: *RQ3- How do postdoctoral researchers develop a feel for the game to transit through the field of postdoctoral research?*

The analysis started with a thematic exploration of researchers' narratives, and was also informed by ethnographic encounters and secondary data. Following this stage, critical elements in researchers' experiences were explored under the gaze of Bourdieu's thinking tools. I have identified ways of being, of thinking, but also approaches, practices and actions contributing to differential positioning within the field of postdoctoral research. My analysis combined exploring practices contributing to accumulation of different types and configurations of capital that provide spaces of possible within the field; and also position-taking within the field of postdoctoral research: the "choices [they] make about the desirability of any particular position" (Hardy, 2012, p. 230; Thomson, 2012). Taken together, this constitutes an exploration of the habitus of postdoctoral researchers. Understanding *researcher development* within the field of postdoctoral research through the use of *habitus* pertains to viewing choices and actions as the embodiment of previous and current experiences, the "amalgam of accumulated history, both personal and collective" (Adams, M., 2006, p. 515). Habitus can help us view researcher development as a practice, realising agents' trajectory through the field of postdoctoral research. Through this approach, we can:

> Understand practices for what they are, namely complex, situated actions with a range of precursors and a range of consequences, anticipated, unanticipated, highly visible and less visible (Reay et al., 2011, p. 26)

In my analysis, I follow a similar approach to Mendoza et al. (2012):

> Agents…in social fields are distributed according to three dimensions related to capital: volume or amount of capital, distribution of types of capital, and the trajectory in the social space in terms of the evolution over time of the volume and distribution of capital acquired. Those who are located in close proximity within social fields are placed under similar conditions and subject to similar factors; therefore, they are likely to

> exhibit common dispositions and interests that translate into similar practices and representations. In other words, those in close proximity in social fields share the same habitus. (p.559)

I have schematised, in Figure 7, the 3 dimensions of capital (Bourdieu, 1988, 2004) that may be acquired in the field of postdoctoral research: scientific, social and academic .
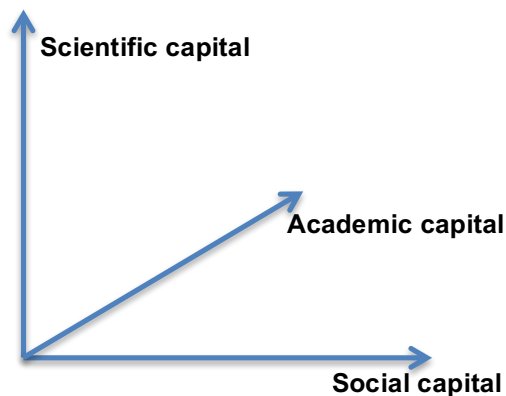

Figure. 7. Schematic representation of 3 dimensions of capital. The possession of variable levels of capital along these 3 axes establishes for each individual, a volume and configuration of capital that contributes to offering "a range of position" (Hardy, 2012, p. 230) within the field.

The capital that postdoctoral researchers can access in the field of postdoctoral research is an "institutionalized form of cultural capital" (Naidoo, 2004, p. 458). Different terms are used by Bourdieu to describe capital in HEIs: academic, scientific, intellectual (Bourdieu, 1988, 2004). On the basis of interview and ethnographic data, I have collated different types of practices in the field of postdoctoral research that mediate access to various forms of capital. I have organised the classification as follows:

- **scientific capital:** relates to research and its forms of recognition, such as papers and grants, but also approaches to developing scientific knowledge and expertise.

- **academic capital**: relates to knowledge about how to do things in academia, such as knowing about funders, writing applications, or engagement in activities beyond the restricted focus of the PI's research project. It includes activities considered peripheral, such as teaching or public engagement.

- **social capital**: relates to connection to a broad network that brings substantial symbolic capital.

I have described, in table 4, some of the practices mediating these different forms of capital.

Table 4. Practices mediating acquisition of capital in the field of postdoctoral research		
Scientific capital	Academic capital	Social capital
Developing expertise in new techniques/ methodology	Developing side projects different from research contract project	Working with known/renowned PI or PhD supervisor (*pedigree*)
Applying techniques to new system (e.g. to new model organism) or bringing new techniques to own research system Connecting different areas of research	Accessing independent funding (e.g. Research funding, travel funds, outreach funding) - *Experience of applying for funding* - *Experience of being successful in accessing funding* - *Understanding of the expectation of funders and how to write a funding application* - *Awareness of the funders and areas with availability of funding*	Institutional location of UG/PhD degrees
Gaining broader scientific knowledge by changing field, topic or area of research	Participating in non-research activities: - *Being a Postdoc representative on a departmental, faculty or university committee* - *Establishing a research network* - *Delivering outreach and public engagement activities contributing to the impact agenda*	Rank of the institution where research projects have taken place and/or renowned research group

Developing a good publication record	Teaching: - *Formal or informal* - *Sought or imposed*	Size of the research group
Publishing in high impact factor journals	Supervision of UG/ Masters students on project developed by Postdoc	Possession of own collaborators, independently from PI
Receiving prizes	Being a reviewer for journals or funders	Being known by others in the research field as having a specific, particular expertise
Developing instruments, techniques, methodologies usable by others	Reflecting on previous experiences and considering other options	Experience of interactions with senior academics
Developing new research ideas or Focusing on a research aspect that no one else is looking at.	Negotiating with PI that side projects and fellowship applications are as important objectives as research project objectives.	Convincing experts to help you
Continuing to engage in project after funding has run out	Changing lab when having learnt enough techniques or realising it may not be a good enough research environment anymore	Socialising with other researchers
Adaptability in research approach (changing approach if something else better appears even if different from written funded application).	Organising research conference, choosing topics, keynote speakers, introducing and chairing sessions.	Negotiating job location with family needs (not capital in itself but element mediating other forms of capital)

To guide readers towards an understanding of researchers' habitus, I start by presenting the career history and PhD experiences of the study participants. These have shaped their individual habitus towards entry into the field of postdoctoral research. I describe modes of entry into postdoctoral research as position-taking within the field, prior to presenting an analysis of different habitus within the field of postdoctoral research.

8.2 Postdoctoral participants: career history overview

Bourdieu's work and Boudieusian studies have extensively explored the role of early experiences and different experiential contexts (e.g. race, gender and class) in shaping the complexities of individuals' habitus (e.g. Bourdieu, 1988; Rapoport & Lomsky-Feder, 2002; Reay et al., 2011). However, this study has limited the scope of its exploration of habitus, starting with early scientific socialisation during the doctoral period, followed by entry into postdoc position and, finally, through the experience of being a Postdoc. This approach parallels recent use of Bourdieu's concepts in the study of scientists (Mendoza et al., 2012; Sidhu et al., 2015). Researchers were not asked about family or early educational backgrounds during interviews.

The Postdocs interviewed varied between individuals who were within the 1st year of their Postdoc [Sadie], to researchers who had the experience of multiple research contracts (with up to 8 years as a Postdoc [Neal]). Some of the researchers were actively seeking transition to the next career stage. For example, Kendra (in her 2nd Postdoc position, for which she had accessed funding as a co-investigator) was in the process of applying for lectureship and fellowship funding; while Charlie, who had gained her second fellowship, was applying for senior fellowships. This researcher[45] was the only one who had experience of working outside the UK as a research fellow (not employed on a PI's grant). All of the non-UK researchers had gained their entire postdoctoral experience within the UK, with 2 [Sadie and Victor] of them having done their PhD in their home country, and a 3rd one [Isabel] in between the UK and her home country. One [Sadie] had done a PhD abroad spanning a longer period than in the UK, and another one [Zoe] had started a PhD as a mature student when moving to the UK from overseas, and after having worked as an engineer and a teacher. One researcher [Zoe], employed on a Postdoc contract, had previously worked with independent funding, on projects she had applied for. All researchers, except one [Neal], had changed research group (three having changed multiple times). There was a wide spectrum regarding shifts in research topics between PhD and postdoc positions.

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[45] Strictly speaking this researcher was not employed on a postdoc research contract, but her experience and perspective was an important illustration of field position.

The diversity of career history and situations was a reminder that employment as a researcher merely represents a structural feature, associated with the temporary nature of research funding, and is not a sociological characteristic indicative of a particular volume of capital, level of research maturity or independence, nor is it an indicator of the length of employment in research. The volumes and configurations of scientific, academic and social capital that researchers hold and that contribute to their habitus can appear at odds with their temporary status and position, within the hierarchy of the institution and the field of postdoctoral research.

8.3 Doctoral socialisation: shaping researchers' habitus

Researchers described a vast range of formative doctoral experiences. Several researchers made no mention at all of their PhD supervisors, while others talked about them being too busy or "hands-off". Two researchers [Isabel and Zoe] had, in effect, to change supervisors; one of them because the supervisor did not have enough knowledge about the research project he had offered and the other because she felt her supervisor:

> *"was very unhelpful and not very…I felt it wasn't going anywhere"*
> *but also,*
> *"things with my normal supervisor kind of got out of hand" [Zoe].*

The manner in which these two researchers chose to replace *deficient* supervision was an important experience in constructing their habitus.

When Isabel started her PhD, she had already experienced success in accessing research funding. The reasons for her choice of PhD supervisor and lab had been two-fold: firstly, based on the potential offered by the supervisor and the group's accumulated capital:

> *"he was very strong in his field and he had this spin-out company…his group was really strong and it was a big group"* [Isabel]

and, secondly, she had a strong personal interest in the research topic. The reality of working with this supervisor did not match her expectation. He had no time for supervision, lost interest in the project, and did not have the scientific expertise needed. She had to decide whether to abandon her PhD and start again or not. She was aware that stopping would mean losing the symbolic capital of her prestigious PhD funding award. She identified an alternative solution by gaining funding to travel and access scientists with the required expertise. She finished her thesis in the UK, whilst working as a research assistant; she submitted her thesis in her home country without any input from her supervisor. This experience shaped her as a very independent researcher, without a strong bond to any particular senior academic.

Zoe described two very different experiences of PhD supervision, with an initial supervisor that she "dumped". Her department, aware of issues with this particular supervisor, was supportive in letting her access another academic. She described the supervisory transition as: *"I basically had to adopt a PhD supervisor"*. While she was still being supervised by the first one, an academic from the department had requested some input on a project requiring a set of specific skills, which she had. She made the decision to help this academic with the idea that he may then accept to be her 2nd supervisor. She became aware of the capital she held. Firstly, through having a specific set of scientific skills needed by this 2nd academic and, secondly, by being able to transfer her PhD studentship funding:

> *because the funding stayed with me, both for the project and for me, you can imagine that I became a very desirable student to have, so I had several approaches from several people and I got to choose the person. [Zoe]*

In the end, because she enjoyed working with this other academic, she asked whether he would accept to supervise her. She was very positive about her experience in this second supervision relationship and about being given freedom to explore. Interestingly, she was not sure whether this sense of freedom had come from the supervisor, or whether she had claimed it. She described the relationship as particularly influential in having shaped her thinking about how to ask and answer research questions.

Studies concerned with doctoral researchers argue that the institutional environment (through department/ research group/ PhD supervisor) by contributing to the socialisation of researchers, influences careers post-PhD (Hottenrott & Lawson, 2015; Weidman & Stein, 2003; Weidman et al., 2001). Few participants, except Charlie, mentioned the influence of PhD supervisors on the acquisition of academic or social capital. Charlie was the researcher with the highest volume and a distributed configuration of capital. She provided numerous examples of opportunities offered by her PhD supervisor (who she described as adapting his approach to supervision, based on the career desires and aspirations of students), such as reviewing papers and discussing reviewers' comments with her. A particularly significant example in the approach of developing academic capital within her lab had been the organisation of a lab retreat that included many elements of developing an understanding of academic practices: grant writing practice, writing lay summaries, cover letters for paper submission and feedback on each other's writing and proposals. Whilst running such a lab retreat does not seem particularly innovative, retreats are in reality extremely rare in research groups. Charlie felt that spending time away from campus and the lab, being immersed and focused on elements other than the experimental side of research practice, was critical:

> I think at the time I knew that was useful but looking back I realise that was phenomenally useful…like the things that you need to know as you progress through your career but you never do because there's always an experiment to do. [Charlie]

Through this retreat, Charlie was developing an understanding of the *rules of the game* for academic progression, such knowledge was contributing further to her acquiring academic capital. Additionally, she had been involved in an international research network that enabled ECRs to converse with scientists from multiple labs. The ethos within this research network had contributed to making her feel like an equal member.

As illustrated in these examples, researchers left doctoral studies with diverse habitus and volumes of capital. For some of the interviewees who hardly mentioned their PhD experience, I was able to explore their habitus further through their approach to entering the field of postdoctoral research.

8.4 Entering the field of postdoctoral research

Approaches to entering the field were the result of complex combinations involving networks of dispositions acquired during doctoral studies (doctoral habitus), constellations of motivations, strategies, expectations, circumstances and discourses. The motivation to acquire and ownership of different types of capital contributed to the choices made about where, with whom and on what topic to do a postdoc, or the approach to accessing a postdoc position. Zoe expressed the complexity of these choices as follows:

> *Yeah, I think my career is probably, is a mixture of indecisiveness and sort of circumstances but also quite a lot of active choices, you know at different points. [Zoe]*

I describe how researchers negotiated the pathway to postdoctoral research, deciphering how to *play the game* for successful postdoctoral research periods. I present 3 modes of entry that appeared among the 9 researchers interviewed, contributing to their positioning within the field.

8.4.1 Entering the field on a 'high'

Entering the field on a 'high' meant entering with a high volume of capital, although the configuration of capital could be variable, leading to important differential positioning in the field.

When Charlie entered the postdoctoral field, she had already accumulated significant capital. Not only did she come from an excellent lab in a reputable institution, but she had also been able to publish a high impact journal article as a joint first author during her PhD. In addition, she had acquired substantial academic and social capital stemming from the very supportive approach of her PhD supervisor. To help her decide where to undertake her postdoc, her PhD supervisor had not only suggested but also financially supported several weeks of visits for her to give talks in labs across North America. This experience was critical in getting her to vastly increase her network. Whilst she was interested in staying in the same research domain and continuing to ask similar questions, her focus was to: "expand both my technical knowledge and my sort of scientific knowledge". She only realised afterwards that her choice had been

about creating her research niche, about bridging a knowledge gap. Her choice of laboratory (one of two in the world doing the type of work she was interested in developing) was based on her critical evaluation of the scientific quality and trust of the work coming out of the lab. She really liked the science published by the group and felt that this research group could "really push the boundaries":

> *they're a really good solid X lab, and that's why I wanted to learn. And all the papers that had come out of their lab that I'd read were just really good and really carefully done and just…I thought it was a good lab to go to really learn how to do science. I'd come from a good lab anyway for my PhD but I just thought this was another good lab who were doing science really carefully, like you could always trust their results and they'd always done the controls, and they were quite careful in their analysis, and their conclusions were always very much based on their data and they would only conclude what they had evidence for, they wouldn't sort of…there were lots of things that they could have said in their conclusions and they didn't because you couldn't back it up, so they're not….they wouldn't like lie? [Charlie]*

With the support and collaboration of her PhD supervisor and the PI from her chosen lab, she applied for fellowships on the basis of findings from her PhD. She was successful with her three applications, further accumulating symbolic capital through this success.

Isabel was also interested in obtaining a toolbox of new techniques; in contrast to Charlie, she did not frame progression to her 1st postdoc around building a personal research narrative, but more on applying her broad technical expertise to other scientists' research questions. Through a very challenging PhD journey, Isabel had developed a very independent research habitus adapting to circumstances and finding her way through the research system. She entered the postdoc field on a high, in terms of her excitement and joy for the science (going back to interdisciplinary work which she missed), applying her technical expertise to lots of different research areas ("opening a box of toys for me"). However, she somehow seemed less strategic than she had been as a PhD student. This also contrasted with her awareness of laboratory positions within the landscape of research. Although she had learned a great deal of experimental techniques in her department, she became aware that it "was going down a bit" so chose to make a change. Her PhD habitus (great sense of independence) shaped her choice but a lesser volume of capital, and less

diverse capital configuration compared to Charlie, positioned her in quite a different position within the field (she was employed on a research contract not as a research fellow and worked on other PIs' projects not on an independent project).

8.4.2 Mobility and temporality at the point of entry

In the context of a "stylized narrative" in mobility discourse (Carrozza & Minucci, 2014, p. 27), and "mobility fetishism" (Bauder et al., 2016), where mobility *per se* may be serving "as a measure of academic excellence" (p. 8), Postdocs need to develop their own *feel for the game* and decide how they may want to play the game.

For her 1st postdoc, Kendra had accepted a 3-year research contract in the same department where she had done her PhD, instead of a 1-year postdoc position in Italy. The topic offered overseas was close to what she had done during her PhD, but had a focus on technique development. She described her choice being about *reason above adventure,* when abandoning the opportunity of mobility, but also about the structural advantage of a longer contract:

> *it was purely a choice between a one-year contract and a three-year contract…yeah I chose to stay in X on that contract, that was mostly because it was a three-year job to be honest. [Kendra]*

Her decision to stay in the same institution offered a different type of mobility, research mobility:

> *And the topic of the research was a lot more inspiring and I saw more of a career in that area of [X] rather than what I would have been doing for a year in Italy, which was really method development stuff. [Kendra]*

She shifted research focus and changed research group. She felt that the shift in research emphasis could sustain her interest throughout the course of a career, and offered more future opportunities.

Physical mobility was shaped by different aspirations. For Sadie, her choice was about the desire to experience research life abroad and moving to the UK for her 1st postdoc seemed timely, since moving abroad later appeared less probable. In contrast, Victor's choice of being mobile was linked to his

perception that the symbolic capital associated with international mobility may help him progress in his home country's academic system. Sadie had originally started to apply for several postdoc jobs, with the idea of "trying to branch into a different field[46]", but a position with a research topic very well aligned to her own PhD and with a well-known PI had appeared on the job market. So maintenance of her research habitus was balanced with the symbolic capital perceived in working with a renowned scientist. For Victor. his postdoc choice was based on trying to extend his social capital by joining a project network with 8 institutions, which he considered an excellent "research community". His choice was pro-active, as he contacted laboratories directly to express interest in joining research groups, but he chose to stay within a similar research area.

