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Ready for careers within and beyond academia? Assessing career competencies amongst junior researchers

I. Skakni ^a, C. Maggiori ^b, J. Masdonati ^c and J. Akkermans ^d

^aResearch and Innovation Division, University of Applied Sciences and Arts, Delémont, Switzerland; ^bHETS-FR, University of Applied Sciences and Arts, Delémont, Switzerland; ^cInstitute of Psychology, University of Lausanne, Lausanne, Switzerland; ^dSchool of Business and Economics, Vrije Universiteit Amsterdam, Amsterdam, Netherlands

ABSTRACT

This study examines the extent to which career competencies (knowledge, skills, and abilities necessary to manage one's own work and learning experiences to achieve the desired career progression) are prevalent amongst early career researchers (ECRs). We adapted the Career Competencies Questionnaire [Akkermans, J., Brenninkmeijer, V., Huibers, H., & Blonk, R. W. (2013). Competencies for the contemporary career: Development and preliminary validation of the career competencies questionnaire. *Journal of Career Development*, 40(3), 245–267] to ECRs' training and career specificities, considering the two career tracks facing them: within and outside academia. This questionnaire was sent to PhD students and junior PhD holders in 16 countries ($n = 727$). Our results show that career competencies for within and outside academia are clearly contrasted. Furthermore, compared with their female counterparts, male participants generally reported stronger career competencies in preparation for careers both within and outside academia, while PhD students perceived having more career competencies in preparation for careers outside academia than PhD holders did. We also found a positive link between ECRs' career competencies and their perceived employability, and those who perceived themselves as having strong career competencies were more likely to consider their current work meaningful. While most PhD holders pursue careers beyond academia, the concept of career competencies offers an innovative theoretical contribution to the field of ECRs' development, by highlighting how this population perceives their preparedness for diverse professional paths.

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Introduction

Within contemporary labour markets, individuals face the need to take responsibility for their careers and adapt to increasingly dynamic and changing work environments and more complex career trajectories (Akkermans et al., 2013). In such a context, individuals have to acquire the resources and competencies necessary to cope with career changes

CONTACT I. Skakni  Isabelle.Skakni@hes-so.ch  Research and Innovation Division, University of Applied Sciences and Arts, Route du Moutier, Delémont 2800, Switzerland

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and transitions and achieve their career goals (Sullivan & Al Ariss, 2021). Academia is no exception to this reality. Over the past few decades, the growing number of PhD holders has significantly exacerbated the competition for tenure-track positions (OECD, 2021). Meanwhile, postdoctoral positions have become precarious and are no longer a simple step toward an academic career (Van Weijden et al., 2016). Therefore, a vast majority of PhD holders find themselves working in non-academic sectors, whether intentionally or not (Skakni et al., 2021; Vitae, 2016). Thus, it is increasingly difficult for early career researchers (ECRs)¹ to anticipate and prepare for their future careers. However, motivations for undertaking doctoral studies are multiple and complex, ranging from personal development or the search for intellectual challenges to more pragmatic career-oriented intentions (Guerin et al., 2015; Skakni, 2018). Thus, many ECRs are aware of the limited number of academic positions available (Gokhberg et al., 2017), have previous work experiences outside academia or do not wish to pursue an academic career (Skakni et al., 2021). However, large surveys, conducted notably in the United States (Woolston, 2019) and Europe (LERU, 2018; Vitae, 2016), have shown that academic careers remain the primary goal for most ECRs. When, by choice or obligation, ECRs begin to consider career options beyond academia², many of them have limited knowledge of the rapidly changing hiring trends and the range of job opportunities available to them (Gokhberg et al., 2017).

Such conjuncture has raised global concerns about the purpose of the contemporary doctorate (Coates et al., 2020) and how to prepare ECRs adequately for both academic and non-academic careers (Broms & de Fine Licht, 2019). Thus, universities are facing increased pressure to reform their approaches to PhD training so that graduates are equipped with the knowledge and skills to secure employment opportunities in various types of careers (Kiley & Cumming, 2014). One particular area of research that might be fruitful in this regard but has received little attention thus far is the development of career competencies amongst ECRs. Such competencies, which individuals need to navigate their future careers, have proven to be paramount in the current increasingly flexible and competitive labour market (De Vos et al., 2019). As such, they are likely to be important means for ECRs to engage in and steer their career trajectories.

