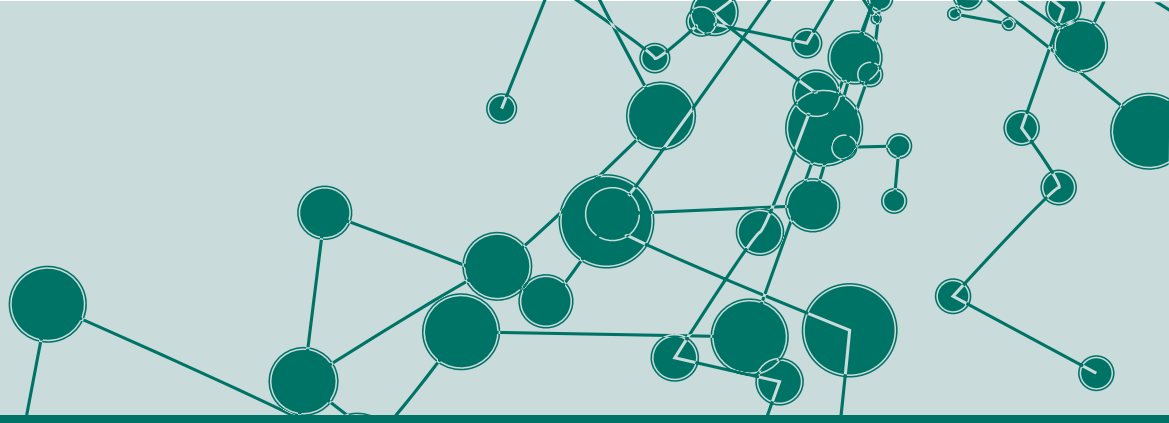


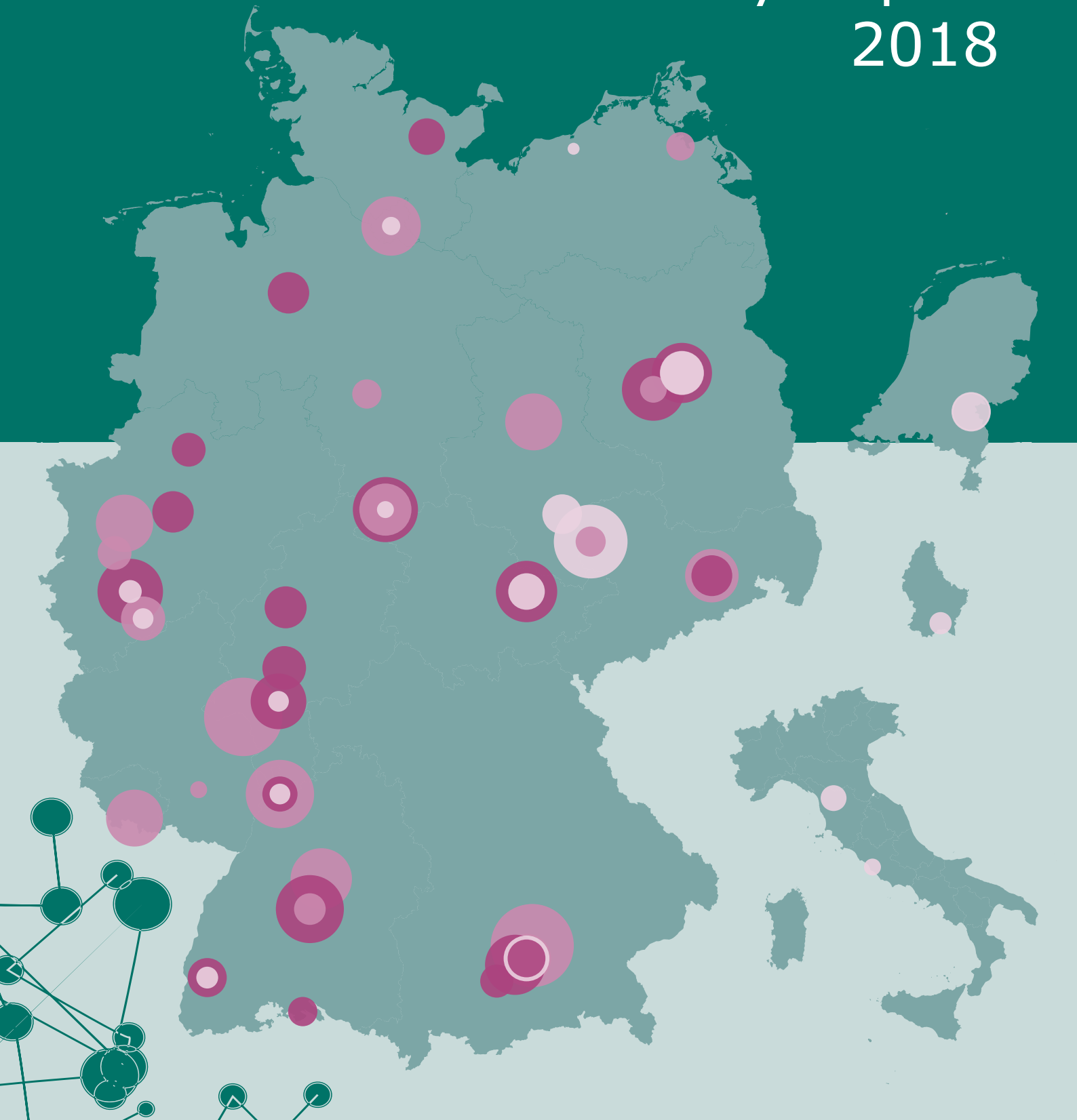


Max
Planck

PhDnet



Survey Report 2018



PhDnet Report 2018

PhDnet Survey Group

May 17, 2019

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Chapter 1

Introduction

The Max Planck Society (MPS) is one of the leading non-university research institutions for basic research in Germany. As of 2018, there are more than 5100 doctoral researchers (DRs) working at 85 Max Planck institutes. The work that the DRs contribute is vital to furthering the research upon which the MPS generates its scientific excellence and its renowned international reputation. The Max Planck PhDnet represents the interests of DRs within and beyond the Max Planck Society. It was founded in 2003 and is a platform for lively exchange between DRs across the three sections of the MPS: Biology & Medicine (BM), Chemistry, Physics & Technology (CPT), Humanities & Social Sciences (HUM). It aims to improve the overall conditions of doctoral education, to foster scientific exchange, and to strengthen academic solidarity.

To this end, a crucial step is a proper evaluation of the situation of DRs in the Max Planck Society and an assessment of the positive and negative aspects related to their work as DRs. This report is the result of a large-scale survey, organized by the PhDnet and conducted among DRs in 2018. It builds on the successful completion of similar surveys in 2009, 2012, and 2017 and gives DRs from various backgrounds an opportunity to voice their suggestions and concerns. In the future, PhDnet seeks to conduct similar surveys on a regular basis, in close cooperation with the DRs' networks of the Helmholtz and Leibniz Associations, to provide a more comprehensive picture of DRs' working condi-

tions in non-university research institutions all over Germany. This will also enable comparisons over time and across institutions.

The PhDnet Survey 2018 put special emphasis on DRs' overall working conditions, good scientific practice, supervision, and on family planning. 2522 out of 5037 DRs from all three sections completed the survey, providing us with the valuable opportunity to offer results which are statistically representative of the situation of DRs within the MPS.

The report starts with a description of key demographic data in Chapter 2. 46% of all DRs are German, with the highest share of international DRs (60%) working in the BM section. 52% of DRs identify as male but there is a pronounced difference in gender ratios across sections: Two thirds of DRs in the CPT section are male while this is only true for two fifths of DRs in the HUM section.

In Chapter 3, we take a closer look at DRs' working conditions. 86% of DRs are now on contracts rather than stipends, which is a marked increase compared to 2012 (50% on contracts) and compared to 2017 (79% on contracts). From the outset, PhDnet advocated funding by contracts rather than stipends for all DRs. In 2012, for example, PhDnet already pointed out that most DRs preferred contracts over stipends if given the choice¹. The MPS reacted to these demands in 2015 by aiming to give contracts to all new DRs. We highly appreciate these changes and hope to see the general trend towards contracts continue.

¹See PhDnet Survey 2012, page 26.

However, we still observe that a larger proportion of international DRs are on stipends compared to German DRs (16% vs. 7%, respectively). Additionally, contracts between – and also within – institutes vary dramatically, with large salary differences across sections, thus also contributing to a significant gender pay gap. While we acknowledge the difficulties in achieving absolute convergence in salaries across sections, we highly encourage institutes to provide their DRs with equal working conditions across research groups and independent of their scientific background. Making decisions related to salaries and contracts transparent and accountable contributes to building equality and trust for future DRs and should thus be a prime objective for all MPIs.

On average, DRs work about 47.3 hours per week which is 11.2 hours more than they are paid for. Only 4% of DRs never work on weekends or holidays. While for some, working on weekends or holidays is considered an upside of flexible working hours, for the majority it is an unpleasant necessity due to a high workload and immense time pressure.

Still, DRs are overall satisfied (71%) with their working conditions. They are attracted to the MPS based on its scientific reputation and the research being conducted, although the pay and benefits are considered unattractive. This is mirrored by the fact that the highest satisfaction among DRs is related to office equipment and work environment, while the greatest dissatisfaction is voiced concerning the number of holidays and the salary and benefits. On top of that, one third of DRs at least occasionally think about giving up their research completely. This number is even higher among female DRs and among DRs closer to finishing their PhD – both aspects resemble the results of last year's survey. It is evident to us that stress factors for DRs differ depending on their age, gender, nationality, household situation etc. Yet, with the recent decision made by the MPS to increase the number of

holidays for all DRs on support contracts to 30 days, we are happy that a major source of stress for DRs has been alleviated. Still, we will continue advocating higher wages for DRs that compensate and value their work adequately.

Regular social activities for DRs are organized in the majority of institutes. 57% of respondents report that social events are offered at least monthly, if not weekly. A similarly high number also attends these activities frequently. 85% of DRs know their PhD representatives while the PhDnet and the Max Planck Alumni Association are less popular.

Chapter 4 focuses on supervision, career planning and good scientific practice. First of all, we observe a divergence between DRs when it comes to their supervision. Some DRs meet their supervisors to discuss their projects weekly or even daily (about 60%) and others are not in close communication with their supervisors, meeting them less than once a month (16%). There are also marked differences between sections which, to some extent, reflect the diversity in research approaches and requirements. On average, female researchers meet their supervisors less frequently than male researchers which may partly be a result of the differences in gender ratios across sections. However, as the frequency of DRs' supervisory meetings and their overall satisfaction correlate, there are good reasons to advocate for more regular interaction and closer cooperation between DRs and their supervisors across sections.

Supervisors usually advise four to five DRs at the same time and about one quarter of DRs have to compete with six or more DRs for their supervisors' time. Compared to 2017, supervisors assist fewer doctoral projects which hopefully leads to a general increase in the quality of supervision. Still, there is room for improvement: DRs' satisfaction with their supervision and its frequency show a strong correlation with DRs'

likelihood of considering giving up their doctoral research. There are also pronounced differences regarding DRs' satisfaction with their supervisors across sexes and across sections. Male researchers are, on average, more satisfied with their supervision, as are DRs working in the CPT section. Those least satisfied with their supervision are DRs in the BM section. Mandatory leadership training for supervisors, supervision contracts and more open and frequent debates about the potential pitfalls of supervision could be expedient and are advisable.

Furthermore, we found that more than two thirds of DRs have a Thesis Advisory Committee (TAC) and a majority of those DRs believe their TAC significantly contributes to the quality of their research.

We want to emphasize the importance of Thesis Advisory Committees and therefore encourage institutes and supervisors to universally adopt the practice and to support DRs in the process of implementing them. Finally, we again advocate for supervisors to receive mandatory training on leadership and communication to help with creating a fruitful and positive work environment for DRs.

When it comes to DRs' attitudes towards academia, they place high value on the service for the society which comes with their work. They further like teaching and appreciate the international mobility as part of their job. On the other hand, the academic job market and the lack of compatibility with family planning are perceived as less attractive aspects of an academic career. As found in last year's survey, we see a high level of intrinsic motivation among DRs but we also see that the expectations and preferred future career paths of DRs still differ. Many do not expect to work in a research job even though they would like to. However, the number of DRs who want to work and who see themselves working in a field other than public scientific research has increased compared to last year. This may be interpreted as a result of DRs' disillusionment with the

attractiveness of academic careers and with the scarcity of available positions in particular. Consequently, we urge institutes to provide their DRs with information about job perspectives outside academia and to openly communicate the career challenges that may be encountered in the respective academic fields.

Fortunately, violations of good scientific practice are not pervasive within the MPS, but our survey results still indicate their existence. The most common violation of good scientific practice is sloppy work, i.e., skipping necessary steps in the research process. In addition, authorship of research articles is a main cause of conflicts and 'honorary' authorships are still a problem. These problems could be reduced by more strongly emphasizing the importance of best practices across sections. Many DRs are not well informed about the ombudsperson system so increasing its popularity can be a means to avoiding scientific misconduct. At the same time, it is essential that ombudspersons are neutral, trustworthy and reliable which was called into question by a notable number of DRs in our survey.

The ombudsperson system needs to be taken more seriously by all institutes as a crucial and necessary guarantor of mutual trust within the scientific community and beyond. Indispensably, ombudspersons need to be neutral and independent.

The last chapter, Chapter 5, deals with parenthood and with DRs' attitudes towards having children. Only 8% of female DRs currently have or are expecting children which is an intriguingly low number compared to women with higher education in Germany (15%). The majority of DRs want to have children but only after completing their PhD. The most-cited reasons for not having or wanting children during the PhD are related to family-unfriendly working conditions, including a lack of financial support and time, high stress levels, and mobility requirements.