For one participant, Neal, notions of temporality rather than mobility were more attuned to his feel for the game in shaping his Postdoc choice; postdoctoral time was perceived as needing to provide sufficient longevity and continuity to focus and develop a very specific line of enquiry. This led him to stay and work with the same supervisor on the same research topic throughout his research career from his UG Masters project, his PhD and now in his 3rd postdoc contract. During his PhD, he had developed what he considered:

> *a couple of different techniques that were very promising I thought and they're quite niche… And I wanted to continue trying to progress those, was the main reason really. [Neal]*

He acknowledged that his lack of mobility (physical and research) might limit his career prospects, but temporality was a salient choice from his point of view:

> *staying in the same place for a long time has allowed me to have a lot of continuity and to develop things that I wouldn't have been able to develop, and publish things that I wouldn't have been able to publish if I'd have kept moving. So yeah it's good I think. I'm able to do very interesting research which motivates me [Neal]*

Other temporalities appeared through structural limitations; the opening of a postdoc position, at a time when funding has come to an end, may be the main motivation to accept a position. In the case of Zoe, she had worked for over a year on her own projects with independent funding, and had used this period to

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[46] In the quote the use of field means particular disciplinary domain of research

write papers based on her thesis, develop new ideas and create collaborations. When her funding finished, she had to make challenging decisions about her career. Not wanting to up-root her family, she had to come to terms with not applying for a "fabulous kind of postdoc, fabulous opportunities in different universities". She accepted applying for a postdoc in her PhD department following encouragement from her adviser who had said to her: "just do it", even though the topic was not really her area of interest. Although her habitus encompassed a very strong agency, having made very active choices throughout her career, and having done a PhD as a mature student while raising children, her transition to her Postdoc position felt like "a career but a compromise".

8.4.3 Emotional leverage in Postdoc choices

In two cases [Elena/Jed], entry into the field was linked to emotional components, albeit quite different from each other.

Elena described being offered a postdoc position through happenstance, following a conference and striking up an informal conversation with a PI. Within the traditions of scientific research, the scientific conference is an important site of practices that structure networks of interactions, reputations, and beliefs. If an academic attends a researcher's talk, likes the way he/she thinks about their research, and gains confidence that the researcher is experimentally skilled, this could be sufficient for an academic to offer a researcher a job opportunity. Elena's decision to accept the position appeared to be based on following her emotional intuition. She simply felt that the PI seemed like *a good person to work with*. The relational and emotional dimension in her choice was also visible when she talked about not considering doing a postdoc in the US, because of the reputation of intensity and competitiveness within American research labs; she felt that this would not be an environment in which she could thrive. She did not seem to take into account a long-term view of her career progression or a projection of the future acquisition of capital.

A different emotional element was observed with Jed's career history. His decision to do a postdoc was based on discontent with his PhD experience. Although he described the work undertaken in his research group as good science, he felt that due to his supervisor's approach to laboratory management, the lack of funding and investment in the infrastructure of the laboratory had meant that research had been "low throughput" and research outputs were not what they could have been either. Doing a postdoc meant attempting another, and hopefully more satisfactory, research experience in a different environment, to decide whether he *still liked science*. Jed did not seem particularly astute in his approach to where to do a postdoc; he was merely approached by a PI from his department while being on the redeployment register (after demonstrating at the end of his PhD and doing "odd jobs" across campus). As such, Jed entered the field with limited capital and his choice was not linked to considerations about positions within the field of postdoctoral research or acquisition of capital.

Following the presentation of participants' doctoral experiences and entry into the field of postdoctoral research, I continue to explore the Postdoc's habitus through considering researchers' trajectories within the field.

8.5 Trajectory of actors within the field

In this section, through analysing participants' narratives of their experiences, entry and trajectory in the field, I have compared how different individuals had or were accessing different types of capital, and compared the 'volumes' of capital for each individual. I have schematised the volume and configuration of capital for each researcher across the 3 axes of scientific, social and academic capital, in order to understand positions of researchers within the field (Figure 8). Figure 8 is a schematic visual representation; it does not result from a formal quantitative analysis or intend to represent precise quantitative volumes, it is only used to help visualise and conceptualise positions in the field. I organised researchers across a spectrum of volumes for each capital and applied this strategy for the 3 dimensions of capital. The visual illustration

results from plotting on the 3 axes what I understand to be the volume and configuration of capital. The size of each bubble represents the volume of academic capital, positions on the x axis represent relative volume of social capital and positions on the Y axis the relative volume of scientific capital. The development of this representation was iterative and made an important contribution to my reflections on different positions within the field. This representation was inspired by theoretical schema developed by Bourdieu (Bourdieu, 1984, 1988), but is the result of a qualitative analysis and not multiple correspondence analysis, as used in some of Bourdieu's schemata.
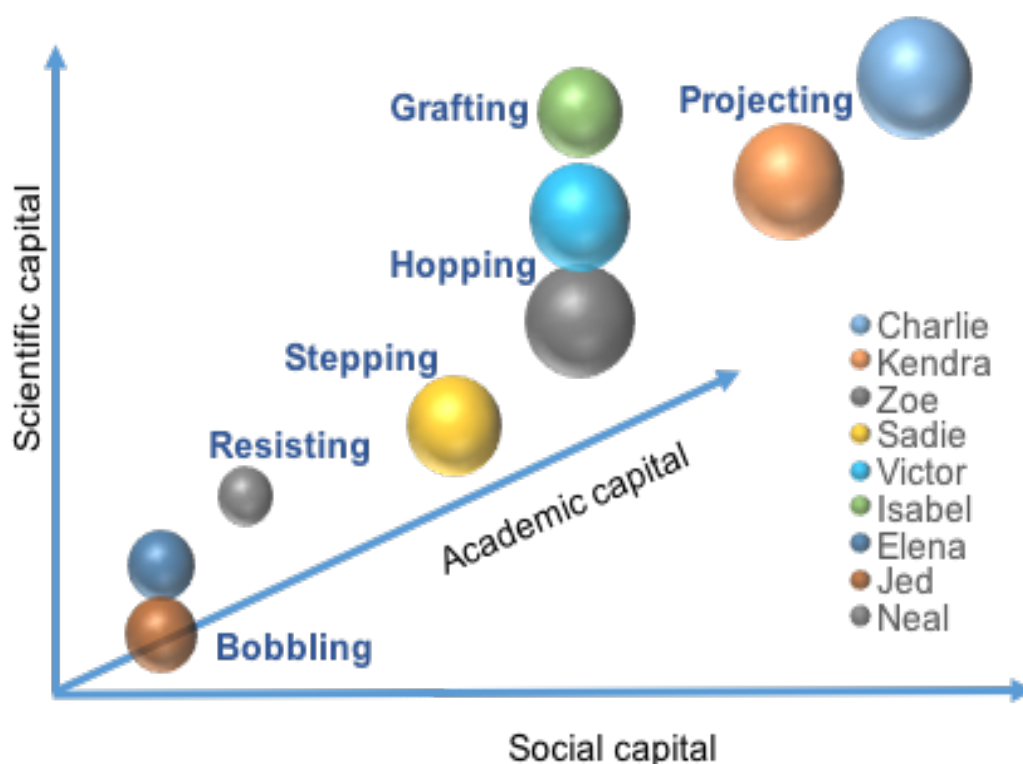
Figure 8. Schematic representation of participants[47] configuration of capital

On the basis of the postdoctoral participants interviewed in this study, I have conceptualised 6 domains of positioning in the field of postdoctoral research: *projecting (n[48]=2), grafting (n=1), hopping (n=2), stepping (n=1), resisting (n=1) and bobbling (n=2).* These domains represent different ways of seeing, acting and thinking about developing as researchers. They represent positions in the

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[47] Victor, Elena and Jed were researchers from the other institution (see chapter 4). I have used data from these interviews in the findings as they brought experiences not observed in the participants from my institution.
[48] n represents the number of participants identified with a particular field position.

field and, as such, particular postdoctoral habitus that result from different volumes and configurations of capital, and previous experiences, as well as agents' position-taking in the field. I have labelled these domains mostly with words describing different types of motions, to illustrate that the Postdoc habitus, as a disposition, contributes to trajectory within the field. One habitus is described with the non-motion word *grafting,* as it relates to a particular metaphor described by the researcher within this position.

It is important to bear in mind that this is a small scale study with 9 researchers whose habitus were explored. The field positions and habitus conceptualised and presented here, are by no means exhaustive within the field of postdoctoral research and need to be considered as exploratory within the scope of this project. I present in what follows captivating features of these positions, offering a worthwhile lens on postdoctoral experiences.

8.5.1 Projecting

Two researchers (Charlie and Kendra), who held the highest volumes and configuration of capital among the participants were positioned within *Projecting*. They had accessed significant symbolic capital through gaining research funding on their own research ideas, on which they had the potential to build academic careers, *projecting* themselves into the future. The habitus of these two researchers embodied the *feel for the game,* although their positions at field entry had been quite different.

Charlie had entered the postdoctoral field with all the volumes and distribution of capital of an already successful researcher (e.g. High impact factor publication, fellowship funding, excellent laboratories, wide scientific network, clarity of research goals, understanding of academic practices). She was using her postdoctoral period as a research fellow, to consolidate the high level of capital accumulated during her doctoral studies.

In contrast, Kendra had felt she was going backward upon entering the postdoctoral field and talked of a "lifestyle transition". She was puzzled by her

field position, unprepared for the loss of scientific capital and agency, which did not seem to fit her habitus:

> to begin with I felt I was just somebody who had been employed to do those experiments rather than a highly specialised scientist who could contribute themselves. [Kendra]

Her new field position was compounded by the transition to a new research topic, but she accepted the situation as a temporary measure, in order to bounce back at a later stage:

> Because I'd completely changed fields and I didn't know what I was doing, and you're on a fixed term so things have to be done at certain times otherwise you're not going to get where you need to be. So whilst it was a complete shock to the system and wasn't something I necessarily enjoyed, I think I needed to do it and it's set me up well for what I'm doing now. [Kendra]

Kendra was exposed to very different academic habitus in terms of interpretations of research projects management, when she worked in a research team of three PIs. One of the PIs interpreted the contracted project as a very defined project, with set ideas, and was focused on timely delivery. She felt "micro-managed" with a regimented path of "sets targets and set points":

> And there was a set of experiments that I was told- these are what you need to do and this is what we're going to publish and when, and it was a lot more regimented I felt. [Kendra]

It took until the end of her 1st postdoc to transition to a field position more attuned to her habitus; Kendra had regained a portfolio of capital resources that she perceived as adequate to exercise her agency:

> I kind of realised actually I know what I'm doing and there were points at which I was kind of well actually what you are telling me to do doesn't make sense and I'm not going to do that, that's not how it should be done, which made me kind of feel like I am well placed so I can write stuff, I know what I'm talking about now. [Kendra]

She established a close collaboration and friendship with the 2nd PI, was able to discuss research ideas and career issues with him, and, through this interaction developed an understanding of the capital she needed to gain:

> awareness of long term career goals and that if I wanted to stay in that area I needed to do something related and I needed it to be novel and I needed it to be something I was sort of leading the field in, which if you can invent your own field in that way it makes it a lot easier to be the leader in it… [Kendra]

She went on to apply for travel funds to visit collaborators, accessed summer student stipend funding and applied for a grant as a co-investigator. Kendra did not feel bounded by laboratory work. She had been given access to a technician during her 1st postdoc and had realised that her experimental work was very demanding. She included funding for a designated technician in the grant that she co-wrote. Spending less time doing experimental work meant more time for developing collaborations, building relationships within her research community and expanding her horizons to identify where to go next. Her focus was becoming more about asking research questions than the physicality of doing experimental work herself.

Knowledge about the acquisition of different types of capital, beyond experimental craft knowledge, did not seem to emerge as part of the interactions with peers within the research group. Through her field work, Kendra had been able to build strong bonds with an informal research network that contributed to her broader view of the research environment, and the accumulation of her academic capital.

8.5.2 Grafting

Grafting reflected the field position of Isabel. She was very independent and had great confidence in her scientific capital, having developed extensive technical expertise. As an interdisciplinary researcher, she understood what she could bring to other researchers. She used the metaphor of a tree to describe transition within the field, but saw herself as a "graft" and not a "branch" in the process of knowledge production, and in relation to interactions with senior academics:

> I think I'm not a branch but I am…what do you call it when you cut….so you have a tree and then the tree is doing such and such, and then you cut a branch from off the tree and you stick it and you make it grow…. a graft, a graft on a tree, because I think I can improve. I mean his work is amazing, it's flawless and he's one of the best X, one of the top X, but I can bring a different aspect to his work. So I feel I am a part of his team but I'm a completely new part of it, and he is a bit excited about it I think. [Isabel]

The problem she faced seemed to be the expectation of how one should transit within the field:

> *But yet you need to belong to a tree. So if you look at the very successful scientists – because that's something, I say "what am I doing that is not correct", so who are the successful youngy's that are getting the positions then, you know, such and such. You can trace all of them to one tree, so it's just branches out from a tree, and then you go back and there's just the…whoever, you know, it's like a family of….In a way now, I think it makes sense and it's important that you trust people that you've trained and they are going to help you in research because times are hard. So I wish they would say that on the applications, and say you need to have pedigree, you need to come from a lab that will support you no matter what. [Isabel]*

Her disposition towards independence appears conflicted with the expectation of the field, in terms of accepted ways of progressing. She had devoted her energy to increasing her scientific capital by learning and applying techniques, acquiring a good publication record, and training younger scientists. Nevertheless, there was a sort of mismatch between her scientific capital and other forms of capital; her habitus felt *out of sync* within the field. She realised that her unbalanced configuration of capital positioned her quite differently from what she would have expected, considering her volume of scientific capital. She particularly struggled to engage in what she called the politics of academic careers, which included, for her, socialising with academic colleagues. She felt she had no time for this and needed to focus on her science. She uncovered some of the unwritten rules: "you have to read in between the lines" through talks by funders explaining how to comply with expectations and how applications should be written. She struggled with these formatted expectations, judging them almost as forms of cheating. She was also becoming aware of the symbolic capital held in social capital, resulting from understanding who sits on review panels and how it may inform the writing of applications.

There was a certain sadness in Isabel's narrative; the realisation that doing good science may not be enough to progress and that the *politics* of the field may play a significant role in career progression:

> *I guess I learn in the end politics you know, but there are so many different ways of learning that you know. There are definitely tricks to it you know, it's not only how good the science is, which is a naïve way of putting it I guess." [Isabel].*

The most significant element that had contributed to her current position in the field were enactments of symbolic violence exercised by the PI of her 2nd postdoc. Isabel had been very excited about the work this PI was presenting; as he had no [X] background, she started to explore what she could bring to extend his work: "So we talked a lot and I think he understood that I had big vision as well". She started to volunteer some of her spare time and did some preliminary work to show him what the [x] side of his project could be. Her passion for the work is what motivated her: "it was just out of interest really, literally, I loved it, I thought it was really cool". She produced experimental pilot data, which allowed the PI to write a grant and eventually employ her. The PI became very successful very quickly and his laboratory expanded extremely quickly. She gave her full energy to the research and helped set up and run his lab and the day-to-day training and supervision of students.

She lost faith in her PI when she realised that he would not support her in transiting to a fellowship. It started with him using some of her preliminary work in grant applications that she intended to use in fellowship applications. She was very open with him about her experimental work, wanting to discuss interesting ideas and results, and felt shocked by his unidirectional *modus operandi*. It progressed to symbolic violence when he made the decision to move to another institution and tried to force her to move with him. With her growing awareness that he did not have her best interests at heart, she made the decision not to follow him. He told her that he would take everything away from her, and that she was not allowed to carry on working on the project. He threatened that she would never have a career in this field; and went as far as to tell some of her institutional collaborators that she was no good:

> *So basically he said: either you come with me or you will never work on this field ever again, I'll just make sure that…And I said "well…" by then I was a bit "this is not going to go anywhere" I could see that he was just a one- way direction. And so I wanted exit. And at that time I could as well. My financial situation was difficult and so I needed to stay…I just didn't want to go there for many reasons but one of them was that I didn't see a clear path, it was just one direction. [Isabel]*

This significantly impacted her field transition.

8.5.3 *Hopping*

Zoe and Victor were positioned within a field domain I call *Hopping,* reflecting
the embodiment of a challenged trajectory within the field. These researchers
had accumulated significant volumes and configuration of capital, showing a
good understanding of the academic game, which could have predicted a
straightforward transition within the field. Their career trajectory had become
restricted through the balancing of family and career aspirations. For Zoe, her
children had asked her not to move again. For Victor, his partner was also a
researcher and, after having spent several years apart, he chose to stay in the
same institution after his 2nd postdoc in order for them to live in the same city.

Although their entry into postdoctoral research had been different, they shared
experience of bounded agency and capital loss at different stages. Their
positions also resulted from related approaches to capital accumulation, having
developed strategies to expand and diversify their configuration of capital with
very active engagement in learning and teaching activities, and network
developments. However, their transition within the field was slowed and
partially impaired through their bounded agency.

Both had confronted limitations to their career manoeuvring scope. In the case
of Victor, he had faced two situations of symbolic violence during the course of his
postdoctoral period. He had developed a good working relationship with most of
the Postdocs involved in his project, which was part of a multi-institutional network.
However, one of them, based in a very prestigious institution, had behaved
unethically and published an article based on the work of many members of the
network without acknowledging the contributors. As this Postdoc came from the lab
of "a big cheese", Victor's PI appeared not to want to make any waves and told him
and his colleagues to forget about it. In this case, symbolic violence was
experienced because a PI with less capital did not feel able to support the
authorship attribution due to his own Postdocs by challenging the situation coming
out of the lab of a PI with higher research capital, risking limiting the capital gain of
his own Postdocs. The PI from the other institution, who realised what was
happening eventually resolved the situation; he was mortified and corrected the

authorship. I felt that this had significantly impacted Victor's habitus, in terms of his perception of his own position within the field.