Career competencies

Career competencies refer to ‘knowledge, skills, and abilities central to career development, which can be influenced and developed by the individual’ (Akkermans et al., 2013, p. 249). They comprise a set of knowledge, skills, and attitudes that positively influence professional opportunities. Career competencies involve critical reflection on oneself and one’s professional life and, as such, they are part of a continuous process of learning through experience. Moreover, they are distinct from generic or transferable skills because they are meta-competencies (Hall et al., 2018): they do not focus on specific skills to practice a profession or perform specific tasks but instead allow individuals to develop skills for navigating their career trajectories. Given the need to deal with contemporary careers’ uncertainty, career competencies’ fundamental function is to foster career development and advancement.

According to Akkermans et al. (2013), career competencies can be categorised into three core dimensions, each comprising two sub-dimensions. First, the reflective dimension refers to awareness and critical thinking about one’s work-related values,

motivations, strengths, and weaknesses. The sub-dimensions are reflection on motivations (values, passions, and intentions concerning one's career) and reflection on qualities (strengths, shortcomings, and perceived skills concerning one's career). Second, the communication dimension relates to the ability to network professionally and promote oneself in professional contexts. The sub-dimensions are networking (ability to create and expand personal and professional networks for career-related purposes) and self-profiling (ability to promote one's knowledge, abilities, and skills in the workplace and external labour markets). Finally, the behavioural dimension refers to the active exploration of career opportunities and an ability to steer one's career. The sub-dimensions are work exploration (ability to explore and search for further education, work, and career-related opportunities) and career control (ability to influence learning and work processes related to one's career by setting goals and planning how to fulfil them).

Previous research has shown that career competencies are associated with positive study, work, and career-related outcomes. For instance, Lo Presti et al. (2021) showed that the development of career competencies would allow students to engage in employability-enhancing activities more actively during the school-to-work transition and, ultimately, experience higher levels of subjective career success. In general, career competencies have also been studied within educational settings: notably, amongst students in vocational education (Kuijpers et al., 2011) or undergraduate and graduate university students (Dumulescu et al., 2015). Research also has examined certain aspects of a specific learning context (Kuijpers & Meijers, 2012) or a particular educational programme (e.g., MBA; see Sturges et al., 2003) that contribute to developing career competencies. In terms of work-related outcomes, career competencies can interact with job resources to enhance work engagement and they are positively associated with work-related well-being and health (Plomp et al., 2016) and job satisfaction (Kong, 2013). Finally, career competencies are associated with various career-related outcomes, such as career satisfaction (Kong et al., 2016), work-life balance (Cappellen & Janssens, 2008), career support at work and in private life (Kuijpers et al., 2006), and perceived employability (Blokker et al., 2019). Importantly, research has shown that career competencies can be actively developed and can lead to improved employability amongst young workers (Akkermans et al., 2015). Certain personal dispositions such as being proactive (Plomp et al., 2016) and having high core self-evaluation (Tims & Akkermans, 2017) have been acknowledged to foster the development of career competencies, and support outside of work (e.g., from family) can also have an influence in this regard.

Career competencies amongst ECRs

Despite this wealth of knowledge about career competencies, to our knowledge, no study on career competencies to date has focused specifically on the population of ECRs. Yet, the concept of career competencies likely sheds new light on how PhD students and PhD holders anticipate and prepare for their future careers. Assessing career competencies amongst ECRs is particularly relevant given their career routes' specificities. On one side, the length of doctoral training involves long-term projections into a professional future that is unpredictable. On the other side, postdoctoral researchers, who now typically cumulate fixed-term contracts, often find themselves in a continuous job-searching situation that implies continually thinking about and searching for their next positions

(Skakni et al., 2019). Over time, such a situation manifests through job insecurity, which negatively affects these researchers' perceived employability: It makes them doubt their ability to find satisfying positions within or beyond academia (Skakni et al., 2019). This self-doubt issue is particularly crucial, as the gender gap in self-esteem and self-confidence is already well documented in both the general population and academia (e.g., Bleidorn et al., 2016; Herbst, 2020), including with regard to career progression (Manfredi et al., 2017). Hence, for ECRs, developing meta-competencies that help them navigate this complex career landscape seems highly important.