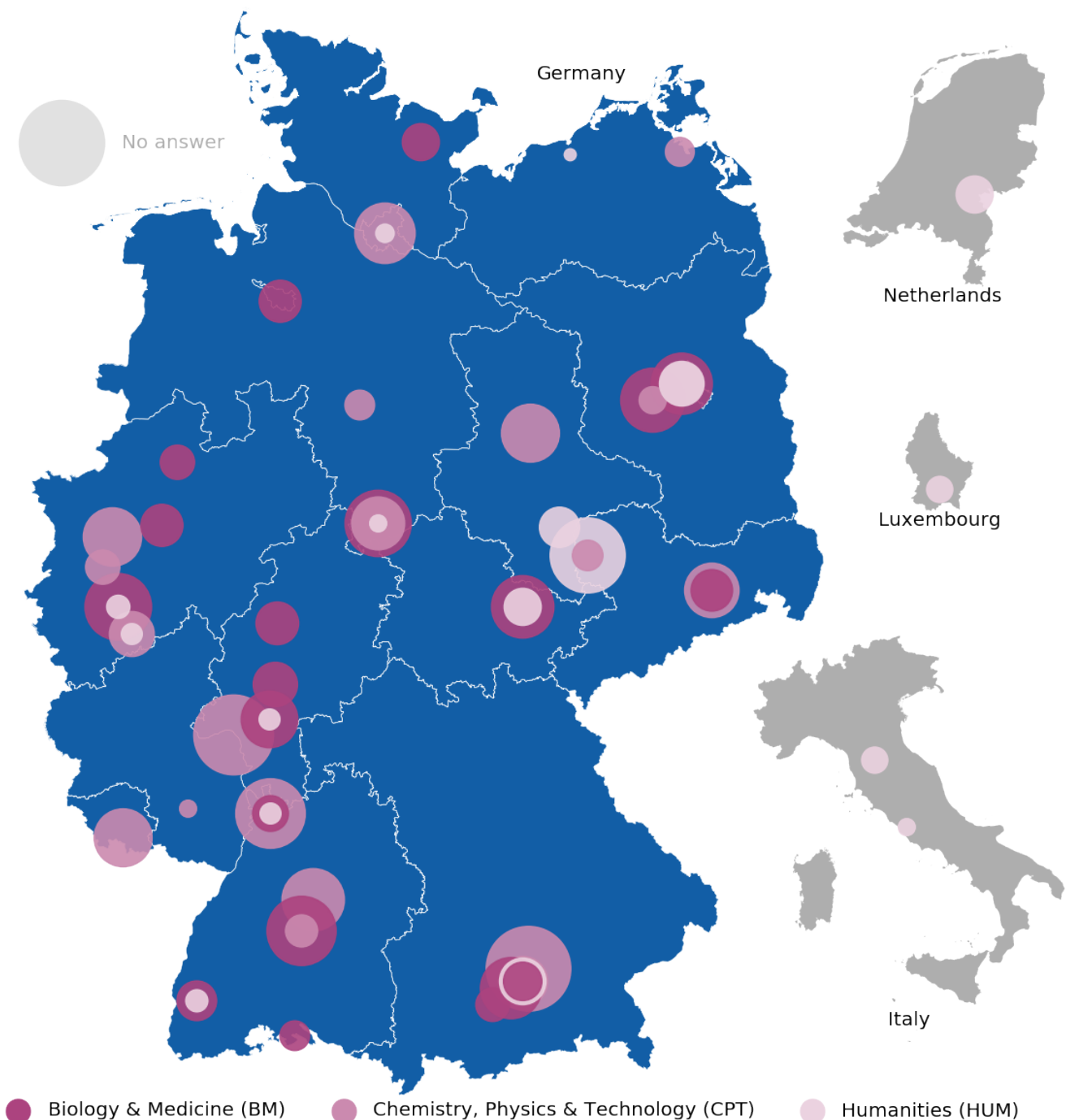


Figure 1.1: "Which Max Planck Institute are you associated with?" Distribution of responses from Max Planck doctoral researchers in Germany, Netherlands, Luxembourg, and Italy color coded by section. Larger circles indicate more responses.

Parents in the MPS are generally satisfied but often don't feel sufficiently supported by their institutes. DRs with children and those who would like to have children during their PhD also report that they are not likely to take full parental leave. To make matters worse, this disproportionately disadvantages female

DRs compared to male DRs who, to this day, more often face negative social consequences not taking full parental leave. To the contrary, all DRs should be encouraged to exercise their right to taking full parental leave without having to fear any repercussions.

We encourage the MPS and every single in-

stitute to share information about childcare services more proactively. Furthermore, we would like to promote more active discussions about potential ways to improve the compatibility of family and academic careers. We acknowledge that there is a structural facet to this problem in the academic world which cannot be addressed by single institutions in its entirety. However, the MPS maintains a powerful position as a potential role model in the academic system due to its good domestic and international reputation. As a result, we believe that the MPS has the tools as well as the institutional and symbolic power to address these issues and to push for changes on a larger scale.

On a final note, we would like to thank the 2018 Steering Group and the PhDnet working groups for their support, along with the members of the 2017 Survey Group for valuable insights into their work. Last but not least, we would like to thank all doctoral researchers who participated in the 2018 PhDnet Survey and who made this report possible. We wish you all the best for your projects and for your life and career trajectories, however diverse they may be!

For any questions regarding the survey or this report, please contact Benjamin Regler (regler@fhi-berlin.mpg.de), Laura Einhorn (einhorn@mpifg.de), or the 2018 PhDnet Steering Group (sg@PhDnet.de).

Chapter 2

Demographics

The Max Planck Society (MPS) is one of Germany’s most successful non-university research organizations. As such, it attracts doctoral researchers (DRs) from all over the world. Currently, over 5100 scientists are working towards the PhD degree, distributed across 85 institutes in Germany and 5 institutes abroad. The fields of research are divided into three main sections: Humanities (HUM), Biology and Medicine (BM), and Chemistry, Physics and Technology (CPT). This year, 48.8 % of all DRs across all institutions in Germany and four abroad (Fig. 1.1) participated in the survey (41.7 % of those belong to the CPT section, 38.4 % to the BM section, and 14.5 % to the HUM section) Fig. 2.1). 2392 DRs belong to the CPT, making it the largest section of the MPS, followed by BM (1921 DRs) and HUM (724 DRs). Therefore, the data obtained in this survey represents the voices of approximately half of the total doctoral staff currently employed at the MPS.

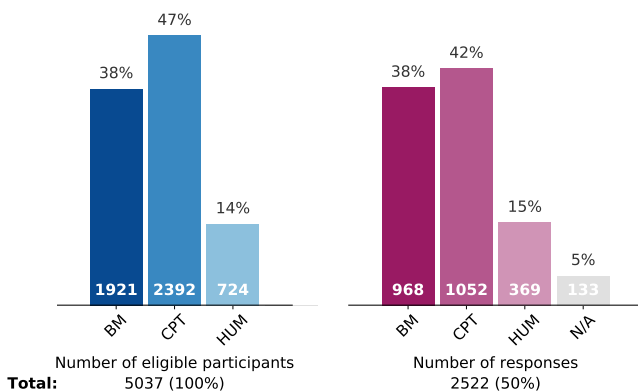


Figure 2.1: "Which Max Planck Institute are you associated with?" Percentages grouped by section.

In the second chapter, we describe the general demographics of these DRs and illustrate that the MPS is a highly international research environment, as only half of the DRs hold German Citizenship. We furthermore show that the gender distribution ratios vary considerably by section, as well as the average age at which female and male researchers start their PhD.

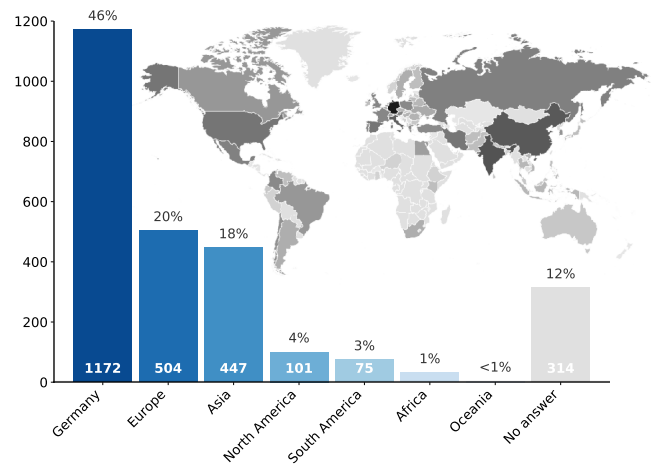


Figure 2.2: "What is your nationality? Should you have multiple nationalities, please select the one you feel best represents you." Responses of German and non-German researchers grouped by continent. Y-axis shows the number of answers.

2.1 Nationality

At 46%, the largest share of participants in this survey report are German, followed by 20% from the rest of Europe and 18% from Asia (Fig. 2.2). Interestingly, analysis by sections reveals that the nationalities are

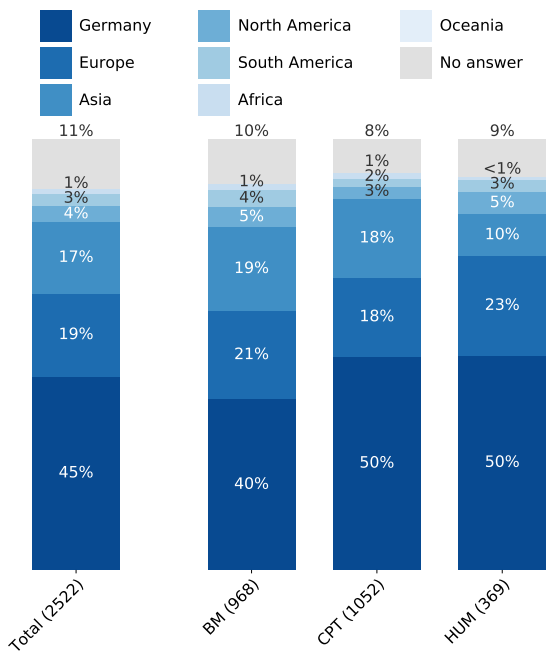


Figure 2.3: "What is your nationality? Should you have multiple nationalities, please select the one you feel best represents you." Relative response rates are grouped by section. The total number of responses is shown in brackets.

distributed differently across individual sections. While half of the DRs in the CPT and HUM sections come from abroad, 60% of DRs in the BM section identify as non-German, making it by far the most international of the three sections (Fig. 2.3). These results portray the highly international working environment for young researchers at the MPS.

2.2 Age and Gender

Of the total participants of this survey, 52% identify as male, 41% as female, and 7% as non-binary (Fig.2.4). We note that all gender-related questions had a non-binary response option. However, due to the relatively low response rate from self-identified non-binary respondents, this fraction does not yield enough data to provide statistically meaningful comparisons and thus is not considered in the following figures.

As seen in the analysis by section, the gender ratio in the BM section is fairly balanced (43 % men vs. 51 % women), whereas the

CPT section is dominated by male researchers (67 % men vs. 27 % women), and the opposite is true for the HUM section (38 % men vs. 57 % women). These results indicate wide differences in the gender distribution ratio across individual sections.

We further evaluated the age at which DRs start their doctoral work at the MPS (Fig. 2.5), as well as their year of birth (Figs. 2.6 and 2.7). The data shows that, on average,

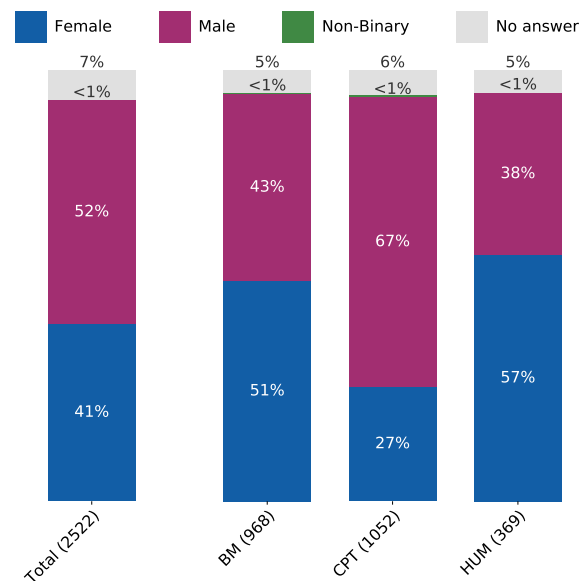


Figure 2.4: "What was your assigned sex at birth?" Relative response rates are grouped by section. The total number of responses is shown in brackets.

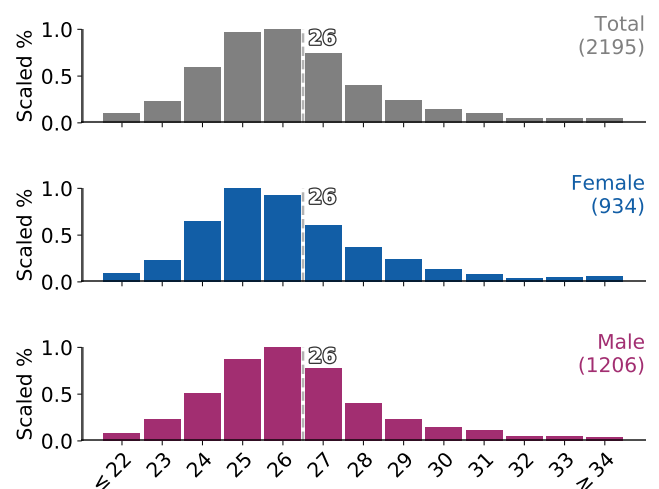


Figure 2.5: "When did you start your doctoral research?" & "What is your year of birth?" Approximate age of PhD Researchers starting their research at the Max Planck Society. Grouped by gender.

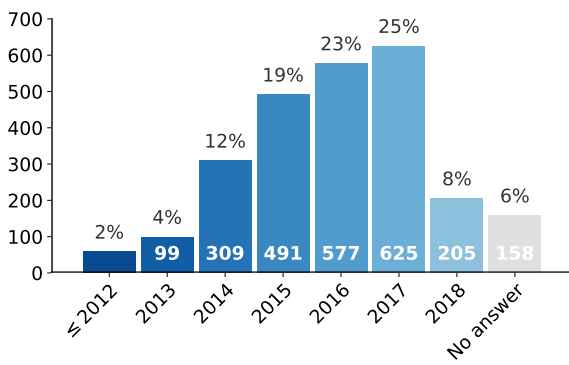


Figure 2.6: "When did you start your doctoral research?" Y-axis shows the number of answers.

female researchers start their doctoral work at the age of 25, whereas male researchers, on average, start their doctoral work at the age of 26; one year later. This holds true across all sections. A possible explanation for this difference is the one year military service

which was mandatory for men in Germany until 2011. We still see this in Figure 2.7, where the majority of DRs was 29 years old at the time this survey was evaluated.

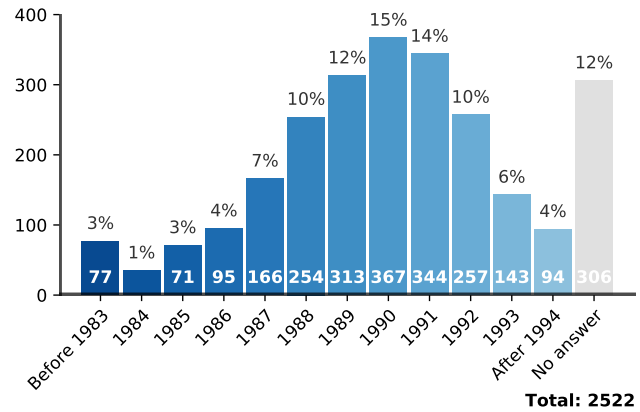


Figure 2.7: "What is your year of birth?" Y-axis shows the number of answers.

Chapter 3

Working Conditions and Satisfaction

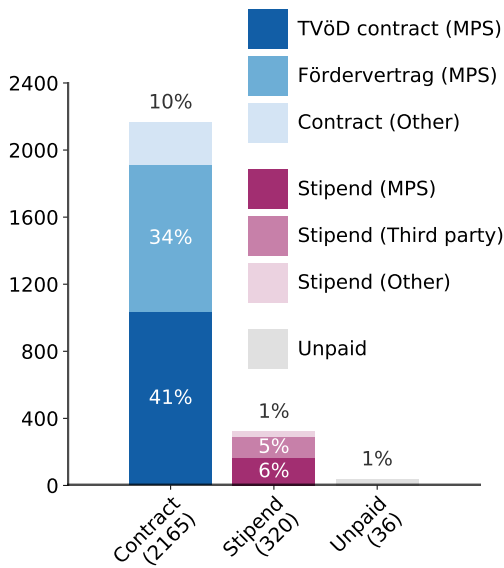


Figure 3.1: "What kind of contract do you currently have?" & "What kind of stipend do you currently hold?" Y-axis show number of answers.

3.1 Working Conditions

Doctoral researchers (DRs) significantly contribute to the quantity and quality of research in the MPS. It is crucial that their work is compensated fairly and that their working conditions meet demands. In this chapter, we take a look at DRs' funding situation, their working hours and work environments as well as at the social events offered for and attended by them.

