

# HELMHOLTZ

Juniors

## N<sup>2</sup> Survey-Report

Center Specific Report:  
UFZ – Helmholtz Centre for Environmental  
Research



PhDnet



Helmholtz Juniors



Helmholtz Juniors

Working Group | Survey



Dear Prof. Dr. Rolf Altenburger,  
Dear Ms Dr. Sabine König,

Dear Works Council Members, Data Protection Officers, Graduate Schools, Doctoral Representatives,  
and Helmholtz Juniors,

We are pleased to present the center-specific reports from the N<sup>2</sup> Survey 2021.

In October and November 2021, we, the Helmholtz Juniors, conducted the N<sup>2</sup> Survey for Doctoral Researchers (DRs) for the second time in 17 of all 18 Helmholtz centers. We want to use this chance to not only present you the full aggregated data for the whole Helmholtz association, which will be published shortly, but also disaggregated data for the *Helmholtz Centre for Environmental Research* (UFZ).

We believe, it is of utmost importance to document, how UFZ is performing in comparison to all other Helmholtz centers. In doing so and presenting the data, we want to initiate improvements in the working conditions of DRs and the exchange of best-practice examples between the different centers. Still, only the result compared to all other centers does not necessarily indicate an absolute answer, but should be seen in context of the general fraction of DRs answering in a certain way and the overall goal at UFZ for their DRs.

This report is going to present some of the most important topics covered within the N<sup>2</sup>-Survey and we will always put them into perspective, presenting the data for UFZ in comparison to the aggregated data from all other centers. Most of the plots further highlight noticeable differences between UFZ and all other centers.

Please note, that these reports have been automated and therefore we are not discussing all results in specific for UFZ. Especially, it is not possible for us to comment on all results where UFZ is differing from all other centers. Nonetheless, we hope that this report helps you to set the situation of DRs at UFZ into perspective and should you be interested in more detailed analyses or have any further questions regarding the results, feel free to contact us ([heju-survey@listserv.dfn.de](mailto:heju-survey@listserv.dfn.de)).

Many thanks in advance for taking the time to look into this center-specific report. We hope to facilitate improvements for DRs at UFZ and want to provide you with a thorough overview based on collected data.

Sincerely,

Jakob Rauscher (Spokesperson)

Prerna Karthaka (Spokesperson)

Anna Kilanowski (Speaker Survey Group)

Agnieszka Seretny (Vice-Speaker Survey Group)

and on behalf of the whole Helmholtz Juniors Survey Group

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# 1. General

First, we would like to start with a short introduction to the general structure of the N<sup>2</sup>-Survey 2021: This survey is conducted to assess the overall situation of Doctoral Researchers (DRs) at three of Germany's non-university research organizations, the Max-Planck society, the Leibniz association and the Helmholtz association. In addition, it was also ran by the IPP Mainz and the Technical University Munich as university controls. This joint format was first introduced in 2019 and now is the second time that the survey is run in a harmonized manner, meaning that the vast majority of question is asked to all DRs in the same way in all organizations.

The N<sup>2</sup>-Survey 2021 was sent out to more than 16 000 DRs within Germany, and to more than 6 000 within the Helmholtz association. In 2021, we could further increase our total participation number to 2 143 DRs with completely answered questionnaires compared to roughly 1 200 in 2019, which highlight our growing importance and acceptance as stakeholders also in the minds of our peers. The full catalogue of questions answered by participating DRs can be found in the Appenix to this report.

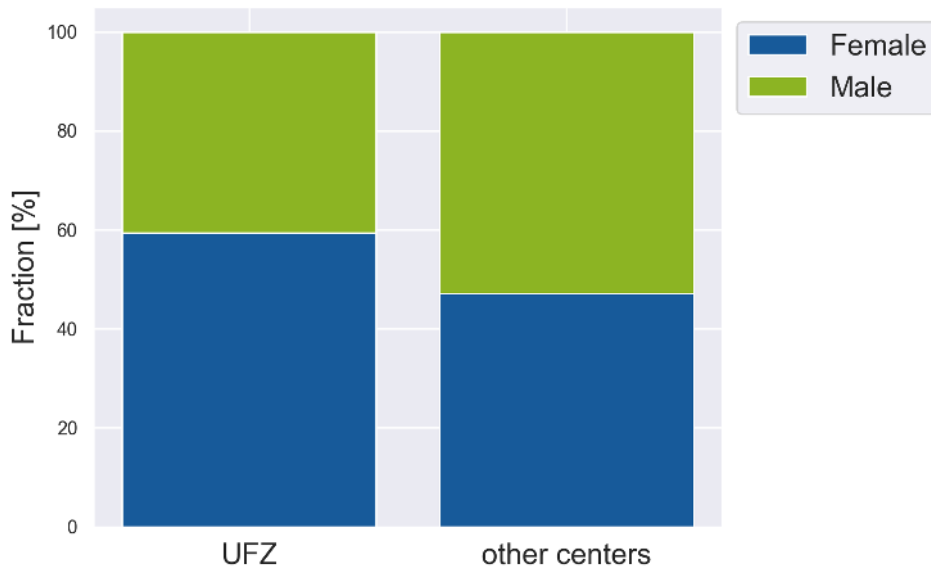
For UFZ a total of 148 DRs, filled out the survey, representing 57.8 % of all DRs listed in UFZ as of the Helmholtz report from 2020 (N = 256). Please note, that the calculated percentages here depend on the official numbers of DRs at each of the centers at the time of the survey. It's extremely important to us that all DRs with all types of employment are represented in our study, so we would be happy to collaborate to improve the baseline data, especially when it comes to external DRs and DRs on stipends, who might be underrepresented in the official numbers.

The N<sup>2</sup>-Survey collected data on 10 broader topics, namely: General (Sec. 1), Working Conditions (Sec. 2), Satisfaction (Sec. 3), Supervision (Sec. 4), Integration (Sec. 5), Career Development (Sec. 6), Family (Sec. 7), Power Abuse (Sec. 8), Mental Health (Sec. 9) and Covid-19 (Sec. 10), which will be presented here in the respective order.

In this section, we explore the demographic properties of UFZ and its diversity compared to other Helmholtz centers. As we aim to create a diverse and inclusive community and work environment, the demographic status of the center should be utilized to guide decisions in both short and long term policies regarding recruitment procedures and support mechanisms for DRs.

## 1.1. Gender Diversity

Diversity of gender identifications is crucial to create an inclusive work environment, where everybody feels welcome and supported. Fig. 1.1 shows the gender distribution of UFZ compared to other centers.



**Figure 1.1.:** Distribution of gender identification at UFZ compared to all centers. This plot presents the fraction of participating DRs with a corresponding answer (see legend) within UFZ (greens) and all other centers (blues). Please note that diverse or non-binary responses were excluded here to protect the anonymity of participating DRs.

The female to male ratio (FMR)<sup>1</sup> of 1.47 at UFZ is higher than at other centers (0.89). Non-binary and gender-diverse responses are low in all Helmholtz centers, which could imply an under-representation of these groups. Due to the low number of reports and to protect the privacy of these individuals, we have not included them in this plot.

## 1.2. Nationality

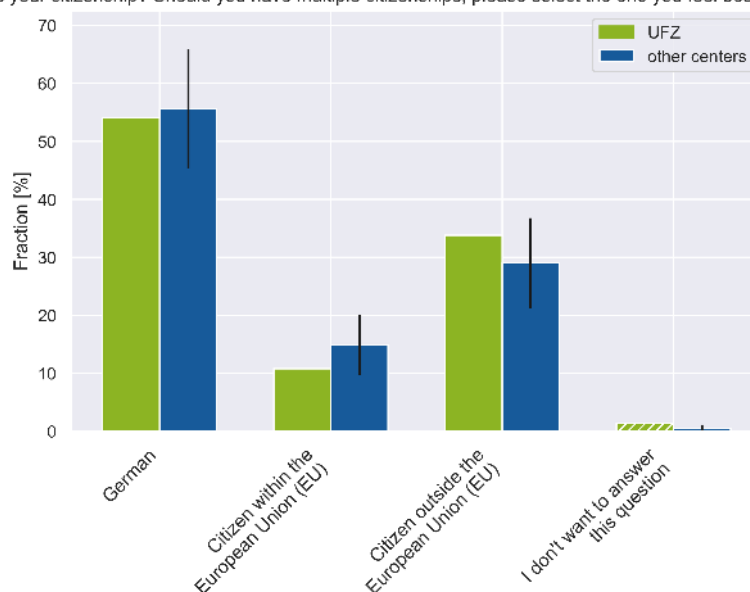
To support researchers in various state related processes and increase diversity, it is important to assess the citizenship status of the DRs (see Fig. 1.2). It is crucial to support international DRs, especially non-EU DRs due to the high bureaucratic effort and other emerging challenges. At UFZ (all other centers) there are 54.8 % (55.8 %) German citizens, 11.0 % (15.0 %) EU, and 34.2 % (29.2 %) non-EU citizens.

In this context, we would also like to introduce in detail a type of data presentation that is used repeatedly in this report: *Comparison Bar Plots*.

In comparison bar plots, the fraction of responses  $P_{UFZ}$  at UFZ are shown next to the fraction of responses  $P_{others}$  given by DRs at all other centers. The standard deviation  $\sigma = \sqrt{\sum (P_i - P_{others})^2 / N_{others}}$ , where  $P_i$  is the fraction at center  $i$ , with  $i$  in other centers, and  $N_{others} = 16$  the number of other centers, which participated in the survey, is displayed by the symmetric error bars. The bars are drawn either vertical or horizontal.

<sup>1</sup>The FMR is calculated as  $n_f/n_m$ , where  $n_f$  ( $n_m$ ) is the number of females (males). If the FMR is one it indicates equality, while values above and below unity indicate female and male prevalence, respectively.

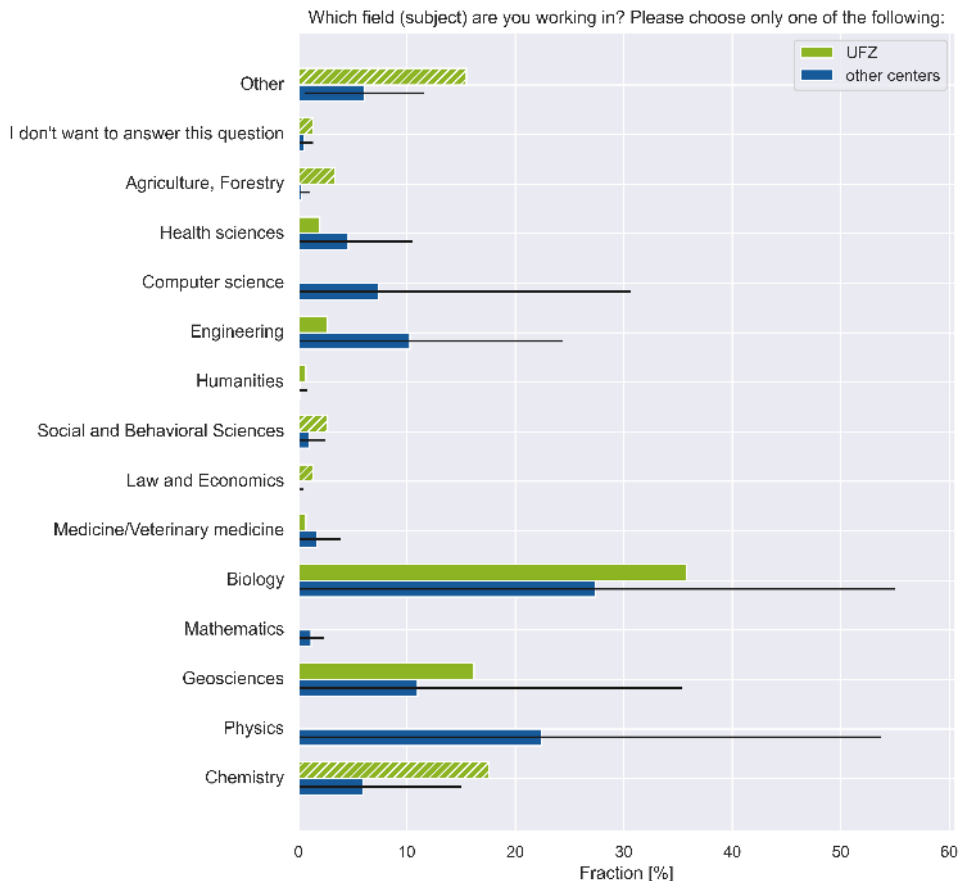
What is your citizenship? Should you have multiple citizenships, please select the one you feel best represented by.



**Figure 1.2.:** *Citizenship of DRs or citizenship DRs feel best represented by, should they have multiple. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. Also, the option "No Answer" was excluded since it was not given by anyone.*

### 1.3. Field of Work

Participants were further asked for the field (subject) they are working in (Fig. 1.3). If this contradicts internal data collections, it still may influence your actions based on this report and target specifically the groups represented.

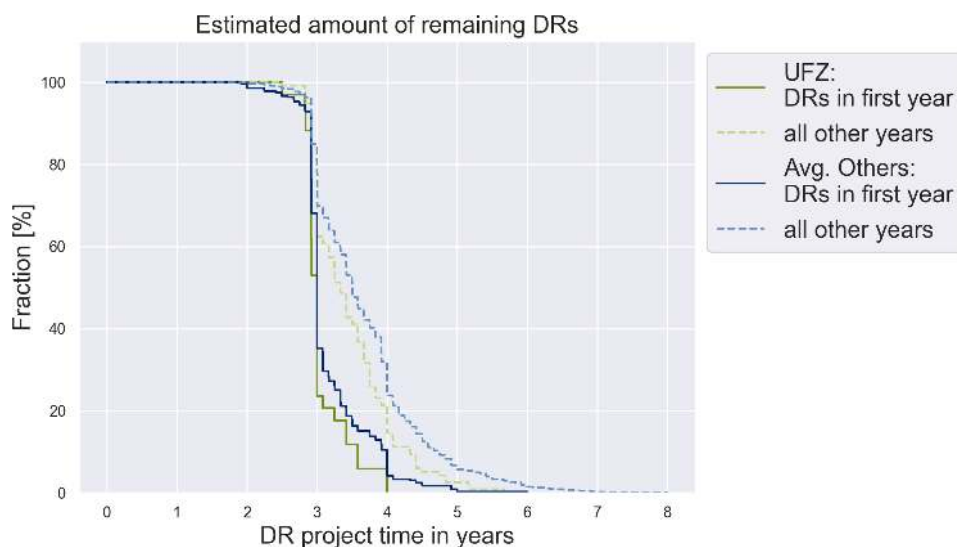


**Figure 1.3.:** *Field or subject DRs are working in.* This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. Also, the option "No Answer" was excluded since it was not given by anyone.

## 1.4. Estimated Project Duration

Durations of doctoral research projects have a significant impact on doctoral candidates' lives, future job prospects, mental health and family situations. The expected duration of the DRs' dissertation is shown in Fig. 1.4.





**Figure 1.4.:** Survival plot of estimated project duration of first year DRs (solid lines) and all other years (dashed lines), shown for UFZ (greens) and all other centers (blues). This plot presents the probability of having a still ongoing doctoral project (y-axis) after the respective amount of time (x-axis). In the beginning all projects are still ongoing, while at the end all are supposed to be finished. Please note, that these time estimates show the expected duration of the doctoral project at the time of the survey.

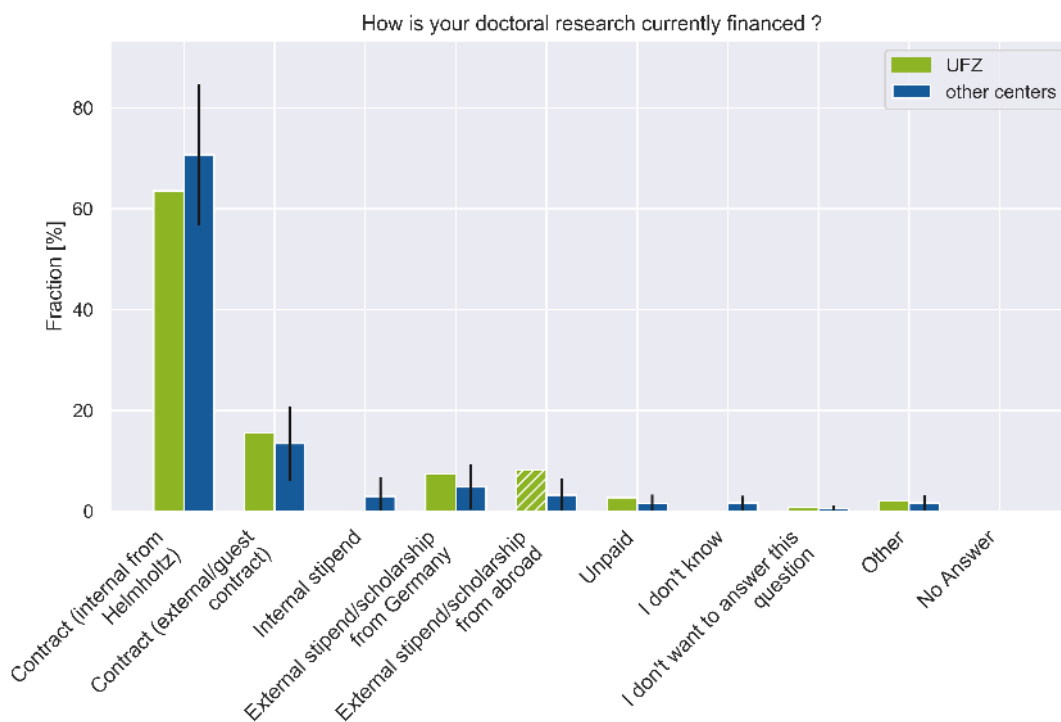
The survival plot shows that most first year DRs expect to finish their dissertation in three years. However, as they progress along their project, potential delays might add to the initially expected time frame. Fig. 1.4 displays this trend for all other centers and for UFZ in comparison. From their responses we calculate the estimated duration of DRs in their first year (UFZ: 3.1 years; others: 3.2 years), and DRs in later years (UFZ: 3.5 years; others: 3.7 years). Concomitantly, the average duration of doctorate in Germany has been shown to be approximately 4.3 years, which seems to be in closer agreement with to the DRs in later years rather than first year DRs<sup>2</sup>.

<sup>2</sup><https://www.academics.de/ratgeber/promotion-dauer>

## 2. Working Conditions

Fostering healthy working conditions should be the aim of each research center as it has been shown to be a cost-effective way of increasing employee satisfaction and labour productivity<sup>1</sup>. This section presents observations about working conditions of doctoral researchers (DRs) for UFZ compared to all other Helmholtz centers. It is focused on different aspects of working conditions such as *financial resources, contract period, working hours, or freedom to take vacations*.

In general, internal or external contracts are the most preferred by the DRs as it reduces financial uncertainty during the course of their studies in comparison to stipends and scholarships. The N<sup>2</sup>-survey asked participants to indicate their source of income (see Fig. 2.1).

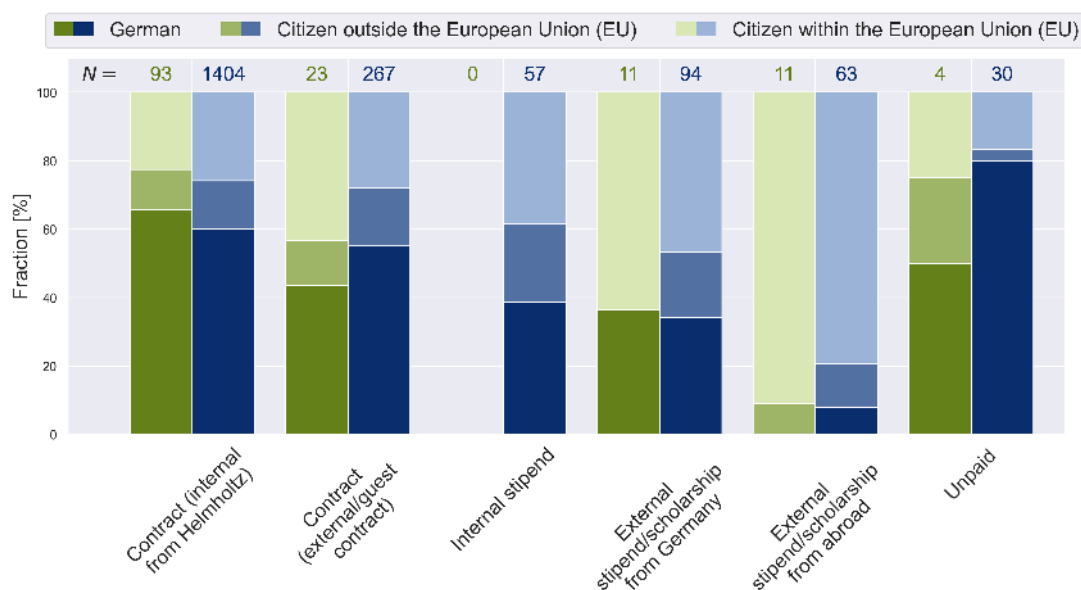


**Figure 2.1.:** Nature of financial sources at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

In the case of UFZ, 79.0% of DRs (84.1% at other centers) indicate that they are employed on a contract, while 15.5% receive stipends (10.9% at others). This marks a welcomed and continuing

<sup>1</sup>Amaya, M., Donegan, T., Conner, D., Edwards, J., & Gipson, C. (2019). Creating a Culture of Wellness: A Call to Action for Higher Education, Igniting Change in Academic Institutions. Building Healthy Academic Communities Journal, <https://doi.org/10.18061/bhac.v3i2.7117>

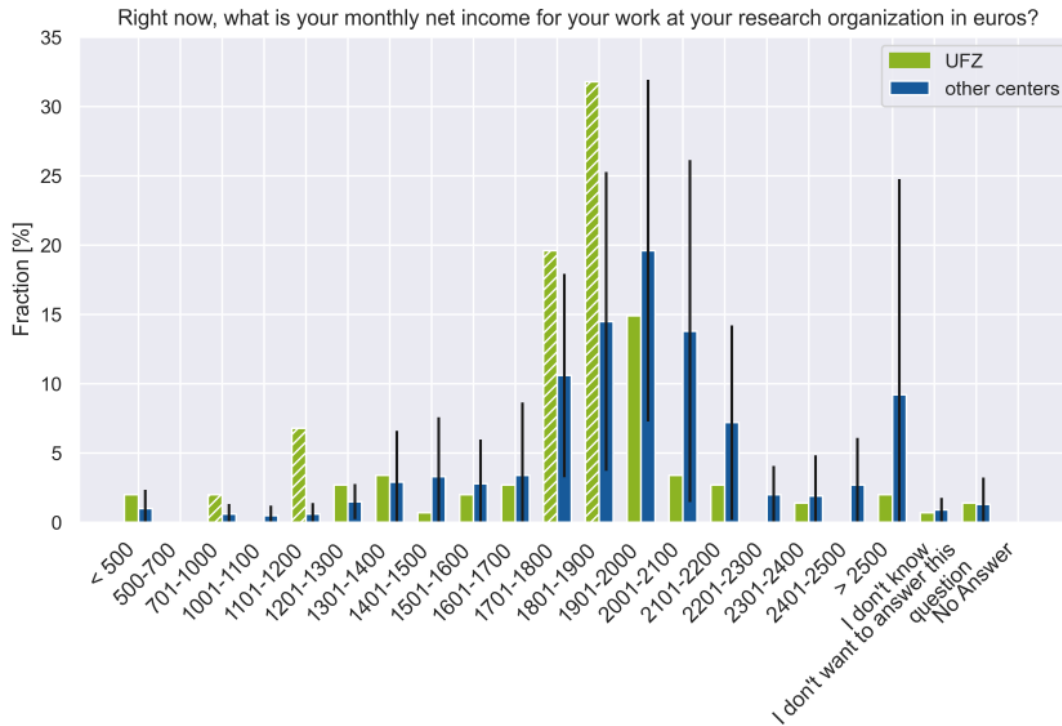
shift to a smaller fraction of stipend holders among DRs in Helmholtz Association we have been observing over the last couple of years (Survey 2019: 13.2% stipend holders, Survey 2017: 20% stipend holders). Internal contracts are the most common type of employment (63.5% of DRs (70.7% at other centers)) which signifies more beneficial conditions for individuals. In our results, we see a tendency that citizenship and contract type are correlated, leading to a higher percentage of international DRs being financed by stipends, which are for example not paying into the German retirement funds or respective DRs have to finance their own health insurance. In general, this is a critical practice and in severe cases against the equal treatment policies<sup>2</sup>, as stipend holders experience more difficulties in their working life. We compared the reported citizenship of the survey participants to their type of contract (Fig. 2.2).



**Figure 2.2.:** *Citizenship of DRs vs. nature of financial sources at UFZ. This plot presents the fractions of participating DRs within other answer categories. As all full bars are filled to 100%, the respective sample sizes are presented above, corresponding to UFZ (greens) and all other centers (blues).*

The standard is to offer salaries to the DRs on the public pay scale (TVöD/TVL) between 65-100%. Fig. 2.3 shows the monthly net income at UFZ compared to all other Helmholtz centers.