Recent qualitative research seems to support the idea that career competencies can be a crucial career development mechanism for ECRs. For instance, in previous studies amongst Swiss ECRs (Skakni et al., 2019), we observed that career competencies were particularly salient in the discourse of many participants who were not always aware that they possessed such competencies. To illustrate, some participants highlighted the importance of developing a sense of self-evaluation in professional contexts and a capacity to anticipate and steer the next steps in their careers. In another recent qualitative study conducted amongst PhD holders from the UK and Switzerland pursuing careers beyond academia, several participants reported that they struggled to integrate into non-academic workplaces, especially in sectors distant from academia in terms of requirements, practices, and values (Skakni et al., 2021). Because they felt they were not prepared for this transition, it triggered a reflection upon what is essential to them in their work and what purpose they attribute to work in general.

Although these qualitative studies revealed that something is at play between ECRs' career competencies, their perceived job security and employability, and the meaning they ascribe to work, this phenomenon has never been quantified. While demographics such as gender, parents' levels of education, or marital status have been shown to affect ECRs' trajectories (Gardner & Holley, 2011; Mullen et al., 2003), considering the influence of these factors on the development of their career competencies also appears worthwhile to us. Thus, the present study focused on the career competencies necessary for ECRs when they prepare for careers within and beyond academia. To this end, we developed a version of the CCQ that considers the specifics of ECRs' career trajectories. Drawing on this instrument, we pursued three objectives:

- (1) To examine whether there are differences in the career competencies amongst ECRs according to gender, marital status, PhD status (PhD students/holders), employment status (within/outside academia) and parents' education level;
- (2) To examine whether ECRs' job insecurity is associated with their career competencies for within and outside academia;
- (3) To examine whether ECRs' career competencies for within and outside academia impact their perceived employability and the meaning they ascribe to work.

Method

Procedure

Given the very specific population targeted, we used a purposive sampling method (Etikan et al., 2016). Participants were recruited through a snowball strategy; from

March to November 2019 an email invitation was sent directly to PhD students and PhD holders in each of the authors' universities and networks. This invitation was also sent to colleagues affiliated with different universities in Europe, Australia, New Zealand, South Africa, Canada and the United States, who were asked to share the recruitment message amongst their networks. The recruitment message explained the aims of the study and provided a link to the online questionnaire. Participation in the online questionnaire was voluntary, anonymous and in compliance with the ethical rules of the Swiss Federal Act on Research involving Human Beings (Human Research Act, HRA) of 30 September 2011 (Status as of January 1, 2014). This overall recruitment procedure was not meant to obtain a sample representative of the ECR population.

Sample

The sample comprised 727 participants, of whom 383 were PhD students (52.7%) and 344 were PhD holders (47.3%), mainly from the following countries: Austria, Belgium, Estonia, France, Germany, Italy, the UK, the Czech Republic, the Netherlands, Slovakia, Switzerland, Australia, New Zealand, South Africa, Canada and the United States. Amongst the participants, 446 were female (62.5%) and 265 were male (37.1%), while three indicated 'other' (0.4%).³ Participants were aged between 22 and 65 years old; their mean age was 33.82 (SD = 8.14). With regard to their employment status, 90.1% worked within academia and 9.9% – representing 20.9% of PhD holders – worked outside academia. Regarding marital status, 262 were single (36.7%), 234 were living with a partner (32.8%) and 218 were married (30.5%). For the analyses, we considered 262 single and 452 non-single (with a partner or married). Finally, regarding parents' highest level of education, 59.4% of the participants had at least one parent with a bachelor's degree or higher, and the remaining 40.6% had a parent/parents with less than a bachelor's degree.

Instruments

Career competencies of early career researchers (CCQ-ECR)

To assess ECRs' specific career competencies, we reworded some of the 21 original items of the Career Competencies Questionnaire (CCQ; Akkermans et al., 2013) (e.g., 'I can make clear career plans' reformulated into 'I can make clear career plans within the academic sector') and created 20 additional items (e.g., 'I know how to promote the value of my PhD amongst employers outside academia'). This process took into account both the comments of the author of the CCQ and the feedback of four career developers working with ECRs, five doctoral students and five PhD holders from Australia, Canada, the UK and Switzerland. Then, for the purpose of the present study, we selected from this pool of 41 items the 18 items that were explicitly related to careers within and outside academia.