3.1.1 Contracts and Salaries

The majority of DRs (86%) are now on contracts, marking a noticeable and welcome shift from stipends compared to previous

years. Figure 3.1 shows the distribution and types of contracts and stipends among DRs. However, we still find substantial variations in monthly salary (netto) which can be seen in Figure 3.2. There is a statistically reliable gender gap, with female DRs earning substantially less than male colleagues¹. This

¹Two sample t-test: $t(2225) = 5.85, p < .001, d = .25, BF > 100$. Because income was given as a range, we

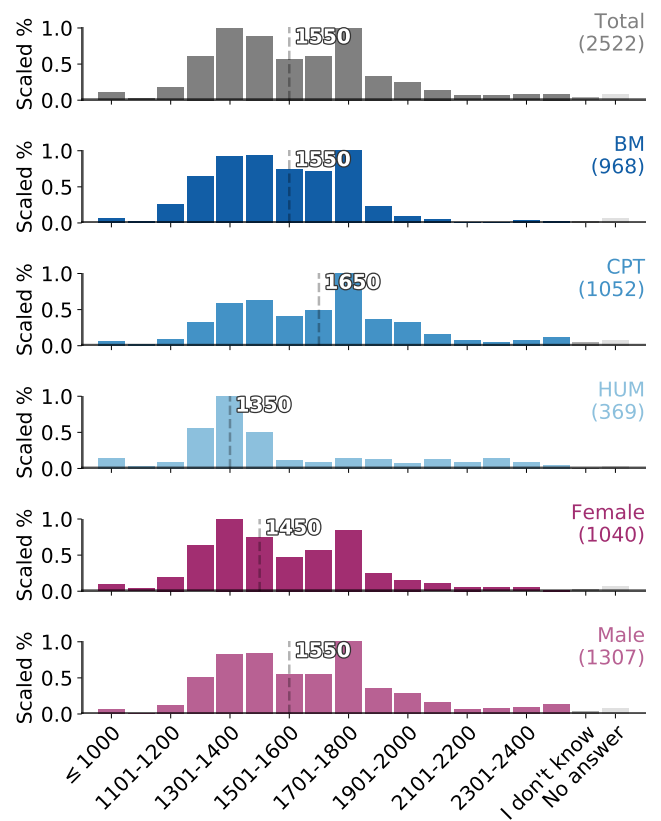


Figure 3.2: "How much money (net amount in euros) do you receive for your doctoral research work per month?" Y-axis shows the scaled number of responses relative to each section and gender.

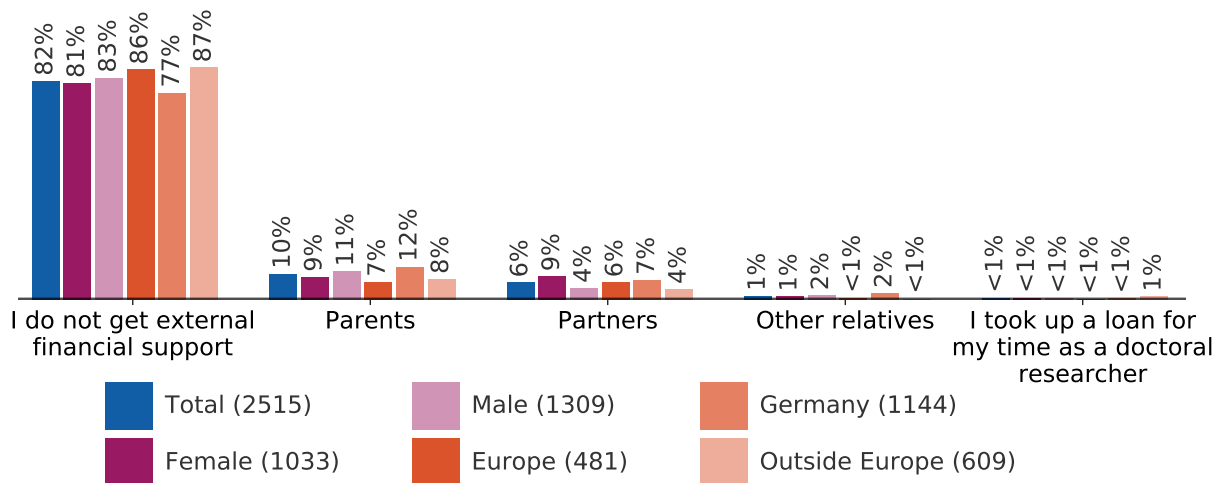


Figure 3.3: "Do you get external financial support to cover your living expenses? If yes, who is assisting you financially (multiple answers possible)?" Relative response rates grouped by section and nationality.

gender pay gap is partially mediated by the even larger variation in salary across sections. The Chemistry, Physics and Technology (CPT) section earns more than both the Biomedical (BM) section² and the Humanities (HUM) section³. There are no reliable differences between the BM and HUM sections⁴.

This inequality across sections may play a role in the gender pay gap because there is a higher ratio of females in the HUM (60% female) and BM (54% female) sections compared with the CPT section (28% female), which is predominantly male. Thus, as long as both a salary variation and a gender inequality exist across sections, we will continue to see a gender gap in PhD salaries.

3.1.2 External Support

Almost one in five DRs (18%) rely on external financial support (Fig. 3.3). One in ten

DRs borrow money from parents (10%) while about one in twenty rely on their partner for financial support (6%).

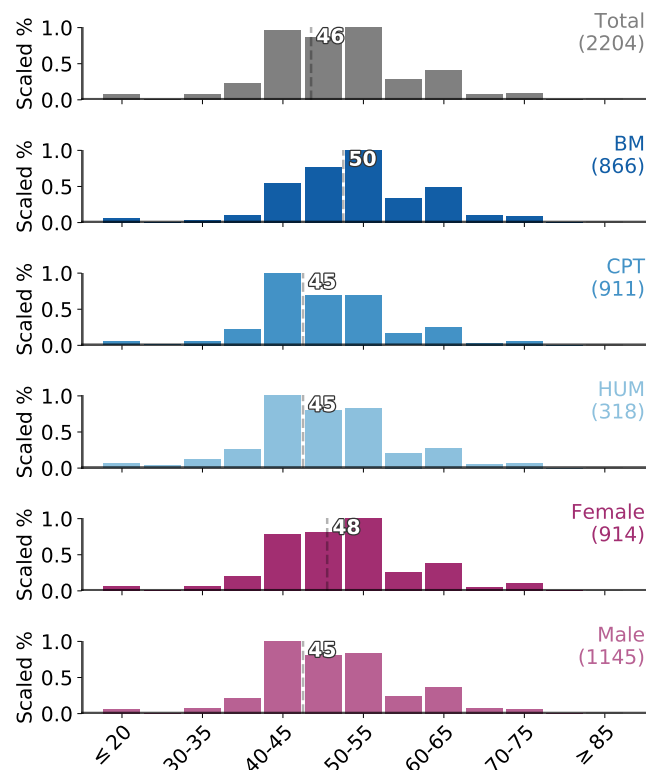


Figure 3.4: "How many hours per week do you usually work for your doctoral research, the institute or the university (courses, teaching, etc. included)?" Y-axis shows number of responses relative to each section and gender and the dashed line the median of each class.

use the median value of each range (e.g., 1350.5 for the range [1301,1400]) and use the conservative assumption that the last bin has a short tail using 2450.5 for the range "2401 or more". The Bayes Factor (BF) quantifies the relative evidence the data provide in favor of the alternative hypothesis (H_A) over the null (H_0). We report a two-sided Bayesian t-test for independent samples using a Jeffreys-Zellner-Siow prior with the scale set to $\sqrt{2}/2$.

² $t(1981) = 9.43, p < .001, d = 0.42, BF > 100$

³ $t(1392) = 6.91, p < .001, d = 0.42, BF > 100$

⁴ $t(1319) = 1.17, p = .24, d = 0.07, BF = .14$

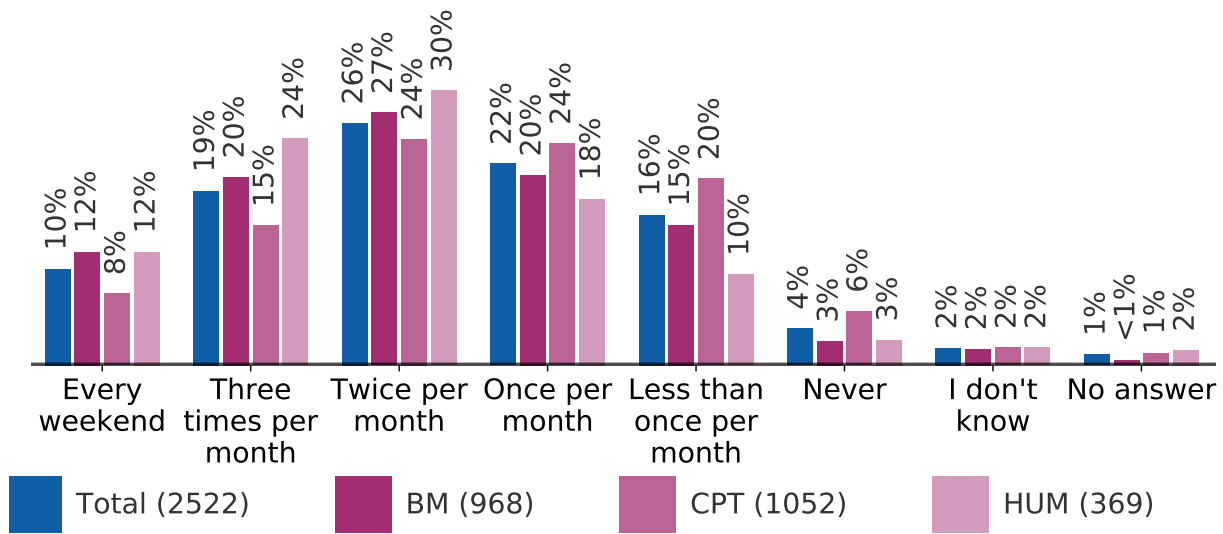


Figure 3.5: "How often have you worked during weekends or public holidays in the past year?" Relative response rates grouped by section. The total number of responses is shown in brackets.

3.1.3 Working Hours and Holidays

On average, DRs work 47.3 hours per week, with a standard deviation of ±14.6 hours (Fig. 3.4). Comparing the different sections, students in the BM section work more hours than both CPT (49.6 to 45.5 hours) and HUM (49.6 to 45.8 hours), while there were no differences between the BM and HUM sections. We found no differences between genders.

Overall, DRs are working far more than they are being paid (11.2 hours per week more on average)⁵. This reflects the strong disconnect between the hours a DR is paid for and the hours actually put in.

Figure 3.5 shows the rate that DRs report working on weekends or public holidays with the most common response being twice per month (26%), although 10% report working every weekend and 29% report working at least three times per month. In contrast, only 4% report never working during weekends or holidays. While some DRs consider the flexibility of working times an asset of the academic work environment, most DRs work on weekends or holidays by necessity; as a result of time pressure and a high workload.

⁵One sample t-test: $t(1142) = 22.78, p < .001, d = 0.67, BF > 100$.

3.1.4 Social Activities

An open atmosphere at work and regular exchanges with colleagues are vital for a healthy research environment. The majority of DRs (57%) report that their institute offers social activities like sports events, movie nights or drinks out either monthly or weekly

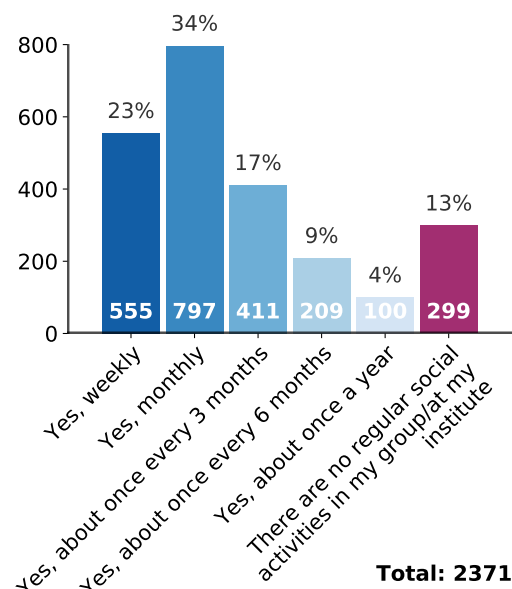


Figure 3.6: "Are there regular social activities in your group or at your institute (e.g., sports events, going out for dinner/drinks, discussion forums, movie nights, etc.)?" Y-axis show number of answers.

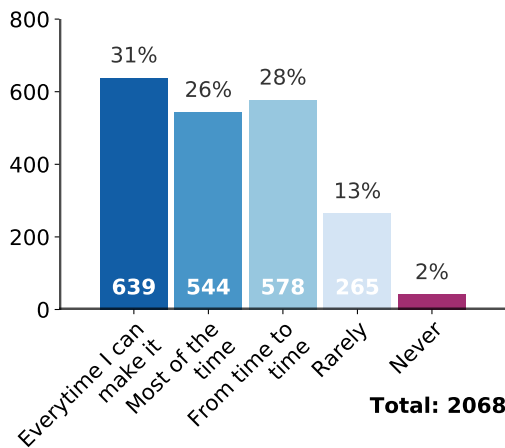


Figure 3.7: "How often do you attend these activities?" Y-axis show number of answers.

(Fig. 3.6). For a quarter of DRs, these offers are either only available once or twice per year or they report having no social activities at their institute at all.

If DRs are offered social activities, they participate in them to a great extent. 85% of DRs attend at least from time to time and about one third of DRs do so every time they can make it (Fig. 3.7). The popularity of social gatherings among DRs shows that extracurricular events are very much welcome. We found a correlation between DRs' overall level of satisfaction and the amount of social activities offered to them (data not shown). Although cause and effect might be entangled, we still want to emphasize the importance of these events for fostering social interaction and bonding.

On a more formal level, doctoral spokespersons are the link between DRs and their respective administrations and directorate and the PhDnet is the link to the MPS. While 85% of DRs know their current representatives (Fig. 3.8), only 20% of DRs have a good grasp of the activities of PhDnet (Fig. 3.9) which represents DRs' interests and perspectives mainly through the institutes' doctoral spokespeople. It would be valuable to make the PhDnet's activities and events more popular among DRs so that as many of them as possible can make their voices heard by engaging with PhDnet.

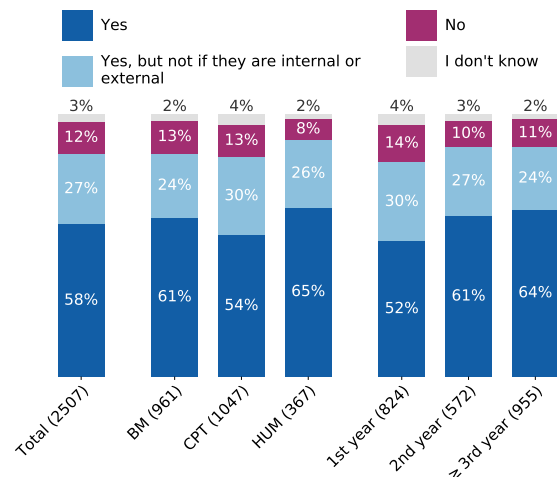


Figure 3.8: "Do you know your current internal and external PhD representatives at your institute?" Relative response rates grouped by section and PhD duration. The total number of responses is shown in brackets.

