Hanging tough: post-PhD researchers dealing with career uncertainty

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ABSTRACT

This study examines the impact of career uncertainty on post-PhD researchers' experiences. Drawing on an identity-trajectory approach and a qualitative design, we analysed experiences of post-PhDs from the UK and Switzerland. Our findings show that in the course of their work experiences, career uncertainty takes two different forms: intellectual uncertainty and occupational uncertainty. On a daily basis, both forms strongly impact the participants' work and personal lives and can limit their ability to plan for the future, restrict their developing research expertise and networks and induce tension in trying to reconcile work and personal lives. While often struggling with a blurred institutional status, participants 'hang tough' despite their uncertain situation, notably by clinging to the academic researcher identity. Contributing to the previous work on the increasing casualisation of post-PhD positions and the resulting challenges, our study offers new insights into how different aspects of career uncertainty influence post-PhDs' work and identity.

As an intrinsic part of the research process, uncertainty, regarded as risk, unpredictability, or ambivalence (Sigl, 2016), is probably what makes being a researcher particularly appealing for many people. Such uncertainty characterises the journey of becoming a researcher as establishing one's intellectual credibility and becoming recognised for one's expertise in a field (McAlpine & Amundsen, 2018), which represents a transition from dependent to independent research (Laudel & Gläser, 2008); this period is often marked by self-doubt and questioning (Skakni & McAlpine, 2017). To some extent, well-established researchers still deal with uncertainty through the ongoing search for making an intellectual contribution and the uncertain processes of research funding and publishing (Laudel, 2006). However, uncertainty has taken on a different significance over recent years: increasingly, career uncertainty is emerging as a concomitant concern for post-PhDs in the academy as individuals aspire to secure employment as researchers (Ortlieb & Weiss, 2018). On the one hand, the growing number of PhD holders worldwide (OECD, 2016) has increased the competition for tenure-track academic positions, with more than half of the PhD holders finding themselves outside academia (Vitae, 2016). Further, while the number of graduates has increased, the number of permanent research-teaching positions has not (Larson, Ghaffarzadegan, & Xue, 2013), with temporary positions increasing (Loveday, 2018). Thus, postdoctoral academic futures have become more precarious, and fellowships or contracts are no longer short-term entrance trajectories into an academic career (Van der Weijden, Teelken, de Boer, & Drost, 2016). The new norm consists of accumulating multiple short-term contracts over the years (Fitzenberger & Schulze, 2013), which often translates to several institutional or geographical relocations (McAlpine, 2012). This situation is generally characterised by low incomes, high workloads, last-minute appointments, poor resources and support, and few professional-development opportunities (Browning, Thompson, & Dawson, 2017). Such casualisation of postdoctoral positions shapes not only researchers' working lives, but also the research they produce (Wöhrer, 2014). In brief, choosing a traditional academic career path now appears a risky undertaking.

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Previous studies show that insecure career prospects contribute to the dissatisfaction of post-PhDs in their daily work experience (Van der Weijden et al., 2016), often inducing a high level of stress and anxiety (Gloria & Steinhardt, 2016) as they try to reconcile their work and personal lives (McAlpine & Amundsen, 2018). Short-term contracts and working on someone else's projects have also been shown to impede one's research niche development by leaving little time for fundamental analysis or high-quality publications (Wöhrer, 2014). In the same vein, while a relatively uninterrupted research focus positively impacts postdoctoral experiences (Scaffidi & Berman, 2011), short-term contracts/projects hinder developing an in-depth and coherent research profile (Wöhrer, 2014). Throughout repeated changes of institutions, projects or funding, post-PhDs have to adapt to new topics and research paradigms continually and to publish on different subjects (Wöhrer, 2014), which may be far from their own expertise and interests. Ultimately, it has been argued the high level of uncertainty that characterises current post-PhD career paths reduces the attractiveness of academic research as a profession (Roach & Sauermann, 2017) and the sector's ability to recruit in the future (May, Strachan, Broadbent, & Peetz, 2011).While this previous work has been helpful in highlighting the increasing casualisation of postdoctoral positions and its challenges, very few studies have examined how post-PhDs deal with career uncertainty. Thus, we undertook this analysis to examine how career uncertainty was experienced by post-PhDs' in their work experiences and their identity development. More specifically, we examined how post-PhDs from the UK and Switzerland deal with career uncertainty by asking the following questions:

. What form does career uncertainty take within post-PhD researchers' work experiences?