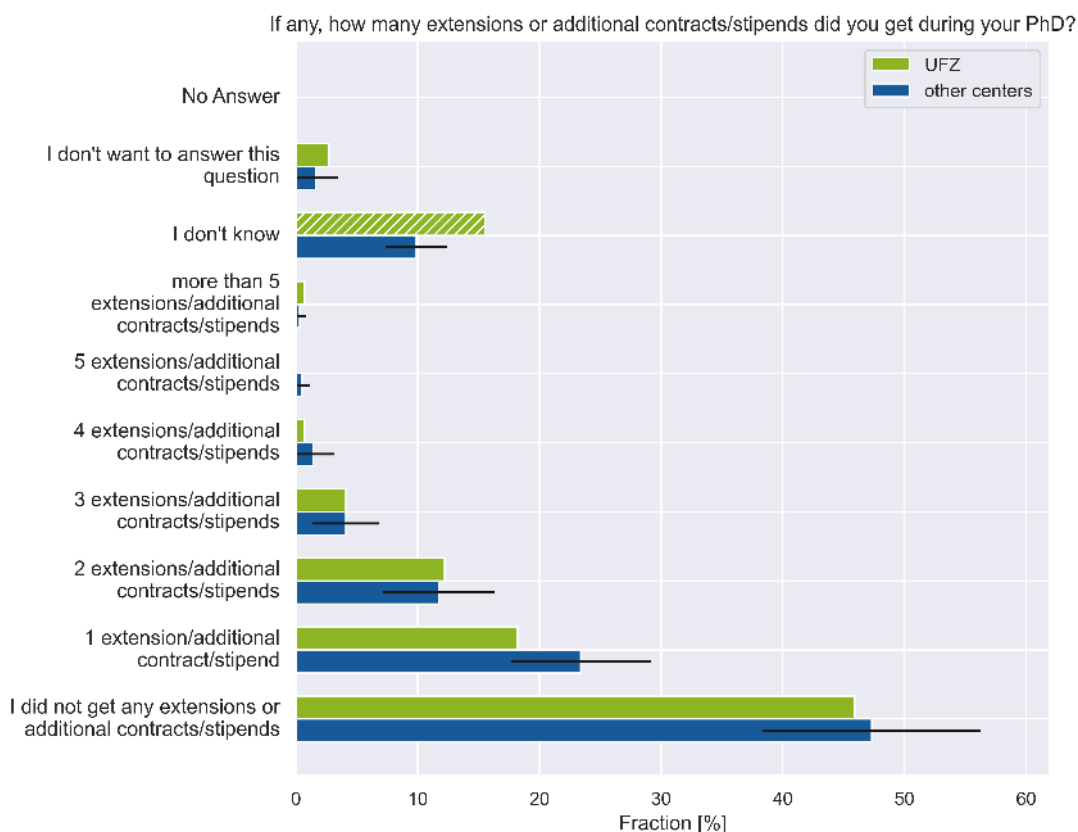
<sup>2</sup><https://www.antidiskriminierungsstelle.de/EN/about-discrimination/order-and-law/general-equal-treatment-act/general-equal-treatment-act-node.html>



**Figure 2.3.:** Varied pay-scale of DRs at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

Another struggle for DRs is the uncertainty regarding contract duration and extensions to cover the whole period of their doctoral project. Not having a stable working situation with a contract duration covering your whole doctorate can contribute to the occupational stress due to financial insecurities which could result in a detrimental effect on mental health<sup>3</sup>. Therefore, we strongly advocate for a general contract duration of 4 years for all DRs and to abolish the practice of handing out multiple short-term contracts following each other towards the end of the project while the DR is still working on their thesis. At UFZ, the most common contract duration is at least 25-36 months and 35.8% of DRs (41.3% at other centers) received so far at least 1 contract extension during their doctorate, with 5.4% who already received 3 or even more extensions (6.2% at other centers) (Fig. 2.4). Of note, all DRs irrespective of their current year of doctoral project were asked this question.

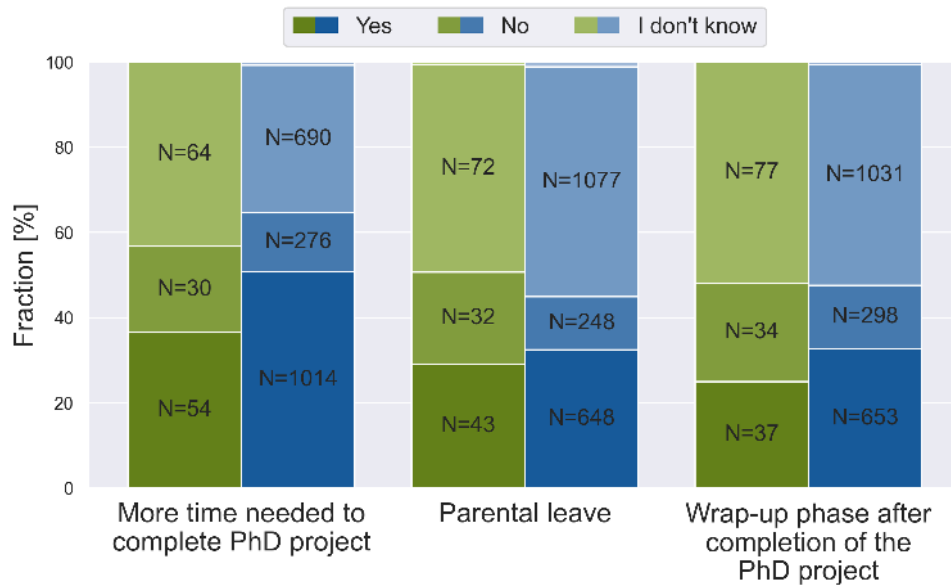
<sup>3</sup>Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868-879.



**Figure 2.4.:** Extensions or additional contracts/stipends participating DRs at UFZ and other centers received at the time of the survey. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

It is frequently observed that DRs require more time than the duration of their contract (see also Fig. 1.4). Centers may offer contract/stipend extensions to allow DRs to complete their studies. Survey participants were asked if their centers provide possibilities to extend their contract due to more time needed to finish the project ('yes': UFZ: 36.5%; others: 50.8%), for a wrap-up phase ('yes': UFZ: 25.0%; others: 32.7%) or parental leave ('yes': UFZ: 29.1%; others: 32.5%) (Fig. 2.5)<sup>4</sup>.

<sup>4</sup>Please be aware that this dataset reflects the situation at the time when the survey was conducted (September 2021).



**Figure 2.5.:** Possibility to extend a contract/stipend for the listed reasons at UFZ. This plot presents the fractions of participating DRs within other answer categories. As all full bars are filled to 100 %, the respective sample sizes are presented above, corresponding to UFZ (greens) and all other centers (blues).

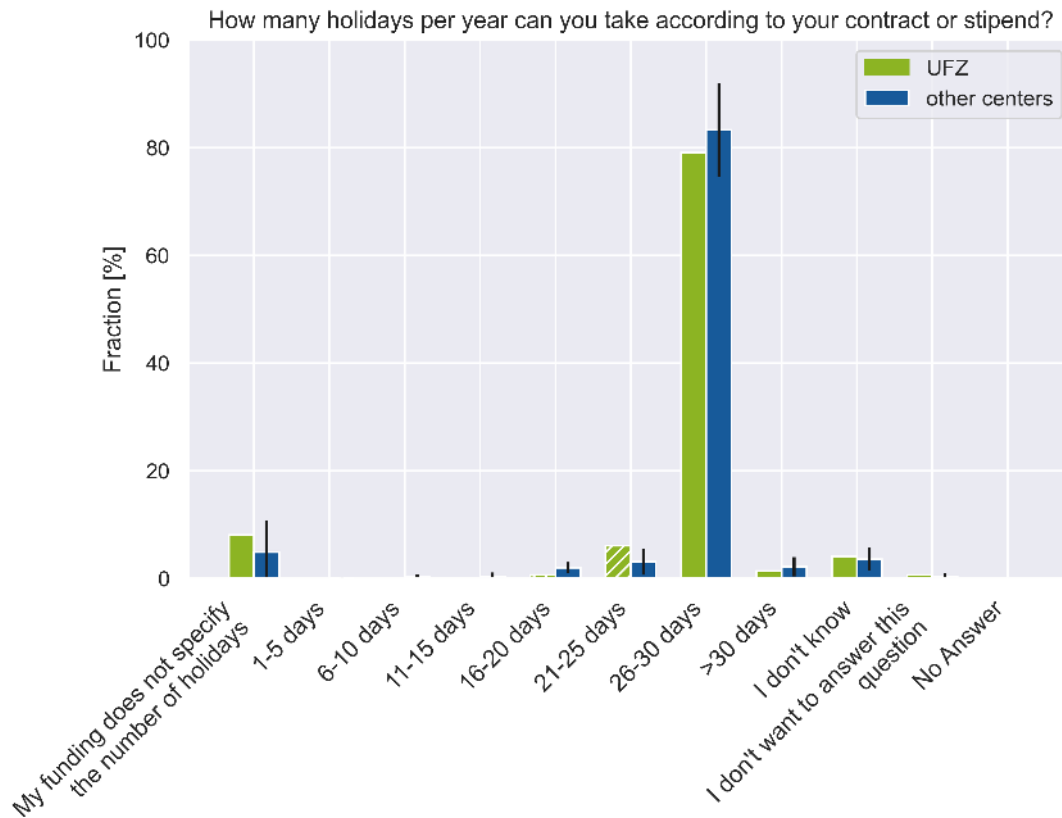
Of note, parental leave is a legally binding reason for contract extensions<sup>5</sup>, which many DRs are either not aware of or the opposite is communicated within their research group.

Centers are expected to provide all equipment required for work purposes. This may differ with the working environment of the individuals. Due to remote work and home-office, DRs felt the urge to buy equipment from parts of their salary. 39.2 % of DRs indicate that they did spend salary on items primarily used for work in the past year (47.4 % in other centers). Of note, this might have been a special situation during the Covid-19 pandemic when mobile working hit everybody in equally unexpected manner. The most common items at UFZ included:

- Computer hardware (cable, mouse, camera, microphone, headset),
- Office equipment (folders, pens, etc.),
- Chair.

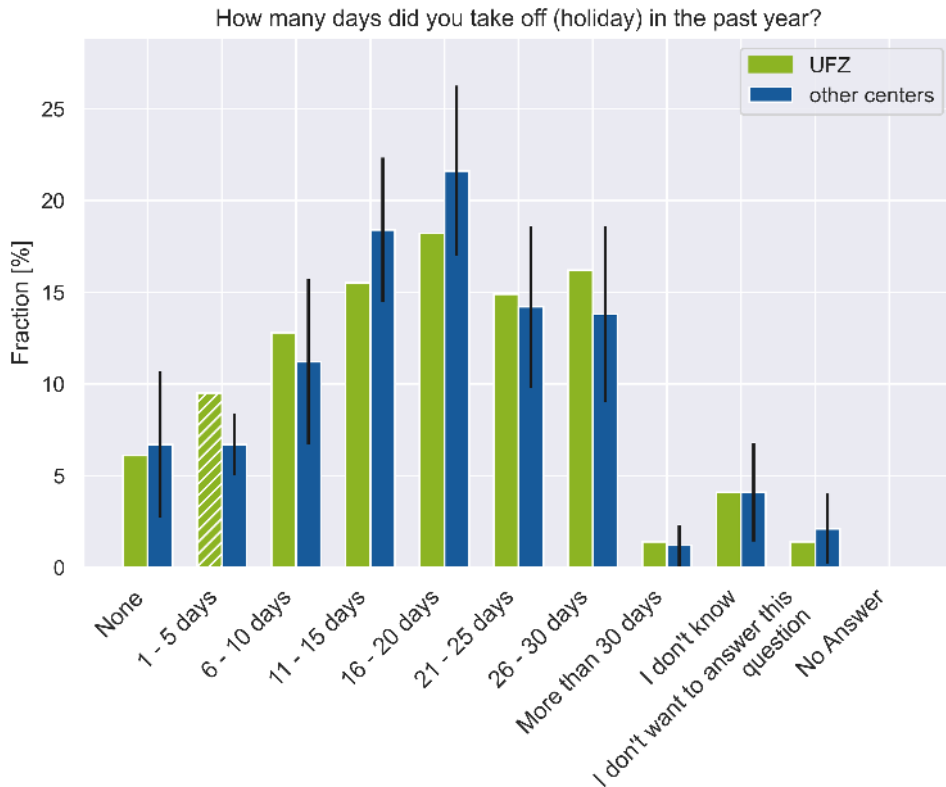
Now, we would like to move on to another aspect of working conditions addressed in the survey. DRs are entitled to have a specific number of days as paid vacation days per year, pursuant to their contract or stipend agreement (Fig. 2.6). Of note, as per standard Helmholtz guidelines, a DR with a contract should have 30 paid vacation days.

<sup>5</sup>The Federal Parental Allowance and Parental Leave Act <https://www.bmfsfj.de/bmfsfj/meta/en/publications-en/parental-allowance-and-parental-leave-139912>



**Figure 2.6.:** Number of paid vacation days offered to the DRs at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

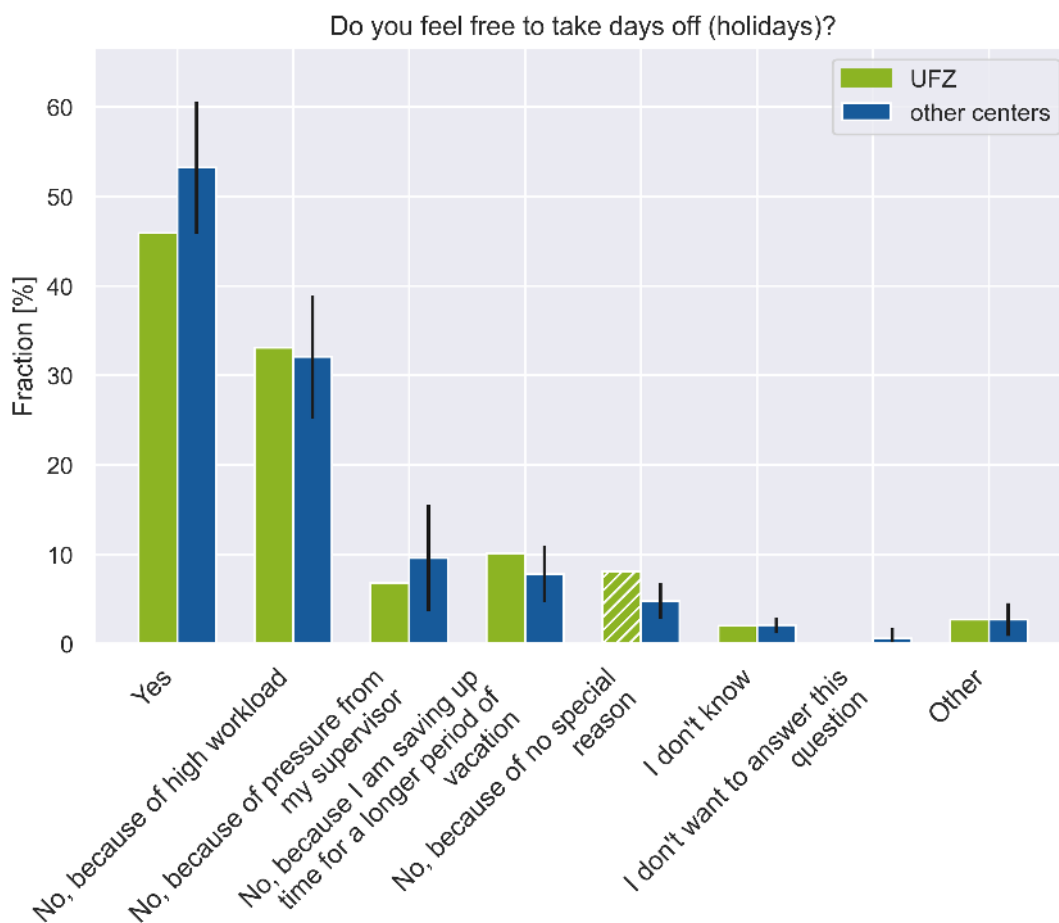
While there is an official number of vacation days for DRs, it is often the case that DRs do not take holidays. This may be due to a variety of reasons. The DRs were asked in the survey about the number of vacation days that they took off in the last one year. We observe that in this case, over 46.4% (45.9%) of the DRs at UFZ (all other centers) have taken 15 or less vacation days in the past year (Fig. 2.7).



**Figure 2.7.:** Number of vacation days actually taken by DRs at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

Considering the fact that high percentages of DRs who don't feel free to take holidays could suggest unhealthy working conditions, we decided to investigate the underlying reason why DRs do not sufficiently utilize their vacation days. They were asked to provide any working environment related issues that prevented them from taking vacation such as high workload, pressure from supervisor, etc. Fig. 2.8 represents the responses from UFZ vs. other centers.



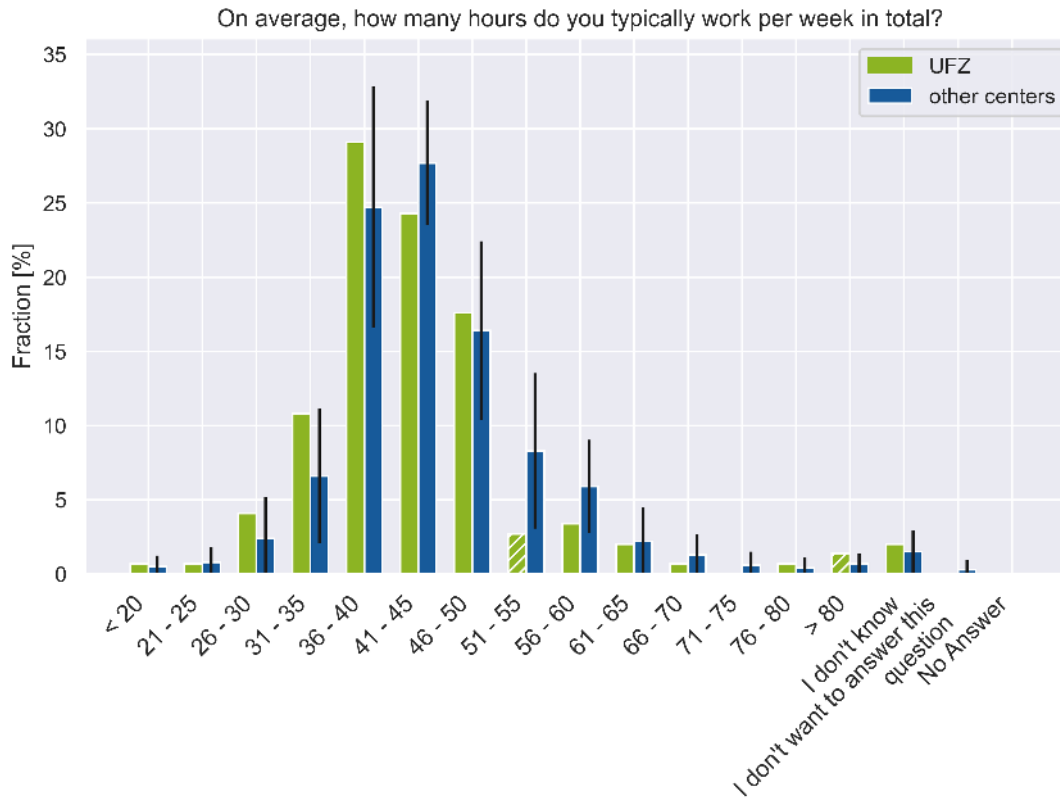


**Figure 2.8.:** Utilization of holidays by DRs at UFZ and other centers. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format.

While it could be a personal choice not to take vacation, any of these factors may negatively influence the work quality as sufficient time to recharge is not taken and taking time off from work is important for work-life balance and mental health. Those who don't feel free to take holidays (58.1 % at UFZ; 54.3 % at other centers), have listed as top reasons why they feel like they cannot take days off:

- No, because of high workload,
- No, because I am saving up time for a longer period of vacation,
- No, because of no special reason.

As high workload is one of the key components contributing to the level of job satisfaction among DRs, we reported the average working hours of DRs per week in UFZ (see Fig. 2.9).



**Figure 2.9.:** Comparison between total reported working hours per week at UFZ and all other Helmholtz centers. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

In total 52.7% of DRs work more than 40 h per week on average (63.3% at other centers). It is crucial to mention that working time consists not only of hours spent working on the dissertation but also of scientific work not related to the doctoral research such as helping other projects, as well as attending courses and seminars, administrative tasks, and in some cases teaching. Moreover, 17.6% (20.7%) of DRs at UFZ (other centers) have indicated that they work at least once a month during weekend and public holidays in the past year.

Our results indicate that providing a platform and support for well managed work-life balance and taking time off from work is incredibly important to improving DRs working conditions. This is further highlighted in the next sections, especially in Figure 9.3, where workload is the most important factor correlated to both depressive syndrome and state anxiety of DRs.

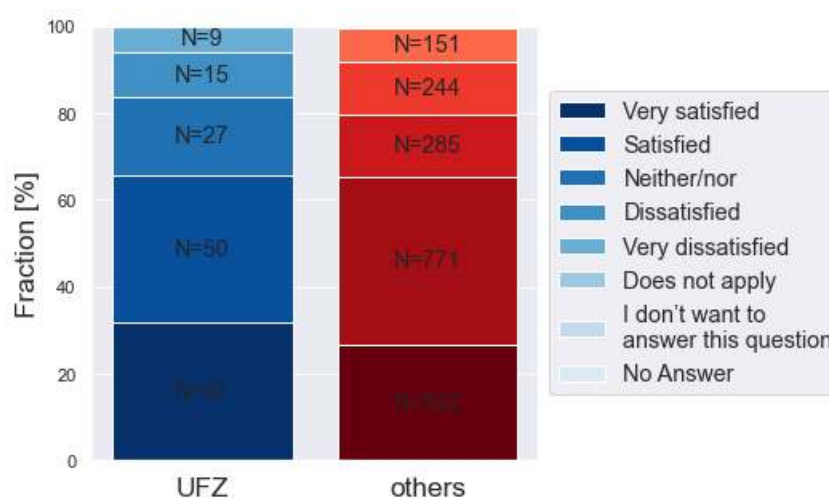
### 3. Satisfaction

Measuring and analyzing job satisfaction gives valuable insights into the health of a workplace and is closely related with mental health outcomes. Academic institutions, just as any other workplaces, depend on motivation, productivity and morale, which are tightly linked to job satisfaction and work culture. It is important to consider this aspect of a workplace since job dissatisfaction can be closely related to mental health issues (e.g. depression, anxiety, and stress)<sup>1</sup>.

In this section of the survey, satisfaction of doctoral researchers (DRs) is evaluated. We have delved into questions concerning different aspects of work culture in Helmholtz centers, e.g. supervision, workload, and career development.

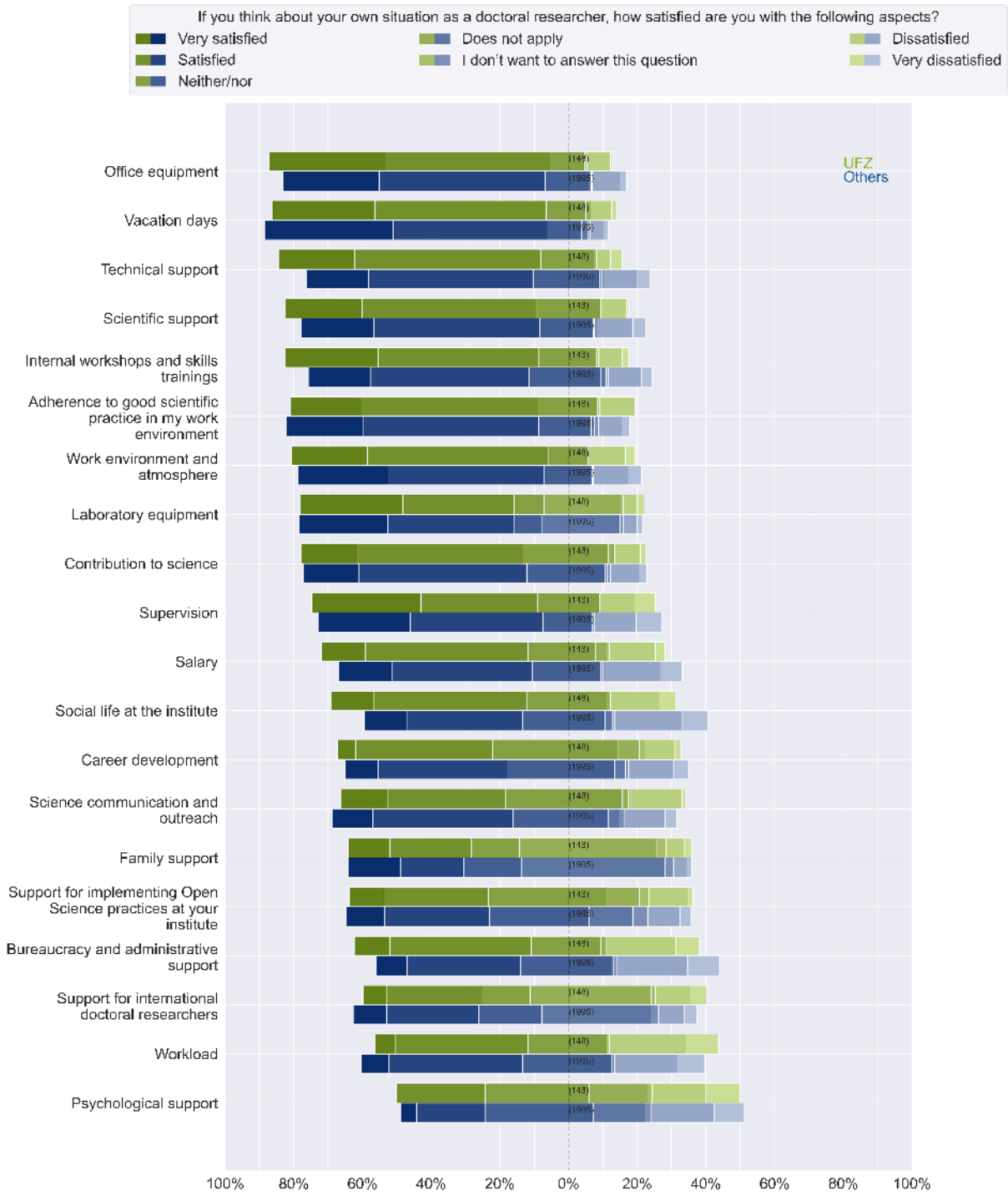
The overall job satisfaction was assessed with the following question “*If you think about your own situation as a doctoral researcher, how satisfied are you with the following aspects?*” which were rated from *very dissatisfied* to *very satisfied*.