The 2nd instance of symbolic violence faced by Victor was also likely to result from the lack of institutional capital of Victor's PI. Victor had written a grant at the end of his 1st Postdoc and recounted that Human Resources (HR) had forbidden him from submitting the grant. The intensity of his frustration and anger was palpable. He described being "lied" to by HR, who explained to him that, because of some European employment regulation, he could not be allowed to apply in his own name or as a co-I:

> *So the University of X forbid me to apply for money myself…Because at that time, they worked out that because of the law, if I would have worked for them for more than 5 years, they would have to give me a permanent job so they forbid me to apply…When I say forbid me, they refused to give me support. In practice it's the same thing…They refused to sign up the papers when we applied for grants. When you apply for grants they have to, you know, write a letter of support, they refused to write the letter of support which in practice is refusing to give me support. So that's how they did it, so we had to write with my PI grants on which I'd be named but I still had to apply for the job for which I wrote the grant for. [Victor]*

Symbolic violence was enacted through not allowing him to submit the grant in his own name or even as a co-investigator (only as a 'named' Postdoc), and furthermore, by asking him to formally apply for the position that he was creating with the grant. Later on, after changes in HR personel, he was told that this should not have happened. One may consider that his PI should have challenged the situation with the institutional structure on his behalf, but Victor's experience of this situation indicates once more the insufficient academic capital held by the PI within the institution. In contrast, Victor described his PI as being extremely supportive and placed the blame on the institutional structure.

For Zoe, the additional boundedness of her position in the field was the result of working on a topic that was not part of her own research interests and ambition. She was aware that the grant she was paid from had been a good thing for her PI, for whom it was the first big grant, but the very close management of her project felt disproportionate in contrast to her doctoral experience. The structure

of the annual appraisal system had facilitated open and challenging discussions on career direction. Her PI had asked her to consider her career direction and the steps needed to progress on this track. She found considering her future career paths challenging. In this case, the annual review, with its structure of goals and milestones, had enabled her to voice to her PI that applying for fellowships were goals as important to her as the core objectives of his project; these were not to be considered as parallel or of segregated importance. These discussions had provided scope for her to explore how to proceed in developing her own research interests and for the PI to offer a space for sharing academic practices.

8.5.4 Stepping

The field position, *Stepping,* represents an area within the field where the accumulation of different types of capital seemed measured and balanced. Researchers with a *Stepping* habitus, such as Sadie, may seem less flamboyant and even appear to lack confidence, but use strategies within the field to allow them to progress steadily.

Sadie's entry into the field within an area of research similar to her PhD work, had allowed her not to lose any scientific capital. She had benefitted from using her social capital; her peers had advised her on what questions to ask a potential PI during an interview. She had checked the PI's approach on the development of independent projects by Postdocs. This had helped her to understand from the start that working with him meant *being allowed* to progress toward research independence. In addition, her choice of PI (known in the field) could help her gain symbolic and social capital. She described her PI as "hands-off", having given her a project to take forward herself. Sadie had been consciously changing her default position in the way she had been working: "I've been having to be a lot more self-dependent, self-motivated." She felt that she had grown and learned to not always ask for verification and clarification. She was prepared to take more risk by consciously doing things without checking with her PI, even for things she did not know or understand. She described this as: "I've kind of learned how to be my own researcher."

When she was applying for her postdoctoral position, and even though she had done a PhD abroad and was more matured and experienced than UK scientists starting their first postdoc, she still felt that she lacked confidence in her own research ideas: "I didn't feel confident enough in having an idea to propose myself to do." Experiencing research independence (through the development of small side projects during the first year of her postdoc) and framing her experience and perception of herself through reflexivity, had been critical in enabling her to see herself as a potentially independent researcher, projecting a future self within the field of research:

> *And now that I've had at least two small projects where it was my idea and was my effort and my work and I was the lead on it and I actually got the time, that definitely gave me the confidence to say 'maybe I can do this, maybe I can keep going'. So I've kind of been thinking of like trying to apply for Fellowships and things after this. [Sadie]*

She felt that she was able to build on her experience of running these small projects; they had opened the door for her to consider herself able to design a larger project. It was difficult to identify whether she lacked research ideas when she was still a PhD student or whether it was only the lack of confidence, stopping her from putting ideas forward. During her PhD, her attention was so focused on the delivery of her project that she did not feel that she needed to go beyond the scope of her project:

> "Because I had my project, I had my data and I was working on that and I didn't really need to go out and broaden my research field – or at least that's how I viewed it at the time."

I understood the idea of *confidence* in her account, beyond a cognitive concept but as an outcome of the capital acquired and mounting self-awareness.

8.5.5 Resisting

Within the field position *Resisting*, Neal was the epitome of someone choosing strategies congruent with his own values about the purpose of engaging in research work, but at odds with the scientific *capital lens* of academic progression. His resistance to the academic career game made his career situation precarious for his survival in the academic system, and further limited

his access to several capital dimensions, positioning him with low volume and configuration of capital.

He described himself as someone interested in a particular aspect of science (technical scientific development), which he described as an aspect frustratingly unacknowledged as an integral and valued component of the scientific research process:

> *And I think part of that is that in general people don't tend to think of instrument development as science, when I talk to people even within the community I work in who are very interested in instrumentation and in using instrumentation to do new things, people often say that it's a bad thing to become too technique focused. But then actually you talk to people in their group and you find that the people in their group actually don't understand the techniques they're using to do the science with. [Neal]*

Research could not progress without such development, yet, it holds little scientific capital. His colleagues might use the products of his labour and utilise technical tools he has developed, but he was gaining very few credentials in focusing his efforts on these aspects. Whilst his name may be added to a range of publications, his research approach meant that he was less likely to reap rewards with 1st authorship papers. While he had been written into grants to continue his employment, he was not accruing substantially extra capital from his contributions and had never written a grant himself or being a co-investigator on one. He did not feel the need to start developing research projects independently from his PI or pose big research questions, as he felt that he was already experiencing research autonomy because he was able to conduct the work that he wanted in the area of instrument development. His approach was to focus on the technical challenges coming from other academics' projects and identify technical solutions; through this approach, the particularity of his scientific capital remained of limited value within the field.

He had a great conviction that the most important thing during his postdoctoral period was to focus on experimental work and he did not perceive that developing himself ready for the next stage in his career was relevant:

> *that is kind of a convolution of my perception and the way it actually is, the kind of truth of it is that they are probably quite intertwined, but my perception, because I like to think that research is good and important, is*

> *that I shouldn't worry about anything that isn't research. And that may be a good thing or it may be a bad thing. But I think the barriers to improving my research, which obviously also improves my employability, the more papers I get the more places, the more interesting stuff the kind of better I look, is mostly just down to how much time I can spend in the lab. [Neal]*

His resistance extended to his rejection of being involved in other academic activities, such as teaching and supervision:

> *So I find often in the supervision that I've done I'm just problem-solving something. So often I think "well actually if I just did the experiment I could do it in less time and I might learn something", and I'd enjoy it more. [Neal]*

or,

> *it I think is because of my own indifference to that kind of thing [Neal]*

He had numerous worries about the expectations placed on young academics including: teaching, accessing funding, supervising students and developing research projects for students under tight deadlines, among others. The perception of transition to a PI role and associated academic tasks felt to him very challenging and unappealing, not really a position in the field where he wanted to be. Although he may not have been in a position to apply for a research fellowship because of his lack of big research questions, he felt reluctant to apply anyway, as he was aware that such a position might be linked to the obligation to perform more academic tasks. While he acknowledged that his choices could indeed be perceived by others as "baggage", he justified his decisions as good things. His agency was in deciding how to play the academic game, defining the rules as he was prepared to play. Even with a "disposition to resist", Bourdieu posits that "the dominated seldom escape the antinomy of domination" *(Bourdieu & Wacquant, 1992, p. 82).* For Neal, this meant that he was likely to have to move to positions outside of academia in the future.

8.5.6 Bobbling

This position emerge from the experiences of Elena and Jed; I only use Elena here to illustrate particular elements of this position. The physical metaphor, *Bobbling,* illustrates a field position and trajectory through the field that appears

to follow relatively unplanned motions; efforts are not placed on movement in a particular direction and no sense of great tensions is expressed to shift to a particular position. There is more of a sense of comfortable drift. Elena described experiencing little developmental change during her postdoc:

I don't think there was any massive change in, apart from change in location, change in project and all the physical changes, I don't think there has been any mental changes. Like I have said I've been more organised and trying things. [Elena]

Her enjoyment of lab work and experimental problem-solving, and the undesirability to become a manager (perceived as not being a scientist anymore), were strong constituents of her habitus:

I mean part of the reason that I don't feel I want to become independent is because I don't want to have my own lab yet 'cos I don't want to be complete… I don't want to be responsible for managing people. So yeah, I think it does kind of delay me but I think I will delay becoming independent and delay trying to… having my own lab for a while so that I can spend more time in the lab. [Elena]

Similar to Sadie, Elena expressed concerns about the academic lifestyle in terms of work-life balance, and what this may mean for women and family life. She appeared to *not see herself as a PI* and had not developed an overarching *big* research idea*;* this constituted a self-imposed limiting threshold that reduced her scope to acquire valued capital in transiting within the field. For her, developing as a researcher meant gaining confidence in her experiments, being given more responsibility and "my PI backing off a bit". In contrast, she described her need to check things out with her PI prior to doing experiments and explained about not wanting to waste research funding. However, she did not appear to actively seek more autonomy, nor seemed to consider broader scopes of capital. She talked about her focus on and pride in improving organisational aspects in the functioning of the lab, an area which would not help her access the type of capital needed for transition in the field. The hierarchical structure of postdoctoral research seemed to offer her a protective space: "I don't feel ready to be independent, I'd still quite like to be underneath someone really". She had made the conscious decision to be less stressed during her postdoc, than she had been during her PhD, and she had constructed her postdoc trajectory with the end goal of producing just one paper. I was surprised by her idea of a single paper as the outcome of her

postdoc position, instead of a conception about maximising all opportunities to acquire capital. This was likely related to her PI's conception of producing one *big* paper per research grant, but it felt like she was incorporating this end goal of the PI's project into her own disposition. Her PI did not seem to engage her in discussion regarding forward planning or academic practices, challenging her research ideas and exploring future career decisions. Interestingly, she described her PI as very career-focused himself and being very clear on the steps needed to further his own career. However, at no point does she mention her PI applying the same career direction approach to mentoring her in progressing her career. I would suggest that this type of enactment represents a form of *soft symbolic violence*, when the lack of engagement by academics in discussions about careers and academic practices contributes to limiting transition within the field.

8.6 Summary

In this chapter, I have presented the diversity of Postdoc habitus resulting from diversity of experiences and variable volumes and configuration of capital on the basis of the researchers interviewed in this study. Through this analysis, I have constructed 6 domains of positions inhabited by the researchers: *projecting, grafting, hopping, stepping, resisting and bobbling.* Individuals within the field were taking positions at odd with the postdoctoral game and likely to limit their trajectory within the field but in accordance to situations or core values. Their practices and approaches to developing as researchers were embedded in their habitus and field positions. In the next chapter I further the analysis on researcher development by exploring the habitus of principal investigators.

Chapter 9
The habitus of principal investigators

9.1 Introduction

Exploring academics' experiences and practices related to researcher development is a challenge, as the academic body represents a heterogeneous population approaching research (Åkerlind, 2008a; Brew et al., 2016) and the academic profession very differently (Hermanowicz, 1998). In his foreword on Clarks' book about the American Professoriate, Boyer (1987) acknowledged that attempts at mapping academics' milieu can appear quite messy: "[he] finds few universal truths, not for lack of efforts or perception, but because there are exceptions to virtually every practice considered common…We have, in short, a profession consisting of many professions" (p. xv). Practices in the field of postdoctoral research are the results of the interactions between agents' habitus, their positions in the field, and the field itself. In chapter 6 and 7, I have considered structures and sites of struggle within the field, while in chapter 8, I have explored Postdoc habitus and their experiences in the field; in this chapter, I offer a focus on understanding the habitus of academics in the field of postdoctoral research. Maton (2014) simplifies the definition of the habitus to the following:

> Habitus focuses on our ways of acting, feeling, thinking and being. It captures how we carry within us our history, how we bring this history into our present circumstances, and how we then make choices to act in certain ways and not others. This is an ongoing and active process – we are engaged in a continuous process of making history. (p. 51)

To this end, I provide an overview of the range of academic participants' careers, and share critical elements from doctoral and postdoctoral experiences, that have shaped individual PIs habitus. I discuss academics' ways of *talking, seeing and thinking* about Postdocs and researcher development.

9.2 Academic participants: diversity of career history

The timeline of careers among study participants span academics having done postdocs in the 1970s to an academic having gained entry into a fellowship post in 2005. Of the 12 academics interviewed in my institution, 7 had gained their first academic position via lectureships, with one of them having moved

from a temporary teaching post; for the other academics, 2 entered via fellowships, 1 after a short period in a research centre (which had followed a fellowship), and 2 entered HEIs after substantial research careers, in a governmental laboratory for one and overseas research institutes for the other. One academic was an honorary, recently retired Professor. All of my interviewees had been in the institution for more than 8 years. Four academics had been recruited between 1990 and 1992; one in the mid-1990s, while the other 7 were recruited between 2000 and 2005. Furthermore, two of the academics had been head of department; one had spent her career mostly on fellowship funding, two others had obtained senior fellowships later in their career and one was coming to the end of an 8 year-fellowship. None of the academics interviewed had worked after their PhD in industry or in a non-research environment.

All but two participants, had undertaken what they considered postdoctoral periods. One of these two came from a discipline with less of a tradition and less funding opportunities for postdoctoral positions; this academic had held a teaching post within the Golden triangle[49] prior to getting a lectureship. The other one, had made a conscious decision not to do a postdoc (will be discussed later in the chapter). Those who had done a postdoc had not applied for advertised postdoctoral positions, but directly contacted scientists with whom they wanted to work. For the academics who had spent time in postdoctoral positions, half of them had taken these positions in the USA, while other countries included (New Zealand, France, Germany, and the UK). The postdoctoral positions ranged from 6 months to 3 years. Two academics had done a postdoc in the same lab as their PhD. Two academics had held postdoctoral positions in 2 places and one in 3 locations. Access to funding sources for positions was diverse, with 5 academics having spent postdoctoral periods on the basis of accessing their own fellowship funding. One had a short travel fellowship (prior to being employed as a staff scientist for another year), another had a fellowship that allowed several years abroad, then 1 year of funding back in the UK (also received one additional year funded by the host lab), a third had gained funding from an overseas foundation, and the fourth

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[49] Term used to describe a group of elite English HEIs: Cambridge, London and Oxford.

had received a Research Council fellowship. The last researcher with independent funding had managed to access funds from two different sources and negotiated to take the positions in succession.

Several academics described that the *held view* at the time was that a postdoc in the USA was needed for progression, but that the postdoctoral period had to remain short. Normative expectations of mobility and postdoctoral period already existed for their generation, part of an academic research *doxa*. The Bourdieusian concept of doxa helps to understand the connection between field structures and habitus. In Deer's (2014) explanation of doxa, she describes the concept as:

> broadly defined refers to the misrecognition of forms of social arbitrariness which creates the unformulated, non-discursive, yet internalised and practical recognition of that same social arbitrariness. As such, doxa contributes to its reproduction in social institutions, structures and links as well as in minds and bodies, expectations and behaviour. (p. 114)

Doing a postdoc abroad for a research career was part of the doxa, the *taken for granted* of academic progression, but also "field-specific sets of beliefs that inform the shared habitus of those operating within the field" (Deer, 2014, p. 120).

All academics had moved institution to acquire their first academic position. It is worth mentioning that, in contrast to recent works on Postdocs (Chen et al., 2015; McAlpine & Emmioğlu, 2014), while 4 academics made reference to elements of their family or personal lives, none mentioned that their career trajectory had been impacted by personal circumstances.

These descriptions indicate that the academics interviewed in this study represented a diverse range of career histories, and a longitudinal spectrum of research experiences, within and outside the institution, likely to have contributed to the shaping of diverse individual habitus.

9.3 The shaping of PIs' habitus

Following this brief outline of academics' diverse trajectories, I describe in this section critical experiences in the research socialisation of PIs and elements contributing to positions in the field, which shaped their habitus.

9.3.1 Compelling socialisation experiences

Socialisation in scientific careers is a lengthy process with unclear and unbounded territories. The role played by PhD supervisors, PIs and research environment was extremely diverse across the academics. There was not a clear pattern for the source of mentorship or decisive factors for trajectory in the field. Different elements came into play at various points throughout research socialisation.

A recurring feature in the narratives of academics was the experience (either at doctoral or/and postdoctoral level) of autonomy and *space to play* with their experimental work, and of doing the research that they wanted. The physicality of being in the lab was influential for academics to develop a sense of *being* researchers. Socialisation to scientific research is described as: "a good part of the craft of the scientist is acquired via modes of transmission that are thoroughly practical" (Bourdieu & Wacquant, 1992, p. 223). In the interviews, academics did not refer to how and from whom the transmission took place; it was more described in terms of the physicality of being and doing in the research space.

A *freedom charter* appeared to have greatly contributed to their positioning in the field. For some, their doctoral research topics had not really been part of the main interest of the supervisor, but projects on the edge, forcing them to become self-reliant, and making things work by themselves. Some belonged to large research groups, which provided a supportive and friendly social environment, but the development of their doctoral project was not always part of the group epistemic community. The transition to autonomy could be extreme and abrupt, as described by Simon who had moved at the start of his postdoc to an empty and isolated lab, which he had to set up from scratch:

But for 2 years I worked in a basement lab with no natural light and with nobody in the lab either, I worked by myself, so it was actually quite unusual. [Simon]

While he described having a "good relationship" with his PI, the PI himself and the research group were based at another site, to which he had almost no access, because of issues with security clearance. The physical and social isolation meant that he was forced to create a *connective space*, to develop his own network of collaborators, in order to access equipment and research interactions. He was able to thrive in these particularly challenging circumstances and publish extensively over the couple of years of his postdoc. This was an unusual context but he had been able to draw on the experience gained during his PhD, when he had already experienced a certain level of independence.

