

# An Insecure Start

Early-career researchers on the barriers they experience



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The start of the 2024 City-Pier-City run (photo: Iris van den Broek/ANP)

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## Preface

Researchers are crucial for the development of Dutch academia. That is part of the reason why we conduct a large-scale study every four years into what drives researchers and what barriers they experience in their work. Following the publication of our most recent motivations study in 2022, the Ministry of Education, Culture and Science asked us to conduct a follow-up study into the barriers that early-career researchers in particular face.

For this follow-up study, we talked to early-career researchers who were working on their dissertation, had just obtained their PhD or were doing research at a university of applied sciences. In focus groups, we discussed the barriers they experience in their work, the causes and consequences of these barriers, and possible solutions.

The stories told by these PhD candidates, postdocs and practice-oriented researchers confirm the picture from our motivations survey and add more in-depth insights. The freedom that many researchers get to pursue research that interests them is amazing, but it does come at a cost. Some early-career researchers struggle with considerable uncertainty about the requirements their work must meet, unclear hierarchies at the institute where they work and unpleasant interactions.

Postdocs in particular, who often have fixed-term employment contracts, sometimes face harrowing situations as a result. Because they want to have their contract renewed, they feel a constant need to prove themselves, and after their contract is renewed twice, they need to find a new employer, which often also means finding a new place of residence. Important decisions like buying a house or having children are frequently postponed indefinitely.

Postdocs are not the only group that requires extra attention. All early-career researchers would benefit from clear agreements with their employers on conditions they must meet and what support they can expect. Responsibility for this should not just lie with their supervisors, but also with the institutes they work for. By creating a culture that is less hierarchical and less competitive, research universities and university medical centres could lower the threshold for early-career researchers to indicate what they would need to remove the barriers they experience in their work. This could benefit all of academia.

**Prof. Eefje Cuppen**  
Director of the Rathenau Instituut

## Summary

At the request of the Minister of Education, Culture and Science, the Rathenau Instituut created an overview of the barriers experienced by early-career researchers, specifically PhD candidates, postdoc researchers and researchers at universities of applied sciences. We gathered the insights from existing studies and explored these in depth in six focus groups with early-career researchers who indicated they experienced barriers in carrying out their ambitions. The present report sets out what they enjoyed about their work, what barriers they experience and what solutions they envision. The conclusion will focus on the barriers. We have summarised the main differences and similarities between the groups and offer six points of attention for policymakers and institutes for higher education and research.

Our research shows that job insecurity and unclear expectations and requirements are important barriers for early-career researchers. Under these circumstances, they must determine which tasks to prioritise, keeping in mind both their current position and their future career, resulting in mental pressure. Effective support, strong embedding in the organisation, a socially safe working culture and a diversity of possible career paths could help early-career researchers cope with this uncertainty. The realisation of these conditions is currently hindered by the competitive and hierarchical culture at research universities and the small volume of research at universities of applied sciences.

Although there is considerable overlap in the barriers experienced by early-career researchers, there are also differences between the various positions. The insights we have gained per group are summarised below. Our research shows that the position of postdoc researchers is especially precarious.

### **PhD candidates**

PhD candidates appreciate the creative and intellectual freedom associated with the PhD track, as well as the inspiring work environment and the opportunity to contribute to finding solutions to societal challenges. However, the work environment of PhD candidates is also challenging and limits their freedom. For example, they frequently run up against a hierarchy with many unwritten rules. Over the course of their work, they discover there are unspoken expectations they must meet. They are also subject to pressure to publish. Many PhD candidates find it difficult to balance these two extremes. The degree to which their supervisor supports them varies. This affects not only their well-being, with issues like high mental pressure and a skewed work-life balance, but also their work. For example,

a group that is strongly motivated by the societal relevance of their work may find that relevance diminished by having to make adjustments based on the expectations of others. They experience pressure from their work environment to adjust their research or their publications to better fit the academic consensus, the publication needs of their supervisor or the requirements of the journal in which they are publishing their results. The main solutions PhD candidates envision to the barriers they experience are drawing up a clear framework for obtaining their PhD, broad awareness of the unwritten rules and effective supervision in the process of developing skills and learning to deal with work pressure, from supervisors and independent support centres.

### **Postdoc researchers**

Postdoc researchers value the same aspects of their work as the PhD candidates, with an additional emphasis on the opportunity to carry out groundbreaking research. The interaction with students also plays a greater role for them.

The bottlenecks that postdoc researchers experience paint a picture of an uncertain situation resulting from temporary contracts and strong competition to obtain research funding. The risks for their career and their private life associated with this uncertain situation are fully borne by the postdocs themselves, despite the fact that they experience limited control over whether or not their project will succeed and the potential next step in their career.

In the experience of postdoc researchers, whether they will succeed in making the next step in their career is only to a limited degree based on their own merits. In their eyes, luck plays a significant role, and mention was also made of nepotism. Many focus group participants saw research universities as unreliable employers that offer little support as regards personal circumstances, career development and in obtaining the necessary resources for their research.

These working conditions result in high mental pressure and in the researchers putting off important developments in their private lives, including the decision to have children. This applies in particular to international postdoc researchers, whose residence permit depends on their having a job. Additionally, postdoc researchers indicate that the considerable turnover results in time, financial resources and academic talent being wasted. They would love to continue in academia, but many postdoc researchers indicated that this would also depend on whether they were offered a permanent contract.

The postdoc researchers offered the following possible solutions: increasing the amount of funding available and adjustment of the Work and Security Act (*Wet werken zekerheid*) so they can continue to work for the same employer for a longer time

while still on fixed-term contracts. They also find it important to make decision-making within institutes, for example in relation to HR decisions, more transparent, and they would like to receive support specifically geared towards their situation, for example in the form of postdoc offices.

### **Early career researchers at universities of applied sciences**

Practice-oriented researchers who have previously worked at a research university feel the working conditions at a university of applied sciences are very positive on the whole. They experience more equality, more room to develop different products and less pressure to publish. Achieving societal impact is often a key motivator for their research.

The bottlenecks experienced by practice-oriented researchers are mainly the result of the relatively short history of practice-oriented research. Early-career researchers often experience that there are different schools of thought about what practice-oriented research is, even at their own university of applied sciences. Other problems mentioned were the lack of research facilities, opportunities to request funding and job profiles. A major concern of the researchers in our focus groups was the underappreciation of practice-oriented research, both within and outside of the university of applied sciences. This underappreciation affects not only their opportunities but also their motivation.

The experiences of young practice-oriented researchers paint a picture of research that has yet to establish itself as fully fledged, both within universities of applied sciences and in the broader knowledge ecosystem. Practice-oriented researchers envision possible improvements in the development of a national vision on what kind of research we want to see in the Netherlands and the role of practice-oriented research. They believe a larger portion of research funding, both from the central government and within projects, could be allocated to universities of applied sciences. Moreover, they believe it would be good if the universities of applied sciences themselves could see research more as one of their core tasks.

### **Points for consideration**

Based on the insights from this study, we offer six points of consideration for policymakers and knowledge institutions.

- It is important that early-career researchers engage in conversation with their supervisors about mutual requirements and expectations. Clarity for the researchers becomes even more important when taking into account the focus on differentiated career paths at research universities, university medical centres and research financiers. Making the different career paths, as well as the recognition of different tasks associated with them, clearer can result in better defined frameworks. At the same time, this could also lead to further

diversification of the standards with which early-career researchers must comply. This applies in particular to the stage in which these career paths are in development.

- Postdoc researchers require more support. Their position is very vulnerable, but they barely receive any support from their employer based on their needs.
- PhD candidates should take more space to orient themselves towards a career outside of academia. Research universities are doing a number of things to break the strong focus on an academic career. Graduate schools and HR departments play an important role in this. However, it appears that PhD candidates make insufficient use of these services, either because they are not aware of them or because they feel that they do not have the time. Their supervisors could take on a key role in this regard, by encouraging a broad orientation.
- A cultural change at research universities and university medical centres is essential to remove the bottlenecks experienced by many early-career researchers. Due to the competitive and hierarchical work environment, they find it difficult to stand up for their interests and their personal and professional needs.
- Attention to knowledge management is key. In part because of the barriers they experience, turnover of early-career researchers is high, resulting in the research organisations losing knowledge. This also gets in the way of the development of their replacements, who are frequently expected to repeat the work of their predecessors. That is why it is important for policymakers and institutes to think of strategic ways to retain knowledge, skills and continuity within the academic community.
- Universities of applied sciences need to pay attention to better embedding of and recognition for researchers.

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# Introduction

In the past 15 years, attention for the working conditions of academic researchers has increased significantly. This started with the discussion of the negative effects of the strong focus on academic publications for society and academics.<sup>1</sup> Since then, this has grown into a broad discussion on how we can enable diverse academic talent to contribute to the different goals of academic research and education in a healthy work environment.<sup>2</sup> After all, researchers are ambitious, and society and the political world likewise expect more and more from them. Student numbers are increasing. Societal impact requires ever more intensive collaboration between researchers and professional practice, and actors both within and outside academia aim to make research more open and transparent. At the same time, the academic world is under pressure, with substantial competition, great uncertainty and limited time.<sup>3</sup> Over the past few years, it has also become clear that work pressure in academia is high<sup>4</sup> and that inappropriate behaviour, such as sexual discrimination and intimidation, takes place.<sup>5</sup>

This report contributes to increased insight into the working conditions of academic researchers. At the request of the Ministry of Education, Culture and Science (OCW), we have identified what barriers early-career researchers at research universities, university medical centres and universities of applied sciences experience in realising their ambitions. We combined insights from our own motivations study<sup>6</sup> and other studies<sup>7</sup> and entered into conversation with early-career PhD candidates, postdoc researchers and researchers at universities of applied sciences. In doing so, we assessed insights into the Dutch context and added greater depth to them using experiences from practice. The results presented here will help the Minister of Education, Culture and Science (OCW) explore new ways to improve the position of early-career researchers and highlight various points for attention for higher education institutes.

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1 See, for example, Dijkstra et al., 2013 and Hicks et al., 2015.

2 See, for example, UNL et al., 2019 and KNAW, 2022.

3 See, for example, OECD, 2021; Rathenau Instituut, 2022; Rathenau Instituut, 2023a; Rathenau Instituut, 2023b.

4 See, for example, UNL, n.d.; Tijdink and Van Tol, 2024 and the sources to Sections 1.2.2 and 2.2.2 of this report.

5 See, for example, Naezer et al., 2019 and KNAW, 2022.

6 Rathenau Instituut, 2022

7 For an overview, see the attached bibliography.

## Method

We organised six focus groups for this study: two with PhD candidates, two with postdoc researchers and two with researchers working at universities of applied sciences. Originally, we also intended to organise a focus group with junior lecturers, but in spite of broad recruitment, only two respondents contacted us. We spoke to both of them by telephone. Their experiences largely matched those of postdoc researchers, and we will discuss them in the chapter on that group.

We delineated the group of 'early-career researchers' based on their position, rather than their years of experience. At research universities and university medical centres (UMCs), this meant looking at PhD candidates and postdoc researchers. It was more difficult to define the group of early-career researchers within practice-oriented research, as there is no fixed starting point. While recruiting respondents, we asked researchers to notify us if they saw themselves as an early-career practice-oriented researcher, such as a lecturer-researcher, postdoc researcher, PhD candidate or Professional Doctorate (PD) candidate. Most of the participants had a position as researcher or lecturer-researcher.

### Recruitment

We recruited participants via social media, the Rathenau Instituut's website and network, and relevant network organisations and interest groups, including: Promovendi Netwerk Nederland (PNN), PostdocNL, local postdoc networks and the Young Academies of the research universities. For practice-oriented research, we also recruited participants through the professors' platforms. We actively searched for early-career researchers experiencing one or more barriers. This means the outcomes of the focus groups show which barriers are experienced by early-career researchers, but they should not be relied on as indicators of the occurrence of these barriers among the total population of early-career researchers.

In total, 14 PhD candidates, 14 postdoc researchers and 14 applied researchers participated. Several characteristics are set out in Table 1.

Table 1 Characteristics of the focus group participants

| Position category             | Number of participants | Of which female | Of which international | Number of institutes represented |
|-------------------------------|------------------------|-----------------|------------------------|----------------------------------|
| PhD candidates                | 14                     | 10              | 1                      | 10                               |
| Postdoc researchers           | 14                     | 9               | 5                      | 6                                |
| Practice-oriented researchers | 14                     | 9               | 1                      | 6                                |

Table 2 shows in which academic fields the participants in the focus groups are active. We see that the social and behavioural sciences, the humanities, the natural sciences and medical sciences are more or less equally represented among the PhD candidates. Medical sciences and medical technology are strongly represented among the postdoc researchers. A third of the practice-oriented researchers work in social and behavioural sciences, and another third work in medical and health sciences. Agricultural sciences were not represented in any of the groups.