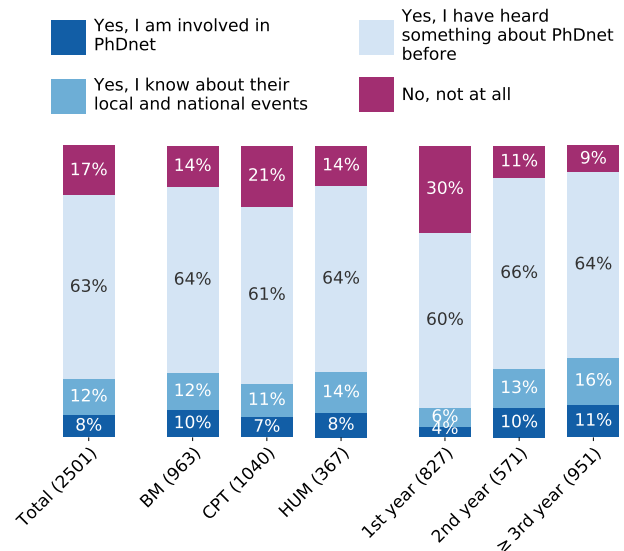


Figure 3.9: "Do you know PhDnet?" Relative response rates grouped by section and PhD duration. The total number of responses is shown in brackets.

The Max Planck Alumni Association is familiar to 30% of DRs overall (Fig. 3.10), with some differences across sections. Additionally, the MPS and PhDnet organize activities and events for DRs (Fig. 3.11), with the most popular being soft-skills seminars or workshops (18% attendance).

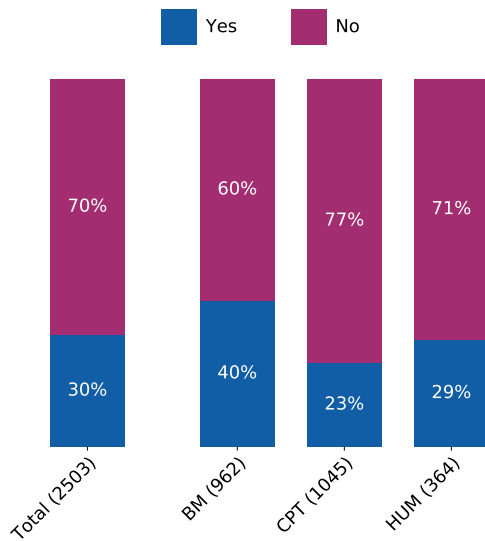


Figure 3.10: "Do you know about the Max Planck Alumni Association (MPAA)?" Relative response rates grouped by section. The total number of responses is shown in brackets.

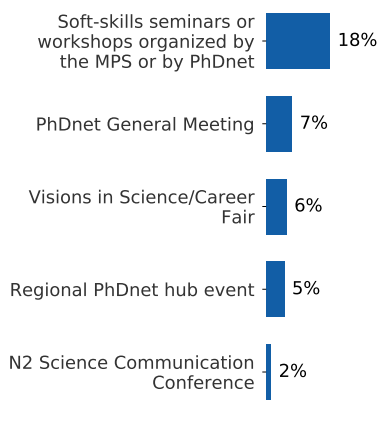


Figure 3.11: "Have you participated in any of the following events in the past (multiple answers possible)?" Relative response rates.

3.2 Satisfaction

Overall, 71% of DRs report either being “very satisfied” or “satisfied” with their PhD (see Fig. 3.12). The top aspects for which satisfaction is high are office equipment (83%) and work environment (75%). The aspects in which satisfaction is lowest are the amount of holidays (39% reporting either “very unsatisfied” or “unsatisfied”) and salaries and benefits (27%).

3.2.1 Why MPI?

There are many reasons why DRs choose to undertake a PhD degree at the MPS (Fig. 3.13). The primary reasons are scientific: 76% responded that the scientific excellence of the MPS or the research group plays a role, while 59% report interest in the specific research being undertaken at the institute. The least common reason cited is the attractiveness of pay and benefits, with only 16% reporting this as one of the reasons for choosing the MPS.

3.2.2 Giving up

Giving up a PhD is a difficult decision that 33% of DRs at the MPS have considered (either “often” or “occasionally”; Fig. 3.14). More female researchers have considered giving up than males⁶. The same is true for those DRs closer to finishing their PhD⁷. There were only marginal differences across sections⁸.

Summary

- 86% of DRs are now on contracts.
- There is a reliable gender gap, with female DRs earning less than male colleagues.
- The gender gap may be partly due to a large difference in salaries across sections, where the CPT section is systematically paid more than other sections, and is also the most male dominated section (28% female).

⁶ $\chi^2(1) = 35.1, p < .001, BF > 100$. We report the default Gunel and Dickey (1974) Bayes factors for contingency tables using a Poisson sampling plan.

⁷Logistic regression of PhD year on giving up either “often” or “occasionally” vs. “never” or “rarely”; $\beta = 0.23, p < .001, BF > 100$. We approximate the Bayes Factor using bridge sampling to compare our model against an intercept only null model.

⁸ $\chi^2(2) = 6.3, p = .043, BF = 0.26$

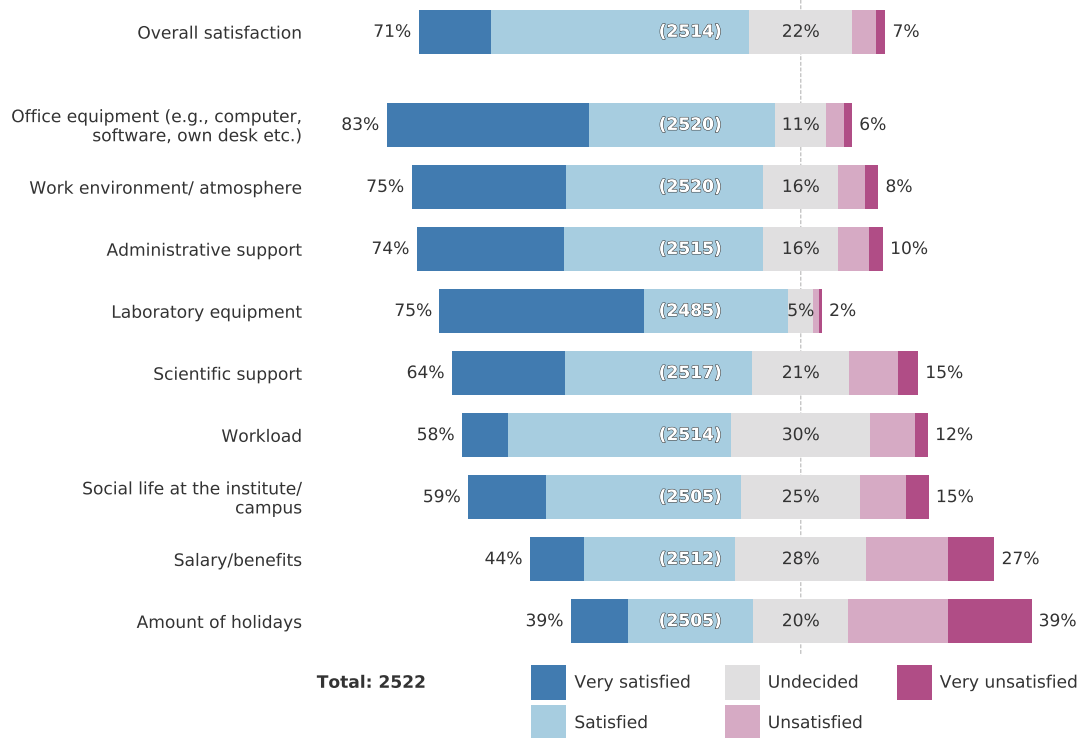


Figure 3.12: "Please rate your overall satisfaction with the following aspects of your PhD" The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Never/Rarely" and "Occasionally/Often" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

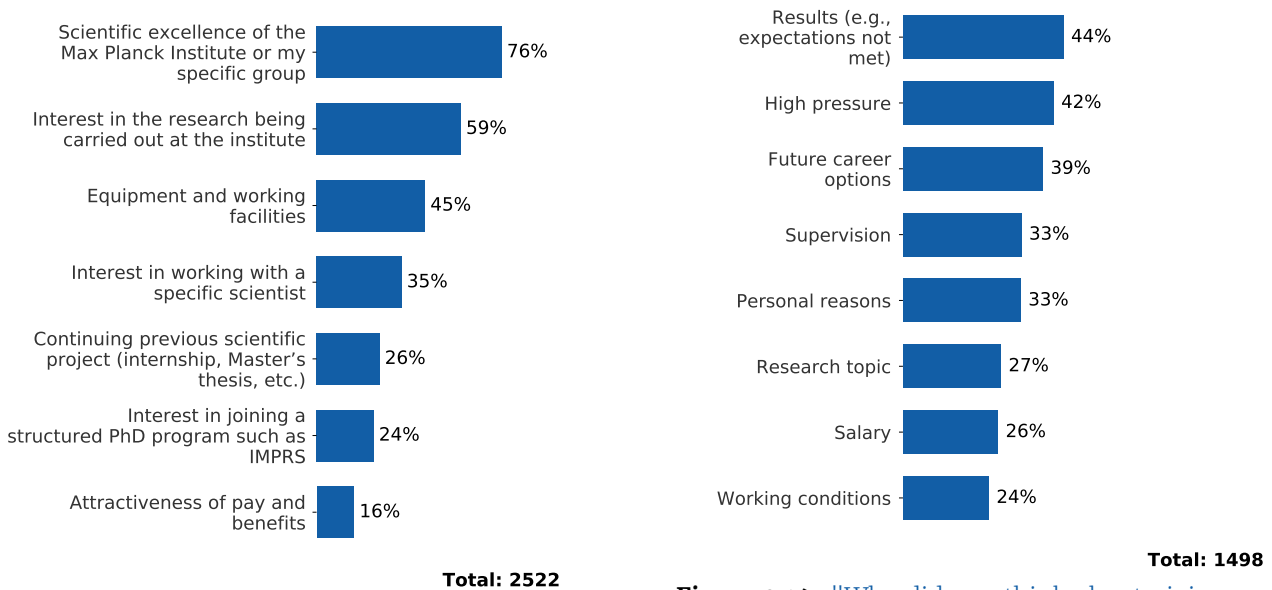


Figure 3.13: "Why did you start your work on your doctoral thesis at the Max Planck Society (multiple answers possible)?" Relative response rates.

Figure 3.14: "Why did you think about giving up your PhD (multiple answers possible)?" Relative response rates. The total number of responses is shown in brackets.

- On average, DRs work 47.3 hours per week, which is 11.2 hours more than they are paid for. Only 4% of DRs never work on weekends or holidays.
- Social activities for DRs are offered in most institutes and are welcomed by the majority of DRs.
- DRs are overall quite satisfied (71%).
- The highest satisfaction is related to office equipment and work environment, while the greatest dissatisfaction is related to the amount of holidays and the salary and benefits.
- DRs are attracted to the MPI based on the scientific reputation and the research being conducted, although the pay and benefits are the least attractive aspects.
- 33% of DRs consider giving up, with the rate higher for female researchers and increasing with each additional year of the PhD.

Chapter 4

Scientific Practices and Supervision

The credibility of scientific results largely depends on the framework in which they are generated. This includes compliance with best practices and is tightly coupled to the attitude and intentions of the researchers. A large part of scientific output is generated by doctoral researchers (DRs). It is therefore crucial to evaluate their experiences and to understand their relationship with the academic system and in particular with their direct supervisors.

In this chapter, we present the results of the survey related to the role of DRs in the academic system. The current PhDnet survey is the first that addresses the experience of DRs with good scientific practice. We also put a special focus on supervision which has been shown in previous sections to be an important determinant of overall DR satisfaction.

4.1 Scientific Practices

4.1.1 Research output

The most common contribution to academic science are conference posters, followed by conference talks and research articles (Fig. 4.1). While DRs start very early with posters, most do not publish their first article before the third year. Book chapters are less common as they are mostly written by more senior researchers. Patent applications are also less frequent as the focus of the MPS is basic research.

4.1.2 Good scientific practice

The most commonly observed violation of good scientific practice is sloppy work. As the term itself is subject to interpretation, we defined it as intentionally skipping necessary checks or steps in a study, e.g., for time

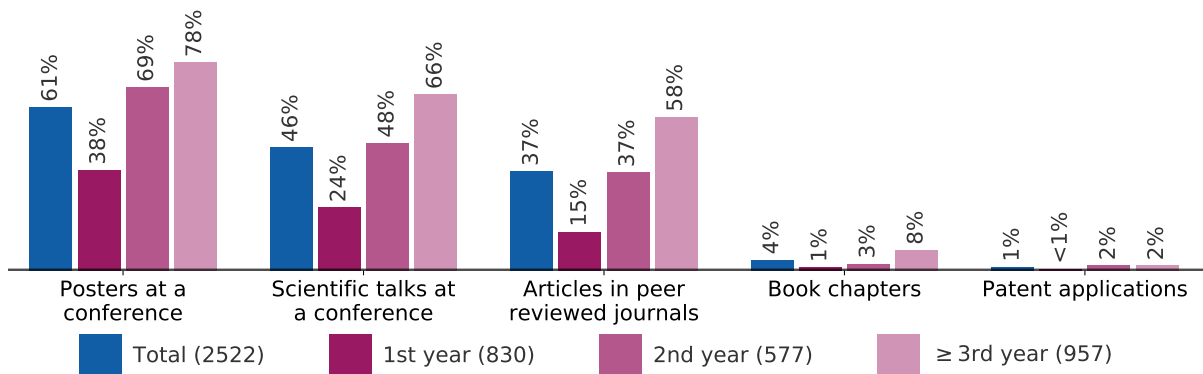


Figure 4.1: "Which of the following types of scientific output have you published so far during your doctoral research (multiple answers possible)?" Relative response rates grouped by types of scientific output.

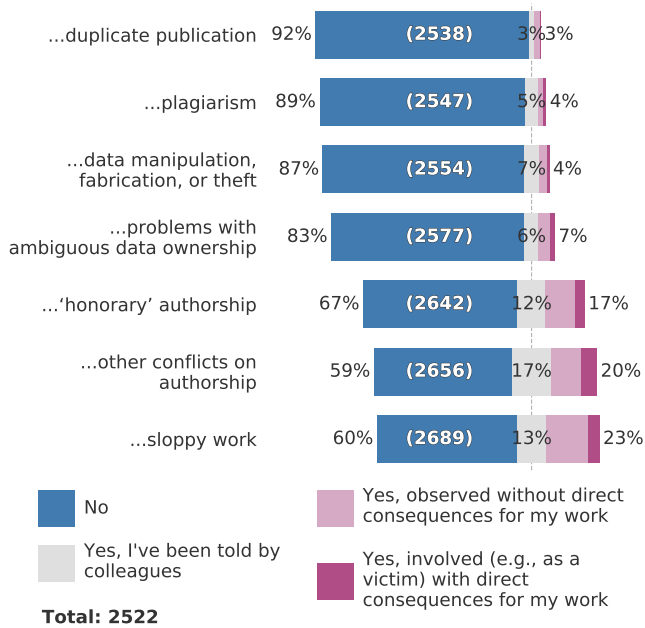


Figure 4.2: "Have you been involved in or observed sloppy work (multiple answers possible)?" The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "No", and "Yes, observed without direct consequences for my work", "Yes, involved (e.g., as a victim) with direct consequences for my work" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

reasons or to not endanger results that support one’s hypothesis. 23% of DRs reported that they were either involved in or had observed this behavior (Fig. 4.2). We did not ask for reasons for specific behaviors, so we can only speculate based on other investigations, e.g., in the context of the ongoing “replication crisis” in parts of biomedical research and the social sciences. One reason to skip necessary checks could be a high workload within limited time and funding. Another one might be the desire (or pressure) to deliver exciting results that can be published in high-impact journals, which is tightly connected to career success.

