

Being a Doctoral Researcher in the Leibniz Association: 2019 Leibniz PhD Network Survey Report

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Being a Doctoral Researcher in the Leibniz Association

2019 Leibniz PhD Network Survey Report

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1 Preamble

The Leibniz PhD Network

The Leibniz PhD Network was founded in 2016 by a group of doctoral researchers as an initiative to build a platform for cross-disciplinary exchange among all doctoral researchers in the Leibniz Association and to represent their interests towards the Leibniz Association. One of the aims of the Leibniz PhD Network is to work towards common standards of working conditions for doctoral researchers within the Leibniz Association and help create greater transparency regarding careers within and outside of academia.

The network is organized in a Steering Committee and working groups, which cooperate closely to produce supportive material for the PhD phase, events and online seminars. The Steering Committee is elected on an annual basis by the elected PhD representatives of the Leibniz Institutes. For more information on the Leibniz PhD network visit <https://leibniz-phd.net>.

The Leibniz Association is a German non-university research association that currently connects 96 independent research institutions divided into five sections (Fig. 1).

Section A

Humanities and Educational Research

Section B

Economics, Social Sciences, Spatial Research

Section C

Life Sciences

Section D

Mathematics, Natural Sciences, Engineering

Section E

Environmental Research

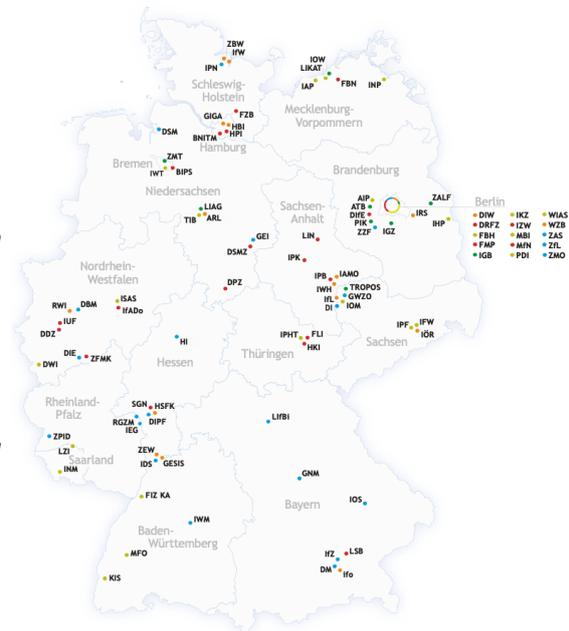


Figure 1: Distribution of Leibniz Institutes in Germany coloured by section

This report presents results of the second Leibniz PhD Survey, developed and conducted by the Leibniz PhD Network in collaboration with members of the Helmholtz Juniors and the Max Planck PhDnet. From September until December 2019, all doctoral researchers working at Leibniz Institutes were invited to take part in the online survey. 937 doctoral researchers working at 88 out of 95 Leibniz Institutes followed this invitation and took part in the survey. This report

includes information from 93% of all Leibniz Institutes and the number of respondents accounts for approximately a third of all doctoral researchers in the Leibniz Association. It does not focus on the situation of PhD's in single institutes, but on the overall situation of Leibniz researchers and whether this situation differs among the 5 Leibniz sections.

Data from the 2017 Leibniz PhD Survey, as well as demographic data provided by the Leibniz Head Office allow us, in addition to the very good response rate, to assess the quality of the survey data and to ensure representative results. Key variables like gender, age, affiliation to Leibniz Sections, nationality, and types of payment are in line with other Leibniz data sources, not showing any implausible distortions.

Chapter 3.2 presents further information on the assessment of data quality

The report starts with an executive summary in which the main findings and our conclusions are presented together. Each chapter of the report begins with an introduction to its main findings. We think a number of different readers might find this report and its lessons interesting. Firstly, the report naturally addresses individual doctoral researchers, PhD representatives, and their network, the Leibniz PhD Network. Secondly, the Leibniz Association, namely the Leibniz Head Office and the management and administration of every single Leibniz Institute are another important target group. Last but not least, this report, as well as reports published by our partner networks working in the Max Planck Society and the Helmholtz Association, are relevant for the broader political sphere concerned with science policies in Germany. We hope that many of those recipients pick up some of the fields of action we identified in this report on different intervention levels and help to work on constant improvements for the benefit of doctoral researchers in the Leibniz Association and beyond.

The present report and the underlying survey are the products of a collaborative process within the Survey Working Group of the Leibniz PhD Network. The survey was developed, conducted, and analyzed by doctoral researchers in various Leibniz Institutes in close collaboration with our partner PhD networks, the Helmholtz Juniors, the Max Planck PhDnet and IPP. We would like to thank our partner networks for their constant and ongoing support, as well as the Leibniz Head Office, the representation of the works councils, individual non-university research institutes, namely GESIS - Leibniz Institute for the Social Sciences, and the German Centre for Higher Education Research and Science Studies (DZHW) for their important feedback on the questionnaire. The authors of this report would like to thank their colleagues Guilherme Abuchahla, Dolly Montañó, Irene Broer and Elliot Clayton Brown for all their valuable feedback during the analysis and writing of the Leibniz PhD Survey. We also would like to thank Anja Jahn and Jacob L. Gorenflos López for their support as Spokespersons of the Leibniz PhD Network, and Leibniz President Matthias Kleiner, Secretary General Bettina Böhm, Vice president Katrin Böhning-Gaese, Birgit Schröder-Smeibidl, Caroline Lodemann, Ricarda Opitz, Johanna Wiebeler, Sabine Müller, Daniel Sattler and Marvin Bähr for their support and valuable input on behalf of the Leibniz Association and the Leibniz Head Office. Last but not least, we want to thank all the committed and interested PhD representatives who worked with us on the topics addressed in this report during the various General Assemblies of the Leibniz PhD Network.

2 Executive summary

2.1 Demographics

Of the survey participants 35% are non-German citizens with 23% of them stemming from outside of the EU. The gender distribution is nearly equal with 53.6% of respondents identifying as female and 46.4% as male. The average age is 29.1 years. 65.5% of doctoral researchers are between 26 and 30 years old.

2.2 Contracts, Payment, and Working Hours

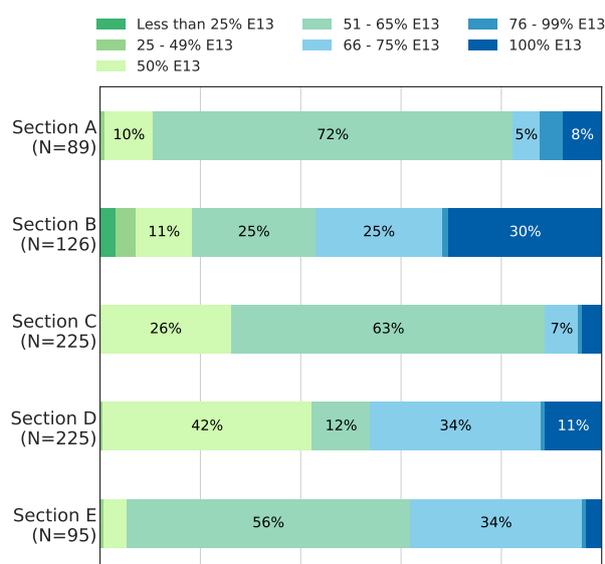


Figure 2: Level of payment by affiliation to Leibniz
Sections in reference to E13.

Doctoral researchers in the Leibniz Association estimate that their PhD will take 3.8 years. Nearly 83% of all respondents are paid by a contract based on the public German payment system (TV-L, TVöD, etc.), which is a slight improvement compared to earlier numbers from the 2017 Leibniz PhD Survey. 10.9% of all respondents are financed with a stipend, another 2.2% of all respondents reported they are paid with a mixture of a contract and

stipend, and less than 4% of all respondents hold either a guest contract (1.9%) or are unpaid (1.9%). The levels of payment vary heavily from section to section (Fig. 2). For the Leibniz Association as a whole:

- 26% receive 50%
- 41% receive up to 65%
- 20% receive 66 to 75%
- 12.5% receive 76 to 100%

of a E13 (TV-L, TVöD, etc.) contract. 9% of doctoral researchers earn less than 1,200 in a month (Fig. 18). According to the German Federal Office of Statistics, single person households are relatively poor if they have less than 1,035 per month at their disposal. Not considering potential additional partners or family members, 3.4% of our respondents could be classified as relatively poor on the basis of their reported net income.

Doctoral researchers in the Leibniz Association must work 28.4 hours a week per their contracts. 8.4% of the respondents work just as many hours as stated in the contract, whereas the remaining 90.7% of respondents work longer hours than contractually obliged. For 36.2% of respondents, their overtime amounts to between 1 and 14 hours each week, while another 27.4% report to work up to 20 hours more than required. 44% of respondents work at least 2 weekends per month and 7% work every weekend. According to the respondents, the number of vacation days is fixed in more than 80% of all cases, either 21 to 28 days (10.9%) or 29 to 32 days (70.9%). 35.5% take all their vacation days and 15.4% take none. The culture of working overtime without sufficient leisure time should be perceived as very critical, because our data shows a decreasing mental health with less time off.

For more info. 4

Fields of Action

- Support the possibility of full-time contracts, as demonstrated by some Institutes in Section B.
- Implement the 4 year contract duration recommended by the "Leibniz career guidelines".
- Harmonise the payment schemes.
- Provide systematic reimbursement of business travel expenses for doctoral researchers.

2.3 On the implications of being paid by stipend

A majority of respondents holding a stipend are funded by external parties (73%), while the remaining holders of stipends reported that their stipend is paid internally by their Leibniz Institute (27%). Presumably internal stipends are not primarily used to finance doctoral researchers to start or terminate their PhD project, as the year of PhD does not differ much across respondents with working contracts, external stipends, or internal stipends. In line with the results of the 2017 edition, the 2019 Leibniz PhD Survey highlights how stipends create inequalities and insecurities outweigh their advantages. Stipend holders are paid on average 500€ less per month than doctoral researchers under contract, which represents close to a third of a 50% E13 salary. Moreover, stipend positions do not offer the same salary adjustments over time as working contracts.

Not only do stipends create financial inequalities, they are also a source of job insecurity. A larger proportion of stipend holders have contracts of less than 2 years compared to working contract holders (38% vs. 27%, respectively), although more stipend holders have contracts over three years (27% vs. 18%, respectively). Importantly, 16% of stipend holders live on contracts of less than a year.

Financial and job insecurity are not the only forms of inequality generated by stipends. Over three quarters of stipends do not specify a maximum number of vacation days in their contracts. Our study clearly shows that the absence of this number in contracts discourages doctoral researchers from taking vacations: only 15% of respondents took days off when no number of vacation day allowed is specified as opposed to 36% when this number is indicated. As a result, stipend holders feel less free to take days off during their PhD than working contract holders, which can be detrimental to their mental health and general well-being (see section 10).

It is generally argued that unlike working contracts, stipends allow doctoral researchers to work full-time on their PhD projects. This argument is based on an outdated conception of working time distribution in PhD projects. Our

For more info. 4.1, 4.2 and 4.4

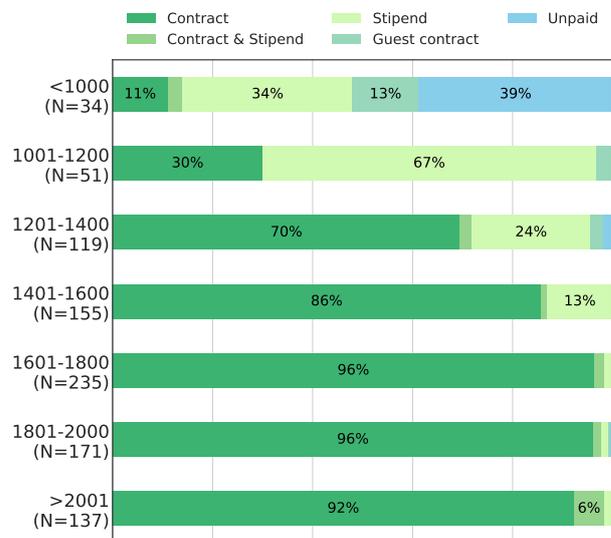


Figure 3: Type of payment in different monthly income brackets

results show there is in fact very little difference between stipend holders and working contract holders in this respect: stipend holders spend only 7 percentage points more time on their PhD work (Fig. 28). Once this argument is set aside, stipends present less advantages than disadvantages, and they appear as a less than ideal solution for funding PhD projects.

Fields of Action

- Abolish stipends (especially internal stipends)
- For the transition phase, make top up contracts the minimum standard.

2.4 How gender makes a difference during the PhD

Most demographic factors like age, duration of a PhD, expression of a wish to have children and working contract related factors like working hours and income do not show significant gender related differences. Furthermore, conflicts with supervisors are equally often reported by male and female respondents.

However, when it comes to the support during the PhD phase and outlook on career perspectives gender related biases can still be observed in the data:

- Female doctoral researchers (daily: 22%; weekly: 27%) report less frequent meetings with the supervisor than male respondents (daily: 26%; weekly: 32%)
- More female respondents judge the compatibility of an academic career and having children to be (very) unattractive (52%) compared to male respondents (47%)
- 39% of female respondents fear to jeopardize their career with (more) children compared to 21% of male respondents
- Less female doctoral researchers (13%) express the wish to open their own business compared to male respondents (20%)
- More female doctoral researchers (38%) feel "unprepared" for a career outside academia compared to 29% of the male respondents
- Less female doctoral researchers (47%) report no to minimal depression compared to male respondents (57%). Gender was especially identified as a significant predictor of mental health.

Fields of Action

- Raise awareness regarding structural challenges that female doctoral researchers face in academia.
- Provide career and skill workshops specifically targeted at female doctoral researchers.
- Tailor working conditions that meet the needs of female doctoral researchers with additional workload, incl. family obligations.
- Establish a mentoring program for female doctoral researchers to connect and exchange with female senior researchers working in academic and non-academic settings.
- Continue research on gender bias in academia to identify barriers that prevent female doctoral researchers from pursuing an academic career.

2.5 How citizenship makes a difference during the PhD

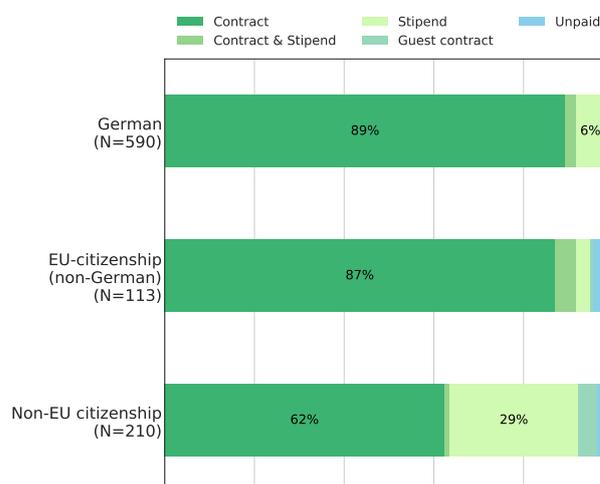


Figure 4: *Type of payment by citizenship*

The group of doctoral researchers working at Leibniz

For more info. [7](#)

Institutes is quite international. More than 35% of our respondents have non-German citizenship. 18% of this group speaks German fluently or very advanced. At the moment, half of all internationals name language barriers as an obstacle for their communication. At the level of the Leibniz Association, 20.6% take German classes outside their institute and another 29% take German classes within their institutes.

International doctoral researchers are more often financed by a stipend, especially if they have a non-EU nationality (see Fig. 4). This is also reflected in the net monthly income. One out of five respondents within this group earns less than 1,200€ per month.

Fields of Action

- Facilitate access to language courses. This should not just entail more offers, but a shift towards a culture that encourages learning German.
- All relevant information should be available in other languages than German to reach internationals within institutes.

2.6 How having children makes a difference during the PhD

One out of ten doctoral researchers is a parent or expecting children. Nearly a fifth of doctoral researchers are thinking of having children during their PhD, a number that varies between contract holders (19%) and stipend holders (14%), and between German (21%) and non-German citizens (12%). Nearly 80% of doctoral researchers do not consider having children over the course of their PhD. Aside from personal reasons, a lack of family-friendly working conditions, financial insecurity, and the fear of jeopardizing one's career are frequently cited reasons for not wanting children, with the ranking of these concerns varying across Leibniz Sections.

One of the factors on which institutes can have a direct influence is the kind of support provided in-house. Two out of five respondents report that their institute provides support: 34% provide support for home office, followed by parent and child-friendly environment (respectively 22% and 12%), access to daycare (10%) and financial support for daycare and childcare during business trips (2% each). In addition to still being limited, the number of options offered does not match the needs of parents, since the most requested services are reimbursement of childcare during business trips, financial support for daycare, and access to daycare. These results highlight the progress that institutes need to make in order to offer a parent-friendly work environment.

Fields of Action

- Enable and financially support childcare services, also during business travels.
- Establish a child- and parent-friendly environment, e.g. offices with fully equipped work spaces and play areas, nursing rooms, etc.
- Facilitate home office / mobile work options

2.7 Satisfaction and career development

Roughly half of all respondents are aiming to complete a cumulative dissertation (48%), while 37% are aiming for a monograph. 14% of the respondents reported that their kind of dissertation was unknown at the time of the survey interview. Gender and citizenship do not have a significant impact on decisions about the type of dissertation.

The doctoral researchers answering our PhD survey expressed high levels of satisfaction with their vacation days, office equipment, and the work environment. We can observe that the general satisfaction with PhD supervision (68%) has slightly increased compared to the 2017 survey (63%). A higher frequency of meetings with the PhD supervisor does have a positive impact on the general satisfaction with supervision.

On the other side, respondents were less satisfied with the workload, career development, and psychological support available at their institutes. Every third respondent has often or occasionally thought about not continuing their doctorate, a significant improvement compared to 43% in the 2017 report. Reasons in the last survey for thoughts about not continuing the doctorate were: unclear career paths (66%), poor or no academic results (31%) and financial insecurities (29%). This year's survey yielded similar results. Respondents assess an unattractive career perspective, they feel unqualified and report no or poor academic results.

More than half of all respondents can imagine to continue their career in academia. The interesting work, diverse topics and the service to society are main drivers of judging a career in academia as attractive. The compatibility of an academic career with children and partners' career plans are rated as less attractive, as well as the absence of permanent positions. Less than 20% of our respondent think that salaries in academia are attractive or very attractive. Nearly half of our respondents also think about career paths outside of academia. In this light, it is not a good sign that 40% of the doctoral researchers feel either "very unprepared" or "unprepared" for a career outside of science.

For more info. 5, 6 and 8

For more info. 9

Fields of Action

- Payment in academia should be considered carefully in remainder strategies.
- Project meetings should happen on a more regular base.

2.8 Power Abuse

For the present report we collected for the first time data

For more info. [11](#)

concerning the two fields of power abuse and mental health in the Leibniz Association. It is not surprising that those two important topics are connected. When analyzing data on power abuse, it is very difficult to draw general conclusions. Fortunately, a minority of doctoral researchers reported negative experiences with bullying and sexual harassment themselves. However, it is not the aggregate number which matters most: Every single case is important, requires attention, and should be taken seriously.

We started by evaluating the doctoral researchers' awareness for already existing resources to turn to in the case of a conflict. To define a conflict in this context we referred to a "behavior of a superior using their power for personal gain and/or to your disadvantage". This can take many forms. As many existing resources could be chosen, we defined the following bodies: Central Leibniz Ombudsperson, the institute's Ombudsperson, PhD representative, Equal Opportunities Officer and the institute's Works Council. Good awareness was reported for most of them. Only 11,5 % reported that they were not aware of any of these institutions. Especially non-German respondents are significantly less aware of these potential aid mechanisms.

In our survey, 83.8% of the respondents stated that they never had a conflict with their superiors. 10.1% had a conflict with a superior and decided not to report it. 6.1% of the respondents have experienced a conflict with a superior and decided to report it afterwards. 41.5 % of those who reported a conflict were satisfied or very satisfied with the consequences following their report.

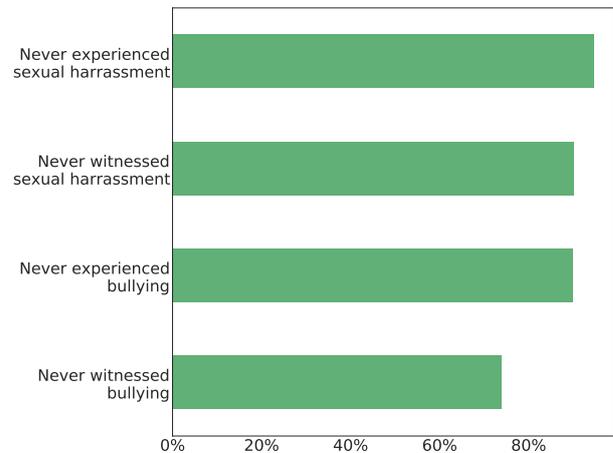


Figure 5: Share of respondents who never experienced power abuse

Furthermore, we were interested if respondents experienced or witnessed bullying or sexual harassment from superiors. 95% of the respondents have never experienced sexual harassment themselves, however, one in ten (9.3%) stated that they have already witnessed this kind of behavior (see Fig. 5). Female doctoral researchers reported a slightly higher frequency of negative direct experiences with sexual harassment than their male peers.

A little more than 10% of the respondents experienced bullying by a superior. In contrast, nearly every third respondent (28%) witnessed bullying from a superior towards a colleague. The likelihood of being subject to bullying or witnessing bullying increases with the duration of the PhD. No gender-related differences can be observed for personally experiencing bullying behavior. However, female respondents observe this kind of behavior significantly more often.

Being directly or indirectly exposed to power abusive behavior like sexual harassment or bullying has a significant negative impact on the satisfaction with the PhD supervision, thoughts about quitting the PhD and the mental well-being of the respondents (see section 11.5).

Fields of Action

- Raise awareness among doctoral researchers regarding mechanisms and support structures like Ombudspersons, Equal Opportunity Officers, or works councils, which help in cases of conflict or power abuse.
- Require transparent, confidential, and reliable mechanisms within institutes to deal with reports of potential (scientific) misconduct or power abuse.

2.9 Mental Health

Doctoral researchers are in the unique position of undertaking their first steps to solve scientific problems on their own while acquiring new knowledge and skills. Yet, academic challenges along the way may have a negative impact on their mental well-being which is detrimental for successfully completing their work while staying healthy.

For more info. [10](#)

What is the mental health situation of doctoral researchers?

Our data echo the results from the survey conducted by Nature in 2019, in which more than a third of the respondents sought treatment for depression and anxiety disorders. In our survey, almost half of the doctoral researchers reported high anxiety (46%), while nearly one out of five reported moderate to severe depression (15%). Since poor mental health takes a toll on someone's capacity to learn, concentrate and perform, doctoral researchers with higher levels of depressive symptoms (31%) and anxiety (71-76%) were also more often thinking about quitting their PhD.

What are the most important factors that contribute to doctoral researchers' poor mental health?

Mental health depends on a range of individual, interpersonal, community, environmental and structural factors. Our data on environmental and structural factors show that a hampered access to psychological support, little time for recreation and a poor relationship with the supervisor were among the most important factors that can have detrimental effects on the mental well-being of doctoral researchers. Doctoral researchers

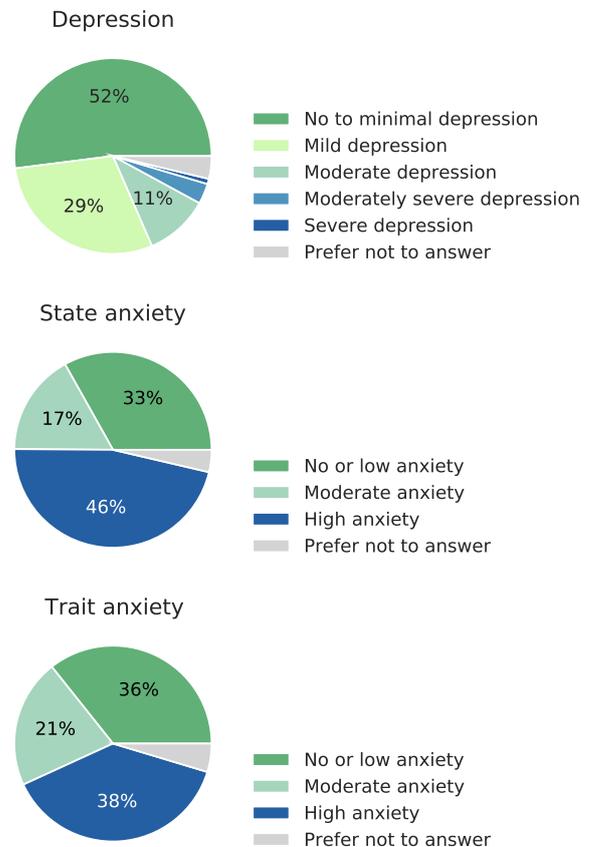


Figure 6: Distribution of depressive symptoms, levels of state and trait anxiety among respondents

with higher levels of depressive symptoms were on average poorly supervised (40%), not feeling free to take vacation days (29%), as well as working on weekends and during vacation (25%).

Which modifiable factors distinguish doctoral researchers with good mental health from those with poor mental health?

Besides receiving good supervision and taking days off from work, doctoral researchers with good mental health have a strong social support system which was reported by more than two thirds who reported no to minimal depressive symptoms (66%). The importance of establishing a social support system at the workplace is also reflected in our results by doctoral researchers with no or low anxiety levels who had low language barriers (44%) and attended social gatherings (34%). Especially for doctoral

researchers who balanced work and family obligations, child support offers (32%) and feeling sufficiently supported by the workplace (48%) contribute to lower levels of anxiety. Lastly, institutional and social support increased doctoral researchers' resilience by buffering the negative impact of work-related stress.

Fields of Action

- De-stigmatize mental health issues in academia and raise awareness regarding mental health inequalities.
- Ensure that doctoral researchers can address their mental health needs by establishing easily accessible infrastructure and increasing funding for psychological counselling.
- Decrease mental health inequalities by facilitating access to psychological professionals, such as overcoming language barriers through English-speaking offers.
- Empower doctoral researchers by providing evidence-based information to improve their mental health and well-being.
- Promote a social support system through reducing communication barriers at the workplace and offering support for family obligations.

3 Demography of doctoral researchers and the duration of their PhD

Main findings from the following chapter:

- In late 2019, 937 doctoral researchers in the Leibniz Association participated in the second Leibniz PhD Survey (33%). The collected data closely matches the official statistics issued by the Leibniz Head Office in terms of affiliation to Leibniz Sections, gender, and nationality.
- We observe a strong temporal stability in many demographic indicators compared to the 2017 Leibniz PhD Survey. Replicating previous findings with respect to gender, nationality, and duration of the PhD can be considered as another positive sign of good data quality.
- The group of doctoral researchers working at Leibniz Institutes is quite international: more than 35% of our respondents are not German citizens.
- A PhD in the Leibniz Association takes 3.8 years on average to complete. A majority of all respondents (69%) estimate a duration from 3 to 5 years.

This report summarizes the main results of the second round of the Leibniz PhD Survey. Like the first survey of this kind conducted in late 2017 [6], it provides a unique and detailed description of the doctoral researchers working and researching at Leibniz Institutes across Germany. The first chapter of the survey deals with basic facts about the respondents, mainly their affiliation to one of the 95 Leibniz Institutes, and a number of socio-demographic characteristics.

The first question concerned the affiliation of respondents. This piece of information helps us check the quality of the survey data and allowed us to gather statistical results at the level of a single Leibniz Institute, provided the amount of data was representative. In the present report, we only analyze data at the aggregate level of the five different sections of the Leibniz Association (see Table 1 in the Appendix). If respondents did not want to provide the name of their Leibniz Institute, we kindly asked them to indicate which Leibniz section they were affiliated.

The following questions asked about respondent's year of birth, their gender identity, their nationality, the time they started their PhD, and the time they expected to submit their thesis. The last two variables allow us to calculate the approximate time required to finish their PhD (estimated duration).

In total, 937 doctoral researchers participated in the 2019 Leibniz PhD Survey. Using the results of the 2018 Leibniz data retrieval¹ as a benchmark, our survey achieves a response rate of 33% of all eligible doctoral researchers at Leibniz Institutes (see Figure 7a). This is a slightly lower response rate than the previous Leibniz PhD Survey (41%); however, the current data still provides us with a great deal of valuable information.

¹As of 31st of December 2018. The Leibniz data retrieval is a yearly survey among the Leibniz Institutes to receive information on various aspects of the research situation and output. Results are the basic for the yearly report "Pakt für Forschung und Innovation Monitoring-Bericht".

3.1 Affiliation with Leibniz Sections

Although we do not analyze data at the level of single Leibniz Institutes in this report, respondents from 88 out of 95 Leibniz Institutes participated in the survey. Participation from more than 90% of all Institutes is a very good sign of the widespread distribution of this survey and indicates good data quality. According to their affiliation to a certain institute we grouped each respondent in one of the five Leibniz Sections. The response rate per section mainly follows the average from the 2017 Leibniz data retrieval (see Table 2 in the Appendix). As Figure 7b shows, sections C and D are the largest sections in our sample with roughly 30% each, followed by sections B and E with approximately 15%, and Section A with 11%.²

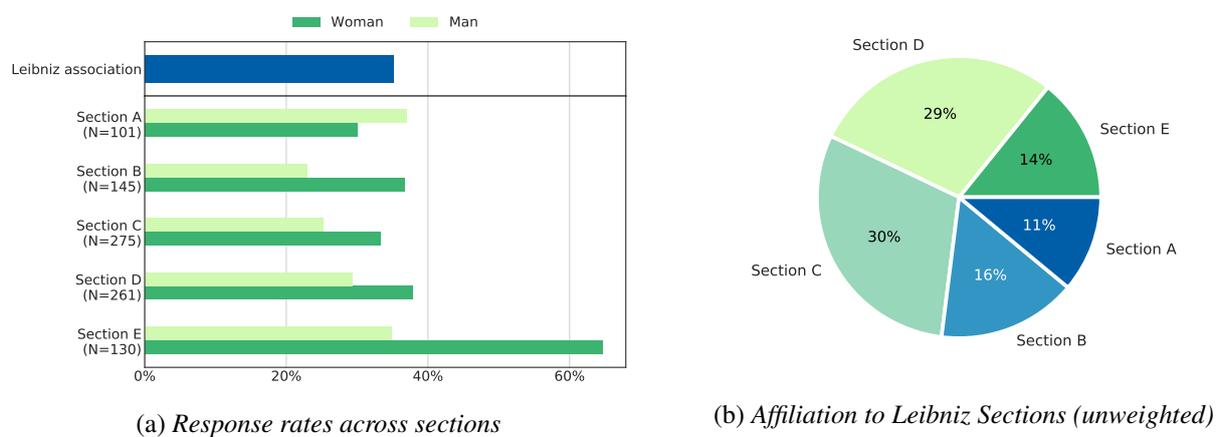


Figure 7: Response population

The response rates differ very little across most Leibniz sections (see Figure 7a). Roughly one out of three doctoral researchers in Section A, B, C, and D took part in the 2019 Leibniz PhD Survey, whereas Section E reached a higher response rate of nearly 50%. To account for the slight under-representation of the first four sections and the over-representation of Section E compared to official statistics provided by the Leibniz Head Office, we applied a straightforward weighting procedure, also adjusting for the gender distributions within the Leibniz sections (see Section 12.1 in the Appendix). The weights do not substantially affect results, but they definitely help to make them more representative of the doctoral researchers working in the Leibniz Association.

Table 1: The sections of the Leibniz Association

Section	Description
A	Humanities and Educational Research
B	Economics, Social Sciences, Spatial Research
C	Life Sciences
D	Mathematics; natural Sciences, Engineering
E	Environmental Sciences

²4 respondents preferred not to answer this question and will be excluded in the following analyses whenever weights are applied.

3.2 Demographics

3.2.1 Gender

Gender distribution is nearly balanced within a sample of respondents and in line with results of the previous Leibniz PhD Survey. 54% of all respondents identify as female, 46% as male. A single respondent defined the gender as "other", and stated that they identify most with the male gender in a follow-up question.³ Gender distribution within Leibniz sections is less balanced than the Leibniz Association average, mostly reflecting a variation in gender rates across scientific disciplines (see Table 1 in the Appendix) and response rates. Figure 8 shows unweighted gender identification data within our sample. Females are the majority in sections A, B, C, and E, representing around 60% of respondents. Section D is the only one with a male majority, with a little more than 65% of all respondents.

Comparing the 2019 Leibniz PhD Survey unweighted numbers to the 2018 Leibniz data retrieval shows a higher propensity of female doctoral researchers to respond to our survey. Women in our survey are over-represented by 7 percentage points (pp). Only in Section A are female doctoral researchers slightly underrepresented (by 5pp), whereas women are slightly over-represented in Sections D and E (by roughly 6pp) and clearly over-represented in Section B (by 12pp) and Section E (by 15pp). Gender distortion as well as respondents' affiliation (Section 3.1) are corrected by weighting the results to make survey estimates meet the Leibniz data retrieval on average. Thus, in the following survey report we display only weighted results⁴.

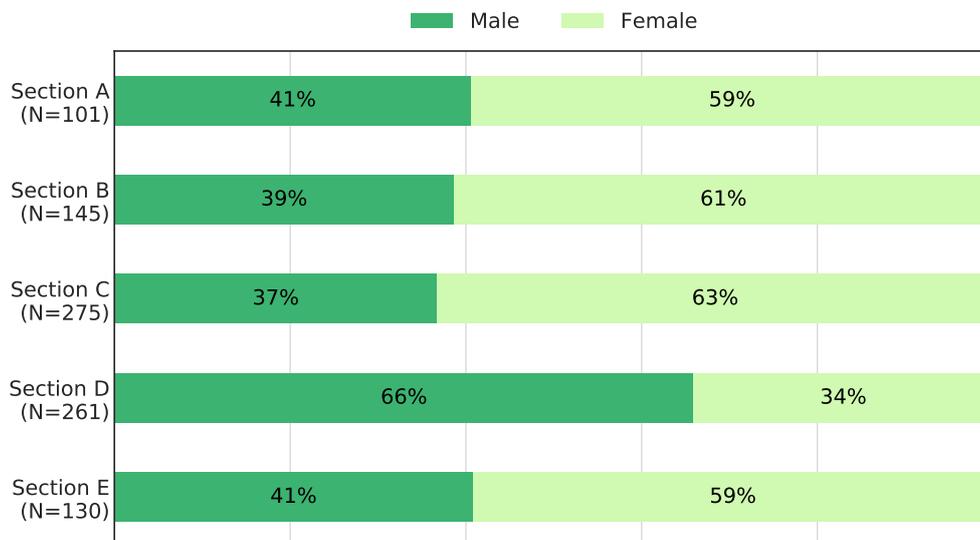


Figure 8: Respondents' gender by affiliation to Leibniz Sections (unweighted results)

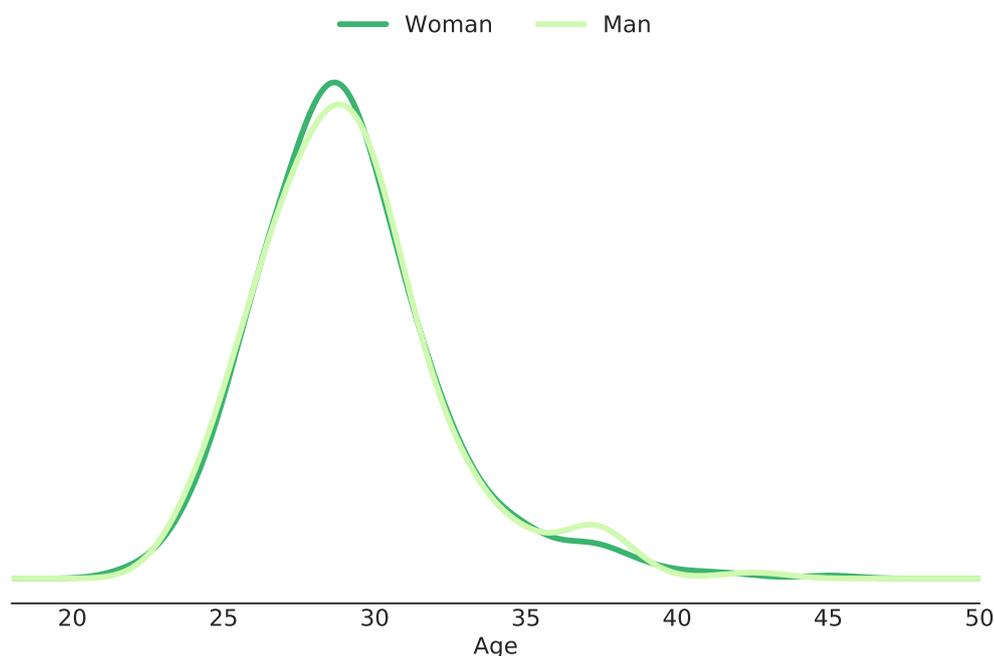


Figure 9: Age distribution by gender in the Leibniz PhD Survey ($N = 873$)

3.2.2 Age

On average, our respondents are 29.1 years old, which is consistent with the 2017 Leibniz PhD Survey. Less than 10% of all respondents are under the age of 25 (9%). A large majority of doctoral researchers are between 26 and 30 years old (66%), and a fifth of doctoral researchers are between 30 and 35 years old. Only 5% of all respondents are over the age of 35. The average age differs only slightly across the various sections. A significant statistical difference can be observed in sections C (28.8 years) and D (28.3 years), meaning doctoral researchers from those sections are a little younger on average than in other sections. Again, the temporal stability of those findings compared to the 2017 Leibniz PhD Survey confirms the validity of the survey results presented in this report.

3.2.3 Nationality

Doctoral researchers working in Leibniz Institutes are very international. More than 35% of our respondents do not have a German citizenship. 12% of the respondents hold citizenship of another EU country and another 23% of all respondents are citizens of a non-EU country. The share of international doctoral researchers is slightly larger than in the 2017 Leibniz PhD Survey. The 2018 Leibniz data retrieval confirms that this share is growing. According to the official statistics, 33% of the doctoral researchers hold a non-German citizenship. Therefore, our survey data only shows a negligible over-representation of international doctoral researchers (less than 3%).

Looking at the distribution of citizenship within Leibniz sections, our survey data mainly follows the Leibniz Association average, regardless of whether data is weighted or not. As shown in Figure 10, 15% of all doctoral researchers in Section A do not hold a German citizenship (compared to 12% in the 2018 Leibniz data retrieval). By contrast, between 33 and 45% of doctoral researcher working for an institute in the sections C to E are non-German citizens.

³22 respondents did not answer this question

⁴For technical details of the weighting scheme used, see Section 12.1 in the Appendix.

While the proportion is very close to the official data for Section C (deviation smaller than 2 percentage points), it is somewhat larger in Section D (by 6pp) and Section E (by 9pp). In between, 25% of all doctoral researchers in Section B do not hold German citizenship. Again, the estimated share of non-Germans is very close to the Leibniz data retrieval for this section (24%). The proximity between survey data and official statistics for citizenship status is a very strong sign for a good quality of the survey data.

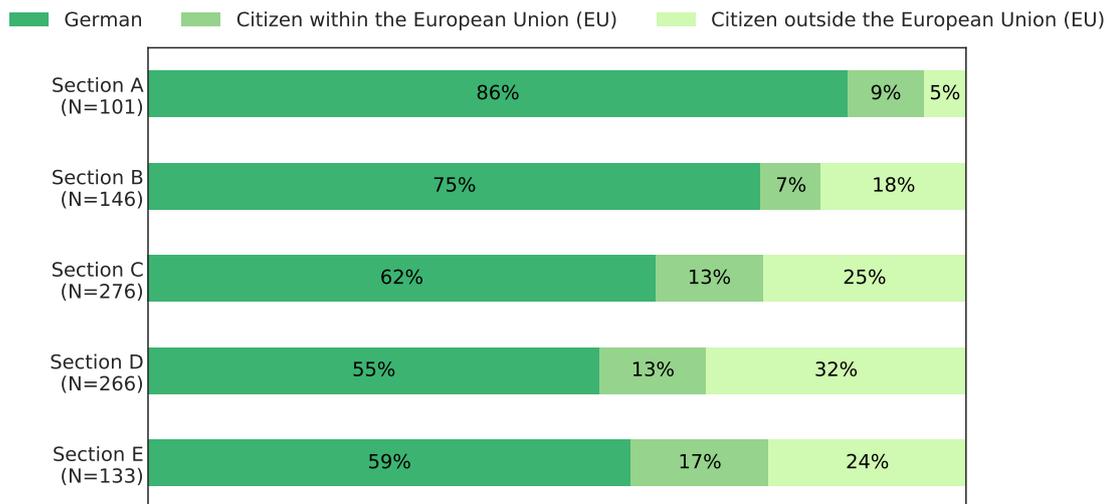


Figure 10: *Nationality of doctoral researchers per Leibniz Sections*

We asked non-German respondents about their self-perceived German language skills. As can be seen in Figure 11, 7% of international doctoral researchers are in fact native German speakers. At the other end of the scale, 17% of this group do not have any German skills at all. In between, a little over a third of respondents report a beginner level (A1 or A2), and another 30% report an intermediate level (B1 or B2). Finally, 11% of international doctoral researchers speak German fluently (C1 or C2).

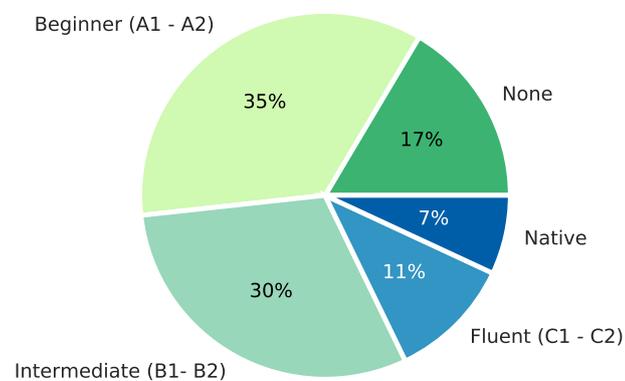


Figure 11: *German language level of non-German respondents (N = 329)*

Nationality and gender are statistically independent. In the same respect, age does not significantly differ when comparing German and non-EU citizens, with both groups being roughly 29 years old on average. Only doctoral researchers with a citizenship from other EU-countries are a bit younger with an average of 28.2 years old.

3.3 PhD factual and estimated total duration

3.3.1 Time elapsed at the point of the survey

We asked respondents for the month and year when they started their PhD. Note that this time might not always correspond to the beginning of their first contract at their Leibniz Institute, since some respondents might have enrolled to the university before getting a contract. At the time when the survey took place, slightly more than 76% of all respondents were in the first (27%), second (27%), or third (22%) year of their PhD (see Figure 12). Another 14% of respondents were in their fourth year, and nearly 11% of all respondents were in their fifth year.⁵

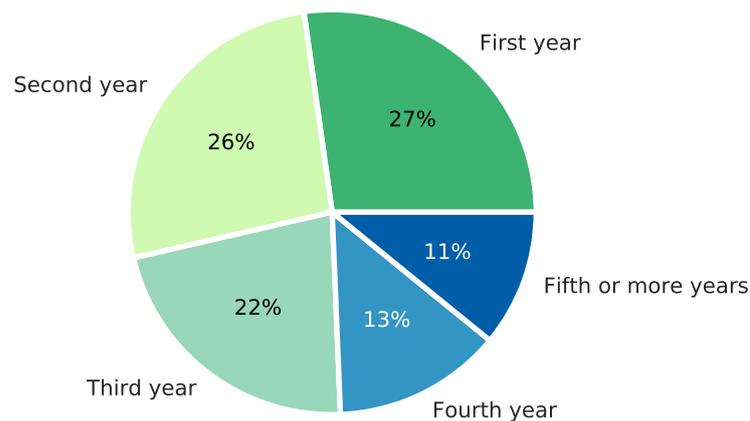


Figure 12: *PhD progress status (N = 905)*

3.3.2 Expected duration of the PhD

We also asked all respondents when they expected to submit their PhD thesis in order to calculate their estimated total PhD duration. On average, doctoral researchers in the Leibniz Association estimate that their PhD will take 3.8 years. Like previously discussed values, this figure reflects a strong temporal stability when comparing it to results obtained from the 2017 Leibniz PhD Survey. However, in this round of the survey, fewer respondents expect that their PhD will take less than 3 years to complete (23%). A large majority of all respondents (69%) estimate a duration of from 3 to 5 years. Around 8% of all respondents expect that their PhD will last longer than 5 years. Roughly 5% of respondents could not provide us with an estimate of the end date of their PhD.

⁵In a multivariate analysis, the PhD time elapsed at the time of the Leibniz PhD Survey does not differ significantly across Leibniz Sections and for gender. Small but significant differences can be observed depending on nationality, with non-German respondents reporting a shorter previous duration of their PhD than German respondents.



Figure 13: *Estimated total PhD duration across Leibniz Sections*

On average, respondents in Section B estimate the longest PhD duration of all sections (4.3 years), whereas respondents in Section C estimate the shortest duration of about 3.5 years (see Figure 13). In a multivariate regression on the total estimated duration of the PhD, only the higher expectations in Section B and the lower expectations in Section D differ significantly from the reference category (Section A). Respondents with non-German citizenship, notably non-EU citizens, expect a shorter duration of their PhD, as do younger respondents. The latter might reflect a more optimistic attitude and greater confidence among younger doctoral researchers in finishing their PhD on time, whereas the respondents who already needed more time to work on their doctoral thesis naturally indicated a longer duration (selection effect). No significant differences between genders can be observed. Being a parent or expecting a child significantly extends the estimated duration of the PhD, even when controlling for age. Future or current parenthood increases the estimated duration of the PhD by close to half a year on average.

4 Contracts, Payment, and Working Hours

Main findings from the following chapter:

- International doctoral researchers from non-EU countries are significantly more often financed by a stipend (29%) than German citizens (6%) or other EU-citizens (3%).
- Respondents holding a stipend are economically worse off: on average, stipends are paid 500€ less per month than working contracts while controlling for other variables. This difference can be also explained with nearly absent rises in the financial remuneration of stipends over time.
- Full-time payment is possible in the Leibniz Association: A third of respondents working at a Leibniz Institute in Section B receive a 100% salary.

4.1 Type of payment

4.1.1 Funding sources

We asked respondents about their contractual situation and how their PhD is financed. In total, 925 respondents provided us with valid information on their type of payment. Nearly 83% of all respondents are paid by a contract based on the public German payment system (TV-L, TVöD, etc.). This proportion is a little higher than in the 2017 Leibniz PhD Survey, in which 79% of all respondents held a working contract. In 2019, 11% of all respondents are financed with a stipend, another 2% of all respondents reported they are paid with a mixture of a contract and stipend. Less than 4% of all respondents hold either a guest contract (2%) or are unpaid (2%) based on their reply to this question. According to replies to open answers provided by 3 of our unpaid respondents, "unpaid" means being affiliated to a Leibniz Institute (e.g., by keeping the institute's email address or being still able to access laboratories) while receiving unemployment benefits. This kind of practice usually occurs towards the end of PhD research to allow doctoral researchers to finish their PhD. Indeed, unpaid respondents are PhD candidates for a longer duration on average. This kind of practice needs to be evaluated very critically because it could imply to profit by the work of an employee without paying a salary but relying on public monies.

4.1.2 Variations across Leibniz Sections

Looking at the distribution of the types of payment across sections depicted in Figure 14, some differences are evident. In sections A and D more than 85% of our respondents hold a working contract, whereas this is the case for approximately three out of four doctoral researchers in Section B and Section E. Stipends are most prevalent in sections B and E: nearly 15% of all respondents are financed with a stipend in those two sections. This is only the case for 7% of doctoral researchers in section D. The majority of unpaid respondents work in Leibniz Institutes in sections C (3% of respondents in this section) and E (7%). Not all of these differences across Leibniz Sections are statistically significant in a multivariate logistic regression. Only the lower proportion of working contracts in section E and the lower proportion of stipends in Section D differs significantly from the reference values in section A.

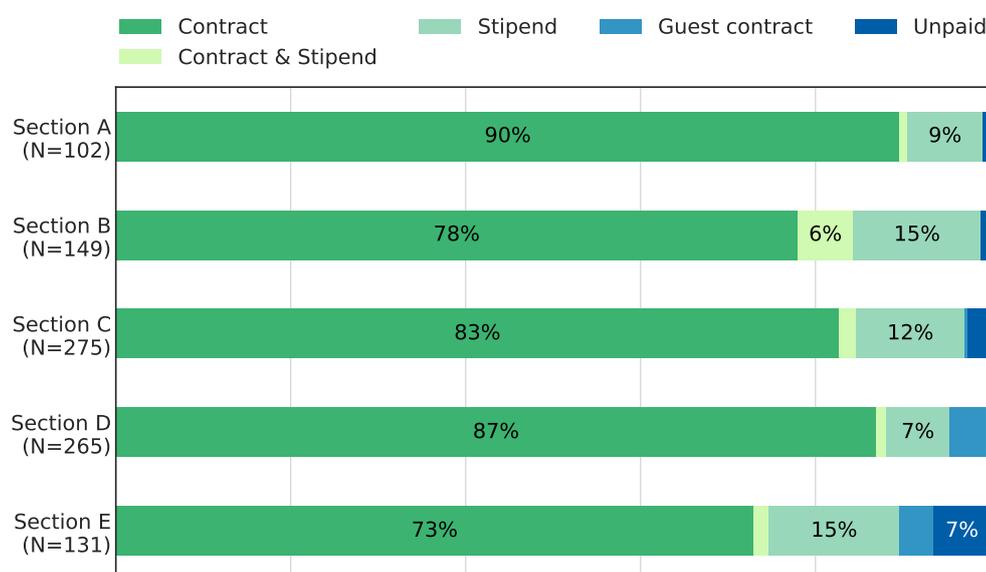


Figure 14: Type of payment by affiliation to Leibniz Sections

4.1.3 Variations across demographics

The type of payment slightly varies across demographics. Male respondents hold stipends more often than female respondents, while international doctoral researchers from non-EU countries have significantly less working contracts and many more stipends than doctoral researchers from Germany and other EU-member states (see Figure 15). Less than 7% of German doctoral researchers are financed by a stipend, while this is the case for nearly 29% of doctoral researchers from non-EU countries. In this group, only 62% have a working contract, compared to 87% of EU citizens and 89% of German citizens in our sample. This substantial gap resembles results from the 2017 Leibniz PhD Survey.