We verified these 18 items for poor acceptability, which was identified as missing data equal to or greater than 5%: Large amounts of missing data may reflect problems in the formulation of the item, in participants' understanding of the question, or in acceptance by the participants (Guarino et al., 2006). All items had less than 5% of missing data. An exploratory factor analysis (EFA) with varimax rotation was then conducted on the set of

the 18 items composing the CCQ-ECR ($n = 727$). The Kaiser–Meyer–Olkin (KMO) value indicated ideal sample adequacy (.87), and Bartlett’s test of sphericity was significant ($p < .001$). Analyses showed four components with an initial eigenvalue greater than 1.0 and explaining 63.07% of the total variance. All the factor loadings vary from .42 to .84 on the concerned factor, and four items loaded ($> .40$) on two different factors. However, Cattell’s (1966) scree test, as well as the interpretability and coherence of the sorted structure, suggested an ideal solution with two factors. A parallel analysis (O’Connor, 2000) conducted on our database supported a two-factor solution. Second, we reran an EFA with varimax rotation and a fixed number of two factors. The KMO value (.87) indicated an excellent sample adequacy, and Bartlett’s test of sphericity was significant ($p < .001$). The extracted factors explained 50.76% of the total variance. All the items showed a factor loading greater than .40 on their respective factor (ranging from .48 to .83) and no items substantially loaded on the other factor.

These two factors correspond to two distinct dimensions of ECRs’ career competencies (see Table 1). The first dimension, called within academia (CC-WA), reflects interest, motivation, and perceived competencies to pursue an academic career (e.g., ‘I can make clear career plans within the academic sector’, ‘I know how to develop a strong academic profile’). The second dimension, called outside academia (CC-OA), refers to individuals’ interest, motivation and perceived competencies and resources for a non-academic position (e.g., ‘I know how to promote my skills and expertise outside academia’, ‘I am able to explore my career opportunities outside academia’). Each dimension is composed of 9 items that assess both reflective, communication and behavioural career competencies. Participants answer to each item using a 5-point Likert-scale (1 = completely disagree, 5 = completely agree). Cronbach’s alphas were .82 and .89 for the CC-OA and the CC-WA dimensions, respectively.

Table 1. CCQ-ECR items and factor loadings.

	Loadings	
	Factor 1	Factor 2
<i>CC-WA</i>		
1. I am interested in pursuing an academic career	.62	
2. I am interested in pursuing a non-academic career	–.48	
3. I know a lot of people within academia who can help me with my career	.59	
4. I know how to promote my skills and expertise within academia	.72	
5. I use academic social networking sites to promote my skills and expertise	.54	
6. I am able to explore my career opportunities within academia	.75	
7. I know how to use academic job portals to explore career opportunities	.59	
8. I can make clear career plans within the academic sector	.75	
9. I know how to develop a strong academic profile	.78	
<i>CC-OA</i>		
10. I know which of my skills are transferable to non-academic positions		.63
11. I know a lot of people outside academia who can help me with my career		.72
12. I know how to promote my skills and expertise outside academia		.82
13. I use non-academic social networking sites to promote my skills and expertise		.49
14. I know how to promote the value of my PhD amongst employers outside academia		.73
15. I am able to explore my career opportunities outside academia		.81
16. I know how to use non-academic job portals to explore career opportunities		.70
17. I can make clear career plans in non-academic sectors		.82
18. I know how to develop a strong non-academic profile		.83

Perceived employability

The ECRs' perceived employability was assessed with De Cuyper and De Witte's (2010) eight items reflecting internal and external employability, which refer respectively to one's perception of employment opportunities with one's current employer or with another employer. Perceived internal employability was measured with four items (e.g., 'In my current job, I would be able to advance to a better job'). Perceived external employability was measured with four items (e.g., 'I would easily find another job if I lost my current job'). All items are rated on a 5-point Likert-scale (1 = completely disagree, 5 = completely agree). Consistent with De Cuyper and De Witte's indications, we assessed a global score of perceived employability. In the present study, the Cronbach's alpha of perceived employability was .82.