Overall satisfaction at UFZ compared to all others is displayed in Fig. 3.1, while Fig. 3.2 shows satisfaction with individual factors at UFZ. Following satisfaction components have been found to be the most dissatisfying at UFZ: *Workload, Bureaucracy and administrative support, Psychological support, Social life at the institute, Supervision*.



**Figure 3.1.:** Comparison of overall job satisfaction between UFZ (greens) and other centers (blues). Overall satisfaction score was calculated as a mean of all categories included in the question. Please note, that the answers to this question were asked in a multiple-choice format.

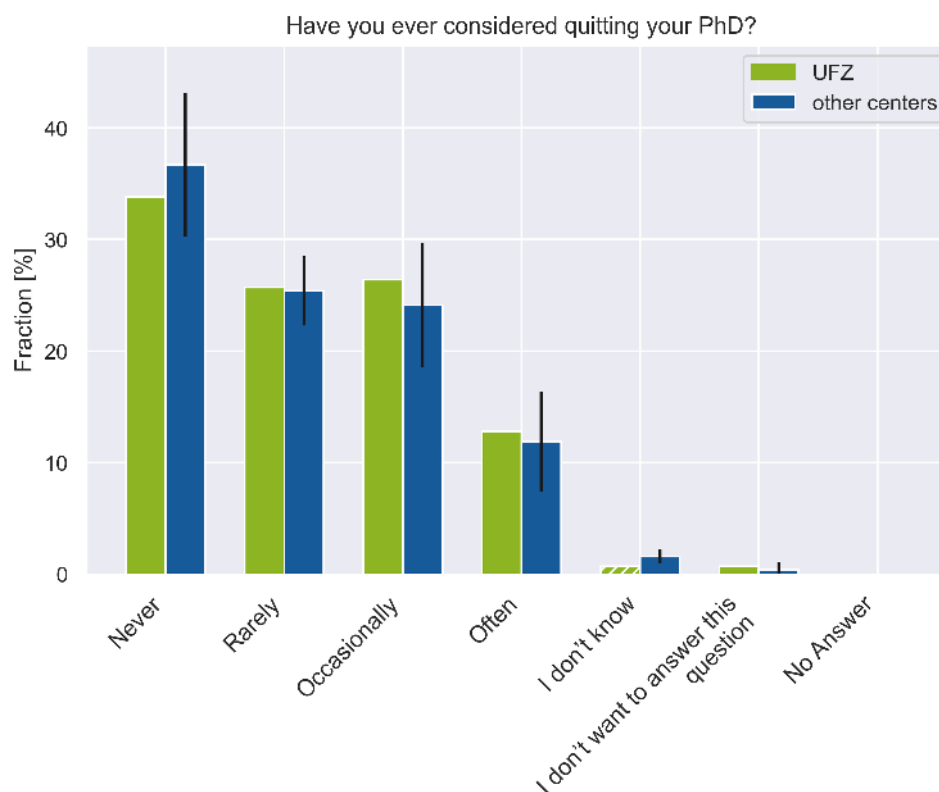
<sup>1</sup>Mark, George; Smith, Andrew P. (2012). Effects of occupational stress, job characteristics, coping, and attributional style on the mental health and job satisfaction of university employees. *Anxiety, Stress & Coping*, 25(1), 63–78, <https://doi.org/10.1080/10615806.2010.548088>



**Figure 3.2.:** Factors contributing to satisfaction of doctoral researchers at UFZ and other centers. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

DRs were also asked if they have considered quitting their PhD (Fig. 3.3). 39.2% of participants

have at least occasionally considered quitting PhD (sum of percentages from often and occasionally), while 36.0% DRs at other centers have put that into consideration.

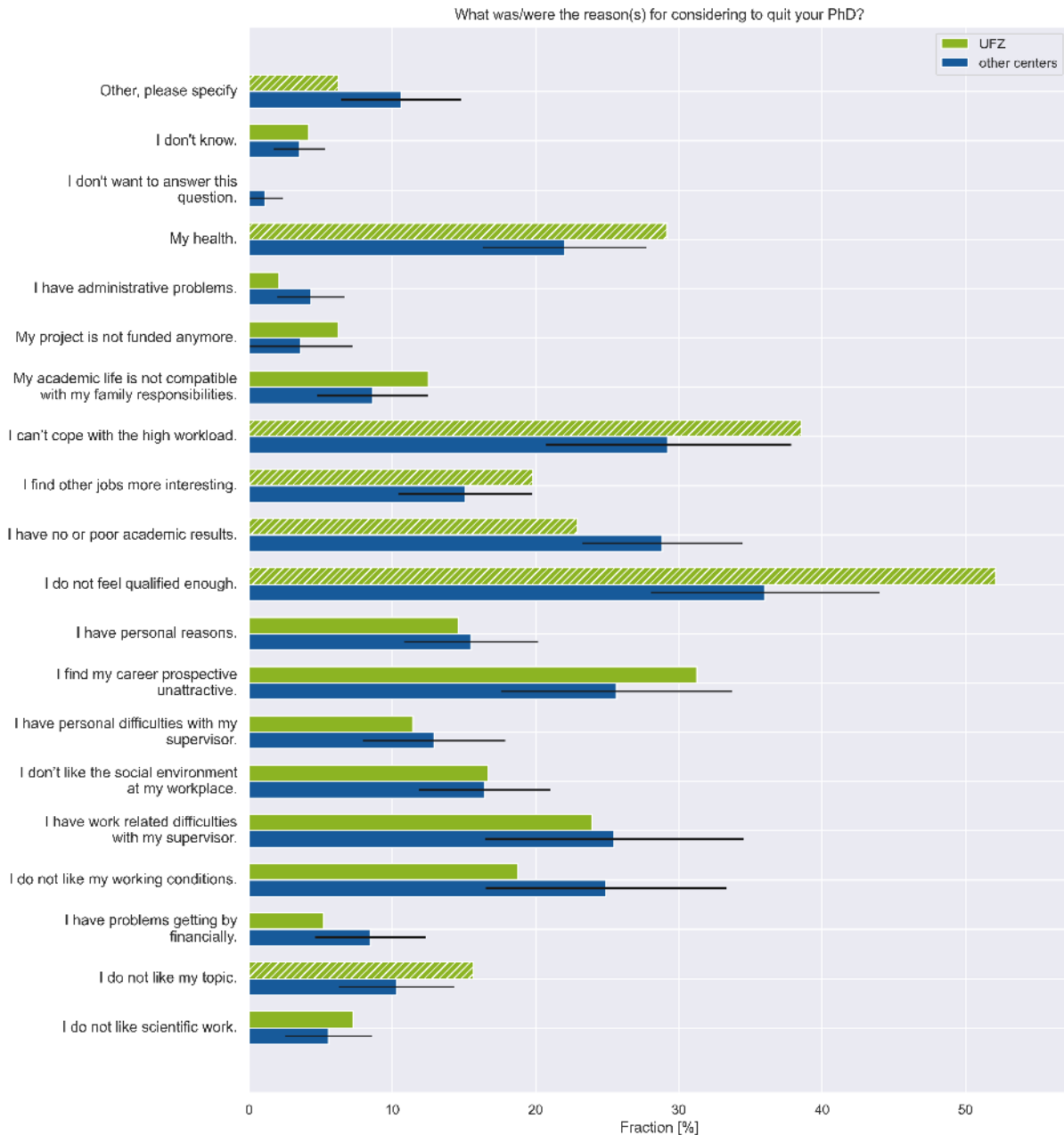


**Figure 3.3.:** Quitting PhD among doctoral researchers. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. In addition, the percentages were calculated only for those DRs that at least rarely consider quitting their project.

Further, we asked DRs to specify the reasons for that situation, they have reported:

- *I do not feel qualified enough,*
- *I can't cope with the high workload,*
- *I find my career prospective unattractive.*

as the most problematic (Fig. 3.4). Of note, the answers to this question were stated in a multiple-choice format only to DRs who have at least rarely considered quitting their PhD.

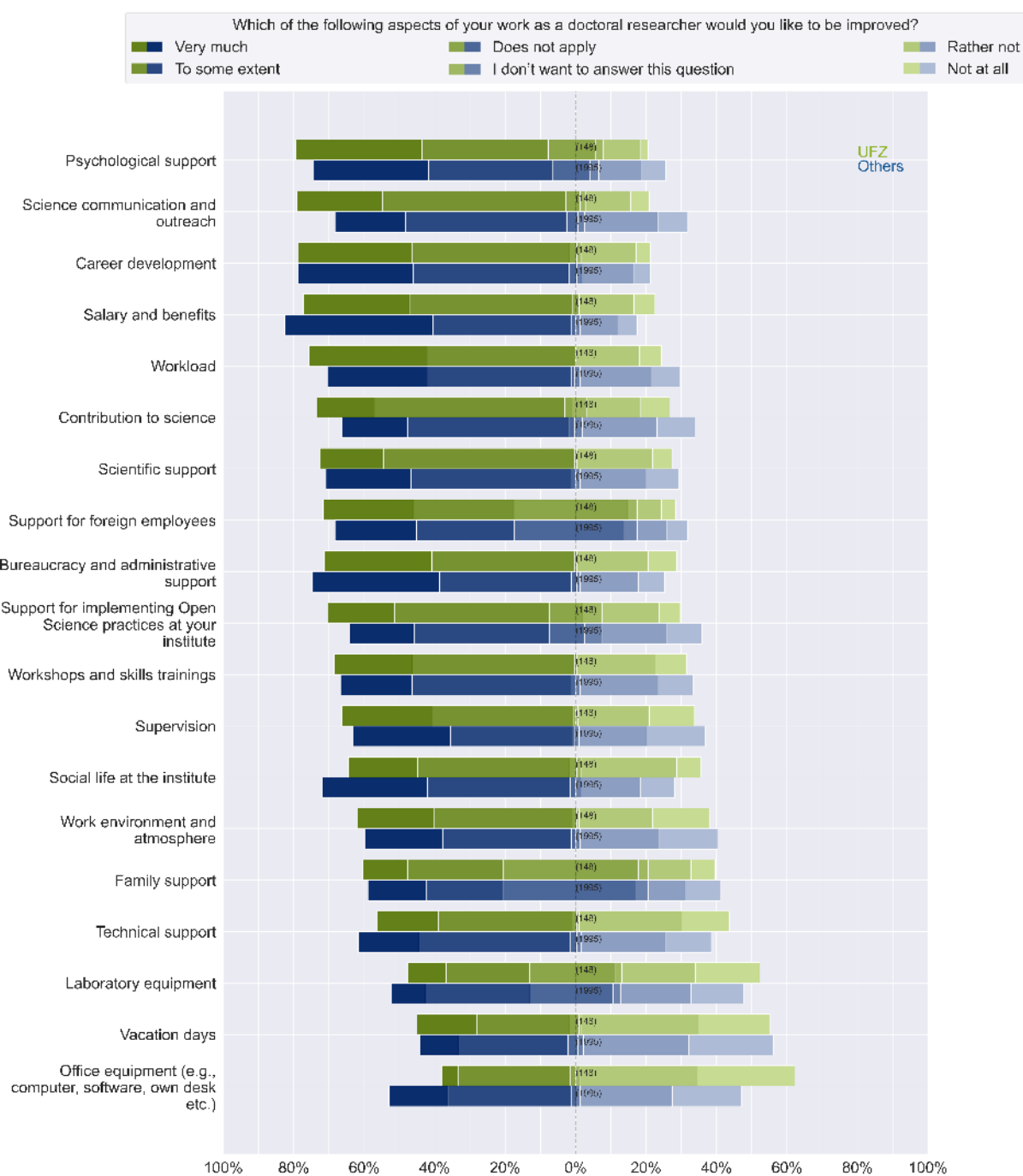


**Figure 3.4.:** Reason for quitting a PhD. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multi-choice format.

DRs were also asked which specific aspects of their work as a DR they would like to be improved. Each of the aspects was ranked by the participants based on their satisfaction or lack thereof and the detailed answer at your center compared to all other centers are shown in Fig. 3.5. To rule the most relevant ones, the sum of positive answers (*Very much* and *To some extent*) was sorted and the highest ranked at UFZ are:

- Career development,

- Salary and benefits,
- Science communication and outreach.



**Figure 3.5.:** Aspects which DR would wish to improve at UFZ and other centers. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

## 4. Supervision

Working on a doctoral project and finishing it with a good or even outstanding grade while providing a significant and original academic contribution is the goal of every doctoral researcher (DR). The supervision on this journey should never be underestimated, as it is one of the most essential parts of a successful doctorate<sup>1</sup>. Similar to a doctoral project, both qualities required for good supervision as well as challenges they present are extremely diverse<sup>2</sup>. We are aware that a good supervisor does not guarantee a good thesis, but it has been shown that improved quality of supervision makes it more likely<sup>3</sup>.

In this section, we will discuss various aspects of supervision at the centers. Firstly, we focus on the supervision structure, examining which supervision tools are implemented at the centers and the roles of the supervisors within the institutes. Secondly, we look at the implementation of these tools, mainly focusing on the meeting frequency. The third and major part of this section will address evaluation of supervision by the doctoral researchers and how they perceive the presence of conflicts.

### 4.1. Supervision structure

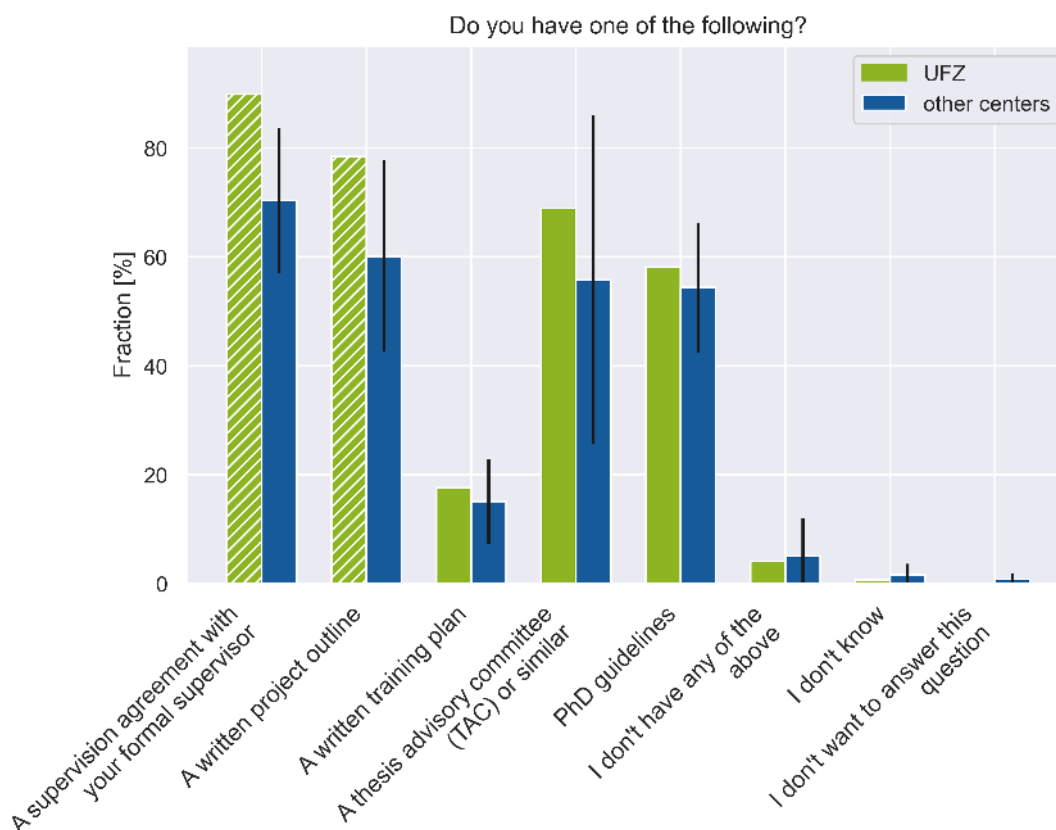
A common supervision structure consists of a formal supervisor, the professor and doctoral advisor, and a direct day-to-day supervisor. Of course, the same person can play both roles. Fig. 4.1 shows an overview of very common supervision tools and how they are implemented at UFZ. Of note, at least part of the tools listed below are part of the requirements of the universities in which DRs are enrolled and while they do not have to be necessarily enforced by the center itself, they do serve as an external directive to support progress of doctoral projects.

<sup>1</sup>Interview: The Essence of Good Supervision (2022), TUM Graduate School, Technical University of Munich <https://www.gs.tum.de/en/gs/doctorate-at-tum/news/article/interview-the-essence-of-good-supervision/>

<sup>2</sup>Conditions for the success of doctoral supervision (2022), Centre for Faculty Development at the University of Fribourg (Switzerland), [https://www.unifr.ch/didactic/fr/assets/public/Ressources/doctorat%20et%20supervision/Booklet\\_ConditionsPhD\\_2020.pdf](https://www.unifr.ch/didactic/fr/assets/public/Ressources/doctorat%20et%20supervision/Booklet_ConditionsPhD_2020.pdf)

<sup>3</sup>Belavy DL, Owen PJ, Livingston PM. Do successful PhD outcomes reflect the research environment rather than academic ability? PLoS One. 2020 Aug 5;15(8):e0236327, DOI:<https://doi.org/10.1371/journal.pone.0236327>





**Figure 4.1.:** *Supervision tools at UFZ.* This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format.

58.1% DRs have PhD guidelines, which is 3.7% more than the 54.4% on average for all centers. The implementation of a thesis advisory committee (TAC) for 68.9% of the DRs is more than 55.8% on average for all centers. Written training plans are more common than in other centers. 17.6% of the DRs have to follow them at UFZ. A majority, 78.4%, of DRs at UFZ have written project outlines, which is more than the average (60.1%). Last but not least, 89.9% of DRs at UFZ have supervision agreements with their formal supervisors, which is more than the average of 70.4%. Only 2.7% don't have a direct or formal supervisor, or are not aware of them. For 62.2% (44.5%) of DRs at UFZ (all other centers) the formal supervisor is also the direct supervisor, and 34.5% (51.2%) are supervised by different persons.

The female to male ratio (FMR<sup>4</sup>) of supervisors is 0.40 and 0.46 for formal and direct supervisors, respectively. Since the respective ratios at all centers are very low (formal: 0.28; direct: 0.38), this clearly displays the presence of a gender gap, so called "leaky pipeline", in the Helmholtz Association. Not only is this a diversity issue, but can also reduce the productivity of DRs<sup>5</sup>. But we also see that UFZ already represents a good example here, and we don't want to diminish that.

<sup>4</sup>The FMR is calculated as  $n_f/n_m$ , where  $n_f$  ( $n_m$ ) is the number of females (males). If the FMR is one it indicates equality, while values above and below unity indicate female and male prevalence, respectively.

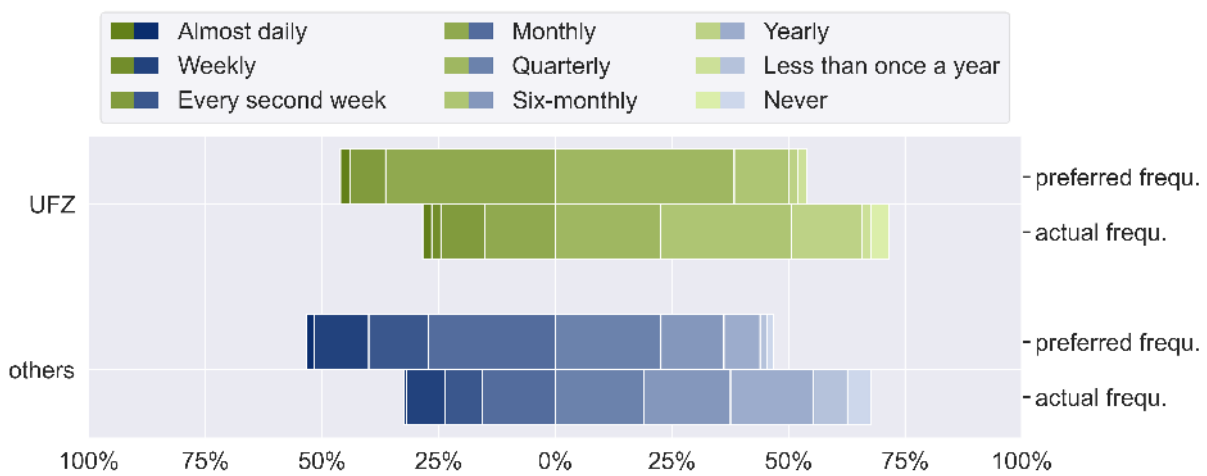
<sup>5</sup>A. Corsini, M. Pezzoni, F. Visentin, *What makes a productive Ph.D. student?* (2022), <https://doi.org/10.1016/j.respol.2022.104561>

## 4.2. Implementation of supervision in the notion of DRs

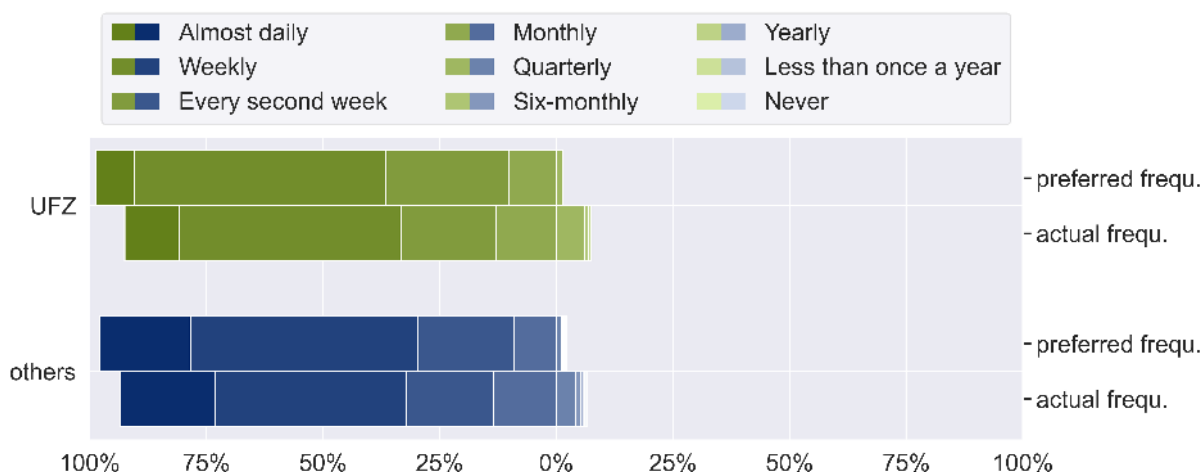
First, we evaluate the implementation of supervision quantitatively by reporting the meeting frequency.

On average 88.7 % of DRs at other centers meet their TAC at least once per year, whereas 77.4 % do so at UFZ. The remaining DRs either have no regular meetings or don't know the meeting frequency.

The graphical representation of meeting frequency with supervisors (see Fig. 4.2, 4.3 for the formal and direct supervisor, respectively) is centered at the boundary of 'monthly' and 'quarterly' meeting frequency. Responses to the options *I don't know, I don't want to answer* were excluded, which are about 2.125 % of all participating DRs, when calculating the percentages. Further, missing answers have been excluded, as there was a filter if direct and formal supervisor are the same person. Generally, meeting frequencies with the direct supervisor are much more frequent as with the formal supervisor, which is not surprising. Also, there is an interest on the side of the DRs to meet more frequently with their supervisors than is actually the case.