Table 2 Research areas of the focus group participants

| Academic field                     | PhD candidates | Postdoc researchers | Practice-oriented researchers |
|------------------------------------|----------------|---------------------|-------------------------------|
| Humanities                         | 2              | 2                   | 1                             |
| Social and behavioural sciences    | 4              | 1                   | 5                             |
| Health and medical sciences        | 2              | 6                   | 5                             |
| <i>Of which medical technology</i> | 0              | 4                   | 0                             |
| Engineering sciences               | 0              | 1                   | 1                             |
| Natural sciences                   | 3              | 4                   | 0                             |
| Agricultural sciences              | 0              | 0                   | 0                             |
| Interdisciplinary                  | 1              | 0                   | 2                             |

### Focus group contents

During the focus groups, we discussed five main questions with the participants.

1. What is it about the research that appeals to you?
2. Which barriers do you experience?
3. What consequences do these barriers have on your work and your private life?
4. What underlying factors for these barriers can you identify?
5. What possible solutions do you think might help?

We started the discussion for each question on an open basis, without first offering insights from previous research. For the questions about appeal, barriers, underlying factors and possible solutions, we also asked the participants to write down their point of view. For the second question, we additionally asked the participants to rank the barriers by severity. The focus groups were conducted in both Dutch and English. For this report, all Dutch quotes have been translated into English.

Based on the participants' notes and the recordings of the meetings, we divided the barriers, consequences and solutions into several groups. We then compared the outcomes with the results from our *Motivations of lecturers and researchers 2022 (Drijfveren van onderzoekers en docenten)* survey and other surveys among both Dutch and foreign early-career researchers.<sup>8</sup>

### Reading guide

In the next chapter, we will successively discuss the barriers experienced by PhD candidates, postdoc researchers and researchers at universities of applied sciences. In the conclusion, we will summarise the insights gained and look at the main differences and similarities. We will also offer several points for consideration to policymakers and institutes for improving the working conditions for early-career researchers.

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<sup>8</sup> See the bibliography for the studies consulted.

# 1 PhD candidates

Obtaining your PhD is the first step of an academic career. Over the course of around four years, the PhD candidate will work on their dissertation. This can be a single study or a collection of academic articles, published or otherwise, on a specific topic. By carrying out this work, in addition to contributing to academia, the PhD candidate is also working to improve their own research skills. Alongside their research, PhD candidates can to some extent be involved in education and valorisation activities. After successfully defending their dissertation, the PhD candidate will obtain their PhD, opening the path for them to continue their career in academia or somewhere else.

We mainly had PhD candidates with an employment contract for research purposes at a research university or university medical centre apply to participate in our focus groups. They all had fixed-term employment contracts at a research university, largely for four years. Around half of the PhD candidates in the Netherlands (2022) are PhD candidates with an employment contract for research purposes at a research university or university medical centre.<sup>9</sup> In 2022, 11,324 were employed by a research university.<sup>10</sup> Staff working on their PhD (4% of all PhD candidates) are also employed by research universities or university medical centres. These are people who, alongside their PhD, also have another position at the same institute. The other PhD candidates are not employed by a research university or university medical centre. Instead, they are funded by means of a research grant, for example, or their funding is provided by themselves or their employer.<sup>11</sup>

The experiences and bottlenecks of PhD candidates with an employment contract for research purposes at a research university or university medical centre may differ from those of other PhD candidates, as demonstrated by the experiences of external PhD candidates on page 26. However, the outcomes discussed in this chapter relate mainly to PhD candidates with an employment contract for research purposes at a research university or university medical centre. We show what it is about their research that appeals to them, what obstacles they experience and what solutions they envision. We also compare the outcomes for the focus groups and

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9 Source: UNL, information requested from universities 2023.

10 Source: UNL, WOPI. Figures exclude seven of the eight university medical centres. Only the number of PhD candidates with an employment contract for research purposes at Maastricht UMC+ is included in the data.

11 You can read more about the different types of PhD candidates and the figures for the Netherlands and at each university in the data publication *Nederlandse promovendi naar type promovendus naar universiteit* (in Dutch).

the literature study carried out for this study with the insights from our motivations study.<sup>12</sup>

## 1.1 Appeal

What is it about their work that appeals to PhD candidates? This was the first question we put to the focus groups. Four main factors emerged from this. Participants mentioned the intellectual challenge involved in the PhD track and the freedom and space given to PhD candidates to follow where their curiosity takes them: *'You get a lot more time and freedom in your PhD to do what really interests you.'* They also noted the diversity of their work:

*'I really enjoy how diverse it is, the fact that I can be working on lots of different things, with lots of different people, going to different places and traveling abroad.'*

Several PhD candidates in the focus groups also mentioned the contact with colleagues and other academics as an important positive aspect. Almost all of them also wrote down societal impact as an important positive aspect of their work. They did note, however, that it is important to be realistic about the possibilities of that impact, including in relation to society. For example, one PhD candidate described how important it is that research provides added value: *'I think everyone probably sees [the added value of their research], [...] but at the same time, that doesn't mean you'll be changing the world.'*

Previous research by the Rathenau Instituut<sup>13</sup> showed that, compared to researchers in other positions at research universities, PhD candidates are more often satisfied with the nature and content of their work. They are more often satisfied with the time they can spend on research (61% satisfied), education (43%), student counselling (58%) and knowledge transfer (53%) than their colleagues. Statistics Netherlands' (CBS) research into people with a doctorate<sup>14</sup> shows that 9 out of 10 people with a doctorate<sup>15</sup> generally look back positively on their PhD track, and in a national UNL survey, respondents gave their PhD tracks an average score of 6.95.<sup>16</sup>

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12 Rathenau Instituut, 2022

13 Ibidem

14 CBS, 2020

15 This study looked at people who obtained their PhD between 1990 and 2018 and were younger than 70 at the time of the study (2019).

16 Bouma, 2023

In these studies, PhD candidates and people with a doctorate mentioned the same positive aspects that were mentioned in the focus groups. For example, the most important objectives of PhD candidates in the motivations study were:

1. doing socially relevant research;
2. working in an environment with high-quality and inspiring colleagues;
3. doing high-quality research; and
4. doing research about things I am curious about.

Doing socially relevant research in particular was something that PhD candidates were more likely than people in other research positions at a research university to have in their top three most important objectives.

The fact that PhD candidates not only considered these aspects important but also assessed them positively can be seen in the CBS study into people with a doctorate.<sup>17</sup> More than 90% of people with a doctorate were satisfied with the subject of their PhD, their dissertation and the scope they had to include and carry out their own ideas. The PhD candidate survey of Promovendi Netwerk Nederland<sup>18</sup> produced a positive image in particular in relation to colleagues and the content of the work. Participating PhD candidates gave freedom in the PhD track an average score of 5.5 on a scale from 1 to 7 and were reasonably satisfied with their work environment, including academic relations, interpersonal relations and a sense of connection.

## 1.2 Bottlenecks and consequences

Even so, many PhD candidates experience bottlenecks during their PhD track. For example, in the motivations study, over three-quarters of the PhD candidates indicated they experienced at least one environmental factor as a barrier for their ambitions. Almost one-third mentioned the lack of possibilities for a permanent appointment, a quarter mentioned the pressure to apply for financial resources and another quarter cited insufficient career opportunities. Additionally, almost a quarter of the PhD candidates experienced one or more personal characteristics as barriers, such as their gender, age or sociocultural background.

Several of these obstacles were also mentioned in the focus groups, as well as others, such as unclear job descriptions and pressure to publish. The PhD candidates indicated that, in addition to obstacles that create work pressure, there are also obstacles that get in the way of their research or their personal

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17 CBS, 2020

18 Mattijssen et al., 2020

development. We discuss these and the extent to which they match findings from previous research below.

### 1.2.1 Bottlenecks

#### **Tension between freedom and unclear expectations**

PhD candidates appreciate the freedom they are given to work on a topic that interests them over a longer period of time and follow where their curiosity takes them. At the same time, they also consider that same freedom a burden. It became clear from both focus groups that it is difficult for PhD candidates to bring structure to the relative open space their project offers: to determine for themselves which goals they should achieve, and within which frameworks. Their environment likewise does not always offer them these frameworks. Participants in the focus groups stated that, in practice, the supervisor decides what is necessary to obtain a PhD. While some universities offer guidelines for this, they are usually quite general. For example, one participant claimed that high-quality dissertations are a prerequisite, but it was not clear what quality meant. According to the PhD candidates, the interpretation of quality varies.

PhD candidates furthermore often receive contradictory signals about what is expected of them and what requirements they must satisfy. As two participants put it:

*'I love the freedom that comes with the PhD track, but it's not completely free. There are still certain expectations placed on you. But every time you ask your supervisor about it, they're just like: "trust the process, it's an individual journey".'*

*'I had no clue about the system I'd ended up in. You're still pushed to publish. It's such a contradiction where everybody says: "just do something and trust the process" – that's where the tension is. It's ok to float around in your first year, but then all of a sudden in your third year you have to know where it's at.'*

The requirements for the PhD candidates are only made explicit relatively late in the PhD track. Moreover, PhD candidates are often unaware of what it will take to achieve those goals, like publishing four articles.

Different measures are taken to support PhD candidates in this, like courses taught by graduate schools and monitoring of activities that will ensure the development of the necessary skills. However, the PhD candidates indicated that these measures



also increase the work pressure by adding an additional task, such as completing all kinds of forms.

Previous research indicated as well that PhD candidates thought that expectations are unclear. International research<sup>19</sup> shows that the PhD track does not meet the original expectations of 40% of PhD candidates. Based on his experiences, Paul Herfs, former ombudsman at Utrecht University, wrote that the tension between working independently on the one hand and completing assigned work on the other can lead to misunderstandings and conflicts between PhD candidates and their supervisors.<sup>20</sup>

### **Pressure to publish**

A second bottleneck for several PhD candidates in the focus groups was the strong pressure to publish in renowned journals. In their experience, the focus on publications is considerable, and the valuation of other activities trails behind:

*'I do a lot of things in terms of outreach, with ministries, municipalities, podcast, news articles, [...] but the only feedback I get from my supervisors is: "this won't end up in your dissertation".'*

In 2019, the research universities, university medical centres, the Royal Netherlands Academy of Arts and Sciences (KNAW) and research funders started the *Recognition and Rewards* programme to work towards a broader assessment of academics. Such an assessment should create more leeway for development based on teaching, valorisation and leadership qualities and focus on themes such as team science and open science.<sup>21</sup> We have yet to see the effects of this. Both in the focus groups and in the motivations study,<sup>22</sup> half of the participating PhD candidates were unaware of this programme. Some PhD candidates in the focus groups stated that their universities do not consider the programme applicable to them: *'I think it's a very important movement, but in our institution they say: "it's not for PhDs".'* A new national study is currently working to obtain a broader understanding of academics' experiences with the programme: the Culture Barometer.<sup>23</sup> The outcomes of this study should make it clear how institutes are implementing *Recognition and Rewards*.

### **Supervision**

All participants in the focus groups agreed that the supervisor has considerable influence over the course of the PhD track and the PhD candidate's experience

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19 Woolston, 2019

20 Herfs, 2022

21 UNL et al., 2019

22 Rathenau 2022

23 NWO, 2024

thereof. Their experiences of how supervisors approach supervision varied. Participants who were satisfied with their supervision stated, for example, that the supervisor introduced a clear structure to their activities. Participants who experienced problems with their supervision mentioned that supervisors regularly had no time or were themselves overworked. Also, PhD candidates indicated that they are very dependent on their supervisor, who ultimately decides on the requirements they must meet in order to obtain their PhD. Some indicated that the interests of the supervisors could be at odds with those of the PhD candidate, especially if they are not yet full professors. For example, one PhD candidate described a supervisor who needed publications with a high impact factor for their own career. However, these publications did not match the goals of the PhD candidate, which therefore fell by the wayside.

Previous research has shown that PhD candidates are relatively often satisfied with the supervision they receive. In the motivations study, a minority of 15% said that a lack of support from their supervisor presented a barrier to their own ambitions.<sup>24</sup> Respondents to the PNN PhD survey<sup>25</sup> gave the frequency of the supervision they received an average score of 7.4 on a scale from 1 to 10, and gave a 7.3 for quality. Of the participants in the UNL national survey, 77% indicated they were satisfied or very satisfied with the supervision they had received.<sup>26</sup>

Even so, the PNN study still highlighted some problems. For example, it showed that supervisors mainly provide support by giving autonomy and personal support and by being available for consultation. Support often does not consist of helping with planning, managing research tasks and teaching research skills, even though this is what the PhD candidates in the focus groups said they needed. Also, 43% of the respondents indicated that their supervisors demonstrated questionable behaviour, such as making light of work pressure, contacting them in the evening or during the weekend and exerting pressure to take on extra tasks.