Conflicts about authorship are similarly widespread (20%) and honorary authorship (17%) seems to be a major problem. Since authorship is a defining feature in the evaluation of academic success, the assignment of authorship, especially in highly collaborative,

interdisciplinary and international projects, is prone to conflicts. These conflicts might also be amplified in collaborative projects when different traditions of assigning authorship and the order of authors in a publication collide. In contrast, duplicate publication is the least common observed violation (3%). This is likely due to the ease of detection, especially given modern plagiarism detection software. Similarly, plagiarism and data manipulation were not observed frequently (4% each). Slightly more DRs (7%) encountered data ownership problems.

Results on the awareness of best practices and knowledge of the relevant reporting mechanisms can help tackling problems with best-practices violations. We find that about half (49%) of DRs feel confident about their

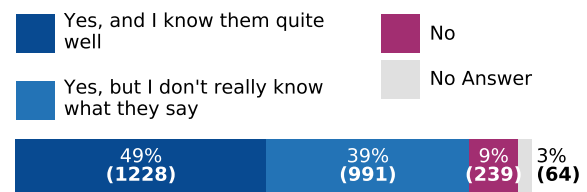


Figure 4.3: "Are you aware of the regulations on good scientific practice by the Max Planck Society?" The bar chart shows the total number of responses and its percentages.



Figure 4.4: "Is there a neutral person to turn to in case you observe severe misconduct (ombudsperson)?" The bar chart shows the total number of responses and its percentages.

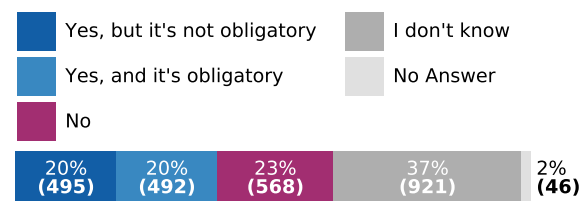


Figure 4.5: "Do you have a workshop on good scientific practice at your institute?" The bar chart shows the total number of responses and its percentages.

knowledge of the regulations on good scientific practice (Figs. 4.3 to 4.5), even though 88% know about them. To resolve arising conflicts, it became mandatory for every institute to have an ombudsperson. About a third of DRs (29%), however, do not know whether there is an ombudsperson at their institute. Many DRs also raised doubts about their ombudsperson's neutrality. These results suggest that the present system of regulations and ombudspersons is not sufficiently implemented and communicated.

It is therefore no surprise that only 5% have reported scientific misconduct, despite many more claiming to have observed it (Figs. 4.6 and 4.7). From this low number of reports, more than half of the cases could be resolved with about a quarter (13% of 53%) entailing negative consequences for the reporter. In

30% of the cases no action was taken. For 18% of the reports the outcome is unknown.

4.1.3 Attitudes towards academia

DRs clearly distinguish between what they consider to be the most and the least attractive aspects of an academic research career. (Fig. 4.8). The most attractive aspect is to bring a service to society, followed by teaching and international mobility. The least attractive aspects are issues related to the academic job market; salaries and availability of permanent positions are rated as very unattractive, similar to applying for funding. The other group of negative aspects is defined by a lack of compatibility of an academic career with family aspects (children and career plans of partner). Only the workload is seen as neutral by a relative majority (49%).

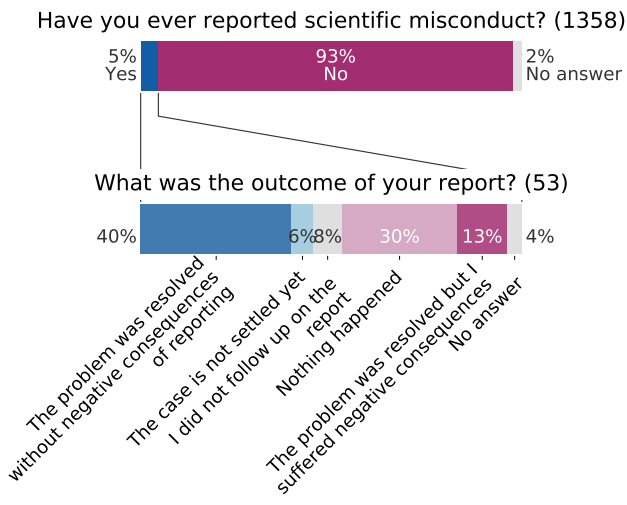


Figure 4.6: "Have you ever reported scientific misconduct?" & "What was the outcome of your report?" The bar chart shows the total number of responses and its percentages.

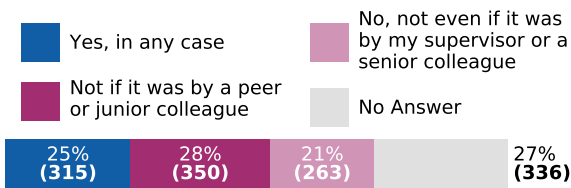


Figure 4.7: "Do you think you would face negative consequences for reporting misconduct in your group?" The bar chart shows the total number of responses and its percentages.

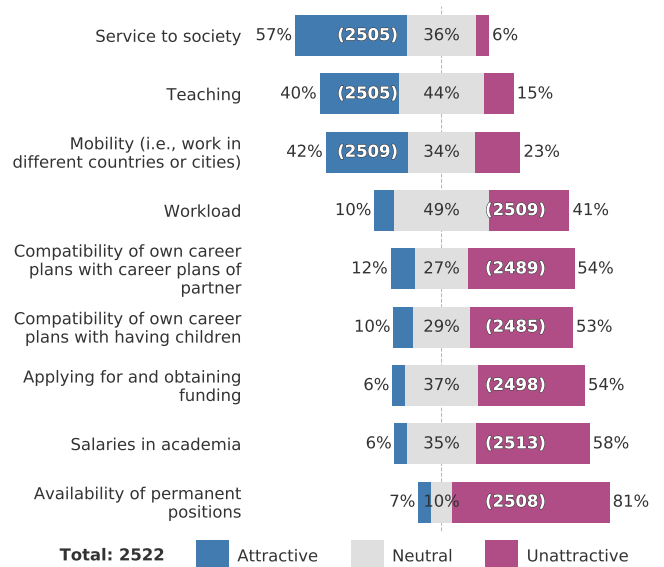


Figure 4.8: "In general, how do you judge the following aspects of an academic research career?" The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Attractive" and "Unattractive" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

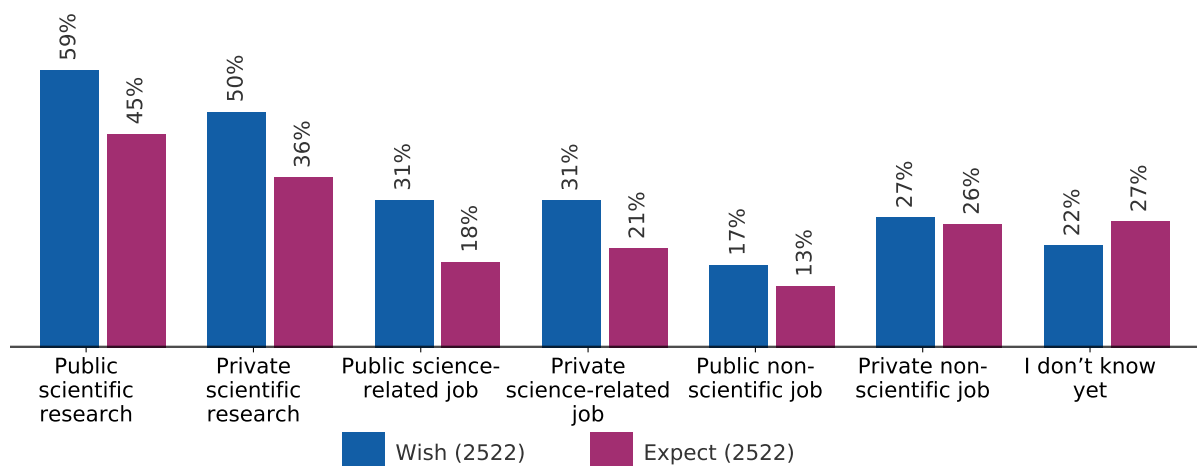


Figure 4.9: "Which field would you like to work in after completing your PhD (multiple answers possible)?" & "Which field do you expect to work in after your PhD (multiple answers possible)?" Relative response rates. The total number of responses is shown in brackets.

4.1.4 Career planning

Similar to last year's survey, we noticed a discrepancy between career wishes and career expectations of DRs. For all fields, the number of people who wish to pursue an academic career is greater than the number of people who expect to really stay in academia (Fig. 4.9). The gap has slightly decreased compared to the previous survey. This shows that DRs in the year 2018 are more informed about their career perspectives than previously and is probably a result of the increasing access to career planning and soft-skills workshops in the MPS. Still, most DRs pursue their PhD with the wish to work in pub-

lic (59%) or private (50%) scientific research. However, much less expect to work in these fields (45% and 36%, respectively).

DRs are very flexible concerning their geographic preferences (Fig. 4.10). More than a third (36%) have not yet decided where they want to live after their PhD. Most of them (38%) want to stay in Germany, mostly those that originally are from Germany.

4.2 Supervision

4.2.1 Direct and Formal Supervision

To obtain a clearer picture of the supervision situation, we asked DRs about their direct and their formal supervisors as well as about the frequency of meetings in which the project is discussed. We defined the direct supervisor as the person who is in closest contact with the PhD project while the formal supervisor refers to a second person who is affiliated with the PhD project but supervises less extensively. Both positions could be held by the same person.

61% of DRs report that their formal supervisor is also their direct supervisor (Fig. 4.11). About half of direct supervisors are group leaders, about one third are directors or professors and only a minority occupy a different

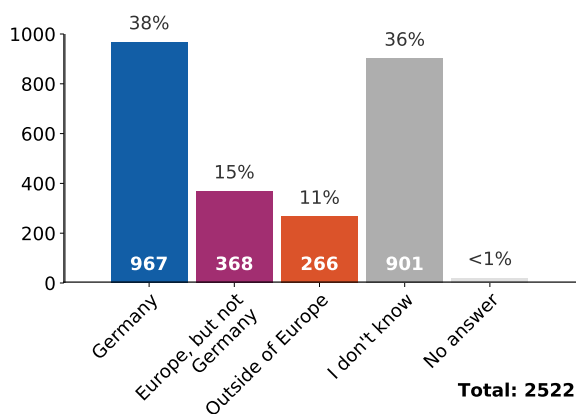


Figure 4.10: "Where do you see yourself living after your time as a doctoral researcher?" Y-axis shows the number of answers.

position (Fig. 4.12). About one third of DRs have a formal supervisor and a direct supervisor, most of whom did not have the option to choose their direct supervisor. About one eighth of DRs report not having the option to change their supervisor if they wanted to. The majority of DRs are satisfied with their supervisors – more than two thirds of them never consider personal changes in supervision and only five percent say they often consider changing their supervisors (Figs. 4.13 and 4.14). The majority (60%) of DRs meet their direct supervisors weekly or even daily to talk about their projects, but a significant

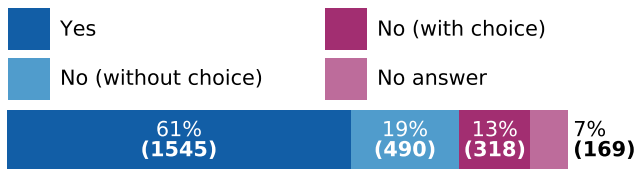


Figure 4.11: "Is your formal supervisor your direct supervisor?" The bar chart shows the total number of responses and its percentages.

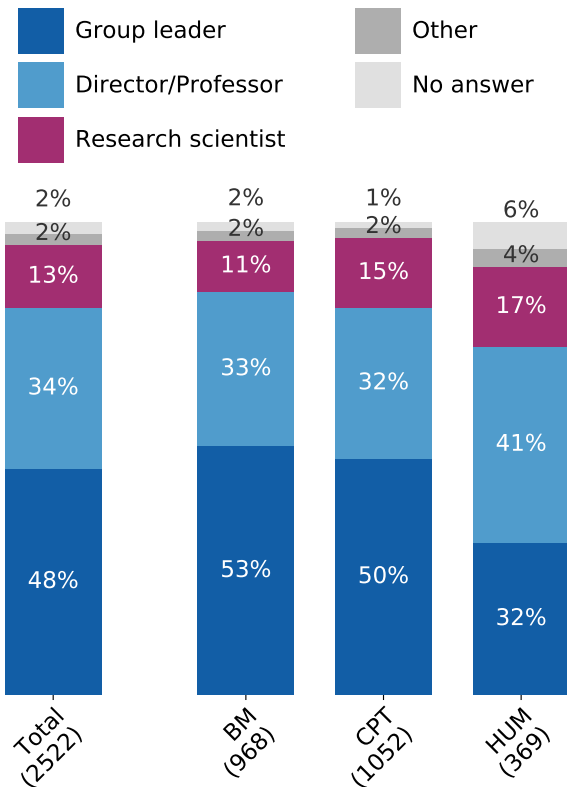


Figure 4.12: "What's your direct supervisor's position?" Relative response rates are grouped by section. The total number of responses is shown in brackets.

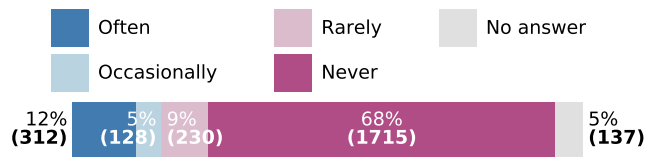


Figure 4.13: "Did you ever consider changing any of your supervisors?" The bar chart shows the total number of responses and its percentages.

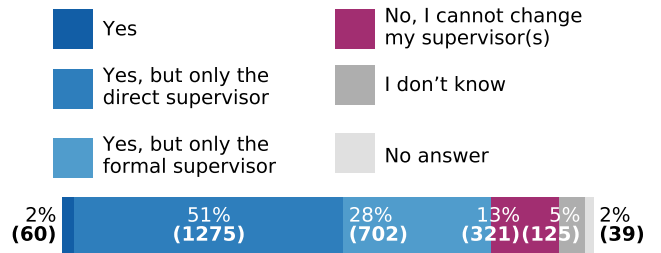


Figure 4.14: "If necessary, are you able to change your supervisor(s)?" The bar chart shows the total number of responses and its percentages.

proportion (16%) of them meet their direct supervisors less than once a month. There is a clear gender difference: Female DRs meet their supervisors less frequently than their male counterparts which can partly be accounted for by a higher share of females in the HUM section and a lower share in the CPT section, the latter one being characterized by more frequent supervision patterns in general (Fig. 4.15).

We also asked about the number of other DRs supervised by one's own supervisor. Direct supervisors advise four to five other DRs on average while about one fifth of DRs has to compete with more than six others for their direct supervisor's time (Fig. 4.16). Formal supervisors supervise even more projects – ten on average (Fig. 4.17).