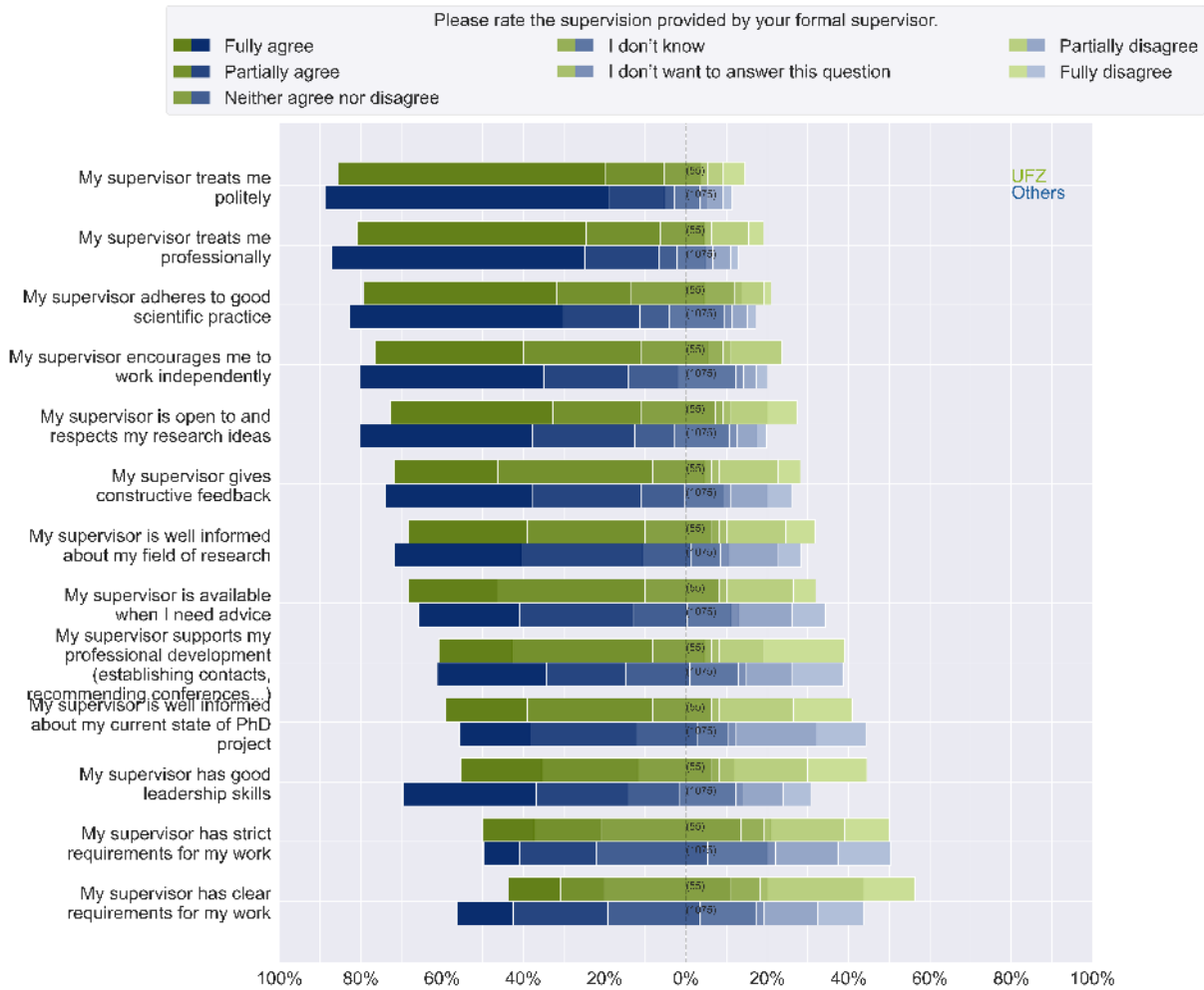
**Figure 4.2.:** Preferred (top bar) and actual (bottom bar) meeting frequency with the **formal supervisor** at UFZ (greens) and other centers (blues). This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.



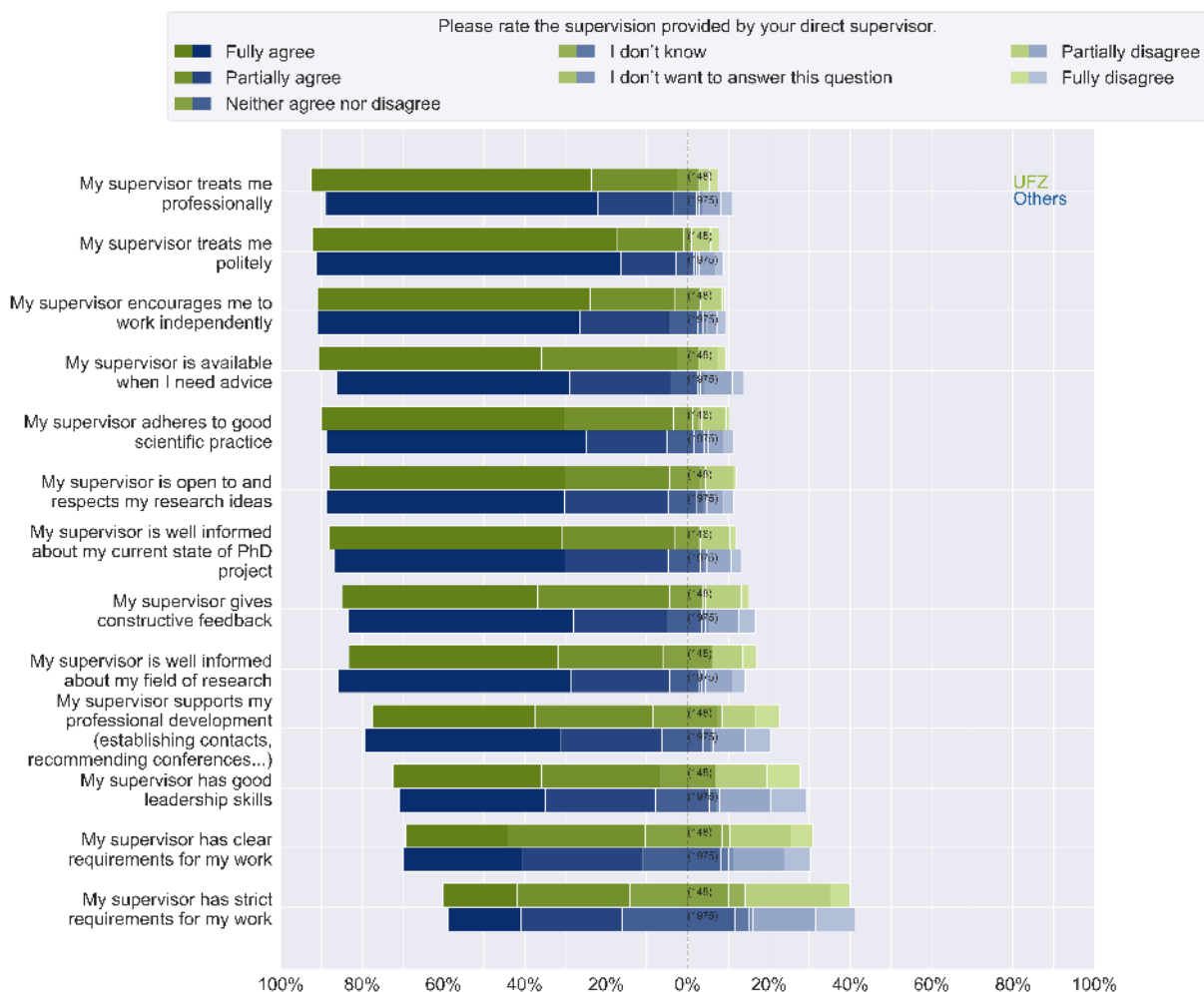
**Figure 4.3.:** Same as Fig. 4.2, but for the **direct supervisor**. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

### 4.3. Supervision rating and conflict perception

We evaluate responses to different aspects of supervision. The detailed answers for UFZ are shown in Fig. 4.4 and 4.5.



**Figure 4.4.:** Rating of *formal supervisors* at UFZ, where 55.9 % (58.1 %) of the ratings were positive at UFZ (other centers). This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

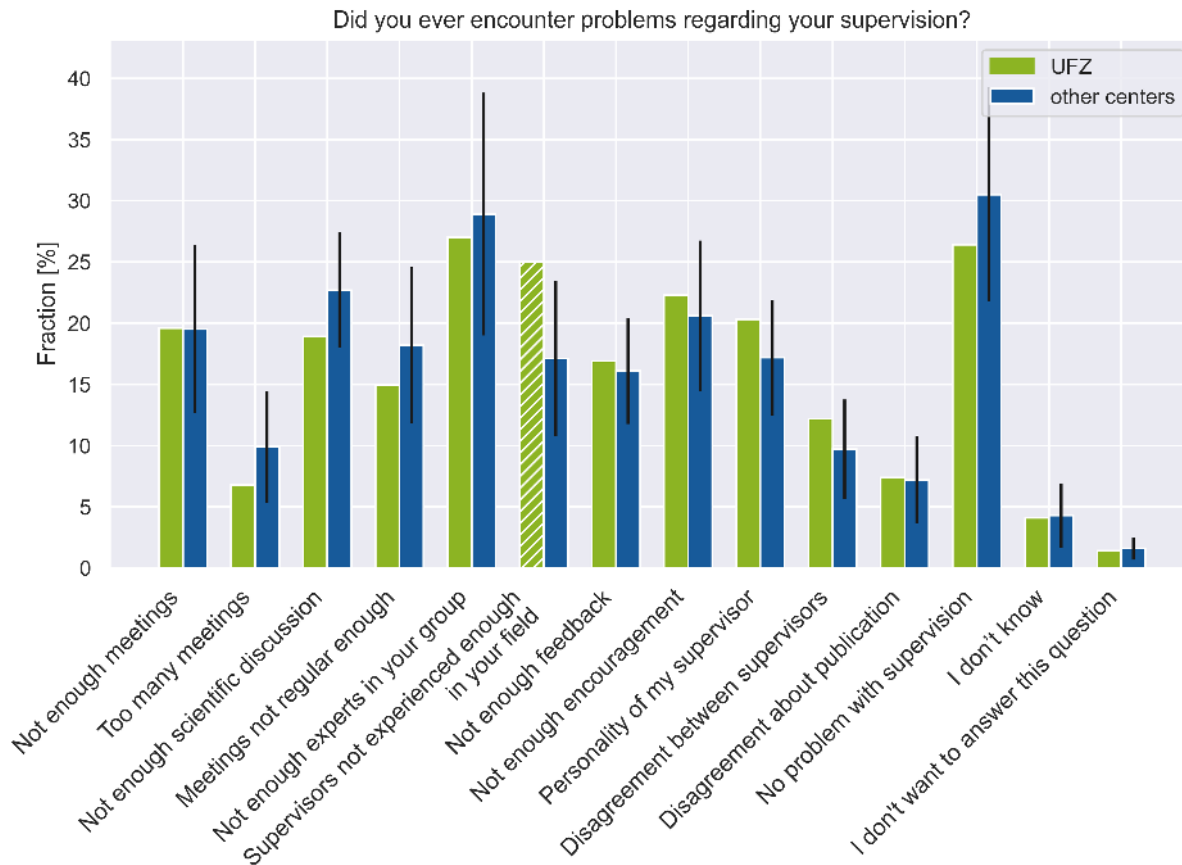


**Figure 4.5.:** Rating of *direct supervisors* at UFZ, where 77.6 % (76.1 %) of the ratings were positive at UFZ (other centers). This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

In order to compare the center specific results of this section with other centers, we have broken down the complexity by counting the ratio of agreement with the questions asked compared to neutral or disagreement options. Note that agreement with the statements is associated with a positive evaluation of supervision.

At UFZ, 55.9 % either agree partially or fully with the questions asked for the formal supervisor. The rating for the direct supervisors is 77.6 % partial or full agreement with the questions asked. Compared to all centers, where the satisfaction with the formal/direct supervisor is 58.1 %/76.1 %, the ratings are similar at UFZ.

Data obtained in the survey portrays the fact that majority of DRs are at least partially satisfied with the quality of supervision at UFZ. Nonetheless, the level of satisfaction with supervision can also be addressed by taking a closer look at specific problems that DRs report regarding the supervision, see Fig. 4.6.



**Figure 4.6.:** *Reported problems with supervision. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described at Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format.*

Top problems listed by DRs are:

1. Not enough experts in your group (27.0%)
2. Supervisors not experienced enough in your field (25.0%)
3. Not enough encouragement (22.3%)

Taking into account that number of publications in high ranked journals drive rankings of scientific institutes, and that publications from DRs contribute approximately one-third of all research outputs from universities<sup>6</sup>, we would recommend strengthening supervision as an important consideration for maximising the contribution of DRs to boosting international standing of each research institute.

<sup>6</sup>Larivière, V. (2012). On the shoulders of students? The contribution of PhD students to the advancement of knowledge, *Scientometrics* *Scientometrics*, 90(2), 463-481. DOI:<https://doi.org/10.1007/s11192-011-0495-6>

## 5. Integration

Work atmosphere at research centers plays a key role in integrating doctoral researchers and empowering them to contribute to their new environment. Successful integration builds communities that are stronger scientifically and more inclusive socially and culturally. Nevertheless, the journey towards integration is often fraught with difficulties, such as language and cultural barriers.

Doctoral researchers (DRs) were asked about support that is provided at their centers in regards to: *university enrollment application to a graduate school, finding accommodation, registering at the local resident registration office, visa for their residency, translation of working contract and relevant documents.*

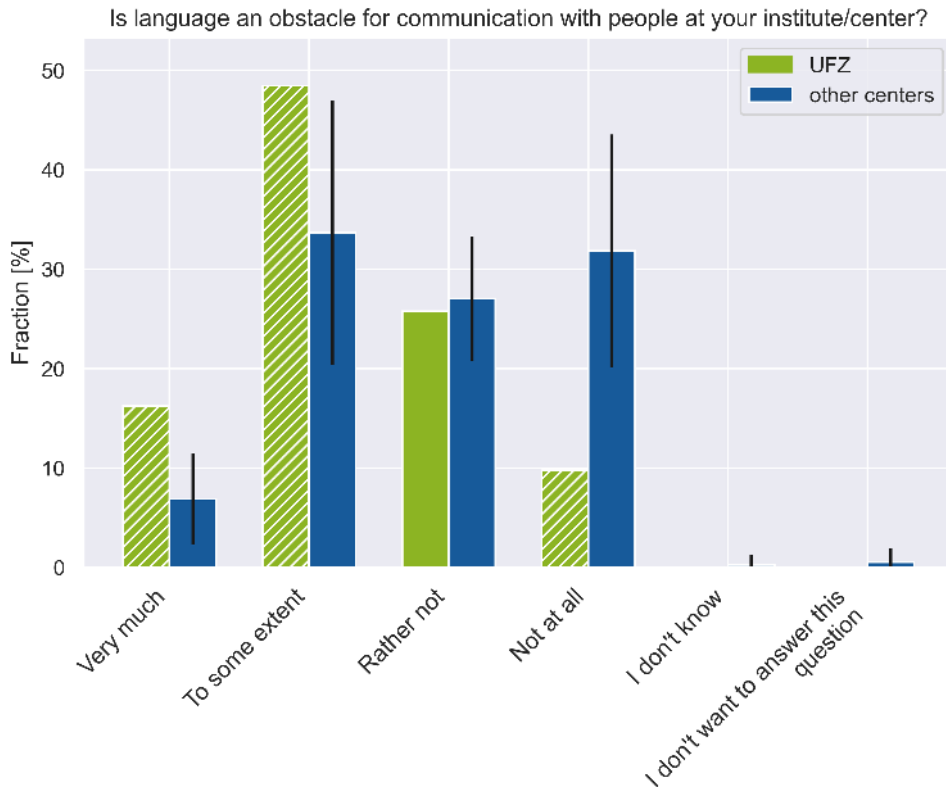
Results suggest that at UFZ doctoral researchers would benefit from more support in the following aspects:

1. University enrollment (UFZ: 39.6%, Others: 28.6%)
2. Finding accommodation (UFZ: 17.2%, Others: 20.6%)
3. Translation of working contract and relevant documents (UFZ: 11.9%, Others: 12.1%)

Language barrier contributes to feeling of exclusion for DRs, thus we asked non-German participants to grade their language fluency in German:

1. None (UFZ: 23.5%, Other institutes: 18.6%)
2. Beginner (A1-A2) (UFZ: 41.2%, Other institutes: 39.3%)
3. Intermediate (B1-B2) (UFZ: 26.5%, Other institutes: 26.7%)
4. Fluent (C1-C2) (UFZ: 2.9%, Other institutes: 9.0%)
5. Native (UFZ: 5.9%, Other institutes: 5.6%)

We posed follow-up questions to the participants who ascertained their German language comprehension with none, beginner or intermediate. Importantly, 58.8% of participants at UFZ report that lack of German is an obstacle for communication with colleagues (34.4% in other centers) (Fig. 5.1).



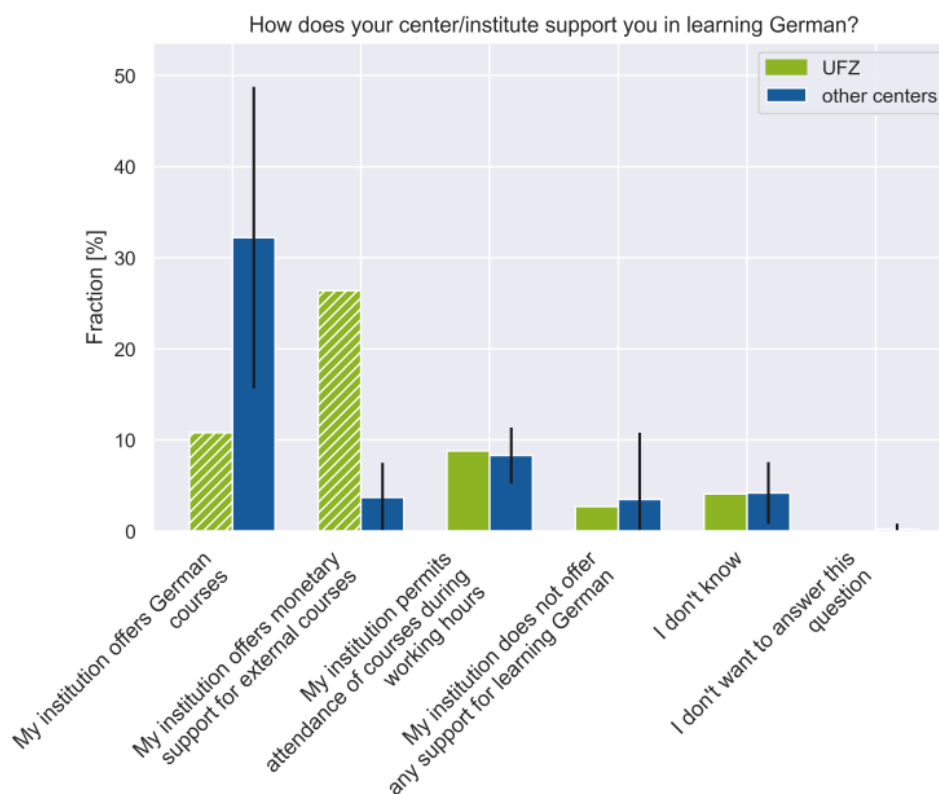
**Figure 5.1.:** Exclusivity of German language as an obstacle in successful integration. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

Especially international DRs need further support to get settled into their new environment and handle everyday life. Not only is the existence of German language courses of utmost importance, but the DRs' knowledge of their availability is also a crucial component (Fig. 5.2).

In our survey, 23.5% (72.5% in other institutes) of non-German participants have indicated that UFZ offers German courses and 57.4% (8.4% in others) reported that UFZ offers monetary support for external courses. Of note, these answers are based on the DRs recollection of their situation and may not reflect the true offers present at UFZ. If these numbers are in fact very diverging, this might indicate a lack of available information.

Moreover, 19.1% of the participants responded that the attendance of courses during working hours is allowed at UFZ (18.7% all other centers). However, based on the answered question, we cannot distinguish whether this may be due to an official rule at UFZ or due to the respective supervision of single DRs.





**Figure 5.2.:** Support for learning German at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format.

We are aware of the fact that breaking down language and cultural barriers is a long and complicated process, but still it is worth highlighting that pushing the boundaries towards implementation of comprehensive diversity initiatives should be the aim of all research institutions. Best practice examples include monitoring of adherence to equity, diversity and inclusion principles and promotion of the usage of inclusive and bias-free language<sup>1</sup>.

<sup>1</sup>Tzovara A, Amarreh I, Borghesani V, Chakravarty MM, DuPre E, Grefkes C, Haugg A, Jollans L, Lee HW, Newman SD, Olsen RK, Ratnanather JT, Rippon G, Uddin LQ, Vega MLB, Veldsman M, White T, Badhwar A. Embracing diversity and inclusivity in an academic setting: Insights from the Organization for Human Brain Mapping. Neuroimage. 2021 April, <https://doi:10.1016/j.neuroimage.2021.117742>

## 6. Career Development

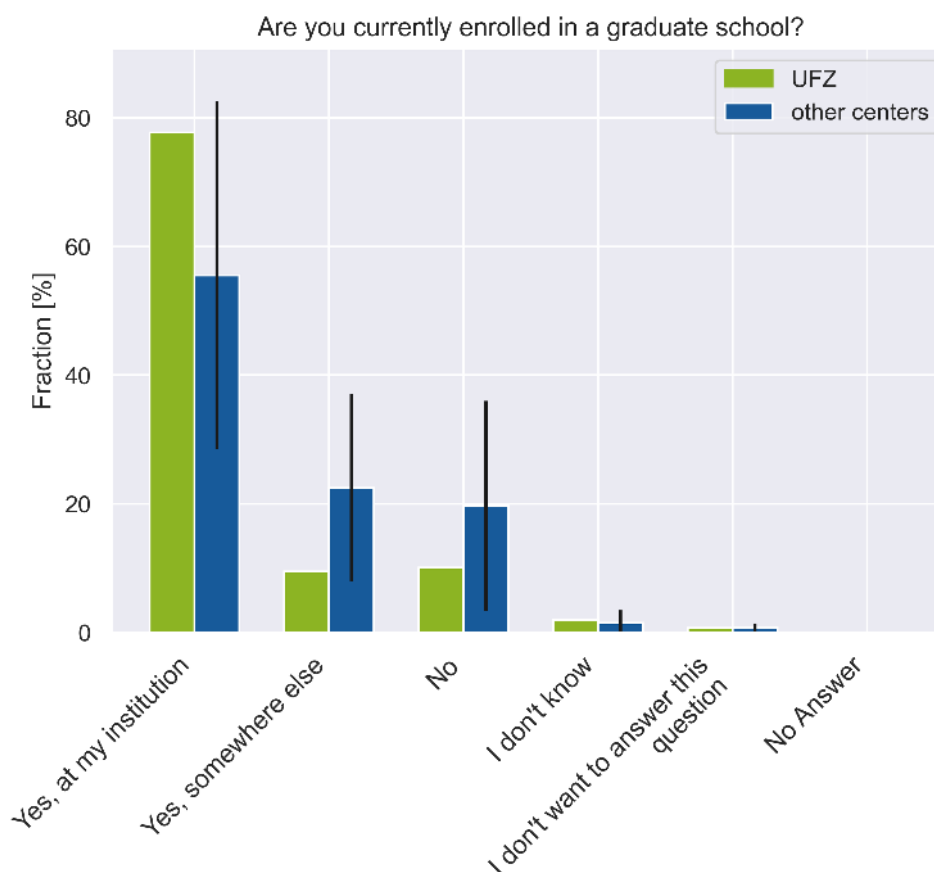
After completion of the doctorate many career paths open up. Choosing the right one is a multifaceted problem. Doctoral researchers (DRs) face difficult questions, *do I stay in academia?, do I want to find a job in industry?, or should I explore less traveled paths (e.g. science management, starting my own business, teaching, etc.)?* The sheer number of possibilities demonstrates the importance of offering guidance in career planning. Career counselling is increasingly offered by Helmholtz Centers for both, DRs and supervisors.

Here, we review how well career counselling is supported within UFZ compared to all other centers.

### 6.1. Are you currently enrolled in a graduate school?

The majority of DRs, 87.2%, (78.0% all other centers) are enrolled at a graduate school at their institution or somewhere else. At UFZ, 12.8% of the participating DRs did not join any graduate school which is lower than the Helmholtz wide average.

An overview of all answers in comparison with other centers can be seen in Fig. 6.1.



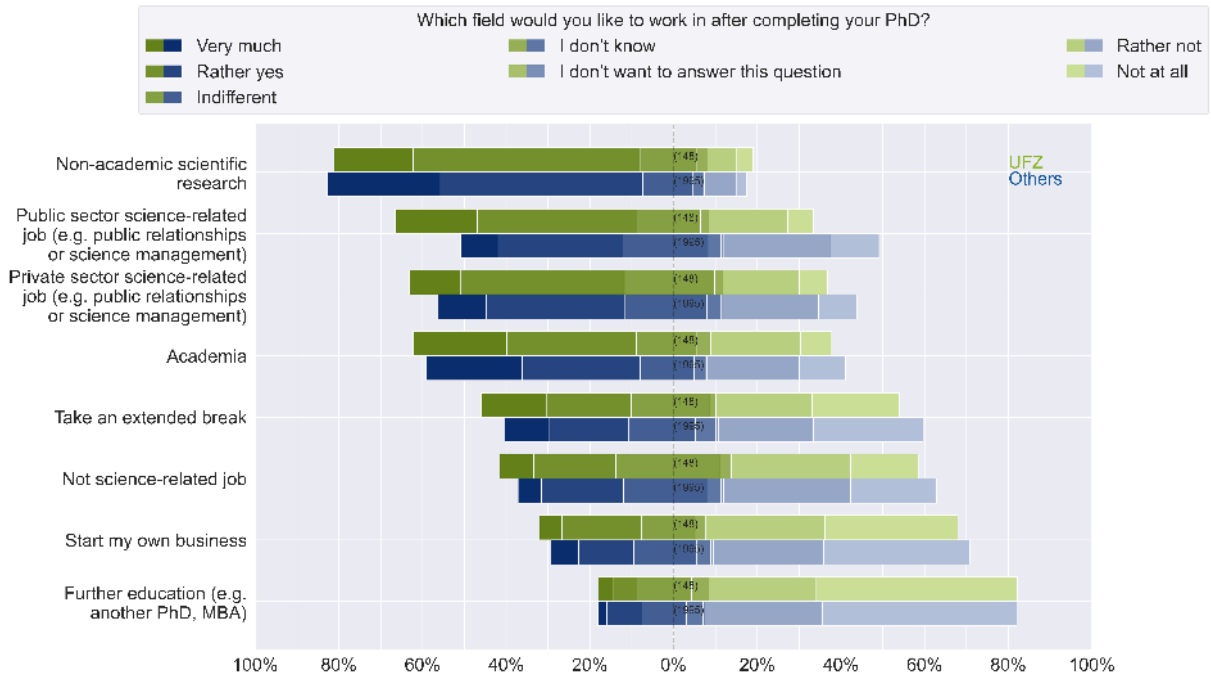
**Figure 6.1.:** Enrollment of DRs in graduate schools. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

Of note, enrollment in a Graduate Program and at a university are not necessarily mutually inclusive.