Supervision is important; problems in this context are often a predictor for other problems. In 2017, Van der Weijden et al. found that dissatisfaction with the supervisor was a predictor for mental health problems.<sup>27</sup> The 2021 Radboud University PhD survey showed that, where PhD candidates experienced problems related to supervision, there were often problems in other areas as well.<sup>28</sup> They worked more overtime, saw the poor supervision as a cause of high work pressure and had less confidence that they would be able to find a job after obtaining their PhD.

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24 Rathenau Instituut, 2022

25 Mattijssen et al., 2020

26 Bouma, 2023

27 Van der Weijden et al., 2017

28 Radboud University, 2022

### **Hierarchical structure and culture**

PhD candidates regularly face unwritten rules and power relationships in their work environment. One participant stated that there is: *'a powerful hierarchy, hidden behind communications that pretend all of us are equal.'* This concerns both a formal hierarchy, where the supervisor determines what requirements the PhD candidate must meet, for example, and informal power relationships, including differences in interests and interpretations between supervisors. *'Politics are a huge aspect of science,'* one of the focus group participants stated. They also felt that the culture was very competitive, due to the relative scarcity of jobs.

PhD candidates are at the bottom of the hierarchy, making it difficult for them to stand up for their own interests. As an example, one PhD candidate mentioned an article that gave the name of the supervisor as the first author, even though the PhD candidate had done all the work. The PhD candidate initially was not sure whether they were even allowed to say anything about it. Discussing it with a colleague gave them the push they needed to do so after all. In his research, former ombudsman Herfs likewise identified the weak position of PhD candidates, caused by their considerable dependence on their supervisor and their temporary contract. He determined that, as a result, PhD candidates were far less likely to discuss their problems with colleagues or refuse extra tasks.<sup>29</sup>

Additionally, in the eyes of some of the PhD candidates from the focus groups, the rigidity of the prevailing standards limits their options. For example, one participant pointed out that it is difficult to go against the scientific consensus, in things like applying a new method, for example. Another participant stated that the culture is rigid to the point that it is impossible to optimally make use of the qualities of different employees, which limits the efficiency of the research and the opportunities for team science. Whereas we saw in previous research that PhD candidates are often satisfied with their work environment, the focus groups showed that there is also room for improvement.

Research commissioned by the Dutch Network of Women Professors (LNVH)<sup>30</sup> and the KNAW<sup>31</sup> in recent years showed that the hierarchical organisational structure, the scarce resources and high work pressure, and the culture in the workplace encourage misbehaviour and intimidation. This was not explicitly mentioned in the focus groups with PhD candidates, but PhD candidates have in previous research also indicated that this is something they encounter. For example, one in five PhD candidates participating in the international study by *Nature* had experienced intimidation or discrimination, and one in five had experienced bullying (mainly on

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29 Herfs, 2022

30 Naezer et al., 2019

31 KNAW, 2022

grounds of gender or ethnicity).<sup>32</sup> Over half of them felt unable to discuss the situation without fearing personal consequences. Of the PhD candidates at Dutch institutes that participated in the PNN study, 19% had experienced inappropriate behaviour in the workplace, including discrimination, breaches of academic integrity and sexual harassment.<sup>33</sup> Women were more likely to experience socially unsafe situations than men.

### Concerns about future job insecurity

The structure of academic positions is shaped like a pyramid: in 2022, 33% of academic staff at Dutch universities were PhD candidates and 10% were professors.<sup>34</sup> This means not all PhD candidates will be able to continue working in academia. To illustrate: around 5,000 PhD candidates obtain their PhD every year.<sup>35</sup> In 2022, universities employed 3,698 FTEs of postdoc and other researchers.<sup>36</sup> It is therefore no surprise that the PhD candidates in the focus groups were uncertain about their career opportunities in academia.

It is not simply the job insecurity, but also the low salary that the PhD candidates consider problematic: *'if I earned enough now that I could really save up a lot of money, I wouldn't mind the current lack of job security as much.'* For other PhD candidates, it is not so much about how much money they can save, but the limited extent to which their salary reflects their efforts and overtime. This dissatisfaction with the salary is nothing new. Of those who obtained their PhD between 1990 and 2018, 74% were dissatisfied with their salary during their PhD track.<sup>37</sup>

Another factor that may contribute to the job insecurity of PhD candidates is the lacking overview of their opportunities following their PhD track – and of what they will need for this. The PhD candidates in the focus groups mentioned that it is not clear what activities during their PhD track will increase their chances of finding a job. Previous research has shown that PhD candidates often feel poorly prepared for the rest of their career, especially outside academia. Of the former Dutch PhD candidates who obtained their PhD between 1990 and 2018, almost 60% felt insufficiently prepared for a career outside academia, and almost 30% felt unprepared for a career within academia.<sup>38</sup> Only 26% of the respondents in the international PhD survey by *Nature* did feel sufficiently prepared for a career.<sup>39</sup>

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32 Woolston, 2019

33 Mattijssen et al., 2020

34 UNL, WOPI data (2022) in Rathenau factsheet: [Academic careers of researchers](#)

35 CBS Statline (2022) in Rathenau factsheet: [Van promovendus tot promotie](#) (only in Dutch)

36 Universities of the Netherlands (UNL)/WOPI, modified by the Rathenau Instituut. For more information, see the [Academic careers of researchers](#) factsheet.

37 CBS, 2020

38 CBS, 2020

39 Woolston, 2019

PhD candidates often aspire to an academic career. Based on the results of the 2021 UNL survey, 51% would like to continue their career at the research university.<sup>40</sup> This desire explicitly came to the foreground in the focus groups: the competition for the available jobs within academia causes considerable work pressure.

## 1.2.2 Consequences

### Work pressure

The majority of participants in the focus groups suffered from work pressure. The way in which participants experienced work pressure and the causes thereof differed, but it was mainly related to the lack of clear expectations mentioned earlier in this chapter, the combination of different tasks and the job insecurity.

Around half of the PhD candidates in the focus groups indicated that they worked overtime. This is comparable to previous research.<sup>41</sup> The PhD survey by PNN, for example, showed that PhD candidates at university medical centres are more likely to work overtime (82%) than PhD candidates at universities (57%). However, the main cause of work pressure is mental pressure. For example, the PhD candidates in the focus groups explained that they often feel mentally tired because they are constantly thinking about obtaining their PhD:

*'[Obtaining your PhD] impacts a significant portion of your life, or time in your week, whether you are actually working for a long time or it's on your mind all the time. [...] [I] don't sleep well because of the pressure [...] and I just don't have the energy to relax or do things I want to do.'*

Another participant described the feeling that it would be their own fault if their academic career ended in failure: should have tried harder. Several participants who consciously defended their own boundaries, for example to limit their working hours, felt guilty about this.

PhD candidates experience the effects of work pressure in their private lives, and it also affects their mental health. Some participants in the focus groups had identified symptoms of a burnout in themselves or in other PhD candidates. They also explained that they are asking a lot of their partners, who take care of the majority of work in and around the house. Furthermore, they postpone a lot of decisions

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40 Bouma, 2023. This percentage is even higher abroad. Three out of four respondents to the International Nature PhD survey gave academia as their first or second choice of career (Woolston, 2019).

41 Rathenau Instituut, 2022; CBS, 2020; Mattijssen et al., 2020; Woolston, 2019

such as buying a house or having children, because they are unsure about future prospects.

The high work pressure and mental and other consequences also came up in previous research. Of those who obtained their PhD between 1990 and 2018, 60% had experienced very high work pressure.<sup>42</sup> This group suffered from fatigue and physical and psychological symptoms. Surveys carried out by PNN in 2020<sup>43</sup> and UNL in 2021<sup>44</sup> showed that around 50% of the PhD candidates consider the work pressure high during the PhD track, and around 10% too high. Over one-third experienced this as a considerable barrier. Women, PhD candidates with a scholarship and PhD candidates in the humanities were more likely to experience this as a barrier.<sup>45</sup> According to a 2020 study by WOinActie, one in three PhD candidates suffer from fatigue and physical complaints.<sup>46</sup> Surveys carried out by *Nature*<sup>47</sup>, PNN<sup>48</sup>, Radboud University<sup>49</sup> and Leiden University<sup>50</sup> show that many PhD students struggle with mental health symptoms. For one in three people who obtained their PhD in the period from 1990–2018, their hobbies and social contacts came under pressure. A WOinActie study<sup>51</sup> from 2020 shows that, for over half of all PhD candidates, work pressure results in stress or consequences for their social contacts, hobbies and sport. In late 2023, the Young Academy initiated a new study into the mental health of academics: the Academy Thermometer.<sup>52</sup> The results are expected in the first half of 2024.

Van der Weijden et al.<sup>53</sup> gave a number of predictors for developing mental health problems, including the relatively young age of PhD candidates, a sense of incompetence, dissatisfaction with their supervisor and a lack of skills for dealing with work pressure. In our focus groups as well, we saw that the quality of supervision and the insecurity resulting from a situation with a lot of freedom on the one hand and numerous requirements on the other were often mentioned as important factors causing work pressure and physical and psychological complaints.

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42 CBS, 2020

43 Mattijssen et al., 2020

44 Bouma, 2023

45 Mattijssen et al., 2020

46 WOinActie, 2020

47 Woolston, 2019

48 Mattijssen et al., 2020

49 Radboud University, 2022

50 Van der Weijden et al., 2017

51 WOinActie, 2020

52 The Young Academy, n.d.

53 Van der Weijden et al., 2017

### **Many PhD candidates want to quit academia**

Many of the participants in the focus groups had their doubts about whether they wanted to stay in academia after obtaining their PhD. Three had in fact already decided that they would not do so:

*'In year two I decided "I'm just going to finish my PhD", but just to stay healthy and don't work the hours I chose not to be im competition anymore.. That has made it much easier for me, because it took away a lot of pressure.'*

That last sentence implies that part of the work pressure is due to the PhD candidates' own ambitions. Other participants in the focus groups who had given up on these ambitions similarly clearly experienced less work pressure. The PNN study shows that quitting is an option for many PhD candidates, with 42% having at least considered it.

### **Losing sight of the original objective of the research**

However, there are also consequences other than those of a personal nature. Since the PhD candidates need to adjust to the requirements and expectations of others during the PhD track, their original research question and their intended societal impact may also change. For example, some of them feel that they have had to make changes according to the wishes of their supervisor or that they are not given enough room to do something (like applying a new method) that goes against the prevailing consensus within their academic field. The journals in which they publish their work also set requirements for articles:

*'You always aim high [for publications], so you go somewhere you're sure to be denied, then the next one, and the next one. And it takes vey long. We just got a paper accepted, and the reviewers asked us to put a lot in – which I think made it a lot better. But now the editor says just cut half the words. It's not going to be a good paper anymore, but we are so dependent on editors and journals, we have no choice.'*

The focus group participants stated that these processes reduce the societal impact of their research. On the other hand, some of them felt that they had to overstate the societal impact just to get research funding, even though this is also undesirable. Various PhD candidates were worried about the possible politicisation of their results in the media or in politics. This applied in particular to the focus group participants who were dealing with sustainability. One of them said they were afraid a politician might use research that shows a particular sustainability measure is ineffective to halt all sustainability policies.

### Increased risk among international PhD candidates

In 2022, 55% of PhD candidates with an employment contract for research purposes<sup>54</sup> at a Dutch university came from abroad. Although only one international PhD candidate participated in the focus groups, there are broad concerns about the situation of international PhD candidates. Several of the PhD candidates stated they thought international PhD candidates had a more difficult time, in part because their visa depends on their job. If they fail to obtain their PhD in time, that means they have a big problem. It was also stated that international PhD candidates with a scholarship have a low income. A previous study by PNN<sup>55</sup> showed that, in 2023, their average net monthly income was 1,402 euros. A beginning PhD candidate with an employment contract for research purposes at a university in 2024 had a net salary of around 2,343 euros per month.<sup>56</sup>

Previous research has also shown that international PhD candidates are more likely to experience bottlenecks and the associated consequences. For example, the PNN survey and a study at Leiden University showed that international PhD candidates were at an increased risk of developing mental health problems.<sup>57</sup> They also experienced symptoms of extreme burnout.<sup>58</sup> Research at Radboud University showed that international PhD candidates are more isolated than the average PhD candidate and have less access to training courses.<sup>59</sup> Both of these factors also applied to external PhD candidates.

## 1.3 Possible solutions

Finally, we also asked the participants in the focus groups how they viewed the underlying causes for the obstacles they experienced, as well as the possible solutions. The main common denominators for the underlying factors are: the funding structure for research and the pressure to publish. According to some of the participants, the former is also related to a lack of support by, for example, statisticians and laboratory technicians. The previously mentioned hierarchical culture, supervision, unclear expectations and temporary contracts were also brought up again.

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54 This concerns PhD candidates employed by a university, so around 51% of all PhD candidates. Other PhD candidates work on the basis of a scholarship (11%), as external PhD candidates (16%), with external funding (13%) or otherwise (data: UNL).