Job insecurity

Participants' job insecurity was assessed with the Job Insecurity Scale (JIS; Urbanavičiūtė et al., 2015) through two 4-item scales covering quantitative and qualitative insecurity. The quantitative job insecurity scale measures the perceived threat of losing one's job (e.g., 'I think I might lose my job in the near future'). The qualitative job insecurity scale measures the perceived threat of facing unfavourable changes in working conditions (e.g., 'I think my job will change for the worse'). Participants are asked to answer on a 5-point Likert scale (1 = totally agree, 5 = totally disagree). In our study, the Cronbach alphas for the qualitative and quantitative insecurity dimensions were .89 and .91, respectively.

Meaning of work

The meaning participants ascribe to work was assessed using the 10-item Work as Meaning Inventory (WAMI; Steger et al., 2012), which is comprised of three subscales: positive meaning, meaning making through work, and greater good motivations. The positive meaning scale measures whether individuals experience meaningfulness in relation to their work (e.g., 'I have found a meaningful career'). The meaning making through work scale captures how participants' meaning in life benefits from their work (e.g., 'My work helps me make sense of the world around me'). The greater good motivations scale measures if the meaning one ascribes to work is seen as having a broader impact (e.g., 'I know my work makes a positive difference in the world'). All items are rated on a 7-point Likert-scale (1 = do not agree at all, 7 = totally agree). Consistent with Steger et al.'s indications, we measured a global meaning of work score. WAMI's Cronbach alpha was .84 in the present study.

Participants' characteristics

We also considered the following variables: gender (1 = female; 2 = male), parents' highest education level (1 = no bachelor degree; 2 = bachelor or higher degree), singleness (1 = single; 2 = with a partner), PhD status (1 = PhD student; 2 = PhD holder), employment status (within/outside academia), and age (measured as a continuous variable).

Data analyses

The analyses were conducted using SPSS 25. A series of one-way analyses of variance (ANOVA) were conducted to test possible differences in participants' characteristics (gender, PhD status, employment status, parents' highest education level) on the CCQ-ECR dimensions. To assess the association between job insecurity and career competencies within and outside academia, as well as the association between the latter and perceived employability and work meaning, a series of hierarchical multiple regressions were conducted (with an Enter method). Participants' individual characteristics (age, gender, singleness, employment status, and parents' highest education level) were entered in Step 1 to control for their confounding effects. The other independent variables were entered in Step 2.

Findings

Analyses of variance

With regard to the 'within-academia' dimension (CC-WA), the analyses indicated that PhD holders ($M = 3.42$) scored higher than PhD students did ($M = 3.25$), $F(1, 725) = 10.49$; $p < .001$, men ($M = 3.41$) reported higher scores than women did ($M = 3.29$), $F(1, 709) = 4.30$; $p < 0.05$, and participants working in academia scored higher than those working outside academia did, $F(1, 725) = 25.48$, $p < .001$. Analyses on the 'outside-academia' dimension (CC-OA) highlighted similar results concerning gender, namely a significant difference between men ($M = 3.19$) and women ($M = 3.04$), $F(1, 709) = 5.80$; $p < .05$. In contrast, participants working outside academia and PhD students reported higher scores than did those working in academia, $F(1, 725) = 24.37$, $p < .001$, and PhD holders, $F(1, 725) = 6.52$; $p < .05$, respectively (see [Table 2](#)).

Regressions

Two hierarchical regression analyses (using the Enter method) were performed to predict both CC-WA and CC-OA scores (see [Table 3](#)). With reference to the CC-WA dimension, the final model accounted for approximately 10% of the variance of this DV. More specifically, the analyses highlighted that PhD holders and participants currently working in academia obtained a higher score on the within-academia dimension. Furthermore, CC-WA was negatively associated with JIS-Qualitative. Thus, the perception

Table 2. CCQ-WA and CCQ-OA M and SD based on participants' characteristics.

	CC-WA		CC-OA	
	M	SD	M	SD
PhD student	3.25	0.68	3.17	0.76
PhD holder	3.42	0.74	3.02	0.84
Women	3.29	0.70	3.04	0.78
Men	3.41	0.72	3.19	0.84
Working in academia	3.38	0.68	3.05	0.79
Working outside academia	2.94	0.85	3.54	0.82
Parent education (<BA)	3.34	0.69	3.14	0.80
Parent education (BA or higher)	3.33	0.73	3.06	0.81

Table 3. Predicting CC-WA and CC-OA.