## 6.2. Which field would you like to work in after completing your PhD?

When asked about the future prospects, non-academic scientific research is the most obvious choice for most participants (73.0% at UFZ, 75.3% at all other centers) (see Fig. 6.2).

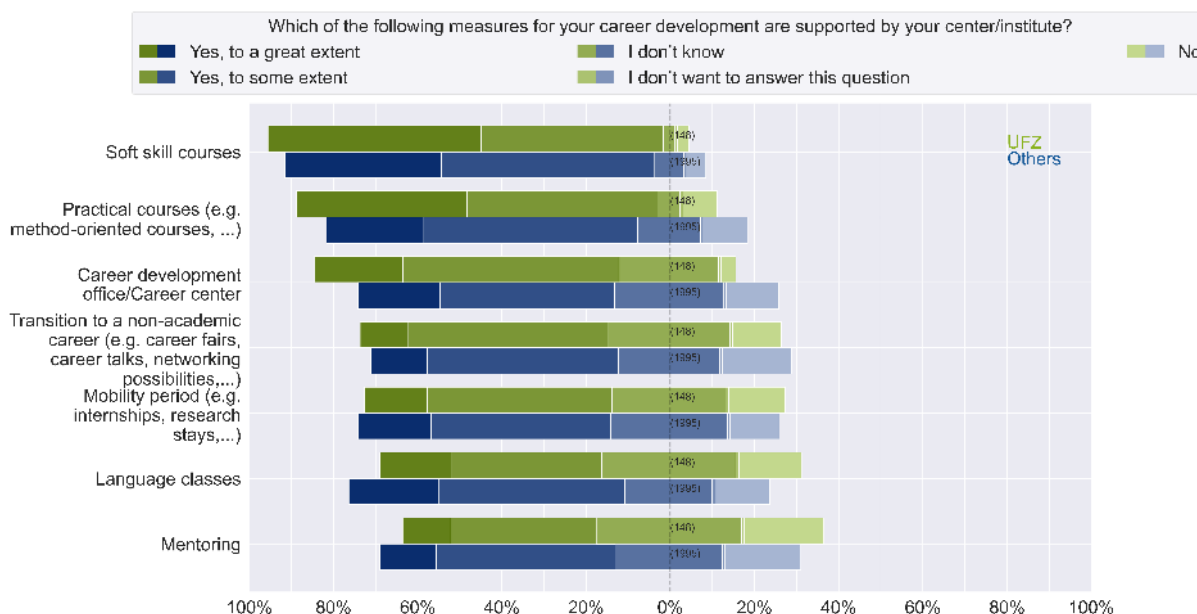
However, still a large portion of participants indicated, they want to stay in academia (53.4% at UFZ, 51.2% at all other centers). Furthermore, a great portion of DRs consider working in a public or private sector science-related job (51.4% in UFZ, 44.5% in all other centers). Notably, a third of all participants (29.7% at UFZ) expresses the wish for an extended break. The number of DRs who would like to start their own business is above 10%.



**Figure 6.2.:** Field of work in which DRs would like to work after graduation. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

### 6.3. Which of the following measures for your career development are supported by your center/institute?

Fig. 6.3 shows how the career development measures at your center are perceived by the participating DRs of your center compared to the DRs of other centers.



**Figure 6.3.:** Offered career development measures. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs. Please note, that the answers to this question were asked in a multiple-choice format.

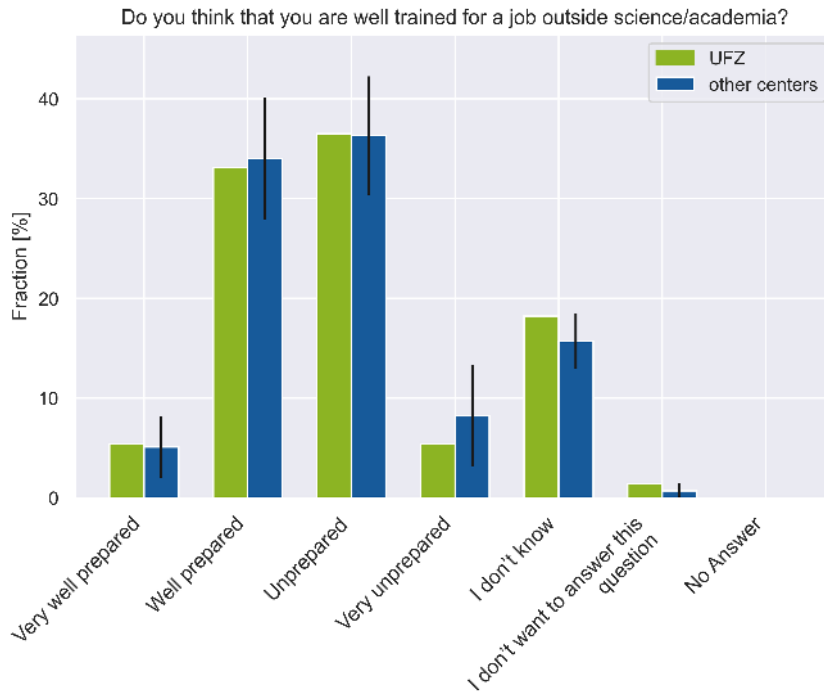
The commitment to support career development at UFZ is visible by the relative amount of positive answers in all categories (66.9 % UFZ; 66.2 % others). Soft skill courses as well as practical courses were generally offered to a great extent. Contrastingly, the offer of a mobility period, support for the transition to a non-academic career, and mentoring leave room for improvement in most centers.

According to our results, UFZ supports a mobility period to a similar extent than other centers. The implementation of mentoring at UFZ is below average. Participating DRs from UFZ rate the support offers for the transition to a non-academic career as similar compared to other centers.

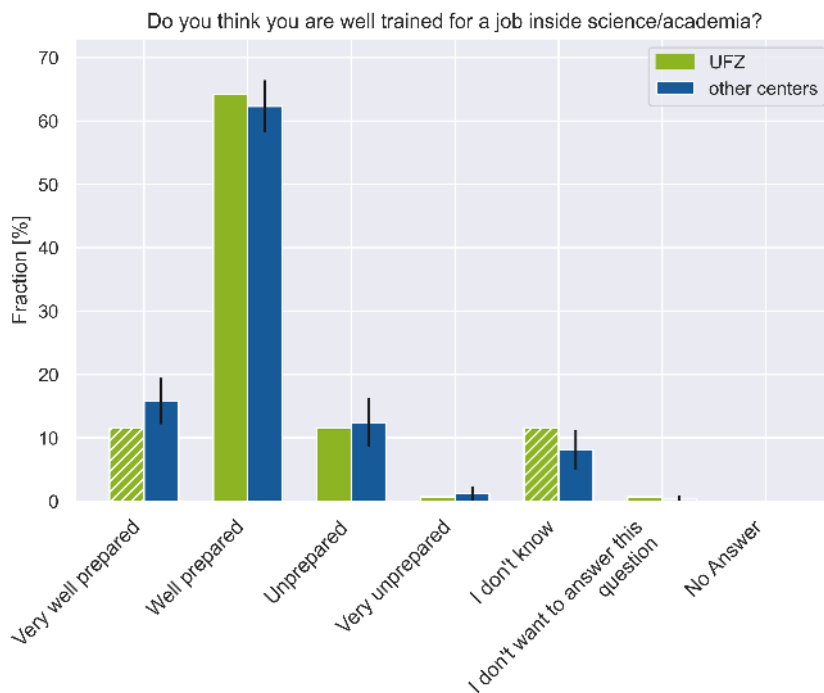
#### 6.4. Perceived preparation for later working life

The distribution of participants that feel very well to well prepared for a job outside science/academia was bivariate: from the results of all participating DRs we find that the majority feels more prepared for a job inside academia than outside. In UFZ, the amount of participants who feel well or very well prepared for a job outside science (38.5 %) is similar to the results in other centers (39.1 %). On the other hand, the majority of participants indicated that they feel well prepared for a job inside academia (75.7 % UFZ; 78.0 % others).

Interestingly, the number of participants that replied with *I don't know* differs between both questions. A greater portion (> 15%) of participants were not aware if they were prepared for a job outside academia, which indicates the need to support career development and orientation outside as well as inside of academia.



(a) Outside of science/academia



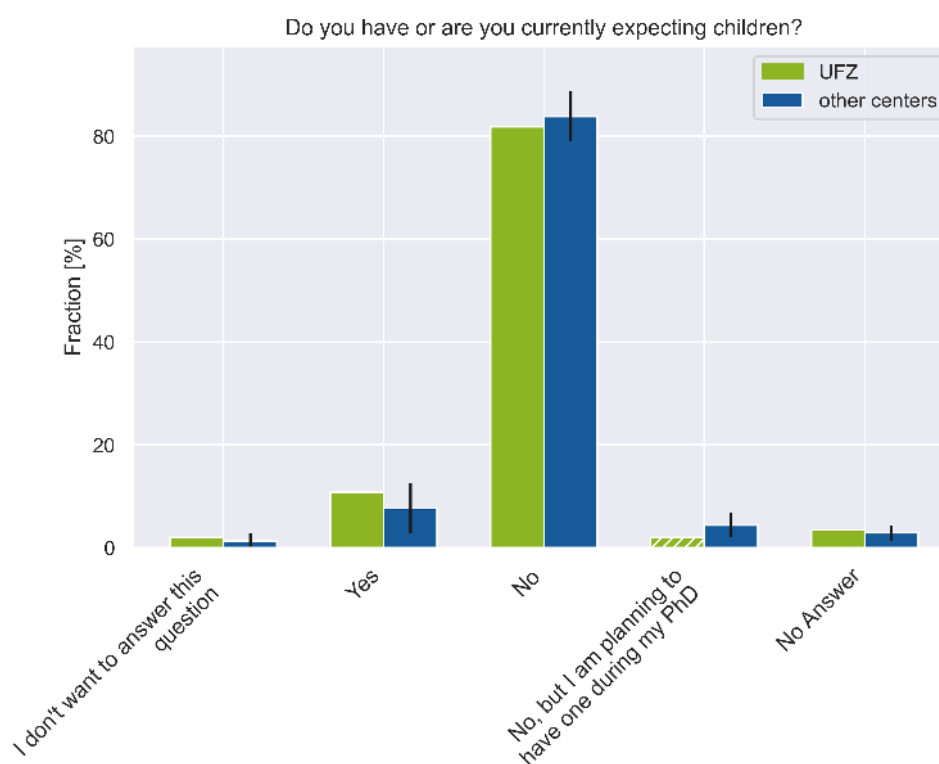
(b) Inside science/academia

**Figure 6.4.:** Perceived preparation for later working life outside (a) or inside (b) science/academia. These plots presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to these questions were asked in a single-choice format.

## 7. Family

This section contains questions related to family life while conducting the doctoral project. We are interested in whether the Doctoral Researchers (DRs) have children and how families are supported at UFZ in terms of childcare, organizational and financial aspects.

For many DRs, the timing of their doctoral project coincides with the chapter of their life to start a family. Both, a thesis and a family, are time consuming endeavours and therefore they could possibly clash with one another. The survey results support this. 81.8% (83.8%) of the participants at UFZ (other centers) have no children and merely 10.8% (7.7%) have or currently expect children (see also Fig. 7.1). On a Helmholtz level, this is in the same range compared to previous HeJu surveys: in 2019 about 8.7% and in 2017 about 7% of the HeJu survey participants were parents.

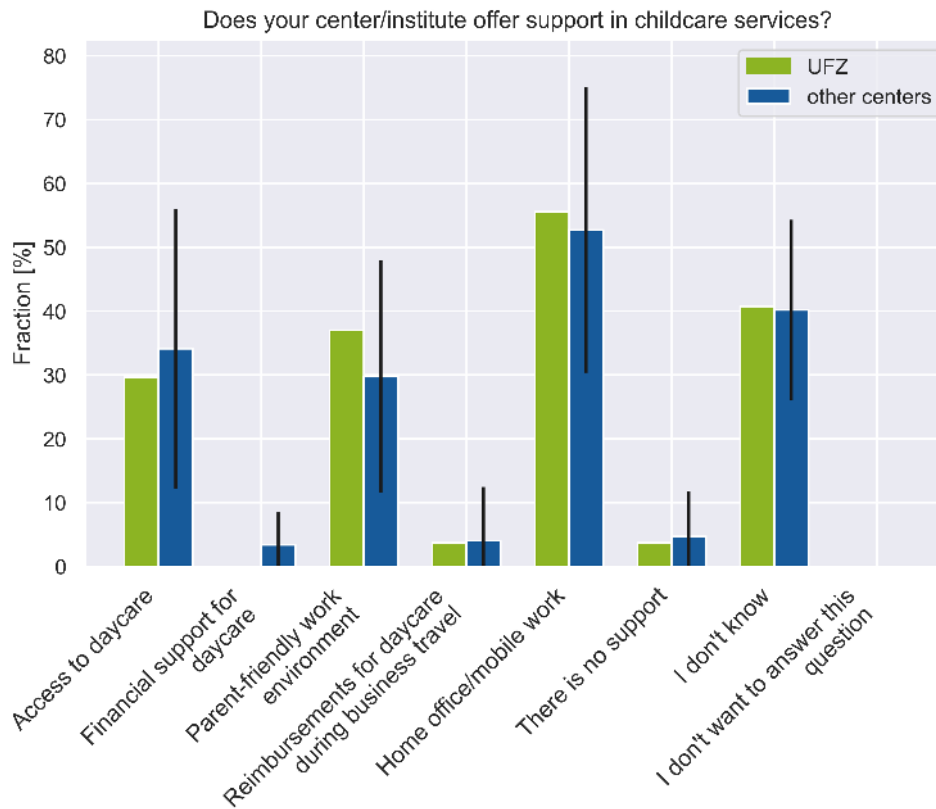


**Figure 7.1.:** Amount of DRs who have or expect children, and those who do not at UFZ compared to other centers. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. Also, the option "No Answer" was excluded from the analysis, as only participants who responded to have, to expect or to currently be planning for children were asked this question.

Making a decision on whether to have a family during one's DR time can be supported by the

availability of childcare services, which helps to reconcile a family life with the scientific work (Fig. 7.2).

However, 40.7 % (40.2 %) indicated that they do not know whether UFZ (other centers) offers childcare services. Other survey participants state that their center offers access to day-care (UFZ: 29.6 %, others: 34.1 %), the possibility of home office or mobile work (UFZ: 55.6 %, others: 52.7 %), a general parent-friendly work environment (UFZ: 37.0 %; others: 29.7 %).

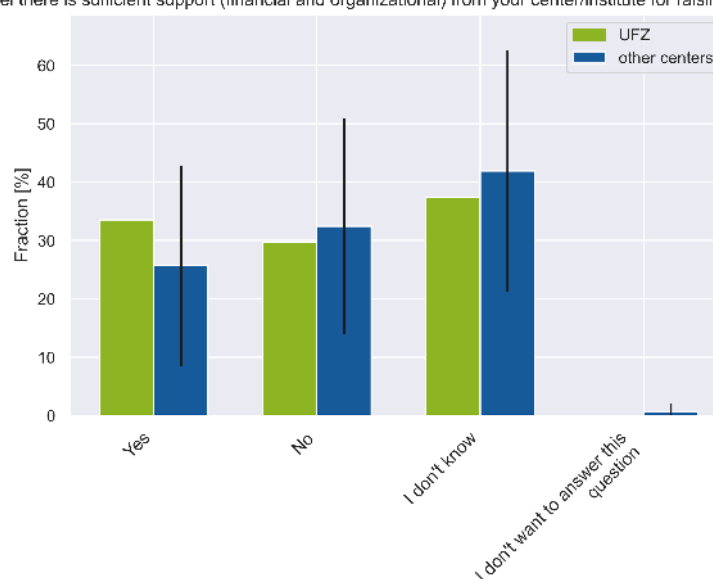


**Figure 7.2.:** Support in childcare services at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format. Also, this question was only asked to DRs who indicated that they have or plan to have children.

Overall, 33.3 % (25.7 %) of the family-minded DRs at UFZ (others) say that they feel sufficiently supported financially and organizationally by their center for raising children (Fig. 7.3). On the other hand, 29.6 % (32.1 %) see this differently and say that they do not feel supported sufficiently. At the same time, 37.0 % (41.6 %) say that they do not know whether they feel supported sufficiently. Of note, these questions were only posed to DRs already having, expecting or actively planning for children.



Do you feel there is sufficient support (financial and organizational) from your center/institute for raising/caring for a child?



**Figure 7.3.:** Support (financial and organizational) for raising a child at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. Also, the option "No Answer" was excluded from the analysis, as only participants who responded to have, to expect or to currently be planning for children were asked this question.

Data collected in this dataset reveals that there seems to be an amount of miscommunication within the centers when it comes types of support that are available to DRs who have, plan or expect children. It would be recommended to raise awareness of childcare services at UFZ to make DRs feel more secure with their family situation.

## 8. Power Abuse

Various reports have shown that doctoral researchers (DRs) have unfortunately been subject to power abuse<sup>1,2</sup>. This comprises many different forms starting with small conflicts but also moves up to bullying and sexual harassment. Anyone can be a perpetrator of such unhealthy behaviours at the workplace, e. g. the direct supervisor or an administrative person with direct/indirect influence.

In this section, we asked all survey participants agreeing to answer these sensitive questions if they have experienced any form of power abuse, conflict or discrimination at their workplace. Further, we also asked them about the responsible authorities, the process of reporting such conflicts and their satisfaction with the resolution at respective centers.

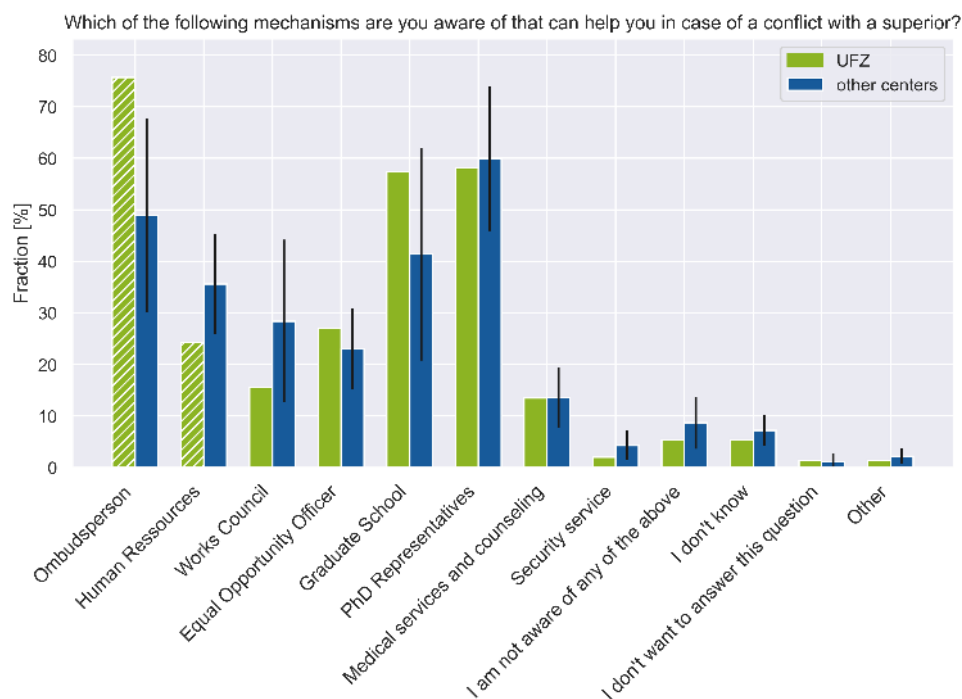
### 8.1. General conflicts

There are standard guidelines for Helmholtz Research Centers to have administrative positions at each center to act as an impartial and neutral point of contact for DRs in case of any case of power abuse. For example, an *Ombudsperson* or *Equal Opportunity Officer* may be informed about a certain form of power abuse to take necessary actions. However, centers may choose to deviate from this, or DRs may not even be aware of these point-of-contacts. Thus, we ask all the participants to indicate whether they are aware of such authorities at their center (see Fig. 8.1).

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<sup>1</sup>Moss, S. E., & Mahmoudi, M. (2021). STEM the bullying: An empirical investigation of abusive supervision in academic science. *EclinicalMedicine*, 40, 101121.

<sup>2</sup>Keashly, L. (2021). Workplace bullying, mobbing and harassment in academe: Faculty experience. *Special topics and particular occupations, professions and sectors*, 221-297.



**Figure 8.1.:** Awareness of point-of-contacts in case of a conflict with a superior amount the participating DRs at UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a multiple-choice format.

Although several point-of-contacts are known to some participants, we observe that 10.8% of the DRs are not aware or do not know any of them. This is a low amount compared to the results at other centers (15.899999999999999%). Raising awareness about sources of support is very important and enables DRs to report and take active measures against any form of power abuse.

To better understand if there were cases that led to conflict and further, if they were also reported, we asked participants if they reported any conflict in the past. This may also indicate how feasible it is to report such conflicts at respective centers. For instance, if there is a higher number of unreported conflicts, the DRs may be uncomfortable to report them or even threatened not to do it. However, since we did not ask if the conflict person was directly approached, there might be some bias for those who did not report the conflict, as they sought a solution without the implemented measures. For the participating DRs at UFZ, we find a larger number of not reported conflicts compared to reported cases. The relative amount of experienced conflicts (7.0%) is higher than in other centers (5.4%) and could be matter of concern. We are aware that this data might not necessarily be comparable with your collected numbers of reported conflicts at your center. Here, we are addressing the numbers based on the answers from participating DRs from UFZ and we are looking forward to starting a conversation about this dataset and potential reasons for discrepancies.

Those DRs who reported a conflict were rather unsatisfied with the solution of the conflict. At all Helmholtz centers we find that the DRs were more likely to be unsatisfied than satisfied with the solution.

We further asked participants who indicated that they did not or could not report any conflicts in the past about the underlying reasons that prevented them from reporting such issues. This could be due to various reasons dependent on the severity of the conflict, perceived inefficiency of the concerned authority to handle conflicts or uncontrollable consequences which might end up impacting the DRs in the process.

Top reasons for not reporting a conflict at UFZ were:

1. I didn't think the conflict was severe enough
2. I was afraid of repercussions
3. I didn't think it would be resolved

Also, the most DRs reported to have the conflict with:

1. Direct supervisor
2. Formal supervisor
3. Administrative staff

Of note, these questions was posed only to DRs who have faced a serious conflict and they were able to provide mutiple answers.

## 8.2. Sexual harassment

We asked our participants if they have personally been subject to any form of sexual harassment at their workplace in the past. We find that 17 (11.5%) of the participating DRs at UFZ have experienced unwanted behaviour that they would call *sexual harrassment*, which is higher than in other centers (9.1%). Even when the prevalence may not be significantly high at your center, every single case is one too many and the problem should be brought to everyone's attention and preventive measures should be installed.

When it comes to witnessing sexual harassment, 5.4% (5.9%) of DRs reported witnessing sexual harassment at UFZ (other centers). The most commonly experienced perpetrators of sexual harassment are:

1. Other scientific staff
2. Other doctoral researcher
3. Direct supervisor

Of note, these questions were posed only to DRs who have at any point experienced unwanted behaviour that would qualify as sexual harassment or have witnessed such behaviour. These participants were able to provide multiple answers. In the survey answers about actions qualifying as sexual harassment ranged from unwanted verbal remarks of a sexualized nature and/or obscene gestures to physical acts of sexual assault.

### 8.3. Bullying

We ask our participants if they have personally been subject to any form of bullying at the workplace in the past. Here, we observe 33 events (22.3 %) of bullying among the participating DRs, which is similar to the amount at other centers (24.4 %).

The three most commonly reported perpetrators of bullying include:

1. Other scientific staff
2. Formal supervisor
3. Direct supervisor

Of note, this question was posed only to DRs who have at any point been subjected to bullying. These participants were able to provide multiple answers. In the survey answers about actions qualifying as bullying included indirect bullying, destabilization, pressured overwork, verbal harassment, social isolation, threat to professional status, and physical attack.

### 8.4. Discrimination

DRs with different backgrounds, age and gender could also be subject to discrimination at their workplace. Hence, we ask the participants to indicate if they have had such experiences in the past. It is imperative that even a single case of discrimination and of any form is unhealthy and shall be pro-actively prevented from occurring.

In the case of UFZ, we do see 34 DRs (23.0 % of participating DRs) being affected by discrimination at their workplace, which is higher than at other centers (19.1 %).

Top three perceived reasons are:

1. Nationality
2. Gender identity
3. Age

Of note, this question was posed to all participating DRs, and they could provide multiple answers. In the survey the following bases of discrimination were included: nationality, ethnicity, age, sexual orientation, gender identity, religion, disability, pregnancy and maternity, parenthood, and mental health.

Considering the numbers of participants who have indicated that they have experienced or witnessed sexual harassment, bullying and discrimination, we would like to encourage all the Helmholtz centers to establish a clear and detailed code of conduct and to raise the awareness of the existing sources of support at UFZ to which DRs could reach in case they find themselves in situation like this.