. How does career uncertainty manifest on a daily basis?

. How does career uncertainty influence their developing researcher identities?

Conceptual framework

Career and identity development are examined here at the intersection of individual and contextual factors that evolve over time, while continually interacting. On one side, sociopolitical and economic contexts influence post-PhDs' career paths (Ylijoki & Henriksson,

2017) while work environments shape their experience of becoming or being recognised as researchers (Antony, 2002). Further, on an ongoing basis, post-PhDs' work situations influence their personal lives, while personal aspects of their lives influence their work experiences and career decisions (Chen, McAlpine, & Amundsen, 2015). Drawing on McAlpine and Amundsen's (2018) identity-trajectory approach, we apprehend research career trajectories as complex ongoing processes comprising three distinct but interwoven work strands that develop through time: intellectual, networking, and institutional. These strands represent complementary inter-connected threads through which post-PhDs' careers and identities are developed and consolidated over the years.

The intellectual strand refers to post-PhDs developing research expertise which comprises the past and current projects they conduct or collaborate in, the research niche (theoretical/methodological/disciplinary) they have been developing throughout these projects and the resulting artefacts (peer-reviewed papers/conference papers/citations). It is through this intellectual strand that post-PhDs establish their credibility as researchers and become recognised by their peers. Inability to do this can negatively influence career trajectories (Wöhrer, 2014). The networking strand is related to post-PhDs developing academic networks, which comprise local, national and international relationships with peers or colleagues, including supervisors, mentors, and line managers. These relationships are established within research collaborations or memberships in scholarly organisations and journal boards and are developed at inter-personal (e.g., talking to scholars at conferences) or inter-textual (e.g., reviewing manuscripts for journals) levels. Overall, this networking strand constitutes post-PhDs' larger research community. Active networking offers, for instance, opportunities for collaboration (Ansmann et al., 2014), whereas a limited investment in networking creates isolation and limits research possibilities. The

institutional strand refers to the formal affiliations (being employed) with specific institutions in which post-PhDs' research projects and expertise, as well as scholarly/academic networks, are developed (e.g., research institutes/universities). Further, this strand refers to (a) institutional responsibilities as represented in availability of different kinds of job and (b) different levels of institutional resources that contribute to post-PhDs' networking or intellectual strands such as support from a host supervisor, access to departmental career development initiatives or fellowships/grants awarded by funding agencies. Post-PhDs are often weakly embedded institutionally and may not have access to resources that others do (Van der Weijden et al., 2016). It is through the individual's efforts to advance these interacting strands that post-PhDs can build and consolidate their career potential.

Given the current complexity of research career trajectories – particularly, the interaction between individual's efforts to advance their careers and the labour market, our focus is also on how career uncertainty affects post-PhDs' identity development. Thus, we mobilised the concept of 'career uncertainty', defined here as a set of factors 'that make the individuals feel uncertain of their career future' (Tien, Lin, & Chen, 2005, p. 164) – combining both occupational and intellectual uncertainty. Career uncertainty is different from and more subtle than the ideas of 'barriers' or 'difficulties' that might interfere with one's career development. It rather refers to post-PhDs' perceptions of an inability to control their academic situation and their feeling of personal efficacy to cope with circumstances. As a contextual factor beyond their control, career uncertainty is likely to influence post-PhDs' agency, defined as their motivations, intentions and efforts to plan and persist despite constraints, whether expected or not (McAlpine & Amundsen,

2018). In response to such constraints, individuals may induce the role of luck as part of succeeding or not (McAlpine, 2016) – thus enabling resilience to uncertainty. Career uncertainty influences individuals' experiences of becoming researchers, their personal lives and their identity-trajectories.