4.2.2 Thesis Advisory Committee

More than two thirds of DRs have a Thesis Advisory Committee (TAC); 8% of those meet their TAC only once during their PhD while 67% meet once a year and 13% once per semester. 58% of DRs agree that their TAC significantly contributes to the scien-

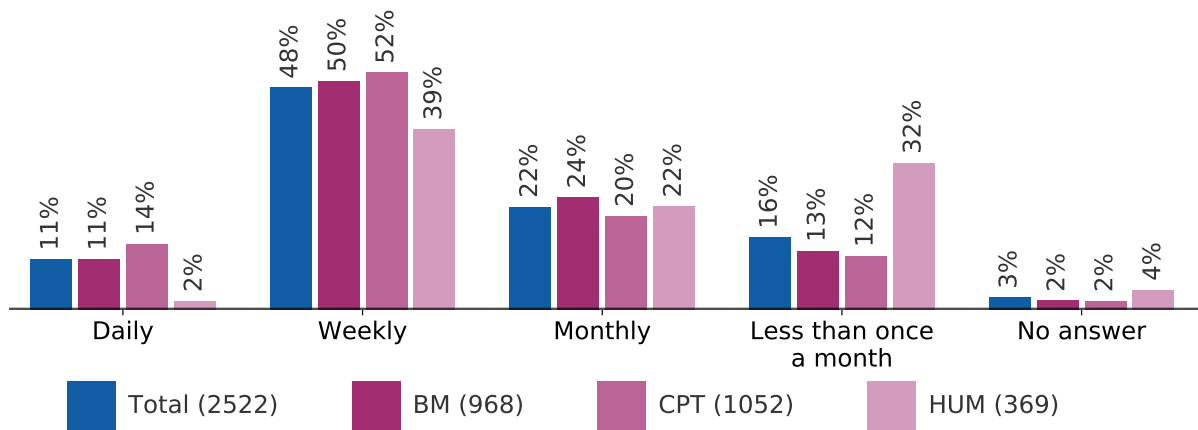


Figure 4.15: "On average, how often do you meet your direct supervisor to talk about your project?" Relative response rates grouped by section.

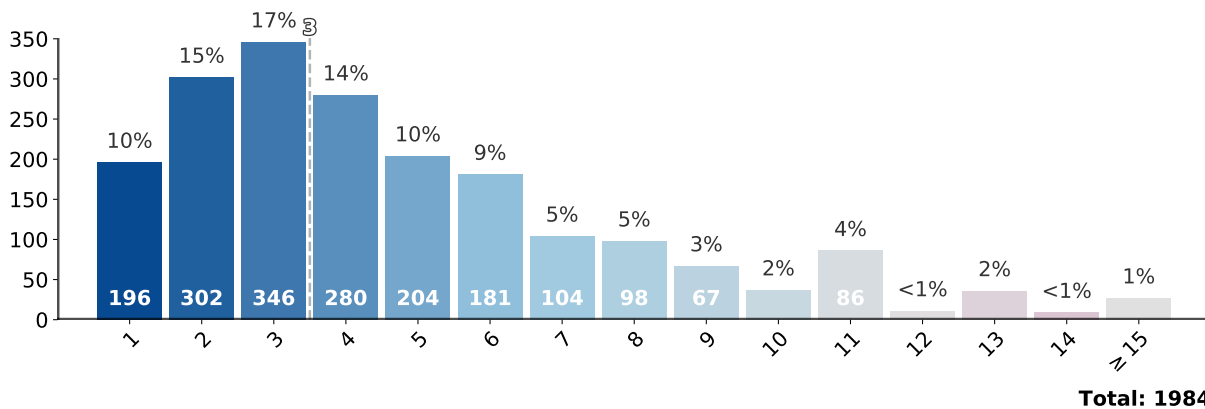


Figure 4.16: "How many other doctoral researchers (yourself not included) does your direct supervisor have?" Y-axis shows the number of answers and the dashed line the median of each class.

tific quality of their projects. 49% think that their TAC helps them in planning their research and 42% think that their TAC will help them completing their dissertation on time (Fig. 4.19).

4.2.3 Other Mentors

Informal exchanges with other people are an important resource for many DRs (Fig. 4.18). While more than 80% of them discuss their research with other colleagues in their research group and almost 70% discuss their research with other colleagues at their institute, more than one third of DRs report that talking to their friends and family about their work contributes to it as well. In fact, only 1.3% and 1.7% respectively report that they don't talk to others about their research or

that informal exchanges are not important for their work.

4.2.4 Supervision and Satisfaction

Good supervision is the key to a successful research project. In addition, and maybe more importantly, the quality of supervision significantly contributes to a positive work atmosphere, to personal confidence in one's abilities and to overall job satisfaction for DRs. While more than three quarters of DRs think that their supervisor is open to their ideas, informed about the current state of their research and that she or he has excellent knowledge of their field of research, there is still a considerable number of DRs who think otherwise (Fig. 4.19). Male DRs and those working in the CPT section are gener-

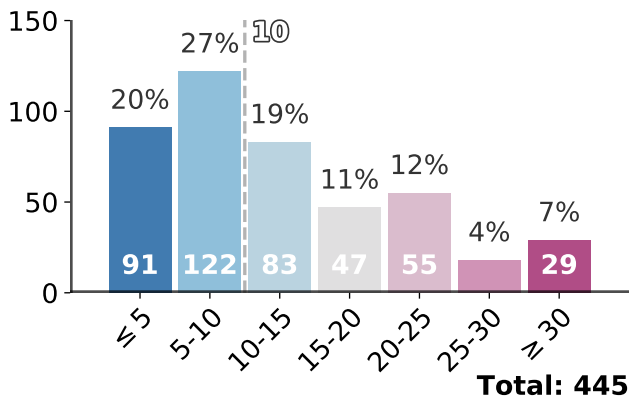


Figure 4.17: "How many other doctoral researchers does your formal supervisor have?" Y-axis shows the number of answers and the dashed line the median of each class.

ally more satisfied with their supervision situation. The HUM section occupies an intermediary position while DRs in the biomedical section are least satisfied with their supervision.

In our survey data, we also observe significant positive correlations between DRs' overall satisfaction and the frequency of their supervisory meetings (Fig. 4.20). The same is true for the relationship between DRs' overall satisfaction and their assessment of every aspect of supervision (e.g., openness, availability, provision of helpful feedback). Similarly, a more negative assessment of su-

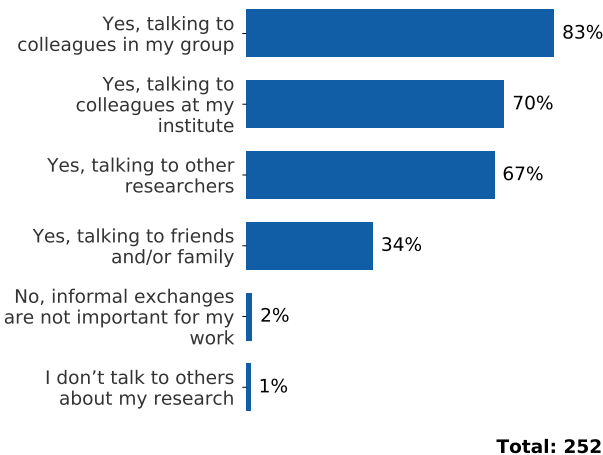


Figure 4.18: "Do you feel informal exchanges with other people contribute to your work? If yes, what kind of exchanges (multiple answers possible)?" Relative response rates.

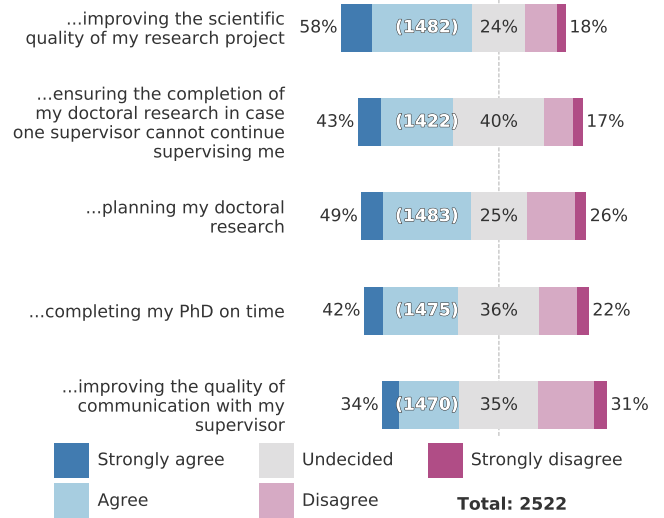


Figure 4.19: "How much do you agree with the following statements: My Thesis Committee significantly contributes to..." The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Strongly agree", "Agree", and "Disagree", "Strongly disagree" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

perception is strongly related to a higher frequency of thinking about giving up one's PhD (Fig. 4.21). Almost 40% of DRs who report having thought about giving up their PhD at some point mention supervision as a reason.

Finally, we asked DRs who they think is mainly in control of different aspects of their PhD (Fig. 4.22). While almost all DRs feel like being in control of their daily routine and of their daily work hours, a considerably smaller share of them feel like being in control of their research topic or of having a say in deciding when and where their work is going to be published. Intriguingly, almost half of all DRs think that others – such as: supervisors, institute directors or their Thesis Committee members – are in control of the total duration of their research. Drawing on these findings, we would like to disentangle these aspects in future surveys and assess what are the reasons behind these statements.

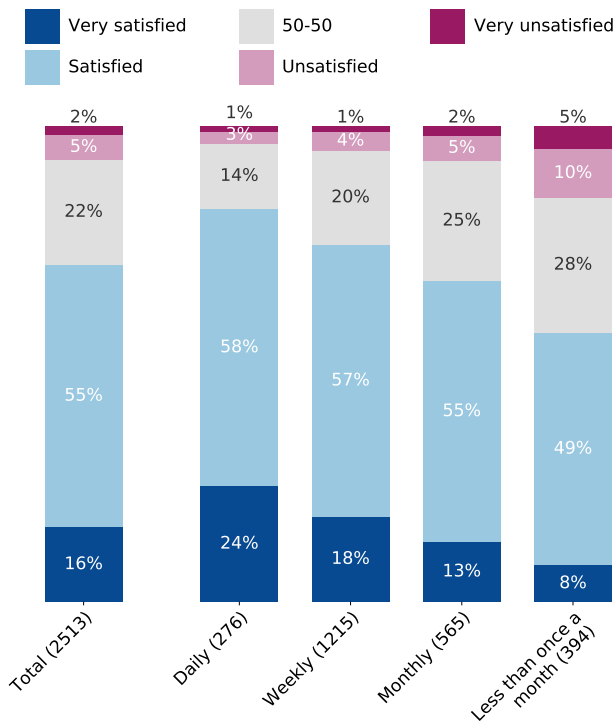


Figure 4.20: "On average, how often do you meet your direct supervisor to talk about your project?" & "Please rate your overall satisfaction with the following aspects of your PhD: [Overall satisfaction]." Relative response rates.

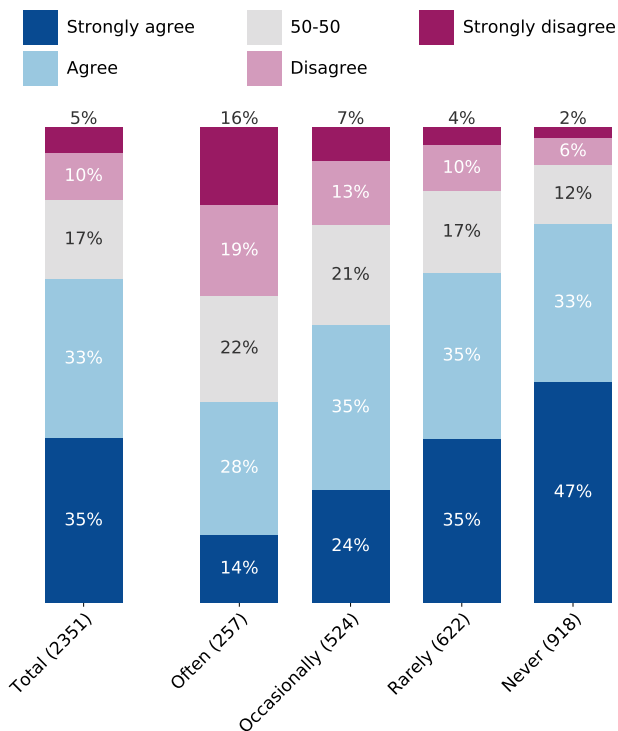


Figure 4.21: "Have you ever thought about giving up your PhD?" & "Please rate how much the following applies to your direct supervisor." Averaged relative cumulative response rates of all questions as being asked for supervision. Stronger agreement indicates a more positive view on supervision.

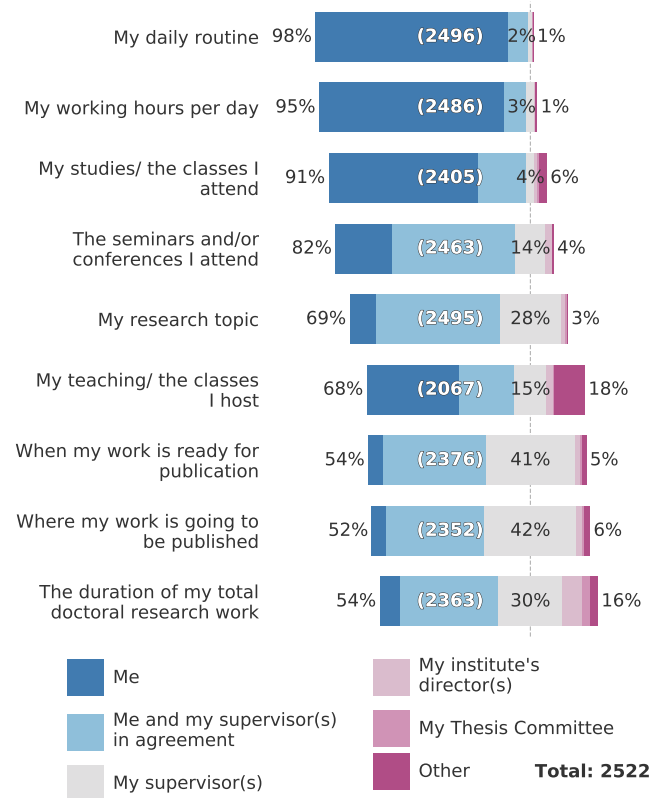


Figure 4.22: "Who is, in your opinion, mainly in control of the following aspects?" The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Me", "Me and my supervisor(s) in agreement", and "My institute's director(s)", "My Thesis Committee", "Other" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

Summary

- The most common violation of best scientific practice is sloppy work, i.e., skipping necessary steps or checks in the research process.
- Authorship of research articles is a main cause of conflicts and honorary authorship is still a problem.
- Knowledge about best practices and especially about the ombudsperson system has not reached all DRs yet.
- DRs value the service of society their work comes with. They also like teaching and international mobility while the academic job market and the lack of compat-

ibility with family planning are perceived as less attractive.

- Job wishes and expectations of DRs differ. Many do not expect to work in a research job even though they wish to.
- About 60 % of DRs meet their direct supervisors weekly or daily while 16% of them meet their direct supervisors less than once a month.
- Female DRs meet their supervisors less frequently than male DRs which is partly a result of different gender ratios across section.
- On average, supervisors advise four to five DRs at the same time.
- More than two thirds of DRs have a Thesis Advisory Committee (TAC) and a majority of them thinks that their TAC significantly contributes to the quality of their research.
- There are pronounced differences regarding DRs' satisfaction with their supervisors across sexes and across sections.
- DRs' satisfaction with their supervision and the frequency of supervision show a strong correlation with DRs' likelihood to consider giving up their doctoral research as well as with their level of overall satisfaction.

Chapter 5

Family Planning

Mastering the early challenges of being an academic scholar is tough, even when devoting the majority of time to the task. Arguably the same statement can be made for being a parent. Hence, the question stands how those two worlds can be combined sensibly, a challenge itself which is proactively faced by the Max Planck Society¹.

The current survey specifically queried the family planning situation of doctoral researchers (DRs). What obstacles in their work environment are commonly faced by DRs when considering to start a family? How many DRs are parents and are they satisfied with their family support? Is the support offered by the MPS considered an asset?

5.1 There is no rush, but why?

Currently, 8% of female DRs have or are expecting children (Fig. 5.1); in comparison to 15% of women with higher education between 25–29 in Germany.² Parents are dramatically underrepresented in the MPS. Why are DRs reluctant to have children?