Academics' embodied habitus (Reay, 2004b) was palpable in the use of metaphors describing the physicality of the interaction with supervisors or PIs being "hands off", or contexts of "being left alone". They felt entitled to do experiments on the side (in addition to their main research project). Access to autonomy came variably: as a default position, meritocracy based on good results or the taking of a stance. Paul described realising that information provided by his supervisor was inaccurate, after trying to repeat some experiments, and becoming aware that his supervisor had been wrong. This moved him to not being over-reliant on his supervisor and developing an inner trust in his own experimental abilities and scientific judgement. This freedom charter could be gained through independent funding and research capital.

Daniel described that the funding structure for his postdoctoral period meant that he had "almost total freedom", with very open-ended projects and much less pressure to have results than the current experience of his own Postdocs. Jack had also experienced such freedom when he worked abroad (as a fellow then later as a staff scientist) in a research institute, where the research output had been going down. The institute was more focused on applied research; it hoped to gain some good research output from him, by giving him the freedom to explore his own research area (which was not applied research, but more basic scientific explorations).

Nevertheless, a freedom charter was not always easily offered by PIs, but might rather have to be gained on the *battlefield*. Jeff's description of his postdoc painted the picture of an extremely masculinised laboratory: "you've got to take the rough with the smooth…you sort of roll with the punches". His desire to move to a challenging environment, and get himself out of his comfort zone, had led him to choose a US Postdoc position. He was given a new project to set up and told to get it to work. The PI used very close supervision, and was very present on the ground within the laboratory, constantly challenging researchers openly about their ideas, experiments and analysis. He moved people often from project to project, and researchers were not given much choice. PhD students and Postdocs appeared to be managed indiscriminately. Postdocs were expected to work extremely hard and do long hours, with no possible negotiation about working any less. His description of the environment felt bullish, with a lot of pressure and an acknowledgement that not everyone may be able to cope, but he seemed quite proud of having done well in this setting. He did not challenge the brutality of the approach, as he considered that people were made to understand the ways of working from the start: "I knew that was part of the deal I'd signed up to go to the US…It's part of the offer, it's almost part of the contract, which I think is fair"*.* He described an environment, where Postdocs were made to understand the pressure of international competition and that the only way to succeed and progress in research, was to work with such intensity.

> *So that level of intensity and challenge of course brings the best out of people who can cope under the pressure I suppose…although it was tough going, really forced me to really up my game. [Jeff]*

Experimental playfulness could be a social process with peers. Paul, who had an overall thread of what he was interested in researching in the future (but was still working through multiple ideas) realised that his 2nd postdoc project (suggested by the PI) was going nowhere. He reinitiated discussions about his own research interests with one of his previous colleagues. They decided to do some experiments together during a Christmas break:

> *we just went into the lab and spent 3 weeks setting up these experiments, just ourselves, no-one else around, so we sort of set up these experiments…to see what we could get. So I'd spent some time just playing, doing that experiment, and we got*

> *some X out of it, it wasn't what we wanted….we thought this was*
> *kind of interesting anyway so I actually went back and had*
> *another holiday with him for 3 weeks and we kind of tied them*
> *up, and this kind of got me interested back into what I'd been*
> *doing. [Paul]*

He held enough capital and agency to feel he could just go and *play* with his friend, in order to develop more precise concepts for his future work. The circumstance of a research environment with sufficient funding enabled him to take advantage and attempt some experimental work, without feeling the need to ask permission.

Although academics had experienced rejections when applying for lectureships or research funding, their postdoctoral period seemed less troublesome compared to the feelings expressed by contemporary Postdocs. Academics were aware that they had probably escaped a period of emotional labour regarding uncertainty in academic progression:

> *I've been quite unusual in that I've never really gone through some of*
> *the worries that a lot of the early career researchers have, you know,*
> *when it comes to uncertainty about where their career's going and what*
> *the future holds, I've always been quite fortunate in that regard. [Jack]*

Academics talked fondly about this period, that "[it] should be the best time of life" [Murray], even when remembering having worked extremely hard.

9.3.2 *Positions in the postdoctoral field*

It was interesting to note that more than half of the interviewed academics had either done their undergraduate degree, PhD or both at Oxford, and one had been a research assistant at Cambridge prior to the PhD. Only 2 academics [Jeff and Nigel] had undertaken Bachelor and PhD studies in non-Russell group institutions and none of them had been educated overseas. Positions of academics and hierarchies within the fields of research and academia have been extensively studied (Bourdieu, 1988; Clark, 1987); for example, hierarchy of institutions, of faculties, of disciplines and of tasks are elements that differentially position academics. Pointing to the symbolic capital (associated with the location of their early academic socialisation) with which the majority of the academics in this sample started their professional life is, relevant to an

understanding of their habitus. A hierarchy and reproduction mechanism represents: "several interlocking ladder systems. How far up the ladder one can proceed often depends on which rung one's foot lands first" (Clark, 1987, p. xvi). Beyond early socialisation in elite institutions, capital was accumulated through different routes: working with world-leading academics (e.g. 2 with Nobel Prize winner, 1 with FRS) and/ or research groups ("It's probably the strongest place in the UK, one of the strongest in the world" [Jack]), being part of a "tight knit culture" [Jack] with very ambitious students and Postdocs, or producing an excellent publication output during a short period (e. g. Simon had published 11 papers out of a 2-year postdoc). This capital provided them with a sense of place within the field, and a diversity of possible field positions.

The two academics, who had not come from elite institutions had both done postdocs in the US, experiencing very intense periods of research socialisation. However, these two academics differentiated themselves from the other academics through two examples that appeared in the interviews.
Jeff was the only academic out of the 12 who mentioned having a strong identity as a teacher before that of being a researcher. He had wanted to be a teacher before wanting to do a PhD and, later on, as a Postdoc, had convinced his American PI (after having demonstrated his scientific abilities through getting results) to let him undertake a teaching qualification.

In Nigel's case, he was the only academic who seemed to have been less at ease with developing *a feel for the game* during his trajectory and mentioned having queried, at several points, his ability to progress. Nigel had been very closely mentored and supported by his PI during his postdoc in the US. He described spending a very large amount of his time as a Postdoc helping others in the lab, which was not something that the other academics mentioned. He had been able to run with his own ideas as a Postdoc since he was very productive, getting good results and publishing well. He felt that comparing himself to others (by comparing his publication record) had been an important element in self-assessing and raising his awareness, as well as confidence, of where he fitted within the field, in terms of his research capital. However, his transition to the fellowship position had felt much more

uncomfortable, as his department had been very unwilling to set a development pathway to guide his academic transition. He had not seen his 8-year fellowship transformed into an open-ended lectureship (he moved to another institution shortly after the interview took place); his lack of progression had come as a shock. His case indicated that understanding the subtleties of the academic game at different trajectory points was a process of unveiling and discovery rather than an induction into the folds of academic life.

An early understanding of the *academic game* contributed to their habitus. Jack had greatly benefitted from his social and academic capital, having been informed through peers and supervisor of the different types of fellowship available and of the need to have a good academic host for his fellowship (because of the limited funding available for consumables with the type of fellowship he was applying for). He had drawn on his network of collaborators to identify a fellowship host. He explained that he had a clarity of direction regarding his research, and of purpose on what to gain from his postdoctoral fellowship. Although not all drew on their social capital early on in their career, its availability contributed to their habitus. Another example relates to position-taking in the field. Ellen had taken a temporary teaching position after her PhD, but started to apply for lectureships before the end of her contract, as she knew that with the Research Assessment Exercise (RAE) approaching, there might be risks of a recruitment freeze during a post RAE period. For Jeff, understanding the game had been about ensuring he did not tread on the toes of his PhD supervisor and PI when he started to write research proposals. He had checked with both of them that his proposals were not conflicting with the direction of their own research, and that they were happy for him to take these projects forward. Seeing himself as a co-worker and co-thinker, and aware that ideas are fluids and never belong to single individuals, he showed a certain humility, but also an astute awareness that competing with them on the same projects would have been risky.

Awareness of their own capital provides individuals with the scope to take particular *desired* positions within the field: "players who begin with particular forms of capital are advantaged at the outset because the field depends on, as well as produces more of, that capital." (Thomson, 2005, p. 742). However,

desired field positions did not always equate to feeling at ease within the position. This was the case of Theo who had obtained funding post-PhD that provided dedicated time to write articles based on his PhD work; this had allowed him to publish a high impact factor journal article. Theo had decided not to do a postdoc, as he perceived it, to be a period where he would have to work on someone else's research project; and would not be able to further his own research. His publication constituted scientific capital that gave him confidence, so that applying for a lectureship felt the natural progression. His publication acted as symbolic capital for the department, which recruited him one year out of his PhD. He perceived this symbolic capital as risky in the way it positioned him within the field. He felt he had to prove himself even more at the start of his lectureship, but did not regret not having done a postdoc:

> *I was aware that I was young and that I'd got a lectureship, and I thought like they'd given me a chance and perhaps they were taking a bit of a risk on me because I'd got one paper – well I had a few papers but one really big paper...I had the sense that they'd taken a risk by employing me and I had to sort of perform. And so I worked very, very long hours… Now I look back on that period of my life and think that was probably a mistake... So I mean perhaps in retrospect I wish I had been…I wish maybe I had done a post-doc. But I don't…I don't regret that, they gave me the space to do the research that I wanted to do. [Theo]*

This exploration of the early experiences of PIs has set the frame of their habitus. The shaping of their habitus during these early years in research were articulated around 3 sets of experiences: space for experimenting, freedom to explore areas of interest, and early understanding of what was at stake for transition and survival in a highly competitive environment. To continue to explore PIs' habitus, I progress in the next section with an analysis of the ways PIs talked about Postdocs.

9.4 Ways of talking about postdoctoral researchers

In this section, by considering how PIs talk about Postdocs, I am aiming to pursue what Maton (2014) describes as:

> The underlying structuring principles of the habitus… empirically, one does not 'see' a habitus but rather the effects of a habitus in the practices and beliefs to which it gives rise. (p. 60)

9.4.1 'Being cut out for' academic research

An idealised perception of 'what it takes to make it' as an academic scientist was firmly anchored in the habitus of PIs; it was expressed in different ways, but all had in common an intensity, a sense of sacrifice, an eagerness to give everything to the research pursuit. Paul described it as follows:

> *I tell people I actually lived in a lab effectively since I was 16…, it's probably not what one's supposed to say these days, but I say if you're going to be a scientist you have to be prepared to live it, it's got to be your life, it's a weird existence and you have really got to be prepared to spend 24 hours a day, 7 days a week, 365 days a year doing it. Because if you don't, you're competing with people who will do that and if you're not prepared to engulf yourself in it to that extent you may as well give up and go and do something else, because you're not going to be able to compete. [Paul]*

This image of what I call the *total scientist* remained unproblematised by academics. 'Being cut out for it' was described as a way of *being* in research more than a strategy for career progression:

> *And I don't think you get to be a PI without always, not necessarily aiming for it in a very directed way but having that intensity about what you're doing to make it almost inevitable that it will happen. And I think that's a very different thing, you don't need to have a plan, it's just it becomes the natural course of things if you're going to [Clara]*

'Being cut out for' scientific research was also expressed as "being intellectually adventurous" [Jeff], and as having its core in individuals' deep sense of "innate curiosity" *[Paul]*, which could have arisen in many ways, but was part of individuals' early habitus:

> *I remember the little thing, it was a trivial thing but it just made me suddenly realise what is I think behind this. We were walking along and he suddenly leant down and he picked up a feather, and he said "this is kind of interesting". And I suddenly realised that he actually was…he was a farmer's son, he had lived out in the country, he obviously kind of was observant about what was going on around him, he was interested….you know, little things like that sort of sparked his imagination somehow. And I thought maybe that's it, maybe it actually is somehow…you know, it's too late by the time you get to this stage, someone has either got it or not, they've sort of…it's how they've grown up, what are the drivers that have got them to that stage. [Paul]*

Discussions about notions of nurture versus nature were strongly present throughout academics' interviews. Transition in the field was constructed

through the notion of "personality" [Jeff] and "raw talent" [Ellen] being perceived as the makers of scientific careers, and positioned researchers with or without the intrinsic capability to transit within the field:

> *I suspect it's more to do with the innate personality and hunger if you like of the postdoc. I suspect it's probably not anything I'm contributing. I can provide a general framework and advice but I think ultimately it's who that individual is as to how successful they are in that regard… Yeah, I think nurture definitely helps but I think nature is probably more important, in that context. [Simon]*

Simon felt that his own role might be limited in supporting researcher development and that field transition would more likely come from an inner drive and desire or, as Clara puts it, "how much they want it'. The impact of PIs or any support for researchers to develop was framed as limited, and could only "hone the rough edges" [Jack]. This sense of innerness was particularly perceptible in discussions about developing research ideas. Perceptions about 'having it in you or not' were expressed as follows:

> *I don't think you can teach somebody how to have good ideas – I don't think you can. I think at the end of the day the spark has to come from something inside you. I mean the reason why some postdocs don't reach that point is because they just don't have the…I can't think of a better word…because it's a point too far for them…And so I think it's something you can stifle and you can probably stifle it quite effectively, but it's not something that you can magic out of – and it's something you can encourage and nurture – but it's not something that you can magic out of nothing. [Ellen]*

Some academics made reference to a timeframe (of 6 months to a year) where they could assess whether a researcher had the potential and motivation for academic research:

> *I really do feel that, you know, you can quite easily detect the ones that, for want of a better word, have the hunger to do that. [Jack]*

Simon conceded having been wrong before in his assessment of individuals and that development towards *getting it* could sometimes take much longer, aware that transition was also influenced by 'research luck'.

Paul encapsulated his view of 'what it takes' around a set of core abilities (e.g. asking questions, time management, selling yourself, good writing and presentation skills); he also saw the need for individuals to focus on research

ideas and take them to conclusion. In his view, an understanding of balancing risks mattered greatly, keeping a double-pronged approach of safe, deliverable projects alongside more adventurous ones, which may potentially deliver more interesting research results.

9.4.2 Positioning Postdocs in spaces of deficit

Some academics located postdoctoral researchers in spaces of deficit instead of spaces of transitions, expressing different types of deficit that hindered the transition of researchers. They held expectations that Postdocs ought to already understand how to go about *being and doing* in the field, without considering that Postdocs may have entered the field with less accumulated capital than academics had acquired themselves at this stage, or with very different experiences.

An extreme *deficit* view was expressed by one academic, who perceived that postdoctoral researchers from this institution had very limited prospects for academic progression, because of their lack of symbolic capital in not coming from elite institutions or research groups, and also because of not publishing enough in high impact factor journals. His comments felt extremely uncomfortable, as he did not consider his own role in the field positioning of postdoctoral researchers, but placed the onus of their situation on their lack of realistic appreciation of future prospects: "*I do feel like some of them do live in cloud cuckoo land and do think they're going to become academics.*" Deficits were expressed particularly about Postdocs' lack of awareness of what is involved in progressing, of what they needed to do, of the level of competition and of timeframes for research career transition. Academics described some Postdocs as being good experimentalists, but lacking pieces of the jigsaw needed to construct research careers, especially in terms of individual awareness of their own position in the field: "they can be very unrealistic about what their potential [is]" [Daniel].

The most significant deficit was a concern about the difficulty for some postdoctoral researchers to think for themselves and frame new research

questions. Clara considered that the current cohorts of Postdocs drew from a much wider pool of people, whose socialisation to research had been very different. She perceived that the rigid structure of PhD timelines and departmental PhD submission rates required by the funders meant different doctoral experiences. She proposed that PhD supervisors may now choose less exploratory topics, rein in their PhD students more, limiting their ability to explore or take risk, but also avoid letting students make mistakes in developing experiments independently, so as not compromise PhD outcomes. Daniel also suggested that, within this context, Postdocs may not have realised the extent of the support they had received during their doctoral period and the need to shift to a different way of working. Some academics suggested that although there is a larger research workforce, the pool of those able to transit effectively within the postdoctoral field may not have increased because of all these changes:

> *So I think probably at all stages we have taken something away and maybe there's more postdocs now who wouldn't have been postdocs in the past. [Clara]*

Some academics wondered whether Postdocs who do not transit to being PIs were either "not able or prepared" [Clara] or unwilling to move to the next stage.

9.4.3 Getting them to work hard

Academics were conflicted in the appropriate contractual structure that could be positive for both the development of individuals, and projects. For example, Gareth, who had been awarded 5 years funding, perceived the availability of a long funding period as the opportunity to: *"be able to recruit some really good people…who were the sort of people who might go and have academic careers"*. He felt he could encourage researchers to think about the funding as "being a bit like a fellowship". It seemed fair to him to offer 5-year contracts to Postdocs recruited on this grant. This contrasted greatly from the perception of his academic colleagues:

> *So some of my colleagues felt we should only appoint people for 2 or 3 years because then we could get rid of them if they weren't performing very well… A lot of academics do seem to think that the way to manage*

postdocs is to, you know, to have them work under the fear of dismissal – if they know they've got funding for more than 2 years they may not work hard enough. And I don't think that's right or fair because I suspect none of us would be motivated by having a 2-year renewal of our contracts. [Gareth]

His intentions were challenged by the funders during a review meeting:

The view was that it was wrong to appoint people for 5 years because it wasn't good for their development as researchers. [Gareth]

The funder asked the academics to consider how a long-term postdoc would be beneficial, or not, to transitioning into academic positions. While some of his colleagues approached the employment of postdoctoral researchers as a form of commodification of knowledge production, this PI experienced the dilemma generated in the employment of researchers:

I care about the people who work for me I suppose, and in all honesty I'm not very sure, you know, what I'm... how... I'm not sure how best to support them often. And as I say, I do feel these conflicts between, you know, the idea that a postdoc position is a short term position that leads to a lectureship, the fact that a lot of postdocs are quite happy to be long term postdocs, and I feel kind of sometimes morally conflicted about that. I think if everybody who went into a postdoc position was somebody who is dead set on an academic career I'd feel a lot more relaxed about the whole thing, because I'd feel that they were headed onwards and upwards, and if I was grabbing the best that I could from them on the way that would be fine, that would be a bit of mutual benefit. But I feel kind of in my mind a little bit conflicted, I'm not entirely sure how I should think about these people, or what morally speaking I ought to be doing in their best interests. [Gareth]

This indicated the uneasiness for PIs to identify an appropriate combination of a mode of employment and development that allowed effective knowledge production, while acknowledging diverse postdoctoral career ambitions, between those aiming to progress towards PIs positions and those wanting to continue doing experimental work as Postdocs or aiming to move outside of research. Several of the academics commented on the idiosyncratic structural features of research careers, in particular for those who do not progress to PIs status; however, as beneficiaries of the labour of these knowledge workers, they did not take action to challenge these structures.