Method

This qualitative study draws on data gathered in the UK and Switzerland, although it is part of a larger research project also conducted in Spain and Finland. This cross-national project aims to investigate early career researchers' experiences in these different national contexts (http://www.fins-ridss.com). Based on a mixed-methods design, the two-step research protocol was the same in each country. The first step consisted of an online survey, including quantitative items and open-ended qualitative questions, sent to PhD students and post-PhDs in various universities in the UK and Switzerland. The quantitative items covered the respondents': (1) experiences in research/publication; (2) work environment relationships/support; (3) career goals and (4) strategies to overcome difficulties. The qualitative open-ended questions were related to respondents': (1) most significant events that have marked their academic paths; (2) dropout intentions and interruptions and (3) work-life balance challenges. The last question of the survey was an invitation to participate in a subsequent individual research interview. As a second step, these one-hour semi-structured interviews were based on a multimethod approach integrating (a) survey responses (quantitative/qualitative) and (b) visual methods: the network map and the journey plot to explore in depth their perceptions and experiences.

Sample

For the purpose of this article, we focused on the 24 post-PhD respondents from the UK (n = 11) and Switzerland (n = 13) who, after having completed the online survey, participated in semi-structured interviews. At that moment, these participants were aged between 28 and 56 years (median 36), in a postdoctoral position for an average of 3.5 years and mostly from humanities and social sciences fields. Table 1 shows their anonymised characteristics.

Data sources

Three primary data sources were mobilised for the analysis: (1) interview accounts, (2)

visual displays from the journey plot and (3) responses to one open-ended survey question about dropout intentions.

Interview accounts and journey plot

The interview accounts from the 24 respondents (10 men; 14 women) were primarily examined. The protocol was designed to deepen their survey responses, which were reviewed prior to the interviews. During the interview, participants were asked to use the journey plot to illustrate, on a time axis, the most significant events (positive/negative) they had experienced in the previous 12 months, which resulted in 24 visual displays. By capturing participants' own interpretations of their experiences, this type of visual method

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is considered well suited for researching complex and dynamic phenomena (Mazzetti & Blenkinsopp, 2012) such as career uncertainty.

Survey open-ended question accounts

The open-ended question selected for this analysis was the following: Have you considered dropping out of your post-doc work? If they responded yes, they were then asked to briefly explain why they had considered this option, which provided narrative accounts about reasons behind their intentions. Although the principal data source remained the interview accounts, the visual displays and open-ended question responses brought more accuracy and completeness to the analysis.

Analysis procedure

The data were analysed by a team of four researchers through a procedure inspired by the consensual qualitative research approach (Hill, 2012). Using MAXQDA 12, we followed an iterative four-step process combining deductive and inductive procedures (Graneheim, Lindgren, & Lundman, 2017):

Table 1. Interviewees' characteristics.

Pseudo	Country	Age	Gender	Discipline	Stage	Source of income	Career goal
Abbey	UK	28	F	Sport sciences	1st year	Contract at a university	Researcher at a university
Geri	UK	44	F	Education	1st year	Contract at a university	Other
Anne	UK	30	F	Sociology	1st year	Postdoctoral scholarship	Researcher at a university
Jake	UK	41	M	Sociology	1st year	Postdoctoral scholarship	Researcher at a university
Sue	UK	31	F	Psychology	2nd year	Unemployed	Lecturer (non researchintensive)
Gord	UK	40	M	Social work	2nd year	Contract at a university	Lecturer (research-intensive university)
Rob	UK	42	M	Education	2nd year	Contract at a university	Lecturer (research-intensive university)
Fred	UK	33	M	Sociology	3rd year	Postdoctoral scholarship	Lecturer (research-intensive university)
Kelsey	UK	36	F	Sociology	5th year	Postdoctoral scholarship	Lecturer (research-intensive university)
Sandra	UK	39	F	Life sciences	5th year	Postdoctoral scholarship	Other
Faye	UK	36	F	Molecular bio	7th year	Postdoctoral scholarship	Lecturer (non researchintensive)
Emma	CH	56	F	Education	1st year	Postdoctoral scholarship	Lecturer (non researchintensive)
Clara	CH	31	F	Social sci.	1st year	Postdoctoral scholarship	Researcher at a university
Mark	CH	38	M	Sociology	2nd year	Postdoctoral grant	Lecturer (research-intensive university)
Pio	CH	35	M	Natural sci.	2nd year	Contract at a university	Researcher at a university
Noah	CH	33	M	Education	3rd year	Contract at a university	Other
Juan	CH	30	M	Psychology	3rd year	Postdoctoral scholarship	Researcher at a university
Gaïa	CH	38	F	Humanities	4th year	Contract at a university	Self-employed
Céline	CH	36	F	Education	4th year	Contract at a university	Lecturer (research-intensive university)
Ian	CH	34	M	Psychology	5th year	Contract at a university	Other
Lloyd	CH	31	M	Engineering	5th year	Contract at a university	Lecturer (research-intensive university)
Joëlle	CH	34	F	Social sci.	7th year	Contract at a university	Researcher in government
Marta	CH	39	F	Life sciences	8th year	Contract at a university	Researcher at a university
Jada	CH	37	F	Neurosciences	8th year	Postdoctoral grant	Other