Of the childless DRs roughly 70% (1434 DRs) actually want to have children, but the majority of those prefer to have kids after their doctoral research. The most quoted reason not to have children during the doctoral research is a lack of money to support children (819 DRs), followed by unfriendly working conditions (770 DRs). In total, more than 80% (1149 DRs) name reasons related to their work environment for not wanting children (Fig. 5.2). The wish for a child is pushed to the time after the PhD, which paints a dire picture for the compatibility of parenthood and a PhD.

Comments often include the frequent traveling as scientists or high stress as reasons that we did not ask for specifically. Comments such as:

"I feel often so stressed out, that I cannot imagine to take care for children in the near future."

or

"The high demand on mobility when pursuing a scientific career during the

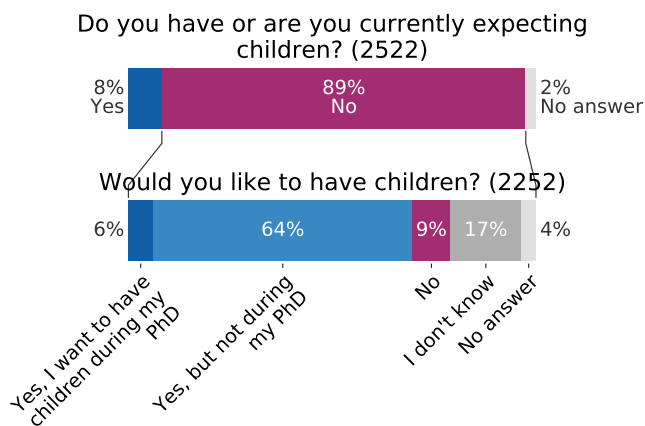


Figure 5.1: "Do you have or are you currently expecting children?" & "Would you like to have children?" Relative response rates. The total number of responses is shown in brackets.

¹<https://www.mpg.de/11723196/family-and-career>

²Daten zu Geburten, Kinderlosigkeit und Familien – Ergebnisse des Mikrozensus 2012 – Tabellen zur Pressekonferenz am 7. November 2013 in Berlin

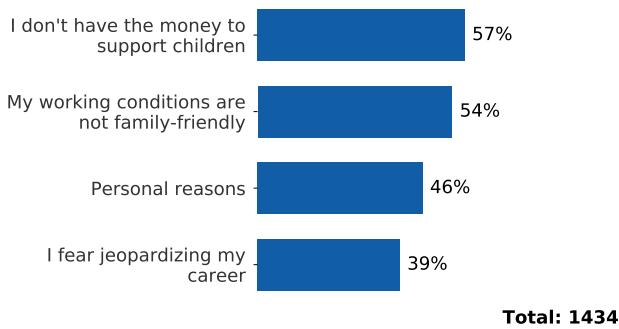


Figure 5.2: "What are the reasons that you don't want to have children during your PhD (multiple answers possible)?" Relative response rates.

time when most people would like to have kids (age 25-35) is very detrimental to the founding of a family."

are representative comments for the majority of responses. Other reasons mentioned in the comment box include a feeling of insecurity for the time after the PhD or being afraid of not getting an extension after the parental leave.

5.2 Being a parent during the PhD

Even though parents or expecting DRs are more optimistic than non-parents by some accounts, the general situation for parents is difficult. As an example for the apparent optimism: the overall satisfaction of parents is either on equal levels or else higher than that of other DRs (data not shown). Furthermore, the support received from the institute is more often perceived as being sufficient by parents than it is expected to be by non-parents. Yet, still 76% (153 DRs) of parents feel that there is not enough support; either financially, organizationally or both: a daunting number.

Most parents (57%; 117 DRs) agree that they have family-friendly working conditions at their institute, while the number of parents who feel like they have enough money to support children equals the number of parents who do not (39% and 37% respectively, Fig. 5.4). 64% (130 DRs) of par-

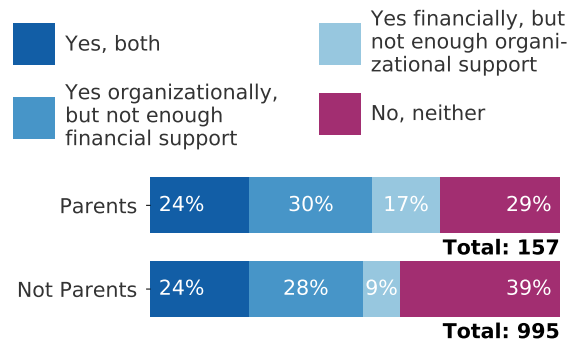


Figure 5.3: "Do you feel that there is sufficient support (financial and organizational) from your institute for raising a child?" The bar chart shows the total number of responses and its percentages.

ents have worries about their academic career because of having children and only 16% disagree. A looming fear of not being able to combine a future career and their children accompanies being a parent as a DR at the MPS and the concerns are voiced in the survey:

"Having a child is a big commitment, which absorbs a lot of your time and energy. This comes back to the lack of clear rules of the competitive game within science operates: I am better able to outmatch my competitors if I do not have a child than if I do have one."

Parents and DRs who wish to have children during their PhD were also asked if their

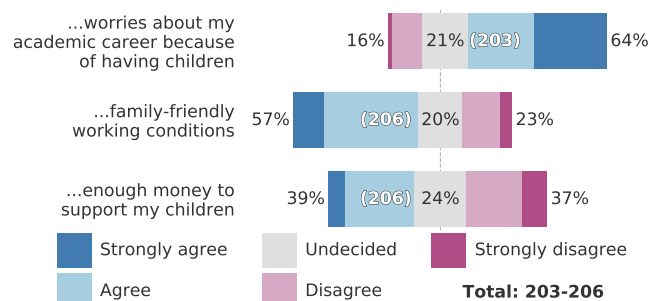


Figure 5.4: "How much do you agree with the following statements? I have..." The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Strongly agree", "Agree", and "Disagree", "Strongly disagree" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.



Figure 5.5: "Does your institute offer support in childcare services (e.g., access/financial support for daycares, child-friendly environment, reimbursements for daycares during business travel, etc.)?" The bar chart shows the total number of responses and its percentages.

institute offers support in childcare services (Fig. 5.5). Only 9% reply with "No", showing a widespread availability of such facilities. However, 30% did not know about the situation at their institute. This indicates that access to information on childcare services is problematic for those who want to directly benefit from such services. Beyond individual institutes the comment section reveals that the child support in the MPS overall is difficult to deal with:

"The MPG childcare fund is appreciated, although the first year was complete chaos in regards for applying, as it seemed no-one knew what the criteria were or who was eligible."

5.3 Parental leave and Equal Opportunities Officer

In Germany, employees – and with that DRs on a contract – are allowed to go on paid parental leave after childbirth³. The allowance and the total duration vary, but it is encouraged that both parents stay with the child for some time. Furthermore, the allowances encourage an easy transition period between the parental leave and full-time work by supplementing a part-time employment with extra funding.

³<https://www.bmfsfj.de/bmfsfj/service/publikationen/.../elterngeld-elterngeldplus-und-partnerschaftsbonus/133568> or <http://www.bamf.de/EN/Willkommen/KinderFamilie/.../Elterngeld/elterngeld-node.html>

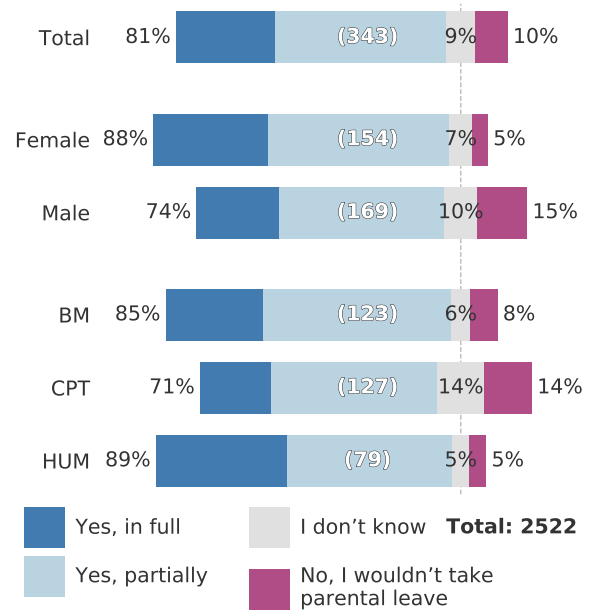


Figure 5.6: "If you are or were to have children during your doctoral research, would you take parental leave?" The black dashed line indicates a reference point of the neutral position; the ratio of responses stating "Strongly agree", "Agree", and "Disagree", "Strongly disagree" is given by the percentages on either side of the bar. The total number of responses is also shown in brackets.

Most of the DRs who are parents and those who plan to have children during their PhD would opt for a parental leave period (80%, see Fig. 5.6). Yet, the majority would not want to take full parental leave but would rather go back to work earlier (Fig. 5.7). The most quoted reason not to take full parental leave (74%) is finishing up the PhD, but also the workload (45%) is an often cited reason. Only 17% of people do not feel like it is necessary to take full parental leave, indicating that most DRs would prefer to take a longer parental leave than they feel comfortable with taking.

Even though the gender differences are not large, female DRs are more likely to take parental leave compared to men. The inequality is mentioned frequently in the comments section, often with a frustrated connotation:

"I noticed that at our institute, many male PhD candidates and post-docs

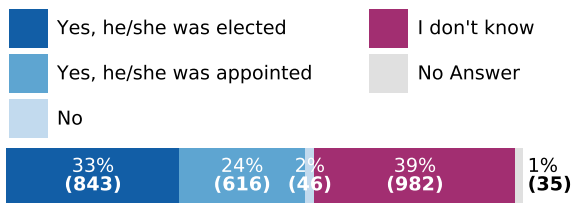


Figure 5.8: "Is there an Equal Opportunities office/r at your Institute?" The bar chart shows the total number of responses and its percentages.

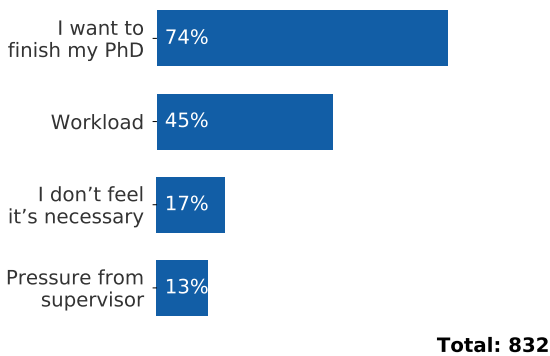


Figure 5.7: "Why would you not take (or have not taken) the full parental leave (multiple answers possible)?" Relative response rates.

have had children during their time at the institute but no female PhD candidates. Having to take a leave from the institute because of pregnancy or child care is not encouraged by our directors."

The gender difference in taking parental leave still epitomizes traditional gender roles. While attitudes towards gender and family norms have become increasingly progressive overall, various factors (e.g., gender pay gap, employers' expectations, lack of

male role models) exacerbate change in practice. The negative effects of inequality are evident in our comments and we hope to see the MPS encourage a fair and equal treatment for expecting parents.

Furthermore, we asked DRs about the Equal Opportunities (EO) office at their institute (Fig. 5.8). More than half of the DRs know about their respective EO officer and only 2% say there is no EO office at their institute. The fact that EO officers can only be women and can only be elected by women was frequently mentioned and criticized by DRs in the comment section.

Summary

- Most DRs want to have children, but not during their PhD time.
- DRs mostly named work-related reasons for why they do not want to become parents during their PhD time.
- With 8% parents among the DRs, they are underrepresented to comparable groups in Germany.
- While in general satisfied, DR parents do not feel fully supported by the MPS.
- Parents and DRs with a wish for a child would rather opt against full parental leave to finish their PhDs.
- The widespread notion that mothers should rather take time off for their children is also prevalent for DRs in the MPS.

Appendices

Appendix A

Additional Figures

Not all available data was used and explained in the respective chapters. For the sake of completeness, remaining figures without explicit reference are listed in the following.

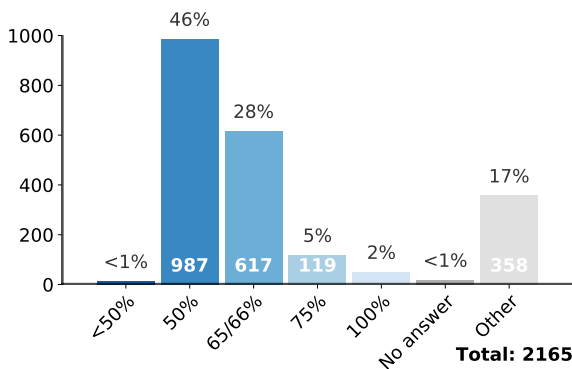


Figure A.1: "What is the percentage of payment in your contract according to TVöD level 13 (if applicable)?" Y-axis show number of answers.

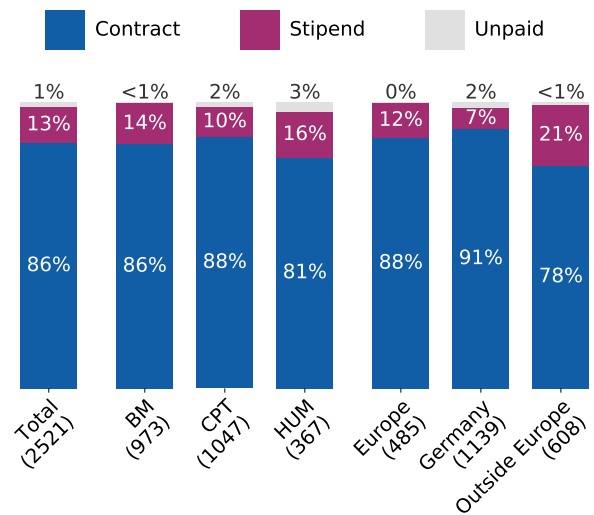


Figure A.3: "What kind of contract do you currently have?" Responses grouped by section and nationality. Responses stating "I don't want to answer that question" were excluded for analysis.

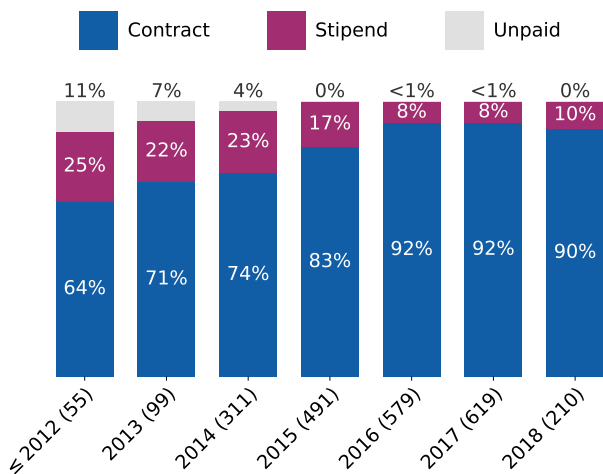


Figure A.2: "When did you start your doctoral research?" & "What kind of contract do you currently have?" Responses grouped by start year of PhD. Responses stating "I don't want to answer that question" were excluded for analysis.

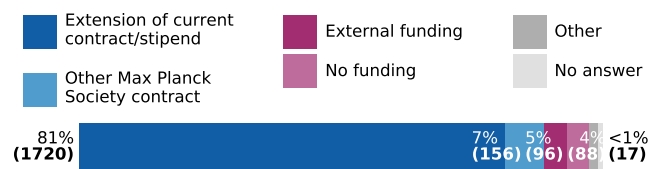


Figure A.4: "Should you exceed the initially allotted time for your contract or your stipend, how do you expect your doctoral research to be funded?" Responses shown in relative and absolute numbers of doctoral researchers.