55 Kastelein et al., 2023

56 Collective Labour Agreement of Dutch Universities 2023–2024, appendix: Salary scales as of 1 August 2023. Calculation of net wages by the Rathenau Instituut

57 Van der Weijden et al., 2017; Mattijssen et al., 2020

58 Mattijssen et al., 2020

59 Radboud University, 2022



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### Box 1 Experiences of an external PhD candidate

There was only one external PhD candidate who participated in the focus groups, whose situation differed significantly from those of the other participants, especially because he had already advanced a lot further in his career and had already started on his second PhD. Of the bottlenecks mentioned by the other PhD candidates, this external PhD candidate mostly recognised the unwritten rules: the university as a work environment and the rules that apply there are vastly different from other places he had worked. With regard to work pressure, the external PhD candidate noted that he experienced this differently from the other PhD candidates because he did not see obtaining his PhD as a job, but as a passion alongside his other job. He also mentioned specific bottlenecks, such as the high costs associated with doing an external PhD (which could damage the connection between research and practice), the more limited access to necessary resources for research, such as articles, and the requirements of his employer, who initially thought the research question for the PhD was too political.

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Many of the solutions offered by PhD candidates related to providing clear frameworks for obtaining a PhD and providing effective supervision to PhD candidates – not only from supervisors, but also from independent support centres. Several participants mentioned the establishment of independent support centres where PhD candidates could turn to, to discuss their problems without involving their supervisor. Others suggested introducing more resources to support PhD candidates in developing their skills, with the caveat that courses can also result in an increased workload. They also mentioned focused training for the supervisors in supervising PhD tracks.

With regard to clear expectations, the PhD candidates suggested formulating and communicating rules and expectations more clearly. These should not only relate to what the institute and the supervisor expect of the PhD candidate in terms of content and performance, but also to overwork.

The PhD candidates in the focus groups moreover made suggestions for a cultural change, such as greater awareness of unwritten rules among PhD candidates and supervisors. This was also mentioned in the Royal Netherlands Academy opinion

on increasing social safety, with one of the recommendations to improve the culture being to actively encourage the discussion about behaviour and teaching employees to make issues with behaviour something that can be discussed.<sup>60</sup> Some focus group participants also felt that PhDs are still seen too much as something of a calling. They believe doing a PhD should really be seen as more of a job. In terms of employment conditions as well, PhD candidates would like to have more security and leeway, for example, to have the PhD track overrun its schedule, or to temporarily pause the PhD track in the event of mental health problems.

## 1.4 Conclusion

PhD candidates appreciate the intellectual and creative freedom of the PhD track, as well as the opportunity to contribute to tackling societal challenges and the inspiring work environment. Nevertheless, this work environment also presents a challenge for PhD candidates. For example, they run up against unwritten rules, discover over time that there are unspoken expectations they must meet and experience pressure to publish. These barriers limit their freedom. It appears to be difficult for many PhD candidates to balance these two extremes. The degree to which their supervisor supports them varies. This affects not only their well-being, with issues like high mental pressure and a skewed work-life balance, but also their work. For example, a group that is strongly motivated by the societal relevance of their research may find that external pressure has distorted their objectives, their research questions and the societal relevance of their research. They feel that they are forced to adjust their research or publications to align with, for example, the academic consensus, the interests or expectations of supervisors or the requirements of the journals in which they hope to be published. PhD candidates primarily see drawing up clear frameworks for obtaining a PhD, broad awareness of unwritten rules and effective supervision for PhD candidates in developing skills and dealing with work pressure, from supervisors and independent support centres, as solutions.

## 2 Postdoc researchers

For those who have obtained their PhD and want to continue working in academia, becoming a postdoc researcher is usually the next step. Postdocs are effectively the bridge from the PhD track to the academic career path running from a position as assistant professor to becoming a full professor. This mostly concerns temporary employment contracts,<sup>61</sup> with academics who recently obtained their PhD carrying out independent research and trying to obtain research funding for their next research projects, in order to secure a higher position on the ladder of academia, with a better chance of a permanent appointment.

The number of university postdocs in the Netherlands grew significantly between 2005 and 2022, from 2,179 FTEs to 3,698 FTEs.<sup>62</sup> That increase of 70% is greater than the increase in overall academic staff at universities, at 62%. Over that same period, the working population increased by 17%.<sup>63</sup> In 2022, 68% of postdocs came from outside the Netherlands, and 41% were female.<sup>64</sup>

In this chapter, we discuss what it is that makes their research appealing to postdoc researchers in the Netherlands, what bottlenecks they experience and what solutions they envision. In doing so, we compare the results from the focus groups carried out for this study with insights from previous research. We also briefly describe the experience of two respondents working at a research university as junior lecturers. Junior lecturers only have an educational task, but they often also have aspirations for an academic career.

### 2.1 Appeal

Postdoc researchers consider the space they are given to follow where their curiosity takes them the most appealing factor of working in academia, according to the focus groups. The intellectual challenge is also important. In this context, postdoc researchers are less likely than PhD candidates to refer to their own development and more likely to refer to the opportunity to contribute to the development of new knowledge. The postdoc researchers in the focus groups furthermore mentioned the societal impact of their work, such as providing

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61 UNL article: Permanent and temporary staff

62 Data: WOPI/UNL

63 Data: Eurostat

64 Data: WOPI/UNL. For more information, see the [Postdocs factsheet](#) (Rathenau Instituut).

education for the next generation, the impact on patients and the '*contribution to a sustainable future*'. Having the sense that they are doing something that matters is important to them.

As regards their working conditions, the postdoc researchers appreciate the same aspects as the PhD candidates: the collaboration with colleagues and other academics, the diversity of their work and the associated freedom and flexibility, such as the lack of hard deadlines and the opportunities to experiment. For example, one participant described the following: *'I get to do different stuff every day. [The] freedom to also have some playtime within your work is very nice.'*

Several participants mentioned the non-profit nature of the university as a positive aspect. One of them referred to the university as: *'an environment where you cannot get away with nonsense or bragging or fast talks'*. For another participant, academia gave them the space to *'pursue what you want to learn and what you see as a benefit to society'*.

All participants in the focus groups were enthusiastic about the interaction with students and the chance to transfer knowledge. They mainly valued the collaboration with interns in the lab and learning from students: *'I really like working with students, doing a project with them and see what others come up with.'*

These results match the insights from previous research, which also showed that the content of the work, the freedom and autonomy and the interaction with colleagues were important aspects of working as a postdoc researcher.<sup>65</sup> In their top three most important objectives, most postdoc researchers in the motivations study chose:<sup>66</sup>

- working in an environment with high-quality and inspiring colleagues (54%);
- the opportunity for high-quality research (40%); and
- doing research about things I am curious about (39%).

Almost all postdoc researchers who participated in the motivations study considered doing research with societal relevance and disseminating knowledge for societal impact important, but these objectives did not make it to the top three as often. 29% gave research with societal relevance as one of the three most important objectives, and 11% disseminating knowledge for societal impact.

Enjoying the interaction with students also came up in the motivations study. Over 85% of the postdoc researchers considered effective supervision of students, lecturers and researchers and educating students to become critical citizens

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65 Van der Weijden and Teelken, 2023; Rathenau Instituut, 2022; Teelken and Van der Weijden, 2018

66 Rathenau Instituut, 2022

important objectives. A relatively high percentage of postdoc researchers considered that last objective important, as did the assistant professors.

## 2.2 Bottlenecks and consequences

According to the motivations study, a clear majority (86%) of postdoc researchers saw one or more factors within their own organisation or the academic system as barriers to their ambitions. This percentage was comparable to that for lecturers (82%), but higher than for PhD candidates (76%) and practice-oriented researchers (71%).<sup>67</sup> According to a previous study, out of 676 postdoc researchers, 161 were negative about their work and 137 felt ambivalent.<sup>68</sup> In an international study by the journal *Nature*, over a quarter of postdoc researchers worldwide indicated that they were dissatisfied with their current position.<sup>69</sup>

In the motivations study, 46% experienced at least one personal characteristic as a barrier to their ambitions.<sup>70</sup> This percentage is higher than for lecturers (37%), PhD candidates (23%) and practice-oriented researchers (26%).

### 2.2.1 Bottlenecks

#### Temporary contracts and competition for funding

The international literature also refers to postdoc researchers as '*the research precariat*'.<sup>71</sup> The precariat is the class of employees for whom labour participation is constantly insecure.<sup>72</sup> Postdoc researchers are often employed on temporary contracts in a highly competitive environment, in which they try to climb their way onto the ladder of academia to claim a permanent position, often as an assistant professor.

Postdoc researchers in the Netherlands are relatively more likely to have a temporary contract, even compared to the situation abroad. In 2016, 78% of them had a temporary contract, compared to an average of 50% in the European Union.<sup>73</sup>

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67 Rathenau Instituut, 2022

68 Van der Weijden and Teelken, 2023

69 Woolston, 2020a: 7,670 postdoc researchers from 93 countries participated in this international study. 34% of the respondents were from Europe. At the time of the study, 122 respondents were working in the Netherlands. Over half the respondents worked in biomedical sciences.

70 Rathenau Instituut, 2022

71 OECD, 2021

72 Translation of a definition taken from the *Van Dale Groot Woordenboek van de Nederlandse taal* (Dutch dictionary), 2023

73 Data: European Commission, MORE3 study. In: Rathenau Instituut, [temporary contracts factsheet](#) (in Dutch)

In previous research, we likewise saw that postdoc researchers frequently change to a different job. For instance, a Rathenau Instituut from 2013 showed that almost one in three changed their job annually. In doing so, no less than 80% quit academia.<sup>74</sup>

Participants in the focus groups also considered the combination of temporary contracts and a low chance of succeeding when applying for research grants a major bottleneck. In the limited time available to them, they must complete their research while also securing funding for the next step in their career. They indicated that any time lost due to sickness or pregnancy leave, for example, cannot be compensated. As a result, the time pressure is immense.

In addition to this time pressure, there is also psychological pressure. Postdoc researchers in the focus groups indicated that they are constantly thinking of ways to get research funding. This uses up *'both brain space and emotional space'*. In their eyes, there is insufficient funding to go around. Additionally, the opportunities for requesting funding are limited, for instance because the institute where they work will not want to offer them a permanent position if they are successful.<sup>75</sup> The application process is also experienced as *'a waste of potential'*, because they spend so much time on it: from *'several weeks'* to *'about two months'* per grant, or: *'10 to 15% of [their] time'*. In a WOinActie study from 2020, 42% of the postdoc researchers already mentioned performance pressure<sup>76</sup> as a cause of work pressure. This was around 10% more than the other job categories.<sup>77</sup>

The postdoc researchers in our focus groups were not opposed to competition: *'it is good for the quality of your work, because you really have to think about what you want to do in the coming years.'* However, in their experience, competition is currently having the opposite effect:

*'The motivation to apply for a grant is not optimal. Now you have to do it to stay in science, whereas you should be doing it because you have a fantastic idea and want to do it.'*

The postdoc researchers indicated that they are often forced to step down from positions and leave institutes due to temporary contracts and heavy competition,

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74 Rathenau Instituut, 2013

75 In order to obtain a Vidi grant, one needs an 'embedding guarantee' from an institute, in which the institute declares the researcher will be granted a Tenure Track or a fixed appointment if they are awarded the Vidi grant.

76 WOinActie defines performance pressure as: 'The obligation to publish and obtain research funding. The necessity to perform at a high level with a view to a later job, extension of their contract or career progression, e.g. obtaining their PhD in their own time.'

77 WOinActie, 2020

even though they do have the necessary experience to deliver a valuable contribution.

Various studies over the past five years have shown that the lack of career opportunities within academia is problematic for postdoc researchers, both within the Netherlands and abroad.<sup>78</sup> The competitive quest for funding had already been identified as an important stumbling block for postdoc researchers previously. Research by Van der Weijden and Teelken showed that performance pressure, consisting of pressure to publish and pressure to obtain funding, is an important stressor for postdoc researchers.<sup>79</sup> Half of the postdoc researchers participating in the motivations study stated that pressure to obtain funding was a barrier to their ambitions.<sup>80</sup> Additionally, 12% gave the requirements of bodies funding research as barriers – which is twice as high as for the other job categories at research universities. In international research<sup>81</sup> as well, many postdocs mentioned the competition for funding as an obstacle to their career progress (64%), and 45% mentioned the lack of jobs.

Funding and temporary contracts are the main causes underlying the insecurity of the situation in which postdoc researchers find themselves. However, during the focus groups, we also identified other factors that increase this insecurity. We discuss them below.