(1) Building the codebook. The general structure of the codebook used for analysing UK and Swiss data was developed based on the key constructs underpinning identity-trajectory

(deductive): intellectual strand (research/publication/careers), institutional strand (work environment), and networking and agency (significant events).

(2) Coding. To ensure that we shared the same definition of these themes, we started by using them to code two UK participants data files (survey responses/interview accounts/visual displays). The four of us coded a large part of a transcript together, using a common computer screen to enable discussion and agreement; code definitions were developed as we proceeded. The same process was subsequently conducted in pairs and individually. We then compared our results, reconciled them, and assessed our intercoder agreement by calculating a Kappa coefficient. We reviewed any unresolved questions and modified the definitions when necessary. This process was repeated on one-third of the entire transcript set until we reached a Kappa coefficient of at least 0.75% (Syed & Nelson, 2015). The remaining transcripts were coded independently. The general themes were finally clustered into sub-themes. The final version of this codebook was eventually used to code the Swiss data.

(3) Searching for emerging themes. While examining more especially the interview excerpts related to the intellectual strand (research/careers) and the institutional strand (work environment), we observed that uncertainty was a theme recurrently referenced by participants (inductive). Thus, a further analysis was conducted by the first author to get a better understanding of the importance of uncertainty in their overall post-PhD experiences. To that end, each of the 24 participants' journey plots, as well as the narrative accounts from the survey open-ended question about their dropout intentions, were analysed in depth, seeking further information about 'career uncertainty' – two sub-themes emerged: intellectual uncertainty and occupational uncertainty.

(4) Reviewing and defining themes. In line with the collaborative consensus approach, these emerging themes were revised by the co-authors as well as an 'external auditor' (Hill, 2012), who is a researcher with expertise on identity development theories. This review mainly led to the inclusion of 'personal life' as an element interacting with career uncertainty. Any disagreements or differences of opinion were reviewed, and the definitions of themes and sub-themes refined accordingly. Ultimately, the entire process allowed the examination of how career uncertainty influences post-PhDs' identity development.

Findings

In the UK and Switzerland, post-PhD research positions remain temporary, difficult to obtain and marked by uncertainty. In this regard, 9 of the 24 interviewees reported in the survey past or present intentions to quit their postdoc with career uncertainty as a central reason in most cases (8 out of 9). Further, just over half of the journey plot visual displays (n = 13), in which participants indicated the most significant events that have marked the previous year, were directly related to career uncertainty – though not necessarily intention to leave the academy. In other words, career uncertainty – both intellectual and occupational – is not equally experienced by all. Detailed findings, structured to address the three research questions, are presented in the following sections. We present

first what form career uncertainty takes in participants' work experiences and its daily manifestations before turning to its influence on identity-trajectory.

What form does career uncertainty take within post-PhD researchers' work experiences?

Our analysis showed that, in the course of post-PhDs' work experiences, career uncertainty seems to come in two recognisable forms: (1) intellectual uncertainty (largely evident in excerpts coded as intellectual and networking) and (2) occupational uncertainty (largely evident in excerpts coded as institutional and personal). When considering research careers, post-PhDs experience intellectual uncertainty in the same manner as do more senior researchers, in relation to their intellectual and networking strands. In contrast,

occupational uncertainty is mostly related to the development of an institutional strand and is likely to affect especially early career researchers. Both forms of uncertainty influence participants' sense of agency, in other words, are tightly related to the perception of an (in)ability to control their work situation or a feeling of personal efficacy to cope, or not, with circumstances (Tien et al., 2005).