Looking at parenthood or the duration of the PhD, no significant differences can be found. Evidently, the share of respondents with a stipend in their first or second year is higher than in later years (13% compared to around 7% in the third or fifth year). This finding is, however, explained by the citizenship of respondents, because the duration of PhD is correlated with the citizenship of our respondents (see Chapter 3.3.2). The respondents from non-EU countries are in an earlier phase of their PhD on average than respondents from EU countries. It can be assumed that stipends generally run shorter than working contracts (see below).

4.1.4 Stipend funding sources

We asked scholarship holders about the origin of their stipend, whether it is issued by their respective Leibniz Institute or through third party funding. This is a highly relevant question because Leibniz Institutes should not avoid paying social contributions for their employees by issuing stipends instead of working contracts. Around 120 beneficiaries provided us with information. While 73% of those respondents rely on stipends funded by external parties, the remaining 27% reported that their stipend is paid internally by their Leibniz Institute. This practice is less common in Section E (true for 7% of all stipends) and most used in Section A (52% of stipends). It could be that internal stipends are issued by Leibniz Institutes instead of contracts for doctoral researchers in their early or late phase of the PhD, to

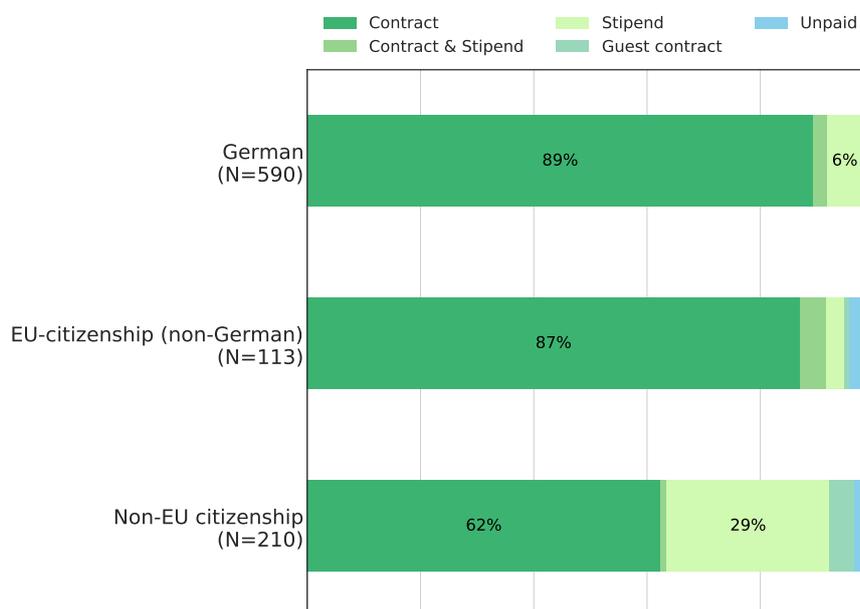


Figure 15: *Type of payment by citizenship*

either start or wrap-up the PhD project. However, when comparing the year of PhD for stipends and contracts (see Fig. 100 in the Appendix), and even more so when comparing the year of PhD within the group of beneficiaries of stipends (see Fig. 16), this is presumably not the case for all internal stipends. The similarities in the year of PhD does not imply that internal stipends are mostly awarded to doctoral researchers in the early or late phase of their PhD.

4.2 Monthly income

4.2.1 Level of payment

Respondents under a working contract from their Leibniz Institutes were asked about the level of payment on the public payment scheme which is applied in the German academic system. A quarter of doctoral researchers in the Leibniz Association are holding a contract paid 50% of a full-time TV-L working contract (24%). A very low share of respondents hold a contract of less than 50% (2%). At the other end of the scale, 13% hold a contract which is paid between 76 and 100% of a full-time working contract. In-between, 41% get paid up to 65% E13 TV-L and 20.2% earn between 66 and 75%.

In comparison to the 2017 Leibniz PhD Survey, the group of respondents earning 50% or less of a full-time working contract is 8 percentage points smaller. The largest group receiving from 50 to 75% TV-L increased between 2017 and 2019 (by about 6pp), while the group of respondents earning up to a full-time E13 salary remained nearly stable. This could be an indication for a positive trend towards better paid working contracts.

Again, differences across Leibniz Sections are evident (see Figure 17). A larger group of respondents in sections C and D are paid with 50% of a working contract compared to the other sections. Nearly half of respondents in Section D hold a 50% TV-L contract (42% in this section). At the next level, the majority of respondents in Section A, Section C, and Section E earn between 50 and 65% TV-L. In Section A, nearly three out of four respondents receive this level of payment. Every fourth respondent in Section B and every third respondent in sections D and E is paid between 66

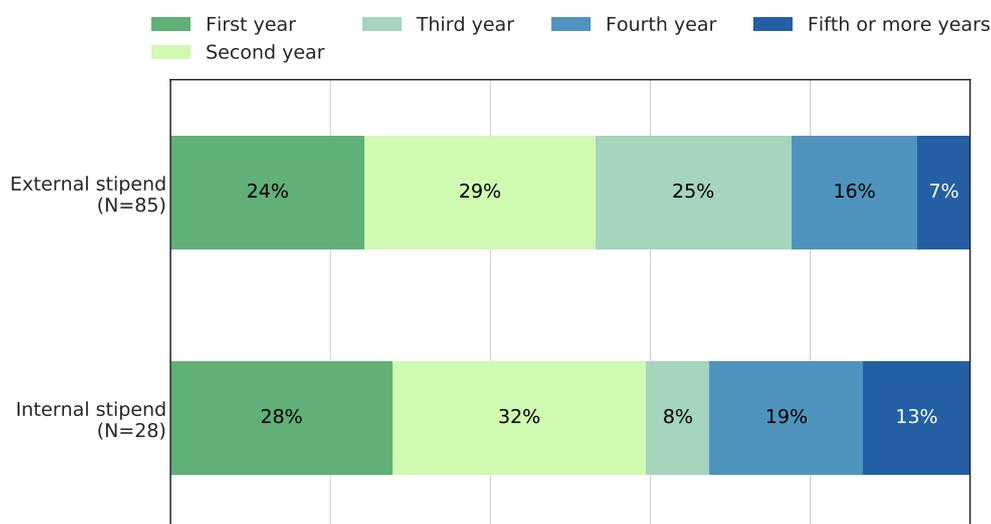


Figure 16: Respondents' year of PhD by type of stipend

and 75% of a full-time working contract. Full-time payment in Leibniz Institutes is possible: a third of respondents working in a Leibniz Institute in Section B receives a 100% salary. It is interesting to observe the congruence of this pattern with earlier findings of the 2017 Leibniz PhD Survey. On the one hand, this helps us to validate the results presented here and earlier. On the other hand, it also shows a lack of progress in terms of salary increases and a higher proportion of paid working time.

4.2.2 Monthly net income

The question on the monthly net income is especially interesting because it allows us to compare the level of payment across contracts and stipends. Figure 18 shows the distribution of this variable for all respondents. We asked doctoral researchers financed by a stipend to deduct taxes, health insurance, as well as bonuses and or holiday allowances before giving us their answer.

As seen in Figure 18, a little more than 50% of all respondents receive a net salary between 1,400 and 1,900€ per month. around 15% of all respondents earn more than 2,000€, whereas 9% earn less than 1,200€ in a month. According to the German Federal Office of Statistics, single person households are relatively poor if they have less than 1,035€ per month at their disposal.⁶ Not considering potential additional partners or family members, 3% of our respondents could be classified as relatively poor on the basis of their reported net income.

Most of the differences in monthly income across Leibniz Sections are not statistically significant. Only respondents working in Leibniz Institutes in Section B earn more money on average compared to respondents in all other Leibniz Sections. This can be explained with the higher share of people with full-time contracts in this section. While we do not find any relevant income differences regarding parenthood, female doctoral researchers earn significantly less money than their male peers on average. Gender differences are not present in the low-wage income brackets up to 1,400€. The strongest difference can be observed for the high-income brackets. While one out of five male respondents earns more than 2,000€ (20%), this is only the case for 12% of female respondents.

⁶see <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Soziales/Sozialberichterstattung/Tabellen/liste-armutsgefahrungs-schwelle.html>

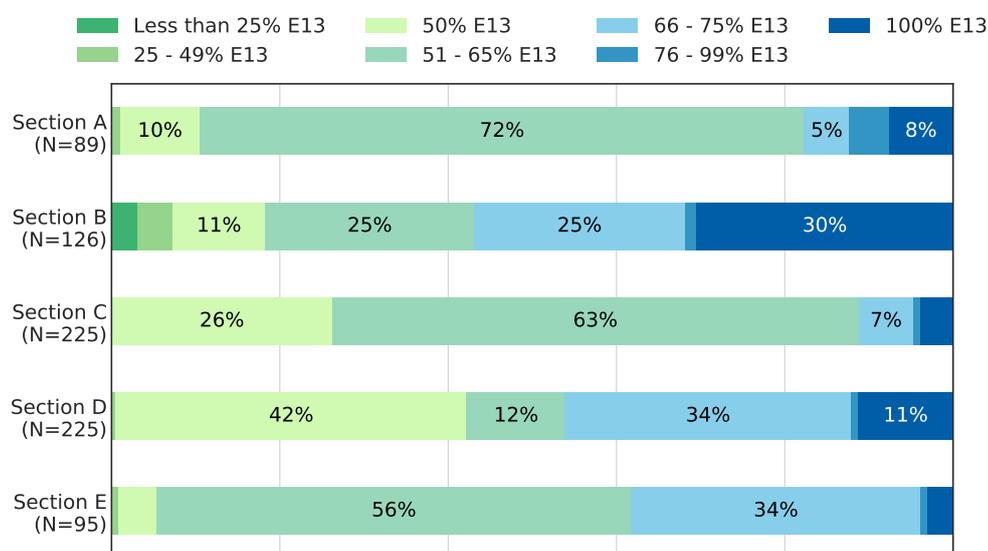


Figure 17: Level of payment by affiliation to Leibniz Sections

4.2.3 Income disparity and poverty

Figure 19 shows how the type of payment explains differences in income distribution better than any other variable. The figure shows the distribution of different types of payment in the various income groups. When considering disposable net income, stipends are on average paid less than working contracts by about 500€ per month when controlling for other variables. Respondents with a guest researcher contract are paid 600€ less than respondents with a working contract, and unpaid respondents have 900€ less than the average.

On the basis of a poverty line at 1,035€ per month, virtually no respondents holding a working contract can be considered relatively poor. However, one out of ten scholarship holders in our sample lies below this line. In the small group of unpaid doctoral researchers, 11 of the 14 respondents are considered as relatively poor according to the official definition (80%). Leibniz Institutes could prevent differences in income by providing beneficiaries of stipends with a working contract. The small group of respondents holding a stipend as well as a working contract are not significantly worse off than respondents with a full working contract on average.

4.2.4 Income increase over time

Adding to the negative economic impact of stipends, the monthly income of doctoral researchers with a stipend does not increase over time as much as for their peers with a working contract. Nearly 27% of the doctoral researchers with a working contract earn more than 1,800€ per month. The share of this group constantly increases over time to 63% among doctoral researchers with a working contract from their fourth year of the PhD onward (Fig. 20). Taking into account the public payment scheme, this can be partly explained with regular rises in salary. On average, the difference in the net salary amounts to nearly 200€ per month over a period of 4 years⁷.

⁷While controlling for other explanatory variables

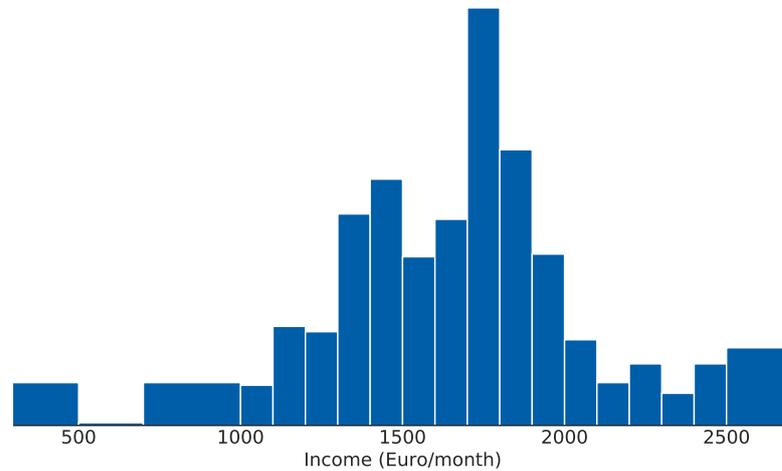


Figure 18: *Distribution of monthly net income (N = 914)*

6% of our respondents who hold a stipend earn more than 1,800€ per month in their first year. As can be seen in Figure 21, this share slightly increases to 21% of doctoral researchers in their third year. At the other end of the income scale, 41% of doctoral researchers with a stipend earn less than 1,200€ in their first year. This number is even higher in the group of stipend holders in their third year (45%), implying doctoral researchers in the later phase of their PhD are paid worse than in their early phase. Comparing Figures 20 and 21 it is evident that there is no clear and constant increase in salaries for those respondents with a stipend in contrast to respondents holding a working contract. This finding is confirmed in a multivariate regression: The slightly upward tendency of income for beneficiaries of stipends over time is not statistically significant.

In Chapter 4.1, we described differences in the type of payment depending on citizenship. Many respondents from non-EU countries are paid by a stipend. This is why non-EU respondents earn less money per month than German respondents or respondents from other EU countries. 22% of all non-EU respondents have less than 1,200€ at their disposal each month. This is the case for 5% of German doctoral researchers and 8% of the doctoral researchers from other EU member states. Citizenship itself is not a statistically significant factor, however, the different payment structure across citizenship translates into an increased economic deprivation for doctoral researchers from outside the European Union.

4.3 Contracts: duration and extensions

In this survey, we asked our respondents for the longest duration of their contract or stipend related to their PhD project (current or past contract) and the number of extensions they obtained, if they got any.

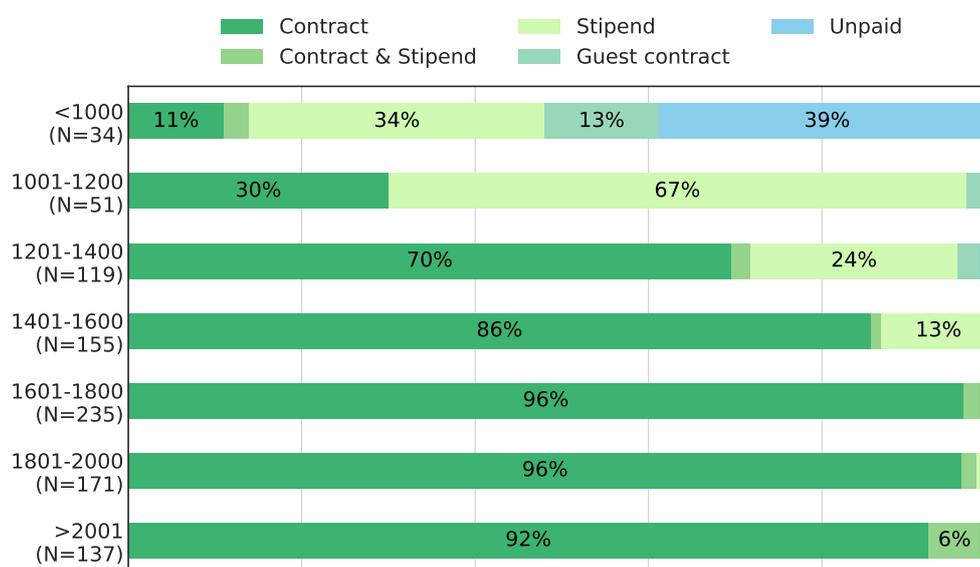


Figure 19: *Type of payment in different monthly income brackets*

4.3.1 Contract duration

At the level of the Leibniz Association, the longest contract duration was only 6 to 12 months long for nearly 7% of our respondents. 21% reported a contract duration between 1 and 2 years, while a little more than 50% of all respondents relied on a contract that lasted between 2 and 3 years. 19% of our respondents had at least one contract over 3 years, among those 7% had a contract lasting 4 years or longer. Such a duration would be in line with the position of the Leibniz Association that a PhD takes 4 years on average. At the moment, the duration of the large majority of contracts is clearly below the expected average duration of contracts described in Section 3.3.2, which would require a contract duration of about 3.8 years. A mismatch between contract duration and expected duration of PhD could be one source of pressure and lead to mental health problems (see following chapter).

We can observe statistically significant differences across Leibniz Sections (see Figure 22). In Section A, nearly no contracts are issued with a duration of less than 12 months, whereas this is the case for 10% of respondents in Section D. More than 23% of the longest contracts in sections B, C, and D were limited to a duration of 2 years, while this is the case for less than 10% of the contracts in sections A and E. Except in Section B and Section D, the majority of respondents had at least one 3-year contract, while more than 10% of respondents in sections A and E had a contract of more than 4 years. In summary, Leibniz Institutes in Section A and E issue the longest contracts of all sections.

The duration of contracts does not differ between male and female respondents, or between parents and non-parents. It is also similar when comparing German respondents with respondents from other EU countries. Contracts are a bit longer for non-EU citizens compared to German citizens in our sample. Even though the share of respondents with a very short contract of less than one year is a little higher among doctoral researchers from non-EU countries, there are less doctoral researchers in this group with contracts between 1 and 2 years, and more with contracts lasting up to 4 years. This difference persists even when controlling for the type of payment.



Figure 20: Evolution of income over time of PhD for respondents who have a *working contract*

Doctoral researchers holding a stipend are worse off regarding the longest duration of their contract than those with a working contract (see Figure 23). A larger share of stipends lasts only up to 2 years (38%) compared to working contracts (27%). However, roughly a fourth of scholarship holders had a contract with a duration from 3 to 4 years, while this is the case for only a tenth of doctoral researchers with a working contract. Further differences across types of payment are not statistically significant.

4.3.2 Contract extensions

Looking at contract extensions, 52% of the respondents did not get any extension of their contract at the time of the survey. A quarter of respondents reported one contract extension, while 13% had two extensions, and another 5% of respondents had three contract extensions. An even larger number of contract extensions is rather rare in the Leibniz Association: 5% of all respondents had four or more contract extensions while working at their Leibniz Institute.

Common explanatory variables like affiliation to Leibniz Sections, gender, nationality, or parenthood show no or very little correlation with contract extensions. Interestingly, respondents from non-EU countries have a lower probability of getting a contract extension than respondents from EU countries (see Figure 24). This relation holds even when controlling for the duration of the PhD and the type of payment. While whether respondents are paid by a working contract or a stipend does not make a significant difference, PhD duration has a very strong influence on contract extensions. The longer doctoral researchers stay at their institute, the higher the likelihood to ask for a contract extension and to obtain more contract extensions. Taking into account the average duration of contracts presented in the previous chapter, this finding is not very surprising.

We asked respondents about potential reasons that could make an extension of their contract happen. Two-thirds of our respondents said "more time needed to complete PhD project" would be a valid reason for an extension, while 55% of the respondents agreed that a wrap-up phase after the completion of the PhD would be a reason for an extension. A parental leave would be a valid reason for an extension in 73% of all cases.



Figure 21: Evolution of income over time of PhD for respondents holding a *stipend*

4.4 Vacations

All respondents were asked how many vacation days they could take each year according to their contract or stipend, when provided, and how many of those days they actually took in the past year. Finally, respondents were asked if they feel free to take days off. We were also interested in reasons why this might not be the case.

4.4.1 Contractual number of days off

According to our respondents, the number of vacation days is fixed in more than 80% of all cases, either 21 to 28 days (11%) or 29 to 32 days (71%). Around one out of ten respondents said that vacation days are not limited in their contract (11%), while 7% did not answer this question. As expected, a larger group of scholarship holders are in the latter groups. Three quarters of stipend holders answered that their funding does not specify the number of vacation days. This is the case for only 1% of respondents under working contract.

4.4.2 Number of vacation days taken

We standardized the scales of two variables asking for the share of days or the number of days respondents took vacation in the past year.⁸ A minority of less than 6% of all doctoral researchers did not take a single day off in the past year. If contracts or stipends do not define a number of days, this share is larger: 15% of respondents in this situation did not take any day off in the last year. Comparatively, 36% of respondents took all the days off specified in their contract or took more than five weeks off, while a fourth of respondents took more than half of their days off or between 3 and 4 weeks.

⁸The standardization is necessary because two different types of questions with different scales are asked depending on whether a number of days is specified or not. The two scales were simply combined after standardizing their scales on a range from 0 to 1.



Figure 22: Duration of the longest contract by affiliation to Leibniz Sections

On average, female respondents took more days off than male respondents. Respondents from non-EU countries are less often on holiday compared to German respondents. Similarly, stipend holders take fewer days off than respondents under a working contract. The number of holidays also increases over the course of the PhD. Respondents in a later phase of the PhD take off more often than respondents in their first year. The Leibniz Section of affiliation and parenthood do not explain any difference in the numbers of days off taken.

4.4.3 Perceived freedom to take vacations

To the question of whether they feel free to take days off, around two thirds of respondents said they do (65%), while another third said they do not (35%). This distribution cannot be explained with common variables, however, small significant differences between Leibniz Sections occur (see Figure 25). The most cited reason for not feeling free to take days off is the perception that the workload is too high (30%). Fewer respondents want to save holidays for a longer vacation in the future (9%) or feel pressured by their supervisors to be present (7%). The measured explanatory variables do not explain why respondents feel their workload does not enable them to take days off. Overwhelming workload was cited by respondents in their fifth year of PhD and picked a little more often than respondents in their first year, while respondents from non-EU countries cited this factor less often than German respondents. Type of payment or contract duration do not have any significant influence on the answers.

4.5 Working hours

In this section, respondents holding a working contract were asked about the number of weekly working hours specified by their contract. On average, doctoral researchers in the Leibniz Association must work 28.4 hours a week. 22% of respondents have to work up to 20 hours a week, 50% of the respondents must work between 20 and 30 hours a week, and a quarter of respondents must work between 30 and 40 hours a week. A very small fraction of respondents (less than 1%) said they need to work more than 40 hours per week according to their contract. Around 5% of respondents could not answer this question.

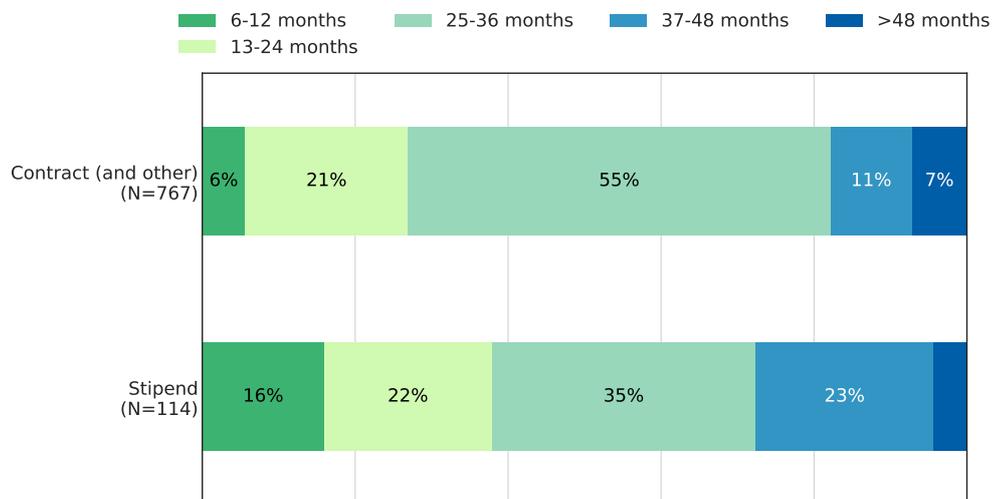


Figure 23: Duration of the longest contract comparing stipends with other types of payment

Following the contractual working hours, we asked respondents how many hours they typically work per week in total, offering a scale reaching from "less than 20 hours" to "over 80 hours" using 5-hour intervals in-between. It needs to be mentioned that this question could be subject to measurement error due to social desirability: Some respondents might tend to over-report their working hours even in an anonymous survey.

At the level of the Leibniz Association, less than 1% of the doctoral researchers work less than 20 hours a week. As can be seen in Figure 26, 95% of all respondents said they work over 30 hours each week. A little less than a third of respondents work between 30 and 40 hours, while nearly 50% of respondents work from 41 to 50 hours each week. A remaining proportion of respondents work more than 51 hours (15%), most of them clustered between 51 and 60 hours (12% of all respondents).

A few significant differences are apparent depending on our measured variables. First of all, respondents working in Leibniz Institutes in sections B, C, and D (in ascending order) work longer hours than respondents in sections A, and E. This relation even holds when controlling for the level of payment for working contracts (TVöD). Men report longer working hours than women on average, as do respondents from non-EU countries compared to EU citizens. The type of payment does not make a difference, although unpaid respondents report a higher number of weekly working hours than working contract holders. Finally, parents are working a little bit less each week than non-parents, most probably because they need to take care of their children.

Contractual working hours are more interesting when compared to the *de facto* number of working hours. Less than 1 in 100 respondents said they worked less per week than agreed in the working contract. 8% of the respondents worked just as many hours as stated in the contract, whereas the remaining 91% of respondents worked longer hours than required in their contract. For 36% of respondents, their overtime amounts to 1 to 14 hours each week, while another 27% report to work up to 20 hours more than required. Respondents working in sections C and D tend to work more overtime than respondents in other Leibniz Sections. No significant differences depending on gender, nationality, or PhD duration could be found. Again, those numbers do not include respondents not holding a working contract.

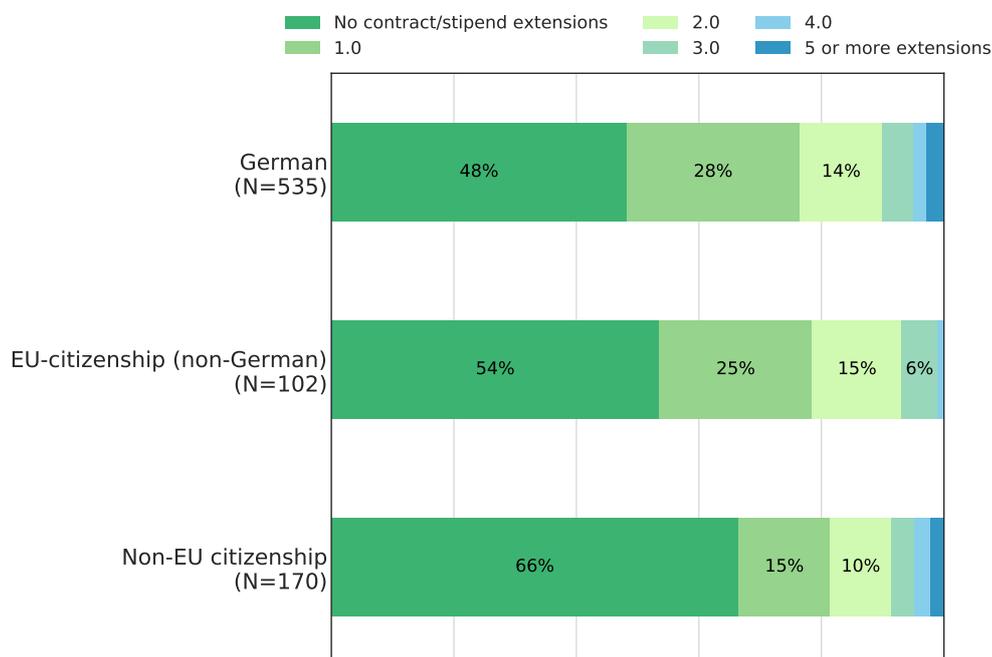


Figure 24: *Contract extensions and the number of extensions by nationality*

4.5.1 Distribution of working time

In addition to gross working hours, we were interested in knowing how respondents distribute their working time in a number of tasks, such as scientific work related to the PhD, scientific work not related to the PhD, teaching, or administrative tasks. In 2019, doctoral researchers participating in this survey dedicate 60% of their working time on scientific work related to their PhD on average. Half of respondents report proportions between 45 and 80% of their working time, while 5% of the respondents spent less than 20% of their time on their PhD (Fig. 27).

The affiliation to Leibniz Section does have a significant impact on the time spent on the PhD. Taking respondents in Section A as a reference group, respondents in Section B spend less time on their PhD (by about 5 percentage points on average), while respondents in sections C and D spend from 5 to 7 percentage points more time on their own research. The difference between Section A and Section E are not statistically significant. In contrast to gender and parenthood, which do not significantly impact the results, there are significant differences depending on nationality: German doctoral researchers spend less time on their PhD than non-EU citizens and other EU citizens even when controlling for the type of payment.

One argument for stipends lies in the possibility for recipients to dedicate their entire working time on their PhD project, independently from any other scientific or non-scientific work. Indeed, respondents holding a stipend do spend a larger share of their working time on their PhD when controlling for other explanatory variables. As Figure 28 shows, the share of respondents with a stipend working less than 40% of their time on their PhD thesis is smaller than among doctoral researchers holding a working contract. However, in line with previous survey results from 2017, the overall average difference is rather small (7 percentage points). In comparison, respondents holding a guest contract spend over 15 percentage points more time on their PhD than respondents holding a working contract.

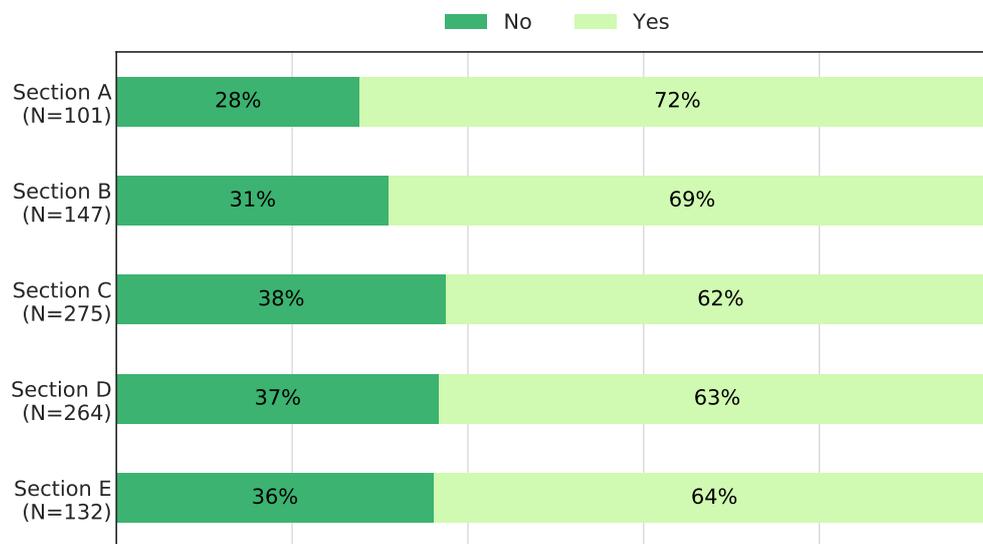


Figure 25: *Do you feel free to take days off?*

Other tasks take up a substantial fraction of the working time of doctoral researchers: on average, 17% of their time is spent on research work not related to their PhD. Respondents holding a stipend spend 8 percentage points less of their time on non-PhD-related projects than respondents with a working contract. Another 7% is dedicated to attending seminars and courses. On average, 4% of the working time of doctoral researchers in the Leibniz Association is spent on teaching, while two thirds of all doctoral researchers do not teach at all. Teaching often takes place in the third and fourth year of the PhD. Administrative tasks take 8% of the working time on average. Finally, 3% of the working time is spent on other tasks. Looking at the open answers from our respondents, these tasks can be PhD representation work, grant writing, or science communication.

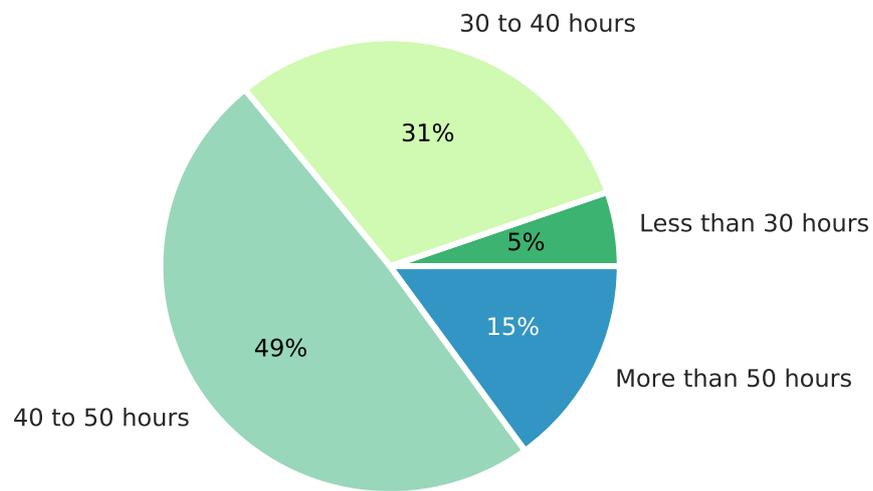


Figure 26: Number of working hours per week (N = 904)

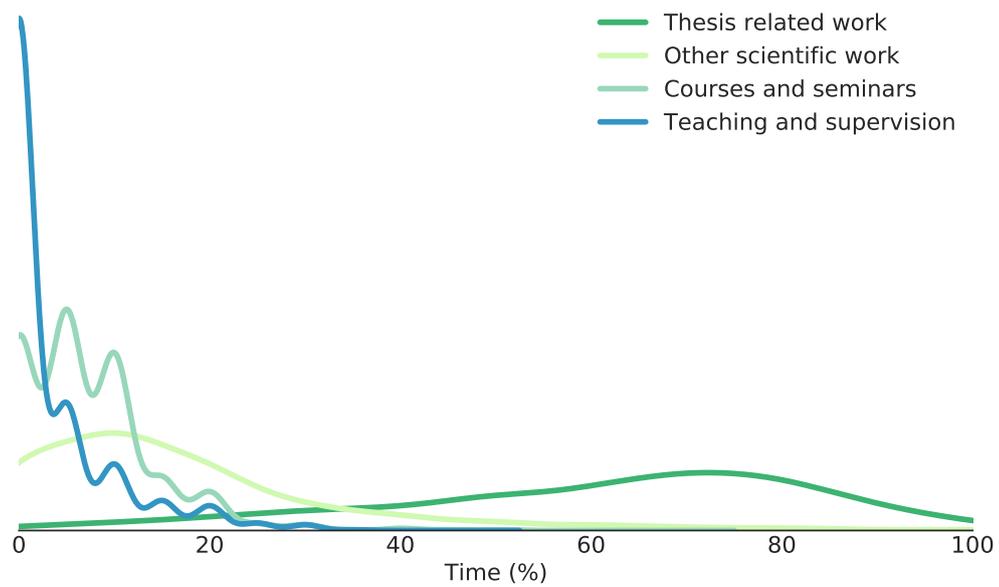


Figure 27: Percentage of working time spent on different tasks (N = 937)

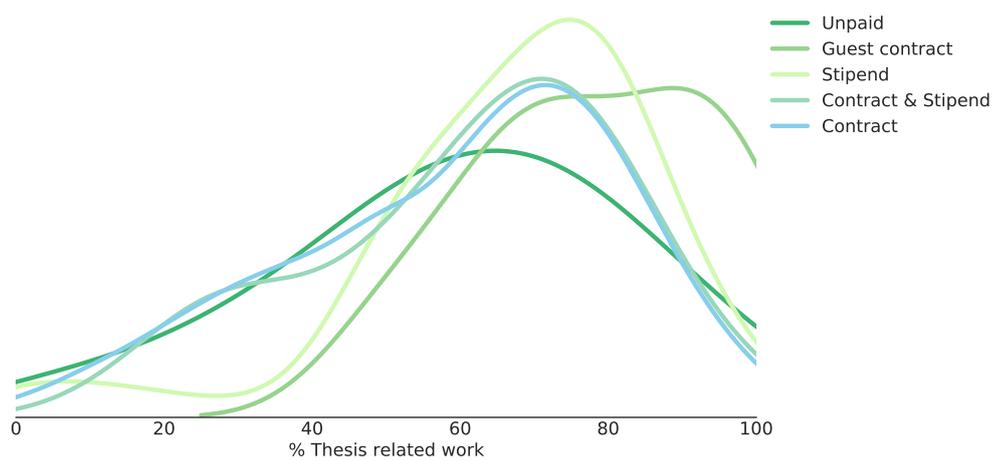


Figure 28: *Percentage of working time spent on PhD thesis by type of payment (N = 925)*

5 Satisfaction

Main findings from the following chapter:

- While the majority of doctoral researchers are satisfied with their supervision (68%) and the scientific support (74%) they receive at their institutes, they are generally less satisfied with other forms of support (44%). Moreover, older doctoral researchers are in general less satisfied with various aspects concerning the work at their institutes than younger doctoral researchers.
- 71% of doctoral researchers somewhat identify with their institute or museum, but identification seems to decline the more time they spent on their PhD.
- For 62% of doctoral researcher the offer of attractive pay and benefits was an important factor for choosing their institute.
- At the same time, only a minority of doctoral researchers find the "hard facts" of a research career, such as the salaries (20%) or chances for permanent positions (19%), attractive. In contrast, the majority of doctoral researchers judges the type of work and the service to society as attractive.
- 32% of doctoral researchers have often or occasionally thought about not continuing their doctorate.
- 44% of researchers reported working at least two weekends or holidays per month.

5.1 Doctoral researchers' affinity towards the Leibniz Association

In the first subsection of this chapter we report on the results for questions we asked the respondents regarding their motivation for starting their doctorate in their institute or museum and to what extent they identify with the Leibniz Association and its institutes.

5.1.1 Identification with Leibniz Association and Institutes

In two separate questions respondents were asked whether they identify with their Leibniz Institute and with the Leibniz Association in general. 71% of doctoral researchers replied that they either identify with their institute a bit or very much. Only the duration of their PhD had a significant influence on respondents' replies (see Figure 29). Identification seems to decline over time. The replies of either not identifying or not quite identifying with the institute were more likely among those that had already spent more time on their PhD.

Regarding doctoral researchers' identification with the overall Leibniz Association, 44% identified to some degree with the organisation while 48% replied that they do not identify with it. Again, Figure 30 shows that respondents' duration in the PhD until the survey had a statistically significant influence on their replies. Identification declines with doctoral researchers' time spent on the PhD. While only 6% of the respondents in the first year of their PhD replied that they did not identify with the Leibniz Association at all, it was 25% of those in their fifth year. Similarly, we can observe a trend of doctoral researchers still at the beginning of their PhD being more likely to respond with "yes, a bit" or "yes, very much" than those at later stages. Moreover, non-EU citizens were much more likely to feel a high level of identification (24%) with the Leibniz Association than German (4%) and non-German EU citizens (8%).

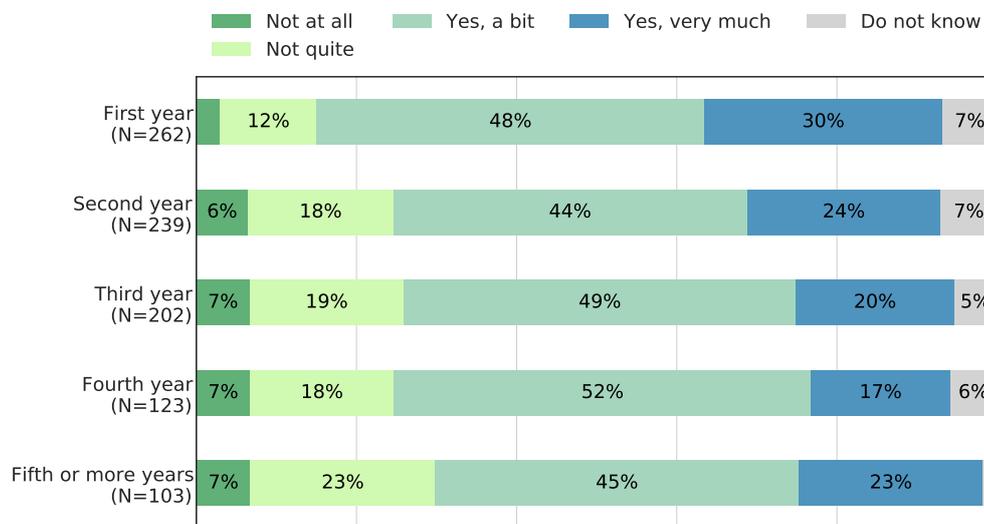


Figure 29: *Identification with Leibniz Institute by year of PhD*

5.1.2 Reasons for accepting job at institute or museum

Respondents were asked about the initial reasons for starting their work on their doctoral thesis at their institute or museum (see 31). They could choose from eight different reasons with multiple answers possible. The reason that was chosen the most was “Attractive pay and benefits” with 62% of the total respondents ticking that box. As could be expected, this number is lower among doctoral researchers that hold a stipend, have a guest contract or are unpaid. However, of these doctoral researchers (n=136) still 52% chose this as a reason. More German than non-German or non-EU citizens chose this reason. There is no significant difference between the replies of male and female respondents.

Only about a fifth of the overall respondents chose their institute because it offers a structured PhD programme. Non-German EU citizens and non-EU citizens were more likely to mention this as an important factor for their institute choice.

For 41% of the respondents “scientific excellence” was among the reasons to join their institute. The percentage of respondents choosing scientific excellence was only slightly higher (46%) in the group of respondents who also stated that they would like to work in academia after completing their doctorate (see Chapter 8.3.1). While scientific excellence does rank second (41%) among the reasons respondents could choose from, it is noteworthy that only 0.4% (n=4) of the respondents stated that interest in the research carried out at the institute was a reason for them beginning their doctorate there.

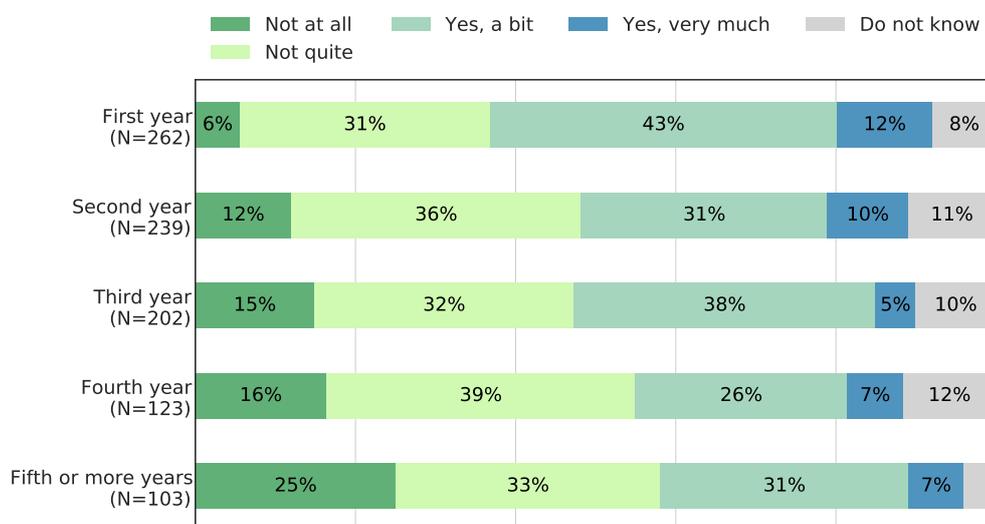


Figure 30: Identification with Leibniz Association by year of PhD

5.2 Personal assessment of situation as doctoral researcher and motivation

This subsection focuses on the doctoral researcher's satisfaction with their working conditions both in terms of scientific circumstances and social life, how they judge their career prospects after completing their doctorate and what their motivations are for seeking a job in academia. Furthermore, it provides valuable insights into the reasons why some doctoral researchers consider or did consider at some point to not continue their doctorate.

5.2.1 Satisfaction with social and professional life

In the Leibniz PhD Survey of 2017 doctoral researcher's satisfaction was inferred from a single item question in which 65% had replied that they were either satisfied or very satisfied with their situation at their institutes and museums. For a more fine-grained insight, we asked respondents of this 2019 survey to rate their satisfaction with 17 aspects of their social and professional life as doctoral researchers. The aspects included issues regarding the support they receive such as supervision, administrative support or scientific support, their working conditions such as office and laboratory equipment or availability of workshops and skills training, and the working atmosphere or social life at their institutes. While the overall results are summarised in figure 32, in the following we will investigate some of the aspects in more detail.

To structure the results for such a large battery of questions we performed a factor analysis which revealed two significant groups of factors. The first group of factors was positively associated with the aspects "scientific support", "contribution to science", "supervision", "science communication and outreach", "career development", and "workshops and skills training". Thus, we characterize this factor as related to the researchers "professional life". The second factor group was positively associated with "family support", "workload", "social life at the institute", "psychological support", and "work life and atmosphere". Since the aspects describe social and support aspects of the researcher's life, we characterize this factor as "social life". Both factors were transformed to have a mean of 50 and a standard deviation of 10.

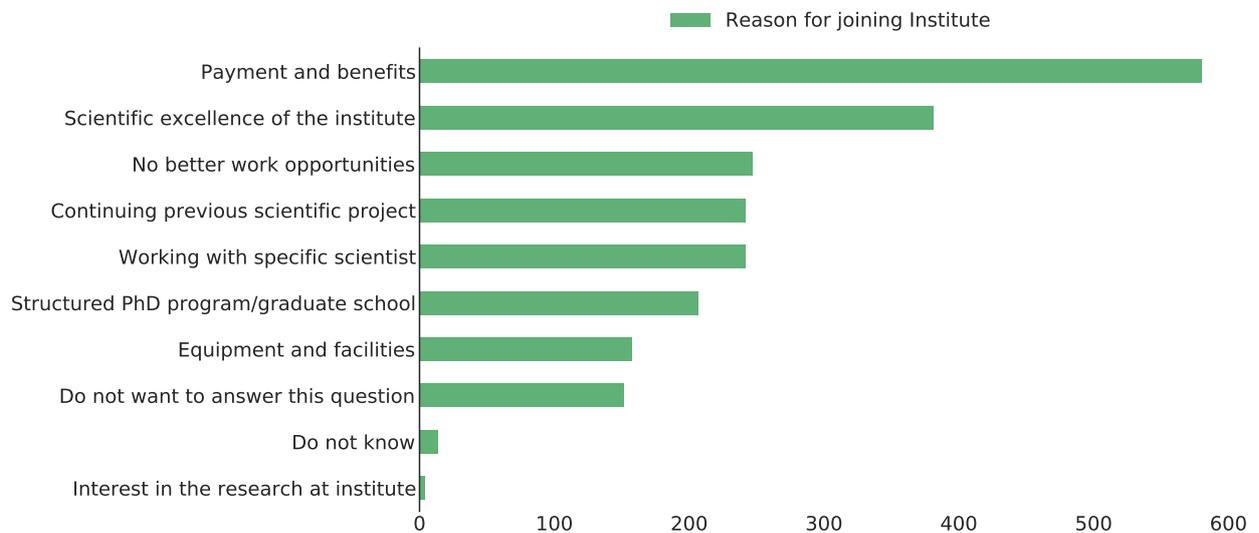


Figure 31: *Reasons for starting the PhD at respective Leibniz Institute*

Before we will explore some of the individual aspects we will provide the overall results of the factor analysis in relation to our independent variables in the following.

Factor analysis: year of study

Doctoral researchers in their first year reported the highest satisfaction with both their professional life and social life, with a mean of 52 for both. Third-year researchers reported the lowest satisfaction with their professional life with a mean of 47, while researchers in their fourth year or higher reported a mean of 48. Second year researchers reported the lowest level of satisfaction with their social life with a mean of 49, which increased for researchers in their third year or more with a mean of 50.

Factor analysis: international researchers

Non-EU citizens are the most satisfied with their professional life, reporting a mean of 51. By contrast, German citizens reported the lowest level of satisfaction with a mean of 48. German citizens also reported the lowest level of satisfaction with their social life with a mean of 48, compared to EU citizens and non-EU citizens who reported means of 52 and 51, respectively.

Factor analysis: parents

Satisfaction with the respondent's professional life did not change when looking at researchers that do not have children compared to those that have or are expecting children. However, there is a noticeable difference in researcher's satisfaction with their social life. Researchers who have children, or are expecting children, reported a mean of 52 compared to a mean of 50 for those who did not have children.