	CC-WA		CC-OA	
	Step 1	Step 2	Step 1	Step 2
PhD status	.18***	.20***	-.25***	-.22***
Gender	.09*	.07°	.09*	.07°
Age	.01	.01	.09*	.08°
Employment status	-.27***	-.29***	.26***	.23***
Parents' education level	.02	.02	.08*	.08*
Singleness	.06	.07	.09*	.10*
JIS-Qualitative		-.24**		-.14
JIS-Quantitative		.10		-.07
Total R ²	.08	.10	.09	.13
ΔR ²	.08***	.02***	.09***	.04***
F	10.10***	9.77***	11.45**	12.50***
df1, df2	6, 627	8, 625	6, 627	8, 625

Note. For each step standardised b are presented. PhD status: 1 = PhD student, 2 = PhD holder; Gender: 1 = Women, 2 = Men; Employment status 1 = working within academia, 2 = working outside academia; Parents' education level (1 = no bachelor degree; 2 = bachelor or a higher degree); Singleness: 1 = single (unmarried), 2 = with partner (married, registered partnership). ° $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed).

of a threat of facing unfavourable changes in one's working conditions was associated with a lower score on career competencies for those within academia.

With reference to the second dimension of the CCQ-ECR, the final model explained 13% of the CC-OA score variance. Amongst the individual characteristics, PhD students, participants currently working outside academia, participants with at least one parent with a bachelor degree or higher, and participants with a partner obtained higher scores on the outside-academia dimension. No significant associations were found between job insecurity (qualitative and quantitative) and the CC-OA score.

Next, we conducted two additional sets of hierarchical regression analyses (using the Enter method) to predict both perceived employability and meaning of work scores (see Table 4). For perceived employability, the final model explained 34% of the variance of the PES score. Amongst individual characteristics, age was negatively associated with the

Table 4. Predicting PES and WAMI.

	PES		WAMI	
	Step 1	Step 2	Step 1	Step 2
PhD status	-.11*	.01	.02	-.01
Gender	.12**	.05	-.02	-.07°
Age	-.15***	-.15***	.10*	.09*
Employment status	.06	-.05	-.01	.04
Parents' education level	.04	.01	.03	.02
Singleness	.06	.03	.06	.04
CC-OA		.33***		.05
CC-WA		.11***		.32***
JIS-Qualitative		-.46***		-.08
JIS-Quantitative		.10		-.09
Total R ²	.04	.34	.01	.15
ΔR ²	.04***	.30***	.01*	.14***
F	4.83***	33.81***	2.30*	12.09***
df1, df2	6, 621	10, 617	6, 627	10, 623

Note. For each step standardised b are presented. PhD status: 1 = PhD student, 2 = PhD holder; Gender: 1 = Women, 2 = Men; Employment status 1 = working within academia, 2 = working outside academia; Parents' education level (1 = no bachelor degree; 2 = bachelor or a higher degree); Singleness: 1 = single (unmarried), 2 = with a partner (married, registered partnership). ° $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed).

PES score. As such, the older the respondent, the less they perceived themselves as being employable. Moreover, both CC-WA and CC-OA were positively associated with perceived employability. Finally, the higher the qualitative job insecurity score was, the lower the perceived employability score was.

Regarding meaning of work, the final model accounted for approximately 15% of the variance of the WAMI score. The age of the participants positively predicted the total WAMI score. As such, the older the participants, the more they perceived their work as meaningful. Moreover, CC-WA and WAMI were positively associated. Thus, the more the participants described themselves as having career competencies for academia, the more they evaluated their work as meaningful.

Discussion

The aim of this study was to examine the extent to which career competencies are prevalent amongst ECRs. Building on the CCQ-ECR, a questionnaire assessing ECR-specific career competencies, our findings generally supported the framework of meta-competencies consisting of reflective, communication, and behavioural career competencies. This offers further empirical evidence that career competencies are independent of a specific job or occupational field. Nevertheless, our findings also indicated that ECRs had career competencies that referred to two distinct career paths: within and outside academia. As such, career competencies might be considered ‘contextualised meta-competencies’. Indeed, because our results showed that academic and non-academic career competencies are contrasted (i.e., they represent two distinct dimensions of the CCQ-ECR), these meta-competencies are arguably not fully independent of the work context that participants think of when they answer the CCQ-ECR. In sum, although career competencies may, overall, be applicable across occupations, specific additions would seem be warranted to detect fully the single challenges of specific occupational contexts, such as the one of ECRs.