Intellectual uncertainty

The first aspect of intellectual uncertainty directly influences the development of participants' research expertise and thus their intellectual strand. It refers to their doubts regarding their capacities for developing original, valuable ideas that are in line with their field's criteria or the more general fear of not being intellectually recognised in their research communities. In the following quote, Ian recounts a situation that happened a few days after he started his postdoctoral fellowship abroad. During a meeting, his ideas were publicly discredited by his hosting supervisor, a world authority in his field. This situation had destabilised his intellectual self-confidence:

He told me: 'Hey! Regarding your project: I read it and found it completely trivial' [...] This project was important to me. It was the very first project for which, based on the knowledge that I had developed throughout my PhD, I had a strong enough theoretical background to say: 'Okay, there is a gap here, I can develop and work on this' ... and then my idea was born, with some feedback from my colleagues, and this idea was accepted and developed...and recognised in Switzerland. Because I received a postdoctoral grant for this idea, and those grants are highly difficult to get. [...] It was very, very hard. It was a complete denial of my researcher identity. (Ian, 5th year, Social sciences, Switzerland)

The second aspect of intellectual uncertainty, which is closely related to the development of post-PhDs' networking strand, entails the difficulty of finding peers who share one's ideas or the feeling of intellectual isolation. As Jake – appointed to a temporary position – explains, this form of uncertainty tends to hinder the feeling of being part of an intellectual community:

At the beginning, of course, you expect to be isolated. You expect to spend some time finding your feet and getting to know people. But after three or four months...It's four months now, when I still feel that I haven't found this community. I haven't found this intellectual inspiration or community which enables me to...to find some kind of joy in the research I'm doing, some kind of...It's not just feedback. It's more than feedback. It's support and intellectual discussion, and it's becoming more and more difficult. (Jake, 1st year, Sociology, UK)

Occupational uncertainty

The first aspect of occupational uncertainty refers to individuals' doubts regarding their opportunities and capacities to find satisfying positions within or outside academia, and thus to develop their institutional strand. Such doubts were often linked to the personal. The following quotes (positive answers to the survey's open-ended question about dropout intentions), represent examples of how post-PhDs from the UK and Switzerland talked about occupational uncertainty and its interaction with personal decisions:

Continued uncertainty of funding...[I] can't live in limbo forever and moving every few years is getting tiresome. (Female, 9th year, Health science, UK)

Because there is no possibility to go further. I need to stay here for family reasons, and there are few professor positions available, and the competition is high. And, it's the fifth time that I have to move since I got my PhD. And I can't. What's the point of keeping going? (Female, 6th year, Natural science, Switzerland)

The second aspect of occupational uncertainty relates to the necessity of constantly thinking about and searching for the next job position. This situation is often seen as unbearable, as Geri explains here:

Well, I've just finished a six-month postdoctoral project, and although I was asked to do some other research for a month, still at the same faculty, at the same department, it's just a month. So I don't know what's going to happen next month. So, in March, I may end up unemployed, and this is a very stressful situation. I'm also applying for new jobs, and I get interviews, but last week, for example, I was notified that I didn't pass an interview. It's very stressful, and the uncertainty just is killing me, you know, because I'm just not sure whether I will even have

a job or not, even though I invest so much and I'm doing everything that I can. I work on my networks, I publish, I engage in very high-level research, but still, it just doesn't come up to a permanent job, and it's really, really stressful. (Geri, 1st year, Education, UK)

Figure 1. Sue's journey plot.

Figure 1 represents the journey plot of Sue, a post-PhD researcher from the UK in her second year. This visual display, in which she mapped the most significant events that marked her previous year, illustrates how occupational uncertainty took form in most participants' career paths, whether they were in the UK or Switzerland. As Sue explains, 'It's all about getting a job, and keeping a job, and getting my next job.'

While some participants talked more especially about one or the other form of uncertainty, in most cases both forms seem to be intimately interwoven as they manifest throughout their daily work experiences.

How does career uncertainty manifest on a daily basis?

Based on our analysis, career uncertainty seems to concretely impact participants' day-today work lives while also interacting with their personal lives. This career uncertainty manifests especially through (1) struggles to plan for the future, (2) difficulty in developing one's research, (3) missed opportunities and (4) precarious work-life balance. Often, occupational and intellectual uncertainties are concomitant.