9.5 Approaches to postdoctoral researchers' development

On the basis of the interviews undertaken in this study, I have understood PIs' approaches to postdoctoral researchers' development as 3 broad stances, representing "position taking… *the choices* made by agents [in the most diverse] domain of practice" (Bourdieu, 1996a, p. 10). These stances link the academics' habitus and their position in the field:

> Bourdieu thereby conceptualizes practices in higher education in terms of strategic 'position-takings' that depend for their form on the meeting of an agent's 'habitus' or dispositions with their relational position within the field. (Maton, 2005, p. 690)

Stances represent different ways of seeing researcher development and transition within the field. These stances contribute to different ways of approaching interaction with Postdocs, which may produce differential positioning, spaces of possible, and scope for navigation for Postdocs' trajectories within the field.

9.5.1 Researcher development through practical mastery

This stance was strongly anchored in the *doing* of science, the experimenting, the physicality of scientific practice perceived as the most significant element for researcher development, the core scientific act, the source of research output, the basis for building scientific capital. This was expressed through a variety of terms: having a go, trying things out, taking risks or being experimentally adventurous. For example:

> *people who are really good are in fact the people who are happy to just go in there, sometimes quite literally get their hands dirty, and feel a very close relationship to the science, which is completely different from reading it. [Clara]*

This corresponded to a stance where researchers were told to be "utterly focused" on the science, or "immersing yourself in it" [Clara] in order to be successful; they were advised to manage distraction to keep themselves on track, in order to avoid losing momentum and drive:

> *I don't know whether people who can somehow compartmentalise their thoughts better are more able to get to the end of something and succeed, and people who say "oh well I'll try that and I'll try that" and*

they end up being very fragmented and therefore it's much harder for them to get to the end of something. And some people are much more easily distracted. I mean it's hard to get a set of experiments done unless you're really focused [Clara]

PIs saw their role as providing a framework for researchers to engage intensively in the scientific practice. This stance focused on the production of research output above all else, not considering other forms of capital until enough research capital has been acquired. Researcher development equates, in this stance, to a straightforward alignment between doing *good* science and publishing well:

I think there's a lot of people create long stories around it, but they're just trying to kid themselves because they haven't got the four big papers. If you had the four big papers you wouldn't need any of the other stories or anything else… To learn to be a better scientist and do good science, and the way you demonstrate good science is that you publish in the best places. And so for me, researcher development is to try to… I try to teach and help people to be good scientists. [Theo]

Problematically in this stance, the boundary of what is enough research output, before considering any other types of capital, might be less simple than presented here.

This stance could lead to a form of technification, representing an approach where a PI perceives researchers as technical skill sets and not agents in transitions within the field. The careers and successes of PIs are intertwined with the ability of researchers to produce successful experimental work. PIs often say that a Postdoc can *make or kill a project*. Some academics may be keen to keep their good experimentalists in their laboratory. Even when they know that, it may not be so good for the researchers themselves:

It can be difficult where you have people with very particular skills that you don't want to lose. I think a lot of academics hang on to people because they've got those specific skills but ultimately I think in terms of development as a scientist a postdoc position really should be something you do for a limited period of time. [Gareth]

The PI-Postdoc relationship can lead to *symbolic violence* being exercised because of the dependency of some PIs on the technical expertise held by some researchers:

I know of a colleague who, he told me, he had a postdoc for a few years and the postdoc applied for one of these teaching-only fellowships at a

teaching-only positions at another university, and I can't remember his words exactly but he basically said he wouldn't write him a reference, or wouldn't write him a good reference because he didn't want to lose him as a postdoc. Well that's awful actually – you should not do that. But I'm sure that's not…you know, I hope it's uncommon but I'm sure it's not a unique example. [Daniel]

Technification was exercised in the employment of highly skilled researchers, employed as Postdocs on temporary research contracts, but in reality working as "service technicians". Murray felt that considerations of development for this category of researchers was particularly challenging, as their positions could not be stepping stones towards academic careers and, at the same time, no permanent career structures currently exists for such researchers. Querying his perception about the fairness of such a funding structure, Murray was reluctant to consider that these positions might be transformed into more permanent technical positions. He evaluated these researchers as "may not have been the best researchers" and assessed that they were often not very happy, losing motivations, and experiencing increasing frustration within these positions. He perceived a flow through these posts as an appropriate strategy for knowledge production, to ensure the maintenance of a motivated work force. In contrast, others felt uncomfortable with the use of researchers on temporary contracts, and attempted to maintain their employment through multiple rounds of grants, placing value on their technical skills and expertise.

Some PIs described working with "weak" Postdocs or Postdocs who had made the decision not to become PIs. In some instances, their approach was to try to get as much as they could from the employment of someone, even if a researcher would not transit within the field. Fruitfulness of research outcomes for a research project could require industrious inputs from PIs: "I've had to work with them quite closely to try and get anything useful out of them" [Simon]. But academics did not seem to consider what could represent development during the period of a research contract for researchers who were unlikely to transit to academic posts. Academics rarely considered the criticality of accessing a broader range of capital; participation and contribution to teaching, scholarly and administrative activities that could be of use to researchers outside of the field of postdoctoral research, particularly for Postdocs unlikely to transit further in research.

9.5.2 Researcher development through assessing and advising

Following this stance, academics adapted their approach based on their assessment of Postdocs. Even with an awareness that the pace of development between Postdocs may vary, they were still fairly quick to judge what they considered an ability to progress towards a PI role. This assessment was often articulated with little descriptive considerations, with a *good* Postdoc described as:

> *in that case you can sort of have an almost hands-off approach where you can really let them get on with the research. [Daniel]*

and *weak* Postdocs:

> *the poor ones can be a real drain on you, I think you get to the point where you just sort of look forward to when they finish and, you know, they don't contribute anything. [Daniel]*

Within this stance, academics saw their role as ensuring Postdocs consider what they may want to do in the future. They advised and mentored Postdocs on what they may need to do to boost their CV appropriately, discussed the *right* places to send manuscripts, or guided them in applying for the *right* positions. Some felt that helping Postdocs maintain motivation to keep going and sometimes persuade them to have another go (even when experiments failed or needed to be replicated) were important contributions to researchers' development. One early academic, Theo, saw his mentoring role as that of "a pace setter", expecting his Postdocs to follow his focus and drive, seeing the delivery of the project as the main goal. His recent participation in a leadership programme had made him aware that he might be placing unrealistic expectations on his Postdocs and that he may need to "let go" of projects, stop micro-managing his Postdocs and trust them to deliver the research.

Incorporation and encouragement of the development of broader academic practices (e.g. reviewing journals, or writing grants) was considered, but PIs tended to expect researchers to come forward and ask for input or discussions, and did not systematically volunteer discussions about acquisition of broader forms of capital. Academics encouraged Postdocs to supervise PhD students and undergraduate students, or gain some teaching experiences (albeit trying

to minimise time spent on these tasks). Interestingly, some academics were unwittingly preventing researchers from acquiring certain forms of capital in attempts to 'protect them'. For example, Gareth had never involved his Postdocs in grant writing because of his own previous experiences. As a PhD student, he had written a grant that had been sent by his supervisor without his name being included and without any acknowledgement of his contribution. Also, during his US postdoc, he had seen PIs get Postdocs to write parts of grant and he perceived this as an abuse of power, not a mechanism of apprenticeship. He felt this was unfair, but had not considered that this could be a process facilitating the acquisition of academic capital. Other examples included cases where PIs were keen to see Postdocs supervise students, seeing this as a way for developing confidence, but not giving them the opportunity to design the projects themselves.

Jeff described his role as manoeuvring researchers along a line that lead to project delivery; in his case, he did not see any difference in his approach with PhD students and Postdocs and described it as:

> *people who are a bit too maverick need to be reined in and people who are a little bit too conservative need to be told to have a go… I try probably to manoeuvre everyone into that line of, I'm happy to sort of guide and help but you try and drive the project forward, and depending on where you are, either side of that line, I'll probably try and buffer you that way. [Jeff]*

They felt that they could only encourage and not force, and could only share with researchers their own perception about what is important, what matters for transition in the field. Daniel conceded that some researchers may not believe or accept academics' advice, but he also felt that, even with all the advices in the world, Postdocs transition was dependent on "ability". Researcher development also meant: "realisation of …how success is judged" [Murray], and:

> *it's learning what you need to do, the level of commitment that's required to be really successful. And that is almost the biggest… there's a level of effort and commitment required that they're not used to in most cases. So anyway, research developments, it's showing by example what is required to be successful at the international level. [Murray]*

As expected, academics perceived that the "bottom line" [Ellen] remained about ensuring researchers understand that producing excellent publications outputs is the "currency" [Theo] within the field, synonymous with academic progression. It is noteworthy that some academics expressed concerns about being too supportive, and feeling that it may risk making things harder for people in the long run.

9.5.3 Researcher development through idea-ing and collaborating

Academics following this stance unpicked researcher development as a gradual, step-by-step process of considering related research ideas leading to new ideas for experiments, interpreting experiments, developing more sophisticated experiments, and articulating completely new ideas that the PI may not have had. They perceived researcher development as the need for Postdocs to position themselves within a defined research area, not only extending and broadening their scientific expertise, but deciding what they may want to research in the future. This meant "think[ing] for themselves about how to solve their scientific questions that excite them" [Clara]. This was felt to be the very core of what the Postdoc period should be about, the source of identity, confidence and ownership. Some academics advised researchers to develop an "overarching thing" [Paul], an umbrella topic that they may be interested in pursuing. Paul felt that having an overall research theme acted dually as a driver and anchor to make strategic career decisions. Clara described what she saw happen to Postdocs when this process took place:

> *They become a lot more... they tend to switch to becoming more forthright about what they're saying and how they're saying it, and more confident in themselves I think. Because they feel that this is now their…they've taken some ownership of it and they feel that they're the person who actually knows – and of course they are, because I only know what they tell me. So the more….so I think they definitely do become, in themselves, a more confident person because they have got that responsibility. And they've got it for themselves, not because they've been given a responsibility but because they somehow sense that they now know something and they can see a way that they're the only person who can see that way. And they can, at least to themselves, justify why they think things should go in that direction. And so when people have it they definitely become more confident in themselves. [Clara]*

Academics also perceived that researchers needed to get a sense of how their work fitted in the broader context of science, how to push things forward, but also a sense of what was possible in science, "a feel for it" [Clara].

The structure of the funding influenced how academics negotiated interactions with researchers, acknowledging working differently with researchers according to whether they were employed as fellows or whether the funding came from a grant. The pressures placed on them by the funding bodies to deliver timely research outcomes rigidified modes of working with postdoctoral researchers, threatening the use of this stance and limiting the space of autonomy afforded to postdoctoral researchers. The seniority of academics appeared to be a contributing factor in structuring the working relationship, with early career academics finding it harder to let go of the control of a research project. However, close control of research projects was more complex than the structural feature linked to the high management of research projects by funders. It could be associated with an intense emotional investment in projects, a powerful desire by the PI to see the work through and produce new knowledge, leading to a lot of pressure placed on Postdocs and limiting the space of freedom offered. Academics did not describe pedagogical strategies that they may use to facilitate a Postdoc in the process of broadening their research ideas. From their descriptions, it felt that, either it just happened, or not.

Some academics went further by framing their interactions with Postdocs as collaborators, in some instances describing them as an investment into the future. Investment was made into the relationship itself, built on trust and seeking a future filled with opportunities to collaborate with an *up-and-coming* academic. In this context, although the delivery of the project still mattered, there was, however, a much earlier encouragement of Postdocs to develop their own spin-off ideas from the project. One of the academics using a collaborating stance described himself as being very interactive, having an open-door policy, as giving a lot of positive feedback and showing enthusiasm about the work done by researchers. He explained that he wanted researchers to take ownership of the project and to see the postdoctoral period as an opportunity, not a job. Jack explains it as:

To make them feel that the project is an opportunity for them rather than just doing a job for me, I think you know to make them try and take ownership of the questions and the outcomes. [Jack]

This stance could lead to less tension *vis-à-vis* research time; research time encompassed everything, the past, the present, the future of the researcher as well as personal time. Although a postdoc on a short-term contract may spend time not working on the actual project but writing papers based on PhD work or previous postdoc positions, applying for the next positions or fellowships, academics within the *collaborating stance* accepted that the funding structures being what they are, it is essential to invest in the relationship in enabling researchers' progress to the next stage, even at the expense of the delivery of short-term goals of a specific project. They described a flow of *give and take*.

But not all Postdocs were perceived as being able to develop interaction with the PI as a *peer-to-peer* interaction. If the interaction did not shift to such a mode of operating, academics felt the need to go back to a more directive mode of interaction. Academics had an expectation that Postdocs presented with a set of ideas at the start of a project should then move with them, take ownership so that they could eventually "develop ideas together" and "work with" each other [Clara]. Clara was looking forward to Postdocs bringing new ideas, proposing alternatives experiments or interpretations, disagreeing with her with the view of pushing the science forward and not waiting to be told what to do.

Academics described that they worked best and were more productive when Postdocs were able to position themselves as collaborators, as colleagues, acting independently, having their own ideas, developing their own experiments and analysis. Simon described the "joy" of working with "highly motivated" researchers. Academics expected Postdocs to take positions as collaborators, rather than seeing it as their prerogative to *offer* such positions. However, Paul had the experience of working very closely in the lab with a Postdoc, thinking at the time that this Postdoc was been independent, but only realising later on that the researcher was probably much too dependent on him. The realisation

that a collaborative stance cannot work with some Postdocs was a source of disappointment for some academics.

However, a collaborating stance had the risk of being misconstrued by grant review panels and appointment committees, and had the potential to have detrimental effects on transition in the field. Distancing oneself from a PI was one of the great challenges for transition within the field; external perceptions of the interaction rather than the true nature of the relationship between PI and Postdocs is what is at stake. One of the academics, Nigel (finishing his 8-year fellowship), had experienced the challenges in these external perceptions himself. He had developed a very close relationship and even friendship with his PI, but made the decision to write his fellowship on a different research topic. This was a conscious decision to display independence externally:

> *Because I thought in order to get the Fellowship I would have to be seen to be doing something different. I think if people saw me just doing the same X, I was doing in my post doc I thought that would affect my chance of getting the Fellowship. [Nigel]*

Later on during his fellowship, he decided to go back to some of his early work done as a Postdoc, as he enjoyed the very productive relationship with his old PI, but the interaction was frowned upon and he had to force himself not to publish with his previous PI.

Furthermore, some academics were also using a collaborating stance to foster interactions between postdoctoral researchers, structuring projects to bring scientists with different skill sets together to benefit from each other and formalising interactions between different Postdocs.

9.7 Summary

This chapter started with a presentation of the experiences of academics' participants in this study, with regard to their doctoral and postdoctoral periods. The analysis points to an early academic habitus that has structured a disposition towards a sense of freedom for research exploration. High symbolic capital held early on by academics contributed to their positioning within the field. Within the PI habitus, I identified 3 broad ways of seeing researcher development: practical mastery, assessing and advising, and idea-ing and collaborating. The analysis made visible elements that the academic habitus

had incorporated as ways of seeing, a doxa about *being cut out for* research or deficits being placed on researchers. In the concluding chapter, I will discuss how taken together the analysis of the PI habitus unearths mechanisms of academic reproduction impacting on postdoctoral researcher development.

Chapter 10
Conclusion

10.1 Introduction

This study started with a concern about *researcher development* during the introduction of the Roberts policies, and with an interest in Postdocs' and PIs' experiences. Following an "at-home" ethnographic methodological approach (Alvesson, 2003, 2009), I have explored my professional context, in a UK research-intensive institution. A Bourdieusian analysis entails core research strategies comprising the construction of the research object, objectivation of one's point of view[50] and a 3-level field analysis (Grenfell, 2014, p. 213) requiring to:

> analyze the position of the field vis-à-vis the field of power…map out the objective structure of the relations between the positions occupied by the agents…analyse the habitus of agents, the different systems of dispositions they have acquired by internalizing a determinate type of social and economic condition… (Bourdieu & Wacquant, 1992, pp. 104-105)

The use of Bourdieusian concepts (field, habitus and capital) has permitted the construction of the research object–*researcher development*–as practices contributing to the positioning and trajectory of postdoctoral researchers within the field. A field analysis of postdoctoral research and its "specific logic" (Bourdieu & Wacquant, 1992, p. 97), as well as the objectifying of my relationship to *researcher development,* was undertaken at the micro-level of an institutional faculty, through an exploration of the local implementation of the Roberts researcher development policies (level 1). Perceptions about researcher development have appeared problematic and are indicative of sites of struggle in the field of postdoctoral research. The postdoctoral field (Bourdieu & Wacquant, 1992; Maton, 2005) was scrutinised through a number of institutional structures and practices contributing to the positioning of postdoctoral researchers (level 2). I have analysed agents' habitus (level 3) through their experiences during research socialisation. In the case of postdoctoral researchers, I have evaluated volumes and configurations of capital, which together offer a scope of possibilities to acquire further capital and positions within the field. Through an analysis of PIs' habitus, I have

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[50] This represents a particular take on reflexivity described as "to be able to objectify one's relation to the objects so that discourse on the object is not the simple projection of an unconscious relation to the object" (Bourdieu, 1993 in Grenfell & James, 1998, p. 126)

considered their researcher development practices as position-takings or stances (Bourdieu & Wacquant, 1992, p. 105) constituting structuring structures (Bourdieu, 1977), contributing to shaping postdoctoral positioning within the field. To conclude my analysis, I now respond to the research questions set out at the beginning of the thesis.