## 9. Mental Health

Working on a doctoral research project, in a highly diverse and innovative field, requires a certain degree of flexibility and resilience. There are many factors making the doctoral time very challenging due to high workload, difficult supervision, competition among peers, and pressure to publish. In this section, the psychological well-being of doctoral researchers (DRs) is assessed by employing the **Patient Health Questionnaire 8 (PHQ-8)**<sup>1</sup> for depressive syndrome and the **State-Trait-Anxiety-Inventory (STAI)** for assessing both forms of anxiety<sup>2</sup>.

Participants were asked to ascertain their mental health in general but rather than directly asking participants to grade severity of their depression and anxiety, we used the two standardized test assessments PHQ-8 and STAI. Briefly, for PHQ-8 a factor was linked with all statements about current emotional state and the results were calculated to a final score assessing presence of depressive syndrome with 0-4 points = *no to minimal*, 5-9 points = *mild*, 10-14 points = *moderate*, 15-19 points = *moderate to severe*, 19-24 points = *severe depression*. Anxiety scores were obtained in a similar manner and categorized into 0-37 points = *no or low anxiety*, 38-44 points = *moderate anxiety* and 45-80 points = *high anxiety*.

**Depression** is a mood disorder marked especially by sadness, inactivity, difficulty in thinking and concentration, a significant increase or decrease in appetite and time spent sleeping, feelings of dejection and hopelessness, and sometimes suicidal ideation.

**State anxiety** can be defined as a transitory emotional state consisting of feelings of apprehension, nervousness, and physiological sequelae such as an increased heart rate or respiration.

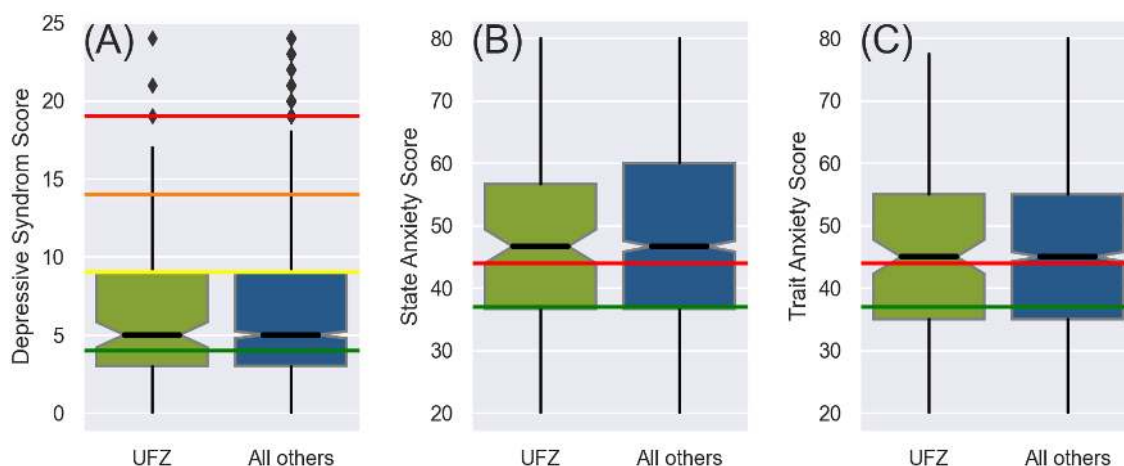
**Trait anxiety** can be referred to, as a stable tendency to attend to, experience and report negative emotions such as fears, worries and anxiety across many situations, it also manifests itself by repeated concerns about body symptoms.

Based on above-mentioned standardized assessment scores, 71.6% of DRs scored either a *no to minimal* or *mild* depression, and 18.2% of DRs have a *moderate to severe* depression score at UFZ, compared to 67.4% and 20.2% at all other centers, respectively. 67.9% are suffering from *moderate to high* state anxiety, and 71.8% from the same levels of trait anxiety at UFZ, compared to 72.4% state and 72.1% trait anxiety at all other centers, respectively.

Fig. 9.1 additionally shows the difference between the uncategorized scores for depressive syndrome (A), state (B) and trait anxiety (C), respectively.

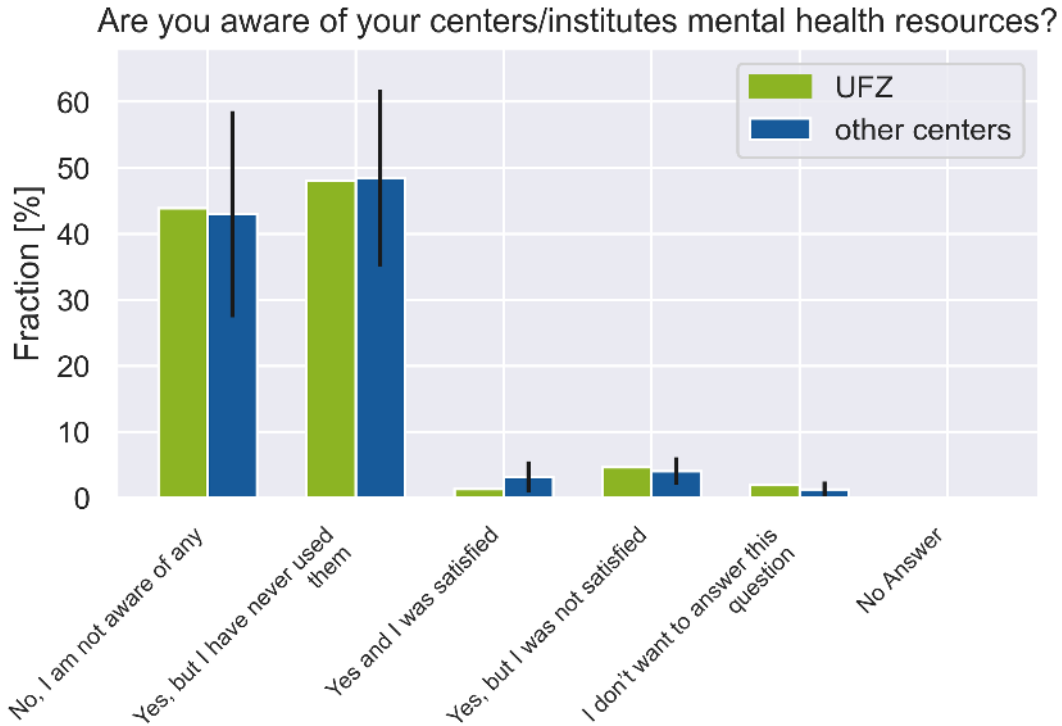
<sup>1</sup>Kroenke, K., et al., The PHQ-8 as a measure of current depression in the general population, *J. Affect. Disorders* (2008), <https://doi.org/10.1016/j.jad.2008.06.026>

<sup>2</sup>Marteau, T. M./Bekker, H. (1992): The development of a six-item short-form of the state scale of the Spielberger state-trait anxiety inventory (STAI). In: *British Journal of Clinical Psychology*, 31 (3), pp. 301-306. DOI: <https://doi.org/10.1111/j.2044-8260.1992.tb00997.x>.



**Figure 9.1.:** Boxplots for comparing the mental health scores between UFZ and all other centers for depressive syndrome (A), state anxiety (B) and trait anxiety (C). Coloured lines show the respective cut-offs as described above and higher values correspond to more mental health issues. The black line indicates the median of all observations (= 50 % of DRs lie above and 50 % below that value), the respective notch indicates a significant difference on a 95 % confidence level, if the notches do not overlap. The complete box depicts the 25 % to 75 % quantiles of observations.

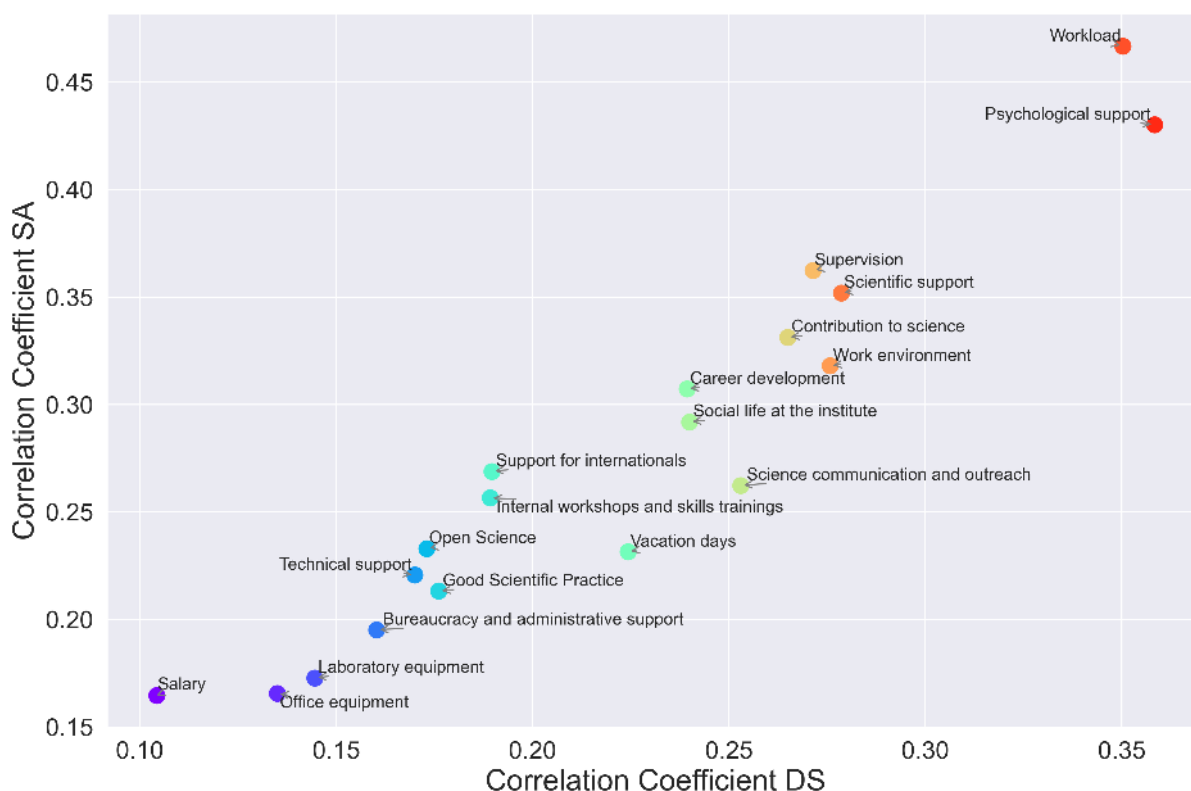
Furthermore, the participants were asked if they were aware of their centers' mental health resources. Importantly, it is observed that 43.9 % of DRs working at UFZ are not informed about mental health resources within the institute (Fig. 9.2) compared to 43.0 % at all other centers. Please note, that this does not necessarily mean that there are no support offers available, in fact, there could very well be as many centers have put in tremendous efforts to establish sufficient psychological support structures over the last years. However, the knowledge about this might still be lacking for the DRs and we encourage a broad advertisement of available services, ideally also in English to better reach international DRs as well.



**Figure 9.2.:** Awareness of mental health resources in all Helmholtz centers and UFZ. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

Moreover, we looked into importance of different aspects of satisfaction on depressive syndrome and state anxiety by performing a correlation analysis. The results for all Helmholtz centers is presented in Fig. 9.3. A further analysis identified *Psychological support*, *Career development*, and *Scientific support* to be the most impactful factors on depressive syndrome at UFZ.





**Figure 9.3.:** Correlation between satisfaction components and their contribution to mental health (Depressive syndrome and state anxiety) for all centers including UFZ. Spearman correlation coefficients were calculated and are depicted by magnitude, hence a the higher the respective factor in the plot, the higher its correlation with the respective mental health domain. This might further indicate a high importance of this factor on mental health of DRs in general and should be focussed on first as a potential area of improvement. Please note, that we excluded the question item “satisfaction with family support” from this analysis, as it was mostly only filled by parents, which are a scarce and indeed distinct group as further sensitivity analyses revealed and will be covered in the whole Helmholtz report in more detail.

Summarizing, our results align with the increasing evidence on a “mental health crisis” in DRs<sup>3</sup>, where depression and anxiety levels are reported to be nearly 10 times higher than within the general population<sup>4</sup>. Therefore, we want to raise awareness for this issue and continue supporting DRs while simultaneously encouraging the centers to provide the best mental health support possible.

<sup>3</sup>Evans, T.M., et al., Evidence for a mental health crisis in graduate education, Nature Biotechnology (2018), <https://www.nature.com/articles/nbt.4089>

<sup>4</sup>Bira, L., et al., Mental health in academia - An invisible crisis, Physiology News (2019), <https://www.physoc.org/magazine-articles/mental-health-in-academia-an-invisible-crisis/>

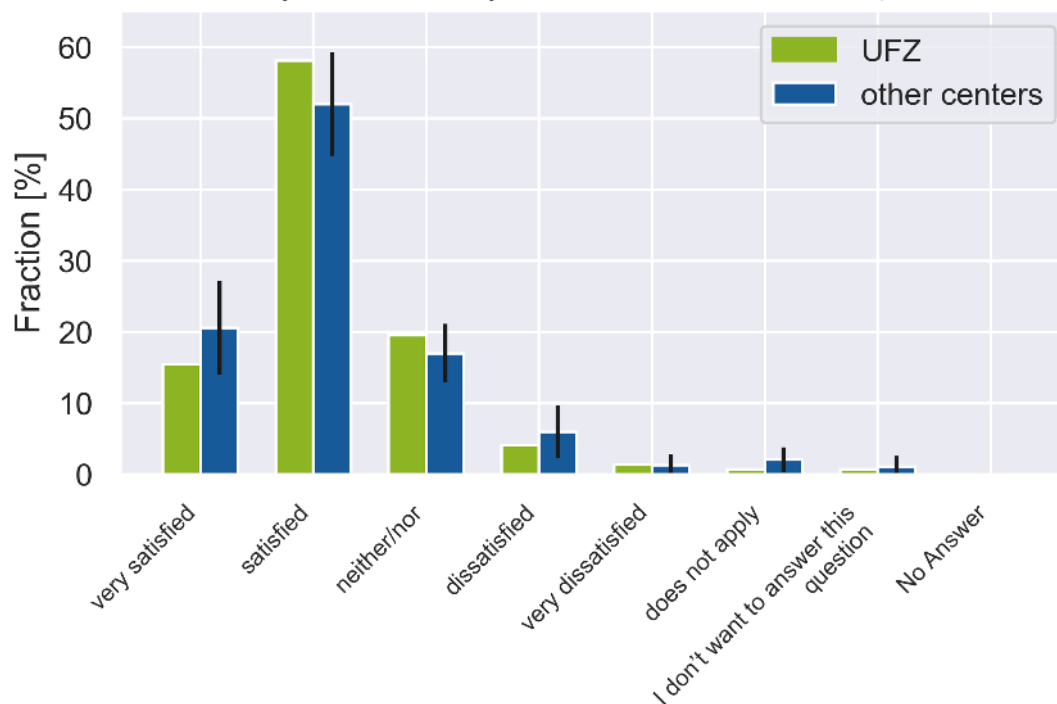
## 10. COVID-19

Since its onset in Germany from early 2020, the Covid-19 pandemic has had a strong effect on doctoral researchers' (DRs) lives, especially with respect to the progression of their research, expected duration of their project, disruptions to experiments, financial pressure, social life/mental health challenges, and future career expectations. Furthermore, specific researcher groups – such as international DRs, people with chronic diseases, and people with family responsibilities – are possibly strongly affected.

In this section, we have asked DRs about (i) the effect of the Covid-19 pandemic on their lives and research and (ii) the response of their respective centers to the pandemic. Insights from these questions are important to analyze the readiness of UFZ to unexpected situations and more importantly can shed light to future steps that can be taken to reduce the negative impact of the pandemic on DRs.

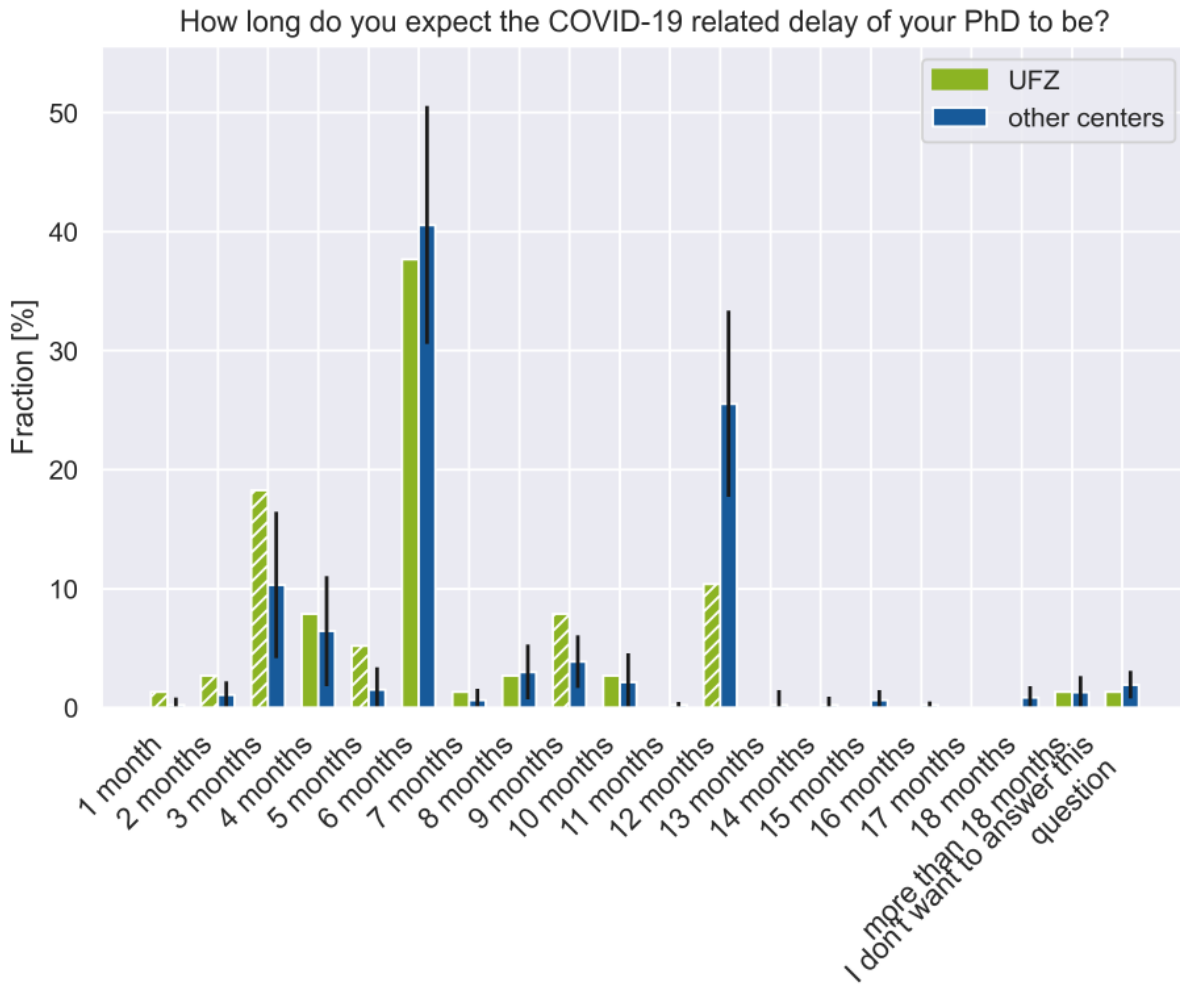
To start with, Fig. 10.1 shows satisfaction of DRs at UFZ with the institute's response to the pandemic. Overall satisfaction of the DRs at UFZ is higher than within all other centers. 73.6% of DRs are either satisfied or very satisfied with the handling of the pandemic situation vs. 72.6% at all other centers.

How satisfied are you with how your institute handled the pandemic situation?



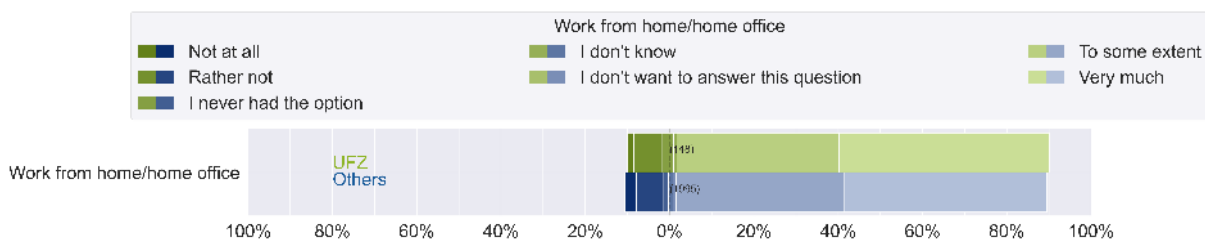
**Figure 10.1.:** Overall satisfaction of the DRs regarding UFZ's response to the pandemic compared to the other centers. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format.

We are aware that the pandemic has caused significant setback when it comes to timelines. The expected delay duration for those who report to have a project delay is shown in Fig. 10.2. The majority of questioned DRs expect an delay of 6 months (38.2%) and 3 months (18.4%). These numbers should be carefully considered at UFZ to guide DRs with contract extensions.



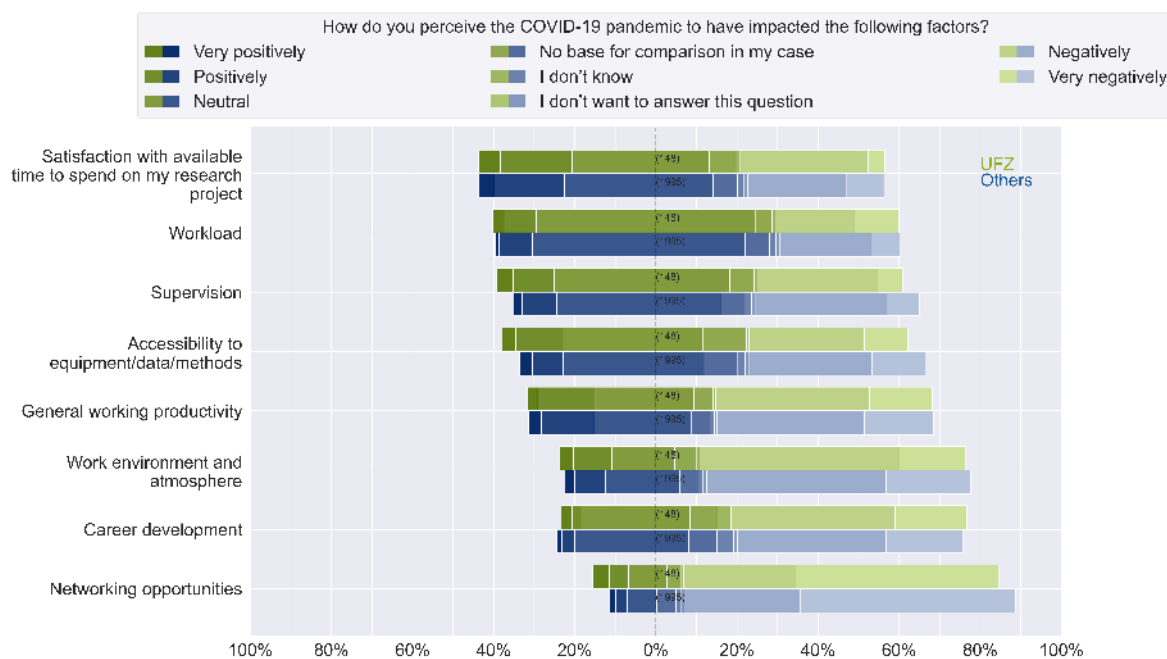
**Figure 10.2.:** *Expected delay of the doctoral project. This plot presents the fractions of participating DRs submitting the respective answers. For the value of all other centers (blue), the fraction is calculated from the data of all participating DRs at these centers. The standard deviation is calculated as described in Sec. 1.2 and displayed by symmetric error bars. If UFZ (green) lies out of this range, the corresponding bars are additionally highlighted with hatching. Please note, that the answers to this question were asked in a single-choice format. This question was only asked to DRs indicating that they are expecting a delay due to Covid-19.*

During the pandemic and especially during the lockdowns, many DRs worked remotely and used the remote working offers by their institutes. At UFZ the average duration of purely mobile working was 7.77 months compared to 8.33 months in the other centers. As some companies/institutions around the world offer remote working options post-pandemic to their employees, we asked participants if they would like this option. Fig. 10.3 shows the preference of DRs at UFZ.