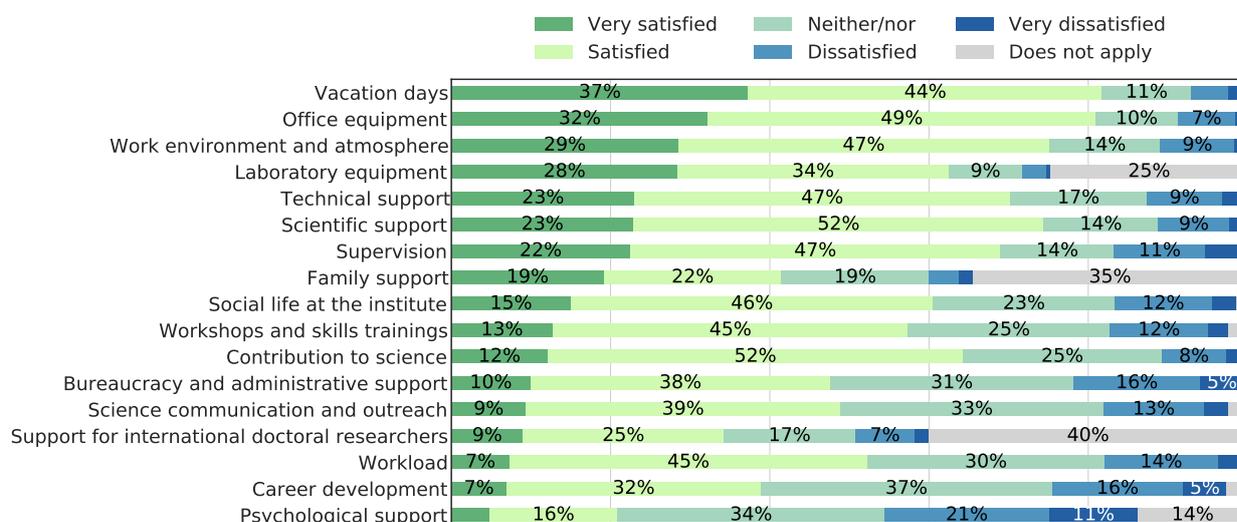


Figure 32: Satisfaction with situation as doctoral researcher

Factor analysis: section

Respondents from section A reported the lowest level of satisfaction with their professional life with a mean of 46, while section E reported the highest with a mean of 51. Section B reported a 49, and sections C and D both reported a 50. The mean scores for the social life factor were more stable, with section C reporting the lowest of 49, section B reporting the highest with 52, section A reporting a 50, and sections D and E both reporting a 51.

There are no significant differences with respect to contract situation or gender.

Aspects of professional life

Overall, the majority of respondents were satisfied with the aspects concerning scientific life at their institutes. 68% of the doctoral researchers were either satisfied or very satisfied with their supervision (in comparison, in the 2017 survey it was 63%). This rate of satisfaction does not significantly vary across the different sections, the gender of the respondents or their nationality. However, the satisfaction with supervision seems to decline over the years into the PhD and with the increasing age of the respondents. Similarly, 74% of the respondents felt satisfied with the scientific support they receive at their institutes. While this number does not vary much across most of the different Leibniz Sections, Section A shows the lowest rate of satisfaction in this regard at 65%. Again, satisfaction rates for this aspect were higher among younger respondents.

While 70% perceived the technical support they receive as either satisfying or very satisfying, only 47% of all respondents thought the same about the administrative support of their institutes. This is particularly the case for respondents from Leibniz Section E where only 30% were satisfied with the administrative support they receive.

Maybe more importantly, on average only 39% of the respondents were satisfied overall with how they are supported in their career development. Much like for the aspects of supervision and scientific support, older respondents were generally more dissatisfied with this aspect than younger ones. While among those doctoral researchers aged 25 years or younger 47% were satisfied overall with career development at their institutes, it was 40% of those between 26 and

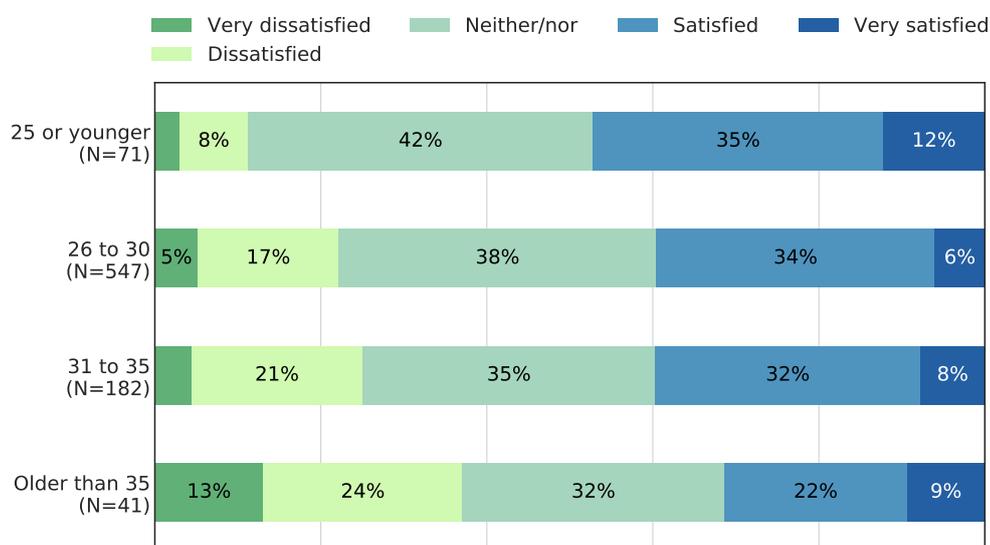


Figure 33: Satisfaction with career development by age of respondents

35 years and 31% of those older than 35. Moreover, German citizens were less satisfied with this aspect than doctoral researchers of other citizenship. 34% of the German respondents were satisfied overall with career development while it was 44% of non-German EU citizens and 46% of non-EU citizens.

Concerning the aspect of support for international doctoral researchers, 58% of the responses from non-German EU citizens and non-EU citizens were overall satisfied with the support they receive while 15% were overall dissatisfied (see figure 34).

Regarding the technical equipment and other benefits offered at the institutes, 57% of the respondents were overall satisfied with the workshops and skills trainings offered, 48% were overall satisfied with the communication and outreach efforts of their institutes while 61% and 81% were overall satisfied with the laboratory and office equipment respectively.

Aspects of social life

In general, respondents were rather satisfied with most aspects concerning the social life and other soft factors of their work environment. When directly asked about social life in the questionnaire, 60% replied that they feel satisfied to some degree. At the same time 75% of the respondents felt satisfied with the work environment and atmosphere at their institutes. There are no big differences in the responses across the Leibniz Sections, gender or citizenship for the latter. However, those doctoral researchers that were both older and had spent more time on their doctorate until the survey were slightly more likely to feel dissatisfied about this aspect. Moreover, 63% felt satisfied about how they contribute to science through their work.

Overall, 81% of the respondents were satisfied with the number of vacations days they receive while those doctoral researchers holding a stipend were less satisfied with this (68% felt satisfied) than those holding some form of contract (83% felt satisfied). When asked about how they feel about the workload they are facing at their institutes, 51% felt satisfied while 29% felt indifferent about it. Only slightly less than a fifth of the respondents felt dissatisfied about it. There are no significant differences in these numbers between males and females, nor between those respondents that

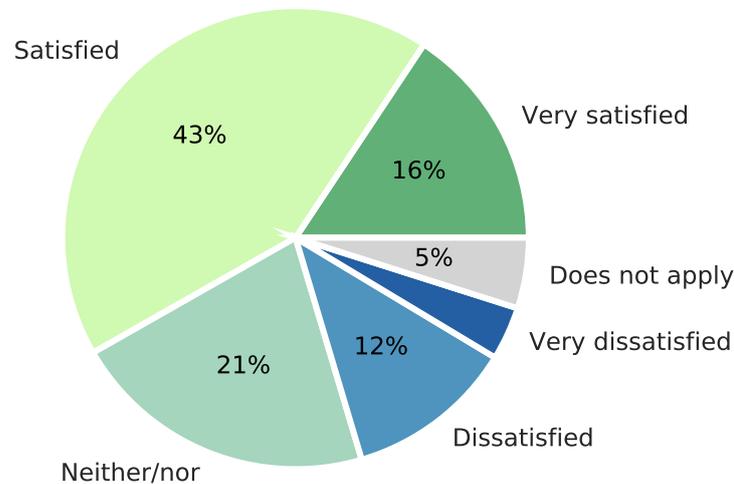


Figure 34: *Satisfaction with support for internationals among non-German respondents*

were having or expecting children at the time of filling out the questionnaire. However, like it is the case for many other of the various aspects of satisfaction, the older the respondents were the less satisfied they were with the work load.

Only 21% of the valid responses were overall satisfied with the psychological support they receive at their institutes, while 31% were overall dissatisfied and the rest of the respondents felt either indifferent about it or did not provide a valid reply. The rate of satisfaction with psychological support is even lower among those doctoral researchers who reported that their work was affected to at least some degree by psychological problems (n=619; see chapter D for more details on mental health). Of those respondents, only 16% felt satisfied with their institute's psychological support, 31% felt indifferent and 40% replied that they are dissatisfied.

5.2.2 Thoughts about Not Continuing Doctorate

Respondents were asked if they have ever thought about not continuing their doctorate. As shown in figure 35, 32% of the 869 respondents indicated that they have either often or occasionally thought about not continuing.

Section

The responses were relatively uniform across sections A (32%), B (33%), C (35%), and D (31%). Section E was considerably lower than the other sections, with only 25% of respondents indicating that they had occasionally or often thought about not continuing their doctorate.

Year of study

There is an increasing relationship between thoughts of not continuing and the year of the study. The increase is most prevalent from the first to second year of study, which rose from 19% to 36%, respectively. The fourth and fifth years slightly increased as well, where 37% and 39% of respondents have occasionally or often thought about not continuing.

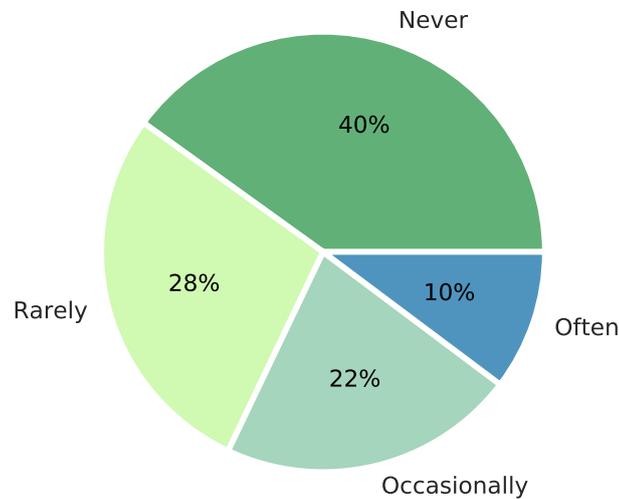


Figure 35: *Frequency of thoughts to quit PhD*

International doctoral researchers

We observe far fewer international doctoral researchers with thoughts of not continuing compared to citizens within the EU or German citizens. Only 23% of non-EU citizens often or occasionally thought of discontinuing, while approximately 35% of both EU citizens and German citizens have thought of not continuing.

Contract situation

The highest percentage of respondents who have thought about not continuing are those that hold only a contract position (33%). 29% of stipend holders have thought of discontinuing, and only 19% of the researchers that hold a contract and stipend have considered not continuing.

There are not significant differences among gender or parenthood found in the analysis.

5.2.3 Reasons for considering not to continue doctorate

Doctoral researcher's were given a list of 18 aspects that may have contributed to their thoughts of discontinuing their doctorate. Multiple answers were possible, and figure 36 shows the frequency of the responses attributed to each aspect. This section will focus on the two aspects that were reported the most: "Career prospective unattractive" and "do not feel qualified enough", which yielded 200 and 184 "yes" answers, respectively.

Section

Section C reported the highest frequency of feeling that their career prospects seems unattractive, with 34% of the 200 responses coming from that section. Section E reported this as a reason to consider quitting the least, with 9% of the total responses. Section C also reported the highest frequency of not feeling qualified enough with 32% of the 184 responses, followed by 26% in section B, 19% in section D, 16% in section A, and 7% in section E.

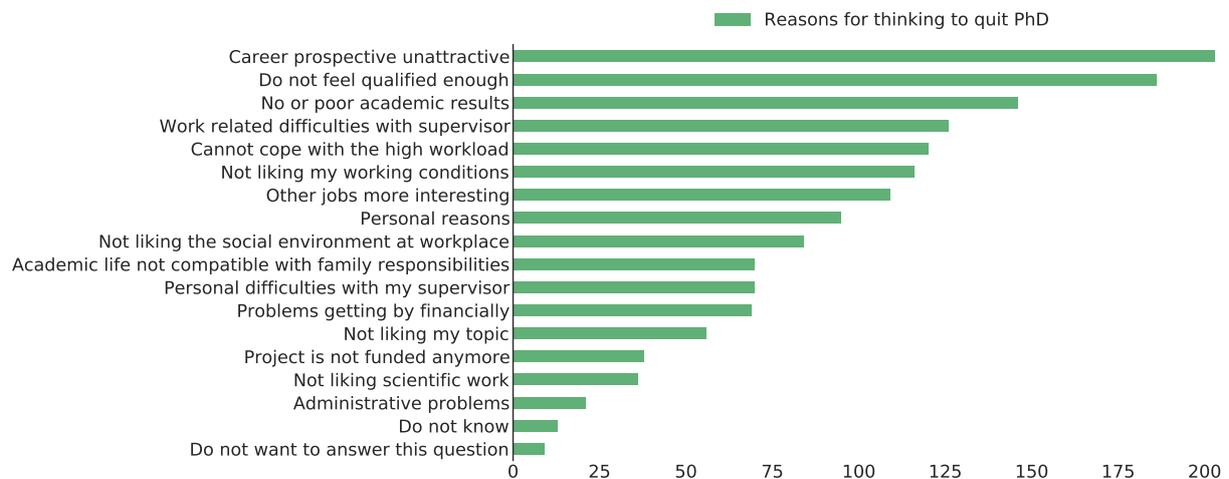


Figure 36: *Reasons to think about quitting the PhD*

Year of study Researchers in their second and third years reported the highest frequencies of unattractive career prospects as a reason for discontinuing their PhD's, with each year accounting for 28% of the total responses. First year researchers reported an unattractive career prospect the least with 14%, and fourth and fifth year researchers each account for 15% of the total responses to this question. With regard to researchers not being qualified, most of the responses to this question are divided between first, second and third year researchers, who account for 26%, 26%, and 25% of total responses to the question, respectively.

Contract situation

Almost all respondents that feel their career prospects to be unattractive are contract holders, with 86% of the total responses to this question. Only 9% of the respondents that identified this aspect as a consideration for quitting are stipend holders, with the remainder being a combination of contract and stipend (2%), a guest researcher (1%), or unpaid (2%). This trend also holds for feelings of not being qualified enough, with 87% of the responses coming from contract holders and 8% from stipend researchers.

International doctoral researchers

German researchers make up a majority of the responses for both aspects of considering a discontinuation of their PhD, with 73% of the responses for unattractive career prospects and 77% of the responses for not feeling qualified enough.

Gender

Female researchers account for a higher response frequency for both questions. Of the researchers that reported unattractive career prospects as a reason to consider discontinuing, 54% were female and 46% were male. Similarly, 56% of the responses on not feeling qualified were from female researchers compared to 44% from male researchers.

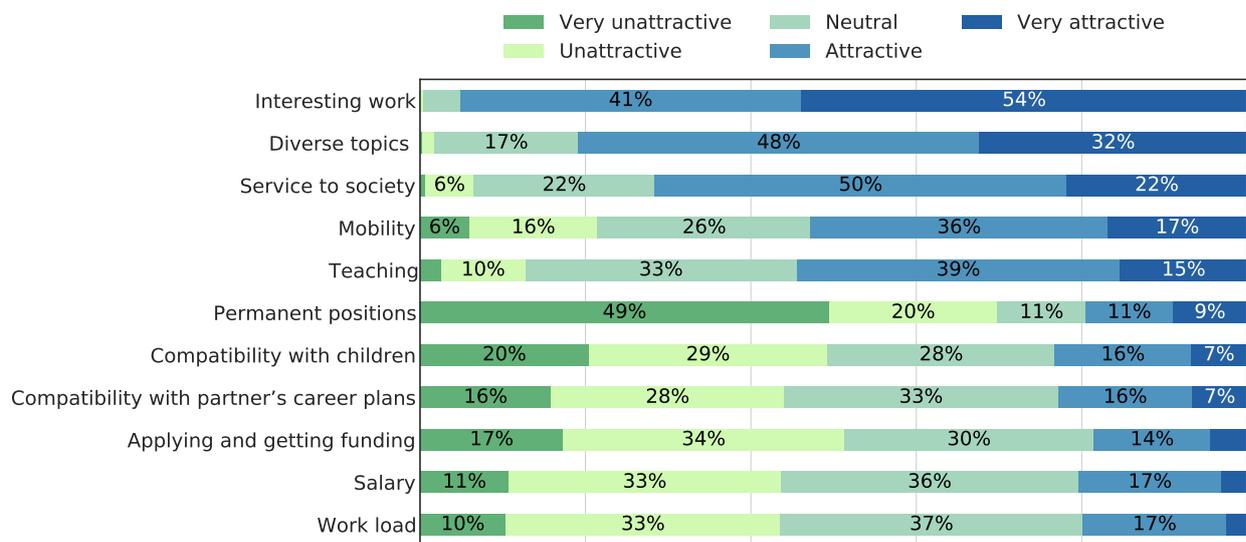


Figure 37: *Judging aspects of career in academia*

5.2.4 Judging aspects of career in academia

Respondents were asked to rate 11 aspects of an academic research career on a Likert scale ranging from "very attractive to "very unattractive". The aspects included, on one hand, issues concerning concrete personal benefits and working conditions such as salary, teaching, funding opportunities, workload or mobility. On the other hand, it included more super-ordinate aspects such as providing a service to society, compatibility with future career plans or interest of work.

The aspects of an academic career relating to rather material career factors and personal life planning were judged in general as not very attractive. Only 20% of the respondents found the salaries in academia at least somewhat attractive. While about 36% judged them "neutral", the majority (44%) judged the salaries to some degree unattractive. Male respondents were slightly more likely to judge the salary unattractive (48%) and less likely to judge it attractive (18%) than female respondents (38% and 23% respectively).

Having or expecting children similarly affected respondents' likelihood to judge the salaries attractive (see Figure 39). Although in both groups the majority judged the salaries neutral (36% of those without children and 35% of respondents with children), those having or expecting children were much more likely to judge the salaries attractive (32%) in comparison to those without children (18%).

Regarding the aspect of permanent positions in a research career, only 22% of the respondents replied with "attractive" or "very attractive" while almost half of the respondents (49%) judged the prospect of permanent positions - or the lack thereof - as "very unattractive" and 20% as "unattractive". Also, only 20% of the respondents judged the expected work load as being at least attractive.

Further, the majority of respondents judged two aspects concerning long-term personal life planning - the compatibility with the partner's career planning and the compatibility with having children - as not very attractive either. Both aspects were judged as overall attractive by only 23% of the respondents. Regarding the perceived compatibility with having children, slightly more female respondents (52% of female respondents) than male respondents (47%) judged it some form of unattractive (see figure 40). At the same time those respondents that were either having or expecting

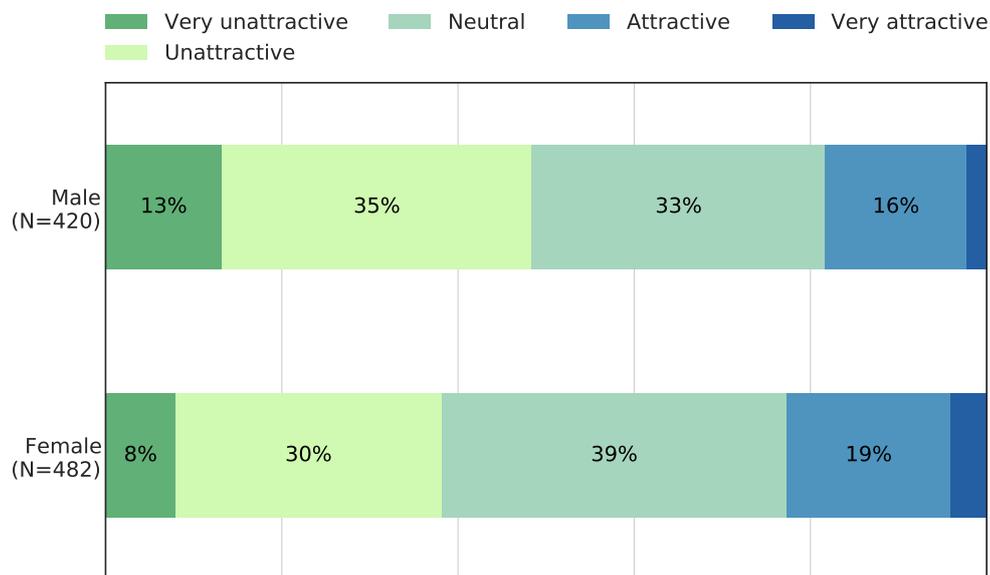


Figure 38: *Judging salaries in academia by respondents' gender*

children at the time of answering the survey (n=119) judged the compatibility of a research career more positive. 35% of those judged this aspect some form of attractive while 20% had a neutral opinion and 42% judged it overall unattractive.

While these more practical aspects in regard to an academic career were not judged as overly attractive, aspects relating to a moral, or personal motivation for working in academia were judged as overall attractive. 95% of the respondents judged the prospect of being able to do interesting work as overall attractive while 80% replied the same for the expectation of working on diverse topics. Moreover, 72% of the doctoral researchers judged the aspect of providing a service to society as either attractive or very attractive. Across the Leibniz Sections, Section E had the highest share (84%) of doctoral researchers that saw this aspect as attractive while Section D had the lowest (64%).

5.3 Workload and living conditions

5.3.1 Working on weekends or public holidays

Researchers were asked "How often have you worked during weekends or public holidays in the past year?", with answers on a 6 point scale ranging from 1 "Never" to 6 "Every weekend". Of the 909 valid responses, 44% of the respondents reported working at least two weekends or holidays per month, and 7% reported working every weekend.

Section

There is little variation among sections A to D, which reported a range of means scores between 2.9 and 3 (i.e. once per month). However, section E works more on average than the other sections with a mean score of 3.2 (slightly more than once per month).

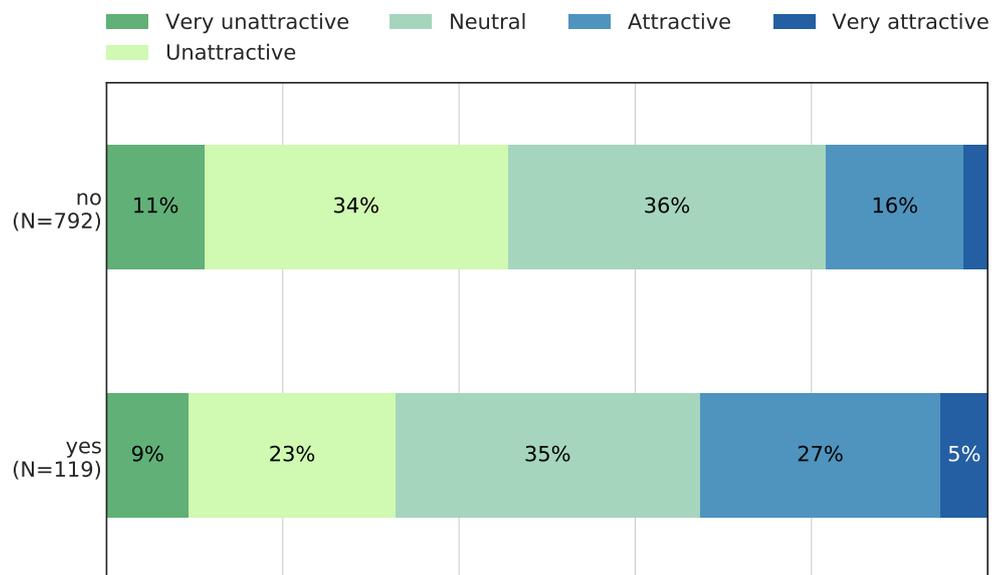


Figure 39: *Judging salaries in academia by respondents expecting or having children*

Year of study

Researchers in their fourth or later year reported working weekends and/or vacations more frequently than those in their third or less year of work. First through third year researchers reported a mean score rounding to 3 (once per month), while the mean for fourth and fifth year PhD candidates rounds to 4 (twice per month).

International doctoral researchers

There is a significant variation with respect to citizenship and working on holidays and/or weekends. Non-EU citizens reported working the most with a mean of 3.7 (almost twice per month), followed by non-German EU citizens with score of 3.5 (between once and twice per month), and German citizens reporting a mean of 3.1 (once per month).

Contract situation

Doctoral researchers holding a contract reported the least amount of holidays/weekends worked with a mean of 3.2 (just over once per month), while stipend holders reported a mean of 3.7 (almost twice per month). However, researchers that hold a guest contract or are unpaid reported the highest means of 4.2 and 4.1 (more than twice per month), respectively.

Parents

There is a slight increase in the amount of holiday/weekends worked for researchers that have, or are expecting, children. This group reported a mean of 3.4 compared to a mean of 3.3 for non-parents. We found no variation in holidays/weekends work with respect to gender.

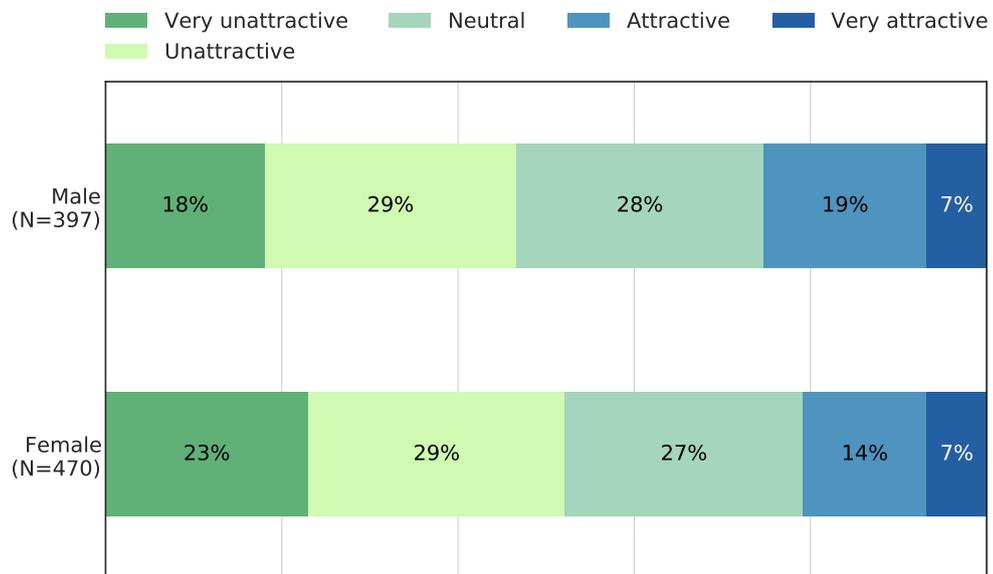


Figure 40: Judging compatibility of academic career and having children by gender

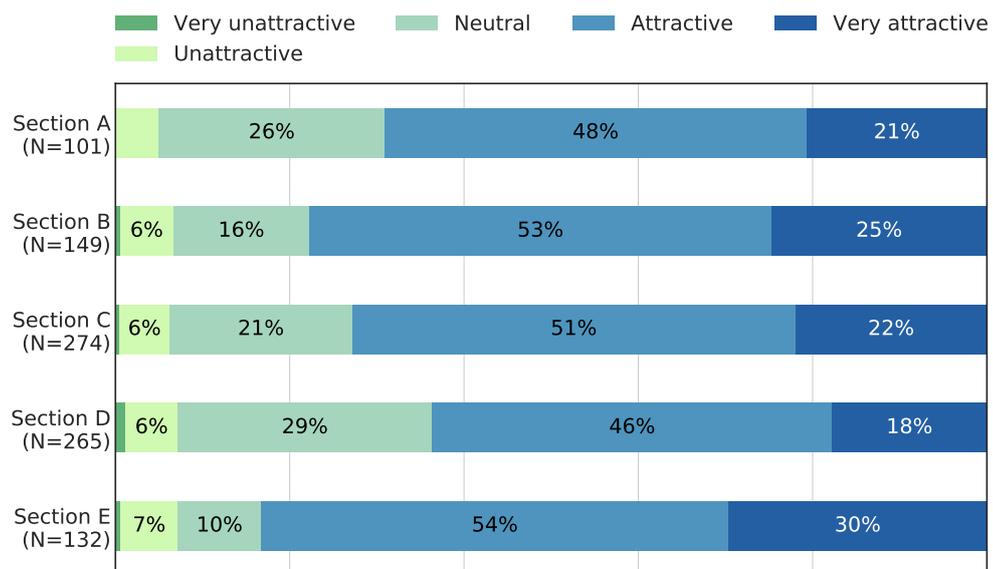


Figure 41: Judging service to society through academic career by Leibniz Sections

6 PhD Supervision

Main findings from the following chapter:

- 77% of the doctoral researchers are satisfied with their supervision.
- Meeting frequency has a significant effect on the mean level of satisfaction with supervision. Doctoral researchers who met with their supervisor almost daily reported a mean close to 5 (i.e. "Satisfied"), which decreases to less than 3 ("Rather dissatisfied") for those that only meet yearly.

6.1 Satisfaction with PhD supervision

Satisfaction with the respondents PhD supervision is inferred from answers to the question "How satisfied are you with your PhD supervision in general?" Answers ranged from 1 "Very dissatisfied" to 6 "Very satisfied." 890 respondents provided valid answers to this question. Approximately 77% of respondents indicated some level of satisfaction with their supervision. The response distribution can be found in figure 42.

Year of PhD

There is a statistically significant negative relationship between the respondents previous duration of their PhD and satisfaction with their supervision, which gets stronger in the later years of study. As shown in figure 43, first year researchers reported a mean satisfaction close to 5 (satisfied), which decreased every year to almost 4 (somewhat satisfied) for researchers in their fifth year or higher. An OLS regression was conducted analyzing satisfaction of supervision based on the explanatory variables from Chapter 3. Our results show that a higher year of PhD predicts a lower level of satisfaction with PhD supervision.

International researchers

The differentiation between international and German researchers with respect to satisfaction with supervision is consistent when compared to the previous report [6]. Researchers that were German citizens reported a mean level of satisfaction correlated to being "somewhat satisfied" (4.3) while international researchers have a mean level of 4.7 (i.e. satisfied). However, non-German EU citizens reported the lowest mean level of satisfaction at 4.1.

Parents

In contrast to the previous report which found a higher mean level of satisfaction with researchers that did not have or expect children compared to those who did (4.6 to 4.2, respectively) [6], the results from this survey recorded a slight increase in satisfaction for the respondents that were parents or planning to have children (4.41 vs 4.33). We observe little variation with respect to gender.

Contract situation

Doctoral researchers holding a stipend tend to be more satisfied with their supervision compared to contract holders. The mean level of satisfaction for each type of funding is between "somewhat satisfied" and "satisfied" with 4.5 and 4.3, respectively.

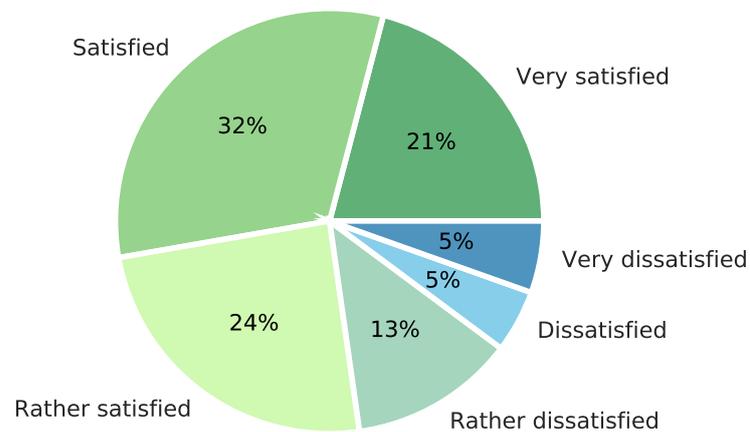


Figure 42: Satisfaction with PhD supervision

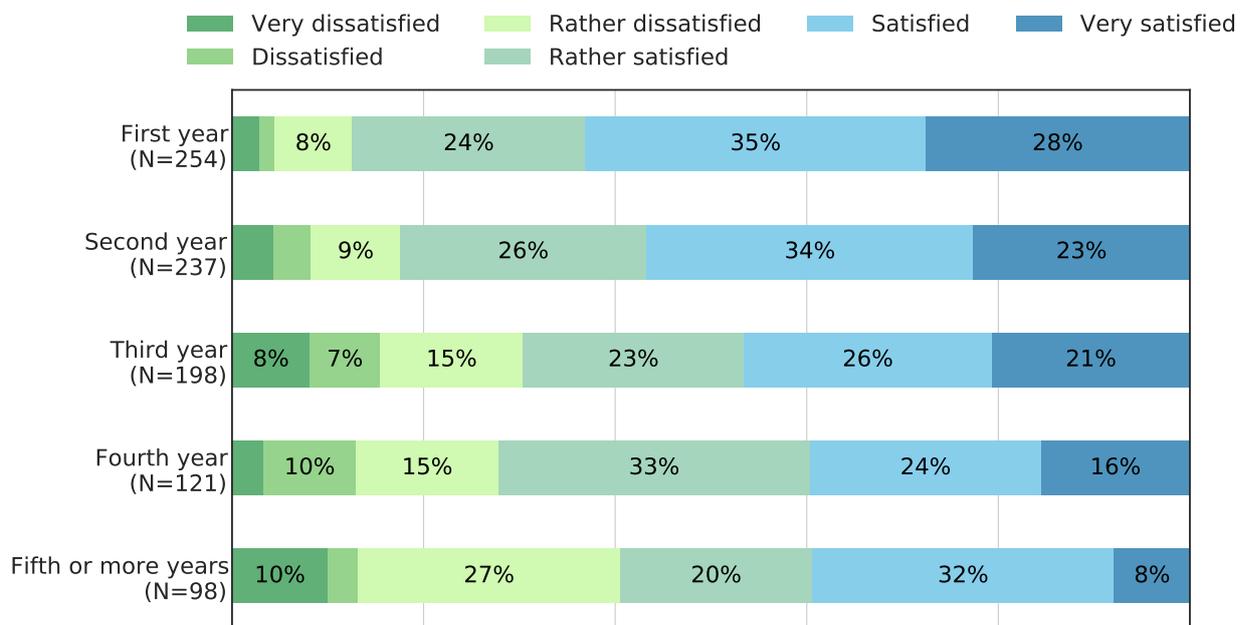


Figure 43: Satisfaction with PhD supervision by year of PhD

Leibniz sections

All Leibniz sections reported a level of satisfaction between 4 and 5, correlating the responses of "somewhat satisfied" and "satisfied". Researchers in Section E are the most satisfied with their supervision with a mean of 4.5. By contrast, respondents from Section A reported the lowest mean of 4.2.

6.2 Employment of the first or main supervisor

Doctoral researchers were asked "Where is your formal/primary supervisor employed?" and were only allowed to choose one option. Of the 882 responses provided, the vast majority (77%) of supervisors were employed at the doctoral researcher's Leibniz Institute. Almost 20% were employed at the university, and were either at another Leibniz Institute (0.5%), Emeritus (1%), or from somewhere else (1%).

Leibniz sections

There is significant variation among the sections with respect to where the supervisors are employed. Sections C and D have the highest percentages of supervisors employed at the researchers institute with 80% and 86%, respectively. Section E ranks below those sections with about 74% of the supervisors at the institute, while sections A and B have the fewest with 62% and 69%. Correspondingly, the share of supervisors that work at the university for each section are 34% (section A), 27% (section B), 17% (section C), 11% (section D), and 24% (section E).

Year of PhD

There does not appear to be a systematic trend with respect to the share of supervisors at the institutes. However, there is variation in the share of supervisors at the university. Of the 877 respondents, no researchers in their first and second years reported being supervised by someone at the university, 21% reported for the third year and fifth year or more, and 57% of fourth year PhD candidates reported a university-employed supervisor.

International doctoral researchers

The highest percentage of researchers with supervisors from their institute are the non-EU citizens with 83%. Non-German EU citizens have a slightly lower share with 82%, and German citizens have the lowest share with 74%. Correspondingly, the share of supervisors at the university are, respectively, 15%, 18%, and 22%. There are no significant differences with respect to contract situation and gender.

6.3 Frequency of interaction with PhD supervisor

Respondents were asked "How often do you communicate on average with your daily/direct supervisor about your PhD project?", and there were 850 valid responses. A majority of researchers interacted with their supervisors almost daily (23%) or weekly (30%).

Leibniz sections

A larger proportion of doctoral researchers in sections C and D report meeting more frequently compared to other sections, as shown in figure 44. In section C, 27% of respondents report meeting almost daily, and 34% meet weekly. In section D, 31% of doctoral researchers report meeting almost daily and 33% report meeting weekly. In contrast, only 14% of doctoral researchers in Section A report meeting almost daily, and 10% meet weekly.

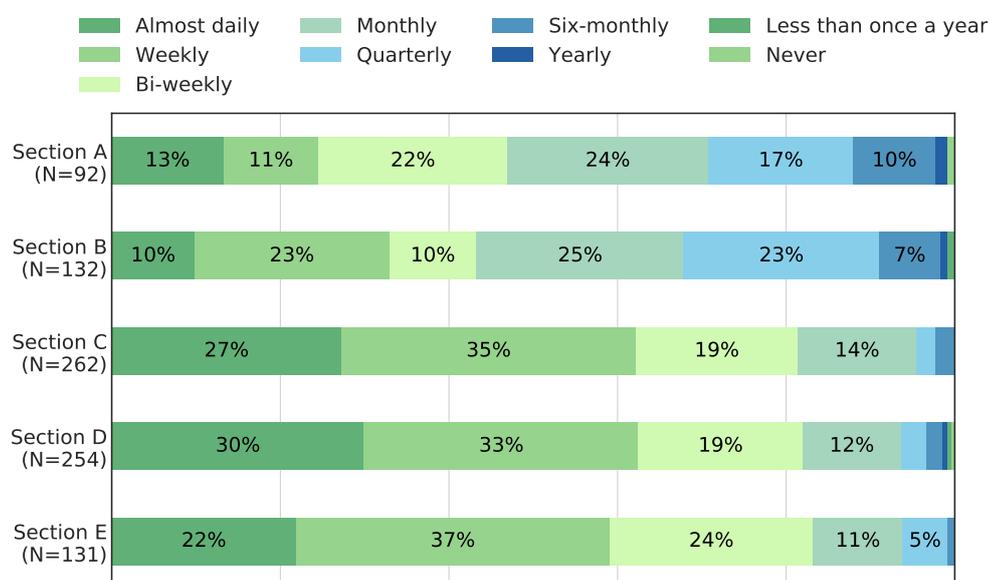


Figure 44: Frequency of meetings by section

Year of PhD

There is a distinct decline in frequent meetings as doctoral researchers make progress on their PhD. Of the respondents that reported meeting with their supervisors almost daily, 37% were in their first year, 27% were in their second year, 19% were third year researchers, and the remaining 17% were in their fourth year or more. This trend is similar for respondents reporting a weekly meeting frequency. First and second year doctoral researchers each make up 31% of the responses, 18% are third year researchers, and the remaining 21% are in their fourth year or more.

International doctoral researchers

German doctoral researchers reported meeting less frequently with their supervisors compared to non-German EU citizens or non-EU citizens. 50% of German respondents reported meeting almost daily or weekly, whereas 60% and 61% of non-German EU citizens and non-EU citizens reported meeting at least weekly, respectively.

Parents

Meetings appear to occur less frequently for doctoral researchers that have or are expecting children. 13% of parents reported meeting almost daily, compared to 26% of those that did not have children. However, more parents reported meeting weekly (36%) or monthly (20%) in relationship to those without children with 29% and 16%, respectively.

Contract situation

Stipend holders reported a higher frequency of meeting almost daily (27%) compared to contract holders (24%). This difference appears to be offset in the frequency of quarterly meetings, with 7% of contract holders selecting this option compared to 15% of stipend holders. Other categories only reflect minor differences between the contract situations.

Gender

Female doctoral researchers report longer meeting frequencies than male respondents. 22% of females reported meeting almost daily and 27% reported meeting weekly. In contrast, 26% of male respondents reported almost daily meetings, and 32% reported weekly meetings.

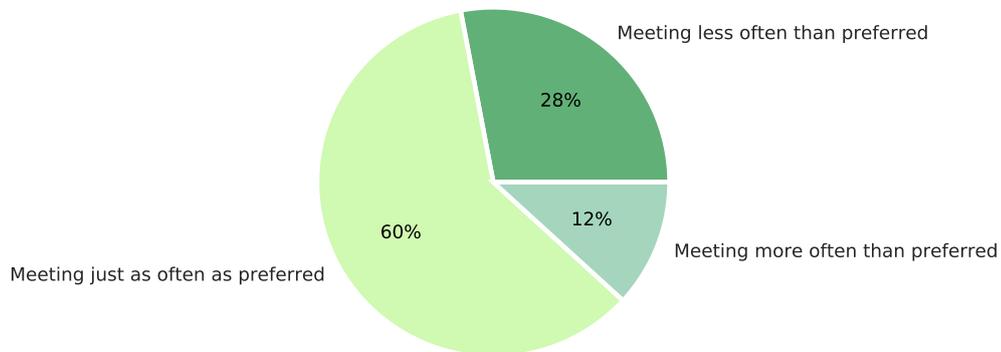


Figure 45: *Frequency of meetings with PhD supervisor: how expectations meet reality (N = 826)*

Satisfaction with supervision and frequency of supervisor meetings

The answers to meeting frequency were compared with the question "How satisfied are you with your PhD supervision in general", which gave a six point Likert scale ranging from "Very satisfied" to "Very dissatisfied". Researchers who met with their supervisors almost daily reported a mean score of approximately 5 (i.e. "Satisfied"), with the mean satisfaction decreasing steadily as the frequency of the meetings decreased to less than 3 ("Rather dissatisfied") for those that met with their daily supervisors yearly.

Comparing actual meeting frequency with preferred frequency

Knowing that the mean level of satisfaction increased in tandem with meeting frequency, we were interested in learning if there is an "ideal" frequency for meeting with supervisors. A new variable was generated that would compare the reported actual meeting frequency with answers from the question "How often would you like to communicate with your formal/primary supervisor about your PhD project?". The variable measured the frequency of responses where the respondents preferred meeting frequency was less than, equal to, or more than their actual meeting frequency. Of the 826 valid responses, 60% of respondents are meeting as often as preferred, 28% are meeting less often than preferred, and 12% are meeting more than they would prefer (Fig. 45). Of the respondents that meet monthly, 56% would prefer to meet weekly or bi-weekly, 77% who meet quarterly would prefer to meet bi-weekly or monthly. While most of the respondents who met with their supervisors weekly or almost daily reported the same actual and preferred frequencies, 22% of those who met almost daily would prefer to meet weekly, and 9% who met weekly would prefer to meet bi-weekly. A raw count of the responses for each option reveals that 21% would prefer to meet almost daily, 41% would prefer to meet weekly 21% would prefer to meet bi-weekly, 13% would prefer to meet monthly, and 4% would prefer to meet less than once per month.

There is also a clear trend in how the frequency of meetings can affect general satisfaction with supervision. As shown in figure 46, 69% of doctoral researchers that have actual meeting frequencies that match their preferred frequencies are either satisfied or very satisfied with their supervision. By contrast, only 25% of doctoral researchers that meet less often than preferred are satisfied or very satisfied with their supervision.

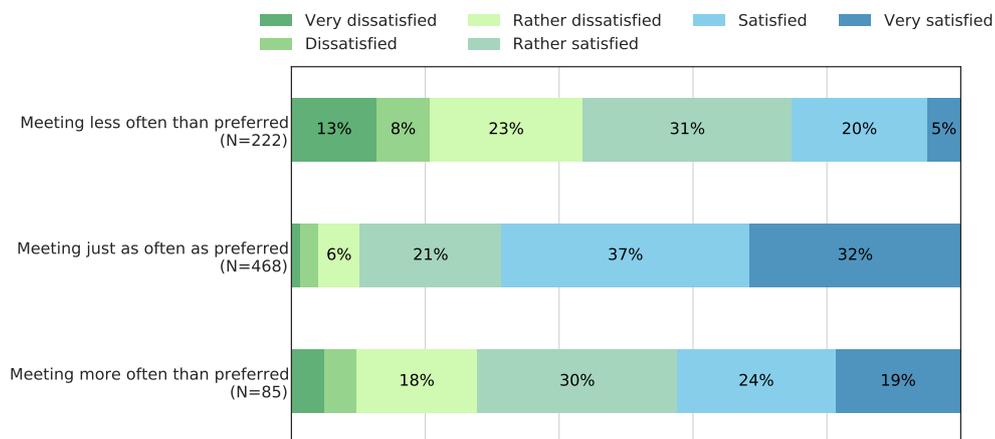


Figure 46: *How expectations about the frequency of meetings with PhD supervisors shape the satisfaction*

6.4 Rating aspects of supervision

Respondents were asked to rate 11 different aspects of their supervision, and answers are given on a five-point Likert scale ranging from 1 “Fully disagree” to 5 “Fully agree.” Factor analysis was performed to identify different characteristics among the aspects, with the analysis revealing two significant factors.

The first factor is positively associated with high ratings on “My supervisor treats me politely”, “My supervisor treats me professionally”, “My supervisor is open to and respects my research ideas”, “My supervisor gives constructive feedback”, “My supervisor encourages me to work independently”, and “My supervisor supports my professional development (establishing contacts, recommending conferences...)”. We characterize this factor as relating to the supervisor being personable and supportive, so we call the factor “Personable”.

The second factor is associated with high ratings on “My supervisor has clear requirements for my work”, “My supervisor has strict requirements for my work”, “My supervisor is well informed about my current state of PhD project”, “My supervisor is well informed about my field of research”, and “My supervisor is available when I need advice”. We characterize this factor as relating to the level of professionalism as a supervisor, and thus call this factor “Professional”.

Both scores were transformed to have a mean of 50 and a standard deviation of 10. Additionally, a multivariate analysis was performed to identify relationships between the explanatory variables and found statistically significant correlations between citizenship and contract situation.

Year of PhD

We found decreasing trends in both factors with respect to the year of the study. First year researchers reported a mean of 53 for the personable factor and 52 for the professional factor, which both decreased for researchers in the fifth year or more to 49 and 46, respectively.

International researchers

There is a significant difference in the professional factor with regard to the nationality of the researcher. While German and non-German EU citizens both reported a mean of 48, non-EU citizens reported a mean of 54. There was no significant difference in the personal factor. Multivariate analysis found a statistically significant relationship between the factors and the citizenship of the researcher.

Contract situation

Stipend holders reported only slightly higher means for both factors when compared with contract holders. The personable factor mean for stipend holders is 52 compared to 50 for contract holders, and the professional means are 51 for stipends and 50 for contracts. Since there is a larger proportion of international doctoral researchers that are stipend holders, it is likely that the difference in the means is attributed to the citizenship of the researcher rather than a difference in the contract situation.

Leibniz sections

Respondents from Section B reported the highest score for the personable factor with a mean of 52, while sections A and E reported the lowest personable mean of 49. Sections C and D reported a 51. For the professional factor, section C reported the highest mean with 51, sections D and E produced a mean of 50, and sections A and B had the lowest mean of 48.

Gender

Female respondents reported a slightly higher mean of 51 for the personable factor compared to 50 for the male researchers. There was no difference in means for the professional factor.

We found no differences in the factors with respect to the parental explanatory variable.

7 Integration

Main findings from the following chapter:

- Over 70% of the doctoral researchers consider that it is easy or very easy to get help of any kind from colleagues or peers.
- 50% of international doctoral researchers find that language is an obstacle in their PhD development.
- 50% of non-German speakers are not taking German courses. Less than 21% of the participants are able to take German courses within their own institutions.
- 11% of the respondents report having poor social support. Respondents who have a poor social support network are more likely to consider quitting their doctoral research project

This section of the survey aims to give insight into the integration of doctoral researchers within the Leibniz Association, taking into account different professional as well as personal aspects of their career. Within this chapter, the support provided and needed within the different Leibniz institutes is considered. This assessment is independent of the nationality of the participants, so as to examine the complexity of handling important aspects related to living and working in Germany. Since international doctoral researchers make up more than one third of all doctoral researchers within the Leibniz Association, part of the analysis carried out within this section is focused on different aspects regarding this specific group. As an example, we analyze the international respondents' proficiency of the German language and outline the difficulties of language barriers that international doctoral researchers experience during the development of their career. Social aspects such as activities organized by different Leibniz institutes are also considered within this section. Finally, we examine the support received by doctoral researchers from their peers and colleagues. We take into account the interest shown in their research topic and their disposition to provide support and help, which reflects the integration of doctoral researchers within the Leibniz Association.

7.1 Support provided and needed within the Leibniz Association

In this section, we analyse the support provided by the different Leibniz institutes, as well as the support required by their respective doctoral researchers. Among others, we take into account aspects such as citizenship, contract situation, and family status.

Overall, the main support provided by Leibniz Institutes to their doctoral researchers is embodied in the enrollment procedures and applications to graduate school. Figure 47 clearly shows this trend by representing the percentage of participants by their respective Leibniz sections who reported different types of support that was provided by their institutes. More than 60% of doctoral researchers from Sections B and E stated that their institutions provide enough support concerning university enrollment. A slightly lower percentage of respondents (between 50% and 60%) from the rest of the sections indicated that their institutions provide enrollment support.