### **Postdoc researchers carry a lot of risk**

In the experience of participants of the focus groups, the risk associated with the uncertainty of their position is fully borne by them. This applies to both progress in their research and their private lives. One participant in the focus groups described this precarious position as follows:

*'What it boils down to is that there is a small funding pool and everybody is fishing in it. But when you are in the postdoc position, you have the highest risk of losing. If you're a postdoc, it's no money and you're out. It's about the distribution of risk. Risk is shifted from the university to the individuals.'*

The postdoc researchers indicated that the temporary contracts and fierce competition can also have negative consequences for the universities and academia, such as talent leaking away. According to them, this will once again

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78 Rathenau Instituut, 2022; Woolston, 2020a; Woolston, 2020c; Van der Weijden and Teelken, 2023

79 Van der Weijden and Teelken, 2023

80 Rathenau Instituut, 2022

81 Woolston, 2020c

mainly result in more work for them, for example because knowledge and expertise that leaked away due to previous postdocs leaving needs to be built up again.

### **Advancement is not purely based on one's merits**

A 2013 study showed that random chance also played a role in the allocation of grants from the NWO Talent Programme (formerly the Innovational Research Incentive Scheme).<sup>82</sup> This concerned matters such as the composition of a committee or the preferences of the committee members.

In the experience of participants in our focus groups, random chance remains an important factor in determining the career opportunities of postdoc researchers. The qualities of a researcher are not the only thing that decides whether or not they are promoted to a permanent position. Factors over which they have no control, including luck, also play a role:

*'There is some luck involved: the right position, the right topic, at the right time. Tiny things really matter, like: you make that discovery or not, you are the first author for that paper or not, you met that person at a conference who invites you or not. And because you don't know which and how many of these building blocks you need, you just try to accumulate as many as possible. But it still feels like a great gamble if you are going to make it or not. It doesn't feel like a competition where the best one gets it, but an obscure game where the people who get it are good, I don't think anyone doubts that, but they also had a lot of luck.'*

In addition to the role of luck, the postdoc researchers in the focus groups also discussed unequal treatment, including the subject of nepotism. One participant described the question of whether or not a permanent position can be created after the temporary contract ends is dependent on the authority of the Principal Investigator involved. Another described how a PhD candidate who had not yet obtained their PhD was able to secure a position as a postdoc, because their supervisor had been awarded an ERC grant.

The discussions also covered sexism. For example, some of the participants mentioned that, when a female postdoc is given a position, other colleagues claim that she was given this position based on the fact that she is a woman rather than because of her qualities. The motivations study also showed that women at research universities and university medical centres are more likely to see their gender as a barrier to their ambitions than men: 18% compared to 5%.<sup>83</sup> In the

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82 Rathenau Instituut, 2013b

83 Rathenau Instituut, 2022



*Nature* postdoc survey,<sup>84</sup> 9 out of 10 respondents who had experienced discrimination based on their gender were women. Of the respondents to the motivations study with a migration background, 20% saw that background as a barrier.

Some focus group participants mentioned a '*toxic environment*', in relation to the lack of transparent decision-making, the dependence on supervisors and the competition for research funding, resulting in colleagues competing with each other rather than working together. Problems related to social safety in academia have been a topic of discussion in the Netherlands for some time already. In reports from 2019 and 2022, the LNVH and the KNAW described how the scarce resources, hierarchical organisational structure, internal power inequalities, high work pressure and the culture in the workplace encourage misbehaviour and intimidation.<sup>85</sup> In studies among Dutch postdocs as well, an unsafe working atmosphere was mentioned as a stumbling block. For example, postdoc researchers in the study by Van der Weijden and Teelken<sup>86</sup> likewise indicated that they had been faced with nepotism and manipulation. Of the postdoc researchers in the motivations study, 10% considered the atmosphere in the workplace a barrier, and 12% did not feel comfortable sharing ideas or opinions – this latter percentage is twice as high as for other positions.<sup>87</sup> In an international study from 2020, almost a quarter of postdoc researchers indicated that they had experienced intimidation or discrimination.<sup>88</sup> 65% had experienced power inequality or bullying.

Because of these bottlenecks, postdoc researchers have little control over their future, despite bearing the risks. The outcomes of their own research, their supervisor and their supervisor's success greatly affect their chances at an academic career. These factors contribute to the high work pressure experienced by postdocs: in order to increase the chances of moving up to a higher position as much as possible, postdocs take on as many tasks as they can.

### **Distrust and a lack of transparency**

Many of the postdoc researchers in the focus groups considered the research university an unreliable employer. They offered multiple examples of situations in which promises were not kept. One participant shared that they had initially been hired as an assistant professor for a tenure track position, but this ultimately did not happen. The policy at the institute had changed, which meant the postdoc researcher had to apply all over again, with a new committee. That committee chose a different candidate, and the postdoc was instead offered a two-year contract as a

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84 Ibidem

85 KNAW, 2022; Naezer et al., 2019

86 Van der Weijden and Teelken, 2023

87 Rathenau Instituut, 2022

88 Woolston, 2020b

postdoc researcher. Also, no embedding guarantee for a grant was issued.<sup>89</sup> Another participant shared that they had at one point been given a position based on a Veni grant, with the promise that a permanent position would follow once the Veni funding had been used up. However, when this actually transpired expired, someone else was chosen instead.

Not all postdoc researchers believe the organisation acts ethically in giving out or withholding permanent contracts. When postdocs are informed by institutes that their contracts cannot be renewed, they believe it is a matter of not wanting to renew the contracts rather than not being able to. In response to a participant who had stated that the institute where she worked could not offer her a contract, another participant said: *'She has internalised the institution's language. Because they can give her a new contract. They just don't want to.'*

The postdocs also mentioned the lack of transparency in relation to decision-making about contracts. In a previous study, Teelken and Van der Weijden described the lack of transparency in relation to related matters, such as career opportunities and selection procedures.<sup>90</sup> Several participants also stated that transparency could in fact be improved across the organisation as a whole: *'The way [research] universities are structures is increasingly diffuse and less transparent. They are creating clusters between faculty board and groups. They make the decisions, but they are not elected or controlled.'*

### **Lack of support**

The postdoc researchers we talked to had experienced a lack of support in different ways. The first concerns a lack of support with the research itself. They mentioned that the number of technical support staff, such as laboratory technicians and school laboratory assistants, who can take on part of the research tasks, such as lab work, has been decreasing. Another described feeling guilty about using the materials in the laboratories: since they had not 'earned' them using funding they had obtained, they were effectively using other people's materials. This is not always permitted.

Secondly, according to the focus group participants, there is a lack of support for postdoc researchers' personal development. In fact, they considered this to be completely lacking: *'You do a lot, but the [research] university is not investing in you'* In a cynical tone, they added: *'One of the [research] universities was good in providing aftercare, courses for a career after the postdoc. They invested in getting*

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89 By means of an embedding guarantee, the institute expresses its trust in and support for the research proposal, by indicating that the research can be carried out at the institute if the grant is awarded. This is a requirement: a Vidi application cannot be submitted without this guarantee.

90 Van der Weijden and Teelken, 2023; Teelken and Van der Weijden, 2018

*people out.*' Van der Weijden and Teelken<sup>91</sup> likewise identified a lack of support from the institute or organisation as a barrier: around 30% of the postdocs in their study were dissatisfied with the guidance provided by the research university. In one of their studies,<sup>92</sup> these academics described that postdoc researchers depend on their supervisors for this type of guidance, but they often also think of this as their own responsibility. As a result, they sometimes fail to make this need for support sufficiently explicit.

### **Flexible with regard to locations**

Another barrier mentioned by the postdocs is the need to be '*location flexible*', if they hope to continue in academia: '*People expect you to regularly switch between employers.*' Different focus group participants had experienced that it was considered necessary for their careers that they switch to a different employer for their work or move to a different city or even country. The postdocs in the focus groups indicated that they would like to get rid of this mindset, because they would like to settle down after moving house several times (sometimes even to different countries), because they have a family or because their partner has a permanent position or is pregnant.

This also means being flexible with regard to locations results in additional insecurity. Postdoc researchers from outside the European Union indicated that this insecurity is even greater for them, because of the temporary contracts and the low funding percentages. Their visa, income and housing are all linked to the contract, as is the entirety of their private life in the Netherlands. That is why one participant, for example, had started as a postdoc even before completing her dissertation. Because she was still very focused on obtaining her PhD in her first year as a postdoc, she had to invest more time in the second year into completing the postdoc and writing grant applications. One participant said: '*I have seen people really go crazy about that, dedicating even more of their time and energy to finding a new job. It was literally the only thing they could think of.*'

International research<sup>93</sup> shows that many internationally mobile postdoc researchers have concerns about their visa, but that they are nevertheless no less satisfied with their work than non-mobile postdoc researchers.

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91 Van der Weijden and Teelken, 2020

92 Teelken and Van der Weijden, 2018

93 Woolston, 2020c

## 2.2.2 Consequences

### Work pressure

The insecure position in which postdoc researchers find themselves causes them a lot of stress:

*'You continually feel like you have to defend what you are doing. You have to show that you're the best, or at least very good at what you do. But you also need to pay for living space and you need to also be able to do that next year.'*

In the focus groups, the participants described having insufficient space to meet their various responsibilities, both at work and in their private lives. The fact that they have to choose between work and their private life, and between their current work and finding funding for future work, results in mental pressure. This does not benefit the quality of their work.

*'It's emotionally draining: do I focus on the work I have now or what I will hopefully get in the future?'*

Many of the participants learned to deal with this the hard way: by almost or completely going through a burnout during their PhD track or postdoc track. In this field as well, many of the focus group participants felt they themselves were responsible for getting a grip on this.

This outcome supports the findings from previous research in the Netherlands and abroad.<sup>94</sup> A study by Van der Weijden and Teelken among Dutch postdoc researchers showed that 39% were at risk of developing a mild psychiatric disorder, such as depression or an anxiety disorder. This means they are exhibiting at least four symptoms that could point towards a psychiatric disorder.<sup>95</sup> Again, mental pressure was a factor: almost half of the respondents indicated that they felt like they were under constant pressure. Additionally, around one-third was experiencing difficulty concentrating and sleeping. More than a quarter had low self-esteem.

According to this study, international postdoc researchers were more likely to suffer from mental health complaints than their non-mobile colleagues. The outcomes of the different *Nature* surveys<sup>96</sup> furthermore implied that postdoc researchers are less

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94 Van der Weijden and Teelken, 2023; WOinActie, 2020; Woolston, 2020b

95 Van der Weijden and Teelken, 2023: a respondent is considered at risk if they demonstrate at least 4 of the 12 indications of psychiatric problems in the GHQ12. This shortened version of the General Health Questionnaire is a questionnaire that asks respondents to what extent they have experienced psychological symptoms over the past weeks, such as insomnia or thinking of themselves as a worthless person.

96 Woolston, 2020b; Woolston, 2019

likely than PhD candidates to seek help with mental health complaints. This matches the finding from the focus groups that the insecurity of their situation has greater consequences for the private lives of postdoc researchers from outside the European Union. With regard to the mental health of postdoc researchers as well, the Academy Thermometer, the results of which are expected in the second half of 2024, may be able to offer new insights.<sup>97</sup>

The number of hours worked by postdoc researchers did not come up as an explicit theme during the focus groups, but previous research indicates that postdocs often have to work overtime. For example, the motivations study<sup>98</sup> showed that two-thirds of the postdoc researchers worked overtime. A quarter worked more than 125% of their contractual working hours. This means postdocs work more overtime than PhD candidates, but less than assistant professors, associate professors and full professors.<sup>99</sup> The postdoc researchers who participated in the WOinActie study worked an average of 12 hours of overtime each week.<sup>100</sup> At the international level, 31% of postdoc researchers worked more than 10 hours of overtime.<sup>101</sup>

If we were to compare postdoc researchers to all high-skilled workers in the Netherlands, we see that they are more likely to suffer mental health complaints on average. In 2022, 22% of all high-skilled workers in the Netherlands had symptoms of burnout, according to the National Survey on Working Conditions (NEA).<sup>102</sup> A comparable percentage felt emotionally drained at least several times a month. The NEA did not enquire as to the amount of overtime, but it did show that 47% of high-skilled persons often or always feel that they have a lot of work to take care of, and 30% indicated that they often or always have to work extra hard.

The knowledge and attitude of a supervisor are major factors for how a postdoc researcher experiences and handles work pressure. The focus groups had had varying experiences with this. Some of the participants had received too little support from their supervisors: *'You learn that you have to take care of this yourself, or find colleagues.'* One participant had been told by their supervisor: *'I can do it, why can't you.'* Other participants had received support from their supervisors, but only after they had indicated that they were having trouble. Yet another participant stated that they did have good role models, who did not work weekends and asked them how things were going.

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97 The Young Academy, n.d.

98 Rathenau Instituut, 2022

99 Of whom more than 80% work overtime and one-third to half (professors) work more than 125%.

100 WOinActie, 2020

101 Woolston, 2020a

102 TNO and CBS, 2022

Van der Weijden and Teelken<sup>103</sup> also noted the importance of good relationships between supervisors, postdocs and colleagues. Although most postdoc researchers in this study, just like in the motivations study,<sup>104</sup> were satisfied with their supervisors, those who were less satisfied also had worse mental health.