Struggling to plan for the future

The difficulty in planning for the future is themost salient manifestation of career uncertainty that emerged from participants' accounts. At a first level, this issue is related to their institutional strand while intimately embedded in their personal life by influencing their life goals or inducing financial duress. Post-PhDs are generally at a crucial life stage where most people have or think about having children and aspire to a stable career situation. Like Faye expressed, many participants considered this issue as central in their current lives:

Not being able to [make] any plans for the future, not being able to aspire to a permanent position or a higher salary to get a mortgage or stable situation to think about having a family. [...] And the fact that you work so hard and you are not...it's not sure that you will get something proportional in return. These are the main problems. (Faye, 7th year, Molecular biology, UK)

For some participants, struggling to plan for the future also manifests at an expertise level, which affects their developing intellectual strand. Jada, who holds a prestigious postdoctoral grant that makes her a PI for five years, explained how she must anticipate her next potential funding:

It's doing research while anticipating future research. Not over a 10-year period, but you need pilot data for your next proposal. So, I must carry on my current research and, at the same time, plan for the next 3–4 years based on what I wish to work on, and collect some pilot data for that. And it's really...planning according to which funding I potentially can obtain. (Jada, 8th year, Neuroscience, Switzerland)

Unlike Jada, who was amongst the only two interviewees awarded a postdoctoral grant, most participants were hired under a non-permanent contract that left them few opportunities to develop their own research expertise.

Difficulty developing one's research

If it seems theoretically possible to reconcile developing one's research expertise and working on parallel projects as part of a post-PhD contract, the reality is different from

the participants' perspective. As Abbey expresses in the following, a gap between one's expertise and the research for which one is hired has the potential of transforming into an intellectual uncertainty issue:

Trying to balance sort of progressing my own research career as well as doing this current job, which is part of the career, but it doesn't focus on my PhD area. That's difficult. When I've discussed it with my line manager, it is supposed to work out that I have a day every week which is my own writing time, but it never works out like that, and I should plan better, and I do try to block out every Friday so it's my own writing day, but then things always come up [...] My work for my managers has to come first because that's what I'm paid to

do. (Abbey, 1st year, Sport science, UK)

In the case of participants hired to work on topics very close to their own expertise, some of them rather reported that their temporary contracts implied a lack of liberty that made them feel they were not developing or felt uncomfortable with the project at an intellectual level:

So, I was doing this part-time postdoc, and it was more or less in my subject area. They were looking at [topic X]. This is a very interesting area for me, very important area, and I was working on this project, and so I was doing lots of reading; I was helping with some analysis …You know, it was okay, it was fine, but I wasn't developing. It was good for my CV, and I was earning money, but it wasn't…it wasn't intellectually fascinating in many ways. (Rob, 2nd year, Education, UK)

Actually, I no longer have any interest in the research problem on which I'm working…even though I was willing to explore it at the beginning. Now, I find that it's more imposed on me since I have discussed several methodological and theoretical issues of the project [with the PI]. I'm asked to continue despite of this. So now, I work on a topic to which I don't feel committed. (Noah, 3rd year, Education, Switzerland)

While trying to reconcile their own research with the tasks they were hired for, some participants also reported how their precarious situations interfered with their career development.

Missing opportunities

Also emerging from our analysis is that career uncertainty manifests through missed opportunities, with an impact on networking and institutional strands. In some cases, the short-term aspect of participants' contracts, when it was not simply their post-PhD status, was limiting their possibilities to benefit from career development initiatives or training offers:

[…] one example is that staff members at my university, they can study for [Certificate X] for free, and this is part of the continuous development for staff members. In principle, I'm eligible for that as well because I am a staff member. But in practice, I can't really do it because this is a one-year program, and I'm not sure that I will be here for the whole duration of that. So, you know, it's just something that shows me that, yes, you are eligible, but in practice, you can't really take advantage of this option. (Geri, 1st year, Education, UK)

Furthermore, as Geri highlighted, missing opportunities due to career uncertainty manifests also through a difficulty in developing strong scholarly/academic networks:

I think, again, it all comes down to having a permanent or a more permanent role that enables me to nurture specific relationships within the network because, at the moment …I feel that I have to cultivate so many different relationships because I don't know

where will I end up, rather than really focusing on a smaller amount of relationships and really investing in these relationships. (Geri, 1st year, Education, UK)

Apart from the above-mentioned consequences on professional development, opportunities, and networks, career uncertainty also appeared to create complicated personal and family situations.