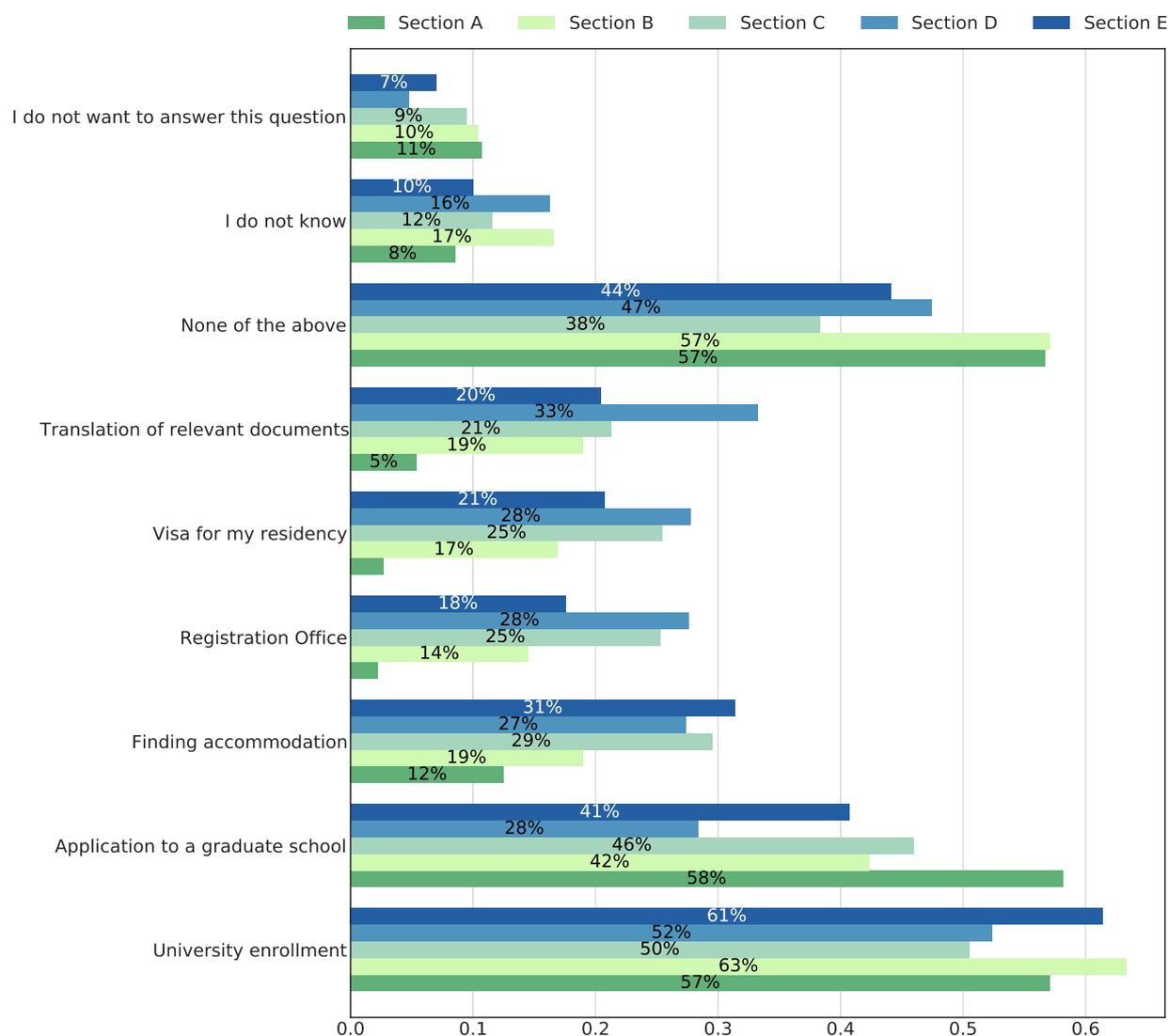


Figure 47: *Different types of support provided within Leibniz Institutes in relation to their respective Sections.*

7.2 Language proficiency and difficulties

One of the main barriers that an international doctoral researcher has to overcome in their professional and personal life while living in Germany is language. It is indicated within Section 4.2 that a considerable percentage of the participants are international doctoral researchers; therefore, it is important to give insight into their willingness to improve their German skills as well as the disposition from the Leibniz Institutes to provide support in this regard. Only international doctoral researchers are considered within this subsection.

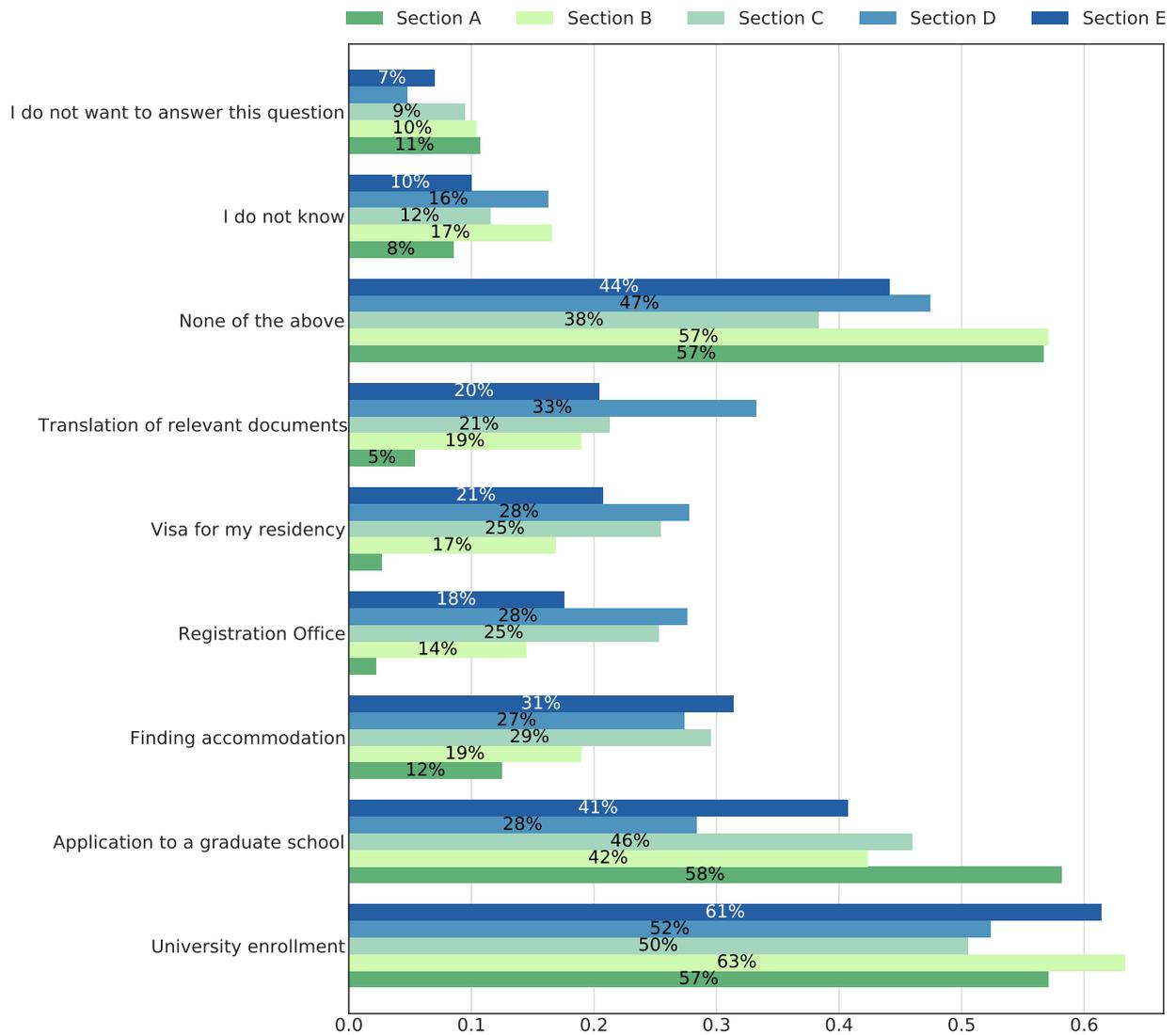


Figure 48: Different types of support needed within Leibniz Institutes in relation to their respective Sections.

Examining Figure 49, where German proficiency is analyzed in terms of the respondent’s citizenship, the participants belonging to the European Union (EU) present higher German skills when compared to citizens from outside of the EU. Considering the latter, less than 45% (N = 213) of the participants indicated having intermediate, fluent or native skills, whereas 58% (N = 113) of non-German EU respondents belong to these proficiency categories. These percentages highlight that due to geographic reasons, non-German EU citizens are more fluent in German than non-EU citizens. Thus, it is important to focus on non-EU doctoral researchers within the Leibniz Association.

Another interesting parameter to analyse is the proficiency levels of doctoral researchers as a function of which year of their PhD they’re at. We find that first year doctoral researchers have the lowest levels of proficiency, where only 35% (N=114) have at least an intermediate (B1-B2) level. However, German proficiency levels rise further into the duration of the PhD and peaks at the fourth and fifth or more years where 57%(N=45) and 78% (N=28), respectively, have at least an intermediate (B1-B2) level proficiency.

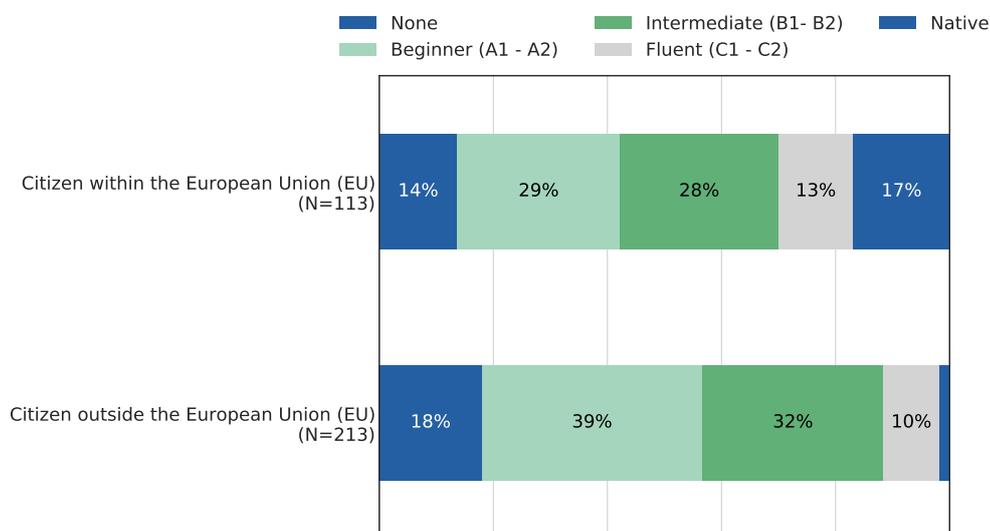


Figure 49: German proficiency levels in relation to the citizenship of doctoral researchers.

7.2.1 Is language an obstacle?

The international respondents were also requested to address whether language (in general) presents a barrier during their stay in Germany. Figure 50 outlines that overall, about 50% of the doctoral researchers find that language does not present a problem. However, almost half of the international doctoral researchers within the Leibniz association consider that language can be a difficult obstacle to overcome. Considering the impact that language barriers can have, this specific group of respondents will be carefully analyzed in the following sections. 57% of female respondents reported that language is, at least, to some extent an obstacle compared to 43% of their male counterpart. The percentages are approximately the same for doctoral researchers with (48%) and without children (49%). Regarding the contractual situation of doctoral researchers, PhD candidates that are funded with stipends report that language is less of a barrier (42%) than those with other means of funding (50%). 47% (N=98) of doctoral researchers in their first year consider that language is, at least to some extent, an obstacle. These rates reach their maximum height during the third year with 62% (N=53) and decrease to 32% (N=18) during the fifth year or more. The peak at the third year can be explained by the fact that doctoral researchers are nearing the end of their PhD and therefore have to deal with more bureaucracy than in earlier years.

7.2.2 Availability of important information in other languages

Since it is evident that language can be an obstacle for doctoral researchers within the Leibniz Association, it is important to examine the support given by the different Leibniz Institutes regarding this issue. Taking into account the respondents' participation, Figure 51 exposes the availability of important information in a understandable language within the different Leibniz sections. In this context, we consider as important any kind of information which is related to group internal, administrative or contract/stipend documentation. We highlight that Section A presents the lowest "Yes, all of the information is available" response rate (18%). However, all participants within this section declared that at least some of the information is available to them. In contrast, Section B presents the best results compared

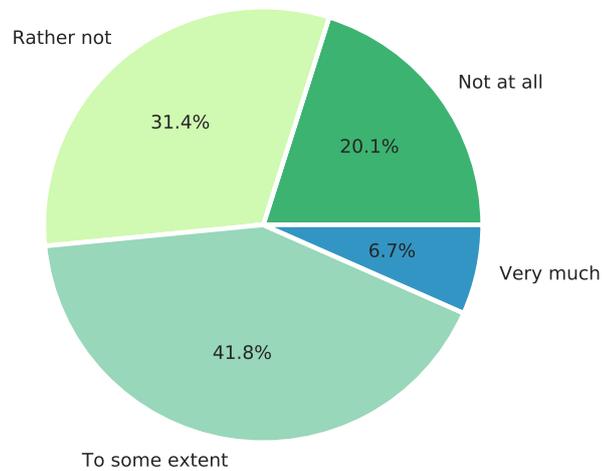


Figure 50: *Language as an obstacle.*

to the rest of the sections: 40% (N = 22) of the participants stated that all the important information is available to them, whereas the rest (60%) indicated that only some of the information is available in an understandable language. It is important to note that Section C presents the highest percentage of respondents who answered "None of the information is available" (7%).

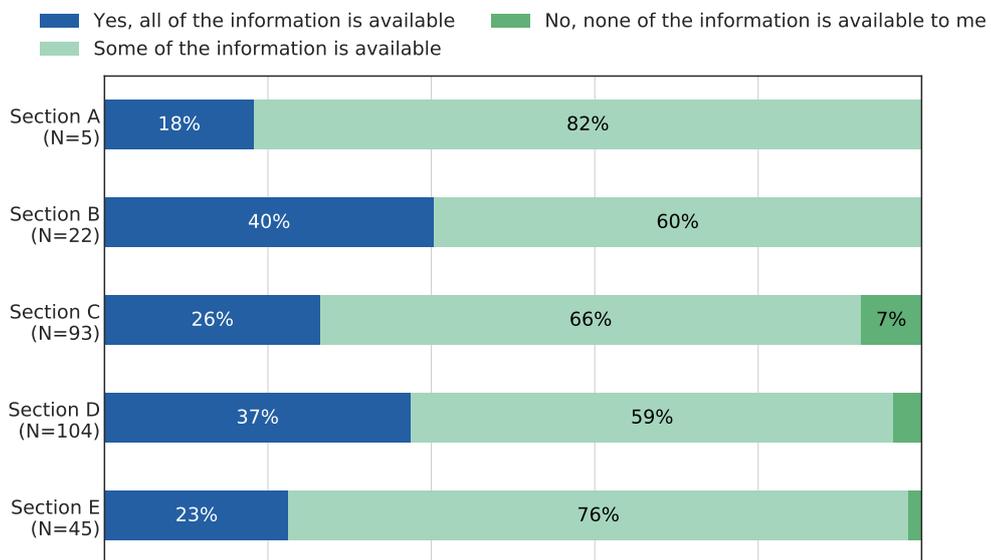


Figure 51: *Availability of important information within Leibniz Institutes in a understandable language in relation to their respective sections.*

Almost 20% of the total respondents stated that none of the information is available in a language understandable to them. Consequently, it is suggested that the different Leibniz institutes from Sections C, D and E should try to tackle this issue in order to ensure the best possible working conditions for all international doctoral researchers within the Leibniz Association. Regarding gender, only 25% of female respondents report that all of the information is available to them compared to 37% of male respondents. No trends were found in terms of contract type and family status.

7.2.3 Attendance to German language courses

Some of the Leibniz Institutes offer their employees the possibility to attend German language courses within or outside their institutions. This great initiative provides doctoral researchers with the possibility of improving their German language skills on a regular basis either for free or at a reduced cost, thanks to agreements between universities, language schools and Leibniz Institutes. Figure 52 exhibits the attendance of the international respondents to German language courses within and outside their respective Institutes. We highlight that Section A has the highest participation in German courses within its respective institutions, reaching 41% (N=5). Section C reports the highest percentage of international doctoral researchers that are not taking any German language courses. In this section, around 12% of the respondents are beginners (A1 - A2) or intermediate (B1 - B2). Moreover, as it was outlined earlier, Figure 51 shows that Section C reports the highest percentage of "None of the information is available to me" (7%; N=93). This could be one of the main reasons why over 48% (N=94) of the international respondents from Section C stated that language is to some extent or very much an obstacle (Fig. 53).

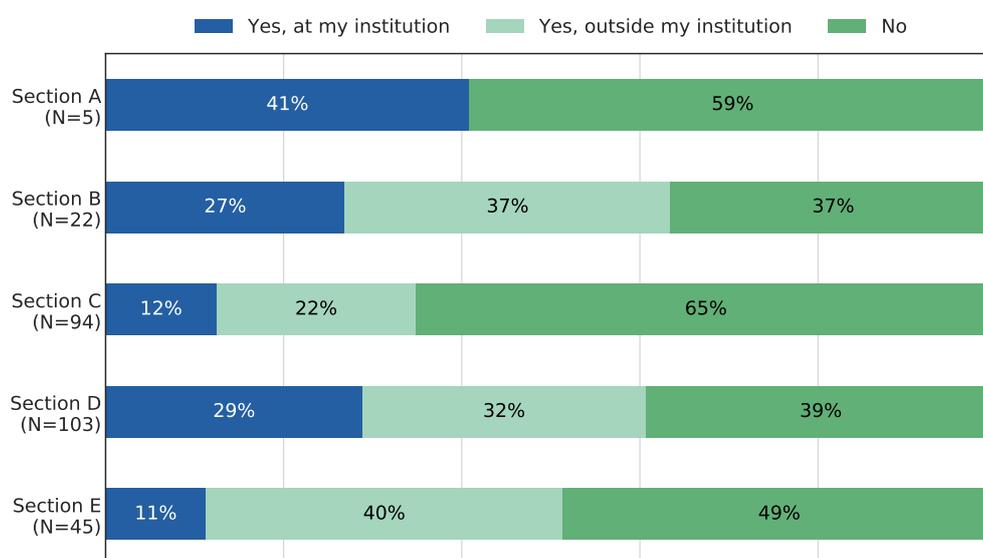


Figure 52: Attendance to German language courses within or outside Leibniz Institutes in relation to their respective Sections.

Regarding Sections B, D and E, options "Yes, outside my institution" and "No" present an average difference of 5%, being the "No" answer the most voted among them. Section E has the lowest percentage of international doctoral researchers attending German courses at their institution. In contrast, Section B presents the highest percentage of respondents that attend German courses at the institutions or outside them (64%; N=22).

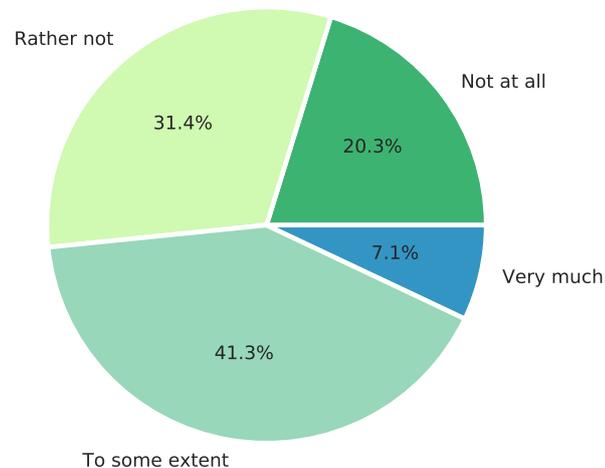


Figure 53: *Language as an obstacle regarding respondents of Section C (N=93)*

With regard to gender, the number of female and male respondents taking German courses within and outside their institutes are comparable at 48% and 51%, respectively. Respondents with children (49%) are slightly less likely to take language courses than respondents without children (53%). Limited availability from family responsibilities may account for this difference. In this demographic, only 37% (N=38) of participants have at least an intermediate proficiency, compared to 49% (N=286) of respondents without children.

7.2.4 Support from Institutes regarding German language courses

The doctoral researchers from the different Leibniz sections were also asked about the support provided by their institutes regarding the attendance to German courses. Figure 54 shows the percentage of respondents who selected the proposed answer to the question "How does your institution support you in learning German?". It can be highlighted that the most voted answer by the doctoral researchers from sections A, B, C and E is "I do not know". This could be owing to the fact that the institutions from these sections do not provide enough information about the availability of German courses in general terms. Section D presents the highest percentage (over 40%) of doctoral researchers who stated that their institutions offer German courses. This could be related to the fact that Section D gathers the highest percentage of international PhD candidates within the Leibniz Institutes (45%; N=259), as presented in Figure 10. Contrarily, Section A reports the highest percentage of "My institution does not offer any support", which could be expected since the percentage of doctoral researchers that possess the German nationality rises to 86% (N=101). This also explains the low ratio observed in the rest of the positive responses concerning support in terms of German course attendance (i.e., the institution permits attendance of courses during working hours, offers monetary support for external courses, or offers German language courses at it).

7.3 Social activities and support

Within this subsection, we analyse the various social aspects concerning doctoral researchers. The availability of social activities provided by the different Leibniz institutes is analyzed, as well as the participation of the respondents in these kind of events. Additionally, the support given by colleagues within the institution and people close to the respondents (e.g. family and friends) is taken into consideration. When asked about the respondents attendance at

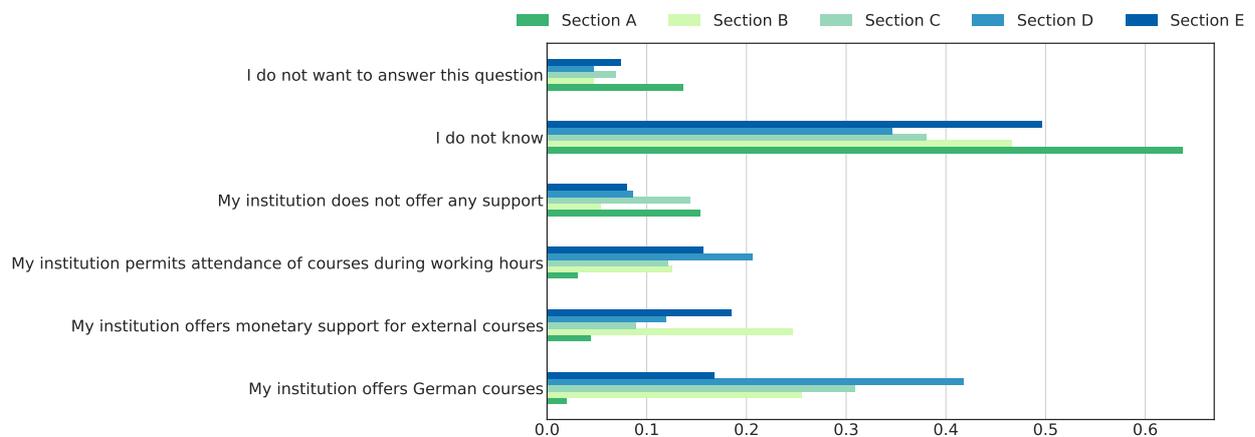


Figure 54: *Support provided by the Leibniz Institutes in relation to German language courses attendance.*

social activities (Figure 55), we find significant differences in both the availability and attendance rates across the Leibniz sections. On average, seven out of ten respondents confirmed their participation at social gatherings, with doctoral researchers reporting the highest attendance rates in sections B (35%) and C (33%). However, the availability of social activities varies between sections and ranges from 10% (Section B) to 28% (Section D).

Family status is an important parameter with regard to the social support and activities doctoral researchers have access to, as having children can have a significant impact on the availability and willingness of parents to participate at such activities. We find that 58% of the respondents with children attend the social activities organized within their group and/or Leibniz institute, compared to 64% of respondents without children. There are also considerable differences in attendance rates with regard to the duration of the doctoral researcher's PhD. It is evident that the social network of doctoral researchers grows with time, but workload and work/life commitments may also increase. We find that the highest attendance rates to social activities organized by the respondent's respective Leibniz institute are by first year (68%, N=235) and fourth year (69%, N=227) doctoral researchers. In contrast, the lowest participation rates are by fifth year or longer (58%, N=96) and third year (60%, N=197) doctoral researchers. No gender patterns are detected when it comes to attending social activities. 65% of both female and male respondents attend social activities organized within their Leibniz institutes at least occasionally. In terms of citizenship, we find that German doctoral researchers have the highest participation rates with 67%, followed by non-German EU citizens (64%) and non-EU citizens (63%).

Social support is a psychosocial resource that significantly improves mental well-being [1]. Social ties and networks are crucial components in a doctoral researcher's working environment that are not only career relevant, but may also buffer the impact of stressors through work and adverse living conditions. Almost half of the respondents report having moderate social support (46%; N=416), while two out of five indicate having a strong social network (39%; N=353). However, one out of ten respondents report poor social support (11%; N=98), which can be due to reasons such as starting doctoral research in a foreign country or having less time for close contacts due to a high workload. As a consequence, respondents who have a poor social support network are more often thinking about quitting their doctoral research projects (19%; N=17) (Figure 56). In contrast, the majority of respondents with a moderate (43%; N=153) to strong (48%; N=172) social support system never think of terminating their research work.

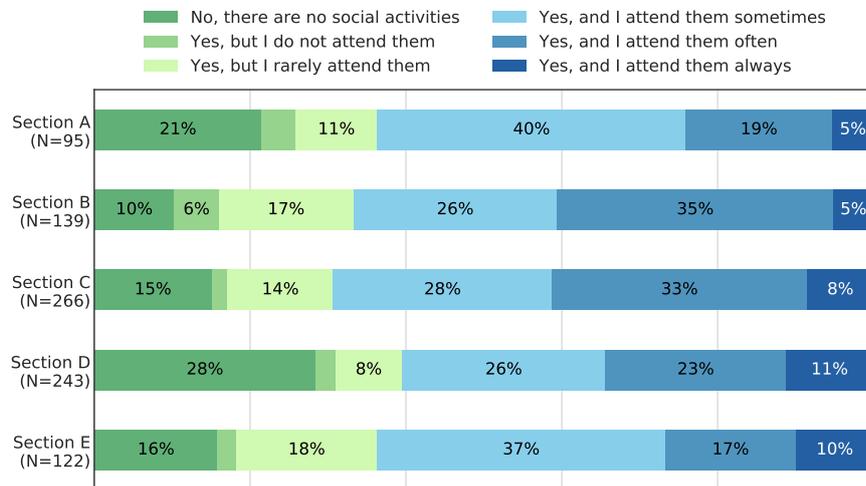


Figure 55: Attendance to social activities by section.

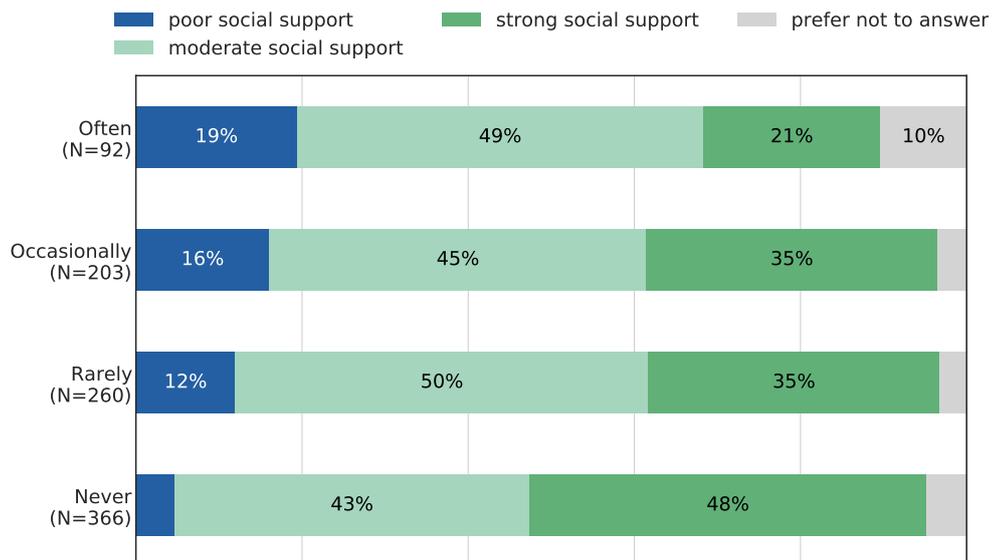


Figure 56: Social support and thoughts about quitting doctoral research

8 Career development

Main findings from the following chapter:

- 48% of all respondents aim for a cumulative dissertation, whereas 37% aim to draw up their dissertation as a monograph. 14% of the respondents reported that the kind of dissertation they are aiming for is unknown at the time of the survey.
- On average, 3.23 publications are required to draw up a cumulative dissertation.
- 55% of doctoral researchers would like to continue working in academia. In general, the majority of doctoral researchers would like to continue to work in some research or science related job.
- 40% of doctoral researchers feel either “very unprepared” or “unprepared” for a job outside of science. The responses per gender reflect that female doctoral researchers feel less prepared than their male counterparts.
- Overall, only 47% of doctoral researchers want to work in Germany after completing the doctorate. The majority of doctoral researchers that are non-EU citizens want to work either in Germany or Europe.

In this section, we focus on the working situation of doctoral researchers in the Leibniz Association and the support for career development offered at their institutes. The survey results provide a unique and detailed description of both career plans of doctoral researchers as well as an evaluation of the measures in place that support the future careers inside and outside of science.

8.1 Progress of PhD

8.1.1 What kind of dissertation are you aiming for?

To obtain their PhD, there are two types of dissertations possible for doctoral researchers. The dissertation may be cumulative in the form of multiple papers published in peer-reviewed journals or written as a monograph. Overall, 937 respondents provided valid answers. As can be seen in Figure 57, 48% of all respondents aim for a cumulative dissertation, whereas 37% aim to draw up their dissertation as a monograph. 14% answered “I don’t know” and an additional 1% did not want to answer this question.

Section

Focusing on the section affiliation of the respondents, the results highlight different shares of cumulative and monographic dissertations within the different sections.

Doctoral researchers aiming for a monographic dissertation mainly work and research in section A (57%) and section D (53%). In comparison, 70% of the respondents in section B, 48% in section C, and 78% in section E aim for a cumulative dissertation. It will be interesting to observe in future surveys of the Leibniz PhD network how this distribution develops overall, but also across the sections.

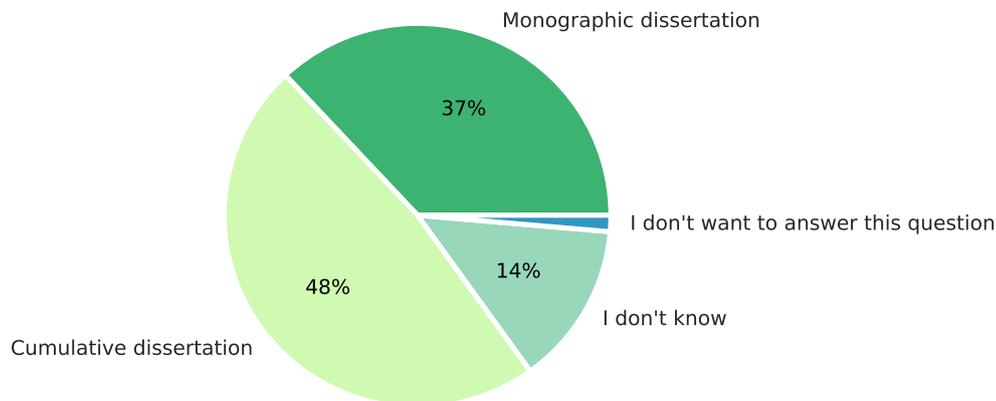


Figure 57: *The kind of PhD thesis pursued by respondents*

Gender

There are no significant differences between males and females aiming for a cumulative or monographic dissertation when controlling for section affiliation, citizenship, age and contract situation. Of the doctoral researchers aiming for a monographic dissertation, 56% are male and 44% female. In the context of a cumulative dissertation, 51% are men and 49% are women.

Contract situation

Regarding their contract situation, we do not observe meaningful differences between those doctoral researchers aiming for a cumulative or monographic dissertation. Of the respondents aiming for a cumulative dissertation, 82% hold a working contract at their Leibniz Institute. In comparison, of the respondents aiming to draw up their dissertation as a monograph, 86% hold a working contract.

Unknown kind of dissertation

The situations of the respondents who answered with “I don’t know” are substantial for a comprehensive insight into the working conditions and career plans of doctoral researchers. Overall, 120 respondents reported an unknown kind of dissertation at the time of the survey. First, it is plausible to assume, that doctoral researchers whose kind of dissertation is unknown at the time of the survey are only at the beginning of their work to obtain PhD. The survey results support this assumption since 48% of these respondents are first-year doctoral researchers. However, additional 28% are second-year doctoral researchers and 18% are in their third year. The other respondents either reported a longer duration of PhD or gave no information on this regard.

In addition to the year of PhD, the section affiliation of the respondents whose kind of dissertation is not known at the time of the survey is a second relevant aspect. The results highlight considerable differences between the sections. 42% work and research in section C and 40% in section D. For the other sections, the share of respondents answering “I don’t know” ranges from 2% in section A, 8% in section B to 6% in section E. A third aspect concerns the kind of payment of the respondents whose kind of dissertation is unknown. In this context it is especially notable that 80% of the respondents answering “I don’t know” are holding a working contract at their Leibniz Institute. In comparison, 10% are stipend holders.

Logistic regression

We used a logistic regression to model the probability of aiming for a cumulative dissertation based. In the following, we present the results of the logistic regression on five predictors: The respondents' section, gender, citizenship, age and contract situation. We estimated average marginal effects of aiming for a cumulative dissertation when every other predictor variable is at means.

- Belonging to a certain section significantly predicts the probability of aiming for a cumulative dissertation. Based on the average marginal effects, the predicted probability in section A is estimated at 44%, in section B at 78%, in section C at 58%, in section D at 32% and in section E at 87%.
- We estimated the probability of aiming for a cumulative dissertation depending on the section affiliation and the citizenship of doctoral researchers. We controlled for gender, contract situation and age. The following figure displays the results. The results highlight that there are no significant differences within the sections regarding the citizenship. However, the results reveal substantial differences between the sections.

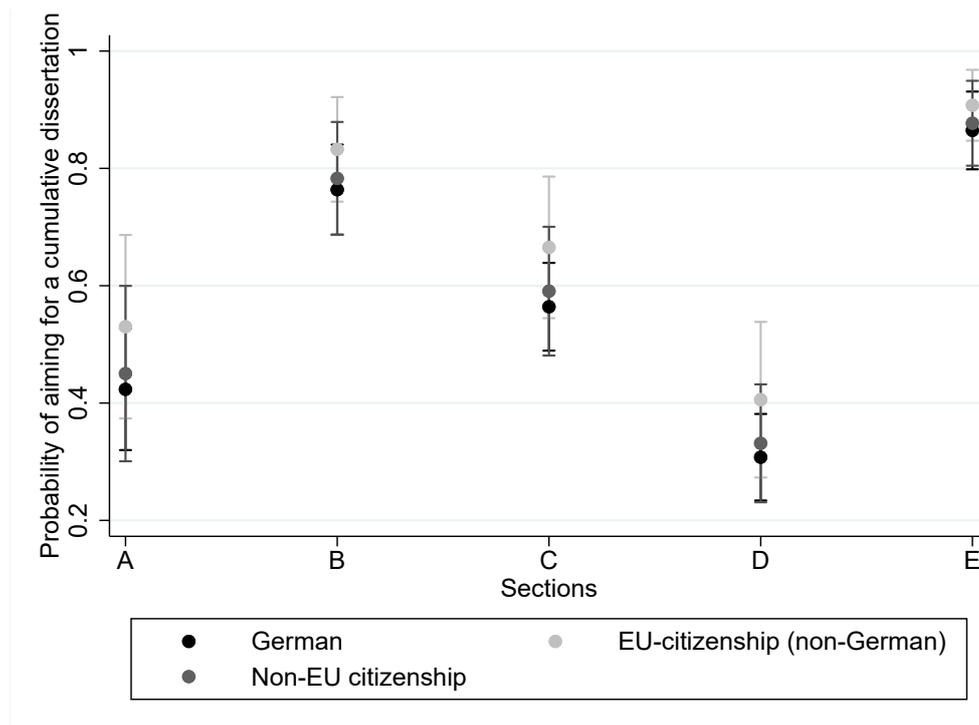


Figure 58: *Probability of aiming for a cumulative dissertation by citizenship*

- We estimated the probability of aiming for a cumulative dissertation depending on the gender of the doctoral researchers within the sections, controlling for citizenship, contract situation and age. The results highlight that there are no significant differences within the sections regarding the gender of doctoral researchers. However, the results reveal substantial differences between the sections.

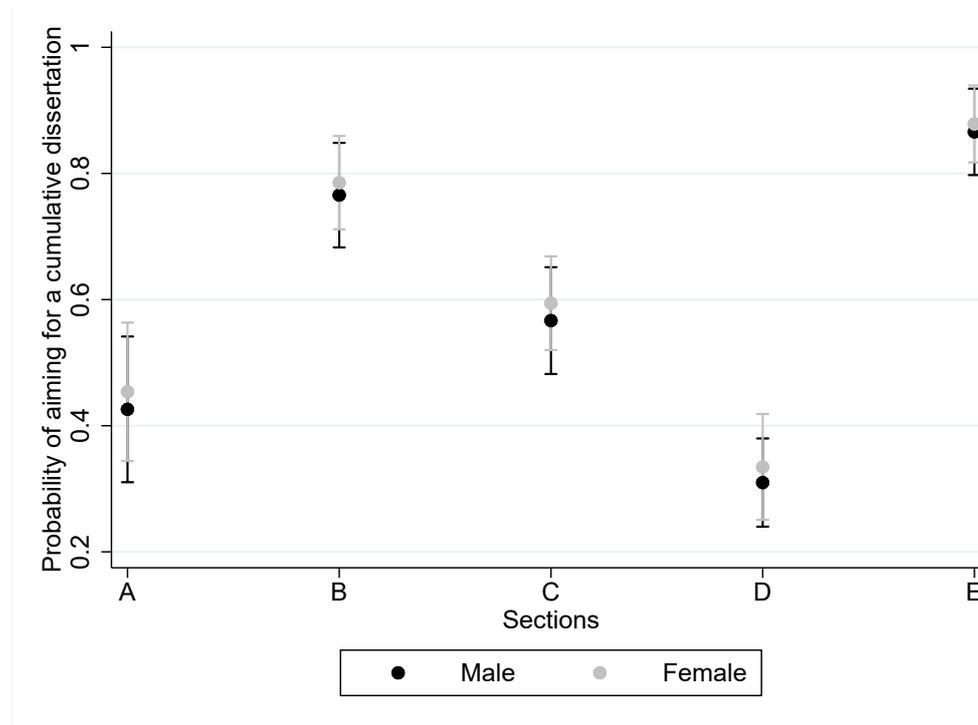


Figure 59: Probability of aiming for a cumulative dissertation by gender

8.1.2 Required kind and number of publications to obtain PhD – cumulative dissertation

To generate knowledge about the conditions to obtain a PhD at Leibniz Institutes, the survey asked the respondents aiming for a cumulative dissertation about the required kind and number of publications. Publications are distinguished in *first or co-author publications in peer reviewed journals* and *first or co-author other publications*. For this question, the number of valid answers ranges from 278 (co-authorship in other publications) to 385 (first authorship in peer reviewed journals). The results show that in order to obtain a cumulative dissertation, researchers need to primarily publish through peer reviewed journals rather than through other forms of publication. In the following, we present the percentages of doctoral researchers answering that they are required to publish at least one publication of the respective type.

- 84% of the respondents aiming for a cumulative dissertation stated that they are required to publish *first author publications in peer reviewed journals*.
- 52% are required to publish *co-author publications in peer reviewed journals*.
- With regard to authorship in *other publications*, 26% of the respondents stated that they are required to be the first author, whereas 20% reported that only co-authorship in *other publications* is required.

Furthermore, we calculated the average number of required publications to obtain PhD based on the specified number of publications by the respondents. These publications can either be published, accepted for publication or submitted. Of the overall 442 respondents aiming for a cumulative dissertation, 379 respondents gave a valid specification of the required number of publications, independently of the kind of publication. The results revealed that on average 3.23 (SE=1.14) publications are required to draw up a cumulative dissertation.

Furthermore, the respondents were asked if it is required by the Leibniz Institute to give presentations or present posters at conferences to obtain PhD. Of the 297 valid answers, 51% of the doctoral researchers affirmed this question.

8.1.3 Types of published scientific output

The survey distinguished five types of scientific output: *Scientific talks at conferences, posters at conferences, articles in peer reviewed journals, book chapters and patent applications*. Overall, 912 valid answers were given. 76% of the respondents specified the types of published scientific output based on the given five different types. 23% stated, that none of the given types applies to their so far published scientific output. Less than 1% did not want to answer this question.

- 54% of the respondents stated that they have already given a *scientific talk at a conference*.
- 55% reported having presented a *poster at a conference* before.
- 37% already published an *article in a peer reviewed journal*.
- 7% already published a *book chapter* at the time of the survey.
- 3% stated that they previously registered a patent application.

Doctoral researchers aiming for both a cumulative and monographic dissertation stated that they have published articles in peer reviewed journals. Of the respondents stating that they have published articles in peer-reviewed journals, 40% of the respondents aim for a cumulative dissertation, whereas 38% aim for a monographic dissertation.

First year of PhD

At the time of the survey, 28% of the respondents were in the first year of their PhD. The first year of PhD primarily concerns formulating the research problem and central research question(s), mastering the literature and drawing up a research proposal to specify a research program on how to address the research problem identified and the research questions formulated. Publishing scientific output refers to the process of exposing the research to discussion by presenting and defending the results orally and/or in writing. This process can take the form of the five given types of scientific output distinguished in the survey. However, publishing scientific output may not always be the priority at this first stage of the PhD. Therefore, it is of special interest to analyze the published scientific output of first-year doctoral researchers. Of the first-year doctoral researchers, 44% specified their published output, whereas 56% stated that none of the given types applies to their output or that they have published other output. Another 3% reported that they have published other scientific output that was not included in the survey. The results highlight that first-year doctoral researchers often attend conferences with their own contributions. 24% stated that they gave a *scientific talk at a conference* and 29% *presented a poster*. The share of respondents who *published an article in a peer reviewed journal* whether as a first or co-author is 14%. Another 2% have *published a book chapter*. Multiple answers were possible.

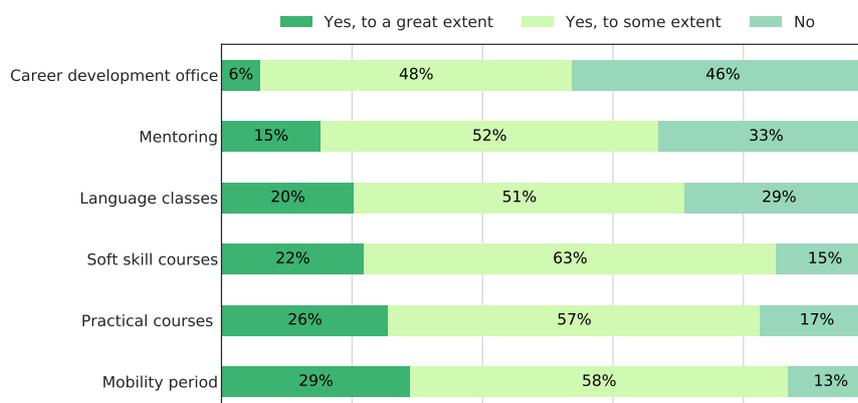


Figure 60: Are measures for career development supported by Leibniz Institute?

8.2 Support from institutes

8.2.1 Doctoral researchers evaluation of career development offered by institutes and museums

Respondents were asked to rate seven measures of career development on a Likert scale to indicate whether they feel that their institutes are supporting these measures. For a detailed overview of the responses to the individual measures, see figure 61.

Respondents felt the highest level of support was offered for soft skill courses, which 65% felt were either supported to some extent or to a great extent by their institutes. This was followed by the transition to an academic career (63%), practical courses (60%), language classes (59%), mentoring (57%), career development office (55%), and mobility period (52%). While we cannot be completely certain about the reality in the institutes based on this kind of data since it relies on the perception of the respondents, the numbers are generally higher than in the 2017 survey. Although the respective questions were formulated slightly different in the previous survey, there seems to be more support now for soft skill courses (33% in 2017), language classes (6% in 2017), and career development (34% in 2017).

However, the results of this current survey imply that there is an overall lack of precise knowledge about the measures offered at institutes among the doctoral researchers. The ratios of respondents replying either with “I don’t know” or “I don’t want to answer” were quite high for some of the measures. For example, 42% of respondents chose these reply options for the measure career development office, 33% for transition to academic career, 32% for mentoring 32% and 26% for language classes.

8.2.2 Research stay abroad

A research stay abroad tends to establish and develop international research collaboration and give new impetus for research projects concerning the dissertation. Usually, the stay is tied to a specific research project and collaborating institute and can last from several weeks to several months. Overall, 912 respondents provided valid answers when questioned whether they have been on a research stay abroad.

- 28% of the respondents stated that they have been on a research stay abroad at the time of the survey.

- 63% stated that they have not been on a research stay abroad.
- Of the respondents stating that they have never been on a research stay abroad, 81% reported that their Leibniz Institute would support such a stay.
- 9% of the respondents did not want to answer the question.

Section

Doctoral researchers who have been on a research stay mainly work in sections C (30%) and D (28%). The shares of the other sections range between 11% and 19%.

8.3 Career perspectives and future plans

8.3.1 Fields doctoral researchers would like to work in after completing the PhD versus the fields in which they think they will work in

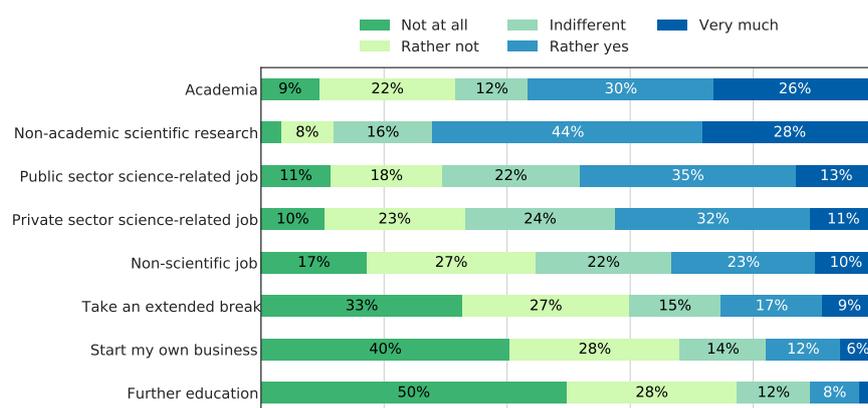


Figure 61: Which field would you like to work in after completing your PhD?

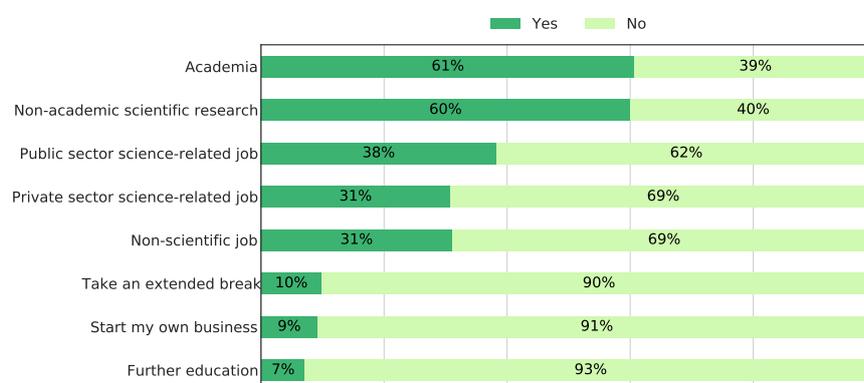


Figure 62: Which field do you think you will work in after your PhD?

For eight possible future career paths respondents were asked to indicate on a Likert scale how much they would like to work in the respective field. The career paths included fields such as academia, non-academic scientific research, private sector related jobs or taking a break. In the next question respondents were asked for the same career paths whether they think they will actually work in these fields, this time only being able to choose between “yes” or “no” as an answer.

Academia and other research or science-related jobs

The majority of doctoral researchers would like to continue to work in some research or science-related job. Although the number in this current survey is lower than it was in the 2017 survey, slightly more than half (55%) of the respondents replied that they would like to continue to work in academia (versus 66% in 2017). There is some variation across the different sub-groups of doctoral researchers. For example, those from Leibniz Section A (70%) preferring it over those from Section D (45%) and non-EU citizens (71%) preferring it over German citizens (49%). Regarding the age of the respondents, 80% of those older than 35 years (n=40) would like to pursue a career in academia, while among the younger doctoral researchers the number ranges from 55-59%. The gender of doctoral researchers does not seem to be of great influence in this regard (57% of male respondents versus 53% of female respondents). The follow-up question, showed that 53% of the respondents also found it likely that they actually will continue to work in academia.