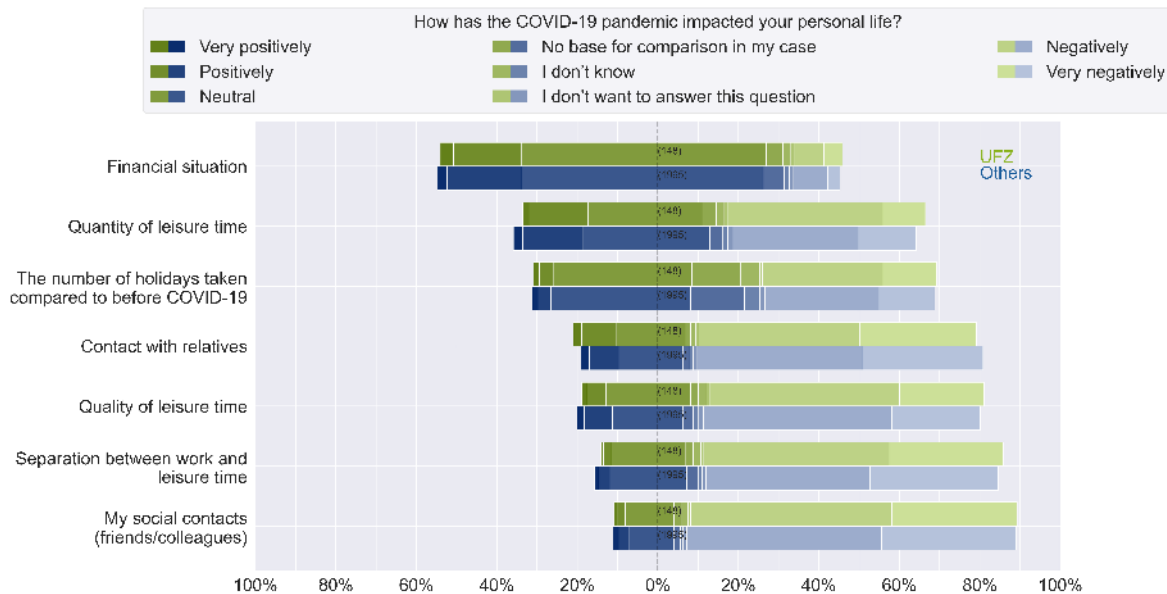


**Figure 10.3.:** Fraction of doctoral researchers with respect to their remote working option preferences. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

Furthermore, we asked DRs how they perceived the Covid-19 pandemic to have impacted different aspects of worklife and the environment in their center (Fig. 10.4)



**Figure 10.4.:** Effects of the Covid-19 pandemic on **work and career**. This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.



**Figure 10.5.:** *Effects of the Covid-19 pandemic on private and social life.* This plot presents fractions of agreement of participating DRs for UFZ (greens) and all other centers (blues). Each bar represents 100 % of DRs and is filled according to their answer levels. Additionally, the bars are moved corresponding to their answer direction, with neutral or not given answer possibilities (e.g. I don't know or I don't want to answer this question) centered in the middle. According to the left- or right-alignment of the bars, you can compare the answer tendencies of DRs.

Further, the private and social life of DRs was heavily impacted by the pandemic (Fig. 10.5) and additional support structures (e.g. psychological services) should be considered and strengthened.

The pandemic has changed the way research is conducted. It has also affected the social environment for many DRs. At this point, we want to congratulate the centers on handling the crisis well and encourage everybody to keep the best developments driven by the pandemic in place (e.g. offers for mobile working), bearing in mind to further alleviate the negative side effects of this situation as much as possible.

## 11. Conclusion

Thank you very much for reading the center-specific report for the Helmholtz Centre for Environmental Research (UFZ). It is based on data collected for the N<sup>2</sup>-Survey 2021 for Doctoral Researchers (DRs) doing their doctorate within the Helmholtz Association.

We aimed to provide an overview of how UFZ is doing in comparison to all other Helmholtz centers, in order to facilitate improvements for the respective DRs and to initiate the exchange of best-practice examples between the centers. Please feel free to reach out to us or other centers to discuss any results.

We further want to encourage UFZ to share these center-specific results with all DRs at your center. As per our data security statement, this report is first only shared with the general administration, graduate schools, works councils, and doctoral representatives. It is your decision, how to further communicate these results.

We would like to suggest a meeting with the Helmholtz Juniors at UFZ (Hugo Enrique Reyes Aldana – hugo.aldana@ufz.de, Masooma Batool – Masooma.batool@ufz.de) and to further distribute the results at your center. The Helmholtz Juniors would also like to present the general results from the N<sup>2</sup> Survey 2021 in a presentation format in 2023. Ideally and if allowed, we would further include the center-specific results in the presentation at UFZ.

Again, thank you for your time and feel free to reach out to us ([heju-survey@listserv.dfn.de](mailto:heju-survey@listserv.dfn.de)).

The Helmholtz Juniors.

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**Editing:** AK, AS, LF, JP

Further, we want to acknowledge our most heartfelt gratitude to the 2134 Doctoral Researchers, who filled in the N<sup>2</sup> Survey 2021. Your effort has enabled this analysis and will hopefully help to improve working conditions for future generations of DRs.



## A. Survey Questionnaire

**N<sup>2</sup>-Survey 2021 – Helmholtz association****Overview of modules:**

(A) <i>[core]</i> General	14
(B) <i>[core]</i> Working conditions	17
(C) <i>[core]</i> Satisfaction	11
(E) <i>[core]</i> Supervision	12
(H) <i>[core]</i> Integration	6
(I) <i>[core]</i> Career development	6
(J) <i>[core]</i> Family	8 (filters applied)
(F) <i>[module]</i> Power Abuse	20 (filters applied)
(D) <i>[module]</i> Mental health	7
(K) <i>[module]</i> COVID-19	13
(L) One last question	1
Free text fields (one at the end of each section):	11
====	
Total:	126

## Welcome to the N<sup>2</sup> Survey 2021,

and thank you for participating! This is a voluntary survey for all doctoral researchers working within the Helmholtz Association, IPP community Mainz, Leibniz Association and Max Planck Society. They are united in the N: 'Network of Networks' representing the doctoral researchers in all these organizations.

The aim of this survey is to provide a clear picture of the situation of doctoral researchers in Germany's non-university research organization. This includes: demographics, working conditions, the quality of the supervision, caring responsibilities, experiences with power abuse and discrimination, mental health, and the impact of COVID-19.

Please take the time and carefully read the following terms and conditions:

Please be assured that your personal information and data will be treated confidentially and will only be accessible to the members of the Survey Group of the Helmholtz Juniors. Any publication or sharing of information with groups outside the survey group will comply with the General Data Protection Regulation (Link: <https://gdpr-info.eu/>) (GDPR). Accordingly, only aggregated and anonymized data will be shared with the administrative bodies of the centers/institutes/units and the public (as well as with PhD representatives upon request).

This survey is hosted on the servers from the Helmholtz Association employing the software solution LimeSurvey. It uses a unique token system tied to your Email. You can leave and come back to complete this survey using your personal link. Please note that only completed surveys will be analyzed.

In order for this survey to be representative, it is vital that the majority of doctoral researchers participate. This questionnaire will take around ... minutes to complete.

If you have any questions, or wish to report technical issues, you can reach us at [heju-survey@listserv.dfn.de](mailto:heju-survey@listserv.dfn.de).

By clicking 'Next', you accept the terms and conditions listed above, including the use of the provided data in case you complete the survey. More information regarding our data security policy can be found [here](#) (Pflichtinformation nach §13 und 14 DSGVO, angehängt).

## Question 0)

This survey contains questions that could be perceived as sensitive and very personal. This includes questions regarding: gender, sexual orientation, ethnicity, general family situation, bullying, sexualized harassment, discrimination as well as health. For these sensitive questions, the first option will always be “I don't want to answer this question”.

Due to the sensitive nature of these questions, below you can choose to not be presented with any of these questions.

However, it is very important for us to ask these questions because they are key determinants for the well-being of doctoral researchers and the environments they work in. Furthermore, we want to understand and portray the diversity present in our organizations.

As for example, the data is used to assess discrimination: If e.g. 50 people feel discriminated because of their sexual orientation does not help us to evaluate the whole problem, as those 50 people could represent only 2% of the Doctoral Researchers from the LGBTIQ+ community or 100%. The first one, would be problematic, as every case of discrimination is one too much but the second one, could indicate a structural problem.

### ***Would you like to be presented with these questions?***

- Yes, it is okay for me.
- No, I prefer not to see them.

All sensitive questions (marked in blue below) will be filtered by the answer here.

## (A) General

In this section, we will ask general questions about yourself and your doctoral project.

### A.1) Have you participated in the last N2 survey 2019?

- Yes
- No
- I don't remember
- I don't want to answer this question

### A.2) Which institute/section/center are you associated with?

[DROP DOWN BASED ON ORGANIZATION]

- I don't want to answer this question

*Comments: Institute-specific data can be useful to facilitate change in single institutes but needs to be balanced with the need to reduce data collected and ensure anonymity. "Associated" chosen as a word because it also includes PhDs who are not officially employed by the institutes but only working at the institutes*

### A.3) Which field (subject) are you working in?

- Humanities
- Law and economics
- Social and Behavioral Sciences
- Biology
- Medicine/Veterinary medicine
- Health sciences
- Agriculture, Forestry
- Chemistry
- Physics
- Mathematics
- Geosciences
- Computer science
- Engineering
- Other, please specify: [FREE TEXT]
- I don't want to answer this question

### A.4) My overall work is predominantly

Choose one of the following answers. Please refer to your overall situation during your PhD.

If you choose 'Other:' please also specify your choice in the accompanying text field.

Please choose **only one** of the following:

- Laboratory work
- Fieldwork
- Computational work
- Library/chronicle work
- Theoretical/methodological work
- I don't want to answer this question
- Other [FREE TEXT]

**A.5) What is your year of birth?**

- Year of birth: [drop down: 1970 - 2005]
- I don't want to answer this question

**A.6) To which gender do you identify most?**

- I don't want to answer this question
- Woman
- Man
- Gender diverse (Gender-fluid)
- Non-binary
- Other [FREE TEXT]

**A.7) With which sexual orientation do you identify most?**

- I don't want to answer this question
- Heterosexual
- Homosexual
- Bisexual
- Queer
- Asexual
- Other [FREE TEXT]

**A.8) When did you start your PhD?**

Explanation: The start of your doctoral research is either the start of your first contract/stipend or your enrollment in a university as a doctoral researcher, whichever is earlier.

- [YEAR] [RESTRICT NUMBER TO -6 YEARS FROM NOW] (2014 or earlier, 2015 - 2021)
- [MONTH]
- I don't know
- I don't want to answer this question

**A.9) When do you expect to submit your PhD Thesis?**

- [YEAR][RESTRICT NUMBER TO +6 YEARS FROM NOW] (2021-2028, 2029 or later)
- [MONTH]
- I don't know
- I don't want to answer this question

**A.10) I identify my ethnicity as:**

Please choose all that apply(multiple options):

- I don't want to answer this question
- European/European descent
- Latino/Hispanic
- Middle Eastern
- African
- Caribbean
- South Asian
- East Asian/Southeast Asian
- Pacific Islander
- Northeast Asian
- Other [FREE TEXT]

To get a better picture on the diversity of the (organization) we're asking questions regarding to your ethnicity. Please select the option(s) that you feel best represent(s) you. We hope this can shed light on issues certain groups could be facing within the (organization). Please be assured that your data will be treated confidentially and used in an ethical way.

(attach EU document about asking

[https://ec.europa.eu/newsroom/just/document.cfm?action=display&doc\\_id=45791](https://ec.europa.eu/newsroom/just/document.cfm?action=display&doc_id=45791))

**A.11) What is your citizenship? Should you have multiple citizenships, please select the one you feel best represented by.**

- German
- Citizen within the European Union
- Citizen outside of the European Union
- I don't want to answer this question

**A.12 a) Were your parents born in Germany?**

Filter for Germans (question A11)

- I don't want to answer this question
- Yes, both of my parents were born in Germany
- Only one of my parents were born in Germany
- No, none of my parents were born in Germany
- I don't know

**A.12 b) Were you born in Germany?**

Filter for Germans (question A11)

- I don't want to answer this question
- No, I was born outside of Germany
- Yes, I was born in Germany

**A.13) Do you consider yourself to have a disability?**

- I don't want to answer this question
- Yes and I have a "Schwerbehindertenausweis" (handycapped pass)
- Yes, but it is not officially recognized in Germany
- No

**A.14) Is there anything regarding this section you would like to tell us?**

[FREE TEXT]

## **(B) Working conditions**

In this section, we ask you about your salary or income, possible contract extensions, your working hours or the number of holidays that you are entitled to.

### **B.1) How is your doctoral research currently financed (multiple answers possible)?**

*Explanation: A contract is usually paid according to the TVöD / TVL system (e.g. 50% or 65%) and also includes the Fördervertrag. With a stipend, you are not legally bound to your workplace but also do not pay into the social security system.*

- Contract (internal from Helmholtz)
- Contract (external/guest contract)
- Internal stipend
- External stipend/ scholarship from Germany
- External stipend/ scholarship from abroad
- Unpaid
- Other [FREE TEXT]
- I don't know
- I don't want to answer this question

### **B1a) Does your stipend get a top-up contract by your center/institute? [Filter for external stipend in B1]**

- No, I don't get a top-up
- Yes
- I don't know
- I don't want to answer

### **B.1b) For how long have you been working on your PhD without pay? (filter: choosing B.1 unpaid)**

- 0-3 months
- 4-6 months
- 7- 9 months
- 10-12 months
- more than 12 months
- I don't want to answer

### **B.1c) Please select all as to why you are currently unpaid (filter: choose B.1 unpaid)**

- It is my choice
- My funding extension was not granted
- The funding ran out
- Other (please specify)
- I don't want to answer this question

### **B.1d) Are you currently collecting unemployment benefits ("Arbeitslosengeld")? (filter: choose B.1 unpaid)**

- Yes
- No
- I do not want to answer this question



**B.2) Right now, what is your monthly net income for your work at your research organization in euros?**

*Explanation: Net income is the amount of money transferred to your bank account every month. Do not count any bonuses such as a Christmas bonus etc. Scholarship holders and freelancers: deduct tax and health insurance. Income not related to work in the institute/doctoral research should not be included.*

- < 500
- 500-700
- 701-1000
- 1001-1100
- 1101-1200
- 1201-1300
- 1301-1400
- 1401-1500
- 1501-1600
- 1601-1700
- 1701-1800
- 1801-1900
- 1901-2000
- 2001-2100
- 2101-2200
- 2201-2300
- 2301-2400
- 2401-2500
- > 2500
- I don't want to answer this question
- I don't know

(Drop down)

**B.3) How much do you pay for your rent and associated living costs per month in euros (e.g., heating, gas, water, and electricity)?**

*Example: Your rent is 600€, you additionally pay 70€ for warm water and heating, 20€ for electricity, 20€ for internet and 10€ for garbage disposal plus elevator fees. This amounts to total costs of 720€.*

- <100
- 100-200
- 201-300
- 301-400
- 401-500
- 501-600
- 601-700
- 701-800
- 801-900
- 901-1000
- 1001-1100
- 1101-1200
- 1201-1300
- 1301-1400
- 1401-1500
- 1501-1600

- 1601-1700
- 1701-1800
- 1801-1900
- 1901-2000
- >2000
- I don't want to answer this question
- I don't know

**B.4) What was or is the longest duration of your contract or stipend related to your PhD project?** (Drop down)

- <6 months
- 6-12 months
- 13-24 months
- 25-36 months
- 37-48 months
- >48 months
- I don't want to answer this question
- I don't know

**B.5) If any, how many extensions or additional contracts/stipends did you get during your PhD?**

*Choose one of the following answers*

- How many? (dropdown : 1,2,3,4,5, more than 5)
- I did not get any extensions or additional contracts/stipends
- I don't know
- I don't want to answer this question

**B.6) Would it be possible for you to extend your contract/stipend for the following reasons (options: Yes, No, I don't know, I don't want to answer this question)**

- More time needed to complete PhD project
- Wrap-up phase after completion of the PhD project
- Parental leave

**B.7) Are you financially responsible for anyone else?**

- Yes
- No
- I don't want to answer this question

**B.8) Do you get external financial support to cover your living expenses? If yes, who is assisting you financially (multiple answers possible)?**

[MULTIPLE ANSWERS POSSIBLE]

- I took up a loan for my time as a doctoral researcher
- Parents
- Other relatives
- Partner(s)
- State - Kindergeld
- Other job
- I do not get external financial support
- I don't want to answer this question
- Other, please specify [FREE TEXT]

**B.8a) How strongly do you depend on this external support to cover your living expenses?**

(if yes from C6)

- Very strongly
- Strongly
- Neither/Nor
- Weakly
- Not at all
- I don't want to answer

**B.9) Did you spend parts of your salary on items you primarily used for work in the past year? If yes, how much money in Euros did you spend?**

- No
- Yes, I spent roughly the following amount: € [only integers]
- Yes, but I do not know or do not want to disclose the amount
- I don't want to answer this question

**B.9a) What did you buy from parts of your salary on items you primarily used for work?**

Filter for C8

- Computer
- Chair
- Computer hardware (cable, mouse, camera, microphone, headset)
- Tablet
- Screen
- External hard drives
- Office equipment (folders, pens,...)
- Software
- Desk
- Books and articles
- Accounts for databases
- I don't want to answer this question

Other [free text]

**B.10) How many holidays per year can you take according to your contract or stipend?**

- My funding does not specify the number of holidays
- 1- 5 days
- 6 -10 days
- 11- 15 days
- 16 -20 days
- 21 - 25 days
- 26 - 30 days
- More than 30 days
- I don't know
- I don't want to answer this question

**B.11) How many hours per week are you expected to work according to your contract?  
Please specify the number of hours in the field "Hours per week".**

Example: A 50% contract according to TVöD demands you to work 20h or 19.5h depending on the state you work in.

Conditions: The answer was 'Contract' at question '10 [B1]' (How is your doctoral research currently financed (multiple answers possible)?)

- Hours per week [drop down: 0-45]
- I don't know
- I don't want to answer this question

**B.12) Is there anything regarding this section you would like to tell us?**

## (C) Satisfaction

In this section, we ask questions about how satisfied you are with different aspects of your work as a doctoral researcher, e.g. which of them could be improved, what you think about a career in academia, and if you have ever considered quitting your PhD.

**C.1) If you think about your own situation as a doctoral researcher, how satisfied are you with the following aspects?** [ANSWER POSSIBILITIES: “very satisfied”, “satisfied”, “neither/nor”, “dissatisfied”, “very dissatisfied”, “does not apply”, “I don’t want to answer this question”]

- Supervision
- Salary
- Vacation days
- Support for international doctoral researchers
- Bureaucracy and administrative support
- Internal workshops and skill training
- Contribution to science
- Technical support
- Career development
- Science communication and outreach
- Psychological support
- Laboratory equipment
- Office equipment
- Scientific support
- Family support
- Work environment and atmosphere
- Workload
- Social life at the institute
- Adherence to good scientific practice in my work environment

*Technical: randomize order*

**C.2) Have you ever considered quitting your PhD?**

- Never
- Rarely
- Occasionally
- Often
- I am quitting
- I don’t know
- I don’t want to answer this question

**C.3) What was/were the reason(s) for considering to quit your PhD? (multiple answers possible)**

*Conditions:*

*Answer was 'Rarely' or 'Occasionally' or 'Often' or 'I am quitting' at question '29 [C2]' (Have you ever considered quitting your PhD?)*

Please choose **all** that apply:

- I do not like scientific work.
- I do not like my topic.
- I have problems getting by financially.
- I do not like my working conditions.
- I have difficulties with my supervisor.
- I don’t like the social environment at my workplace.

- I find my career prospects unattractive.
- I have personal reasons.
- I do not feel qualified enough.
- I have no or poor academic results.
- I find other jobs more interesting.
- I can't cope with the high workload.
- My academic life is not compatible with my family responsibilities.
- My health.
- My project is not funded anymore.
- I have administrative problems.
- I got another job offer.
- I don't want to answer this question.
- I don't know.
- Other, please specify:

*technical: randomize order*

**C.4) On average, how many hours do you typically work per week in total?**

*Explanation: Working time - that is both for your dissertation and all other tasks you have to perform at your institute or university, for instance, project work or meetings (in your office as well as at other places) and teaching*

- < 20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 61-65
- 66-70
- 71-75
- 76-80
- > 80
- I don't know
- I don't want to answer this question

**C.5) What percentage of your working time do you currently spend on average on the following tasks?**

- Scientific work directly related to the doctoral research [INTEGER]
- Scientific work not related to the doctoral research (helping other projects, maintenance, etc.) [INTEGER]
- Attending courses and seminars [INTEGER]
- Teaching/supervision [INTEGER]
- Administrative tasks [INTEGER]
- Other: [FREE TEXT]

*Comment: Technical implementation: Each answer must be between 0 and 100  
The sum must be at most 100. Only integer values may be entered in these fields.*

**C.6) Are your working hours tracked officially in your institute?**

- Yes
- No
- No, but I track my working hours myself
- I don't want to answer this question

**C.7) How often have you worked during weekends or public holidays in the past year?**

This question asks for work related to your PhD. It is place-independent and includes all work done at your institute/center, your home or any other location. It does not include an additional part-time job or other work which is unrelated to your PhD.

- Never
- Less than once per month
- Once per month
- Twice per month
- Three times per month
- Every weekend
- I don't know
- I don't want to answer this question

**C.8) How many days did you take off (holiday) in the past year?**

- None
- 1- 5 days
- 6 -10 days
- 11- 15 days
- 16 -20 days
- 21 - 25 days
- 26 - 30 days
- More than 30 days
- I don't want to answer this question
- I don't know

**C.9) Do you feel free to take days off (holidays)?**

[MULTIPLE ANSWERS POSSIBLE]

- Yes
- No, because of pressure from my supervisor(s)
- No, because of high workload
- No, because I am saving up time for a longer period of vacation
- No, because of no special reason
- No, because other reason [FREE TEXT]
- I don't want to answer this question

**C.10) In general, how do you judge the following aspects of an academic research career?**

[ANSWER POSSIBILITIES: "very attractive", "attractive", "neutral", "unattractive", "very unattractive", "I don't want to answer"]

- Availability of permanent positions
- Workload
- Service to society
- science communication and outreach

- Diversity of work
- Self-fulfillment
- Applying for and obtaining funding
- Mobility (i.e., work in different countries or cities)
- Teaching
- Compatibility of own career plans with having children
- Interesting work
- Salaries in academia
- Skill development
- Compatibility of own career plans with career plans of partner

*technical: randomize order*

**C.11) Which of the following aspects of your work as a doctoral researcher would you like to improve? (multiple answers possible)**

[ANSWER POSSIBILITIES: “not at all”, “rather not”, “to some extent”, “very much”, “I don’t know”, “I don’t want to answer”]

- Vacation days
- Support for foreign employees
- Social life at the institute
- Salary and benefits
- Bureaucracy and administrative support
- Office equipment (e.g. computer, software, own desk etc.)
- Workshops and skill training
- Career development
- Workload
- Technical support
- Scientific support
- Psychological support
- Family support
- Contribution to science
- Science communication and outreach
- Laboratory equipment
- Supervision
- Work environment and atmosphere

*technical: randomize order*

**C.12) Is there anything regarding this section you would like to tell us?**



## (E) Supervision

For the following questions, we would like to make the distinction between “formal” and “direct” supervisor clear: “Formal” supervisor refers to the main advisor of your thesis; whereas “direct” supervisor refers to the person you actually consult and discuss your project with on a more regular basis.

### E.1) Do you have one of the following (multiple answers possible)

Explanation PhD supervision agreement: This is a written agreement between the formal supervisor and the doctoral researcher outlining their responsibilities from the beginning of the PhD project until the completion of the doctoral thesis.

Explanation project outline: This is a preliminary project plan defining the objectives of the PhD project as well as the methodology to achieve them within the given timeframe of a doctoral research project.

Explanation training plan: This is a plan detailing the courses mandatory for the completion of your PhD.

Explanation thesis advisory committee: A thesis advisory committee or “TAC” is a group of two or more independent researchers (including your formal/primary supervisor) who you meet on a regular basis, give you advice on how to progress and successfully complete your PhD project.\*

[MULTIPLE ANSWERS POSSIBLE]

- A supervision agreement with my formal supervisor?
- A written project outline?
- A written training plan?
- A thesis advisory committee (TAC) or similar?
- PhD guidelines?
- I don't have any of the above
- I don't know
- I don't want to answer this question

### E.2) How often do you meet your thesis advisory committee (TAC) or similar? Conditions:

Answer was at question '42 [E1]' (Do you have one of the following (multiple answers possible) = A thesis advisory committee? )

- I meet my TAC twice a year or more frequently
- I meet my TAC once per year
- I meet my TAC once during my PhD
- There are no regulations to meet my TAC
- I don't know
- I don't want to answer this question

### E.3) Is your formal supervisor your direct supervisor?

- Yes
- No
- I don't have a formal supervisor yet
- I don't have a direct supervisor yet
- I don't know
- I don't want to answer this question

**E.4) Which gender does your supervisor presents as? [answer possibilities: male, female, diverse, I don't know]**

- direct supervisor
- formal supervisor [*Conditions: Answer was 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?)*]

**E.5a) How often do you communicate on average with your formal supervisor about your PhD project?**

*Conditions: Answer was 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?) - only those with distinction between direct and formal supervisor!*

- Almost daily
- Weekly
- Every second week
- Monthly
- Quarterly
- Six-monthly
- Yearly
- Less than once a year
- Never
- I don't know
- I don't want to answer this question

*Filter: If yes in E3 then don't ask this question.*

**E.5b) How often do you communicate on average with your direct supervisor about your PhD project?**

*Conditions: Answer was 'Yes' or 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?) - basically everybody!*

- Almost daily
- Weekly
- Every second week
- Monthly
- Quarterly
- Six-monthly
- Yearly
- Less than once a year
- Never
- I don't know
- I don't want to answer this question

**E.6a) How often would you like to communicate with your formal supervisor about your PhD project?**

*Conditions: Answer was 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?)*

- Almost daily
- Weekly
- Every second week
- Monthly
- Quarterly
- Six-monthly
- Yearly

- Less than once a year
- Never
- I don't know
- I don't want to answer this question

**E.6b) How often would you like to communicate with your direct supervisor about your PhD project?**

Conditions: Answer was 'Yes' or 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?)