Drawing on the CCQ-ECR, we pursued three objectives. First, we examined whether differences exist in ECRs’ career competencies according to gender, marital status, PhD status (PhD students/holders), employment status (within/outside academia), and parents’ education levels. Our results showed that men reported higher levels of career competencies than women did, for both within and outside academia. Further research will be necessary to better understand this finding, but it should in any case be considered in light of previous research conducted on the general population and in academia showing that women tend to either be accurate in their self-assessments or underestimate themselves, whereas men generally tend to be overconfident, including about their career progression (Bleidorn et al., 2016; Herbst, 2020; Manfredi et al., 2017).

Moreover, PhD students – compared to PhD holders – and participants with partners obtained higher scores on career competencies for outside academia. On one hand, it can be argued that those who have started their PhDs more recently are more likely to be aware of their weak job prospects within academia and thus of the importance of preparing for careers beyond academia. Previous studies have also shown that the longer a person spends in academia after obtaining a PhD (e.g., as a postdoc), the more difficult it becomes to project oneself into other employment sectors (Skakni et al., 2019). Moreover, PhD students who had previous work experiences in non-academic

labour markets, a profile that is increasingly common, are also more likely to know how to prepare for careers beyond academia (Skakni, 2018). On the other hand, participants with partners may be thought to be better supported in their private lives, which is to some extent in line with Kuijpers et al.'s (2006) findings amongst the general population, which showed employees reporting strong career competencies were likely to report better career support at work and in their private lives. Similarly, Akkermans and Tims (2017) showed that career competencies can play a role in people's work–family enrichment, further solidifying the link between support outside work and the development of career competencies.

Interestingly, participants with at least one parent with a university degree also scored higher on career competencies for outside academia, but not for within academia. This result contrasts with previous research indicating that while first-generation students are less likely to enter doctoral programmes compared to their peers whose parents have university degrees (Mullen et al., 2003), when they are admitted to PhD programmes, they tend to experience challenges in terms of belonging and understanding academia's tacit rules (Gardner & Holley, 2011). Our findings indicated no differences regarding career competencies oriented towards academic careers. The finding that those with at least one parent with a university degree had more strongly developed their non-academic career competencies is in line with extant literature on school-to-work transitions, which has shown that young adults with parents from a higher social class generally are more adaptable and have more access to external resources (Blustein et al., 2002).

Our second objective was to examine whether ECRs' job insecurity was associated with their career competencies for within and outside academia. Career competencies for within academia were negatively associated with qualitative job insecurity, which refers to the perception of the threat of facing unfavourable changes in one's working conditions. However, no association was found between job insecurity (qualitative or quantitative) and career competencies for outside academia. We may think that these findings tend to echo previous research, according to which, despite actual precarious job situations and being aware of the limited opportunities for academic careers, many ECRs believe that with enough work, devotion, and sacrifice, they will eventually find stable academic positions (Browning et al., 2017).

Third, we examined whether ECRs' career competencies for careers within and outside academia were associated with their perceived employability and meaning of work. While career competencies have been linked to perceived employability amongst other populations (Blokker et al., 2019), our results indicated that in the case of ECRs, only career competencies for within academia were associated with better perceived employability. Career competencies for within academia were also associated with more meaningful work. We may think that it corresponds to some extent with the idea that academic careers remain most ECRs' primary goals, which may drive them to focus on anticipating and preparing for those careers specifically rather than careers outside academia (LERU, 2018; Vitae, 2016; Woolston, 2019). This could also partly explain why, for some PhD holders, entering non-academic workplaces triggers a reflection upon what is essential to them in their work and what purpose they attribute to work in general (Skakni et al., 2021).

Implications

Our findings contribute to the field of ECRs' career development by offering new insights into how they perceive their preparedness for careers within and beyond academia. Contemporary research careers have specific characteristics that require consideration both from individuals who enter them and from those whose job it is to help people navigate complex labour markets. Notably, while addressing the precarity and job insecurity that currently marks ECRs' careers, we believe awareness needs to be raised amongst this population about the importance of developing career competencies. Indeed, in increasingly challenging work contexts, this set of competencies represents a personal resource that facilitates career advancement and work satisfaction (Akkermans et al., 2013). Moreover, the concept of career competencies offers an innovative angle of analysis by highlighting the importance of examining meta-competencies that enable ECRs to anticipate and prepare for both academic and non-academic career tracks, moving beyond transferable knowledge and skills.