Similarly, many respondents were eager to work in a public sector science-related job (46% “rather yes” or “very much”) or a private sector science-related job (40% “rather yes” or “very much”) such as public relations or science management. The highest ratio of respondents answering “rather yes” or “very much” for a research related job was for the career option of non-academic scientific research (69%), with the most positive replies coming from section D. At the same time, only 53% of the respondents thought that they will work in this field after completing the PhD.

Non-academic jobs and other career options

Regarding the prospect of alternatives to working in academia or other science-related jobs, only 17% of the respondents replied that they want to start their own business in the future while 65% replied that they do not. Only 40% (n=153) of those who want it found it also likely that it will happen (versus 8% overall). While the assessment did not vary much across most of the Leibniz sections, male respondents were more likely (20%) to express the desire to open their own business than females (13%). Moreover, the share of doctoral researchers wanting to start their own business was almost double among those financed by a stipend (29%) in comparison to the rest (15%).

Similar to the results of the 2017 survey, only about a third (32%) of the respondents stated that they want to work in a non-scientific job while 21% felt indifferent about it. However, this desire is more common among the doctoral researchers that have spent a longer time on their doctorate already. While only 24% of the doctoral researchers who were in their first year replied with “rather yes” or “very much”, it was 38% in the group of doctoral researchers that were in their fifth year. Only 27% also found it likely that they will find a non-scientific job later.

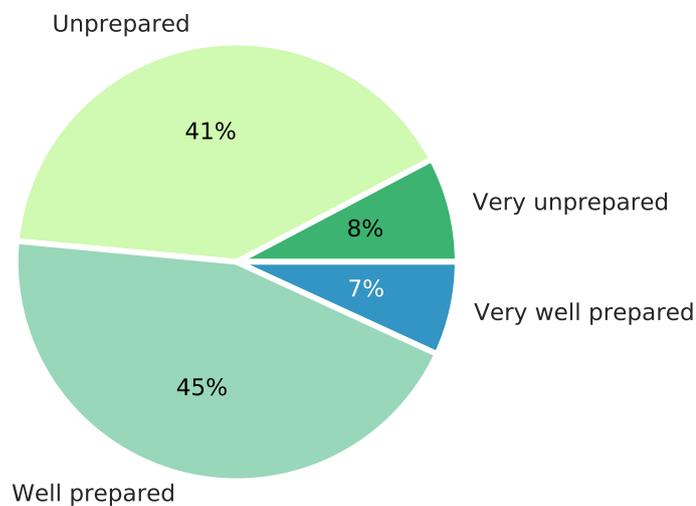


Figure 63: Respondents evaluation on how prepared they feel for a job outside academia

8.3.2 Feeling (un)prepared for a job outside of science

Asked whether they feel well prepared for a job outside of science, 40% of the respondents replied they feel either “very unprepared” or “unprepared”. At the same time, 18% either did not want to answer this question or replied that they do not know. Of those doctoral researchers that had previously expressed their desire to work in a non-scientific job (see chapter 8.3.1; n=287), 43% felt well prepared or very well prepared for a job outside of science.

There is an imbalance between the genders in the perception of being well trained for a non-scientific job. 22% of females did not want to answer or did not feel they know an answer compared to 16% of the male respondents. 34% of males replied they feel “unprepared” or “very unprepared” in comparison to 45% females. Only 27% of female researcher feel well prepared for job outside of science in contrast to 45% of male doctoral researchers.

8.3.3 The geographies of Leibniz’ doctoral researchers’ future plans

We asked the respondents where they would like to work after they complete their doctoral degree. They could choose between the options of either “Germany”, “Europe (but not necessarily Germany)”, “Outside of Europe” or “I don’t know”. Just below half of the respondents (47%) replied that they would want to continue working in Germany. 32% would like to work in another European country while 7% want to work outside of Europe.

As could be expected, the citizenship of the respondents is an important factor in this question. The majority of Germans (58%) want to work in Germany and the majority of non-German EU citizens (64%) want to work elsewhere in Europe; however, the majority of non-EU citizens would also like to work either in Germany (30%) or in Europe in general (37%).

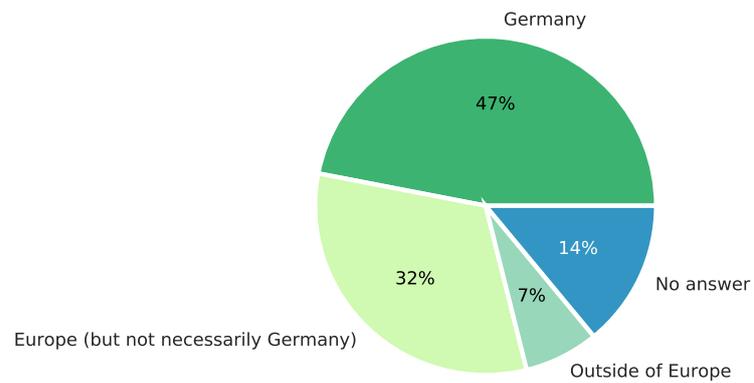


Figure 64: *Where would respondents like to work after finishing their PhD?*

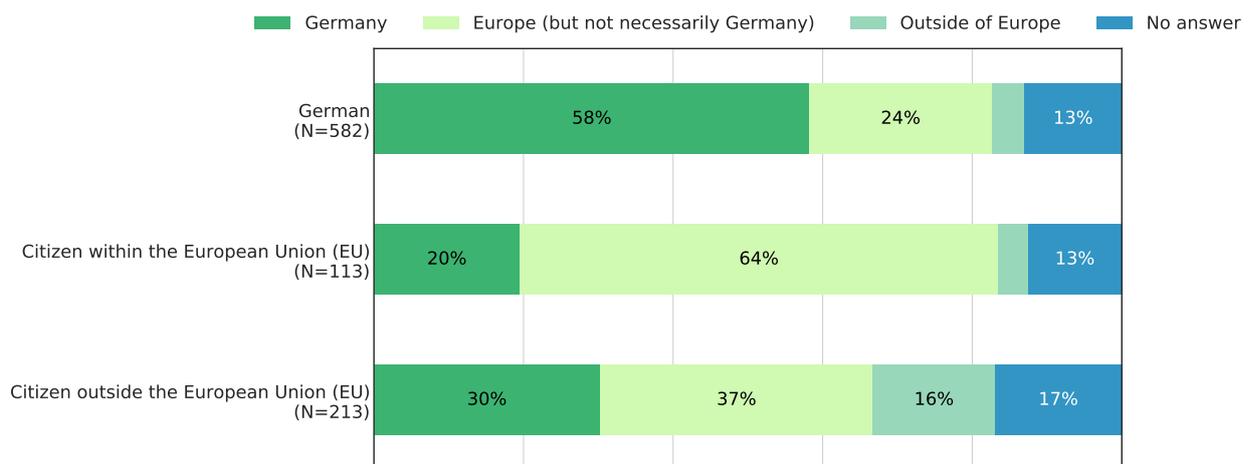


Figure 65: *Preferred place to work after PhD by respondents' nationality*

9 Parenting during a PhD

Main findings from the following chapter:

- One-eighth of doctoral researchers are parents. A fifth considers having (more) children during their PhD.
- Working conditions may pose obstacles to having children. The severity varies across sections.
- Home office and mobile work would ease childcare responsibilities.

In our group of respondents, 13% are parents or currently expecting children. This number matches the results of the 2017 Leibniz PhD Survey where 12% of respondents were parents. Variation in the share of parents can be observed across the Leibniz Sections, with Section D showing the highest value of doctoral researchers with children (18%), and Section C the lowest (7%) (see Fig. 66). While there is an expected increase in the share of parents with the years of PhD or with age cohorts (6% of doctoral researchers below the age of 30 have children against 30% above 30), we do not observe statistically significant differences between genders.

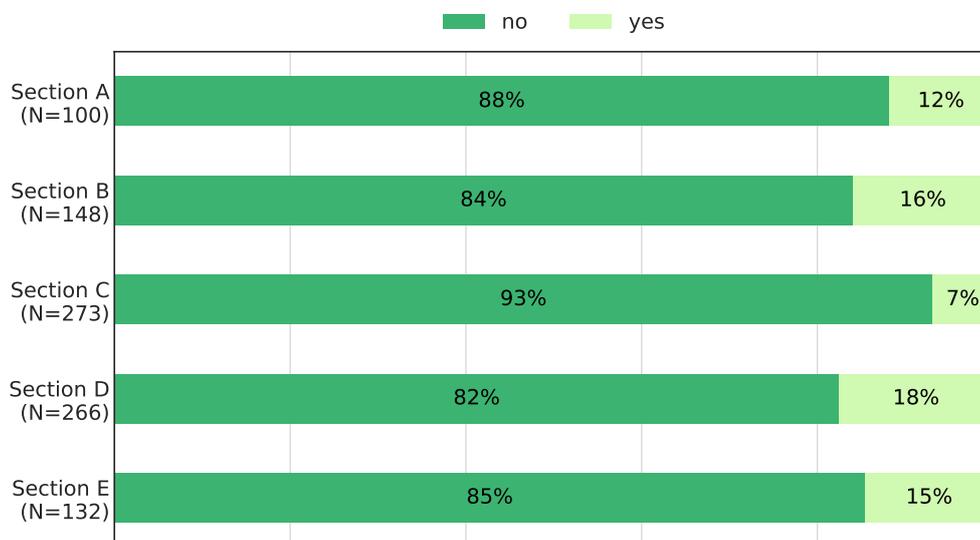


Figure 66: Parents or expecting parents in the 2019 Leibniz PhD Survey

9.1 Becoming a parent during a PhD

9.1.1 Desire for having children

Almost a fifth of doctoral researchers could imagine having (more) children during their PhD, whereas close to a tenth of doctoral researchers have no opinion on this question. Parents are more likely to want more children (31%) than non-parents are to want their first child (16%). Among parents, there is no significant difference between genders on this questions.

However, the intention to have (more) children slightly varies with payment status. More contract holders could imagine parenthood during the PhD (19%) than doctoral researchers on stipends or with a guest contract (14%). Similar differences are observed between Germans (21%) and foreign nationals (12%). Across Leibniz Sections, Sections A, B and E show similar values, with approximately 30% of respondents intending to have children, while the proportion is nearly cut in half in Sections C and D, with 12% and 16%, respectively. (see Fig. 67).

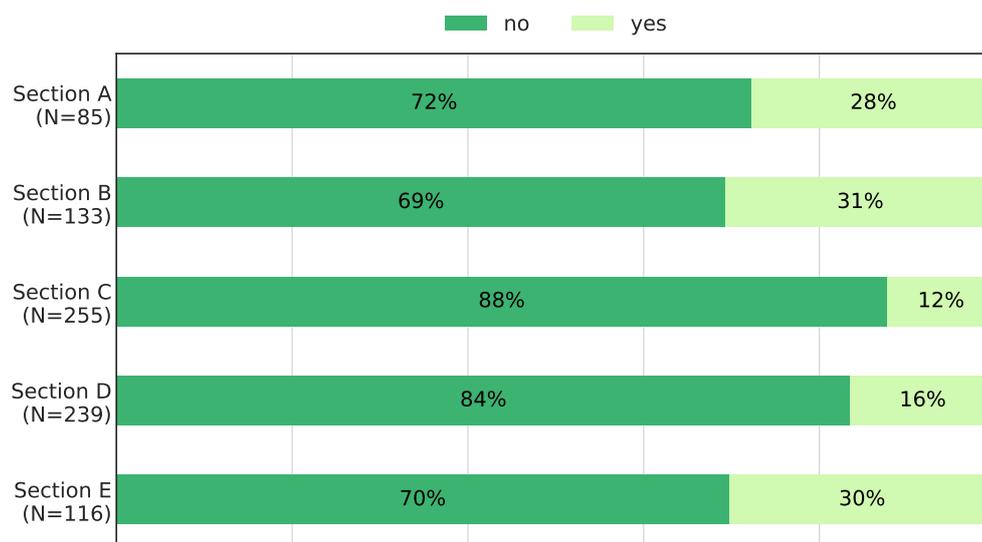


Figure 67: Respondents considering having (more) children during their PhD

9.1.2 Reasons for not wanting children

645 out of 940 respondents do not consider having (more) children during their PhD project. When asked to justify their decision, respondents were offered the following options that they could rank by importance:

- personal reasons (47%)
- non-family friendly working conditions (34%)
- financial insecurity (32%)
- fear of jeopardizing their career (30%)
- other reasons (18%)

For most of the options, gender differences are small except among respondents who did not want to have children out of fear of jeopardizing their career, which was chosen by 39% of females compared to 21% of the male doctoral researchers.

There are some variations in the reasoning for not having children across sections. Section C stands out with the highest number of respondents naming payment (38%) and working conditions (39%) as obstacles to having children. The fear of jeopardizing one's career is highest in Section B (34%) and lowest in Section E (24%). Likewise, for doctoral researchers in Section E, money holds comparably little weight (20%) when it comes to not having children. For doctoral researchers fully or partially dependent on a stipend, lacking money to support a child is more often an obstacle (44%) than it is for their peers with a contract (30%).

Already being a parent slightly changes the reasons for not wanting to have more children. The obstacles of money, working conditions and career perspectives are nearly as important for parents as for non-parents (see Figure 68). Additionally, doctoral researchers without children more frequently name personal reasons for not considering to have children during the PhD.

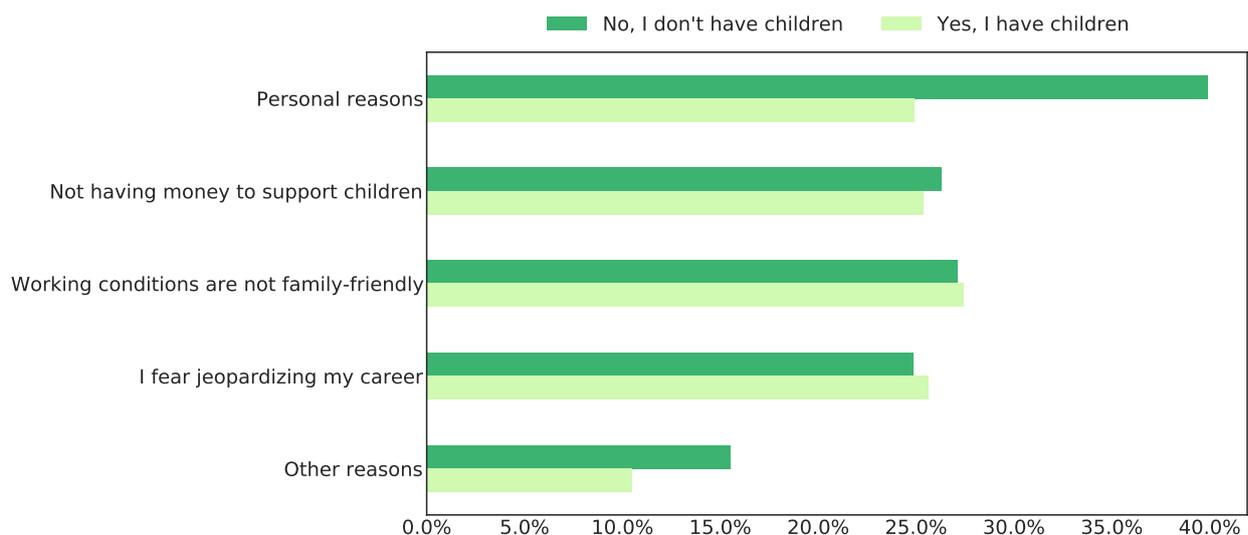


Figure 68: *Reasons for not wanting (more) children (N = 805)*

9.2 Support offered and needed for raising children

9.2.1 Support offered

When asked about available childcare services, 40% of doctoral researchers state that their institute offers some kind of support. There are large differences in the range of services offered (Fig. 69): home office or mobile work is the most common (32%), followed by parent-friendly work environment (22%), a child-friendly work environment (12%), access to day care (10%), financial support for daycare (2%), and reimbursements for childcare during business travels (2%).

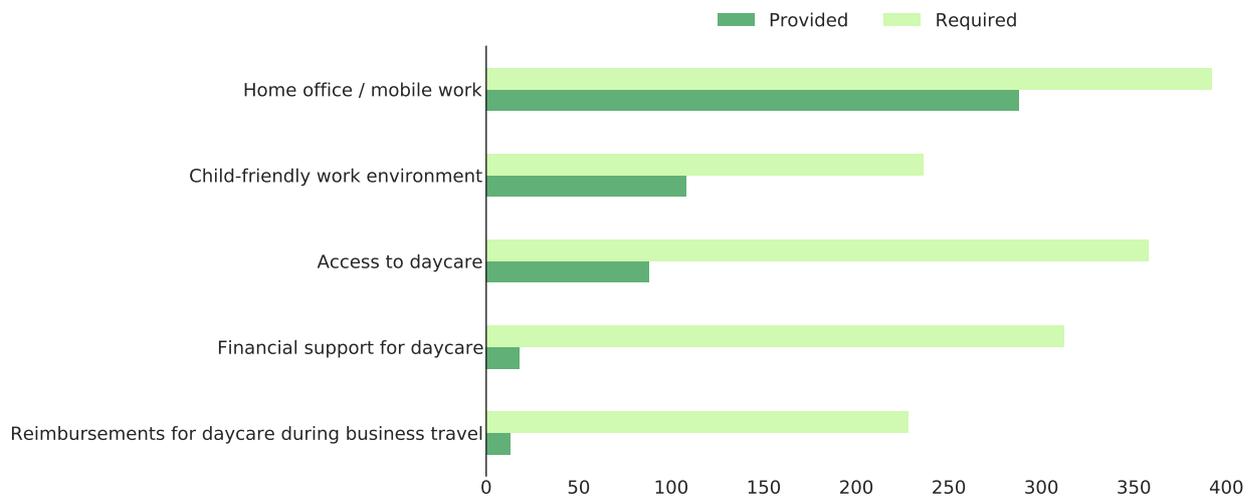


Figure 69: *Provided and needed child support services at Leibniz Institutes (number of times selected)*

There are strong differences in offered services across sections (Fig. 70). Whereas two-thirds of doctoral researchers in Section A say that the institutes do not offer any of the above options, this applies to less than a third of doctoral researchers in Sections C and D. The latter two are also the Sections where people could least imagine to have (more) children during their PhD. Figure 70 also shows that differences are more prominent with regard to home office options or to rating the work environment as parent-friendly. Besides differences across institutes, strong differences prevail between the perceptions of parents and non-parents on the availability of support. Parents are more aware of the available options. The difference is stronger for the possibility of home office and mobile work (65% vs. 27%).

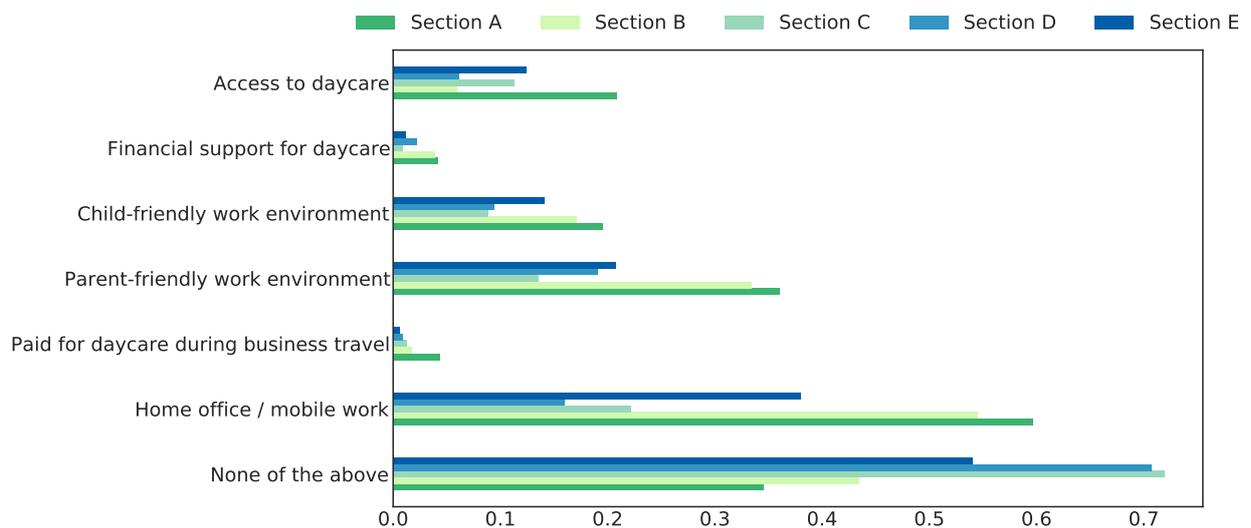


Figure 70: *Childcare support offered by Leibniz Institutes by Leibniz sections (N = 875)*

9.2.2 Support needed

Doctoral researchers could indicate which support services they use or would use if they were available. Instead of the categories of child-friendly and parent-friendly work environment, the option "possibility to bring my child to work" was provided. 54% use or would use at least one of the offered possibilities. Only 6% stated that they do not or would not use any of the given options. Interestingly, 40% are not sure whether they would use the described support strategies. Male doctoral researchers are more often unsure whether they would use offers, as are younger respondents.

The most frequently mentioned support is home office or mobile work (44%), followed by access to daycare (40%), financial support for daycare (35%), the possibility to bring children to work (26%), and the reimbursement of daycare during business travels (26%). There is little difference between Leibniz Sections with respect to these requests. One notable exception is the higher than average share of doctoral researchers who would use the opportunity to bring their child to work (38%) against home office (55%) in Section A. Another exception can be observed in Section A and B where the request for reimbursement of childcare during business travels is higher (ca. 30%) than in the other three Sections (ca. 23%).

The main difference between parents and non-parents is that the former are more aware of their needs. Only 8% of parents chose the "I don't know" option. Unsurprisingly, parents stated more frequently that they use or would use child support options than non-parents. The strongest differences exist regarding the possibility to bring children to work (39% vs. 23%) and to work remotely (60% vs. 42%), which parents picked more frequently. Female respondents report a stronger need for support than males for every childcare service (cf. Figure 71): over 10% more female doctoral researchers ask for the possibility to bring children to work, the reimbursement for daycare during business travel, and the option to take home office, than their male counterparts.

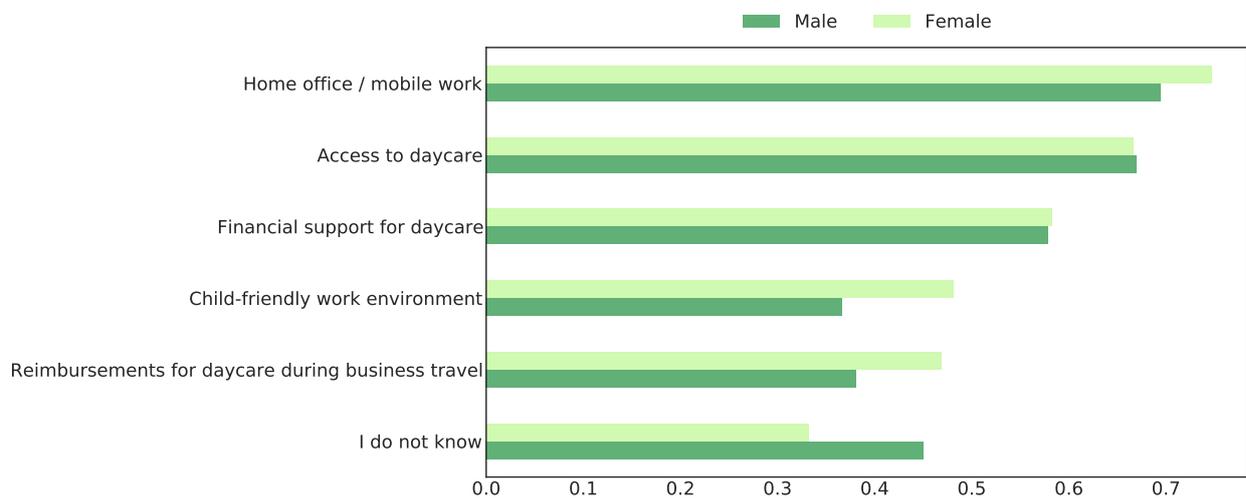


Figure 71: *Childcare support required by respondents (N = 531)*

9.2.3 Satisfaction with support

Because of the existing differences in availability and demand for support, respondents could state whether they feel that sufficient support options were available at their Leibniz institute. Only 327 respondents offered their perception on this question, while nearly 600 respondents said they do not know whether there is sufficient support from institutes. Four out of ten respondents who answered this question think there is enough financial or organizational support at their institute for raising children. The satisfaction is highest in Sections A and B and lowest in Section C (see Figure 72). Although female doctoral researchers would use offered services more often than males, there are no gender differences regarding the feeling whether the support is sufficiently available. The difference between parents (44%) and non-parents (40%) is also rather small for this question.

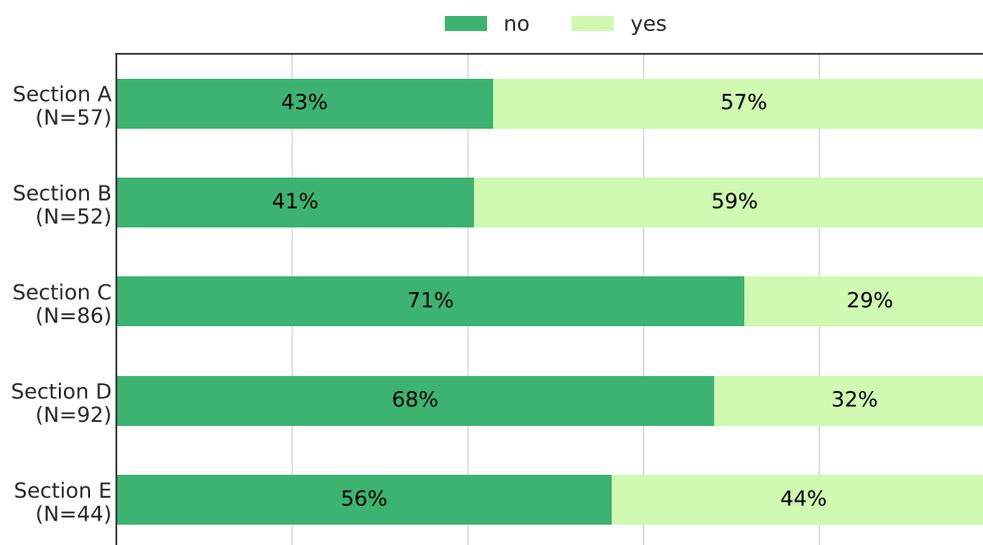


Figure 72: *Feeling that there is sufficient support from the institute for raising a child*

10 Mental Health

Main findings from the following chapter:

- Almost half of our respondents reported high anxiety (46%), while one out of five reported moderate to severe depression (15%).
- Among doctoral researchers who are not feeling free to take days off, 24% fall into the moderate to severe depression categories. Moreover, higher levels of depression were more prominent in people who worked during weekends or vacations.
- Approximately 25% of respondents are dissatisfied with their PhD supervision. Of these doctoral researchers, 50-75% suffer from high trait anxiety and 40% show moderate to severe depression.
- The affiliation to Leibniz sections, gender, parenthood and the year of PhD are the most important predictors for mental health. Yet, resilience factors such as institutional or social support can buffer the negative impact of work-related stressors.

As part of a broader drive to improve working environments in science, a global survey conducted by Nature and Shift Learning among 6,000 doctoral researchers last year revealed that 36 % of respondents sought help for anxiety or depression due to their studies [12]. Long hours, working in a foreign country, poor supervision, lack of institutional support, harassment and discrimination in the workplace, financial difficulties, and an uncertain future are all factors that can have a detrimental effect on the mental well-being of doctoral researchers.

These findings motivated this year's report to explore the mental health situation in Leibniz Institutes in Germany in order to understand the challenges doctoral researchers face and which resources are available for coping. Thus, this chapter gives a broad overview of the mental health status of respondents, describing the general situation and identifying potential drivers of mental health issues.

Mental health classifications Mental health was assessed via three different constructs:

- State anxiety refers to the level of anxiety that arises in particular situations and is attributable to an event, i.e. the current level of anxiety
- Trait anxiety refers to the level of anxiety as a relatively stable personality characteristic, i.e. the general level of anxiety
- Depression refers to the general presence and severity of depressive symptoms

Two validated psychometric instruments were used to assess the mental health status of respondents: The short form of the Spielberger State-Trait Anxiety Inventory (STAI), which is used for common classification of anxiety in research and clinical settings [8], and the Patient Health Questionnaire module PHQ-9 [5], which is used as a measurement tool for common mental disorders. Further information on the classifications can be found in the Appendix 12.1.

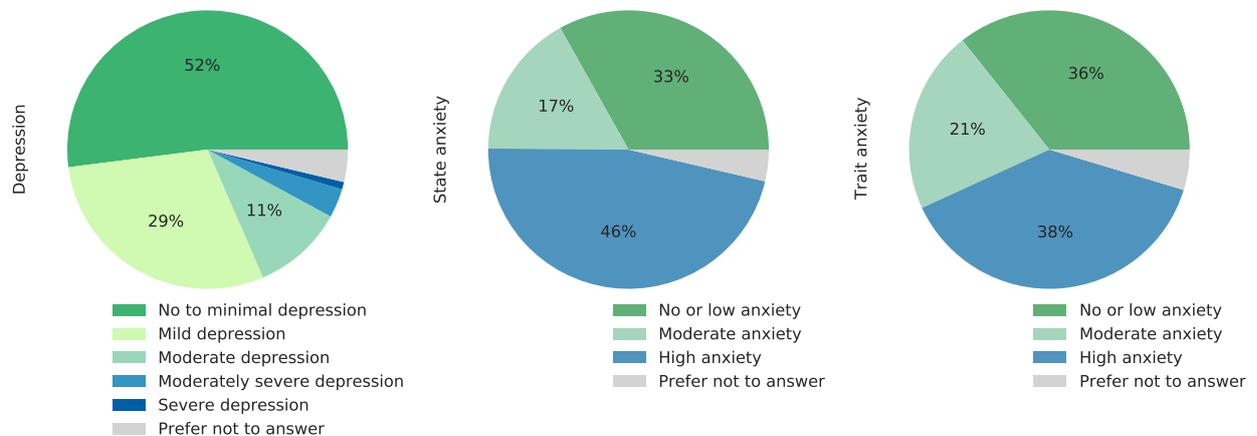


Figure 73: Distribution of depressive symptoms ($N=898$), levels of state ($N=901$) and trait ($N=887$) anxiety among respondents

10.1 Mental health situation of doctoral researchers

In total, 898 valid responses were given for depressive symptoms, 901 for state anxiety and 887 for trait anxiety. Descriptive results on all mental health variables in Figure 73 show a prevalence of at least mild mental health problems among the majority of doctoral researchers working at Leibniz Institutes. In particular, more than half of the respondents reported moderate to high levels anxiety at the time of the survey (state anxiety: 63%, $N=586$) and in general (trait anxiety: 59%, $N=530$), whereas more than a third reported low or mild levels.

In terms of depression, more than half of the respondents reported no to minimal depression, whereas almost a third were affected by mild depression. However, around 15% had more serious depression (PHQ-9 sum score ≥ 10 , i.e. moderate, moderately severe and severe), which is twice as much as the general population in Germany. In 2016, the prevalence of depressive symptoms (PHQ-9 sum score ≥ 10) in Germany amounted to 7.4% for male (95% confidence interval (CI): 5.3-10.3) and 12% for females (95 %-CI:9.5-14.9) in the age group 18-34, and 5.4 % (95%-CI: 3.6-8.2) and 9.5% (95%-CI: 7.2-12.4) in the age group 35-44, respectively. [9].

According to our qualitative analysis ($N=43$; Report in 12.2) almost half of the respondents ($N=20$) report serious mental health conditions ranging from stress, social anxiety and diagnosed clinical depression due to work-related as well as personal stressors. These underscore the need for accessible mental health support. Unaddressed mental health issues are likely to be worsened through continued work-related stress, which may be exacerbated through reported publication pressure ($N=7$) and low self-efficacy ($N=7$).

Four out of five respondents report problems that cause difficulties in conducting their work (Figure 105). These difficulties negatively affect both depressive symptoms and levels of anxiety, as well as willingness to quit the doctoral research. For instance, those who often think of quitting report moderate to severe (39%) depression (Figure 74) as well as high levels of both state (76%) (Figure 101 in Appendix) and trait (71%) anxiety (Figure 102 in Appendix).

Since all mental health variables show a positive trend, i.e. respondents with severe depressive symptoms score also high in state (Figure 103 in Appendix) and trait (Figure 104 in Appendix) anxiety, we will display our results dependent on the survey question for only one mental health variable, e.g. only depressive symptoms.

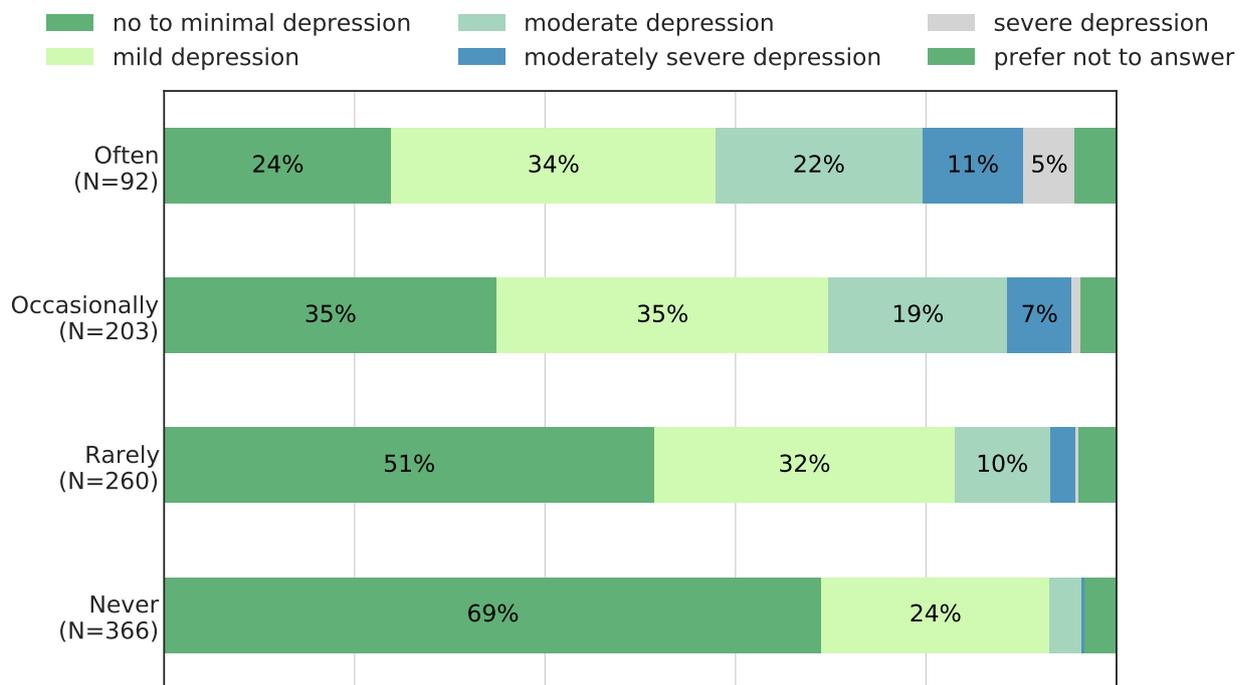


Figure 74: Depressive symptoms in relation to thinking of quitting the PhD

10.2 Socio-demographic determinants

This chapter will explore mental health inequalities among doctoral researchers by taking a closer look at socio-demographic characteristics of doctoral researchers who report good mental health.

Section affiliation

In terms of section affiliation, Figure 75 shows a relatively stable distribution among respondents with a few exceptions. For example, section B has the largest amount of respondents with no to minimal depression (65%, N=97) and section C has the largest amount of respondents with moderate to severe depression (20%, N=56).

Age

Looking at the age distribution in Figure 76, younger respondents report no to minimal depression symptoms more frequently than their older peers (61 %, N=48 vs. 47%, N=20). Interestingly, almost one out of ten respondents did not prefer to answer this question. Age discrepancies might be related to typical major life transitions in older age groups, such as starting a family and/or having childcare responsibilities (see more in chapter 9).

Gender

Regarding the gender distribution in Figure 77, close to half of male (57%, N=242) and female (47%, N=231) respondents report no to minimal depression. However, slight gender differences exist between male and female doctoral researchers, in which females report more depressive symptoms than males. This result is consistent with the literature on gender differences in mental health with respect to biological factors and an elevated exposure to psychosocial stressors among females [10, 11].

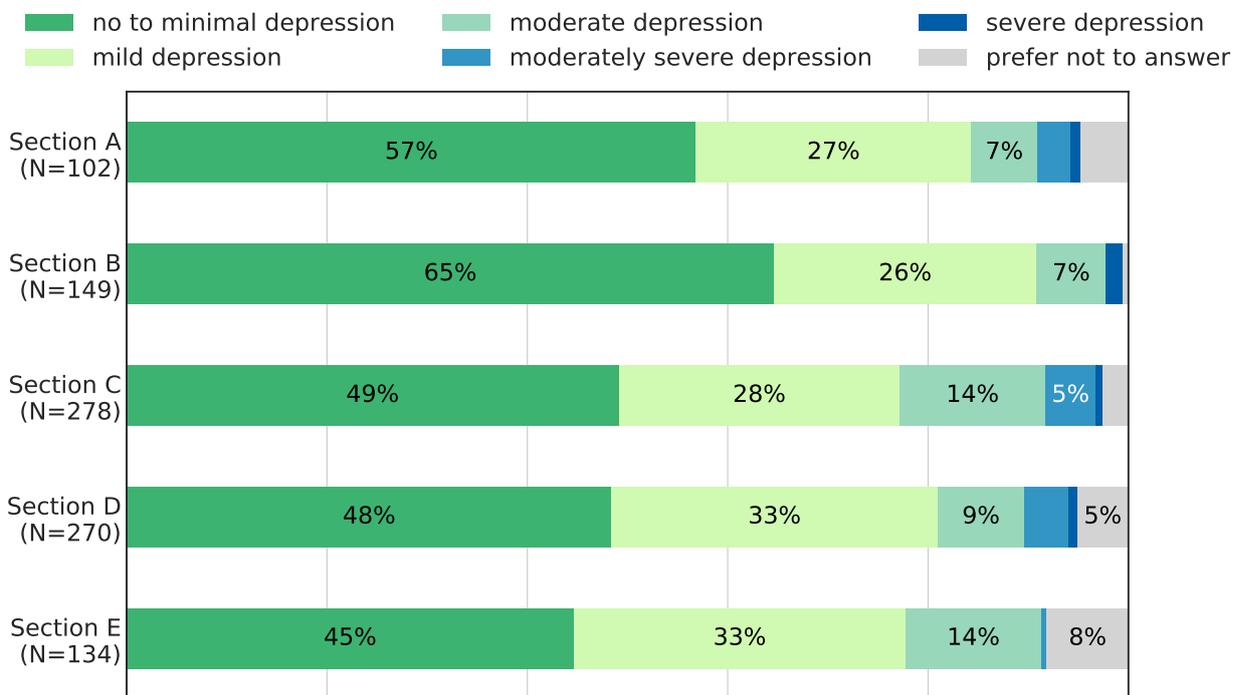


Figure 75: Depressive symptoms across Leibniz Sections

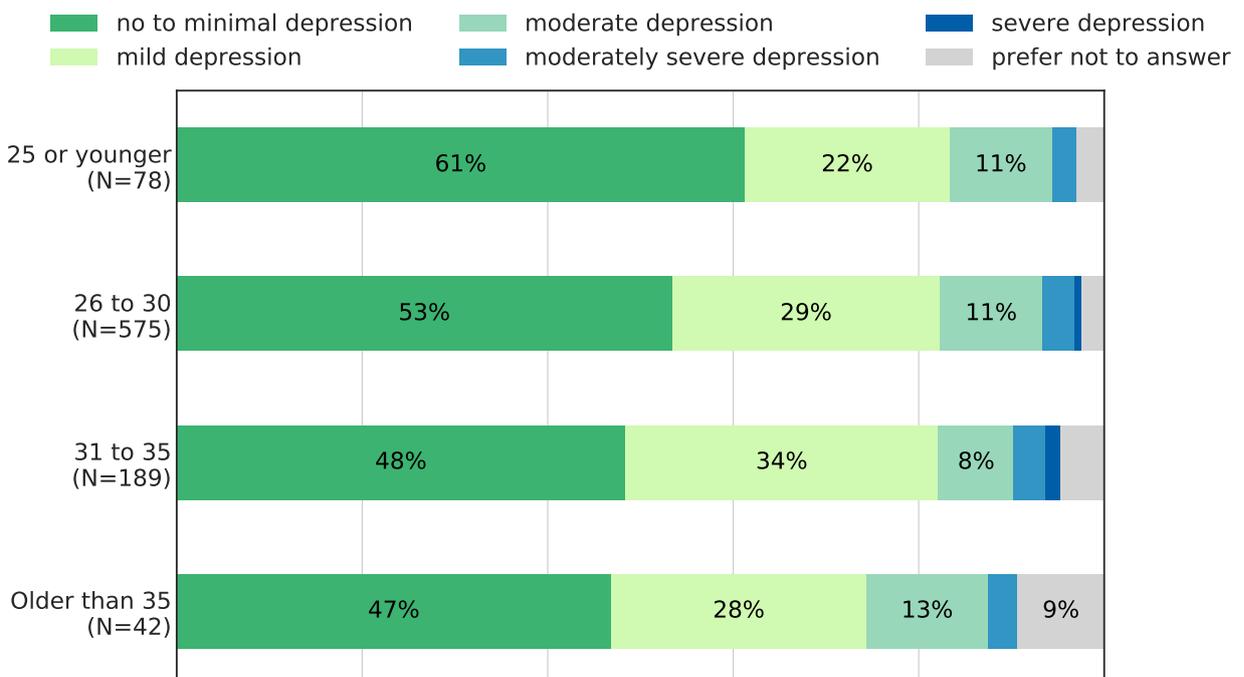


Figure 76: Depressive symptoms by age

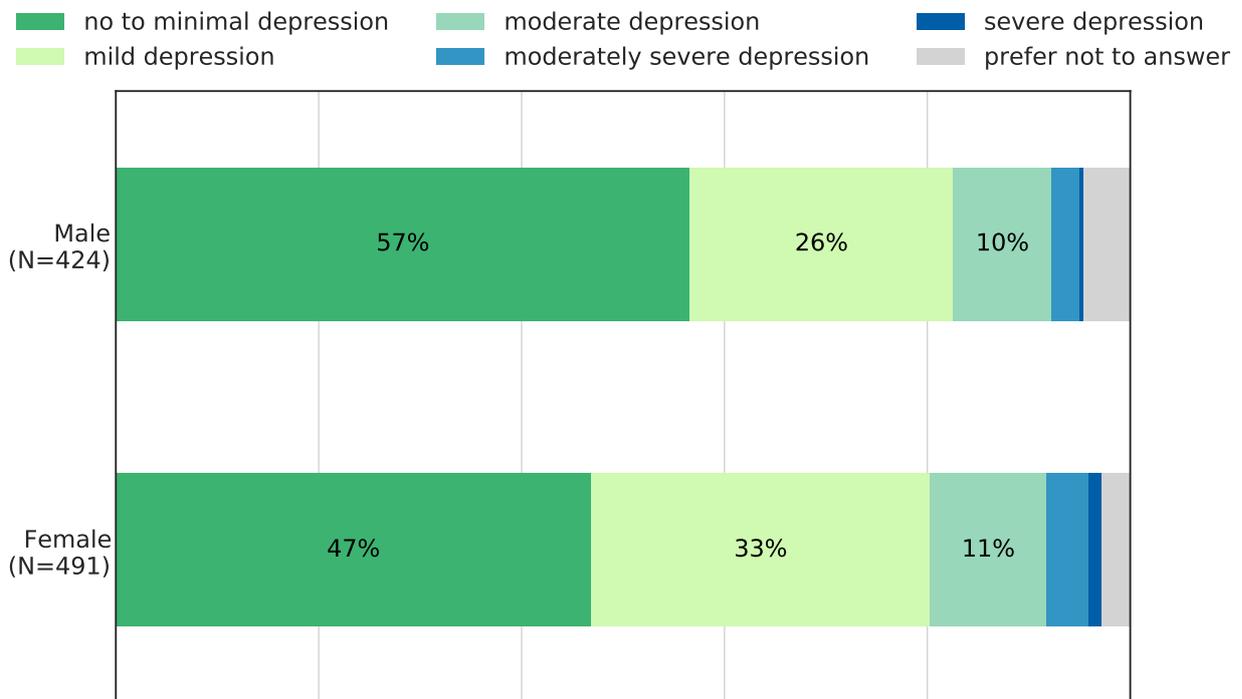


Figure 77: *Depressive symptoms by gender*

Citizenship

In Figure 78, more than half of the respondents with German citizenship report no to minimal depression (57%, N=339). In contrast, fewer respondents with EU citizenship (40%, N=46) and a citizenship outside the EU (45%, N=97) experience no or minimal depressive symptoms. Potential differences could be due to difficulties in integrating into a new cultural and research environment, language barriers, and having a smaller social support system in a foreign country, as mentioned in chapter 7.

PhD duration

As shown in Figure 79, a positive trend is observable between the duration of the doctoral research and depressive symptoms. Respondents in the early stages of their doctoral research report less depressive symptoms (1st year: 58%, N=152) in comparison to those in advanced stages (5th year: 42%, N=43). Potential reasons could come from chronic stress exposure from performance pressure, dealing with financial uncertainties and familial responsibilities.

Environmental factors

When looking for modifiable causes that influence mental health, different environmental factors have to be taken into consideration. Respondents who report higher levels of anxiety and depressive symptoms are highly unsatisfied with their workload and psychological support. Our correlation analysis on factors and depressive symptoms yields statistically significant results for work environment and atmosphere, scientific support and supervision. Due to the tremendous impact on doctoral researchers' mental well-being, workload, supervision, and support will be further explored in the following sub-sections.