### **Impact on personal lives**

In the focus groups, the postdocs gave poignant examples of the negative impact of the insecurity and work pressure on their private lives. One of the female postdocs stated that she had decided not to have a second child because of the insecurity of her position. Another said that having a child had meant an interruption of her academic career, as a result of which she was still going from one temporary contract to another many years later. An international postdoc explained that the stress of obtaining a grant prevented her from taking the time to learn Dutch in order to obtain a residence permit. As a result of which she could not bring her partner to the Netherlands. Again, the insecurity of the situation was the reason for the absence of a child. Another postdoc researcher indicated he had come to the Netherlands and bought a house here because of the promise of a permanent contract. This promise was not kept, leaving him unable to pay his mortgage.

In a general sense, it is difficult to combine working as a postdoc researcher with a private life. The participants in the focus groups considered a partner with a stable job simultaneously important and a liability: *'In essence it is not possible to combine personal life and professional life.'* Being a partner on an equal basis is difficult. This was also one of the conclusions of the study by Van der Weijden and Teelken: postdoc researchers who had conflicting obligations in their private life were more likely to have mental health problems.<sup>105</sup> A study by WOinActie showed that more than 4 in 10 postdoc researchers felt the impact of work pressure in their social contacts, hobbies and sports, even more so for PhD candidates and lecturers.

### **Lack of rewards**

The combination of high work pressure and the insecurity of their position leaves postdoc researchers feeling undervalued and disillusioned – even when appreciation of their work is communicated to them in words. Some of the participants in the focus groups stated that they had not noticed any relation between the amount of work they did for their employer and the rewards they received for this. This was not only about the amount of work, but also about additional activities, such as open science efforts or valorisation activities. Regardless of all the work they do, they will ultimately still end up on the street, they explained. The previously mentioned lack of support also plays a role in this. One

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103 Van der Weijden and Teelken, 2020

104 Rathenau Instituut, 2022

105 Teelken and Van der Weijden, 2018

participant said it can be very demotivating to write a grant application together with your research group *'if you cannot do the project because you know you will be out by then.'*

### **Wasting talent**

The postdoc researchers in the focus groups pointed out that knowledge and talent leak away in different ways or are sometimes not optimally used, for example because people leave when their temporary contract expires.

*'In our institute there were several very advanced methodological breakthroughs that no one [uses] anymore, because the people that did it left for multiple reasons. Now we want to do it, but nobody knows how to do it practically, so it will take [the person responsible] another year to refigure it out. It is a waste for the Dutch system. You don't have to hire everybody in a permanent position, but it might be nice if occasionally you have somebody that brings stability in that group.'*

This citation shows that it is not just about talent leaving, but also about the time allocation for incoming talent. Focus group participants said, for example, that they have to repeat previous analyses, leaving them with less time for innovative work. They are also sometimes forced to take on work that could have been done by technical and support staff, which have been cut for budgetary reasons. As a result, the postdoc's capacities are not optimally utilised. This bottleneck was less prevalent in previous studies, which mainly focused on personal consequences. Incidentally, one of the participants indicated that there is less room for researchers who do not necessarily feel the need to become group leaders and would rather continue their career as researchers, which was the case for several focus group participants.

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### Box 2 The experience of junior lecturers

Junior lecturers can also be considered early-career researchers. While their appointment is initially focused on education, the motivations study<sup>106</sup> showed that they also spend time on research. Of this group, 70% indicated that they would like to develop their research skills. Around half would like to develop their skills in the field of education and student supervision.

Not enough junior lecturers responded to the call for focus group participants to organise a separate focus group for them. We interviewed a junior lecturer who applied, and one of the PhD candidates in the focus groups also worked as a junior lecturer.

On the whole, these two junior lecturers experienced the same bottlenecks as postdoc researchers, with one major difference. Even though research and publications are the only way to carve out a career in academia, there is no room for junior lecturers to join the competition for research grants, one of the two explained. Nor there is enough time and energy to do this in one's own time. No support is provided either.

Just like the postdocs, the junior lecturers see further standardisation of their position as a potential solution. One of them indicated that the appointment of a junior lecturer should include opportunities to do research, as long as this is necessary for an academic career.

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## 2.3 Possible solutions

Participants in the focus groups saw the temporary contracts and the lack of funding as the main factors underlying their bottlenecks. Some of them also mentioned the lack of transparency at the institutes.



Participants referred to an adjustment of the Work and Security Act (*Wet werk en zekerheid*) as a possible solution. This Act stipulates that employees should be offered a permanent contract following two temporary contracts. In practice, for many postdoc researchers, this means that they will have to find employment at a different institute after a maximum of two temporary contracts, because there is no permanent position for them, or at least they are not offered a permanent position. Several participants indicated that they would rather have a longer string of temporary contracts: *'I know that without the flexwet (Work and Security Act) I could have had many consecutive positions without a problem.'* They also suspected that they could have stayed with the same research university or university medical centre for longer. At the same time, we saw earlier in this chapter that various postdocs referred to the responsibility of institutes to offer more permanent contracts.

The participants in the focus groups also made suggestions for strengthening transparency within the institutes, for example with regard to decisions about appointments and promotions. Another participant suggested creating a more level playing field by not placing the decisions of who will be appointed and who can submit grant applications with the same professor. The participants believed this would reduce the impact on your career opportunities of who you know and who your supervisor is. In a study into the research precariat, the Organisation for Economic Co-operation and Development (OECD) also recommended greater transparency, developing flexible and predictable career opportunities for postdoc researchers, making the promotions process more transparent and improving HR policy for this group in general.<sup>107</sup> Other suggestions included 'co-supervisors' monitoring the ethical course of processes, increasing the visibility of ombudspersons and introducing training courses for supervisors. This last suggestion closely matches the social safety advice issued by the KNAW in 2022.<sup>108</sup> Among other things, the KNAW recommended paying attention in the selection and development of supervisors to their responsibility for the welfare of their employees, using an intricate structure for social hygiene to highlight problems and teaching employees to raise behavioural issues for discussion. The 2019 LNVH study into harassment offered similar recommendations.<sup>109</sup> One of the participants in our focus groups offered the idea of creating more awareness for stressors that are specific to international employees.

The suggestion to create a formal job description for postdocs, to standardise their employment conditions and reduce the lack of clarity, came up in both focus groups. A minimum duration of employment contracts could also be laid down in

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107 OECD, 2021

108 KNAW, 2022

109 Naezer et al., 2019

this, for example. The OECD likewise recommends implementing a minimum duration to improve continuity.<sup>110</sup> Another similarity between our focus groups and the OECD recommendation is the suggestion to create separate positions for tasks that need to be carried out over a longer time period, such as laboratory technicians and software developers.<sup>111</sup>

The focus group participants suspected that better support could also help them. One participant suggested that every research university should have its own postdoc office, to map the needs of postdocs, organise contact with other postdocs and represent their interests. The OECD also indicated that it is important to make sure postdoc researchers are heard, including through postdoc networks.<sup>112</sup> Another participant stated that the postdoc councils already in existence have difficulty finding and retaining members.

The focus group participants made suggestions in the field of funding as well, such as more funding opportunities offered by the Dutch Research Council, a larger chance that research proposals will succeed and subsidies for projects that received an excellent score but no grant. Both groups suggested making more funding available to knowledge institutions themselves or to long-term projects.

## 2.4 Conclusion

We have learned from our focus groups that accepting a position as a postdoc researcher, even more so than starting a PhD track, implies a specific decision to continue in academia. The reasons for postdocs to make this decision are comparable to those of PhD candidates, but the opportunity to stretch the boundaries of available knowledge and the interaction with students play a greater role. The bottlenecks experienced by postdoc researchers paint a picture of an uncertain situation, resulting from temporary contracts and strong competition to obtain research funding. The risks for postdocs' careers and private lives associated with this uncertain situation rest entirely on the shoulders of the postdocs, despite the fact that they feel they have limited control over whether or not their project will succeed and the potential next step in their career.

In the experience of postdoc researchers, whether they will succeed in making the next step in their career is only to a limited degree based on their own merits. According to the focus group participants, they often have to deal with arbitrary decisions, and luck often plays a major role. Many participants saw research

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110 OECD, 2021

111 Ibidem.

112 Ibidem

universities as unreliable employers that provide insufficient transparency with regard to, for example, career opportunities. They offered painful examples of promises that were not kept by their employers and had the impression that their employers were not investing in them enough. They also felt they received little support, both with obtaining the necessary resources for research and with personal circumstances and career development. In other words, postdocs bear the weight of the risks without being given the room to shape their careers and their lives.

Postdocs therefore experience severe consequences in terms of their private lives and mental health. The working conditions get in the way of important developments in the private lives of different focus group participants, such as having children. Postdoc researchers experience considerable mental pressure. They also indicated that there are consequences for institutes and academia as well. Because of the combination of high turnover and the lack of technical staff, postdocs regularly have to take on extra tasks, such as laboratory work, and gain knowledge and experience that were lost when previous postdoc researchers left. This is a waste of time, money and academic talent. The postdocs themselves would like to continue working in academia, but several of them indicated that they will leave the choice of their next workplace up to the question of whether they will be offered a permanent contract there, or at least the prospect thereof.

The participants in our focus groups saw a number of possible solutions, such as increasing the amount of funding available and adjusting the Work and Security Act so they so they can continue to work for the same employer for longer on fixed-term contracts. They find it important to make decision-making within institutes, for example in relation to HR policy, more transparent, and they would like to receive support specifically geared towards their situation, for example in the form of postdoc offices.

### 3 Early career researchers at universities of applied science

In 2001, the government and universities of applied sciences concluded an agreement to further develop the research function at universities of applied sciences. This applied research was to focus on developing knowledge and practical solutions for education and the professional practice in which higher professional education students end up. We refer to researchers who work at universities of applied sciences as practice-oriented researchers.

Practice-oriented research is organised into professorships, led by one or more professors (*lectoren* in Dutch). In 2022, there were 723 active professors at universities of applied sciences. Over 5,000 lecturer-researchers and 769 PhD candidates worked in their professorships as practice-oriented researchers.<sup>113</sup> The scale of the professorships differs widely in practice. For example, the focus groups had participants who worked in a professorship consisting of 30 people and participants who worked with only a few colleagues. Researchers and professors often have part-time appointments for research. Alongside this research, they teach at the university of applied sciences, for example, or work in the business sector.<sup>114</sup>

In this chapter, we discuss what it is that makes their research appealing to early-career practice-oriented researchers, what bottlenecks they experience and what solutions they envision. In doing so, we include findings from both the motivations study and the focus groups organised for this study. No other recent study has looked into the bottlenecks experienced by practice-oriented researchers.

#### 3.1 Appeal

Almost all of the participants in the focus groups for practice-oriented researchers were strongly motivated by the direct connection between research and professional practice, as well as the impact of their research visible there.

*‘During my Master thesis I was doing fieldwork, and recognising the things I read in papers, seeing it happen. That’s something I wanted to pursue, and I think I found that at the university of applied sciences.’*

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113 Rathenau Instituut, 2024

114 Ibidem.

Many participants were in direct contact with the practice they wanted to study, for example because they develop research questions together with healthcare workers, do research at primary schools or get in touch with people who became enthusiastic after reading a newspaper article. This gave them a lot of satisfaction and motivation. For some of the participants, this was part of the reason why they deliberately opted for a research position at a university of applied sciences rather than at a research university. They felt this gave them more leeway to create impact.

*'For the past 1.5 years I think I have made more impact than in my whole PhD, because I had much more freedom. There were less strict rules that I had to work with.'*

Additionally, some focus group participants who had also worked at a research university mentioned that they experienced more equality and influence, less pressure to publish and more space to develop different products at universities of applied sciences.

At the same time, the freedom associated with the position to develop new knowledge is another important motivator for practice-oriented researchers. Working as a practice-oriented researcher gives them the opportunity to ask in-depth questions, for which there is less room in professional practice, to contribute to knowledge development and innovation and to continue learning. One of the participants, for example, said that her current position is *'the ideal match between indeed making the impact in companies and at the same time also being able to ask the questions that you can't ask within a company.'* Another said they saw practice-oriented research as an opportunity to do something else alongside providing education. Research offers them room to *'think about your own curriculum, innovation or adding new knowledge and realising what is actually at play, for example.'*

With regard to the working conditions, some participants indicated they appreciated the flexibility associated with working as a researcher: working independently and deciding how you will use your time yourself. This flexibility compares favourably to the situation in education, where there is considerably less flexibility. Some participants mentioned the overlap in motivation with colleagues as an important advantage.

This last item also came up as a strong source of motivation in the motivations study.<sup>115</sup> In this study, half of the early-career applied researchers<sup>116</sup> chose ‘working in an environment with high-quality and inspiring people’ as one of the three most important objectives. This concerned researchers, lecturer-researchers, PhD candidates and postdocs. Among these groups, the objective ‘doing socially relevant research’ was the next to stand out as important. Over 40% of the respondents added this objective to their top three. Over 20% chose the objectives ‘the opportunity to do high-quality research’ and ‘being able to research topics I am curious about’. For almost 30%, earning a good salary and fringe benefits were in the top three.