More specifically, the difference between men's and women's CCQ-ECR scores and the fact that PhD holders perceived themselves as less equipped than PhD students to prepare for careers outside academia appear to be important elements to consider when developing institutional career development policies and training programmes. These findings prompt consideration of gender-sensitive forms of support. Moreover, policies and training programmes should provide tools and resources for exploration of career opportunities beyond academia, starting in the first year of doctoral studies and being offered to those in postdoctoral positions.

Indeed, the notion of career competencies challenges the prevailing assumption that to prepare for careers beyond academia, developing transferable skills is crucial above all. It is reasonable to assume that the development of career competencies as types of meta-competencies actually allows ECRs to acquire in a more purposeful way the skills and knowledge they need for the type of work they aspire to obtain. Therefore, this study highlights that ECRs also need to develop an awareness of their work-related strengths and weaknesses, cultivate the ability to promote themselves in professional contexts and engage in active exploration of career opportunities, and acquire the ability to steer their careers.

The CCQ-ECR could also be a relevant tool for career advisers and developers in universities because it assesses the career competencies necessary to prepare for careers within and beyond academia. Such a tool could be used to identify which competencies a person has mastered and those they could develop further. This is particularly promising, as career competencies are malleable and therefore can be trained (see Akkermans et al., 2015). Furthermore, in a qualitative further step, the career advisor will be able to examine, for a given person, which competency each item reflects and hence which one is a strength or would benefit from improvement. As such, discussing the CCQ-ECR scores as part of an individual's career counselling session could provide a retrospective and prospective view of their career trajectories and goals. Career advisors, and, more broadly, universities' career centres would also benefit from collaborating closely with stakeholders from non-academic sectors, which would enable them to understand better how these employment sectors are organised, their recruitment traditions and expectations, and what career opportunities they concretely represent for ECRs.

Finally, although the CCQ-ECR consists in an individual support tool, we believe that it would likely be complementary to more collective initiatives aimed at preparing ECRs for careers in diverse employment sectors, such as career development workshops (e.g., how to adapt CVs, prepare for job interviews in diverse sectors) or career fairs intended for PhD students and postdocs that are increasingly organised by universities and allow for direct contact between ECRs and employers.

Limitations

This study includes some limitations that call for further research. First, we did not consider personal dispositions and institutional conditions that are likely to support or hinder the development of career competencies amongst ECRs. Research has shown that individuals who, for example, have high core self-evaluations (Tims & Akkermans, 2017) are more likely to develop career competencies. Furthermore, contextual factors such as satisfaction with one's academic institution may enhance development of career competencies (Presti et al., 2021). Therefore, we suggest that further studies consider personal attributes and specific contextual elements that may hinder or stimulate development of career competencies among ECRs. Another limitation is associated with the sample group selected for this study, which comprised participants from 16 countries, with their respective higher education systems and labour market specificities. Although this provides a rich and diverse study sample, it may also offer too generic a view because unique features of each country's educational system and labour market may impact ECRs' development of career competencies and the subsequent outcomes. Moreover, we did not control for country in the regression analyses because of the uneven and sometimes insufficient number of participants in each country. Therefore, cross-national comparisons based on larger samples would be an interesting avenue for further research. Finally, considering that some regression models explain only a small to moderate part of the DV variance, these results should be considered cautiously.

Notes

1. PhD students and people who had received their PhD in the previous 8 years.
2. By 'beyond academia' we mean careers and positions in employment sectors other than universities, whether or not these careers and positions involve research activities.
3. Given the size of the sub-sample, we did not consider this gender category for the analyses. Moreover, 13 participants did not provide sociodemographic information.

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ORCID

I. Skakni  <http://orcid.org/0000-0001-7704-7737>

C. Maggiori  <http://orcid.org/0000-0002-6303-7965>

J. Masdonati  <http://orcid.org/0000-0002-1897-1425>

J. Akkermans  <http://orcid.org/0000-0003-2870-6921>

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