10.2 RQ1 - What was the institutional journey of researcher development policies and what does it tell us about the field of postdoctoral research in a research-intensive institution?

The origins of researcher development policies were presented in chapter 2. In chapter 6, their institutional journey, with regard to postdoctoral researchers was explored through an ethnographic analysis. These policies were concerns from the field of power (e.g. Government, Research Councils) about the production of researchers as highly skilled individuals aware of their competencies and able to move seamlessly and flexibly throughout the knowledge economy. This was also about ensuring that aspirations towards research careers remain, so that highly trained PhD graduates continue to attempt transitions towards academic research, in order to sustain the innovation system.

What is valued and at stake in a field represents the specific logic of a field (Bourdieu, 2004; Bourdieu & Wacquant, 1992). These policies were equivalent to "the appropriation of the field of education by the field of employment" (Robbins, 1993, p. 161), placing skills and competencies as core values. The logic of the field of employment[51] was confronted by the logic of the field of postdoctoral research, that of scientific capital functioning as symbolic capital (Bourdieu, 2004, p. 55). Maton (2005) describes such a process as "adopting heteronomous principles from the economic field as the dominant measures of achievement" (p. 699). Embedding an external logic – that of production of knowledge workers – meant reshaping the internalised logic of the field of postdoctoral research, which is one of knowledge production; knowledge production representing the *doxa* (Deer, 2014) of the field. Researcher

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[51] We may want to broaden to the field of the knowledge economy

development policies intended a combining and balancing of the weight of these two logics.

I have shown in chapter 6 that the field of postdoctoral research (within the limit of a science faculty within a research- intensive institution) was slow to respond to the implementation of researcher development policies, and lacked institutional direction and strategies. The initial 'free money' of the Roberts funds, to incentivise changes in the logic of the postdoctoral field had little effect. Up to 2012, the lack of policy drivers meant that the uptake of this agenda remained *ad hoc* or taken up by isolated agents.

HEIs and academics appear to have introduced adaptive mechanisms to preserve autonomy of the field (Maton, 2005) and buffer the influence of the many external policy agendas (e.g. impact agenda, commercialisation, widening participation), through the employment of new agents (e. g. impact agenda officers, knowledge transfer managers) who become the respondents to external forces. Here, the strategy was one of introducing and/or relying on new agents in the field, researcher developers. Researcher developers offered the external appearance of embracing the external logic, while the field retained the established doxa. Responses to policies are *othered*, rather than embraced by the academic habitus, and external logics remain contained within the field, without encroaching on the doxa of the field itself. This approach allows academics to *refract* external policy demands (Maton, 2005), or these external forces may be "restructured, repelled or even reversed" (Naidoo, 2004, p. 467), while *appearing* to embrace them.

The vignettes presented in chapter 6 and experiences described by Postdocs and PIs (chapters 8 and 9) reveal sites of struggle within the field and are indicative that the logic of the field and the internal logics of researchers/ academics' habitus have not intrinsically been challenged by the logic of researcher development policies.

10.3 RQ2 - How are researchers positioned in the field of postdoctoral research within a research-intensive institution?

In chapter 7, I have analysed a number of institutional structures and practices representing objective structures of the field, which position researchers, contribute to the doxa of the field and are constituted by the doxa, and from which internal structures of the habitus are formed.

The taken-for-granted of the postdoc position is anchored in transience and short-termism. Field boundaries between doctoral and postdoctoral fields are not considered, meaning that the same logic of practice is assumed, confusing Postdocs' incorporation of a new logic, which could support their transition in the field. Postdocs' trajectory depends almost exclusively on research outputs; so *being removed* from other academic activities means being able to prioritise research outputs. There is a lack of integration of Postdocs into institutional decision making processes and representation, and a reluctance or limitation of integration of Postdocs into diverse scholarly activities, such as teaching. This instils a logic of practice dominated by specific principles of valuation in the field (Fochler et al., 2016), that of production of research outputs above all else. Postdocs contribute to a much greater diversity of functions beyond the research-only scope, but the *ad-hoc* nature of these contributions, their lack of visibility in job descriptions or the lack of awareness of these contributions render them invisible. This misrecognises researchers' actual positions within the field, but ensures the maintenance of a particular academic logic. Values are shaped through the lens of research-valuation. However, this is a mechanism of misrecognition, as scientific capital alone is not sufficient for transition within the field. The taken-for-granted of scientific capital hides elements of the logic of the field, misrecognising that broad configuration of capital will be needed for transition (within and outside of academia). The doxa of scientific capital shapes the Postdoc habitus. There is a homology between field and habitus, as both have structures that are both structured and structuring (Grenfell 2017). The structures of the field contribute to the Postdocs' habitus, their ways of seeing, which themselves contribute to

maintaining particular field structures. Here, the field structures contribute to a Postdoc habitus being constructed with a valuation of research above all else.

10.4 RQ3 - How do postdoctoral researchers develop a feel for the game to transit through the field of postdoctoral research?

The *feel for the game* represents agents' "practical logic*", "the source of this practical logic is the habitus. 'The habitus as the feel for the game…is the social game embodied and turned into a second nature'." (Bourdieu 1994 in Maton, 2014, p. 53). Developing a feel for the game means navigating the doxa of the field from a certain position within the field, with a particular habitus shaping this trajectory.

The experiences of the 9 postdoctoral participants interviewed for this study (chapter 8), their feel for the game, has been understood as 6 domains of position within the field: *projecting, grafting, hopping, stepping, resisting and bobbling.* Researchers encounter the doxa of the field in different ways. For them, assessing the contribution of different forms of capital to trajectory within the field resided in an understanding of the symbolic capital resulting from different practices. This meant deciphering the unwritten expectations, grasping what is valued, or what may not be valued, but still required (what Traweek (2009, p. 89) calls the *double-bind*), and understanding how to go about things within the field.

While within the *projecting* domain, the feel for the game was acquired through osmosis of being in the field and via the support of mentors, for other researchers, osmosis did not seem to take place (*bobbling* domain) or the feel for the game came at the expense of symbolic violence (*grafting* domain). Resisting the rules of the game represented a particular habitus and with such position-taking came risks and costs (Bourgeois, 1989 in Bourdieu & Wacquant, 1992, p. 82). The accounts of Postdocs illustrated the criticality of early acquisition of capital during the doctoral period. Doctoral habitus influenced entry position into the postdoctoral field. Transitions between doctoral and postdoctoral fields could result in unexpected shifts in positions. Individuals with significant capital accumulated during the doctoral period, could

find themselves being positioned with much less capital than expected. However, the initial positioning at entry did not necessarily prevent the desired field transition, although postdoctoral trajectory may be more erratic. In this case, individuals could draw from their doctoral habitus to support their repositioning. For example, Zoe (*hopping* domain) told her PI that developing research proposals based on her own research interests were goals that mattered as much as the delivery of his project, or Kendra (*projecting* domain), who after changing research topic, had to re-accumulate enough scientific capital to reposition herself. PIs or mentors could offer a *space of possibles* for Postdocs to shift position within the field. This could come in different forms, from being open about informing Postdocs that they could develop independent ideas and side projects, or from discussing the steps needed to be taken to progress. However, the *feel for the game* was not systematically acquired through inputs from mentors and PIs. If the feel for the game (e.g. *Bobbling* or *Resisting*) was not aligned with the logic of the field, this could challenge individuals' trajectory, but their position in the field was not necessarily perceived as problematic by the individuals themselves, who appeared reluctant to engage in the logic of practice, leading to their exclusion from the field sooner or later. Reproduction takes places as agents are unable to challenge the internal logic of the field, and rejecting the logic becomes being rejected by the field.

The logic of practice in the field, centred on knowledge production dominated how Postdocs were able to engage in broad scholarly activities, limiting considerations of the acquisition of other forms of capital, such as academic or social capital.

10.5 RQ4 - How do PIs approach postdoctoral researchers' development?

In chapter 9, I have explored the narratives of 12 PIs working with postdoctoral researchers, to understand their *stances* towards researcher development. In the descriptions of PIs about *what it takes* to progress in the field of postdoctoral research, the notions of raw talent, innate ability or capacity to generate ideas, were strongly anchored in their system of dispositions. These

notions were used as classificatory principles of postdoctoral researchers. Naidoo (2004) describes that in Bourdieu's sociology, the notion of being "academically talented", as an "academic taxonomy [that] is in fact organised according to the hierarchy of qualities commonly ascribed to the dominant group" (p. 459).

The 3 main stances towards researcher development were aligned to key elements of their habitus: (1) space for experimenting/ practical mastery, (2) early understanding/ assessing & advising, and (3) freedom charter/ idea-ing and collaborating. The challenges raised by PIs' stances were the assumptions that Postdocs had entered the field with similar volumes of capital at entry as PIs had themselves acquired, and that Postdocs needed to enter the field with an already formed *feel for the game*; PIs did not seem to consider that their own early academic socialisation and/or early capital accumulation could have meant a differential entry positioning compared to their Postdocs. PIs had expectations that Postdocs would display similar *practices* as themselves, such as putting new ideas forward, asking about specific opportunities, or developing things on the side. PIs tended to position Postdocs in spaces of deficit (related to Postdocs not always having an understanding of the rules for the game). Like Traweek (2009, pp. 85-94) observed with physicists, progression was seen as fair and on the basis of meritocracy, on the basis of ability, the *hunger for it* and beliefs in a certain *innerness*, instead of considerations of the hierarchy of capital held by Postdocs when they enter the field. Misrecognition of the differential positioning of researchers was a repeated feature. PIs, as dominant agents in the field, are able to enact micro-level field logics within their own labs, meaning that subtle variations are assigned to the values of different capitals; through varied stances and micro-level field logics, PIs contribute to postdoctoral researchers' experiences and the development of academic habitus.

After addressing each sub-question, I will now turn to the main research question of this study.

10.6 RQ - How do postdoctoral researchers and principal investigators from scientific disciplines experience researcher development, post-Roberts implementation?

The experience of researcher development by Postdocs and PIs results from numerous elements: the objective structures of the field, the doxa and rules of the game and the individual habitus of agents in the field. What this study indicates is that these experiences have remained largely unchallenged by the implementation of the Roberts policies. These policies have enabled better institutional Postdoc representation, and the emergence of parallel researcher development programmes that attempt both to bring in the logic of employment and articulate the unwritten logic of the postdoctoral field. In contrast, the objective structures of the field itself, which reflect and construct the logic of the field, valuing research output above all other contributions, remain dominant and deep-rooted. Browning et al. (2016) describe the rise in professional development programmes for researchers using the metaphor "it takes a village to raise an ECR". However, my study indicates that up until now, the logic of the field in Postdoctoral research has remained unchanged and while PIs are part of this *village*, their stances taken regarding researcher development are likely to remain practices that will favour those with already accumulated capital, or with an already established (even if primitive) feel for the game. The researcher development policies, in attempting to bring a different logic, foresaw a reshaping of research careers towards alternative conceptions of careers described by some authors as: protean, boundaryless or portfolio careers:

> Careers no longer rest on the assumption of upward vertical mobility, and refer to different constructions of careers across all levels in the occupational hierarchy…Workers are supposed to develop a portfolio of skills, which implies the ability to quickly convert existing skills according to the environment and tasks. (Cuzzocrea & Lyon, 2011, p. 1032)

However, the analysis proposed of researchers and academics' habitus suggests that these do not align to the protean model (Inkson, 2006). The protean model is constructed through a parallel stream of researcher development activities developed and delivered by researcher developers, but is not constitutive of the research habitus.

With the massification of HE and the commodification of knowledge production, the increase in postdoctoral researchers has meant drawing from a wider pool of researchers, entering the field with more diversity in their accumulated capital (compared to the current generation of PIs). This analysis has revealed a number of assumptions made by PIs that contribute to mechanisms of social reproduction of the academic body. Undertaking this Bourdieusian analysis was an attempt to construct "a double object" (Bourdieu & Wacquant, 1992, p. 67), that of *researcher development* in the postdoctoral field as the research object, but also the objectivising of my "own universe" (p. 67) as researcher developer. What this objectivation highlights is that the lack of awareness and reflexivity of PIs concerning mechanisms of reproduction may need to be challenged. By unveiling the functioning of the field of postdoctoral research, this study may support researcher developers creating new pedagogies that challenge this system of reproduction, going beyond the implementation of particular logics of employment. This study has implications for UK HE policy makers in their attempts to shape the logic of practice in HEIs. Shaping the logic of practice in HEIs entails attending to both field structures and academic habitus. If a combining of the two logics (knowledge production and production of knowledge workers) are to become intertwined new strategies of engagement will need to be deployed.

The *academic research game* has been embraced by institutions nationally and globally, creating a hierarchised academic field (Lucas, 2006), where *research* is valued above all else. This research illustrates that through the current socialisation model of postdoctoral researchers a particular *research habitus* is produced through the structuring of the postdoctoral field, where activities unrelated to research are devalued, discouraged, limited or done under the radar. The next generation of academics, raised through this entrenching logic of research competition as the main academic doxa may conceive of their academic roles quite differently from previous generations. This further highlights that: "The academic world is the site of struggle over the truth of the academic world." (Bourdieu & Wacquant, 1992, p. 70).

McAlpine et al. (2013) remark that critics of social theories concerned with

mechanisms of social reproduction and of socialisation regret the downplay of individual agency, personal experiences, and evolving identity: "how individuals are intentional in pursuing their desires" (p.51). In contrast, Cuzzocrea and Lyon (2011) reject the "overemphasis on agency" (p. 1029) in the current career literature and lament the loss of a sociological dimension in recent career research. In addition, the use of Bourdieu's theory of practice is seen by Chudzikowski and Mayrhofer (2011) as a starting point for interdisciplinary approaches to studying careers. I have proposed here an analysis using Bourdieu's tools of field, habitus and capital that is intrinsically about a consideration of individual agency, represented through position taking within the field. This approach allows a dual consideration of structure and agency removed from a dichotomy or polarised viewpoints.

10.7 Limitations and future research

A limitation of this study remains its small scale, with ethnographic data from a Faculty of Science in a single UK research-intensive institution; while the number of participants, 12 academics and 9 Postdocs, was small, its scale was in accordance with similar studies looking in depth at individuals' experiences (Chen et al., 2015; Felt et al., 2012; McAlpine, 2016; Sidhu et al., 2015).

I did not include in the analysis the role of gender (Bryson, 2004a; Morley, 2003; Smith, 2005) or disciplinarity (Becher & Trowler, 2001; Trowler et al., 2012) in the shaping of academics' / PIs' habitus and researcher development practices. However, I am aware that these elements mediate academic experiences (Deem & Lucas, 2007; Reay, 2004a). Further studies incorporating these frames of analysis could expand and refine the schemata of habitus and stances proposed.

These limitations indicate that the findings should be considered as exploratory understandings of Postdocs and PIs' habitus. I was able to identify different field positions/ habitus for postdoctoral researchers and particular stances of researcher development taken by PIs. Neither the positions, habitus, nor

stances presented could be described as exhaustive or representing all possible experiences and perceptions of Postdocs and PIs in the field of postdoctoral research. Going beyond these limitations would mean continuing a similar exploration in different institutional research contexts. The value of this approach is based on being an in-depth exploration of a particular site, and at a particular time in the field of postdoctoral research.

This study has permitted an entry into the sociological exploration of postdoctoral research, using a Bourdieusian theoretical framework, the "logic of practice" (Bourdieu, 2004). It contributes to theorisation in the domain of HE research. A further step in theoretical developments will require further conceptual refinements, and further engagements in the critical scholarship of the Bourdieusian tradition (Elder-Vass, 2007; King, 2000). At this stage in my scholarly work and through my use of Bourdieu's concepts in this analysis, my understanding of researchers and academics' habitus is that it multi-layered. It incorporates the reflexive habitus, reflects conscious and unconscious affects, positions and interactions within and across field and amalgamates both early socialisation and ongoing dynamics (Decoteau, 2016; Elder-Vass, 2007; Mouzelis, 2007). Disentangling these many strands to increase our understanding of individuals' choices and transitions in fields represent an ongoing challenge.

This study also serves as an inspirational trigger for further explorations of the postdoctoral field at the national and global levels of research systems. Further work may extend the present study towards exploring practices, experiences and habitus into other institutions or types of institutions, different research environments (e.g. research institutes and industrial laboratories), as well as disciplines and national contexts. A comparative perspective between these different environments and contexts could help us consider whether the postdoctoral research period is contributing to homogenising the research population, shaping a particular type of academic habitus, and whether a homogenised habitus might be problematic in the diversity of institutional contexts.

In addition, further mapping of the postdoctoral field–*a sort of Homo Postdoctoralus*–through national systems and the role of the funders and charities in shaping the policies, discourses and structures of the postdoctoral field need to be explored. Furthermore, the role of PIs themselves, as contributing agents to the functioning of funders' strategies and practices, would make an important contribution to a better understanding of the global research innovation system. The role of PIs in the socialisation of the research workforce, and of the knowledge workers for the knowledge economy, remains a critical site of exploration. In particular, PIs' lack of awareness of mechanisms of reproduction may need to be challenged, in order to develop new research pedagogies that go beyond subsidiary researcher development initiatives.

An important element to further explore is the transfer of postdoctoral researchers to other fields of employment, and how the configurations of accumulated capital in the postdoctoral field and the Postdoc habitus shape the transition and positioning into other fields or into different parts of the hierarchised HE sector.