The motivations study also identified objectives related to education as relatively important. They were not chosen to be in the top three quite as often, but over 80% thought ‘training students to be critical citizens’ or ‘independent professionals’, ‘making students excited about my discipline’ and ‘providing high-quality’ education were important objectives. Similarly, 80% of early-career practice-oriented researchers thought ‘involving social partners or citizens in research or education’ was important.

## 3.2 Bottlenecks and consequences

Of the practice-oriented researchers who held a position as lecturer-researcher, PhD candidate or postdoc and participated in the 2022 motivations study, 71% had experienced one or more barriers in their organisation or the broader system of academia. 9% had experienced their gender as a barrier, 7% age and 8% personal circumstances (such as family or care responsibilities). We discuss the main bottlenecks experienced by practice-oriented researchers below.

### 3.2.1 Bottlenecks

#### **Lack of clarity regarding the tasks of practice-oriented researchers**

It was not always clear to participants in the focus groups what a practice-oriented researcher is meant to do. In their experience, the role of practice-oriented researcher and the job description for practice-oriented researchers are not yet sufficiently developed. They can differ widely between and even within universities

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115 Rathenau Instituut, 2022

116 With regard to the motivations study, this group was defined as those who indicated they had a position as researcher, lecturer-researcher, PhD candidate or postdoc. The self-selection we applied for the focus groups, in which we looked for early-career applied researchers, was not part of the motivations study.

of applied sciences. One participant mentioned it is similarly not always clear to supervisors what is expected of an early-career practice-oriented researcher. The focus group participants found this lack of clarity difficult.

### **No clear job profiles and career paths for researchers**

Several participants explicitly mentioned the lack of clear job profiles.

*'There are no job profiles at our institute, for researchers at least..., or at least, [there are] junior researchers and then associate professors, but there's a massive gap between those two. And in between those two, there is hardly a vision of what researchers should be doing [and] what their career prospects are.'*

Clear career prospects are missing as well. Several focus group participants had a contract for teaching, and they were effectively on loan for research purposes. This means the job requirements in their contract are related to teaching, even if they do not teach. For one participant, the education manager assessed their performance, despite not really being able to assess their research. That same participant also described the difficulty of giving a colleague recognition for their research achievements. Education does provide some security: this is something the participants could fall back on, but most of them do not want to.

### **Underappreciation of practice-oriented research**

A third bottleneck experienced by practice-oriented researchers is the underappreciation of practice-oriented researchers at universities of applied sciences and beyond. The statement that practice-oriented research may be different but is no less valuable was heard frequently during the focus groups.

Within their own universities of applied sciences, the researchers notice that education is prioritised. Research is often still just an afterthought. The attention and room they are given for their research depends on how valuable the managers for the educational unit they belong to consider it. The participants felt that they often had to defend their research towards colleagues. For example, one participant had heard a colleague refer to the professorship as *'a playground for smart people'*. That underappreciation is something they experience in various ways. For instance, one participant stated that the salary is not effectively valued based on research performance: *'Your scale in research is not reflected in education, while the other way around it is...'* Another participant said: *'There are less means [for us]. We had three or four professorships, but no room to work in, so we all had to work from home. Sometimes a [multi-purpose] room was available.'*

Within the broader academic system as well, researchers believe that practice-oriented research is undervalued. They see this reflected during conversations and with grant applications. For example, one participant pointed out that, when applying for a grant, making it appear that a research university is involved is practically a requirement.

*'When I just know they're gonna say, "there is no research university involved", I don't feel like making the necessary effort to submit an application.'*

Another participant noted that a relatively large portion of research funds goes to research universities – and relatively little goes to consortium partners like universities of applied sciences. They shared the experience of how a typical practice-oriented research assignment ends up at a research university – which then comes knocking at a university of applied science asking how they should go about such district research. One participant describes the resulting feeling as follows:

*'It's like you're playing with dolls. So let's put the dolls away and do something serious.'*

### **Imbalance between education and research**

Not only does education receive a higher valuation, it is also given a higher priority in daily activities. Education is very structured and must continue, while research can wait. Education often also takes up more time than scheduled. This became clear from the motivations study, in which around half of the practice-oriented researchers indicated that education takes up more time than agreed. As a result, early-career practice-oriented researchers experience an imbalance between education and research, with education always being prioritised and taking up more time, at the expense of research.

### **Facilities for research remain limited**

Practice-oriented research is still relatively young, and the facilities offered by the organisations therefore remain somewhat limited. Previously, we already noted the lack of clear job descriptions. Other facilities are missing as well. For example, some of the participants indicated that far fewer academic journals and programmes for research are available, or that they have trouble finding a workspace. The range of courses available to them is also mainly focused on education.

*'I think in a university of applied sciences you have way less regular means to actually gain that knowledge on how do I find the*



*right journals, how do I find the right things [and] get your information out into the world. [...] That is something traditional universities are good at. [At universities of applied sciences], because of the educational focus, there is considerably less support for research.'*

According to the focus group participants, not only does this mean that fewer resources are available, it also becomes more difficult to find your way, to learn how to use the right journals, to find out the best way to approach research and to understand how to get your findings published. Even the experiences from previous researchers that they can build on is something that some still see as limited. There is not yet a real community that you can be part of and where you can share your experiences.

Some participants also missed the cohesion with fellow researchers within the professorship. Many researchers spend one to one-and-a-half days working in the professorship – neither necessarily on the same day nor at the same location. This is something that researchers in small professorships, or professorships spread out across multiple locations of the same institute, struggle with in particular. However, based on the experiences of some of the participants, small actions on the part of the organisation can change this. For example, one researcher described how her supervisor encourages her to join in on various meetings. Another described how his professor ensured that everyone working for the professorship have their workplace on the same floor as the teaching staff and are invited to team days.

### **Finding funding**

Funding of practice-oriented research comes from a direct subsidy to universities of applied sciences from the government, obtaining research grants and contract research. The participants in the focus groups found themselves in varying situations. Some received their funding from the government subsidy or from other grants and assignments obtained by the professor. Others were responsible for getting funding themselves. Bottlenecks arise in particular in relation to the availability of research grants and the conditions that apply to them. Previously, we already mentioned that a research university needs to be involved in large-scale applications for funding. Additionally, some participants pointed out that the funding is often aimed at concrete research questions and cares less about the researcher's development or building up a research line over the long term.

The participants also described the broad consortia which are often necessary as limiting. According to one participant, this often leads to situations in which a large number of people spend only a few hours on the project each week at different project partners. Some of the participants indicated that funding is not always

available for all tasks. For example, two participants said that they must financially account for the hours spent drawing up applications, even though no time is reserved for this. Another participant mentioned that projects often do not include time for revising texts.

### **3.2.2 Consequences**

#### **Work pressure**

The practice-oriented researchers also indicated that they initially often struggled with how to divide their time, because of the combination of education and research. They found it very difficult to find the right balance in their first year, especially because they noticed that education took up way more time than they had initially expected. Different focus group participants indicated that they got to grips with this after raising the issue for discussion and setting boundaries in consultation. One participant, for example, said that she spent a long time enjoying teaching less because of the extent to which it was prioritised over research. She was able to solve this by making new agreements about her teaching tasks.

#### **Research delays**

Due to the imbalance between education and research, the research of the focus group participants often runs into delays. They had also seen some research activities slip through net because, when working in broad consortia, there are times when no one wants to take responsibility for finishing up a project after its official end date. When the work is not yet finished by the end of a project, the participants' priorities shift to other tasks. One of the focus group participants believed this is because tasks and responsibilities are not always clear, making it difficult to call each other to account.

#### **Difficult to find a place in research networks**

Some of the focus group participants indicated they found it difficult to find and claim a place in networks consisting mainly of researchers at research universities. The reasons mentioned by them include underappreciation of practice-oriented research, the unclear definition of practice-oriented research and the fact that the relatively low numbers of researchers are spread across a large number of institutes. One of the participants, who worked in education research, did not share this experience. He believed this was because educational sciences already have a better framework for collaboration.

### 3.3 Possible solutions

The participants in the focus groups offered various suggestions for limiting the bottlenecks. Several of them were overarching, at the system level. One of the participants' suggestions concerned developing a clearer vision of what kind of research we want to do in the Netherlands and what role practice-oriented research at universities of applied sciences should take. A clear vision would make it easier to get recognition for the value of practice-oriented research and organise collaborations. The two groups did, however, have different views on what the contents of such a vision should be. The first group mainly held that practice-oriented research is a domain in which universities of applied sciences excel and in which research universities should not interfere. In the other focus group, one participant suggested that research at research universities and universities of applied sciences could be further integrated.

According to the participants, the second solution at the system level relates to funding. More research funding focused on the development of researchers should go to universities of applied sciences – and not just research funding focused on concrete solutions for professional practice. Additionally, a larger portion of the available research funding could go to universities of applied sciences. One participant mentioned that, although research projects usually involve many different parties, a large portion of the funding still goes to the participating research universities. Another suggested that universities of applied sciences should be allowed to benefit more financially from the PhD tracks they are involved in.

A second string of suggestions from the participants related to the working atmosphere at universities of applied sciences. For example, one suggestion was that universities of applied sciences should take the position of researchers more seriously and should see research as more of a core task. Another internal solution would be to draw up job profiles with research as their main task and make the job profiles uniform across all universities of applied sciences.

### 3.4 Conclusion

Practice-oriented researchers who have previously worked at a research university feel the working conditions at a university of applied sciences are very positive on the whole. They experience more equality, less pressure to publish and more room to develop various products. Achieving societal impact is often a key motivator for their research.

If we look at the bottlenecks experienced by practice-oriented researchers, we see that these are largely related to the relatively short history of practice-oriented research. Early-career practice-oriented researchers experience that there are different schools of thought about what practice-oriented research is, even within the same university of applied sciences. Other problems mentioned were the lack of research facilities, scope to request funding and job profiles. Finally, a major concern of the participating researchers was the underappreciation of practice-oriented research, both within and outside the university of applied sciences. This underappreciation affects not only their opportunities but also their motivation.

All things considered, the experiences of young practice-oriented researchers paint a picture of research that has yet to establish itself as fully fledged, both within universities of applied sciences and in the broader knowledge ecosystem. They envision possible improvements in the development of a national vision on what kind of research we want to see in the Netherlands and the role of practice-oriented research. They believe a larger portion of research funding, both from the central government and within projects, could be allocated to universities of applied sciences. Moreover, they believe it would be good if the universities of applied sciences themselves could see research more as one of their core tasks.

## 4 Conclusion

In this study, we mapped out which challenges early-career researchers in different positions run into in their work, as well as the consequences of these challenges. To this end, we gathered the findings from previous studies and talked to early-career researchers who indicated they experienced barriers in carrying out their ambitions. We looked at PhD candidates and postdoc researchers at research universities and practice-oriented researchers at universities of applied sciences. Each of these positions has its own challenges. Nevertheless, we noticed some degree of overlap when it came to specific bottlenecks and needs. In this chapter, we discuss the main differences and similarities, based on the overall picture that emerged from the focus groups and previous studies. Based on the conclusions, we offer six points for consideration to strengthen the position of early-career researchers.

Early-career researchers find themselves in an uncertain situation. They often work on temporary contracts and realise that their opportunities for moving up in the sector in which they work, especially at research universities and university medical centres, are limited. Many early-career researchers do have the ambition for this, especially once they have taken the next step in academia after obtaining their PhD. Another aspect of this insecurity is that, for many early-career researchers we talked to, it is not always clear what their supervisors and the institute where they work expect from them. In some cases, this is because the research task of the group or institute where they work is not yet fully developed. This is the case at universities of applied sciences in particular. In other cases, the expectations are not communicated clearly and explicitly. Formal requirements are only drawn up late in the research process or are formulated too vaguely. Even when tasks are clear, early-career researchers sometimes fail to realise how much time they will take. For PhD candidates, it can also be difficult to get a good understanding of how to structurally work towards long-term goals. A third source of insecurity for early-career researchers is that it is unclear how and on the basis of what achievements they will be able to take the next step in their career within academic or practice-oriented research. This applies to postdoc and practice-oriented researchers in particular.

Even while dealing with this uncertainty, early-career researchers must still make choices, because their tasks outweigh the time available to them. They must choose which tasks to focus on, with a view to both their current job and their future career. This leads to continuous uncertainty: am I doing the right things, both for my job and for my career? Am I doing enough? Am I doing it right?

This combination of unclear tasks, uncertain career opportunities and academic ambitions creates considerable mental pressure, especially among PhD candidates and postdoc researchers. Everything you do better or beyond what is necessary increases your chances of taking another step in your academic career. That is why many PhD candidates and postdoc researchers suffer from mental health symptoms. This also has an impact on their private lives. For many PhD candidates and postdoc researchers, their work-life balance became tilted at a certain point, leaving them unable to find an equal partner and no time for their hobbies. Because of their uncertain situation, they postponed important milestones in their life, such as having children, buying a house or becoming a citizen of the country they work in. This applies to postdoc researchers in particular. The underappreciation of their work experienced by early-career researchers contributes to this mental pressure as well.