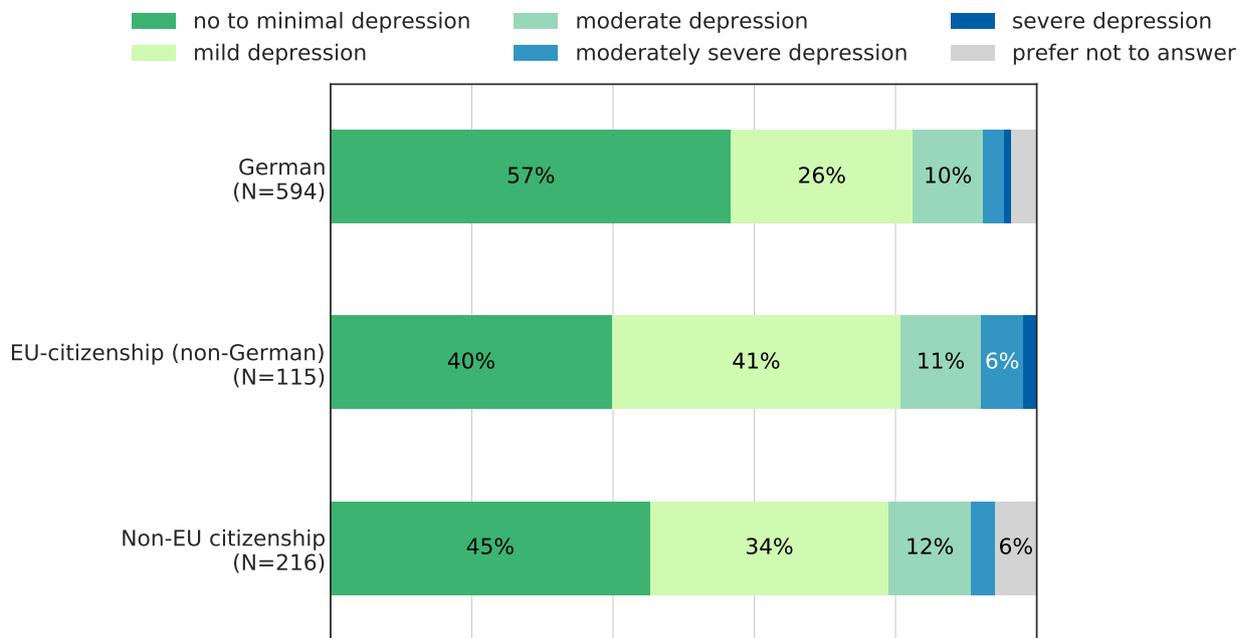


Figure 78: Depressive symptoms by citizenship

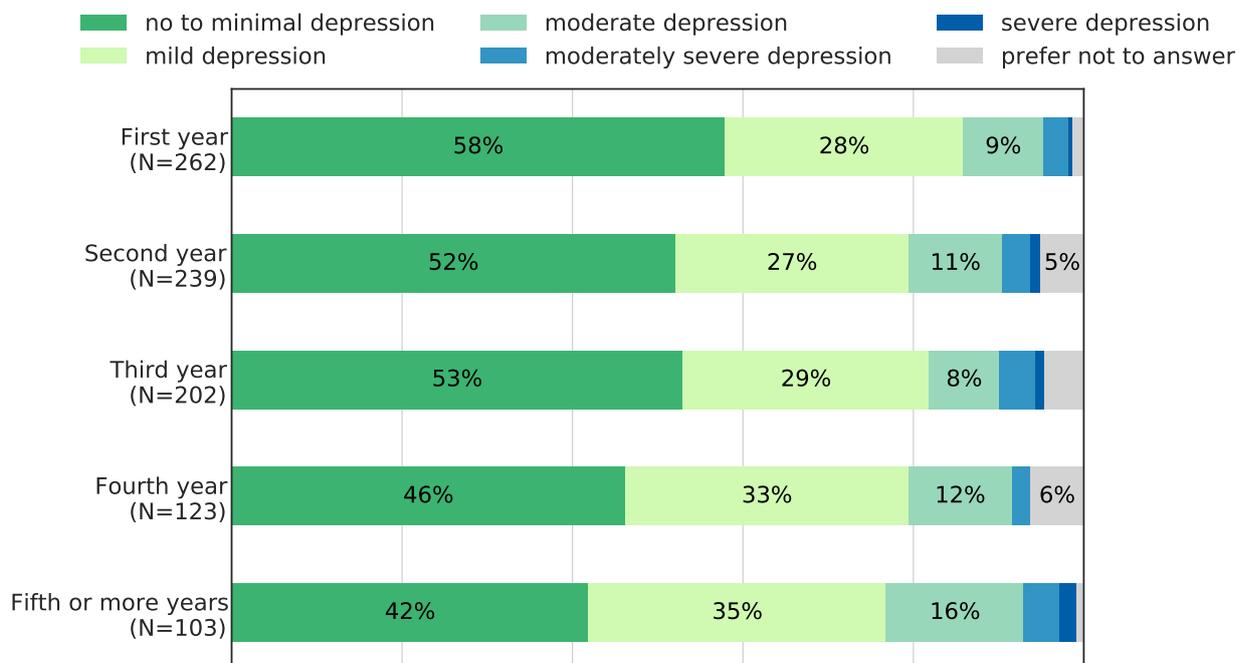


Figure 79: Depressive symptoms by year of PhD

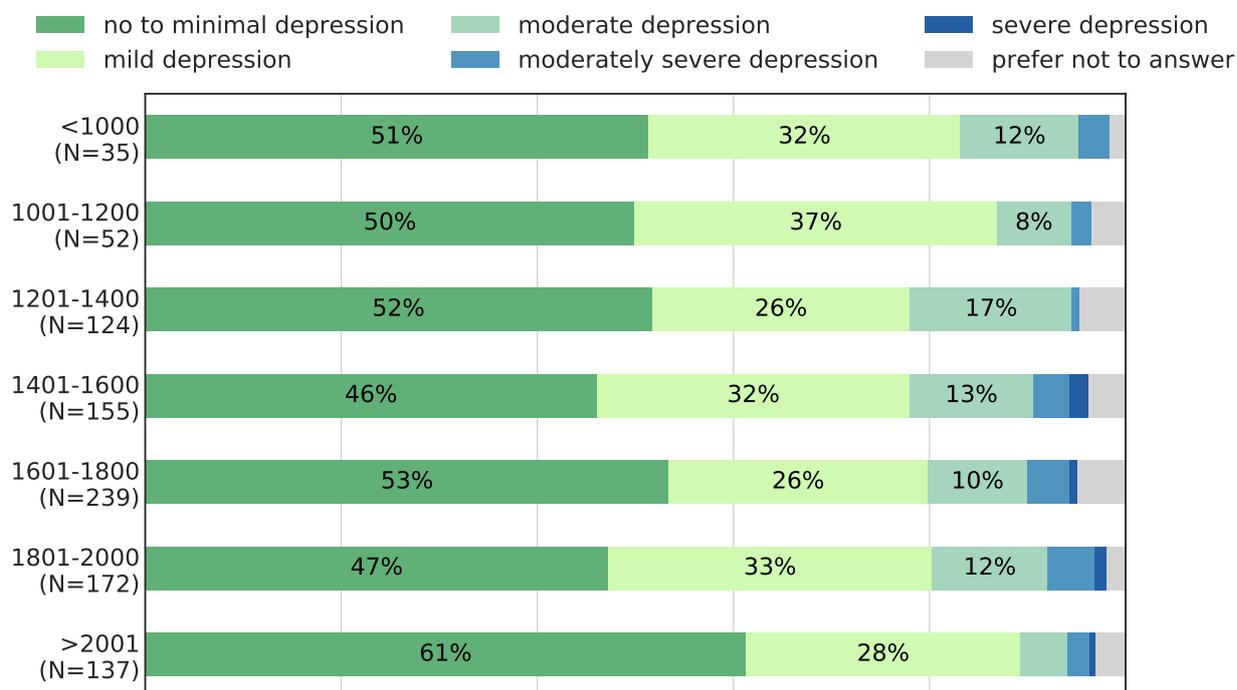


Figure 80: *Depressive symptoms in relation to income*

10.3 Workload - More time for work and less time for recreation

The previous chapter showed that higher levels of anxiety and depression correlate with higher dissatisfaction with workload. This correlation confirms the widely known fact that occupational stress is often caused by workload and job demands in universities [7]. The drivers of this relationship are analyzed in the following by relating the working conditions described in detail in section 4 with the mental well-being of doctoral researchers at Leibniz Institutes.

Payment Types and Income

In terms of payment and income, we see only slight differences according to anxiety and depression symptoms. Doctoral researchers who receive payment through a stipend or a contract show very similar levels of depressive symptoms (Figure 106 in Appendix). Since 93% (N=768) of the sample hold either a stipend or a contract, the comparison to other payment types should not be over-interpreted. The more important question might be whether the income level affects mental health at the Leibniz Institutes. Doctoral researchers with low income could experience pressure to work more and finish their degree early while worrying about funding themselves and their family. However, Figure 80 shows no pattern that supports this suggestion. Even if comparatively high levels of income (over €2000) are associated with no to minimal depressive symptoms (61%, N=135), depressive symptoms are not substantially greater in the low income groups. The potential negative relationship between mental health and income might not be visible here because the income range for doctoral researchers is relatively small across institutes and within academia in general.

Working Hours

Additionally, respondents were asked about the number of work hours specified in their contracts. It is clear from the results that the contracted number of hours often do not match the actual hours worked in a week. Thus, the specified working hours show no clear relation to the mental health measurement. More informative is the self-reported amount

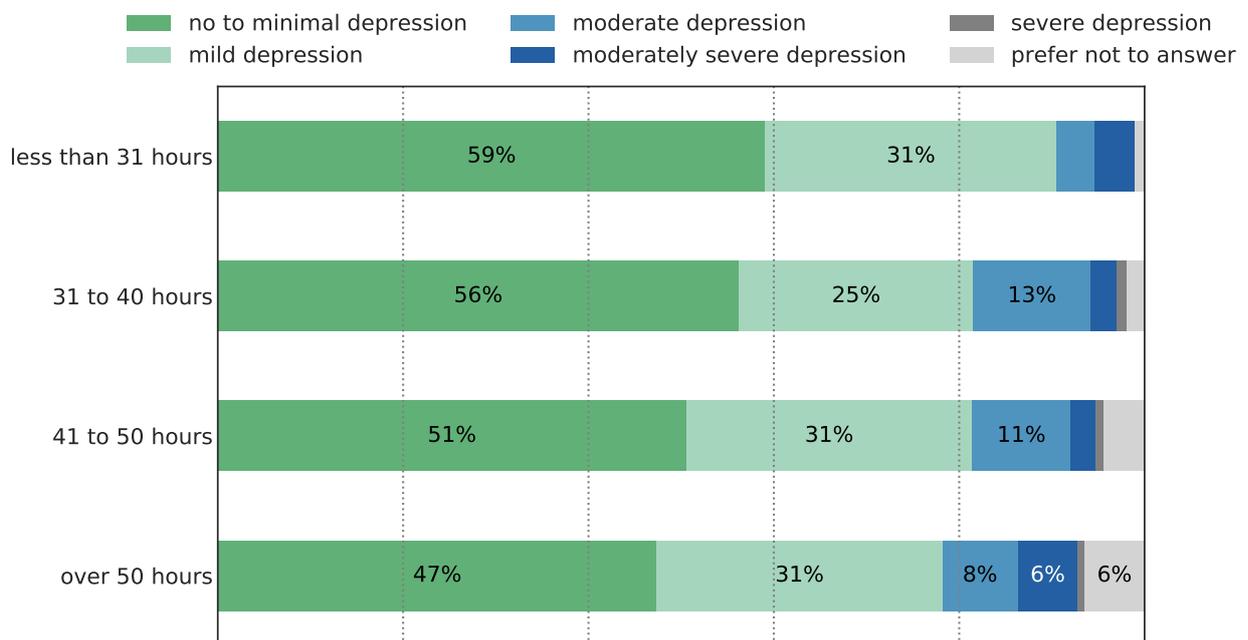


Figure 81: *Depressive symptoms in relation to actual worked hours per week*

of hours actually worked per week. These numbers more accurately reflect the work demands and stress levels doctoral researchers experience. If the average number of worked hours per week rises, the share of respondents with no to minimal depressive symptoms shrinks (Figure 81). Moreover, 15% (N=567) of doctoral researchers exceeding 40 hours per week show at least moderate depression symptoms. This is particularly alarming when considering that approximately 65% of the respondents reported typically working more than 40 hours per week. In the group of respondents who usually work more than 50 hour per week, 7% (N=8) were classified as having moderately severe to severe depression.

Taking Time Off

If workload is high, taking time off during vacations and weekends can provide a opportunity to improve mental health through developing resilience and recharging batteries. As often seen in the culture of academia, doctoral researchers feel high pressure to work during their free time. For example, an alarming 35% (N=316) do not feel free to take days off. However, it is not clear whether taking less time off is associated with lower resilience and more mental health problems.

If the number of vacation days are explicitly specified in a contract, one third of doctoral researchers take less than half of their vacation days (section 4). These persons have more severe mental health problems as Figure 82 shows: Those who took less than half of their vacation days experienced substantially more moderate or worse depression (23%, N=22) compared to those who took more than half or all (11% (N=17) and 15% (N=45), respectively). 32 respondents reported taking no vacation days at all. The majority of them show no depressive symptoms (61%, N=21) but if symptoms occur they are more severe (14% moderate to moderately severe depression, N=5).

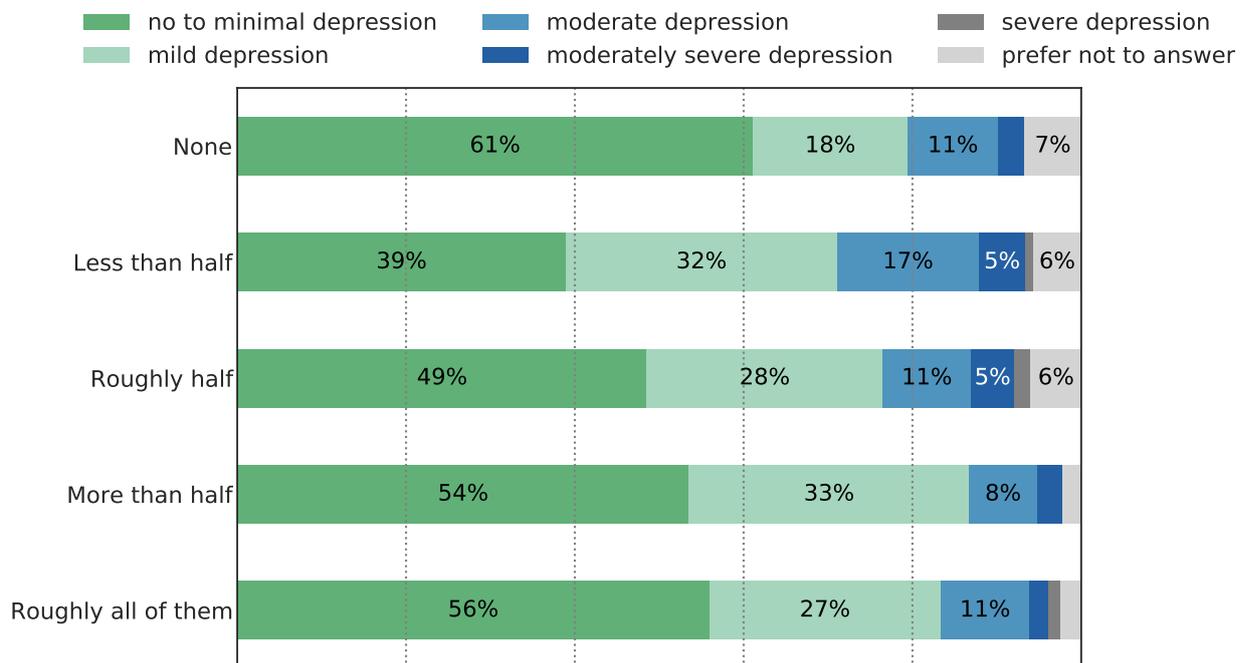


Figure 82: *Depressive symptoms in relation to taken vacation days*

When looking at working during weekends and vacations, a similar pattern emerges (Figure 107 in Appendix). When doctoral researchers work more in their free time, the proportion of respondents with no to minimal depression symptoms shrinks, while the proportion with moderate to severe depression grows.

It becomes clearer that taking days off can help doctoral researchers improve their mental health. However, many doctoral researchers report that they do not feel free to do so. Figure 83 convincingly shows that this feeling is related to symptoms of mental illnesses. Among the people who do not feel free to take days off, nearly one quarter falls into the moderate to severe depression category (24%, N=74). In comparison, significantly less (10%, N=58) of the people who feel free to take holidays reported the same levels of depression. Hence, not only are many doctoral researchers working continuously, without taking time off, but this also seems to be one of the driving factors related to symptoms of anxiety and depression.

Future Career Plans

One last question related to the working conditions is addressed here: How does mental health relate to future career plans? Figure 84 depicts this relation. We know from the results in the previous career development chapter that a substantial proportion (56%, N=503; Figure 60) of doctoral researchers would like to follow careers in academia after graduation. These researchers also show less severe depressive symptoms (58% (N=150) and 52% (N=117) not to minimal depression) than people who do not want to work in academia. This indicates that suffering from mental health problems might influence the decision to not pursue a further academic career.

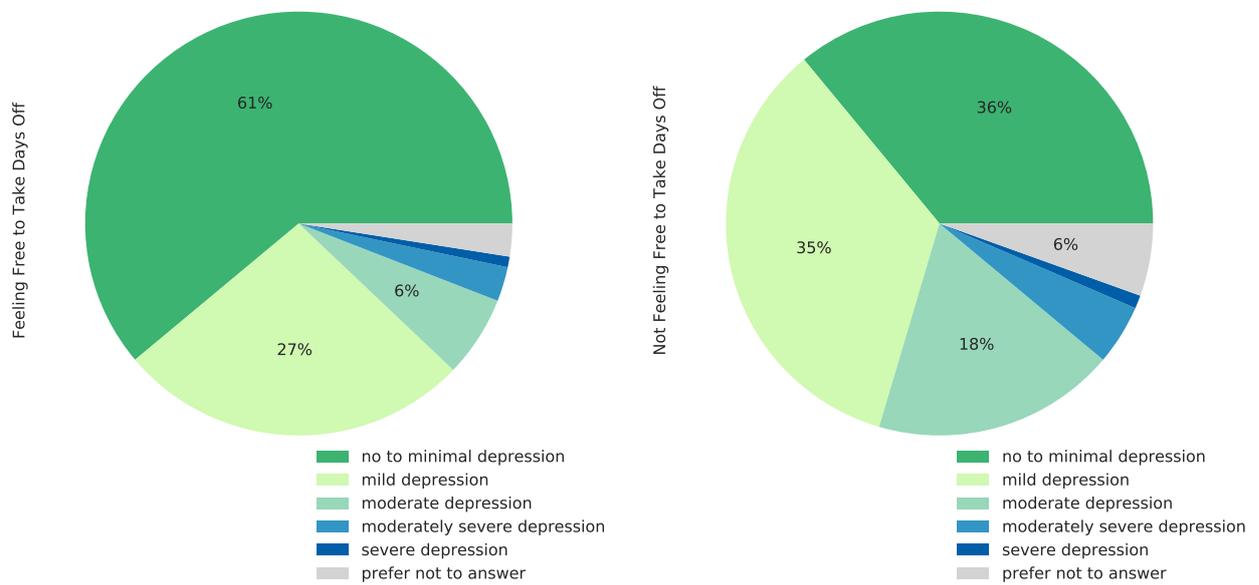


Figure 83: Depressive symptoms and feeling free to take days off

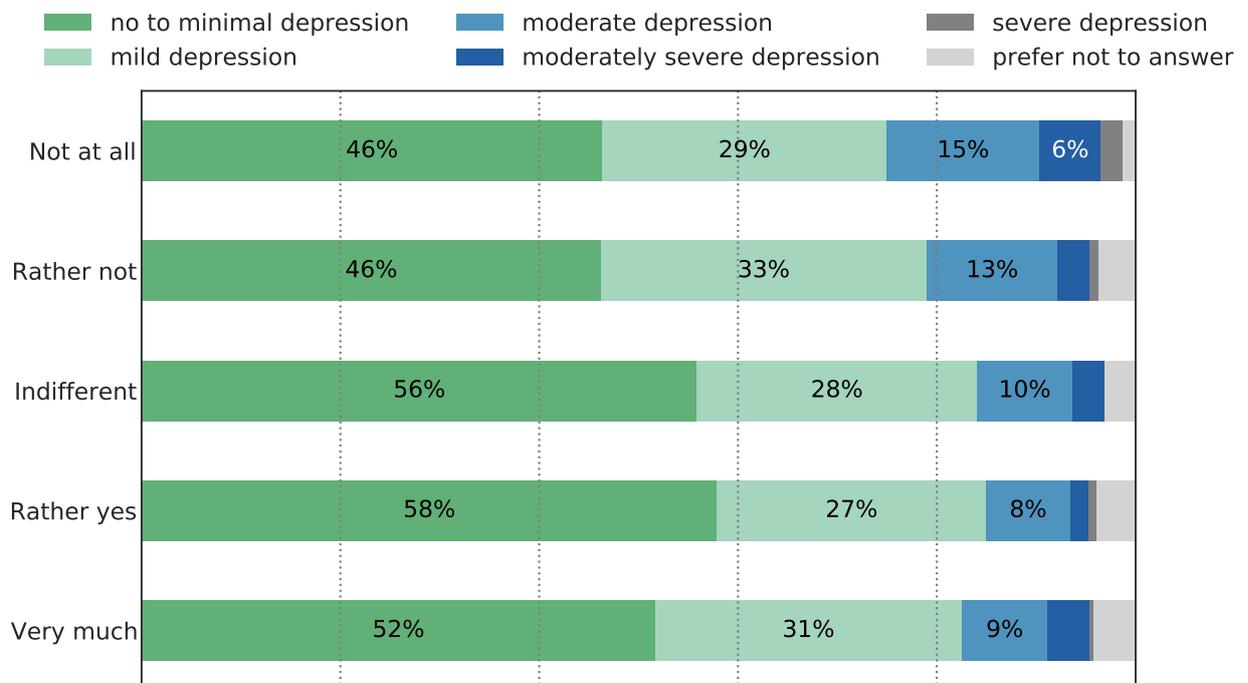


Figure 84: Depressive symptoms and wanting to work in academia

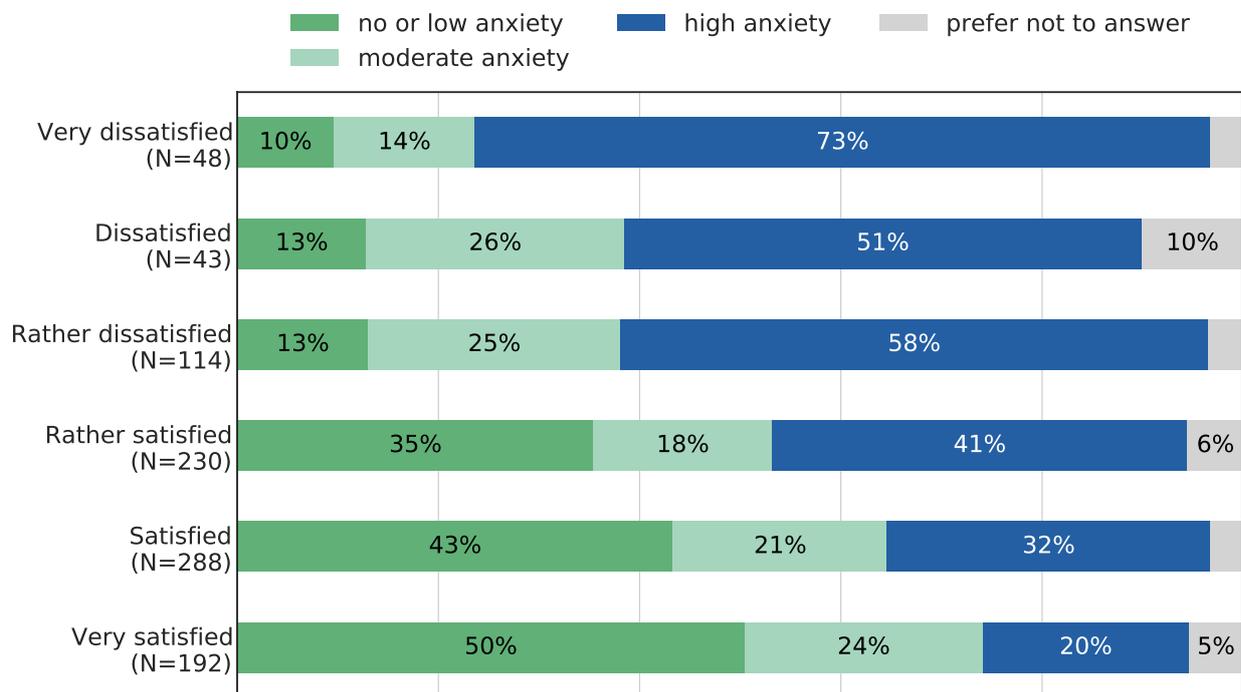


Figure 85: Levels of trait anxiety with respect to the doctoral researcher's satisfaction with their PhD supervision

10.4 Supervision - Blessing or curse for mental health

Good PhD supervision is an essential ingredient for a successful PhD. Hence, it is no wonder that the mental health state of doctoral researchers correlates strongly with their PhD candidate-supervisor relationship ([3], Nicholas E. Rowe (private communication)). Our data confirms this statement with a clear trend: Following Figure 108, about half of the respondents who are satisfied or very satisfied with their supervision have no or low anxiety, while 50-75% of doctoral researchers who are not satisfied show signs of high anxiety and moderate to severe depression (38%, see Figure 104). Fortunately, only ten percent of all respondents reported dissatisfaction with their supervision. Nevertheless, these results show how crucial good supervision is and should serve as a reminder for all advisors to regularly reflect on and evaluate their supervision. In a recent study, it was shown that this problem is also imminent when supervisors are not satisfied with the supervision and can cause mental health issues for the supervisors⁹. It is therefore important to not only focus on one side of the PhD candidate-supervisor relationship, but instead both sides should be considered to find the best possible means of communication.

To find the cause of the dissatisfaction with supervision we looked into different sources of possible frustration. Unless the doctoral researchers meet their advisor less than every six months, there is no indication that the meeting frequency plays a strong role in the doctoral researcher's mental health. However, as discussed in the supervision chapter, a third of our respondents would like to meet their advisor more often. We also found clear connections between high anxiety and all types of problems between supervisor and PhD candidate with typically more than 60% of respondents reporting high anxiety levels when there were problems compared to 30-40% with high anxiety when

⁹<https://supervisingphds.wordpress.com/2019/05/07/protecting-supervisors-who-respond-to-the-mental-health-and-wellbeing-needs-of-international-research-students/>

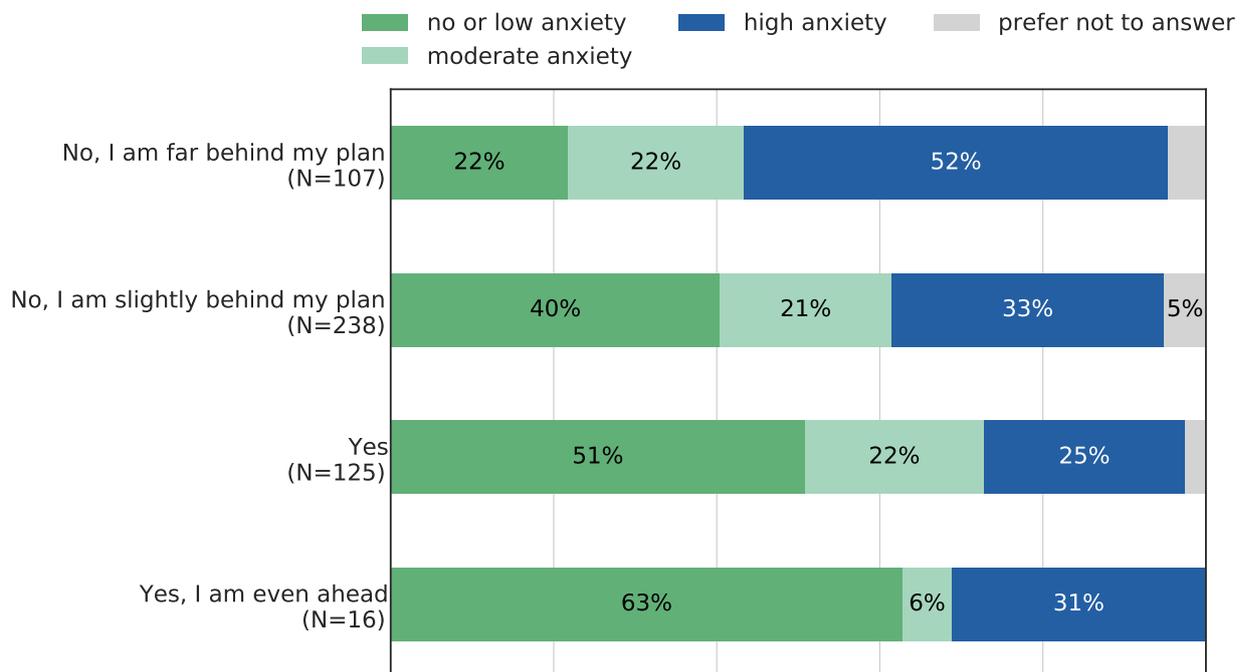


Figure 86: Levels of trait anxiety with respect to the doctoral researcher's fulfillment of their PhD roadmap

there were no problems. The greatest proportion of doctoral researchers reporting high anxiety were seen when the doctoral researcher felt impolitely (65-80%, N=35) or unprofessionally (58-68%, N=57) treated by their supervisor, when the advisor was not well informed about the field (64%, N=128) or the project (50-64%, N=168), or if there was a disagreement between supervisors (60%, N=203). Another trigger of high anxiety levels is whether the PhD candidate meet their PhD plan. Alarmingly, 75% of doctoral researchers are behind their schedule, a surprising 25% are even far behind their schedule (Figure 86). In total, 52% of these doctoral researchers experience high trait anxiety and 65% reported high state anxiety. One obvious reason for being behind schedule are additional tasks and high workload. If supervisors help to better manage the working environment, doctoral researchers are more able to keep on schedule, avoid work during weekends and holidays and consequently reduce their anxiety. One suggestion for supervisors could be to include time buffers into PhD timelines to account for unexpected difficulties and possible changes in research plans, which are very common during a PhD and can add substantial extra time.

Seeing this strong relationship between supervision dissatisfaction and poorer mental health, it is important to identify factors that can support the relationship and communication between supervisor and doctoral researcher. We did not find any connection between the mental health state of doctoral researchers and the presence of a written PhD training plan (mandatory classwork for the PhD) or a thesis advisory committee. However, a clearly structured project outline defining the objectives of the PhD Project and a PhD agreement is shown to reduce the proportion of people experiencing high anxiety by about 10%. Strikingly, while most respondents (N=810) did not have PhD guidelines (Figure 87), 39% of these PhD candidates show signs of high anxiety compared to 22% of the doctoral researchers who do have guidelines. Therefore, the recently released welcome package by the Leibniz PhD network could be a good start to reduce anxiety among the doctoral researchers by helping them to navigate through their PhD.

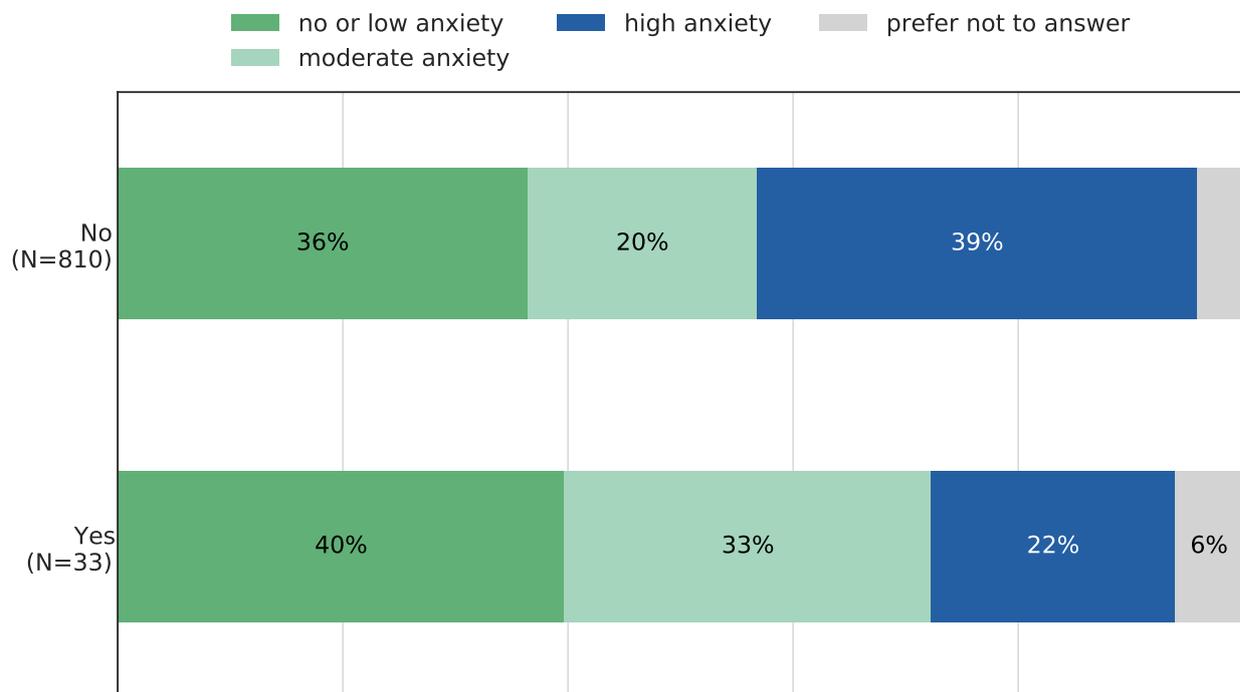


Figure 87: Levels of trait anxiety with respect to the availability of PhD guidelines

10.5 Building resilience through institutional and social support

Besides exploring potential causes of poor mental health, this chapter will also explore resources that contribute to good mental health. One crucial resource for someone's mental well-being is social support. Having poor social support is not only associated with quitting someone's PhD (as previously discussed in (subsection 7.3) but has also been linked to an elevated prevalence of depression [10]. This is in alignment with our results in Figure 88 which suggests a clearly negative pattern. More respondents with a strong social network report no to mild depressive symptoms (66%, N=237) compared to those with a poor social network (23%, N=24). Almost every other respondent with a poor social network (31%, N=32) is affected by moderate to severe depressive symptoms. Since interactions with work colleagues are also considered as daily social contact, there may be other possible reasons for this relationship within the work environment and atmosphere.

For instance, when asked about language barriers for communication (Figure 109 in Appendix), more than two out of five respondents with large barriers report high levels of anxiety. Communication problems can negatively affect the work environment and atmosphere, ultimately leading to reduced work productivity and worsened mental health outcomes. Similarly, more than half of the people who do not have regular social activities organized by their working group or institution report high levels of anxiety (Figure 110 in Appendix). Interestingly, those who were offered social activities but did not want to attend report higher levels of anxiety. These results might indicate personal preferences for limiting social activities or other existing barriers that prevent doctoral researchers from taking part in social gatherings, thus reducing social support.

For doctoral researchers with or planning to have children, the support from the institutions can also have an impact on parents' well-being. Overall, parents do not show higher anxiety levels than doctoral researchers who do not have or expect children (Figure 111 in Appendix). However, the picture changes when comparing the level of childcare support across institutions. Figure 89 clearly shows higher anxiety levels in the group without support (57% with high

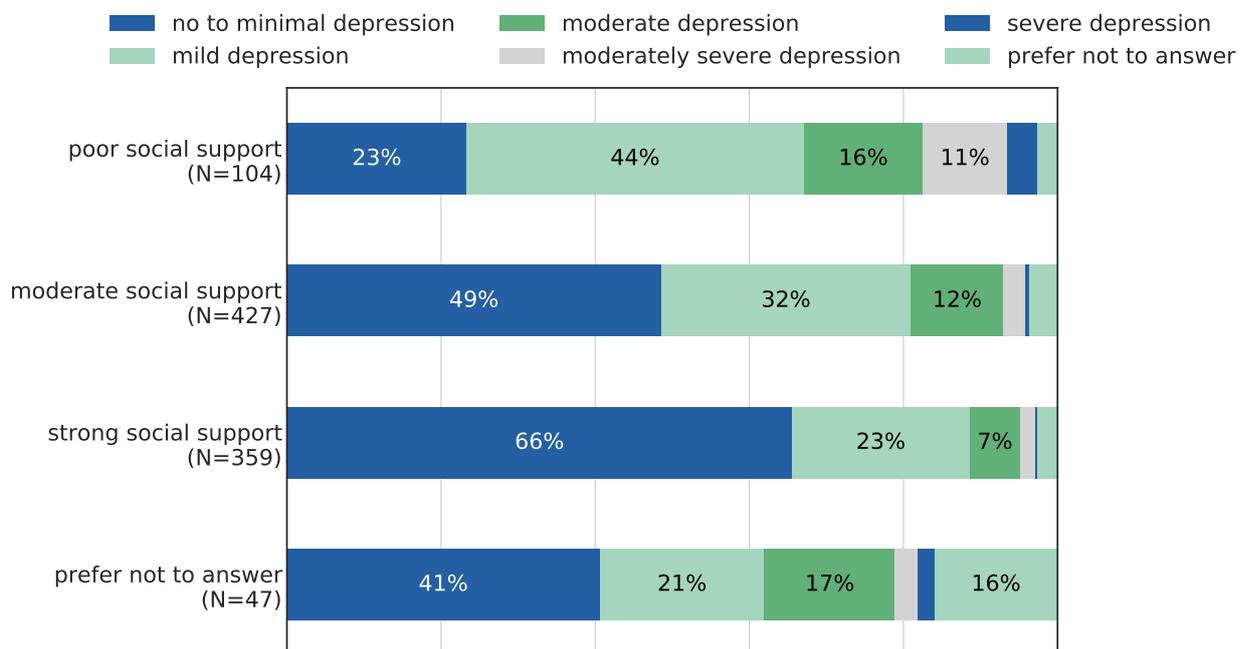


Figure 88: *Levels of depression with respect to social support*

state anxiety). The share of parents with high anxiety levels is even higher when respondents do not feel sufficiently supported (Figure 90). So it seems that the perceived financial and organisational support can be even more important for good mental health in parents than the actual offered support.

A multiple regression analysis for mental health variables on section, gender, age, year of PhD, citizen, parent and contract situation was performed to see which factors are the most important predictors of mental health. Results for depressive symptoms show that the Leibniz section affiliation, gender, parenthood and the year of PhD are the strongest predictors. When including social variables as additional predictors, results show that it leads to a statistically significant improvement in mental health. If controlling for work-related stressors (workload and supervision) and quitting someone's PhD, results show that resilience factors such as institutional or social support can positively influence someone's mental health situation.

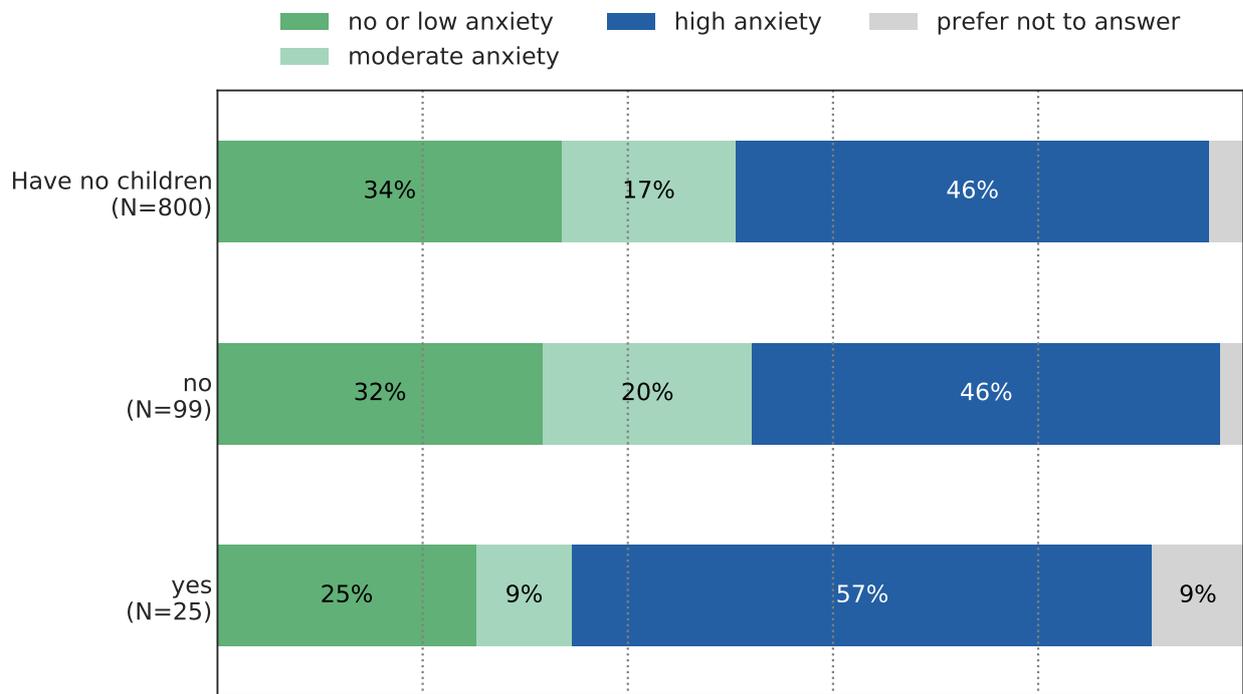


Figure 89: Levels of state anxiety in relation to offered child support

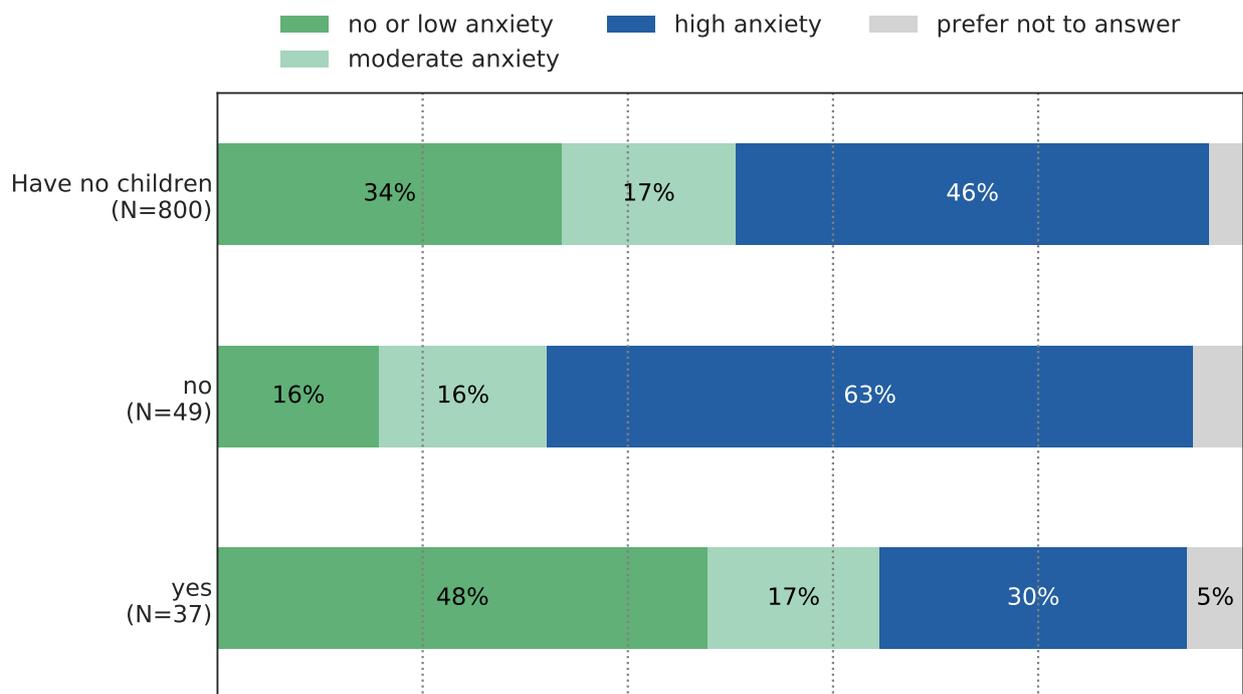


Figure 90: Levels of state anxiety in relation to feeling sufficient supported by institute

11 Power abuse

Main findings from the following chapter:

- Less than 40% of all respondents know about the Equal Opportunity Officers. Only 13% of our respondents are aware of the central Ombudsperson in the Leibniz Association.
- Non-German respondents are significantly less aware of aid mechanisms and contact persons in case of conflicts.
- 16% already had a conflict with a superior, less than half of these doctoral researchers reported it.
- Our data shows that reports of conflict can have a positive impact: More than 40% were satisfied with the consequences of their report, and a report increases respondents' satisfaction with their work environment.
- 10% of our respondents were subjected to bullying by a superior at least once.

11.1 Awareness of mechanisms that can help in cases of conflict with a superior

In the 2019 Leibniz PhD Survey we wanted to know whether respondents are aware of the mechanisms that can support them in cases of conflict with supervisors and superiors. We asked whether they know, among others: their institute's ombudsperson, the respective works councils, the equal opportunities officer at their institutes, and the elected PhD representatives. Moreover, we wanted to know whether they know the Leibniz ombudsperson, who is in charge of the entire Leibniz Association and can act whenever researchers do not want to get in touch with local ombudspersons at their institutes for any reason.¹⁰

Doctoral researchers in the Leibniz Association are quite aware of different resolution mechanisms, but there is still room for improvement. Two thirds of doctoral researchers are aware of their local ombudsperson, whereas only every second PhD knows the institute's works council and even less respondents are aware of the local equal opportunities (EO) officer (39.0%). In contrast, PhD representatives are well known (by 88.4% of the respondents in total), most likely because they are fellow doctoral researchers elected by their peer group to represent their interests within the institute or organize social events. The awareness of resolution mechanisms does not differ much across genders. Turning to those 11.5% of respondents who are not aware of any of the above mentioned mechanisms (N = 101), some differences can be observed in a multivariate analysis. Gender is not a significant explanatory factor in this respect; however, citizenship plays a crucial role. Compared to German respondents, non-EU citizens are five times more likely to be unaware of any aid mechanisms. Looking at Figure 91, respondents with of non-German EU citizenship are also less aware of many mechanisms. Unsurprisingly, awareness increases with the duration of the PhD.

¹⁰We also asked about the general works council, the central equal opportunity officer, external law firms, medical services, and security services.

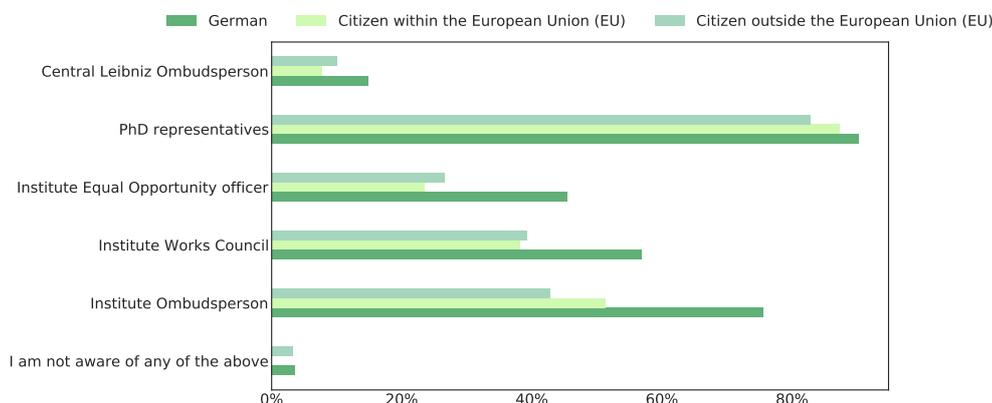


Figure 91: Awareness of mechanisms that can help in cases of conflict with superiors by respondent's citizenship ($N = 779$)

11.2 Cases of conflict: Reporting and satisfaction with consequences

In our sample, 6.1% of all respondents have had a conflict with a superior¹¹ and reported it afterwards ($N = 53$). Another 10.1% had a conflict, but decided not to report it ($N = 88$). The remaining 83.8% stated that they never had a serious conflict with their superiors and consequently did not report anything. We left the term "conflict" as open as possible, only describing it as a "behaviour of a superior using their power for personal gain and/or to your disadvantage, [which] can take many forms" (see full Questionnaire in the Appendix). It needs to be considered that this is a very sensitive topic and a number of respondents might have not reported any conflicts in the survey even if they actually happened.

We had a closer look at those 16.2% of cases who already had a conflict with their superior (irrespective of whether they reported it or not) because we are interested whether those conflicts are clustered in certain Leibniz Sections or demographic subgroups. Descriptive analyses and a multivariate logistic regression show that the prevalence of conflicts is statistically independent from most explanatory variables. There is no Leibniz section with a higher share of unreported or reported conflicts, although the number of reported conflicts is lower in Section E (3.1%) compared to all other sections (between 6.1% and 6.8%).¹² The prevalence of conflicts does not differ significantly across genders or respondents with or without children. Female respondents do not have more unreported or reported conflicts with their supervisors than male respondents.

Regarding citizenship, German respondents reported more conflicts than their EU and non-EU peers, and they also have more unreported conflicts with their superiors. This could be a spurious relation, because the citizenship of respondents is also related to the previous duration of the contract in our survey sample (see Chapter 3.3.2). We observe an increasing number of conflicts in the later phase of the PhD, which makes sense since the cooperation between PhD candidates and superiors is lasting longer and the probability of conflicts increases with time.

¹¹Defined as "a person in a position of power over you [in your working context], for example by having influence on the success of your academic career or the prolongation of your working contract."

¹²On the other hand, we observe the highest share of respondents with unreported conflicts in Section E (11.9%).

For those respondents who already reported a conflict, we followed-up with a question on how satisfied they were with the consequences of their report. A little more than one third was dissatisfied or very dissatisfied with the consequences (36.1%), 22.3% were neither satisfied nor dissatisfied, and the remaining 41.5% were satisfied or very satisfied with the consequences.

11.3 Experiencing and witnessing cases of unwanted sexualized behavior from a superior

In the 2019 Leibniz PhD Survey we were interested whether the respondents experienced "unwanted behavior that you would call 'sexual harassment' from a superior".¹³ Moreover, we asked whether respondents witnessed this kind of unwanted behavior towards a colleague.

Experiencing unwanted sexualized behavior from a superior

In our data, 95% of the respondents have never experienced unwanted sexualized behavior themselves. 1.5% have experienced it once, whereas nearly 3% have experienced it occasionally. A very small number of respondents reported experiences on a monthly, weekly, or daily basis (four doctoral researchers).

The Leibniz aggregate hides small differences between Leibniz sections as can be seen in Figure 92: While the prevalence of respondents without any negative experiences is well above the 95% threshold in Sections C, D, and E, this number is lower in Section A (93.7%) and Section B (91.5%).

As can be seen in Figure 93, female doctoral researchers have slightly higher odds of going through negative experiences of unwanted sexualized behavior than their male peers. 5% of our female respondents reported occasional experiences, and another 2.7% had that kind of experience at least once during their career at a Leibniz institute. The difference between genders is the only statistically significant explanatory variable in a multivariate analysis. Other factors, such as citizenship, duration of the PhD, or parenthood did not lead to more or less negative experiences.

Witnessing unwanted sexualized behavior from a superior

In addition to experiencing cases of unwanted sexualized behavior oneself, we also asked whether our respondents have witnessed such behavior towards their colleagues and peers. The prevalence of observing unwanted sexualized behavior is slightly higher than the experiences presented in the previous section. Still, 90.7% of the respondents have *never* witnessed any behavior in this respect. This share is lower among female (89%) than among male respondents (92.3%). Around 10% of the women observed this kind of unwanted behavior at least once (4.4%) or occasionally (6.7%). Men were roughly 7% of the respondents; however, those differences are not statistically significant. Moreover, 3 respondents in the entire sample reported to witness unwanted sexualized behavior monthly or even weekly. Witnessing sexual harassment by superiors does not seem to be related to respondents' gender, nor to their affiliation to Leibniz sections (Fig. 92). There is also no statistical correlation to citizenship. Duration of the PhD is the only variable that helps explain a negligible share of witnesses: The longer respondents work on their PhD and at their institute, the more often they may witness unwanted sexualized behavior. This can potentially be explained by the simple fact that a longer time within an organisation increases the likelihood of exposure to positive and negative

¹³In an explanatory note, we stated that "such behavior includes for example: sexist remarks, different treatment because of your gender, unwanted attempts to establish a romantic/sexual relationship, unwanted touching, bad/different treatment for refusing to engage in a romantic/sexual relationship, implication that you would advance faster if you agreed to a romantic/sexual relationship."