With the decrease in UK-born postdoctoral researchers and increase in overseas recruitment, many interesting angles of research will be worth considering. Of particular interest linked to this study would be to question whether the Postdoc habitus (and even doctoral habitus) acquired in the UK finds itself as a "fish in water" or not, once researchers leave the UK to return to their home academic research systems. With the Brexit upheaval and the uncertain situation regarding the residency status of European citizens, the structure of the postdoctoral field could change faster than expected, with implications for UK knowledge production. Considering the interface between variable field logics in different national and institutional research settings, and the international mobility of the postdoctoral research workforce would also make an important contribution. This could help develop researcher development practices that are meaningful across national boundaries and support capital accumulation of a portfolio valued across contexts, ensuring that the mobility of the research workforce enables capital accumulation and not proletarisation in research-dominant countries.

Considering the challenges faced by the academic environment, continuing to bring to the fore, the experiences of academics and researchers within the broader context of knowledge economies matters, with many more stories about academic lives needing to be written.

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Appendices

Appendix 1. The 7 principles of the Concordat to support the career development of researchers

Principle 1: Recognition of the importance of recruiting, selecting and retaining researchers with the highest potential
to achieve excellence in research.

Principle 2: Researchers are recognised and valued by their employing organisation as an essential part of their organisation's human resources and a key component of their overall strategy to develop and deliver world-class research.

Principle 3: Researchers are equipped and supported to be adaptable and flexible in an increasingly diverse, mobile, global research environment.

Principle 4: The importance of researchers' personal and career development, and lifelong learning, is clearly recognised and promoted at all stages of their career.

Principle 5: Individual researchers share the responsibility for and need to pro-actively engage in their own personal and career development, and lifelong learning.

Principle 6: Diversity and equality must be promoted in all aspects of the recruitment and career management of researchers.

Principle 7: The sector and all stakeholders will undertake regular and collective review of their progress in strengthening the attractiveness and sustainability of research careers in the UK.

Appendix 2. Ethics Application

University of Sheffield School of Education RESEARCH ETHICS APPLICATION FORM

COVER SHEET

I confirm that in my judgment, due to the project's nature, the use of a method to inform prospective participants about the project (eg 'Information Sheet'/'Covering Letter'/'Pre-Written Script'?:	
Is relevant	Is <u>not</u> relevant
  X	

I confirm that in my judgment, due to the project's nature, the use of a 'Consent Form':	
Is relevant	Is <u>not</u> relevant
X (if relevant then this should be enclosed)	

Is this a 'generic "en bloc" application (ie does it cover more than one project that is sufficiently similar)	
Yes	No
	X

I am a member of staff (Faculty of Science)	X
I am an EdD student	X
I am a Master's student	
I am an Undergraduate student	
I am a PGCE student	

The submission of this ethics application has been agreed by my supervisor

<div style="text-align: right">☐ X</div>

Supervisor's signature/name and date of agreement
DR Vassiliki Papatsiba............24 April 2013...

<div style="text-align: right">☐ X</div>

I have enclosed a signed copy of Part B

PART A

A1.   Title of Research Project
       Conceptualising researcher development and its role in the professional
       lives of researchers.

A2.   Applicant (normally the Principal Investigator, in the case of staff-led
       research projects, or the student in the case of supervised research
       projects):

       Title/ First Name/Initials/ Last Name: Dr Sandrine Soubes
       Post: Researcher Development Manager
       Department: Faculty of Science
       Email: ███████████████   Telephone: ██████████

A.2.1. Is this a student project? Yes
       Supervisor: Dr Vassiliki Papatsiba
       Email: v.papatsiba@sheffield.ac.uk

A2.2. Other key investigators/co-applicants (within/outside University), where
       applicable:
       N/A

A3.   Proposed Project Duration:
       Start date: May 2013   End date: July2015

A4.   Mark 'X' in one or more of the following boxes if your research:

	Involves children or young people aged under 18 years
	Involves only identifiable personal data with no direct contact with participants
X	Involves only anonymised or aggregated data
	Involves prisoners or others in custodial care (eg young offenders)
	Involves adults with mental incapacity or mental illness
X	Has the primary aim of being educational (eg student research, a project necessary for a postgraduate degree or diploma, MA, PhD or EdD)

A5.   Briefly summarise the project's aims, objectives and methodology?
      (this must be in language comprehensible to a lay person)

Postdoctoral researchers in research organisations and Higher Education Institutions represent a core asset for knowledge production. The increase of research funding has led to an increase in the employment of postdoctoral researchers, although the reliance on short-term contracts for the employment of Postdoctoral researchers makes research careers a temporary and unstable mode of employment. Small numbers of Postdoctoral researchers are able to transit to more secure academic positions. Recognising the difficulties in maintaining research careers as attractive careers options and fuelled by ideologies about the need for a flexible and adaptable workforce, the last decade has seen the introduction of policies related to the training and professional development of researchers. These have attempted to change the landscape for researchers' training and development as well as the perceptions of research careers.

Following recent policy changes related to the support of researchers (e.g. The 2008 Concordat to support the career development of researchers), this study is concerned with the conceptions of researcher development held by postdoctoral researchers and their lived experiences of development, as well as those of ex-Postdocs having transited recently to other professional contexts and principal investigators of postdoctoral researchers (holders of the research funds enabling the recruitment of postdoctoral researchers). This piece of research is undertaken within the framework of understanding development and transformations of postdoctoral researchers' identities within the shifts of their professional context. I will seek to theorize on the meanings of researcher development from a range of perspectives between lived experiences and policy developments.

I will explore empirically how postdoctoral researchers from scientific disciplines talk about, experience and understand their professional development. I will ask what development means to them as well as what are the enablers and inhibitors of development (e.g. relationships, networks and communities). I will also seek the perspective of ex-Postdocs who have transited to other professional contexts, as well as principal investigators who have either transited recently to academic

status, or moved to academic positions during periods prior to the changes in researcher development policies.

- I intend to draw data from interviews with postdoctoral researchers, professionals with experience of postdoctoral work and principal investigators employing postdoctoral researchers.
- I am also planning to use documents such as CVs, or application forms written by the participants (specifically in this case postdoctoral researchers) when applying for specific developmental opportunities or when seeking research funding.
- Part of the study will involve observation of postdoctoral researchers and principal investigators undertaking SRDS review, which is a formal university procedure intended to permit conversation about the researcher professional development.
- In 2013, two national UK surveys (CROS and PIRLS) of contract researchers, principal investigators and research leaders will take place. I intend to use secondary data from aggregated results as a source of quantitative data to inform aspects of the study.
- My university role as research development manager will enable me to draw data from my research journal, which will reflect on my interactions with academic research colleagues, and postdoctoral researchers during meetings, workshops and informal encounters during which issues related to researcher development are addressed.

A6.   What is the potential for physical and/or psychological harm / distress to participants?

There is no risk for physical harm in this study. Psychological harm is a low risk. Reflecting on their career and professional situation could bring some participants to feel concerned and anxious. If a participant expresses signs of distress at some point during the interview, I will stop the interview and encourage the participant to contact a career adviser or have a "career conversation" with their principal investigator/ line manager.

As postdoctoral researchers and academics in the Sciences are under great time pressures and because experimental schedules often need to be modified, I will provide flexibility to interview appointments so as not to jeopardise or hinder experimental work.

A7.   Does your research raise any issues of personal safety for you or other researchers involved in the project and, if yes, explain how these issues will be managed?

No issue of personal safety. All interviews will take place on university premises during working hours in offices with windows.

A8.   How will the potential participants in the project be (i) identified, (ii) approached and (iii) recruited?

(i)   Identified

This project will focus on researchers with scientific backgrounds working in research projects or having undertaken postdoctoral research. It will take place in part at X but participants will also be sought from the Universities of XXX

A variety of researchers/ academics will be identified to illustrate the diversity of the researcher/academic population (diversity of age, nationality and gender).
I will recruits researchers/ academics:
- from diverse scientific disciplines (e.g. The Faculty of Science has 7 departments) spanning different research cultures.
- at different stages of their research career: beginning of first postdoc position through researchers with experience of multiple research contracts, but also researchers having transited to research fellowships or first lectureship.

Through my professional practice, I already have a large network of contacts with researchers at different stages of their careers, postdoctoral researchers having moved to other professional environment as well as a network of contacts with academics from the University X I am also kept informed by HR, when new researchers are starting projects in the Faculty of Science enabling me to extend my network of contacts and access to potential participants. I will also make use of the networks from my researcher development colleagues and other professional colleagues in the three institutions.
Researchers and academics in other locations X will be identified via website information provided by academic departments, via contacts with researcher development colleagues in other institutions (through their own contacts), and via snowball sampling.

Researchers having transited to other professional positions will be identified via personal network and via a database held by colleagues.

(ii)   Approached

All potential participants will be approached either directly by the researcher, or via researcher development colleagues when deemed appropriate.

Researchers having transited to other professional positions will be approached either via personal contacts and via colleagues responsible for alumni database. In this case, they will approach potential participants and ask them permission for me to contact them to seek interest in participation to the research project; names and contact details will be released only after agreement by potential participant.

(iii) Recruited

Researchers and academics will be invited to participate in the study, either in person through informal discussion, via phone or email.

- *At the University of XXX*

a) PIs and Postdocs are approached and invited to take part in individual interviews. Participants taking part in interview part of the study are provided with info sheet 2 (attached).

b) Pairs of PIs and Postdocs are approached separately and invited to take part in SRDS observation. They are provided with info sheet 1. When a pair of PI-Postdocs both agree for SRDS observation, then observation study can proceed.

c) In some cases, participants who have taken part in individual interviews may be asked whether they would consider having SRDS conversations observed. This would represent a second part in the study, which only a limited number of participants would get involved in. If an interviewee agrees for SRDS observation, I would then contact the matching PI or the Postdocs (who may not have been individually interviewed themselves) individually. I will ask them whether they were interested and accept to have SRDS observed. Some may accept, while others won't. Participants would be provided with information sheet 1.

HR formal agreement for SRDS observation is added in Appendix.

- *At the University of XX*

a) PIs and Postdocs interested in being part of the study are initially interviewed individually. Participants will be provided with info sheet 2 (attached)

b) Following individual interviews, participants could be asked whether they would consider having SRDS conversations observed. This would represent a second part in the study, which only a limited number of participants would get involved in. I would then contact the PI or the Postdocs of the participants individually interviewed. <u>The initial interview would enable the researcher to build rapport and trust with the participants, who may then be prepared to have SRDS conversations observed.</u>
Some may accept, while others won't. Participants would be provided with information sheet 1.

HR formal agreement for SRDS observation is added in Appendix.

- *<u>At the University of X</u>*

a) PIs and Postdocs interested in being part of the study are interviewed individually. Participants will be provided with info sheet 2 (attached)

b) Director of HR in X did not grant permission for SRDS observation, so we will limit the study to individual interviews in this institution.

All participants receive informed consent form.

A9.   Will informed consent be obtained from the participants?

Yes | X |

No | |

If informed consent is not to be obtained please explain why. Further guidance is at **http://www.shef.ac.uk/ris/other/gov-ethics/researchethics/policy-notes/consent**
Only under exceptional circumstances are studies without informed consent permitted. Students should consult their tutors.

A.9.1 How do you plan to obtain informed consent? (i.e. the proposed process?):

Following face-to-face conversations concerning potential participation to the study, or phone/email conversations, participants will receive an information sheet and a consent form.
Associated with this application are 2 different information sheets, one for request of interview and a different one for request for observation of SRDS meetings.

These documents will support an understanding of the research purpose and processes, will provide explanation and reassurance regarding interview recording, transcription, data use, storage, anonymity and confidentiality. A sufficient amount of time will be provided to potential participants to decide whether or not they would be willing to participate, but also to provide opportunities for further explanation concerning the purpose and process of the study. The informed consent will be signed by both parties at the beginning of the interview and one copy will be kept by each of the participants as well as the information sheet.

A.10   How will you ensure appropriate protection and well-being of participants?

I will remind participants at the beginning of interviews that their participation to the study is confidential and that to maintain their anonymity, I will use a pseudonym when describing participants' conceptions, ideas and experiences or quoting verbatim. Participants will be given the opportunity to choose the pseudonym used for their data. Details of departments and institutions will remain confidential in order to provide as much reassurance as possible regarding the identity of institutions/department/ individuals.

When reporting the findings of the study, I will ensure that only unidentifiable details regarding the participants are included. In some circumstances, it may be necessary to withhold identifiable information.

A.11   What measures will be put in place to ensure confidentiality of personal data, where appropriate?

I will be the only person with knowledge of the real names of participants. Database linking pseudonyms and real names of participants will be stored in password protected documents.

The transcriber of the audio recording will be required to sign a confidentiality agreement and will only be provided with the pseudonym of the participant.
The audio recordings will be stored on password protect folders until the thesis is examined and decision on award made, when they will be destroyed.

A.12 Will financial / in kind payments (other than reasonable expenses and compensation for time) be offered to participants? (Indicate how much and on what basis this has been decided.)

Yes ☐

No ☒ X

A.13   Will the research involve the production of recorded or photographic media such as audio and/or video recordings or photographs?

Yes   X

No

A.13.1 This question is only applicable if you are planning to produce recorded or visual media:
How will you ensure that there is a clear agreement with participants as to how these recorded media or photographs may be stored, used and (if appropriate) destroyed?

I will explain to participants via the information sheet and the consent form that audio recording of the interview will be used to ease the data gathering process during interview. Discussions regarding audio recording will take place prior to the organisation of the interviews, and will be reviewed again at the start of the interview.

These documents will explain to participants that the audio files will be number coded, transcribed by either myself or external provider (who will only be provided with number code of audio file). The audio recordings will only be accessible by myself, will be stored in password protected files, and will be destroyed upon completion of the research project and successful completion of viva.

| University of Sheffield School of Education |
| RESEARCH ETHICS APPLICATION FORM |

PART B - <u>THE SIGNED DECLARATION</u>

I confirm my responsibility to deliver the research project in accordance with the University of Sheffield's policies and procedures, which include the University's *'Financial Regulations', 'Good research Practice Standards'* and the *'Ethics Policy for Research Involving Human Participants, Data and Tissue'* (Ethics Policy) and, where externally funded, with the terms and conditions of the research funder.

In signing this research ethics application I am confirming that:

1. The above-named project will abide by the University's Ethics Policy for Research Involving Human Participants, Data and Tissue': **http://www.shef.ac.uk/ris/other/gov-ethics/researchethics/index.html**

2. The above-named project will abide by the University's 'Good Research Practice Standards': **http://www.shef.ac.uk/ris/other/gov-ethics/researchethics/general-principles/homepage.html**

3. The research ethics application form for the above-named project is accurate to the best of my knowledge and belief.

4. There is no potential material interest that may, or may appear to, impair the independence and objectivity of researchers conducting this project.

5. Subject to the research being approved, I undertake to adhere to the project protocol without unagreed deviation and to comply with any conditions set out in the letter from the University ethics reviewers notifying me of this.

6. I undertake to inform the ethics reviewers of significant changes to the protocol (by contacting my supervisor or the Ethics Administrator as appropriate

7. I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data, including the need to register when necessary with the appropriate Data Protection Officer (within the University the Data Protection Officer is based in CICS).

8.   I understand that the project, including research records and data, may be subject to inspection for audit purposes, if required in future.

9.   I understand that personal data about me as a researcher in this form will be held by those involved in the ethics review procedure (eg the Ethics Administrator and/or ethics reviewers/supervisors) and that this will be managed according to Data Protection Act principles.

10.   If this is an application for a 'generic'/'en block' project all the individual projects that fit under the generic project are compatible with this application.

11.   I will inform the Chair of Ethics Review Panel if prospective participants make a complaint about the above-named project.

Signature of student (student application):

Soukes

Signature of staff (staff application):

Date: 23rd April 2013

Email the completed application form to the course/programme secretary

For staff projects contact the Ethics Secretary, Colleen Woodward
Email: **c.woodward@sheffield.ac.uk** for details of how to submit

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Appendix 3. Information sheet

Conceptualising researcher development and its role in the professional lives of researchers.
Dr Sandrine Soubes (Faculty of Science, X)

Participant Information Sheet (for interview request)

Invitation to help
You are invited to take part in a study concerned with researchers' professional lives and development. This page provides information regarding the study and what it would involve for you if you accept to participate. If anything is not clear, or if you would like more information, please contact me at the number/email below. Thank you for reading this.

What is the purpose of this investigation?
I undertake this research as part of an Education Doctorate in the School of Education at the University of Sheffield. There is no sponsorship associated with this research.

This research will take place between January 2013 and July 2015. The aim of the study is to develop a better understanding of how postdoctoral researchers and principal investigators (PIs) conceptualise, understand and experience *researcher development*. This study is set against the background of changes in Higher Education and research policies regarding the training and development of researchers. The participants will be at different stages of their research careers within scientific disciplines at 3 research-intensive universities in England.

Empirical and qualitative studies of postdoctoral researchers professional lives are scarce. This study will assist our understanding of researchers' professional lives, and will provide some evidence for policies aiming to foster research environments where research and researchers can flourish. The study will support theory building in the conceptualisation of researcher development.

Who is invited to take part?
Postdoctoral researchers, research fellows and academics within scientific disciplines.
Professionals with postdoctoral research experience.

What will you do in the project?
I will invite you to be interviewed. Individual interviews may last between 60-90 minutes . They will follow a semi-structured style and cover experiences, perspectives and conceptions of researcher development.

I will invite you to share prior to the interview documents such as CV, application forms for funding or professional development opportunities, which will help me develop a better depth of understanding of your professional background.

What happens to the information in the project?

To facilitate data collection, the conversation will be audio recorded, and either fully or partly transcribed. Transcription will be carried out by myself and a professional transcriber, who will sign a confidentiality agreement. Prior to the interview, I will invite you to share documents such as CV, application forms for funding or professional development opportunities, which will help me develop a better depth of understanding of your professional background.

You will choose a pseudonym that will be assigned to the audio file and transcript. The audio files will be destroyed at the end of the research project following The University of Sheffield research data storage policy. You will be provided with the opportunity to receive a copy of the full or partial interview transcript.

Personal data will be processed according to The University data protection policies following the Data Protection Act 1998.

What happens next?