Our research has identified factors that could help early-career researchers deal with the insecurity of their position. First, we saw that effective supervision makes a big difference for how early-career researchers experience their work. A good supervisor focuses not just on the content of the work but also helps early-career researchers bring structure to their work and helps consider their personal and professional development. Second, we saw that effective embedding in the organisation is important for early-career researchers. This includes:

- the feeling of being a full-fledged member of an organisation;
- sufficient access to resources for research;
- support with personal and professional development appropriate to their position; and
- contact with other research in similar positions.

Third, it helps when the dominating culture makes it possible to raise issues for discussion and try to find a solution together with the immediate environment. Finally, a greater diversity of career paths and greater recognition of achievements apart from research (research universities and university medical centres) or education (universities of applied sciences) would give early-career researchers more career prospects and result in more appreciation for the different tasks they take on. Research universities and university medical centres hope to achieve this through the *Recognition and Rewards* programme. However, in 2021, half of the early-career researchers at research universities and university medical centres were not familiar with this initiative.

A number of bottlenecks stand in the way of realising these conditions. Within research universities and university medical centres, the hierarchical and competitive culture is the main issue. Early-career researchers experience a political environment with numerous unwritten rules. PhD candidates find it difficult

to stand up for their own interests, are not always sure whether this is even 'allowed' and are worried this might harm their position. Postdoc researchers named several consequences of this culture: a toxic work environment, sexism and unequal treatment. They also indicated there is insufficient transparency on how staff decisions are made. The main obstacle at universities of applied sciences is that the volume of research is still small compared to education, and not everyone sufficiently recognises the value of this research.

The ways in which these bottlenecks manifest and their effects are of course not the same within the groups of early-career researchers we studied. Below, we provide a short, summarising conclusion of the three groups' situations, focusing on the main, distinctive bottlenecks and consequences.

### **PhD candidates**

PhD candidates are often at the very start of their career. They work towards their dissertation over a period of four years. After that, their future is open. Although many PhD candidates aspire to continue in academia, previous research shows that a dissertation also provides added value outside of academia.<sup>117</sup> Despite working towards a clear final product, PhD candidates often have difficulty figuring out exactly what is expected of them. PhD candidates receive considerable freedom at the start, but they run into unspoken yet strict expectations over the course of their PhD track. At this point, they still lack the experience to know how much time and effort certain requirements entail, such as publishing an article. In their direct environment, they notice that the requirement that a dissertation must be of high quality can be interpreted differently by different doctoral thesis supervisors. They also find it difficult to incorporate planning and structure into the space they are given. The extent to which their supervisor offers them support with this varies.

In relation to the three groups of early-career researchers, pressure to publish is the largest problem for PhD candidates. Many PhD candidates still feel that they are being pushed to publish in journals with a high impact factor. Related to this, there is little recognition of their efforts in other aspects of their work, such as achieving societal impact. Multiple PhD candidates were told that the *Recognition and Rewards* programme was not intended for them. They themselves view this differently and would also like to develop skills other than research skills.

### **Postdoc researchers**

Based on our research, the position of postdoc researchers is the most poignant. Postdoc researchers are further along in their career than PhD candidates and have already committed to a career in academia more strongly. The need for a solid

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<sup>117</sup> CBS, 2020; Rathenau Instituut, 2018.

foundation to support their private life is also more important for them: many postdoc researchers are at a stage in their life where they are settling down in one place and considering having kids. Personal ambitions and social and economic security are at stake for this group, more so than for PhD candidates.

At the same time, postdoc researchers find themselves in the most precarious position: they work on temporary contracts and depend on research funding to advance in their career, while dealing with fierce competition. At the end of their PhD track, PhD candidates have a dissertation that will improve their chances on the labour market outside of academia. Practice-oriented researchers can often fall back on education if there is too little funding for their research. Postdoc researchers have fewer options to fall back on. Some indicate that their work is so specialised that there are practically no other places where this could be practised.

Moreover, in the experience of postdoc researchers, whether they will succeed in making the next step in their career is only to a limited degree based on their own merits. In their eyes, luck plays a significant role, and mention was also made of nepotism. Experiences with sexism also came up in the focus groups. Many of the postdoc researchers in the focus groups considered the research university an unreliable employer. They provided painful examples of promises that were not kept by the institute they worked for, claimed there was a lack of transparency around promotion decisions and said they did not feel the research university was investing in them.

This has considerable consequences. Postdocs experience a constant sense of pressure: doing more is always better. Previous research has shown that postdoc researchers are more likely to suffer from mental health symptoms than other highly educated persons. The focus groups gave poignant examples of important life decisions that postdocs had postponed or discarded entirely because of the considerable uncertainty they experienced, such as obtaining Dutch nationality or having children. This also happened among PhD candidates.

The consequence for the institutes is that talent and knowledge are wasted. When postdoc researchers leave, they often take knowledge with them that has not been adequately stored in the organisation and is therefore not retained. Postdoc researchers say they regularly spend time retrieving this knowledge or working on tasks that could also have been performed by support staff. In their experience, this means their capacities are not used optimally.

### **Practice-oriented researchers at universities of applied sciences**

Practice-oriented researchers at universities of applied sciences face a different situation. Whereas research is the dominant ingredient for a career at research



universities, this is education at universities of applied sciences. There is not yet a beaten track for practice-oriented researchers to follow – and the vision on practice-oriented research is consistent neither between universities of applied sciences nor within them, in the experience of the focus group participants. Early-career practice-oriented researchers furthermore state that facilities for research are often lacking: from spaces to work to access to academic journals and from training to clearly defined career paths with associated rewards.

On the other hand, practice-oriented researchers who have also worked at a research university indicate that they experience more freedom to create impact in practice at universities of applied sciences. This direct link to practice is an important source of motivation for many of these researchers. They also experience more equality, less pressure to publish and more room to develop different types of products. Although practice-oriented researchers also have a considerable set of duties, with an imbalance between education and research and the resulting mental pressure, the consequences for their mental health and their private lives seem smaller for this group. The working conditions appear to be more open to discussion.

A specific bottleneck that early-career practice-oriented researchers have to deal with is the underappreciation of practice-oriented research, both within their own organisation and in the broader research community. Within the institute, some see practice-oriented research as '*a playground for smart people*', and in the research community as well, they experience that practice-oriented research is considered subordinate to research carried out at research universities, whereas they themselves would mainly describe their research as different. An example of this is the experience of practice-oriented researchers that applications for funding in which no research university is involved are hopeless. This underappreciation affects not only their opportunities but also their motivation.

### **International early-career researchers**

Finally, the study shows that international PhD candidates and postdoc researchers face even greater insecurity. For those from outside the European Union, their residence permit is also at stake. This will expire as soon as they lose their job. Participants in the focus groups with PhD candidates voiced their concerns about international PhD candidates on research grants, whose income is often very low. Previous research shows that international PhD candidates and postdoc researchers are at an increased risk of developing mental health symptoms.

## 4.1 Points for consideration

Based on the above insights, we offer six points for consideration for policymakers and knowledge institutions.

### **Expectations should be made more explicit, especially considering the focus on diverse career paths.**

This study shows the importance of early-career researchers and their supervisors engaging in conversation about their mutual requirements and expectations. In doing so, it is important that they focus not just on the content of the work but also on the personal and professional development of the early-career researcher.

This is extra important considering the *Recognition and Rewards* movement, which was introduced in recent years.<sup>118</sup> This responds to the need for diverse career paths, which we also identified among early-career researchers. This should give academics greater opportunity to have a career based on achievements in education, valorisation and management. At the same time, *Recognition and Rewards* should help reduce the competition among researchers, giving them more room for team science and open science.

Making the diverse career paths more explicit, along with the associated rewards for specific achievements, could lead to clearer requirements and expectations. At the same time, this could also lead to greater diversification. Not only will career paths become more diverse, the way in which this is implemented can also differ between institutes, faculties and departments. This makes the conversation about requirements and expectations, which can be initiated by either the supervisor or the early-career researcher, even more important. This applies in particular to the stage in which these career paths are in development.

### **The position of postdoc researchers is vulnerable: support is necessary.**

This study shows that the position of postdoc researchers at research universities and university medical centres is vulnerable right now. Their interests are barely represented, and they feel that the support they receive from the employer is barely aligned to their needs. This needs to change.

Knowledge institutions could provide this support in different ways, for example through a postdoc office, coaching or mentorship, to guide researchers in their personal and professional development. Supervisors have a role to play here as well, by focusing on these aspects in their supervision – as also recommended by

researchers Teelken and Van der Weijden and by the KNAW.<sup>119</sup> Additionally, research universities could offer more postdocs contract renewal when their projects run into delays due to pregnancy or illness, for example. Finally, better representation of this group's interests would be welcome. Whereas PhD candidates are well organised and represented both within knowledge institutions and at the national level, the group of postdoc researchers is still relatively invisible. The postdoc researchers are responsible for this as well: the focus groups show that postdoc researchers who are members of postdoc councils find it difficult to fill these councils, because people are quick to leave again.

**PhD candidates should take more space to orient themselves towards a future outside of academia.**

Our analysis shows that many PhD candidates take the perspective that PhD research should in the first instance be preparation for a career in academia. They talk about taking on a position outside of academia as a second choice, the option you pick when you fail to become a postdoc or when you do not want to engage in the competition for a postdoc position.

Research universities have taken several steps to get rid of this limited view. They offer PhD candidates opportunities to explore different careers, develop skills unrelated to academics or do a work placement during their PhD track. Graduate schools and HR departments play an important role in this. PhD candidates appear to make insufficient use of these services, either because they are not aware of them or because they do not have the time.

Supervisors could play a key role in encouraging PhD candidates to take a broader view. Doctoral thesis supervisors and co-supervisors naturally offer a limited view as role models. After all, they themselves are also very academically oriented. They may not always be aware of the various opportunities in the labour market. Besides, it may be to their advantage if PhD candidates focus – for as long as possible – on an academic career, since this will encourage them to try their best to gain academic achievements, which in many cases also reflect well on their supervisors (such as co-authors of publications).

**A cultural change at research universities and university medical centres is essential to remove the bottlenecks experienced by many early-career researchers.**

Our study also shows that the working environment at research universities and university medical centres is competitive and has a strong hierarchy with many unwritten rules. This environment makes it difficult for early-career researchers to

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119 KNAW, 2022; Teelken and Van der Weijden, 2018

stand up for their own needs and interests and could encourage unequal treatment. These results endorse the importance of recommendations from the KNAW opinion on social safety in academia.<sup>120</sup> These concern, among other things, actively encouraging the discussion about behaviour, focusing on the responsibility of supervisors for the welfare and effective functioning of their employees in the selection and development of supervisors, teaching employees to open behavioural issues for discussion and making sure that social hygiene becomes an organisation-wide focus point.

Not only will measures such as these increase social safety, they will also help early-career researchers stand up for their interests and set out their personal and professional needs.

### **Attention for knowledge management is crucial: how do we retain knowledge and talent?**

The focus groups revealed signals that knowledge and investments in talent are leaking away and being wasted in academia. Postdocs in particular indicated that the high turnover of researchers is leading to knowledge being built up within the organisation but then not being retained. The limited availability of laboratory technicians and other technical support staff means they can only cushion the consequences of this to a limited extent. Several postdoc researchers indicated that they waste time repeating or retrieving work done previously or performing work that could also have been done by people with less academic knowledge and experience.

To prevent knowledge and talent (and the associated investments) being wasted, policymakers and knowledge institutions should strategically consider ways to retain knowledge, skills and continuity within academia. The postdoc researchers in the focus groups also indicated that some of them might be interested in continuing to work as university researchers without following the academic career path to becoming a professor.

### **At universities of applied sciences, attention should be paid to properly embedding practice-oriented researchers and offering them appropriate rewards.**

This study shows that effectively embedding early-career researchers in the organisation is important for them, and this is still lacking for practice-oriented researchers at universities of applied sciences. Universities of applied sciences could contribute to effective embedding and rewards for practice-oriented researchers by drawing up clearer job profiles. In the *Practice-oriented research*

*monitor*,<sup>121</sup> many universities of applied sciences indicated that they had revised the job classification system in 2022. They gave better descriptions of research positions and added descriptions for positions that had previously not yet been defined, such as professional doctorate and associate professor. Even so, our research shows that this is not enough. For example, universities of applied sciences could bring the importance of research and its connection with education to the attention of the managers within their own organisation. In the experience of practice-oriented researchers, the extent to which universities of applied sciences value research is crucial for the freedom and support they receive. Demonstrating the impact of practice-oriented research to other knowledge institutions and society remains important as well.

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