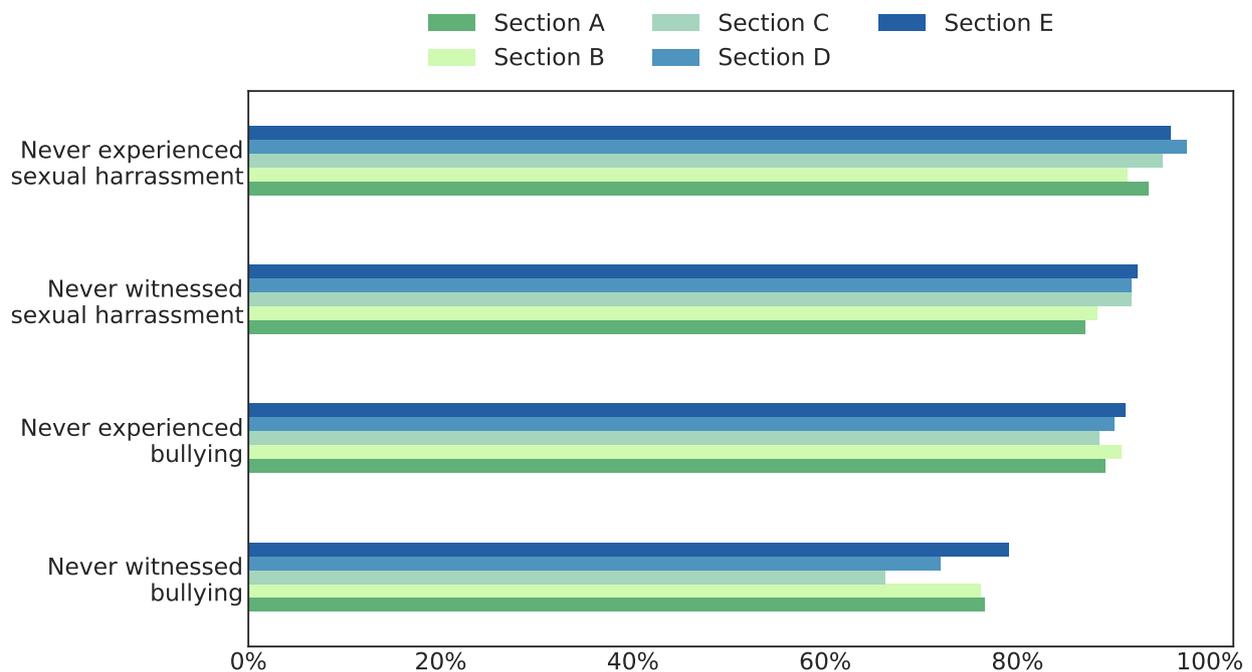


Figure 92: Share of respondents who *never* experienced power abuse by section

experiences. As a robustness check, we also controlled whether the coding of the variable makes a difference: We recoded the variable and grouped all respondents who never witnessed any unwanted behavior in one group (coded as 0) and all witnesses, irrespective of the frequency of experiences, in the other group (coded as 1). This coding did not yield any different results in a multivariate logistic regression.

A cross tabulation of the variables grasping direct and passive experiences of unwanted sexualized behavior shows a little more than 90% of respondents who neither made or witnessed any negative experiences in this respect. 5.5% of all respondents witnessed this behavior directed towards colleagues while they did not make direct negative experiences themselves. A low share of respondents were exposed to unwanted sexualized behavior themselves without seeing it happen to colleagues (0.6%), and the remaining 3.4% of respondents witnessed and experienced this kind of behavior, most of them once or even occasionally.

Summing it up, experiences of unwanted sexualized behavior from a superior sometimes take place at Leibniz institutes, even if those experiences are few. Fortunately, a large majority of doctoral researchers have never had any negative experiences in this respect nor witnessed it taking place. However, it needs to be mentioned that some respondents might have abstained from answering the two highly sensitive questions honestly. Hence, it is possible that there are undetected cases of unwanted sexualized behavior.

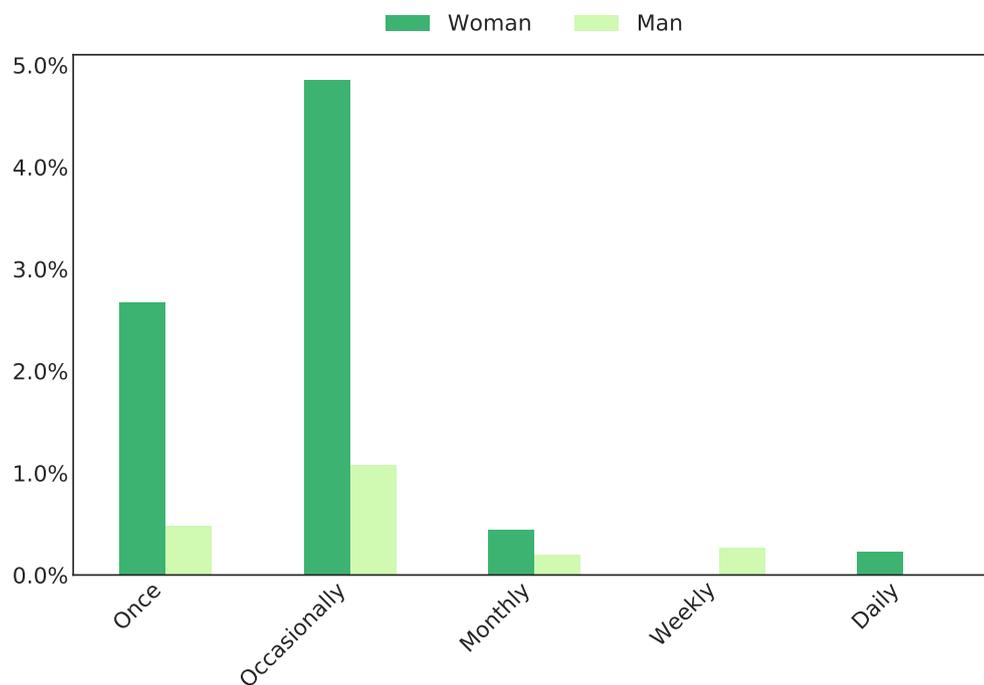


Figure 93: *Frequency of experiences of unwanted sexualized behavior by superiors by respondents' gender (N = 47, "Never" excluded)*

11.4 Being subjected to or witnessing cases of bullying by a superior

Following the question on experiences of unwanted sexualized behavior by a superior, we asked whether respondents have experienced or witnessed cases of bullying by a superior. In an explanatory text, bullying was defined as a "repeated and persistent negative behavior directed towards one or several individuals, which creates a hostile work environment, including gender, cultural or religious discrimination" in the questionnaire.

Subjected to bullying by a superior

A little more than 10% of the respondents reported that they had been subjected to bullying by a superior. 3.8% experienced bullying once, another 5.1% were bullied occasionally. In total, 12 out of 900 respondents said they were subjected to bullying monthly (4 persons), weekly (5 persons) or daily (3 persons).

The differences across Leibniz Sections are negligible for this variable. In all sections, roughly 9-11% experienced bullying by a superior. In a multivariate analysis, we could not find any significant statistical differences regarding those experiences with respect to the respondents' affiliation to Leibniz Sections, their gender, citizenship, or parenthood status. However, even if citizenship did not explain the prevalence of experiences with bullying in a multivariate model, some differences are still obvious in a descriptive analysis. Figure 94 shows the distribution of bullying cases by the respondents' citizenship.

Lastly, the duration of the PhD does play a significant role. More than 90% of the respondents in their first, second,

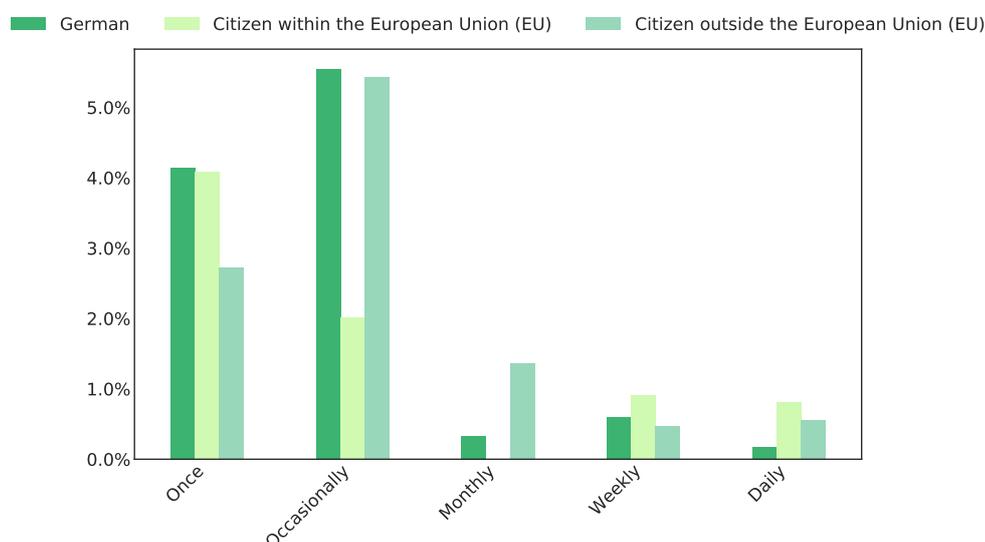


Figure 94: Frequency of being subjected to bullying by superiors by citizenship ($N = 90$, "Never" excluded)

or third year never experienced any bullying at their institute. In the fourth year, this proportion shrinks to 85% and it decreases even further to 78% in the fifth year and following years. 8% of all doctoral researchers in the later phase of their PhD were subjected to bullying once, another 10.6% are occasionally subjected to bullying.

Witnessing bullying by a superior

In contrast to personal experiences with bullying by superiors, witnessing bullying from a superior towards a colleague was much higher. Nearly every third respondent witnessed this kind of behavior (28%). 7.3% of all respondents witnessed it at least once and 18% witnessed it occasionally. Frequent bullying is less prevalent (2.8%), in which respondents observed it at least monthly or more often.

The frequency of witnessing bullying differs slightly across Leibniz Sections. In Section C, 23% of our respondents were witnesses of bullying occasionally, which is the case for 18% in Section D, 15% in Section B, and 13% in Sections A and E. Those differences are not statistically significant in a multivariate regression.

Other correlations seem to be statistically significant in this regard. For instance, female respondents witness bullying more often than male respondents (see Figure 95), whereas non-EU citizens witness bullying less often than Germans. 32.2% of the German respondents witnessed bullying by superiors at least once, while this was the case for 24.6% of the non-German EU citizens and 18% of the non-EU citizens.¹⁴ Again, the changes of witnessing cases of bullying increases along with PhD duration. The longer doctoral researchers work at their institute, the more likely it is that they witness this kind of behavior at least once. This is the case for nearly every second respondent in their fifth or later year (41.5%).

Again, we have a look at the overlap in terms of direct and indirect experiences of bullying. 71% of our respondents never experienced and witnessed bullying at their institutes. 18.7% reported to have witnessed bullying without being the target of this behavior themselves, and 1.3% had negative experiences themselves without witnessing it directed against their colleagues. The remaining group (7.5%) experienced and witnessed bullying at their institute, most of them occasionally and very few at a monthly level or more often.

¹⁴The difference between German respondents and non-German EU citizens is not statistically significant.

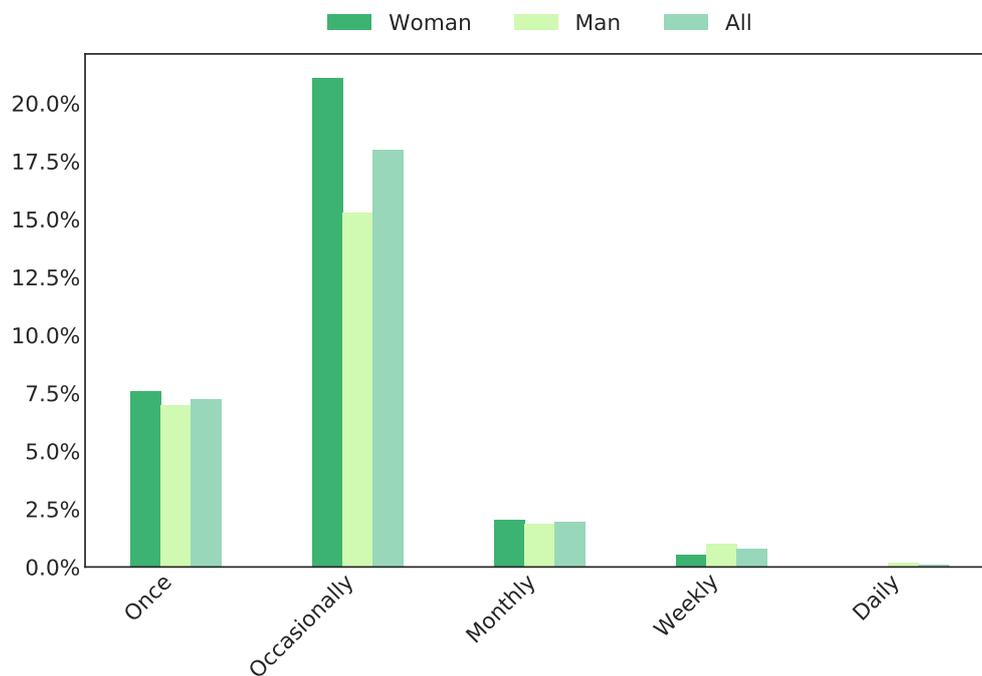


Figure 95: *Frequency of witnessing bullying by superiors by gender (N = 243, "Never" excluded)*

11.5 The impact of power abuse

This subsection briefly deals with the question whether direct or indirect experiences of unwanted sexualized behavior and bullying has any impact on topics like satisfaction with the PhD supervision, thoughts about quitting the PhD, and mental health of respondents.

Looking at the satisfaction of respondents with the work environment and atmosphere at their institute, all indirect and direct experiences with unwanted sexualized behavior and bullying have a significant negative impact, even when controlling for other explanatory variables like gender, citizenship, or duration of PhD. As seen in Figure 96, respondents who were subjected to bullying at their institute are more often (very) dissatisfied with the the work environment compared to other respondents. 41% of those respondents are satisfied or very satisfied with the atmosphere, while this is the case for nearly 80% of those respondents who did not make any negative experiences at their institute. The impact of direct experiences of bullying on the satisfaction with PhD supervision looks similar.¹⁵

Thoughts about quitting the PhD are also influenced by power abuse. Direct experiences of unwanted sexualized behavior, as well as direct and indirect experiences of bullying all increase the likelihood of thoughts about quitting the PhD. Only witnessing unwanted sexualized behavior directed towards peers does not have a significant impact in a multivariate analysis.

It is worthwhile to further examine those 16.4% of respondents who had a conflict with a superior at their institute. Having a conflict with a superior also increases the frequency of thoughts about quitting the PhD (see Figure 97). Nearly 50% of those respondents without a conflict never thought about quitting the PhD, while this is only the case for 16% of respondents with an unreported conflict and for 19% of respondents with a reported conflict. Figure 97 shows empirical evidence that it is very beneficial to report a conflict if it took place. Within the group of respondents

¹⁵Results not shown here

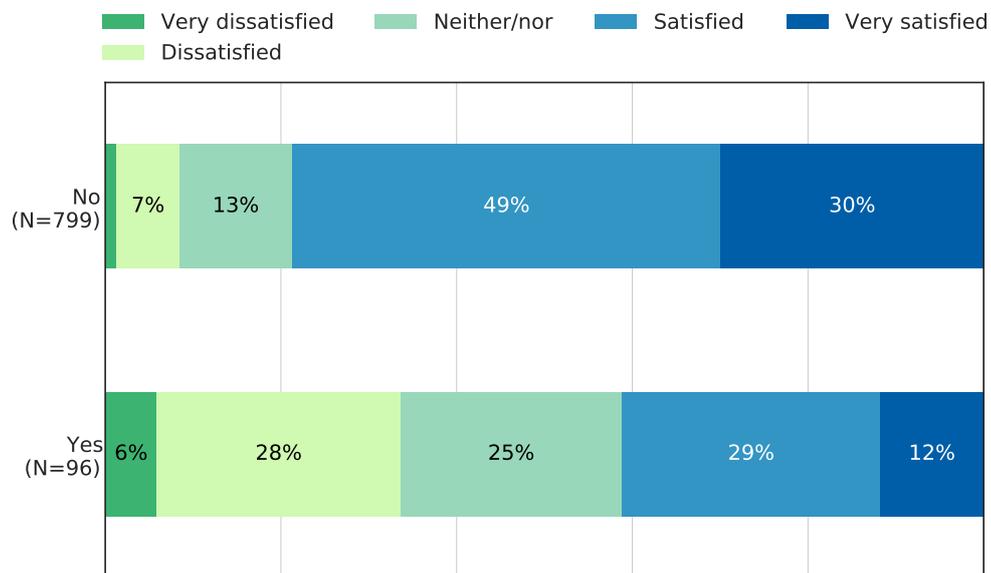


Figure 96: Satisfaction with work environment and atmosphere by whether respondents were subjected to bullying at their institute

with a conflict, those respondent who reported the conflict think less often about terminating their PhD than other respondents. Similarly, reporting a conflict also increases the satisfaction with the PhD supervision and the work environment compared to keeping the conflict unreported. The positive impact of a report for all three dependent variables also holds when controlling for other explanatory variables.

The mental health of respondents is another topic that could potentially be influenced by direct or indirect experiences of power abuse. We only consider the trait anxiety here.

Indeed, the same pattern for conflicts can be observed when considering respondents' anxiety. Having a conflict with a superior increases anxiety compared to those respondents not having any conflict. There is some statistical evidence that reporting the conflict helps to lower anxiety on average: While half of the respondents with a reported conflict show high levels of anxiety, this proportion is higher within the group of respondents suffering from an unreported conflict (see Figure 98).

Direct or indirect experiences of unwanted sexualized behavior did *not* have any significant statistical impact on the level of trait anxiety. A different observation can be made for direct and indirect experiences of bullying. Figure 99 shows a comparison of respondents who did not have any direct negative experiences with bullying compared to respondents who were bullied by superiors. Bullying exerts a negative impact on the mental health of respondents. More than 85% within the group of respondents who were subjected to bullying achieved moderate or even high levels of anxiety, a number much higher than in the remaining group of respondents (59%).

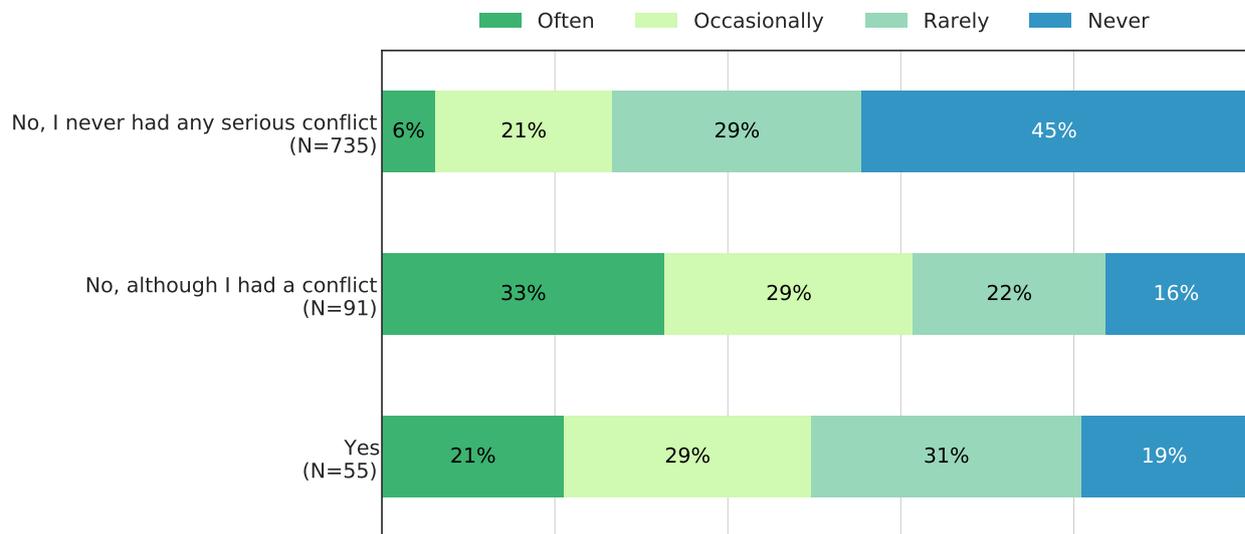


Figure 97: Thoughts about quitting the PhD by "Did you ever report a conflict with a superior?"

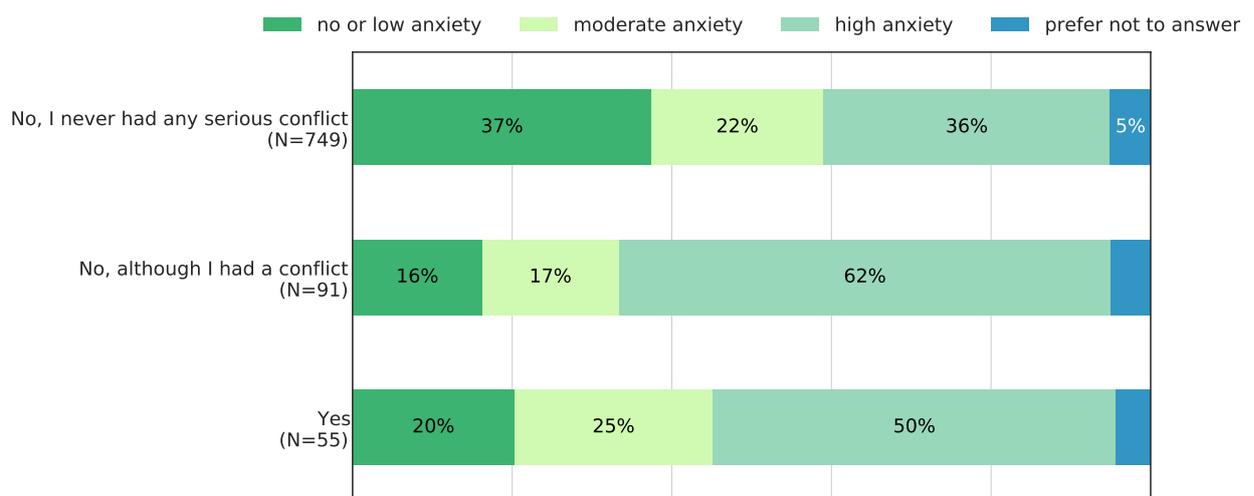


Figure 98: Level of trait anxiety by whether respondents had a conflict and whether they reported it

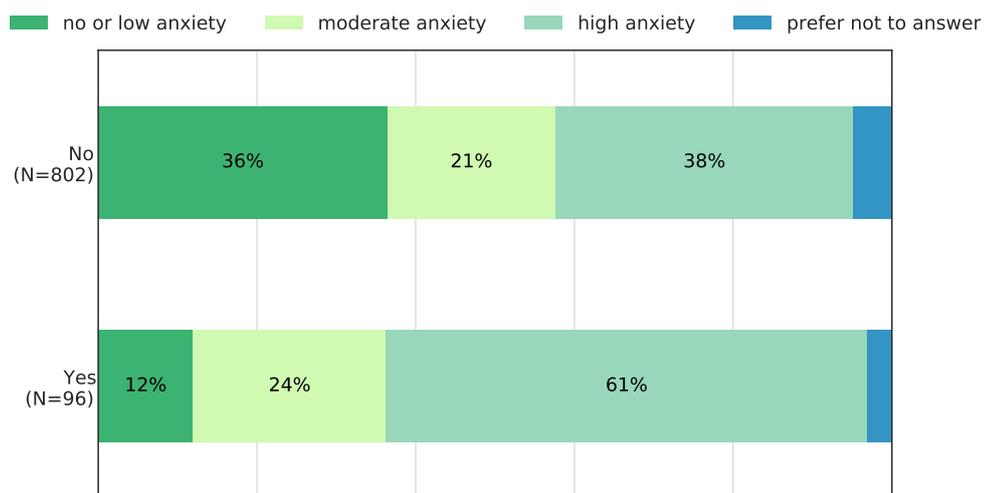


Figure 99: Level of trait anxiety by whether respondents were subjected to bullying at their institute

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12 Appendix

12.1 Methodological Summary

The following section provides a brief summary of the methodological background of the 2019 Leibniz PhD Survey. The target population of this survey are all doctoral researchers in the Leibniz Association who were employed during the period of fieldwork at Leibniz Institutes and Research Museums between late September 2019 and early December 2019.

The questionnaire for the Leibniz PhD Survey was developed by the Survey Working Groups of the Leibniz PhD Network, Max Planck Phdnet, and Helmholtz Juniors. Those three PhD networks are united as *N² - The Network of Networks*. The Survey Working Groups took previous questionnaires by the Leibniz PhD Network, the Max Planck Phdnet, and Helmholtz Juniors as starting points discussed adaptations, additions and deletions within an overarching survey working group. External experts in the Head Offices of the three non-university research organisations, experts working at the *German Centre for Higher Education Research and Science Studies* (DZHW), and experts working at *GESIS - Leibniz Institute for the Social Sciences* were consulted in the process of questionnaire design.

The full questionnaire is attached to this report in the Appendix. The language of the questionnaire is English.

Like in the previous Leibniz PhD Survey in 2017, it is important to note that the survey is *not* the product of a probability-based random sample of doctoral researchers at Leibniz Institutes. For such a survey design, we would have needed a comprehensive and up-to-date list of all doctoral researchers at every single Leibniz Institute. This kind of sampling frame is currently not available. In September 2019, the Leibniz Association counted approximately 3,000 doctoral researchers and we encouraged all those doctoral researchers to take part in our survey.

Fieldwork

A non-personalized link to access the questionnaire was distributed among doctoral researchers in the Leibniz Association from September 30, 2019 onward. We sent the invitation e-mail to PhD representatives in all Leibniz Institutes, to the Leibniz works councils, and further contact persons at Leibniz Institutes. In the period of fieldwork, two reminders were sent via the above-mentioned channels to the doctoral researchers.

Data Processing and Weighting

Following the data collection, members of the Leibniz PhD Network Survey Working Group checked and processed the data. Two members of the Working Group coded the replies given to open answers in the survey; those replies were integrated into existing variables or were used to generate new variables.

After processing the data, we decided to use the official numbers of the section affiliations and respective gender distributions shown in Table 2 to compile simple post-stratification population weights. Weighting the sample with the best data available helps us to improve the representativeness of our data, especially if we draw conclusions at the aggregate level of the Leibniz Association. Depending on the section affiliation and gender, every group of respondents received a specific weight to reproduce the cell percentages shown in Table 2 in the aggregate. We calculated 10 different weights for every possible combination of the two variables. In total, the size of our weights ranges between 0.5 to 1.4.¹⁶

¹⁶For instance, female doctoral researchers from Section C added up to 19.1% in our unweighted sample. Since this group was slightly over-represented in the sample, every respondent from this group was weighted with a factor of 0.97. By contrast, male doctoral researchers from Section D were under-represented in our unweighted survey sample (18.9% instead of 20.8%). Respondents from this group received a weight larger than 1.0 as a consequence (1.10).

Table 2: *Number of doctoral researchers employed at Leibniz Institutes and their gender according to the 2018 Leibniz data retrieval (as of December 31)*

	Women		Men		Total N
	N	(%)	N	(%)	
Section A	200	(7.1)	111	(3.9)	311
Section B	243	(8.6)	245	(8.7)	488
Section C	523	(18.6)	401	(14.3)	924
Section D	235	(8.4)	586	(20.8)	821
Section E	119	(4.2)	152	(5.4)	271
Leibniz Association	1320	(46.9)	1495	(53.1)	2815

Course of analysis

The authors responsible for working on the various chapters of this report used various methods during the analysis. The first step consisted in producing graphs or tables for single variables (e.g., pie charts). As second step, cross tabulation or bivariate analysis was used. For instance, the type of payment was cross-tabulated with gender, or the affiliation to Leibniz sections. Many graphs in this report are the result of this kind of bivariate descriptive analysis. As the third step, variables were analyzed with multivariate analysis, usually logistic regression (if the dependent variable was coded as 0 or 1) or OLS regression (if the dependent variable was metric or quasi-metric).

Multivariate analyses help to establish whether a theoretical relation of two variables can be found statistically in the data or whether it is in fact not existent or driven by additional variables. Dependent variables like type of payment, satisfaction with PhD supervision, or reasons to think about quitting the PhD are analyzed with a set of explanatory variables, usually affiliation to Leibniz sections, gender, duration of the PhD, citizenship, type of payment (stipends and contracts), and parenthood. Additional explanatory variables are sometimes added if they are expected to have a statistical impact on the dependent variables. In this report, we do not report the outputs of those multivariate analyses, but try to be as clear as possible about significant or non-significant results in the text when presenting results. The statistical significance was determined by relying on the p-values ($p < 0.05$). This procedure helps us to avoid conclusions about the relation of two variables when in fact other variables are driving those relations.

Respondents had always the chance to express that they do not know an answer to a question or that they do not prefer to answer a question. Those missing values are reported in this report (in the text as well as in graphs) whenever they add substantive information to an interpretation. For instance, it is important to report if respondents say that they do not know whether certain career support measures are available at their institute.

Description of mental health variables

The short form of the Spielberger State-Trait Anxiety Inventory (STAI) was used to assess state and trait anxiety [8]. For state anxiety, six out of twenty questions were derived from the STAI. They were used to measure the current level anxiety on a 4-point Likert Scale with the additional answer option ‘I don’t want to answer this question’. For each

question, the answer was converted to points (1: Not at all, 2: Somewhat, 3: Moderately, 4: Very much). Three out of six questions needed to be reversely coded. Since some questions were omitted from the original STAI, ascertained points needed to be weighted in alignment with the lower number of questions. The points for all questions were summed up and yielded a score, that was used to assign respondents to categories with different levels of anxiety:

- high anxiety (45-80 points),
- moderate anxiety (38-44 points),
- and no or low anxiety (0-37 points)

Respectively, we proceeded similarly for trait anxiety to assess the general level of anxiety. Specific adjustments were applied to the calculation of the weighted points since eight out of twenty questions were derived from the STAI, as well as five out of those eight items needed to be reversely coded.

For depressive symptoms, derived from the Patient Health Questionnaire module (PHQ-9) [5]. The PHQ-9 refers to the last 2 weeks and is used to briefly screen and measure current depressive symptoms in clinical and epidemiological studies and in health surveys. Yet, the prevalence of depressive symptoms cannot be treated as equivalent to a diagnosis of a major depressive disorder. In our survey, eight out of nine questions were used to measure the presence and severity of depression symptoms on a 4-point Likert Scale with the additional answer option ‘I don’t want to answer this question’. For each question, the answer was converted to points (0: Not at all, 1: Several days, 2: More than half the days, 3: Nearly every day). Since one question was omitted from the original PHQ-9, the maximum number of points was adjusted from 27 points to 24. The points for all questions were summed up and yielded a score, that was used to assign respondents to categories with different levels of depressive symptoms: severe depression (20-24 points), moderately severe depression (15-19 points), moderate depression (10-14 points), mild depression (5-9 points) and no to minimal depression (0-4 points).

For all three constructs, the additional answer option ‘I don’t want to answer this question.’ was assigned to the category ‘Prefer not to answer’ together with respondents, who had at least one missing value in one of the questions.

An individual’s mental health is influenced by many different factors, leading to spurious associations if not appropriately accounted for. Yet, we did not intend to capture all of those factors in our survey because our main goal was to derive initial results that picture the current mental health situation of doctoral researchers. Since most of the analyses were of descriptive nature, composed of correlation analyses and it cannot be ruled out that the prevalence was affected by a general awareness regarding mental health problems, these results have to be interpreted with caution. Nevertheless, they provide a relevant first impression on the current mental health status of doctoral researchers across Leibniz institutes, allowing targeted interventions and guiding structural changes to improve the conditions that promote mental health among doctoral researchers.

Description of the social support variable

The Oslo 3 Social Support Scale (OSSS-3) is a brief and economic instrument that consists of three items assessing the level of social support [2] and has been recommended for epidemiological and population-based surveys [4]. It consists of three items asking for the number of close confidants, the sense of concern from other people, and the relationship with neighbors (for our purposes: colleagues) with a focus on the accessibility of practical help. In our survey, the OSSS-3 consists of a continuous score that ranges from 3 to 14 with high values representing strong and low values poor levels of social support. Three categories can be operationalized: poor social support (3-8 points), moderate social support (9–11 points) and strong social support (12–14 points).

12.2 Report on qualitative data in the Mental Health section

About half of the 43 respondents that took the time to elaborate on their personal situation report having experienced mental health issues during their PhD. These range from stress, social anxiety and diagnosed clinical depression. In addition, some respondents noted feeling exhausted at work for various reasons, such as adjusting to life with a new-born or experiencing jet lag due to overseas research and conferences.

Of the 20 respondents that report mental health issues, at least 9 are currently receiving some form of counselling such as psychotherapy, and find this helpful. Several respondents underscored the need for accessible mental health support for young researchers, and safe spaces to confidentially address problems at work. While many respondents relate their mental health issues to non-work causes, such as problems in the relational sphere, social isolation or coming to terms with medical diagnoses, it does seem that a unsatisfactory work environment can make matters worse. About a quarter of the respondents that experience mental health issues are seriously considering quitting their PhD.

In particular, problems with leadership - lack of structure, security and support - were explicitly mentioned by 9 respondents as causing increased feelings stress and anxiety. Half of these respondents describe a working culture in which it is not encouraged to take up vacation days, or in which the workload is so high that the respondents don't allow themselves to take time off. For some, this had led to medical and psychological issues. On the other hand, it is seen as helpful when supervisors openly encourage their PhDs to take time-off when needed.

Publication pressure, especially compounding deadlines, is explicitly mentioned by 7 respondents as contributing factors to feelings of stress and anxiety. The same number of respondents report feeling insecure about their own ability to deliver high-quality scientific contributions, and experiencing self-doubt about being able to complete their PhDs in time, or at all. These insecurities are particularly strong for respondents who say they lack frequent and constructive feedback from their supervisors.

Finally, uncertain career perspectives and potential financial instability in the future are further causes of frustration and worry for junior researchers. At the same time, the perceived and self-ascribed pressure to complete their PhDs leads some respondents to feel trapped in their situation, even if they are experiencing trouble in the workplace or are unsure about whether they wish to stay in academia.

12.3 Additional Tables and Graphs

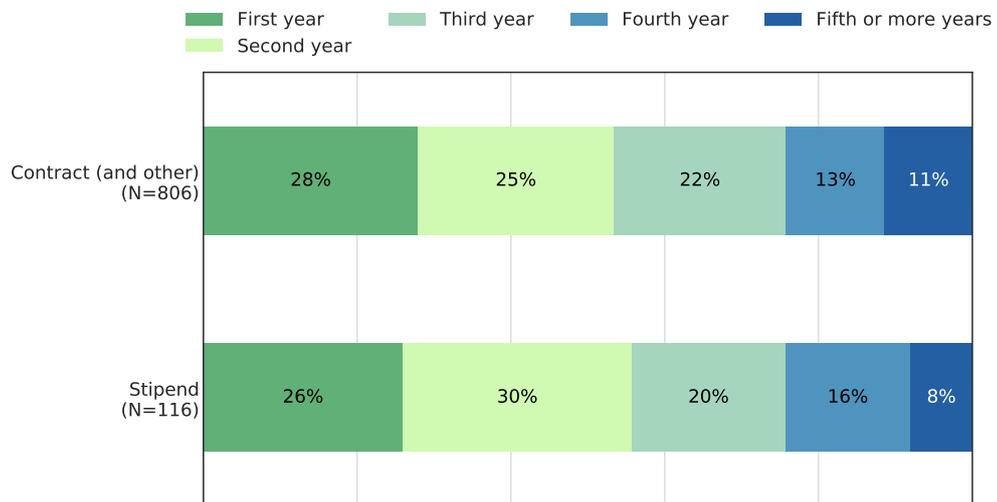


Figure 100: Respondents' year of PhD by type of payment

Chapter Mental Health

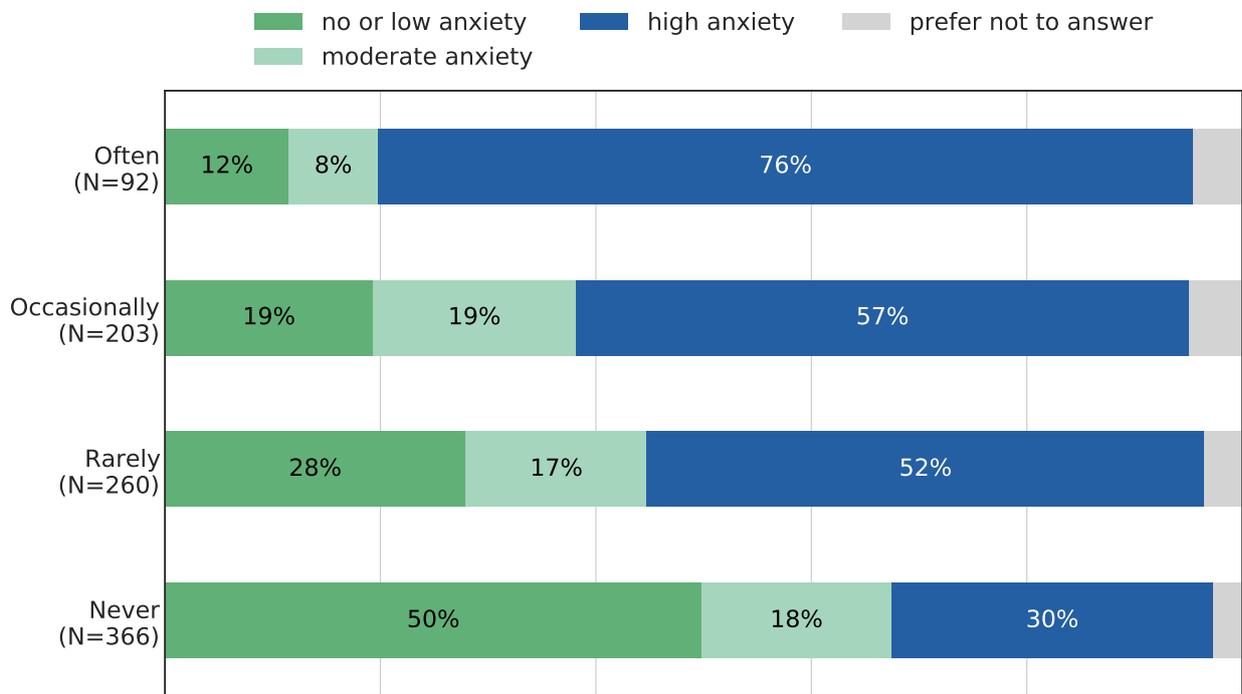


Figure 101: Levels of state anxiety in relation to thinking of quitting the PhD

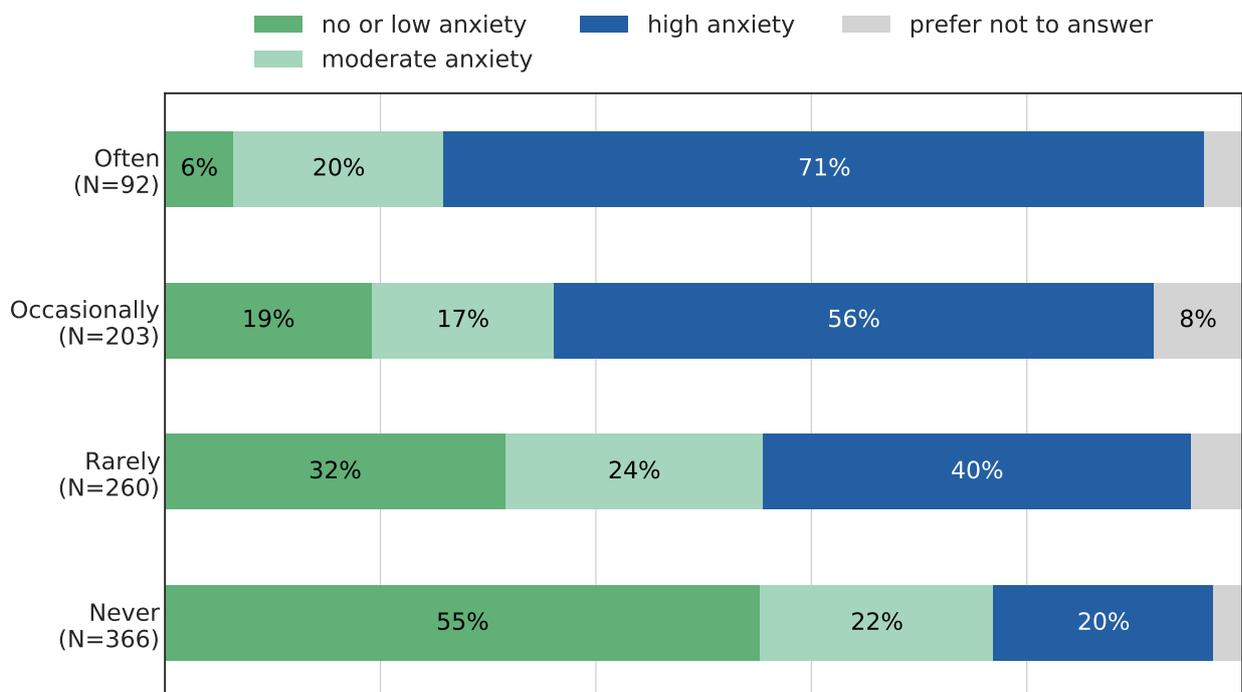


Figure 102: Levels of trait anxiety in relation to thinking of quitting the PhD

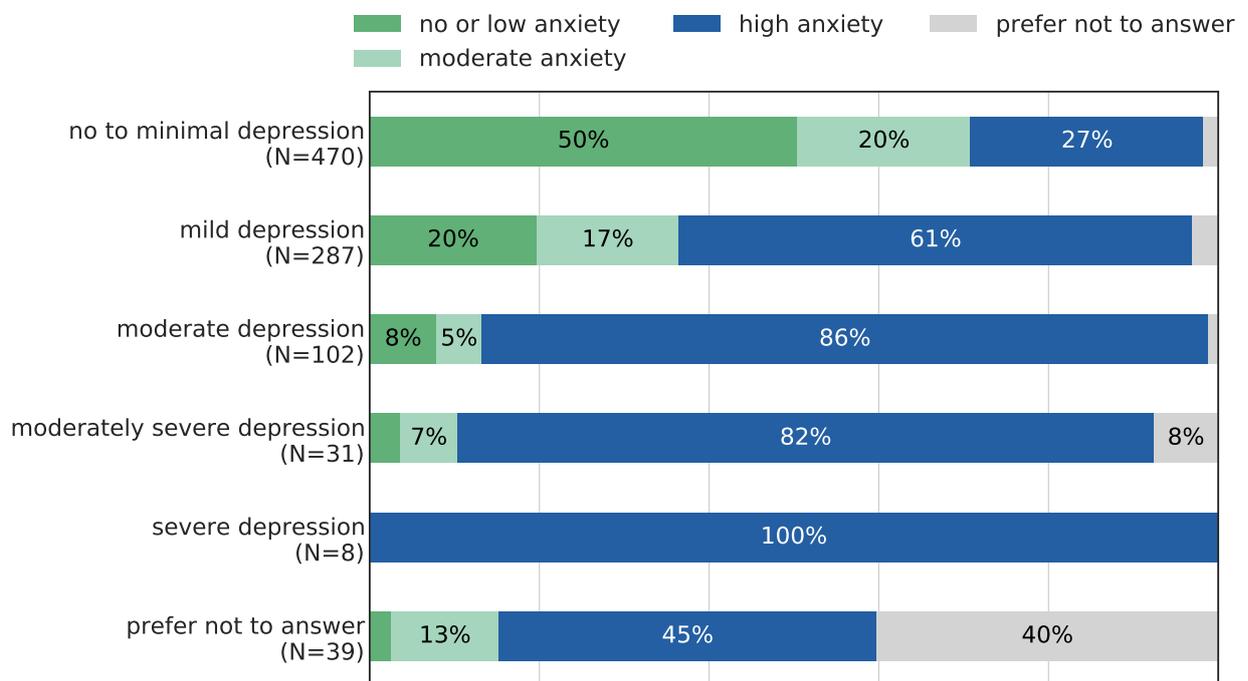


Figure 103: Correlation between depressive symptoms and state anxiety

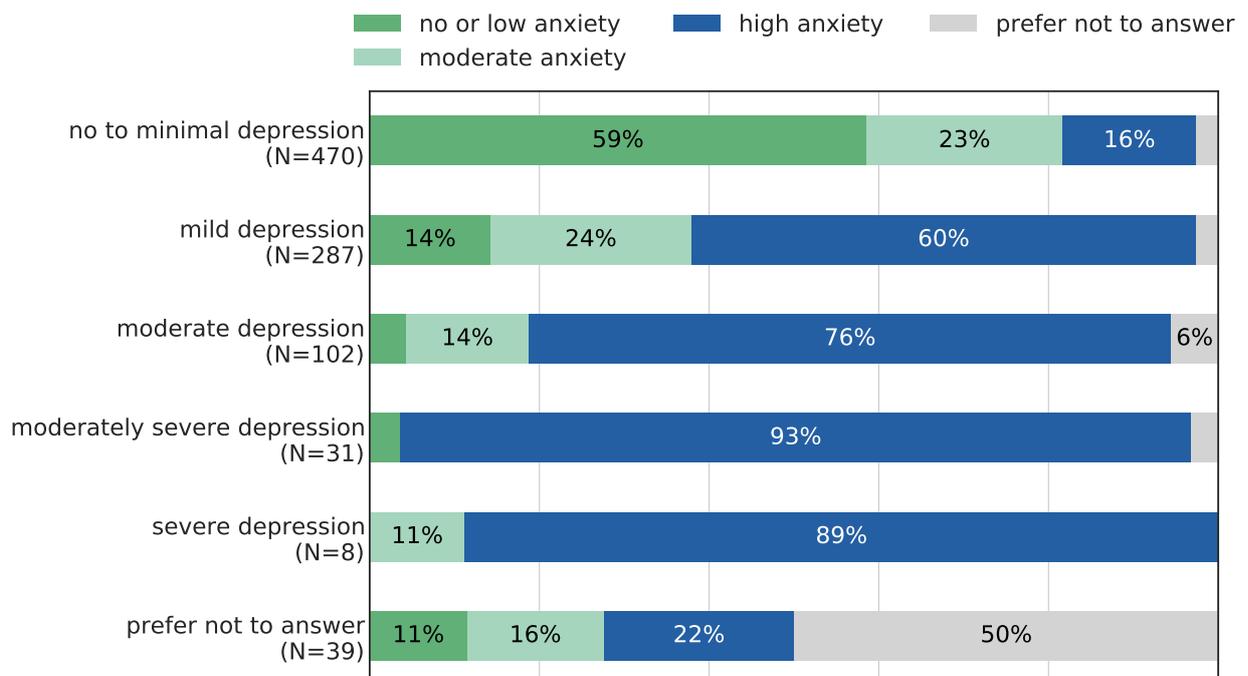


Figure 104: Correlation between depressive symptoms and trait anxiety

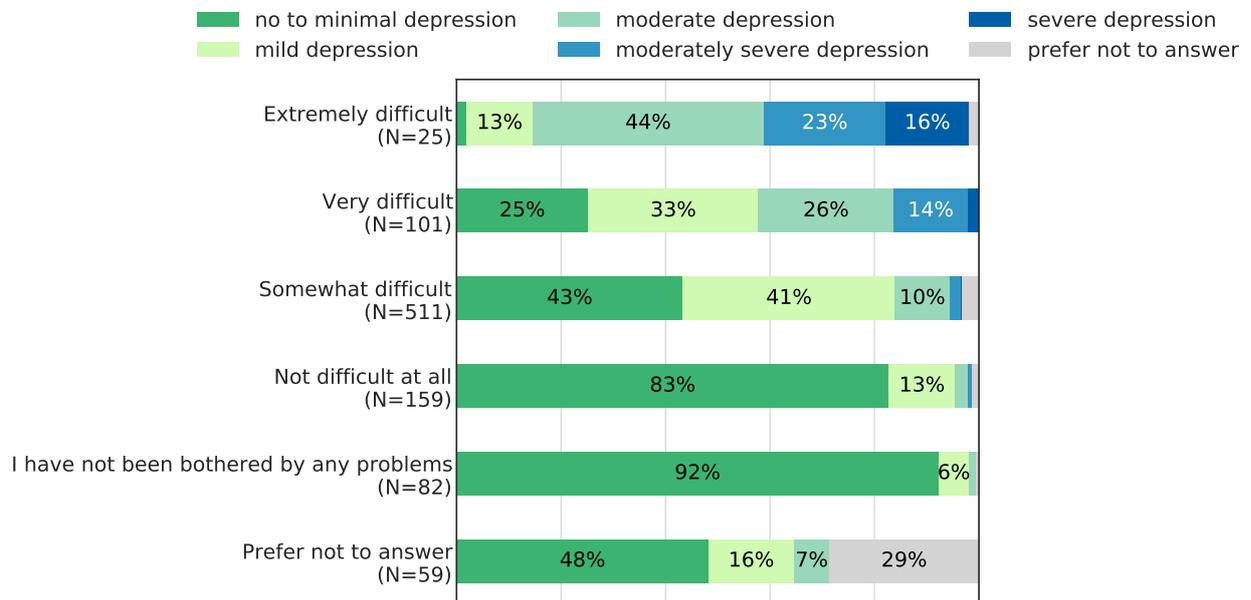


Figure 105: Depressive symptoms in relation to problems causing difficulties at work