- Almost daily
- Weekly
- Every second week
- Monthly
- Quarterly
- Six-monthly
- Yearly
- Less than once a year
- Never
- I don't know
- I don't want to answer this question

**E.7a) Please rate the supervision provided by your formal supervisor.**

[ANSWER POSSIBILITIES: Fully agree; Partially agree; Neither agree nor disagree; Partially disagree; Fully disagree; I don't know, I don't want to answer this question] [Filter: Conditions: Answer was 'No' or 'I don't know' or 'I don't want to answer this question' at question '45 [E3]' (Is your formal supervisor your direct supervisor?).]

- My supervisor treats me professionally.
- My supervisor is well informed about my field of research.
- My supervisor is available when I need advice.
- My supervisor is well informed about my current state of PhD project.
- My supervisor has strict requirements for my work.
- My supervisor has clear requirements for my work.
- My supervisor is open to and respects my research ideas.
- My supervisor supports my professional development (establishing contacts, recommending conferences...).
- My supervisor gives constructive feedback.
- My supervisor encourages me to work independently.
- My supervisor treats me politely.
- My supervisor adheres to good scientific practice
- My supervisor has good leadership skills

**E.7b) Please rate the supervision provided by your direct supervisor.**

[ANSWER POSSIBILITIES: Fully agree; Partially agree; Neither agree nor disagree; Partially disagree; Fully disagree; I don't want to answer this question]

- My supervisor treats me professionally.
- My supervisor is well informed about my field of research.
- My supervisor is available when I need advice.
- My supervisor is well informed about my current state of PhD project.
- My supervisor has strict requirements for my work.
- My supervisor has clear requirements for my work.

- My supervisor is open to and respects my research ideas.
- My supervisor supports my professional development (establishing contacts, recommending conferences...).
- My supervisor gives constructive feedback.
- My supervisor encourages me to work independently.
- My supervisor treats me politely.
- My supervisor has good scientific practice
- My supervisor has good leadership skills

*technical: randomize order*

**E.8) Did you ever encounter problems regarding your supervision? (multiple answers possible)**

[MULTIPLE ANSWERS POSSIBLE]

- Not enough meetings
- Too many meetings
- Not enough scientific discussion
- Meetings not regular enough
- Not enough experts in my group
- Supervisors not experienced enough in my field
- Not enough feedback
- Not enough encouragement
- The personality of my supervisor
- Disagreement between supervisors
- Disagreement about publication
- No problem with supervision
- Other, please specify [FREE TEXT]
- I don't want to answer this question

*technical: randomize order*

**E.9) Are doctoral researchers involved in the process of director/professor/group leader hirings at your institutions?**

*E.g. by giving a letter of recommendation or being asked for their opinion after a presentation by the applicant,.... (more examples??)*

- Yes, we have an active say
- Yes, but we don't have an active say
- No
- I don't know
- I don't want to answer this question

**E.10) Is there anything regarding this section you would like to tell us?**

## (H) Integration

In this section, we ask you how integrated you feel at your [center/institute] in terms of language barriers and social integration and if you received support with administrative tasks.

### **H.1a) For which of the following aspects did you receive support from your institute (multiple answers possible)?**

Explanation 'support': You may have received support to fulfill different administrative tasks and to give you guidance in the process. This support may have been in the form of an information document, personal e-mail or oral correspondence and has been given to you directly or at least upon request. Examples of 'support' can be checklists for University enrollment, visa application, or local resident registration etc.

[MULTIPLE ANSWERS POSSIBLE]

- University enrollment
- Application to a graduate school
- Finding accommodation
- Registering at the local Resident Registration Office
- Visa for my residency
- Immigration office
- Translation of working contract and relevant documents
- None of the above
- Other, please specify [FREE TEXT]
- I don't know
- I don't want to answer this question

### **H.1b) For which of the following aspects would you have needed more support from your institute? (multiple answers possible)?**

[MULTIPLE ANSWERS POSSIBLE]

- University enrollment
- Application to a graduate school
- Finding accommodation
- Registering at the local Resident Registration Office
- Visa for my residency
- Translation of working contract and relevant documents
- None of the above
- Other, please specify [FREE TEXT]
- I don't know
- I don't want to answer this question

### **H.2) Do you speak German?**

conditions: Answer was 'Citizen within the European Union (EU)' or 'Citizen outside the European Union (EU)' or 'I don't want to answer this question' at question '4 [A4]' (What is your citizenship?)

- None
- Beginner (A1 - A2)
- Intermediate (B1 - B2)
- Fluent (C1 - C2)
- Native
- I don't want to answer this question

**H.3) Is language an obstacle for communication with people at your center/institute?**

*Conditions: Answer was 'None' or 'Beginner (A1 - A2)' or 'Intermediate (B1- B2)' or 'I don't want to answer this question' at question '61 [H2]' (Do you speak German?)*

- Very much
- To some extent
- Rather not
- Not at all
- I don't want to answer this question

**H.4) Is all the important information (group internal, administrative, your contract/stipend) available in a language you understand?**

*Conditions: Answer was 'None' or 'Beginner (A1 - A2)' or 'Intermediate (B1- B2)' or 'I don't want to answer this question' at question '61 [H2]' (Do you speak German?)*

- Yes, all of the information is available
- Most of the information is available
- Some of the information is available
- No, none of the information is available to me
- I don't want to answer this question

**H.5) Are there regular social activities in your group or at your institution (e.g., sports events, going out for dinner/drinks, discussion forums, movie nights, OR RESPECTIVE ONLINE VERSIONS DURING THE PANDEMIC etc.)?**

- Yes, and I attend them always
- Yes, and I attend them often
- Yes, and I attend them sometimes
- Yes, but I rarely attend them
- Yes, but I do not attend them
- No, there are no social activities
- I don't know
- I don't want to answer

**H.6) Is there anything regarding this section you would like to tell us?**

## (I) Career development

In this section, we ask you about your career plans and how you evaluate the measures in place at your [institute/center] to prepare you for your future career (publications, transferable skills, soft skills, etc.).

### ***1.1) Are you currently enrolled in a graduate school?***

- Yes, at my institution
- Yes, somewhere else
- No
- I don't know
- I don't want to answer this question

### ***1.2) Which field would you like to work in after completing your PhD (multiple answers possible)?***

[ANSWER POSSIBILITIES: *Not at all, Rather not, Indifferent, Rather yes, Very much, I don't know, I don't want to answer this question*]

- Academia
- Non-academic scientific research
- Public sector science-related job (e.g., public relationships or science management)
- Private sector science-related job (e.g., public relationships or science management)
- Non-scientific job
- Take an extended break
- Start my own business
- Further education (e.g. another PhD, MBA)

### ***1.3) Which of the following measures for your career development are supported by your center/institute?***

[ANSWER POSSIBILITIES: "yes, to a great extent", "yes, to some extent", "no", "I don't know", "I don't want to answer"]

- Mobility period (e.g. internships, research stays,...)
- Language classes
- Mentoring
- Soft skill courses
- Practical courses (e.g. method-oriented courses, ...)
- Transition to a non-academic career (e.g. career fairs, career talks, networking possibilities,...)
- Career development office/ career center

### ***1.4) How does your institute support you in learning German?***

conditions: *The answer was NOT 'Native' at question '61 [H2]' (Do you speak German?)*

- My institution offers German courses
- My institution offers monetary support for external courses
- My institution permits attendance of courses during working hours
- My institution does not offer any support for learning German
- I don't know
- I don't want to answer this question

***1.5) Do you think that you are well trained for a job outside science/academia?***

A job outside academia can be in industry or public service not related to publicly funded research institutions.

- Very well prepared
- Well prepared
- Unprepared
- Very unprepared
- I don't know
- I don't want to answer this question

***1.6) Do you think that you are well trained for a job inside science/academia?***

A job outside academia can be in industry or public service not related to publicly funded research institutions.

- Very well prepared
- Well prepared
- Unprepared
- Very unprepared
- I don't know
- I don't want to answer this question

***1.7) Anything regarding this section you would like to tell us?***



## (J) Family

In this section, we ask questions related to family life while conducting your doctoral research project. We are interested in whether you have children and how families are supported by your institute in terms of childcare, organizational and financial aspects.

### **J.1) Do you have or are you currently expecting children?**

- Yes (if yes, then J3 and J4)
- No
- No, but I am planning to have one during my PhD (filter to skip J2)
- I don't want to answer

### **J.1b) Your youngest child is...**

(filtered for J.1 = Yes)

- Not in external daycare [yet]
- In daycare or kindergarten
- In primary/elementary school
- In secondary school
- I don't want to answer

### **J.2) Are you considering having (more) children during your doctoral research project? (multiple answers possible)**

[MULTIPLE ANSWERS POSSIBLE]

- Yes (if yes, then J3 and J4)
- No, I do not want children (yet)
- No, because I don't have the money to support children
- No, because my working conditions are not family-friendly
- No, because I fear jeopardizing my career
- No, for other reason
- I don't know
- I don't want to answer this question

J3 and J4 filtered for J1=yes, J1 - no, but planning and J2 - yes

### **J.3) Does your institute offer support in childcare services? (multiple answers possible)**

[MULTIPLE ANSWERS POSSIBLE] [Filter for Yes in J1 and/or J2 or J1 – no, but planning]

- Access to daycare
- Financial support for daycare
- Child-friendly work environment
- Parent-friendly work environment
- Reimbursements for daycare during business travel
- Home office / mobile work
- There is no support
- I don't know
- I don't want to answer this question

### **J.4) Do you feel that there is sufficient support (financial and organizational) from your institute for raising/caring for a child? [Filter for Yes in J1 and/or J2 or J1 – no, but planning]**

- Yes
- No
- I don't know
- I don't want to answer this question

**J.5) Do you have caring responsibilities apart from children?**

- Yes
- No
- I don't want to answer this question

**J.6) Do you feel you are supported by your center in your caring responsibilities apart from children? (FILTER for J5 = yes)**

- Yes
- No
- I don't know
- I don't want to answer this question

**J.7) Do you feel able to unite your caring responsibilities with your PhD? (filtered for J.1 = Yes or J.5 = Yes)**

- Very much
- To some extent
- Rather not
- Not at all
- I don't know
- I don't want to answer

**J.8) Is there anything regarding this section you would like to tell us?**

## **(F) Power abuse [additional module]**

In this section, we ask you about mechanisms for conflict resolution in place at your [institute/center], conflicts you are experiencing during your PhD, for instance with a superior and your satisfaction with the resolution of these conflicts.

### ***F.1) Which of the following mechanisms are you aware of that can help you in case of a conflict with a superior? (multiple answers possible)***

A superior in your working context is a person in a position of power over you, for example by having an influence on the success of your academic career or the prolongation of your working contract. Abuse of power describes the behavior of a superior using their power for personal gain and/or to your disadvantage and can take many forms.

[MULTIPLE ANSWERS POSSIBLE: Adapt answers per organization!]

- Ombudsperson
- Human Resources
- Works Council
- Equal Opportunity officer
- Graduate School
- PhD representatives
- Medical services and counseling
- Security service
- I am not aware of any of the above
- Other, please specify [FREE TEXT]
- I don't want to answer this question

### ***F.2) Did you ever report a conflict to one of the institutions above?***

- Yes
- No, although I had a serious conflict
- No, I never had any serious conflict
- I don't know
- I don't want to answer this question

### ***F.2a) Why did you not report your conflict?***

(Filter for F2 = No, although I had a serious conflict)

Please choose all that apply:

- I wasn't sure whom to report it to
- I didn't think it would be resolved
- I felt that the people who I could report to were not sufficiently trained to deal with it
- I was afraid of repercussions
- I didn't think the conflict was severe enough
- I could deal with it myself
- I don't want to answer this question
- Other: [FREE TEXT]

### ***F.2b) With whom was the conflict?***

(filter for F2=yes and F2- no, bu serious conflict)

- Formal Supervisor
- Direct Supervisor
- Other Doctoral Researcher
- Other scientific staff
- Administrative Staff

- Technical staff
- Others [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.3) How satisfied were you with the consequences of your report.** *Conditions: Answer was 'Yes' at question '84 [F2]' (Did you ever report a conflict with a superior to one of the institutions above?)*

- Very dissatisfied
- Dissatisfied
- Neither satisfied nor dissatisfied
- Satisfied
- Very satisfied
- Still ongoing
- I don't know
- I don't want to answer this question

**F.4) While working at your institute/center, have you at any point experienced unwanted behavior that you would call "sexualized harassment"?** (Multiple choice)

- I don't want to answer this question
- Intrusive/unwanted looks and/or non-physical approaching, e.g. catcalling , whistling, staring,...
- Unwanted verbal remarks of a sexualized nature and/or obscene gestures, e.g. sexualized innuendos, jokes and comments on one's appearance,...
- Spreading sexualized information/rumors/lies about a person
- Unwanted material/messages/calls of sexual nature
- Unwanted touching or physical contact, e.g. patting my back, stroking, hugging,...
- Requests for sexual favors or unwelcome sexual advances.
- Feeling pressured to engage with someone sexually.
- Physical acts of sexual assault
- No, I have not been subject to sexual harassment
- Other [FREE TEXT]

**F.4a) How often have you been subject to sexualized harassment?**

(if chose yes from F4)

- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question

**F.4b) Who was(were) the perpetrator(s) of sexualized harassment?** (Multiple choice)

(if chose yes from F4)

- Formal Supervisor
- Direct Supervisor
- Other Doctoral Researcher
- Other scientific staff
- Administrative Staff

- Technical staff
- Others [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.5) While working at your institute/center, have you at any point witnessed unwanted behavior that you would call "sexualized harassment"?**

- Yes
- No
- I don't know
- I don't want to answer this question

**F.5a) How often have you witnessed sexual harassment?**

(if chose yes from F5)

- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question

**F.5b) Who was(were) the perpetrator(s) of sexual harassment? (Multiple choice)**

(if chose yes from F5)

- Formal Supervisor
- Direct Supervisor
- Other Doctoral Researcher
- Other scientific staff
- Administrative Staff
- Technical staff
- Others [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.6) While working at your institute/center, have you at any point been subject to any of these forms of bullying? (Multiple choice)**

- I don't want to answer this question
- **Indirect bullying**, e.g. spreading rumors, lies, making fun of a person, withholding information,...
- **Destabilization**, e.g., failure to give credit when due, constant non-constructive criticism, removal of responsibility, preventing access to opportunities,...
- **Pressured overwork**, e.g., impossible deadlines, unnecessary disruptions,...
- **Verbal harassment**, e.g., name-calling, insults, intimidation, yelling,...
- **Social isolation**, e.g. damage to friendship networks, exclusion,...
- **Threat to professional status**, e.g., degrading one's opinion, public professional humiliation, accusation regarding lack of effort, tampering with a person's work equipment,...
- **Physical attack**, e.g. pushing,...
- No, I have not been subject to bullying
- Other [FREE TEXT]

- I don't know

**F.6a) How often have you been subjected to these forms of bullying?**

(if chose yes from F6)

- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question

**F. 6b) Who was the perpetrator(s) of bullying? (Multiple choice)**

(if chose yes from F6)

- Formal Supervisor
- Direct Supervisor
- Other Doctoral Researcher
- Other scientific staff
- Administrative Staff
- Technical staff
- Others [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.6c) What did you perceive as the basis for bullying? (Multiple choice)**

(if chose yes from F6)

- Gender
- Ethnic group
- Age
- Physical properties (e.g. disability)
- Position of Power/Hierarchy
- Other [Please specify]
- I don't want to answer this question
- I don't know

**F.7) While working at your institute/center, have you at any point witnessed bullying?**

- Yes
- No
- I don't want to answer this question
- I don't know

**F.7a) How often have you witnessed bullying?**

(if chose yes from F7)

- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question

**F.7b) Who was the perpetrator(s) of bullying? (Multiple choice)**

(if chose yes from F7)

- Formal Supervisor
- Direct Supervisor
- Other Doctoral Researcher
- Other scientific staff
- Administrative Staff
- Technical staff
- Others [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.7c) What did you perceive as the basis for bullying? ? (Multiple choice)**

(if chose yes from F7)

- Gender
- Ethnic group
- Age
- Physical properties (e.g. disability)
- Position of *power/hierarchy*
- Other [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.8) Have you ever felt discriminated against in your work environment because of one or more of the following? (multiple answers possible)**Please choose **all** that apply:

- Nationality
- Ethnicity
- Age
- Sexual orientation
- Gender identity
- Religion
- Disability
- Parenthood
- Mental health
- Pregnancy and maternity
- I have not felt discriminated in my work environment so far
- Other: [FREE TEXT]
- I don't know
- I don't want to answer this question

**F.9) Is there anything regarding this section you would like to tell us?**

If you suffer from serious cases of bullying or sexualized harassment, please be aware that those might be cases of legal offense. Therefore, the German state protects you by law.

If you think, this might be applicable to you, please reach out to your centers resources (Ombudspersons, Workers Council or Human Resources) and state your case.

Always remember, you are not alone in this situation and there are people who can help you!



## **(D) Mental health [additional module]**

In this section, we ask you about your well-being. With this section we acknowledge the obstacles, pressure to perform, as well as the impact the latter can have on your mental health.

The term “mental health” has been explained by many scholars. According to the WHO, it has been described as: "subjective well-being, perceived self-efficacy, [...] and self-actualization of one's intellectual and emotional potential, among others."

We want to, again, stress the importance of confidentiality and anonymity of the answers submitted during your participation in this survey. If you feel uncomfortable with the questions in this section, you will always have the option “I don't want to answer this question”.

Since it is a particularly sensitive topic, we want to provide you with the option to not be presented with these questions.

### **D.0) Would you like to be presented with these questions?**

- Yes, it is okay for me
- No, I prefer not to see them

*Filter whole section for D0*

### **D.1) Please read each statement below and then indicate how you feel right now, at this moment.**

*[ANSWER POSSIBILITIES: “Not at all”, “Somewhat”, “Moderately”, “Very much”, “I don't want to answer”]*

- I feel calm
- I feel tense
- I feel upset
- I feel relaxed
- I feel content
- I feel worried

### **D.2) Please read each statement below and then indicate how you generally feel.**

*[ANSWER POSSIBILITIES: “Not at all”, “Somewhat”, “Moderately”, “Very much”, “I don't want to answer”]*

- I am “calm, cool and collected”
- I feel that difficulties are piling up so that I cannot overcome them
- I worry too much over something that really doesn't matter
- I am happy
- I have disturbing thoughts
- I lack self-confidence
- I feel secure
- I take disappointments so keenly that I can't put them out of my mind
-

**D.3) Over the last two weeks, how often have you been bothered by any of the following problems?**

[ANSWER POSSIBILITIES: “Not at all”, “Several days”, “More than half the days”, “Nearly every day”, “I don’t want to answer this question”]

- Little interest or pleasure in doing things
- Feeling down, depressed or hopeless
- Trouble falling or staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself - or that you are a failure or have let yourself or your family down
- Trouble concentrating on things, such as reading the newspaper or watching television
- Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual

**D.4) If you have been bothered by any problems, how difficult have of the above mentioned problems made it for you to do your work?**

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult
- I have not been bothered by any problems
- I don’t know
- I don’t want to answer this question

**D.5) You answered 'I don't want to answer this question' for all questions in block D. We would be interested in your reasons for not answering.**

*Conditions: I don't want to answer this questions for every option D1-D4*

- I feel uncomfortable answering such questions
- I can’t relate to this type of questions
- I don’t want to answer this question
- Because my current situation is unrelated to work
- Other, please specify

**D.6) Are you aware of your centers/institutes mental health resources?**

- No, I am not aware of any
- Yes, but I have never used them
- Yes and I was satisfied
- Yes, but I was not satisfied
- I don’t want to answer

**D.7) Anything regarding this section you would like to tell us?**

Your mental health is utmost important for the success of your doctoral research project, but also for a happy and fulfilled private life. This survey aims to raise awareness amongst you, your colleagues and the scientific community, as we all have our moments.

Please do not hesitate to turn to one of the included help lines, friends or your doctoral representatives, if especially emotionally touched by these questions.

Most Helmholtz centers have psychological counseling available, which can be used by any doctoral researcher free of charge and within their working time.

If you need help, contact the applicable service from your center:

Center:                      Email of psychological services:

*Email addresses of mental health services were provided for each for the participating centers!*

More information for immediate help can be found on your centers webpage.

**(K) COVID-19 related questions (extra module)**

In this section, we are asking questions on how the COVID-19 pandemic influenced your work as a doctoral researcher.

**K.1) Did you test positive (PCR) for COVID-19 at some point?**

- I don't want to answer this question
- Yes
- No, but I had a positive antibody blood test
- No

**K.2) How do you perceive the COVID-19 pandemic to have impacted the following factors?**

**[Answer matrix/scale with options very positively, positively, neutral, negatively, very negatively, no base for comparison in my case, I don't want to answer this question]**

- Accessibility to equipment/data/methods
- Supervision
- Satisfaction with available time to spend on my research project
- General working productivity
- Work environment and atmosphere
- Networking opportunities
- Workload
- Career development
- I don't want to answer this question

**K.3) Are you expecting a delay in your PhD due to COVID-19?**

- Yes
- No
- I don't know
- I don't want to answer this question

**K.3a) How long do you expect the COVID-19 related delay of your PhD to be? (if yes in 3)**

- 1 month to 18 months, and more than 18... (dropdown)

**K.4a) Filter question for yes in J1**

**How did the pandemic change your caring responsibilities for children and how did it influence your workload? [multiple choice]**

- I had more caring responsibilities (eg. KiTa closed, Homeschooling, caring for elderlies)
- My caring responsibilities did not change
- I had fewer caring responsibilities (eg. help by others, visitor restrictions)
- The additional caring duties made it difficult to keep up with my work
- The additional caring duties caused me to work at different times than usual (eg. evening/night)
- My working efficiency decreased due to the enhanced caring responsibilities
- I enjoyed being able to have more time together with my children/person in care
- I am not able to work from home due to my caring responsibilities
- Other (please specify)
- I don't know
- I don't want to answer this question

**K.4b) Filter question for yes J5**

**How did the pandemic change your further caring responsibilities apart from children and how did it influence your workload? [multiple choice]**

- It did not change/does not apply
- I had more caring responsibilities (eg. KiTa closed, Homeschooling, caring for elderlies)
- My caring responsibilities did not change
- I had fewer caring responsibilities (eg. help by others, visitor restrictions)
- The additional caring duties made it difficult to keep up with my work
- The additional caring duties caused me to work at different times than usual (eg. evening/night)
- My working efficiency decreased due to the enhanced caring responsibilities
- I enjoyed being able to have more time together with my children/elderlies
- I am not able to work from home due to my caring responsibilities
- other (please specify)
- I don't know
- I don't want to answer this question

**K.5) How was your working situation during the pandemic? [never, rarely, sometimes, often, always, I don't want to answer, Does not apply]**

- I wanted to work from home
- I could work from home
- I had to work from home
- I wanted to go to my institute
- I could go to my institute
- I had to go to my institute

**K.6) How many months did you spend in home office since the start of the pandemic?**  
[drop-down: 0-21months]

**K.7) Did you feel safe and protected against a potential COVID-19 infection when working in the institute?**

- Yes
- No
- Does not apply
- I don't want to answer

**K.8) Which COVID-19 support did your institute implement/provide/offer for you? (multiple possible)**

- Extension of contracts
- One-time financial bonus
- Financial support for home office equipment
- Office equipment can be taken home (e.g. chair, computer)
- Mental health support
- Regular covid testing
- Opportunity to do home office
- Opportunity to work on home office from another country
- Reduced office/room occupation density
- Supply for masks
- Access to software/resources via remote desktop
- Other, please specify [open answer]

- None
- I don't want to answer this question

**K.9) How has the COVID-19 pandemic impacted your personal life?**

**[Answer matrix/scale with options very positively, positively, neutral, negatively, very negatively, no base for comparison in my case]**

- - The number of holidays taken compared to before COVID-19
- - Quality of leisure time
- - Quantity of leisure time
- - Contact with relatives
- - My social contacts (friends/colleagues)
- - Separation between work and leisure time
- - Financial situation
- - I don't want to answer this question

**K.10) To which degree would you like to keep work options offered during the COVID-19 pandemic afterward? ["not at all", "rather not", "to some extent", "very much", "I don't know", "I don't want to answer", "I never had the option"]**

- Work from home/ home office
- Flexible working hours / "Vertrauensarbeitszeit"
- Less people in the lab/office
- Video calls/meetings
- Online conference
- Other [open text]

**K.11) How satisfied are you with how your institute handled the pandemic situation?**

**[ANSWER POSSIBILITIES: "very satisfied", "satisfied", "neither/nor", "dissatisfied", "very dissatisfied", "does not apply", "I don't want to answer this question"]**

**K.12) Is there anything regarding this section you would like to tell us?**

***(L) One last question***

***L.1) Would you recommend doing a doctoral research project at your center/institute to a friend?***

- Yes
- No
- I don't know
- I don't want to answer this question

**The end**

***M.1) Anything regarding the survey you would like to tell us?***

***Thank you very much for your participation in the 2021 survey!***

*The data of this survey is invaluable for the realistic assessment of the situation of doctoral researchers in the Helmholtz association and the basis for future improvement for our situation. We will carefully analyse the results after the survey closes and will publish the aggregated survey results in the form of a report as soon as they are available.*

*This questionnaire has been developed in the framework of N. the 'Network of Networks'. It represents more than 18.000 doctoral researchers of the Helmholtz Association, the IPP community Mainz, the Leibniz Association, and the Max Planck Society. It aims to promote doctoral researchers, focusing on working conditions, career development, supervision, and equal opportunities.*

*For any questions, comments and concerns, you are welcome to contact us via email ([heju-survey@listserv.dfn.de](mailto:heju-survey@listserv.dfn.de)) or to get in touch with us directly.*