Balancing a post-PhD position with personal life

Whether they were parents or not, most participants reported work-life concerns related to career uncertainty. For many participants, having to change workplaces and the assumed mobility that comes with short-term positions had concrete implications for their personal lives, particularly regarding their family relationships or responsibilities. Such was the case of Gord, who found a new temporary position at the same time that his pre-term baby was born:

[…] I'd only just started my new job, and things were really, really difficult, trying to like find my way as a lecturer, with a new child, and my job is also miles away, so it was four hours commuting every day. (Gord, 2nd year, Social work, UK)

Occupational uncertainty also manifests through dual-career issues. As illustrated in the following quote, when both partners are researchers, their career trajectories might be hardly reconcilable. Sometimes, the success of one partner might even negatively impact the career opportunities of the other:

My husband just got a professor position [in Switzerland] and…he will never quit this position to go elsewhere. […] Of course, I'm happy for him: It was his ultimate goal. But from

now, in terms of mobility, my own options are restricted. (Jada, 8th year, Neuroscience, Switzerland)

Ultimately, in both its occupational and intellectual forms, career uncertainty impacts participants' identity development concretely.

How does career uncertainty influence their developing researcher identities?

Our findings revealed two main effects of career uncertainty on post-PhDs' identity development related to the three work strands of identity-trajectory: (1) dealing with an institutional blurred status and (2) clinging to the academic researcher identity. While the first one appeared to be a direct effect of career uncertainty, the second one was more subtle and must be seen as a side effect.

Dealing with an institutional blurred status

Whether they were considered to be employees or held a postdoctoral grant, some participants highlighted the ambiguity that characterised their temporary post-PhD status. On one side, as illustrated in the following quote, the challenges of such an institutional blurred status had an impact on the institutional strand as they were related to their integration within the institution to which they were affiliated:

What I find hard is that I actually don't have any status. I mean, I'm here but not 'part of it'. It's very destabilising. For example, a few months ago, the university was hosting a reception for the newly hired staff. Then I thought: 'I must go there because I'm a new staff'. So, I went there and…I wasn't on the list! I don't care to be on the list or not, but where do I belong? What is my status? (Jada, 8th year, Neuroscience, Switzerland)

On the other side, this blurred status appeared to impact participants' perceptions of themselves as researchers and, above all, their feeling of being recognised in their research community, which seems to exacerbate intellectual uncertainty. Geri explains how her post-PhD status made her feel that she was not part of a research community yet:

[…] as a postdoctoral experience, my feeling is that I am still very much judged on my performance, so, in a way, I still feel like I felt when I was a PhD student. So I'm still judged. I am not really there yet. I'm not really part of the research community. I don't feel like that. I haven't been accepted yet. I am still a Class B researcher here. (Geri, 1st year, Education, UK)

Similarly, Noah reported that because he was collaborating closely with the PI, he was often labelled as 'the Professor [X]'s postdoc' by his colleagues. He felt that, as a result, his own contributions were underestimated in his research community:

I have been feeling more like a subordinate since I'm [a postdoc] than when I was a [doctoral research assistant] […] Since I got my PhD, I'm often reduced to [being the subordinate of professor X]. But, I also have my own expertise and even more than him in certain domains. I would like to be recognised minimally. (Noah, 3rd year, Education, Switzerland)

Clinging to the academic researcher identity

Another interesting effect of career uncertainty on participants' identity development was a tendency to cling to their identity as academic researcher. As we reported previously, onethird of the participants had thought of quitting their postdoc because of career uncertainty. However, the idea of becoming an academic researcher appeared for many of them as a powerful motivation to keep going. Especially amongst more advanced post-PhDs, some admitted that, after somany years in academia, was it difficult to imagine themselves as anything other than academic researchers. Such was the case of Jada:

I am a researcher: I don't have any other training. And, because I don't have any clinical experience either, I don't have any plan B. So, either I am a researcher or…that's it! (Jada, 8th year, Neuroscience, Switzerland)

Even those who tried to concretely quit academia expressed to what extent the academic researcher identity had remained strongly embedded in their perception of themselves:

Last year, I tried to change jobs, so I tried not to do a postdoc anymore—to do something different—and it was very hard on me, for multiple reasons. For example, because I realised that it was very difficult to reinvent myself in a different position, as I've always been a researcher since I [got my PhD degree] (Faye, 7th year, Molecular biology, UK)

Every time I tried to postulate outside academia—I've had two job interviews so far—it's been extremely hard: I felt like torn a part of myself away, as I would abandon so many things.