If you are interested to help and take part in this study, please contact me via email: s.soubes@XX

I will invite you to take part in an interview at a convenient date and time.

Before we start the interview, I will ask you to sign the consent form attached.

Before we start the interview, I will ask you to sign the consent form attached. Findings from this study will be written for an Education Doctorate thesis examination, but will also be presented at conferences/ seminars. It is my intention to publish research findings in educational journals to contribute to the scholarship of the field of study.

It is your choice whether or not you decide to take part in this study. You can withdraw at any time without having to justify your decision.

What if something goes wrong?

This study has obtained ethical approval via the ethics review procedures of the School of Education, at The University of Sheffield.

If you have any complaints regarding the manner this research project is conducted and are unable to address the matter with myself, I would invite you to contact my supervisor (Dr *Vassiliki Papatsiba, School of Education, TUOS, Email: v.papatsiba@sheffield.ac.uk*). If you feel your complaint has not been dealt properly and resolved, you will be able to contact The University Registrar and Secretary, following standard university procedures.

Contact for further information

Please contact me if you require clarification on any aspects of this project

Dr Sandrine Soubes, Researcher Development Manager, Faculty of Science

I would like to thank you for your time in considering taking part in this study.

Appendix 4. Informed consent for interviews

Participant Consent Form

Title of Project: Conceptualising researcher development and its role in the professional lives of researchers

Name of Researcher: Dr Sandrine Soubes

Participant Identification Number for this project:

Please initial box

1. I confirm that I have read and understand the information sheet dated *May 2013* for the above project and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
   Contact: Dr Sandrine Soubes ██████████████████
   Tel: ████████████

3. I understand that my responses will be confidential and anonymised before analysis.

4. I agree to take part in the above research project.

_____   _____
_____
Name of Participant   Date   Signature
(*or legal representative*)

Dr Sandrine Soubes   _____
 Lead Researcher   Date   Signature
To be signed and dated in presence of the participant

Copies: *Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy for the signed and dated consent form should be placed in the project's main record (e.g. a site file), which must be kept in a secure location.*

Appendix 5. Interview schedules for academics

Theme 1-Academics own career history

- *Could you briefly describe your career so far?*
- *Have you got experience yourself of doing a Postdoc?*
- *Could you describe your own experience of being a Postdoc (eg. choosing your postdoc/ Pi/ topic) and the transitional stages to becoming a lecturer/ established researcher?*
- *How do you think your experience of being a Postdoc differ from the experience of Postdocs working with you? If so, in which way?*

Theme 2- Your experience of working with Postdocs

- *Could you describe your own experience of working with Postdocs? (eg. how many you have employed, what type of people do you tend to recruit, how do you go about choosing your Postdocs?)*
- *What is it like for you to work with Postdocs?*
- *How do you approach your role in working with Postdocs?*
- *What is significant for you in the way you interact with Postdocs?*
- *Which term would you use in describing the way you work with Postdocs? (eg. supervising, managing, mentoring, collaborating)*
- *Could you share some successful and unsuccessful interactions you have experienced when working with Postdocs?*
- *How did you learn to work with Postdocs?*
- *Has your way of interacting with them changed over the years? In what way?*
- *Do you keep track of what people do after they leave being Postdoc with you?*
- *How do you feel about their various career destinations?*

Theme 3- Conceptualising researcher development

- *How would you define researcher development? What is development for a researcher?*
- *How do you understand and think about researcher development?*
- *How do you go about developing researchers as a PI? (eg. what do you need to do?)*
- *What is your approach to helping Postdocs develop as researchers? (eg. transition towards research independence).*
- *Does researcher development mean change and if so what type of change?*
  - o *Behaviour*
  - o *Attitude (perceptions, feelings, motivation)*
  - o *Intellectual*
- *As most Postdocs will not continue their careers as academics do you think that researcher development is more than the development of researchers into academics?*
- *What does the researcher development process involve?*
- *Is researcher training/researcher development the same thing, does it differ? In what ways?*
- *Is it something that is mostly relevant to early career researchers or is it meaningful throughout a researchers' careers?*
- *What are we trying to achieve when we are talking about researcher development?*
- *Whose responsibility is it "researcher development"?*

Theme 4- The individual Postdoc

- *What does an individual need to do/ feel/ think in order to develop as a researcher?*
- *What are the barriers to researcher development at the level of the individual?*
- *Who matters for a Postdoc to develop? How are Postdocs influenced by others in their development?*
- *What makes a Postdoc "become" a researcher?*

- *How would you describe the process thereby a Postdoc develop "independence"?*
- *How do Postdocs move from being employed on a project to developing a sense of wanting to establish their own projects? Is it just about technical/ scientific skills and understandings, is it innate, is it a progression? How does it happen? What makes it happen?*
- *What does it mean to empower researchers? Is it something that can be facilitated? Or is it something that people have/ feel?*

Theme 5- Factors influencing researcher development

- *What are the key factors for development to happen? What facilitate or hinder development?*
- *In your experience, do Postdocs respond differently to opportunities? Where does this difference come from?*
- *Is there such a thing as 'resistance to development'?*

- *Could you think of specific events/ issues/ interactions that may influence the development of a researcher?*
  - *At individual level*
  - *At the broader level/ structures…*
- *How do you feel about Postdocs attending "developmental activities"?*
- *Do you think that these things are about development?*
- *Are there specific development activities that you encourage or discourage your Postdocs to take?*
- *How is researcher development linked to researchers careers?*
- *Some Postdocs engage in "developmental activities" while other don't- what do you think is the difference between these groups? Why do you think some researchers do not engage? What may the impact of engaging or not?*

Theme 6- The policy environment related to researcher development

- *What are your views on Postdocs attending "developmental activities"? How do you perceive these?*
- *Should "development in situ" be sufficient?*
- *Is there more to researcher development than the development of someone into a researcher/ academic?*
- *Could you tell me what you know about the policy environment related to researcher development? (eg. RDF, Concordat)*
- *What are your thoughts about these policies? What do you make of them? When did you become aware of them?*
- *Do you think that things have changed in the way we work with Postdocs? What has changed? What are your thoughts about this?*
- *Have these policies changed the way you interact with Postdocs?*
- *How do you interpret these policies?*

Appendix 6. Interview schedules for researchers

Theme 1- Postdocs career history

- *Could you describe your career so far?*
- *How do you feel about your career and the choices that you have made?*
- *Is this your 1ˢᵗ Postdoc or have you got previous Postdoc experience?*
- *What was your approach to deciding to do a Postdocs and choosing your Postdoc?*

Theme 2- Your experience of being a Postdoc

- *Could you describe your own experience of being a Postdoc?*
- *What does it feel like for you to work as a Postdoc?*
- *How do you approach your role as a Postdoc?*
- *Could you describe transitions or crucial steps from finishing your PhD to working as a Postdoc?*
- *What is significant for you in the way you are working as a Postdoc or what has been significant for your during your Postdoctoral time?*
- *What drives you to work as a Postdoc?*
- *How do you talk about yourself as a professional? How would you describe yourself?*
- *What do you aspire to become?*
- *What do you aspire to achieve?*

Theme 3- Conceptualising researcher development

- *How do you understand and think about your development as a researcher?*
- *How do you go about developing as a researcher? What is your approach to develop as a researcher? (e.g. transition towards research independence).*
- *What do you think you need to do/ feel/ think or what needs to happen in order for you to develop as a researcher?*
- *What experiences or what environments have been significant for you to develop as a researcher?*
- *How does it feel like when you become conscious that you are developing as a researcher?*

- *Who has been significant for you when developing as a researcher? (eg. other researchers/ PI…)*
- *How have you being influenced by others in your development?*
- *Do you feel that you have been supported/ empowered to develop as a researcher? Could you describe how this happened? What and who made you feel empowered?*
- *What makes a Postdoc "become" a researcher?*
- *How would you describe the process of developing your "independence"? What influences the process?*
- *What changes have you experienced during the course of your postdoctoral time when you felt you were developing as a researcher and how do you feel you have matured? (e.g. Behaviour, Attitude (perceptions, feelings, motivation), Intellectual*
- *How do you interpret your development as a researcher in the context of scare academic positions?*
- *Is researcher training/researcher development the same thing, does it differ? In what ways?*
- *Whose responsibility is it "researcher development"?*

Theme 5- Factors influencing researcher development
- *How do you work with your PI?*

- *Which term would you use in describing the way you work with your PI? Do you feel that you are being supervised, managed, mentored, collaborating with)*
- *What is the role of your PI in your development as a researcher?*

- *What are the key factors for development to happen?*
- *Did you model your behaviour or what you do on someone else?*
- *What sorts of networks are you using in helping you in developing as a researcher?*
- *What may be the barriers of your development as a researcher? What facilitate or hinder development?*

- *Could you think of specific events/ issues/ interactions that may influence your development as a researcher?*
    - *At individual level*
    - *At the broader level/ structures…*
- *Are there specific activities that you have been encouraged or discouraged to take?*
- *Do you think that these things are about development?*
- *How do you decide what to take on?*
- *Could you talk about things you have done/ opportunities that you have taken that have been significant in developing you as a researcher? Why did you engage in these?*
- *Do you think that your development as a researcher will be linked to your career as a researcher? What kind of connection do you feel there is in between these 2 aspects?*

Theme 6- The policy environment related to researcher development

- *Could you tell me what you know about the policy environment related to researcher development? (e.g. RDF, Concordat)*
- *Is there more to researcher development than the development of someone into a researcher/ academic?*
- *What are your thoughts about these policies? What do you make of them? When did you become aware of them?*
- *How do you interpret these policies?*
- *What are we trying to achieve when we are talking about researcher development?*

Appendix 7. Secondary data

A survey of postdoctoral researchers in the faculty of Science

This survey was undertaken by three departments across the FoS to seek information from the postdoctoral research community about their experience of being postdoctoral researchers. The survey was intended as an information gathering process to inform the reviews undertaken by departments for the Athena Swan[52] applications. As I was a member of Athena Swan commitees in two departments, then later on as a member of the Faculty Equality and Diversity committee, I was tasked to work with a group of postdoctoral researchers to develop a survey that would address some of the experiences, ambitions and concerns of the postdoctoral community. Our working group developed a questionnaire that was administered in 3 departments during the autumn 2013. The data collected via the survey was not done under the banner of a research project as its primary purpose was to inform the writing of an action plan for departments to support the academic progression of women in departments. However, as I undertook the analysis of this survey, it has influenced my understanding of researchers' experiences. Although data from the survey is not reported as part of this thesis, I am aware that it contributed to influence my approach to this EdD project.

Survey and focus group data about appraisal Processes

In addition, during the course of the EdD, I worked with a colleague from another faculty on a project aimed at improving the experience of postdoctoral researchers with the annual appraisal process. The introduction of appraisal processes in higher education is recent and tends to be perceived as processes of New Managerialism. Although staff appraisal processes are common practices in the public sector, the perception of its purpose and usefulness in the context of academic research is still argued and debated. After a long period of consultation and data collection about the experience of Postdocs of the annual review process, we had proposed changes in documents and processes for the annual review. In order to evaluate the impact of the changes introduced we ran a survey across the two faculties (164 respondents) and hosted 4 focus groups [2 focus groups with academics (n=7) and 2 focus groups with Postdocs (n=10)]. We had obtained ethics approval from the University Research Ethics Committee. Although much of the data collected during this evaluation project is focused on the experience of using new documents and processed in the context of annual review conversations, some of this data has informed my understanding of PIs and Postdocs' approaches to researcher development.

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[52] http://www.ecu.ac.uk/equality-charter-marks/athena-swan/
The Athena Swan is an external charter permitting to assess STEM departments and institutions to review data and practices regarding female academic progression.

Appendix 8. Example of early coding on an interview transcript

Constructing strategies: *Choices*	
Structure	**Agency**
" I knew other people that were in similar…it's not an uncommon situation to start a project that is either poisoned and is not going anywhere, and you still want to finish and be a PhD. And so I knew other people that had similar problems"	"So it was either stopping the PhD and starting a new one with someone else, which does not look very good when you have such a good grant, and I was a very good student so I just thought that that wouldn't be the best choice. So I looked outside and felt "well maybe there is someone else I can put in and…"

Social dynamics: *Postdoc and others*	
Structure	**Agency**
"politics are politics and they are very convoluted. So there are layers on top of layers on top of layers, and I guess that's what I've learnt, you know, things that look like they are like something, they are completely different to what you think they are. And people never tell the truth" "you have to read in between the lines…"	"I guess I'm in the wrong…not knowing what politics is about…a naïve way of thinking about development as a scientist. I develop much too far my knowledge and very little my political skills I guess…" "So what I've learnt in my career is that you need an awful lot of politics for science, and that we didn't know. You need to be…it's not the best that wins, it's…I don't know how to say it, it's someone that is often not the best person but that person seems to be OK with everyone "

Transition of the self: *power*	
Structure	**Agency**
"So basically he said "either you come with me or you will never work on this field ever again, I'll just make sure that…" you know. "Said "you're done, you can't work on this, this is mine". "it's not good for you neither to work on this field, you must…" "I guess he had his own pressures and he needed loads of data, loads of grants, loads of papers, you know, because he was at the beginning."	"I was petrified. At that time I knew that the exit was going to be painful" "I could see that he was just a one way direction. And so I wanted exit…Just one direction, it was for him and for his glory, but he's not known for helping people to become independent. And nowadays you need someone to help you."

Transition towards research independence: *research ownership*	
Structure	**Agency**
"So in the beginning I help without, so I help in my spare time, and then he managed to get some funding… I mean it was working during weekends and out of hours, it was just out of interest really, literally, I loved it, I thought it was really cool."	"what I resented is because often the preliminary work was done by me and said "look, this is good isn't it" and I thought maybe I can write a Fellowship about it or whatever, but often he would use it for his own convenience. And he kept saying "you must take some ideas and save them for yourself" and stuff, but obviously they are very good sometimes so it's interesting and he wanted to follow them on I suppose."

Appendix 9. Additional job titles used in the Grade 7 research-only staff category

Position title in HR database	Further description of role
University/EPSRC Doctoral Prize Fellow	Position for recent PhD holders, funded either by institution or external research council. Offers one year funding to work on developing independent new project and writing articles based on thesis. Requires an application process.
EPSRC Fellow	Independent research position
Neil Rackham Research Associate (The Rackham fellow)	Postdoctoral role advertised externally
Daphne Jackson Research Fellow	Position for returning researchers after career break. Work under the supervision of a PI. Funding application by department/ PI/ returning researcher.
Development Engineer	These are technical positions providing scientific expertise to departments. All researchers likely to be PhD holders; for some, these are transitional positions to lectureships while for others long term scientific service positions post- Postdocs.
Grid Computing System Administrator	
Light Sheet Microscope Manager	
Scientific Officer	
Senior Experimental Officer	
Physicist in Particle Physics	All equivalent to postdoctoral positions but emphasis on particular research areas.
Postdoctoral Researcher in Physics	
Post-Doc Research Associate in AM-OoSN	
Post-doc Research Associate Particle Phy	
Research Associate (in Protein Design)	
Research Associate in LBNE-Liquid Argon	
Research Associate in Particle Physics	
Research Associate in Statistical Ecolog	
Research Fellow	Specific to who is funding the post.
Post-Doctoral Researcher	A version of the title for Postdocs
Vice Chancellor Fellow	Part of a recent university scheme. Aimed at recruiting "the best" researchers (mostly recruited external candidates) to develop independent funding proposals
Research Assistant	Difficult to assess role. Could be promoted technician without PhD or PhD holder.

Appendix 10. Conference talks and previous writing

During the course of the EdD, I wrote a number of assignments on the topic proposed in this thesis, but also presented this work at a number of conferences.

EdD Assignments

Postdoctoral research in universities
https://www.academia.edu/2540233/Assignment_2-EdD-_Postdoctoral_research_in_universities

Module on processes in educational research
https://www.academia.edu/2540237/Assignment_3-_EdD-MODULE_ON_PROCESSES_OF_EDUCATIONAL_RESEARCH

Hypes of the research and innovation discourse versus the tears of researchers' careers
https://www.academia.edu/2540252/Assignment_4-_EdD-_Hypes_of_the_research_and_innovation_discourse_versus_the_tears_of_researchers_careers

The new age of researcher development
https://www.academia.edu/2540258/Assignment_5-_The_new_age_of_Researcher_Development

Conceptualising researcher development and its role in the professional lives of research-trained professionals
https://www.academia.edu/2540266/Assignment_6-_Conceptualising_researcher_development_and_its_role_in_the_professional_lives_of_research-trained_professionals

Presentations

EdD Sheffield teaching session in collaboration with Dr David Hyatt (February 2017)
Research design workshop: trials and tribulations in choosing a theoretical framework

Bourdieu Café-Warwick Business School (January 2017)
Researcher Development: understanding habitus and trajectory in the field of postdoctoral research

The Higher Education Conference. Amsterdam (July 2016)
Postdoctoral researchers and principal investigators in the Sciences: sites of tension in the conceptions of researcher development

British Sociological Association Bourdieu Study Group conference. Bristol (July 2016)
Conceptualisation of researcher development: exploring the habitus of postdoctoral researchers and principal investigators in the Sciences.

Researching Higher Education: the Next Five Years. The University of Sheffield (February 2016).

Rules of the games in postdoctoral research: exploring the habitus of scientists to understand conception of researcher development.

Researcher Education and Development Conference. The University of Sheffield (September 2015).
Researcher development: between policies and lived experiences-Attempting a sociological perspective

The Local, National and Global in Higher Education. The University of Sheffield (February 2015).
Meanders towards research independence for postdoctoral researchers in the Sciences

Higher Education in the Globalised Age. The University of Sheffield (February 2014).
Conceptualizing researcher development: from policy discourse to local practice.

Society for Research into Higher Education conference Newport South Wales (December 2013).
Conceptualizing researcher development: from policy discourse to lived experience. What is it like for postdoctoral scientists to develop?

Comment, Critique and Contestation: Emerging Voices in Higher Education. The University of Sheffield (February 2013). *Conceptualising researcher development and its role in the professional lives of research-trained professionals*