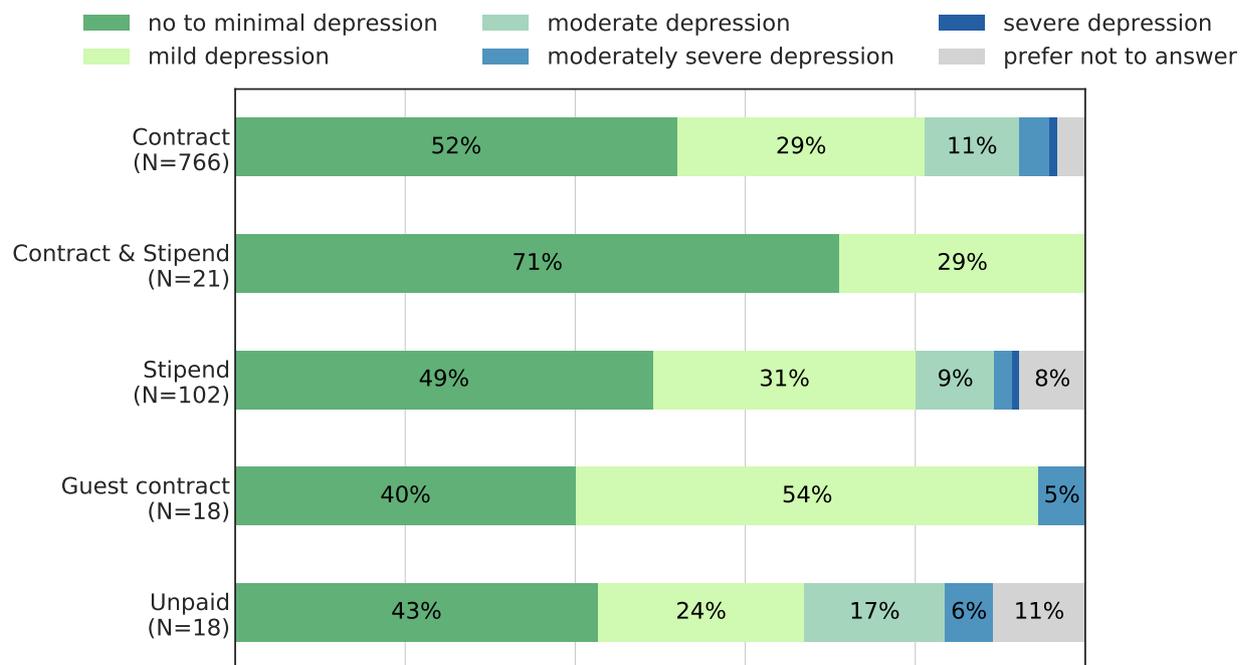


Figure 106: Depressive symptoms in relation to payment types

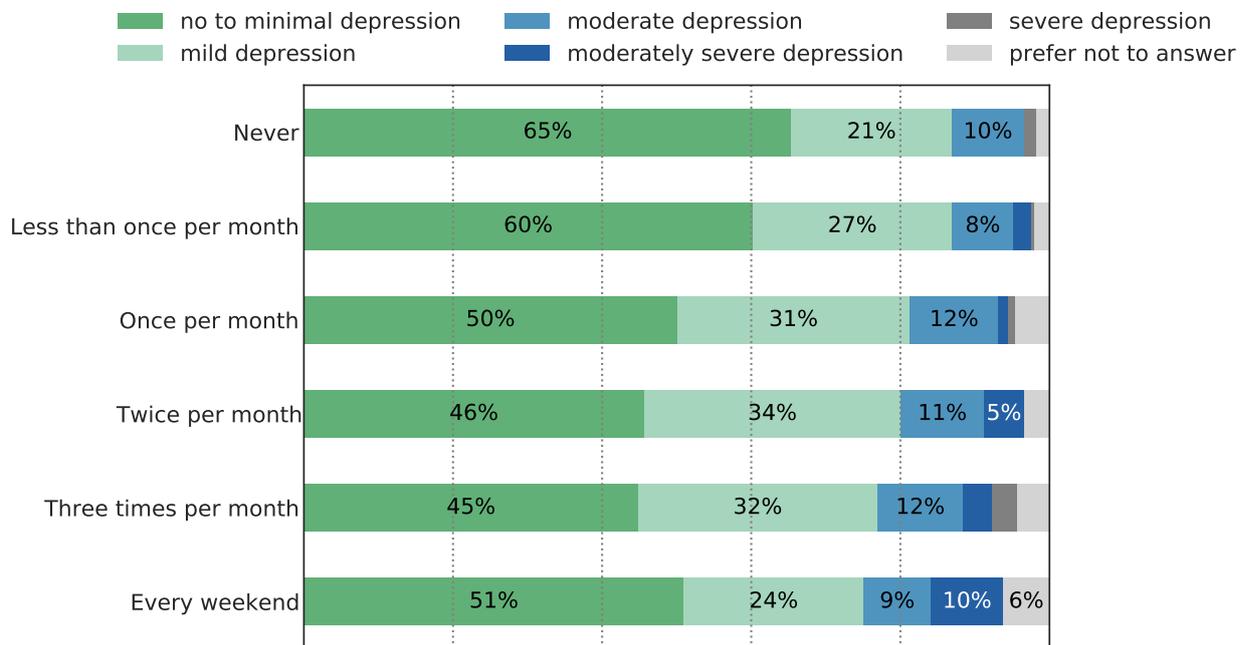


Figure 107: Depressive symptoms in relation to working at weekends and during vacations

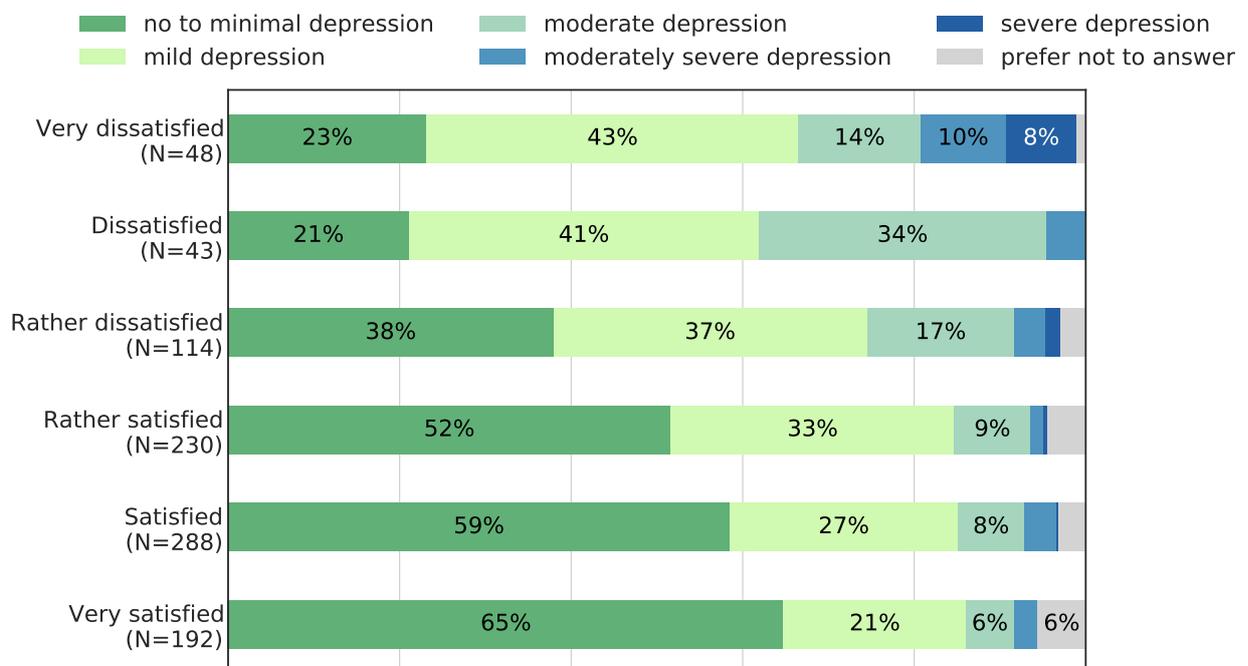


Figure 108: Depressive symptoms with respect to the doctoral researcher's satisfaction with their PhD supervision

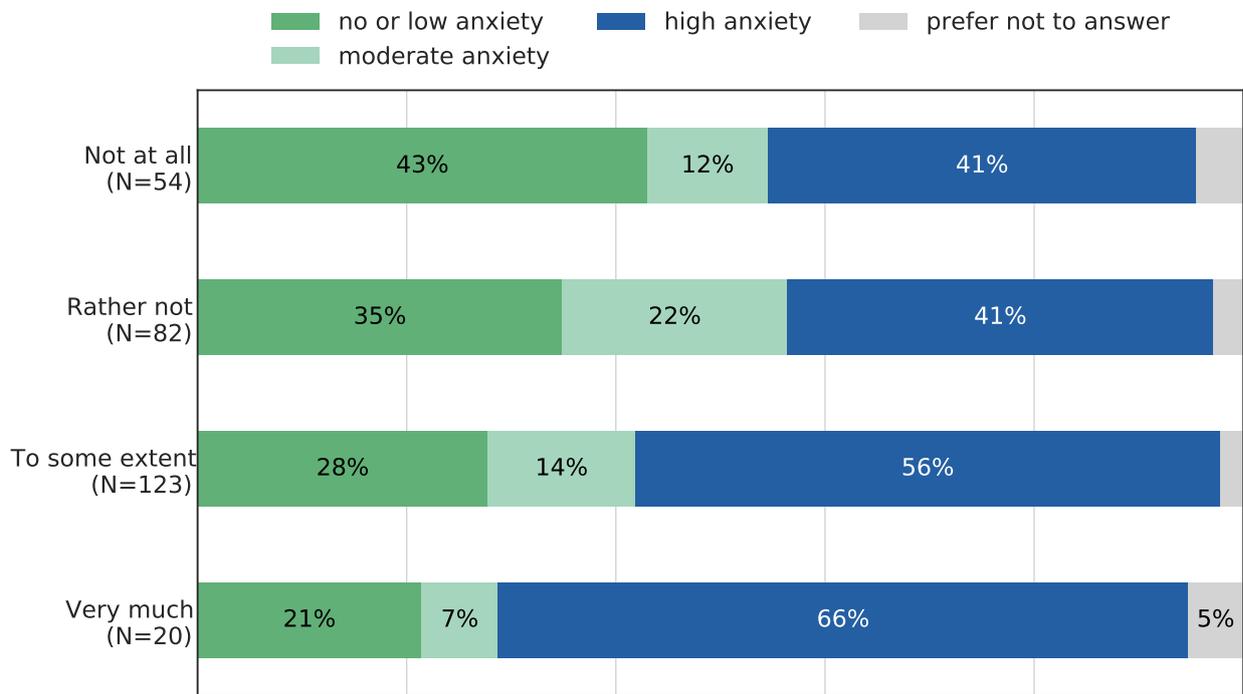


Figure 109: Levels of state anxiety in relation to language barriers

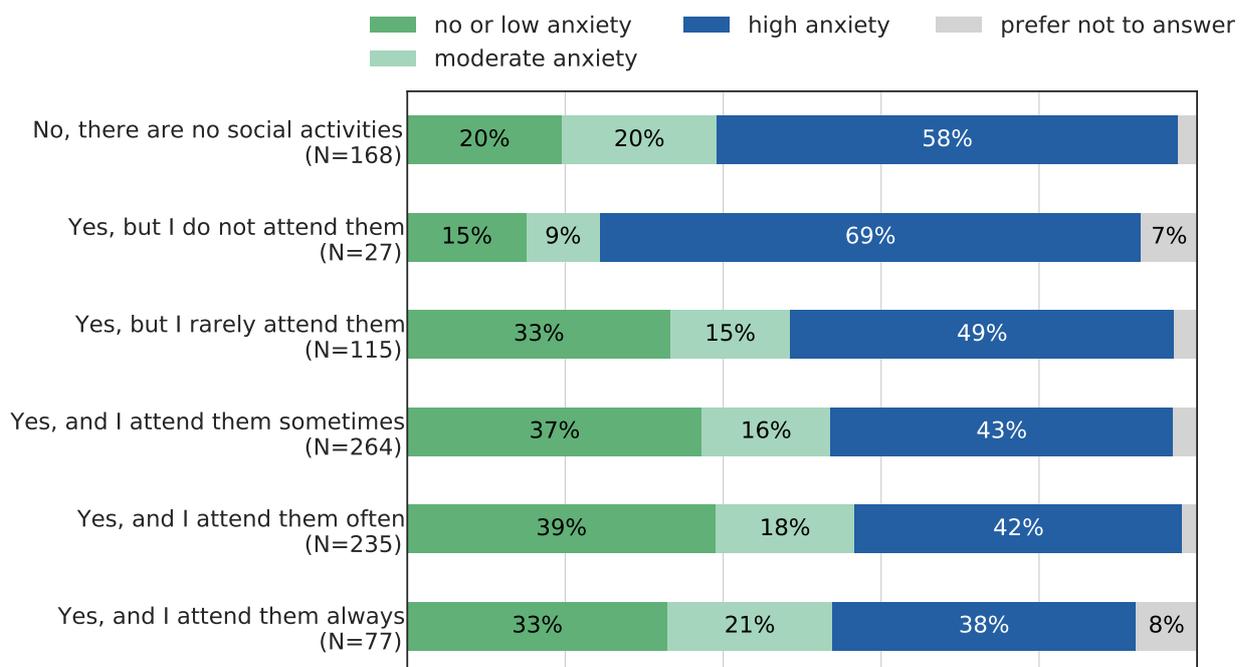


Figure 110: Levels of state anxiety in relation to offered social activities

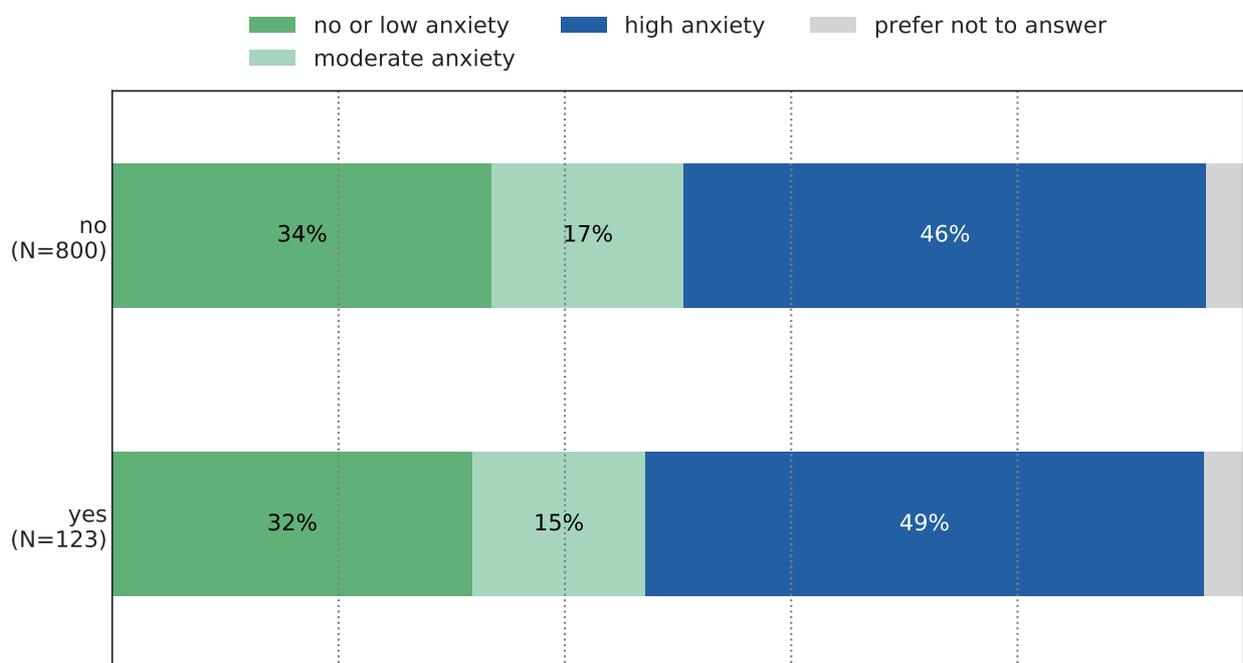


Figure 111: Levels of state anxiety in relation to having children

12.4 Questionnaire of the 2019 Leibniz PhD Survey



Welcome to the Leibniz PhD Survey 2019,

and thank you for participating! This is a voluntary survey for all doctoral researchers working within the Leibniz Association. It was developed by the Leibniz PhD Network in joint work with the networks of the Helmholtz Association, IPP Mainz, and Max Planck Society combined in the platform of the 'Network of Networks' called N2.

The aim of this survey is to provide a clear picture of the current payment and working conditions, the quality of the supervision and scientific practice, and the family plans of doctoral researchers of the main non-university institutes in Germany.

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

The data you are providing is evaluated only in aggregated and anonymized form and complies with the General Data Protection Regulation (GDPR). It is not possible to identify you at any moment, as long as you refrain from providing personal data in the comment sections.

The data will be accessible to the members of the Leibniz PhD Survey Working Group only. Aggregated and anonymized data will be shared with the administrative bodies of the Leibniz Association and the public in the form of reports. Moreover, PhD representatives can request an aggregate analysis for their Leibniz Institute as long as your anonymity is guaranteed and data security laws are followed.

The survey is anonymous, the record of your survey responses does not contain any identifying information about you. The survey uses a unique token system tied to your E-mail. Please rest assured that this token will not be stored together with your responses. There is no way of matching identification tokens with survey responses. Moreover, if you decide to stop your participation in the middle of the survey, collected data can be deleted.

In order for the survey to be representative, it is vital that the majority of doctoral researchers participate. The questionnaire will take between 20 and 30 minutes to complete.

If you have any questions, or wish to report technical issues, you can reach us at survey@leibniz-phd.net.

By clicking 'Next', you accept the terms and conditions listed above, including the use



Section A: Demographics

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

Section 1/10

A1. Which Leibniz Institute or Leibniz Research Museum are you associated with?

Please note, the affiliation to institutes only serves as a control for the representivity of our sample. We will not publish any analyses on the level of Leibniz Institutes but aggregate the institutes into the 5 Leibniz Sections. If you still do not want to answer this question, please chose "I don't want to answer".

- Akademie für Raumforschung und Landesplanung - Leibniz-Forum für Raumwissenschaften (ARL)
- Bernhard-Nocht-Institut für Tropenmedizin (BNITM)
- Deutsches Bergbau-Museum Bochum - Leibniz-Forschungsmuseum für Georessourcen (DBM)
- Deutsches Diabetes-Zentrum - Leibniz-Zentrum für Diabetes-Forschung (DDZ)
- Deutsches Institut für Ernährungsforschung Potsdam-Rehbrücke (DIFE)
- Deutsches Institut für Erwachsenenbildung - Leibniz-Zentrum für Lebenslanges Lernen (DIE)
- Deutsches Museum (DM)
- Deutsches Primatenzentrum - Leibniz-Institut für Primatenforschung (DPZ)
- Deutsches Rheuma-Forschungszentrum Berlin (DRFZ)
- Deutsches Schifffahrtsmuseum - Leibniz-Institut für Maritime Geschichte (DSM)
- DIPF | Leibniz-Institut für Bildungsforschung und Bildungsinformation (DIPF)
- DIW Berlin - Deutsches Institut für Wirtschaftsforschung (DIW)
- DWI - Leibniz-Institut für Interaktive Materialien (DWI)
- Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH)
- FIZ Karlsruhe - Leibniz-Institut für Informationsinfrastruktur (FIZ KA)
- Forschungszentrum Borstel - Leibniz Lungenzentrum (FZB)
- Georg-Eckert-Institut - Leibniz-Institut für internationale Schulbuchforschung (GEI)
- Germanisches Nationalmuseum - Leibniz-Forschungsmuseum für Kulturgeschichte (GNM)
- GESIS - Leibniz-Institut für Sozialwissenschaften (GESIS)
- GIGA German Institute of Global and Area Studies (GIGA)
- Heinrich-Pette-Institut - Leibniz-Institut für Experimentelle Virologie (HPI)
- Herder-Institut für historische Ostmitteleuropaforschung - Institut der Leibniz-Gemeinschaft (HI)





ifo Institut - Leibniz-Institut für Wirtschaftsforschung an der Universität München e. V. (ifo)	<input type="checkbox"/>
INM - Leibniz-Institut für Neue Materialien (INM)	<input type="checkbox"/>
Institut für Weltwirtschaft (IfW)	<input type="checkbox"/>
Institut für Zeitgeschichte München - Berlin (IfZ)	<input type="checkbox"/>
IUF - Leibniz-Institut für umweltmedizinische Forschung (IUF)	<input type="checkbox"/>
Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP)	<input type="checkbox"/>
Leibniz-Institut DSMZ-Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH (DSMZ)	<input type="checkbox"/>
Leibniz-Institut für Agrarentwicklung in Transformationsökonomien (IAMO)	<input type="checkbox"/>
Leibniz-Institut für Agrartechnik und Bioökonomie (ATB)	<input type="checkbox"/>
Leibniz-Institut für Alternsforschung - Fritz-Lipmann-Institut (FLI)	<input type="checkbox"/>
Leibniz-Institut für Analytische Wissenschaften - ISAS - e.V. (ISAS)	<input type="checkbox"/>
Leibniz-Institut für Angewandte Geophysik (LIAG)	<input type="checkbox"/>
Leibniz-Institut für Arbeitsforschung an der TU Dortmund (IfADo)	<input type="checkbox"/>
Leibniz-Institut für Astrophysik Potsdam (AIP)	<input type="checkbox"/>
Leibniz-Institut für Atmosphärenphysik an der Universität Rostock (IAP)	<input type="checkbox"/>
Leibniz-Institut für Bildungsverläufe e.V. (LifBi)	<input type="checkbox"/>
Leibniz-Institut für Deutsche Sprache (IDS)	<input type="checkbox"/>
Leibniz-Institut für die Pädagogik der Naturwissenschaften und Mathematik (IPN)	<input type="checkbox"/>
Leibniz-Institut für Europäische Geschichte Mainz (IEG)	<input type="checkbox"/>
Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden (IFW)	<input type="checkbox"/>
Leibniz-Institut für Gemüse- und Zierpflanzenbau (IGZ)	<input type="checkbox"/>
Leibniz-Institut für Geschichte und Kultur des östlichen Europa (GWZO)	<input type="checkbox"/>
Leibniz-Institut für Gewässerökologie und Binnenfischerei (IGB)	<input type="checkbox"/>
Leibniz-Institut für innovative Mikroelektronik (IHP)	<input type="checkbox"/>
Leibniz-Institut für jüdische Geschichte und Kultur - Simon Dubnow (DI)	<input type="checkbox"/>
Leibniz-Institut für Katalyse e. V. an der Universität Rostock (LIKAT)	<input type="checkbox"/>
Leibniz-Institut für Kristallzüchtung (IKZ)	<input type="checkbox"/>
Leibniz-Institut für Länderkunde (IfL)	<input type="checkbox"/>
Leibniz-Institut für Lebensmittel-Systembiologie (LSB)	<input type="checkbox"/>





- Leibniz-Institut für Medienforschung | Hans-Bredow-Institut (HBI)
- Leibniz-Institut für Naturstoff-Forschung und Infektionsbiologie - Hans-Knöll-Institut (HKI)
- Leibniz-Institut für Neurobiologie (LIN)
- Leibniz-Institut für Nutztierbiologie (FBN)
- Leibniz-Institut für Oberflächenmodifizierung (IOM)
- Leibniz-Institut für ökologische Raumentwicklung (IÖR)
- Leibniz-Institut für Ost- und Südosteuropaforschung (IOS)
- Leibniz-Institut für Ostseeforschung Warnemünde (IOW)
- Leibniz-Institut für Pflanzenbiochemie (IPB)
- Leibniz-Institut für Pflanzengenetik und Kulturpflanzenforschung (IPK)
- Leibniz-Institut für Photonische Technologien (IPHT)
- Leibniz-Institut für Plasmaforschung und Technologie (INP)
- Leibniz-Institut für Polymerforschung Dresden (IPF)
- Leibniz-Institut für Präventionsforschung und Epidemiologie (BIPS)
- Leibniz-Institut für Raumbezogene Sozialforschung (IRS)
- Leibniz-Institut für Sonnenphysik (KIS)
- Leibniz-Institut für Troposphärenforschung (TROPOS)
- Leibniz-Institut für Werkstofforientierte Technologien (IWT)
- Leibniz-Institut für Wirtschaftsforschung Halle (IWH)
- Leibniz-Institut für Wissensmedien (IWM)
- Leibniz-Institut für Zoo- und Wildtierforschung (IZW)
- Leibniz-Institut Hessische Stiftung Friedens- und Konfliktforschung (HSFK)
- Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS)
- Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF)
- Leibniz-Zentrum für Literatur- und Kulturforschung (ZfL)
- Leibniz-Zentrum für Marine Tropenforschung GmbH (ZMT)
- Leibniz-Zentrum für Psychologische Information und Dokumentation (ZPID)
- Leibniz-Zentrum für Zeithistorische Forschung Potsdam (ZZF)
- Leibniz-Zentrum Moderner Orient (ZMO)





- Mathematisches Forschungsinstitut Oberwolfach (MFO)
- Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (MBI)
- Museum für Naturkunde - Leibniz-Institut für Evolutions- und Biodiversitätsforschung (MfN)
- Paul-Drude-Institut für Festkörperelektronik (PDI)
- Potsdam-Institut für Klimafolgenforschung (PIK)
- Römisch-Germanisches Zentralmuseum - Leibniz-Forschungsinstitut für Archäologie (RGZM)
- RWI - Leibniz-Institut für Wirtschaftsforschung (RWI)
- Schloss Dagstuhl - Leibniz-Zentrum für Informatik (LZI)
- Senckenberg Gesellschaft für Naturforschung (SGN)
- TIB - Leibniz-Informationzentrum Technik und Naturwissenschaften (TIB)
- Weierstraß-Institut für Angewandte Analysis und Stochastik (WIAS)
- Wissenschaftszentrum Berlin für Sozialforschung (WZB)
- ZBW - Leibniz-Informationzentrum Wirtschaft (ZBW)
- ZEW - Leibniz-Zentrum für Europäische Wirtschaftsforschung (ZEW)
- Zoologisches Forschungsmuseum Alexander Koenig - Leibniz-Institut für Biodiversität der Tiere (ZFMK)
- I don't want to answer
- Other

Other

A2. To which section of the Leibniz Association does your Institute belong to?

If you do not know which section applies, you can have a look here: www.leibniz-gemeinschaft.de/institute

Section A

Section B

Section C

Section D

Section E

I don't know

I don't want to answer this question



A3. What is your year of birth?

```
$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="A2"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

I don't want to answer this question

Year of birth:

Year of birth:

A4. To which gender do you identify most?

```
$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="A2"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

Woman

Man

I don't want to answer this question

Other

Other

A5. What is your citizenship? Should you have multiple citizenships, please select the one you feel best represented by.

German

Citizen within the European Union (EU)

Citizen outside the European Union (EU)

I don't want to answer this question



A6. Which year did you start your PhD?

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

2012 or earlier

2013

2014

2015

2016

2017

2018

2019

I don't know

I don't want to answer this question

A7. Which month did you start your PhD?

January

February

March

April

May

June

July

August

September

October

November

December

I don't know

I don't want to answer this question



A8. Which year do you expect to submit your PhD thesis?

- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025 or later
- I don't know
- I don't want to answer this question

A9. Which month do you expect to submit your PhD?

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December
- I don't know
- I don't want to answer this question

A10. Anything regarding this section you would like to tell us?



Section B: Working conditions

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

Section 2/10

B1. How is your doctoral research currently financed (multiple answers possible)?

Explanation: A contract is usually paid according to the TVöD system (e.g. 50% or 65%). With a stipend you are not legally bound to your workplace, but do not pay into the social security system. `$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="81161"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });`*

Contract

Stipend

Unpaid

Guest contract

Completion grant

I don't know

I don't want to answer this question

Other

Other



B2. What kind of contract do you have? If you have multiple contracts, please select 'other' and give details.

\$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="A4"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

- Less than 25% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 25 - 49% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 50% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 51 - 65% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 66 - 75% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 76 - 99% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- 100% E13 (TV-L, TVÖD-Bund, TVÜ etc.)
- I don't know
- I don't want to answer this question
- Other

Other

B3. What kind of stipend do you have? If you have multiple stipends, please select 'Other' and give details.

An internal stipend is granted through your graduate school, Leibniz Institute/Research Museum or the Leibniz Association. External stipends are granted through a third party e.g. DFG, DAAD, CSC, foreign associations etc. \$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="A3"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

- Internal stipend
- External stipend
- I don't want to answer this question
- Other

Other



B4. Right now, what is your monthly net income for your work at your research organization?

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



B5. What was or is the longest duration of your contract or stipend related to your PhD project?

-
- 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

B6. If any, how many extensions or additional contracts/stipends did you get during your PhD?

```
$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="A3"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}"+place_before; var move_element="javatbd{SGQ}"+move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

- I did not get any extensions or additional contracts/stipends
- I don't know
- I don't want to answer this question
- How many?

How many?

B7. Would it be possible for you to extend your current contract/stipend for the following reasons (multiple answers possible)?

	Yes	No	I don't know	I don't want to answer this question
More time needed to complete PhD project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parental leave	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wrap-up phase after completion of the PhD project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



B8. How many holidays per year can you take according to your contract or stipend?

21-28

29-32

> 32

My funding does not specify the number of holidays

I don't know

I don't want to answer this question

B9. How many days of your entitled holidays did you take in the past year?

None

Less than half

Roughly half

More than half

Roughly all of them

I don't want to answer this question

B10. How many days did you take off in the past year?

None

Roughly one week

Roughly two weeks

Roughly three weeks

Roughly four weeks

More than four weeks

I don't want to answer this question

B11. Do you feel free to take days off? (multiple answers possible)

\$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="SQ006"; /* Please do NOT change the lines below */ var place_before="jvatbd{SGQ}"+place_before; var move_element="jvatbd{SGQ}"+move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

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

I don't want to answer this question

No, because of other reason

No, because of other reason

B12. 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 (more information here).

```
$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="A1"; /* Please do NOT change the lines below */ var place_before="jvatbd{SGQ}" + place_before; var move_element="jvatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

I don't know

I don't want to answer this question

Hours per week

Hours per week



B13. On average, how many hours do you typically work per week in total?

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

B14. What percentage of your working time do you currently spend on average on the following tasks?

Scientific work directly related to the doctoral research

Scientific work not related to the doctoral research (helping other projects, maintenance, etc.)

Attending courses and seminars

Teaching/supervision

Administrative tasks

Other

B15. If you indicated that you spend your time on other tasks than the ones listed above, please indicate here what those tasks are:



	Very satisfied	Satisfied	Neither/nor	Dissatisfied	Very dissatisfied	Does not apply	I don't want to answer this question
Work environment and atmosphere	<input type="checkbox"/>						
Workload	<input type="checkbox"/>						
Social life at the institute	<input type="checkbox"/>						

C2. Do you identify with your Leibniz Institute or Research Museum?

Yes, very much

Yes, a bit

Not quite

Not at all

I don't know

I don't want to answer

C3. Do you identify with your research organization, the Leibniz Association?

Your institute or research Museum belongs to the Leibniz Association, a non-university research organization comprised of a total of more than 90 institutes which are located all over Germany.

Yes, very much

Yes, a bit

Not quite

Not at all

I don't know

I don't want to answer

C4. Have you ever considered quitting your PhD?

Never

Rarely

Occasionally

Often

I don't know

I don't want to answer this question

**C5. What was/were the reason(s) for considering to quit your PhD?
(multiple answers possible)**

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 work related difficulties with my supervisor.

I don't like the social environment at my workplace.

I have personal difficulties with my supervisor.

I find my career prospective 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 project is not funded anymore.

I have administrative problems.

I don't want to answer this question.

I don't know.

Other, please specify

Other, please specify



C6. How much do you pay for your rent and associated living costs per month in euros (e.g., heating, gas, waster, 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€. \$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="A1"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}"+place_before; var move_element="javatbd{SGQ}"+move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

-
- 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



C7. Do you get external financial support to cover your living expenses besides your salary? If yes, who is assisting you financially (multiple answers possible)?

\$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="SQ001"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

I took up a loan for my time as a doctoral researcher

Parents

Other relatives

Partner(s)

Other job

I do not get external financial support

I don't want to answer this question

Other, please specify

Other, please specify

C8. 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, 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



C9. Did you spend parts of your salary on items you exclusively used for work in the past year? If yes how much money in euros did you spend?

\$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="A3"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

Yes, but I do not know or do not want to disclose the amount

No

I don't want to answer this question

Yes, I spent the following amount: €

Yes, I spent the following amount: €

C10. Do you know the Leibniz PhD Network?

Yes

No

C11. Do you know N2?

Yes

No

C12. Do you know your current PhD representatives at your Leibniz Institute or Research Museum?

Yes

No

C13. Why did you start your work on your doctoral thesis at your institute or research museum (multiple answers possible)?

\$(document).ready(function() { / Adjust these settings */ var move_element="other"; var place_before="SQ008"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; \$("#"+move_element).insertBefore("#"+place_before); });*

Scientific excellence of the institute/center or my specific group

Interest in joining a structured PhD program/graduate school

Interest in working with a specific scientist

Continuing previous scientific project (internship, Master's thesis, etc.)

I did not find or look for better work opportunities

Equipment and working facilities

Attractiveness of pay and benefits



	Not at all	Rather not	To some extent	Very much	I don't know	I don't want to answer
Bureaucracy and administrative support	<input type="checkbox"/>					
Workshops and skills trainings	<input type="checkbox"/>					
Contribution to science	<input type="checkbox"/>					
Technical support	<input type="checkbox"/>					
Career development	<input type="checkbox"/>					
Science communication and outreach	<input type="checkbox"/>					
Psychological support	<input type="checkbox"/>					
Laboratory equipment	<input type="checkbox"/>					
Office equipment (e.g., computer, software, own desk etc.)	<input type="checkbox"/>					
Scientific support	<input type="checkbox"/>					
Family support	<input type="checkbox"/>					
Support for foreign employees	<input type="checkbox"/>					
Work environment and atmosphere	<input type="checkbox"/>					
Workload	<input type="checkbox"/>					
Social life at the institute	<input type="checkbox"/>					

C16. Anything regarding this section you would like to tell us?



Section D: Supervision

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

Section 4/10

D1. Do you have one of the following (multiple answers possible)?

Explanation PhD supervision agreement: This is a written agreement between the formal/primary 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.

A supervision agreement with your formal/primary supervisor

A written project outline

A written training plan

A thesis advisory committee (TAC)

PhD guidelines

I don't have any of the above

I don't know

I don't want to answer this question

D2. Is your project progress according to your (reviewed) project plan?

Yes, I am even ahead

Yes

No, I am slightly behind my plan

No, I am far behind my plan

I don't know

I don't want to answer



D3. How often do you meet your thesis advisory committee (TAC) ?

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

D4. Is your formal/primary supervisor your daily/direct supervisor?

Yes

No

I don't have a formal/primary supervisor yet

I don't have a direct/daily supervisor yet

I don't know

I don't want to answer this question

D5. Where is your formal/primary supervisor employed?

At your Leibniz Institute

At another Leibniz Institute

At the university

Emeritus

I don't know

I don't want to answer

Other

Other



D6. How often do you communicate on average with your daily/direct supervisor about your PhD project?

Almost daily

Weekly

Bi-weekly

Monthly

Quarterly

Six-monthly

Yearly

Less than once a year

Never

I don't know

I don't want to answer this question

D7. How often would you like to communicate with your daily/direct supervisor about your PhD project?

Almost daily

Weekly

Bi-weekly

Monthly

Quarterly

Six-monthly

Yearly

Less than once a year

Never

I don't know

I don't want to answer this question



D8. How often do you communicate with your formal/primary supervisor about your PhD project?

Almost daily

Weekly

Bi-weekly

Monthly

Quarterly

Six-monthly

Yearly

Less than once a year

Never

I don't know

I don't want to answer this question

D9. How often would you like to communicate with your formal/primary supervisor about your PhD project?

Almost daily

Weekly

Bi-weekly

Monthly

Quarterly

Six-monthly

Yearly

Less than once a year

Never

I don't know

I don't want to answer this question



D10. How satisfied are you with your PhD supervision in general?

Very satisfied

Satisfied

Rather satisfied

Rather dissatisfied

Dissatisfied

Very dissatisfied

I don't know

I don't want to answer this question

D11. Please rate the supervision provided by your formal/primary supervisor.

	Fully agree	Partially agree	Neither agree nor disagree	Partially disagree	Fully disagree	I don't want to answer this question
--	-------------	-----------------	----------------------------	--------------------	----------------	--------------------------------------

My supervisor is well informed about my field of research.

My supervisor is available when I need advice.

My supervisor is open to and respects my research ideas.

My supervisor gives constructive feedback.

My supervisor supports my professional development (establishing contacts, recommending conferences...).

My supervisor is well informed about my current state of PhD project.

My supervisor encourages me to work independently.

My supervisor treats me politely.

My supervisor treats me professionally.

My supervisor has strict requirements for my work.

My supervisor has clear requirements for my work.

**D12. Did you ever encounter problems regarding your supervision?
(multiple answers possible)**

```
$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="SQ012"; /* Please do NOT change the lines below */ var place_before="javatbd{SGQ}" + place_before; var move_element="javatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

Not enough meetings

Too many meetings

Not enough scientific discussion



Meetings not regular enough

Not enough experts in your group

Supervisors not experienced enough in your field

Not enough feedback

Not enough encouragement

Personality of my supervisor

Disagreement between supervisors

I did not encounter problems regarding my supervision

I don't know

I don't want to answer this question

Other, please specify

Other, please specify

D13. Anything regarding this section you would like to tell us?



Section E: Graduate Schools

Graduate schools are programs that coordinate and support doctoral researchers. Apart from offering specific lectures and seminars, they may provide interdisciplinary transferable skill courses and if necessary financial support for lab exchanges and international conferences.

Section 5/10

E1. Are you currently registered in a graduate school?

Yes, at my institution

Yes, somewhere else

No

I don't know

I don't want to answer this question

E2. Do you think you profit from enrollment in your graduate school?

Yes

No

I don't know

I don't want to answer this question

E3. Why are you not enrolled in a graduate school?

I don't want to

My supervisor does not support it

There is none available

No time to enroll yet

Other reasons

I don't know

I don't want to answer this question

E4. Do you think you would profit from enrollment in a graduate school?

Yes

No

I don't know

I don't want to answer



E5. Which of the listed items are offered to you either by your institute or graduate school? (multiple answers possible)

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Financial support for conferences or travel

Financial support for equipment

Financial support for publications

Financial support for PhD organized events

Methods courses

I don't know

I don't want to answer

Other, please specify

Other, please specify

E6. Anything regarding this section you would like to tell us?

Section F: Integration

In this section, we ask you on how integrated you feel at your Leibniz Institute or Research Museum in terms of language barriers and social integration and if you received support with administrative tasks.

Section 6/10

F1. 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.

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

I don't know

I don't want to answer this question

Other, please specify

Other, please specify

F2. For which of the following aspects would you have needed more support from your institute?

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$(document).ready(function() { /* Adjust these settings */ var move_element="other"; var place_before="SQ008"; /* Please do NOT change the lines below */ var place_before="jvatbd{SGQ}" + place_before; var move_element="jvatbd{SGQ}" + move_element; $("#"+move_element).insertBefore("#"+place_before); });
```

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

I don't know

I don't want to answer this question

Other, please specify

Other, please specify



F3. Do you speak German?

None

Beginner (A1 - A2)

Intermediate (B1- B2)

Fluent (C1 - C2)

Native

I don't want to answer this question

F4. Is language an obstacle for communication with people at your institute?

Very much

To some extent

Rather not

Not at all

I don't want to answer this question

F5. Is all the important information (group internal, administrative, your contract/stipend) available in a language you understand?

Yes, all 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

F6. Are you currently taking German language classes?

Yes, at my institution

Yes, outside my institution

No

I don't want to answer this question



F7. 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, 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

F8. How easy can you get help from colleagues or peers if you should need it?

Very difficult

Difficult

Possible

Easy

Very easy

I don't know

I don't want to answer this question

F9. How many people are so close to you that you can count on them if you have serious problems?

Explanation: These might include family, friends, partners, or colleagues.

None

1 to 2

3 to 5

More than 5

I don't know

I don't want to answer this question



	Not at all	Rather not	Indifferent	Rather yes	Very much	I don't know	I don't want to answer this question
Public sector science-related job (e.g., public relationships or science management)	<input type="checkbox"/>						
Private sector science-related job (e.g., public relationships or science management)	<input type="checkbox"/>						
Non-scientific job	<input type="checkbox"/>						
Take an extended break	<input type="checkbox"/>						
Start my own business	<input type="checkbox"/>						
Further education (e.g. another PhD, MBA)	<input type="checkbox"/>						

G6. Which field do you think you will work in after your PhD (multiple answers possible)?

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```

- 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)
- I don't know yet
- I don't want to answer this question
- Other, please specify

Other, please specify



G7. Where would you like to work after you complete your doctoral degree?

Germany

Europe (but not necessarily Germany)

Outside of Europe

I don't know

G8. Which of the following measures for your career development are supported by your Leibniz Institute or Research Museum?

	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,...)	<input type="checkbox"/>				
Language classes	<input type="checkbox"/>				
Mentoring	<input type="checkbox"/>				
Soft skill courses	<input type="checkbox"/>				
Practical courses (e.g. method-oriented courses, ...)	<input type="checkbox"/>				
Transition to a non-academic career (e.g. career fairs, career talks, networking possibilities,...)	<input type="checkbox"/>				
Career development office	<input type="checkbox"/>				

G9. How does your institute support you in learning 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

I don't know

I don't want to answer this question



G10. Do you think that you are well trained for a job outside science?

Explanation: 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

G11. Anything regarding this section you would like to tell us?

Section H: 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.

Section 8/10

H1. Do you have or are you currently expecting children?

Yes

No

I don't know

I don't want to answer

H2. Would you consider having (more) children during your doctoral research project? (multiple answers possible)

Yes

No, because of personal reasons

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, because of other reasons

I don't know

I don't want to answer this question

H3. Does your institute offer support in childcare services? (multiple answers possible)

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

None of the above

I don't know

I don't want to answer this question

H4. If your institute offers childcare support do/would you use it? (multiple answers possible)

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```

Yes, access to daycare

Yes, financial support for daycares

Yes, possibility to bring my child to work

Yes, reimbursements for daycares during business travel

Yes, home office / mobile work

No

I don't know

I don't want to answer this question

Other family support, please specify

Other family support, please specify



H5. Do you feel that there is sufficient support (financial and organizational) from your institute for raising a child?

Yes

No

I don't know

I don't want to answer this question

H6. Anything regarding this section you would like to tell us?

Section I: Power abuse

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

Section 9/10

I1. Which of the following mechanisms are you aware of that can help you in case of a conflict with a superior? (multiple answers possible)

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

- Institute Ombudsperson
- Central Leibniz Ombudsperson
- Institute Works Council
- General Works Council
- Institute Equal Opportunity officer
- Central Equal Opportunity officer
- External law firm
- PhD representatives
- Medical services and counseling
- Security service
- I am not aware of any of the above



I don't want to answer this question

Other, please specify

Other, please specify

I2. Did you ever report a conflict with a superior to one of the institutions above?

Yes

No, I never had any serious conflict

No, although I had a conflict

I don't know

I don't want to answer this question

I3. Please indicate the level of satisfaction with the consequences of your report.

Very dissatisfied

Dissatisfied

Neither satisfied nor dissatisfied

Satisfied

Very satisfied

Still ongoing

I don't know

I don't want to answer this question



I4. While working at your institute, have you at any point experienced unwanted behavior that you would call 'sexualized harassment' from a superior?

Explanation: such behavior includes for example: Sexist remarks, different treatment because of your gender, unwanted attempts to establish a romantic/sexual relationship, unwanted touching, bad/different treatment for refusing to engage in a romantic/sexual relationship, implication that you would advance faster if you agreed to a romantic/sexual relationship.

- Never
- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question

I5. While working at your institute, have you at any point witnessed any unwanted behavior towards a colleague that you would call 'sexualized harassment' from a superior?

Explanation: such behavior includes for example: Sexist remarks, different treatment because of your gender, unwanted attempts to establish a romantic/sexual relationship, unwanted touching, bad/different treatment for refusing to engage in a romantic/sexual relationship, implication that you would advance faster if you agreed to a romantic/sexual relationship.

- Never
- Once
- Occasionally
- Monthly
- Weekly
- Daily
- I don't know
- I don't want to answer this question



16. While working at your institute, have you at any point been subjected to bullying by a superior?

Explanation: "Bullying" here denotes repeated and persistent negative behavior directed towards one or several individuals, which creates a hostile work environment, including gender, cultural or religious discrimination.

Never

Once

Occasionally

Monthly

Weekly

Daily

I don't know

I don't want to answer this question

17. While working at your institute, have you at any point witnessed bullying by a superior?

Explanation: "Bullying" here denotes repeated and persistent negative behavior directed towards one or several individuals, which creates a hostile work environment, including gender, cultural or religious discrimination.

Never

Once

Occasionally

Monthly

Weekly

Daily

I don't know

I don't want to answer this question

18. Anything regarding this section you would like to tell us?



Section J: Mental health

In this section, we ask you about your personal, psychological well-being in the context of your doctoral research project. 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 various scholars, but can be summarized, according to the WHO, as the "subjective well-being, perceived self-efficacy, [...] and self-actualization of one's intellectual and emotional potential, among others."

The questions in this section were adapted from the “State-Trait Anxiety Inventory (STAI) and “Beck’s Depression Scale” and enable probing for the frequency of different states of mind. The occurrence of the latter is converted into a score, revealing whether or not different degrees of depression could be present.

We want to, again, stress the importance of confidentiality and anonymity of the answers submitted during your participation of this survey. If you feel uncomfortable with the questions in this section, please consider replying “I don’t want to answer this question” to the questions of this section.

Section 10/10

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.

Please do not hesitate to turn to www.telefonseelsorge.de (anonymous hotline free of charge, German speaking, have a look here for international offers), friends or your PhD representatives, if especially emotionally touched by these questions.

J1. Please read each statement below and then indicate how you feel right now, at this moment.

	Not at all	Somewhat	Moderately	Very much	I don't want to answer this question
I feel calm	<input type="checkbox"/>				
I feel tense	<input type="checkbox"/>				
I feel upset	<input type="checkbox"/>				
I feel relaxed	<input type="checkbox"/>				
I feel content	<input type="checkbox"/>				
I feel worried	<input type="checkbox"/>				

J2. Please read each statement below and then indicate how you generally feel.

	Not at all	Somewhat	Moderately	Very much	I don't want to answer this question
I am "calm, cool and collected"	<input type="checkbox"/>				



	Not at all	Somewhat	Moderately	Very much	I don't want to answer this question
I feel that difficulties are piling up so that I cannot overcome them	<input type="checkbox"/>				
I worry too much over something that really doesn't matter	<input type="checkbox"/>				
I am happy	<input type="checkbox"/>				
I have disturbing thoughts	<input type="checkbox"/>				
I lack self-confidence	<input type="checkbox"/>				
I feel secure	<input type="checkbox"/>				
I take disappointments so keenly that I can't put them out of my mind	<input type="checkbox"/>				

J3. Over the last two weeks, how often have you been bothered by any of the following problems?

	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	<input type="checkbox"/>				
Feeling down, depressed, or hopeless	<input type="checkbox"/>				
Trouble falling, staying asleep, or sleeping too much	<input type="checkbox"/>				
Feeling tired or having little energy	<input type="checkbox"/>				
Poor appetite or overeating	<input type="checkbox"/>				
Feeling bad about yourself - or that you are a failure or have let yourself or your family down	<input type="checkbox"/>				
Trouble concentrating on things such as reading the newspaper or watching television	<input type="checkbox"/>				
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	<input type="checkbox"/>				



J4. If you have been bothered by any problems, how difficult have these 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

J5. 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.

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```

I feel uncomfortable answering such questions

I can't relate to this type of questions

I don't want to answer this question

Other, please specify

Other, please specify

J6. Anything regarding this section you would like to tell us?



Section K: One last question

K1. One last question: Would you recommend doing a doctoral research project at your Leibniz Institute or Leibniz Research Museum to a friend?

Yes

No

I don't know

I don't want to answer this question

Section L: The end

L1. Anything regarding the survey you would like to tell us?



Thank you very much for your participation in the 2019 Leibniz PhD Survey!

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

If you want to have a look at results of the previous Leibniz PhD Survey, we recommend our report and additional information, available at our homepage (<https://leibniz-phd.net/survey/>).

This questionnaire has been developed in the framework of N2 the 'Network of Networks'. It represents more than 18.000 doctoral researchers of the Helmholtz Association, the IPP 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, as well as our social network platforms (Twitter, Facebook, Instagram, LinkedIn). You can also find us on our homepage (<https://leibniz-phd.net/>) or by getting in touch with the PhD representatives at your Leibniz Institute or Research Museum.