(Joëlle, 7th year, Social sciences, Switzerland)

Discussion and conclusions

This study examined how career uncertainty influences work experiences and identity development amongst post-PhD researchers from the UK and Switzerland. Our findings show that, in both countries, career uncertainty tends to take two different forms through the course of their work experiences. Intellectual uncertainty refers to post-PhDs' doubts regarding their capacities for developing original, valuable ideas that are

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in line with their field's criteria or the more general fear of not being intellectually recognised in their research communities. It also entails the difficulty of finding peers who share one's ideas or the feeling of intellectual isolation. Occupational uncertainty refers to post-PhDs' doubts of their ability to find satisfying institutional positions within or outside academia. It includes a continuous job-searching situation that implies constantly thinking about and searching for the next job position, but largely only in academia. This finding is in line with McAlpine and Amundsen's (2018), who observed that those who had been in post-PhD research situations for many years did not actively seek other career options despite experiencing anxiety and stress due to this occupational uncertainty. On a daily basis, both forms appeared to strongly impact participants' work and personal lives by limiting their ability to plan for the future, impairing their developing research expertise and scholarly networks and inducing tension as they tried to reconcile work and personal lives. Regarding their academic researcher identity, participants reported having to deal with a blurred institutional status, which impacts their perceptions of themselves as competent researchers and their feeling of belonging to their research community. However, many of them 'hang tough' despite their precarious situation by clinging to this identity. Overall, as Sigl (2016) argued, dealing with career uncertainty appears as a more encompassing challenge than simply seeking to secure a position or outputs; it also fundamentally affects individuals' self-perception and their ability to project themselves into the future.

Several concerns emerged from these findings. First, our analysis shows that work and personal lives are closely intertwined and must be not considered separately when addressing post-PhDs' career issues, thus uncertainty is expressed in the fullness of each individual's identity-trajectory (McAlpine & Amundsen, 2018). An eloquent example is the case of dual-career couples, when one partner's success may negatively impact the career opportunities of the other, regardless of the strength of their respective investment in the process. Moreover, while precarious employment prospects often involve adverse financial circumstances (McAlpine & Amundsen, 2016), post-PhDs with family responsibilities and those who are unable to afford income insecurity are especially disadvantaged in the pursuit of an academic career (Sigl, 2016). Second, while access to institutional resources, support from the research community, and a broader network promote post-PhDs' positive experiences (Chen et al., 2015), the consequences of the blurred institutional status reported by some participants show to what extent career uncertainty might impede establishing oneself as a recognised researcher. Finally, given the current lack of tenure-track positions, it is surprising to find that some participants reported clinging to the academic researcher identity as a way to maintain their motivation and persist despite career uncertainty. This difficulty to imagine oneself as anything other than academic researchers is in line with the contradiction observed by Wöhrer (2014) amongst post-PhDs repeatedly declaring intentions to leave academia due to career uncertainty while continuing to apply for academic jobs. One possible explanation is the existence of the enduring belief that with enough work, devotion, and sacrifice, the most talented researchers will find academic positions (Skakni, 2018). If obstinacy and a willingness to take risks are indeed considered assets when pursuing an academic career, this enduring belief of 'the survival of the fittest' (Browning et al., 2017) tends to overshadow the actual role of luck as part of succeeding or not in academia (McAlpine, 2016) and likely contributes to the high levels of stress and anxiety observed amongst post-PhDs (Gloria & Steinhardt, 2016).

While we might assume individuals have some responsibility for planning and taking action as regards their career development, the evidence suggests this is not always the case. Yet, doctoral students and post-PhDs need to be better informed about existing non-academic careers, including those in universities (McAlpine & Amundsen, 2018), and, one might argue, better supported in preparing for these types of careers. Since the early 2000s (Golde & Dore, 2001), studies internationally have consistently shown that PhD students and postdocs want more career advice. To what extent should career development be a core institutional concern and formally integrated into doctoral programmes and postdoctoral support schemes? The same question might be asked about more systematic tracking of post-PhDs' paths to better understand the challenges that mark the different stages of their career trajectories.

Disclosure statement

No potential conflict of interest was reported by the authors.

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