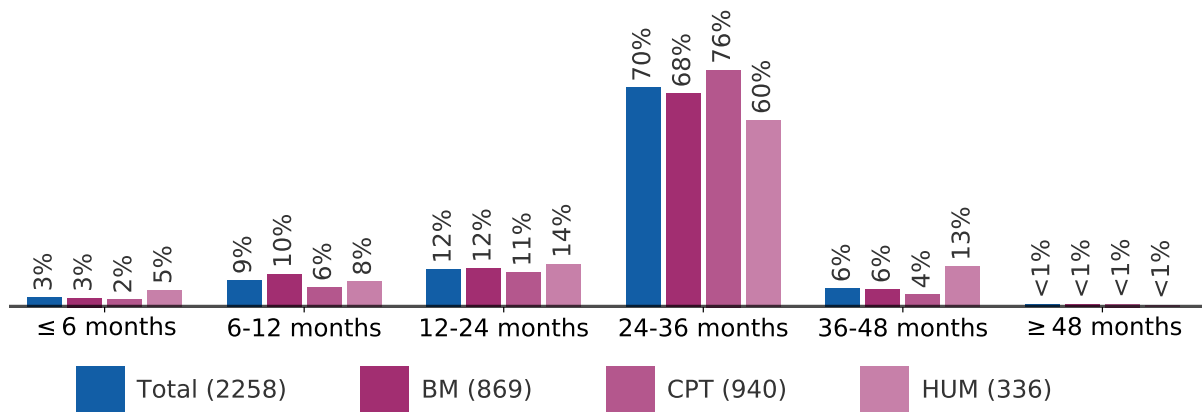


Figure A.5: "How long was the original duration of your contract or stipend?" Relative response rates grouped by section.

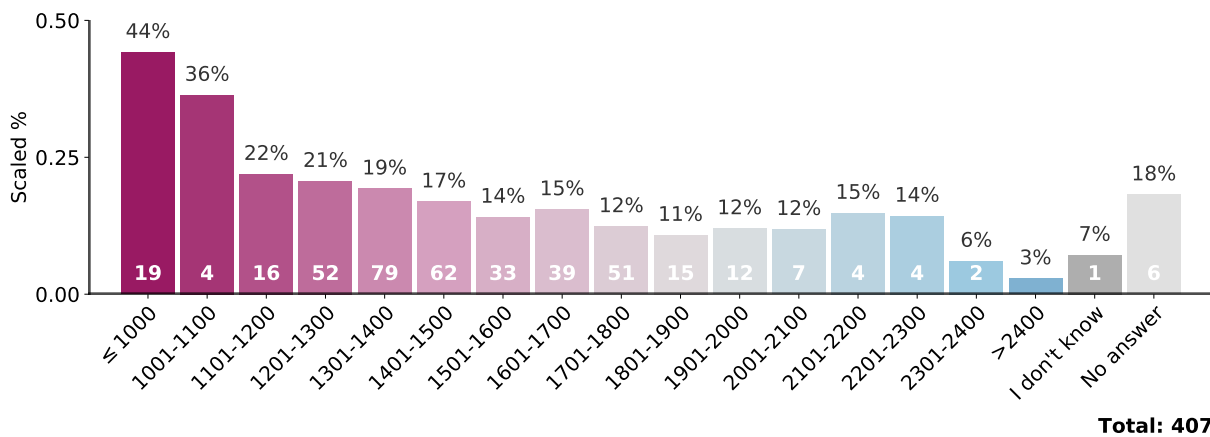


Figure A.6: "Do you get external financial support to cover your living expenses? If yes, who is assisting you financially (multiple answers possible)?" & "How much money (net amount in euros) do you receive for your doctoral research work per month?" Y-axis shows the scaled number of responses relative to financial support conditioned on income.

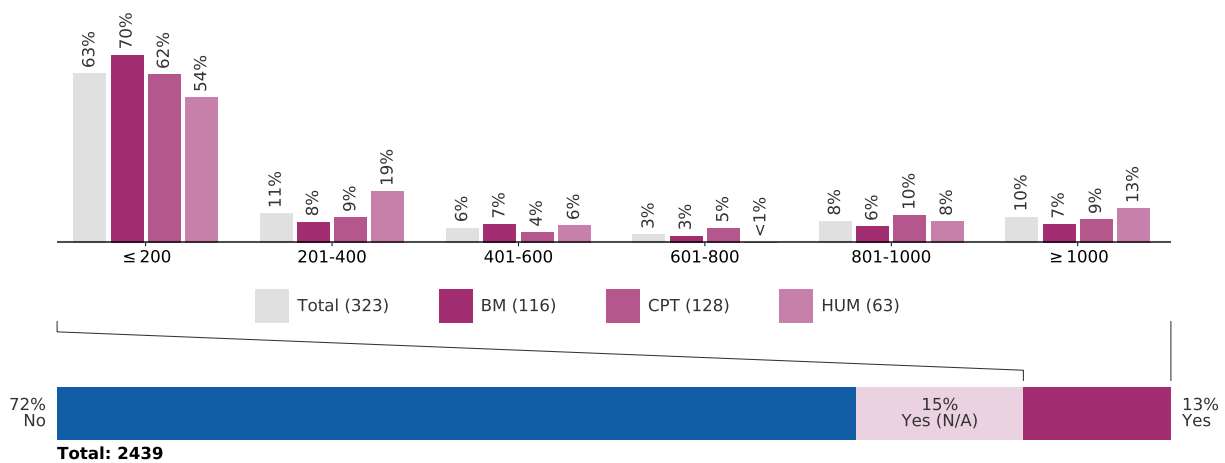
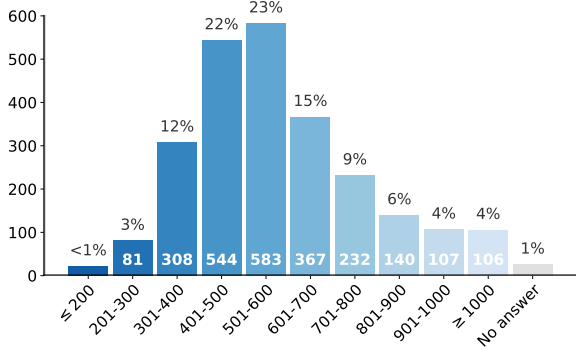
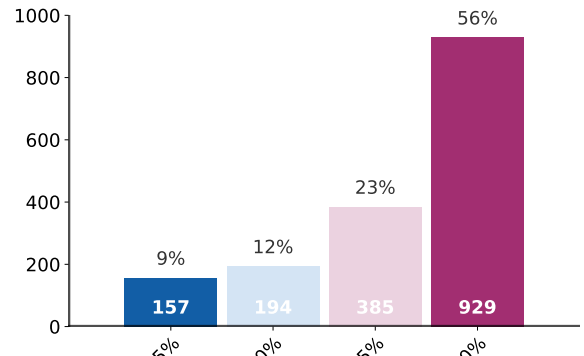


Figure A.7: "Did you spend parts of your salary on items you exclusively used for work in the past year? If yes, how much money in euros did you spend?" Relative response rates. The total number of responses is shown in brackets.



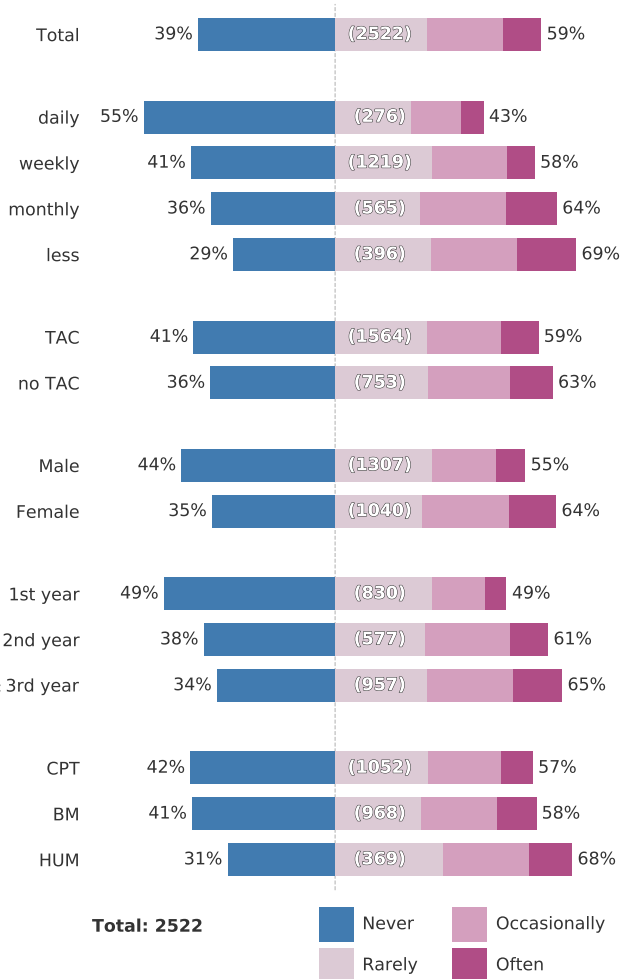
Total: 2516

Figure A.8: "How much do you pay for your rent and associated living costs per month in euros (e.g., heating, gas, water, and electricity)?" Y-axis show number of answers.



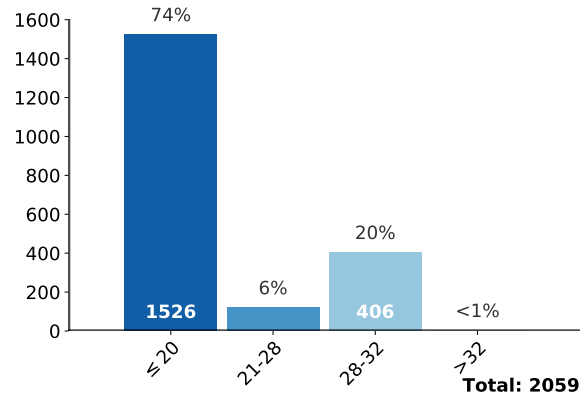
Total: 1665

Figure A.10: "How many holidays per year can you take according to your contract or stipend?" & "How many days of your entitled holidays did you take in the past year?" Y-axis show number of answers.



Total: 2522

Figure A.9: "Have you ever thought about giving up your PhD?" Responses grouped by frequency of supervisor meetings, existence of a thesis committee, gender, stage of PhD, and section.



Total: 2059

Figure A.11: "How many holidays per year can you take according to your contract or stipend?" Y-axis show number of answers.

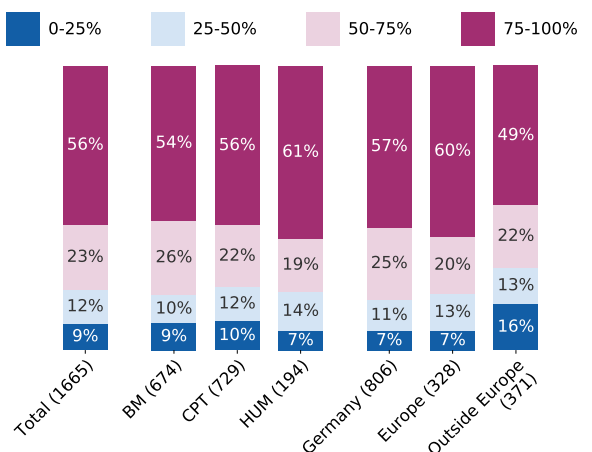
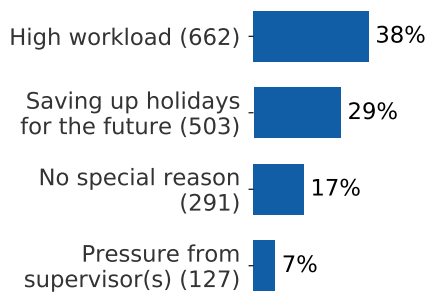


Figure A.12: "How many holidays per year can you take according to your contract or stipend?" & "How many days of your entitled holidays did you take in the past year?" Relative response rates grouped by section and nationality. The total number of responses is shown in brackets.



Total: 1583

Figure A.13: "If you did not take all of the holidays available to you last year, what was the reason to only take part of it (multiple answers possible)?" Relative response rates. The total number of responses is shown in brackets.

Appendix B

Methods

For the PhDnet Survey 2018, we collected email addresses of all doctoral researchers affiliated to a Max Planck Institute (MPI). Although we requested email addresses, the survey was anonymous; email addresses were needed to generate one-time tokens such that no link between the response and the survey participant could be established. The survey was conducted using LimeSurvey (<https://www.limesurvey.org/>), hosted by the Max Planck Society (MPS) at <https://umfragen.vw.mpg.de/>. It was available online from June 11th to July 21st, 2018. We neither tracked IP addresses nor did the MPS administration have access to the raw survey data.

Doctoral researchers eligible for participation in the survey were: those who started a doctoral research project or who have stayed at an MPI for at least six months, who are/were affiliated with an MPI (through MPS or graduate school programs, scholarships, etc.), who are/were mainly working at an MPI at the time the survey was conducted, and whose defense did not take place before the last PhDnet Survey (June 2017).

For some questions, participants could choose to select multiple answers or to skip the question by providing no information. This resulted in varying response rates per question. Unless otherwise specified, each figure and percentage linked to a survey question was generated exclusively from the sample of respondents that consented to answering that question. All percentage points were rounded to nearest integer, whenever increased precision was not required.

Statistical analysis was performed with R, Python (NumPy, Pandas, SciPy), and Excel. The focus of our analysis was merely of a descriptive nature, resulting in histograms and grouped charts to illustrate correlations with up to three variables. For some results, statistical tests were employed to explore associations in the data. Methods we used are:

- Pearson and Spearman's rank-order correlation coefficients to find linear and monotonic relationships between groups of numerical data
- Wilcoxon signed-rank test to compare two related groups of numerical data
- Chi-squared test on two-way contingency tables to find dependencies between discrete or categorical variables
- Student's t-test to determine if two sets of data are significantly different from each other
- Kruskal-Wallis test and ANOVA to compare two or more independent variables of equal or different sample sizes

Appendix C

Acknowledgments

From the very beginning to the final report, the work of the PhDnet Survey Group 2018 lasted 18 months. It was a collaborative effort, not only realized by the PhDnet Survey Group alone. We would like to thank many people who contributed to making the survey possible. Firstly, the PhDnet Steering Group, led by Jana Lasser, who was involved in all stages of decision making and in setting up the main topics of the survey. Secondly, the PhDnet Secretary Group, led by Mohamed El-Brolosy, who helped us to get in touch with the institute representatives. And thirdly, all PhD representatives at the institutes who maintained the contact lists and informed all doctoral researchers about the survey – without them the survey could not have reached such a high participation rate.

Finally, we would like to thank all survey participants for taking the time to answer our questions and the Max Planck Society for financial support of the PhDnet through its president Martin Stratmann.

Many thanks to all involved!

Appendix D

About the authors of this survey

The PhDnet Survey Group aims to uncover what motivates doctoral researchers, and what are the most important topics for them. For us, it was meant to be a collaborative effort, led by the coordinators Benjamin Regler and Laura Einhorn. All members of the survey group were responsible for the questionnaire design, for implementing and conducting the survey, for analyzing the data, for generating the figures, and for writing the report. While some members were more specialized in certain tasks than others, we constantly cooperated, shared our skills and expertise and mutually improved our work. It is thus impossible to assign specific contributions. In other words, all members contributed to the survey and to the report equally.



Benjamin Regler

I am theoretical physicist. I received my BA and MA at the Technical University Berlin, moved to Tübingen for a PhD, and then moved back to Berlin to start a PhD at Fritz-Haber-Institute in materials science. Currently, I'm in my third year working on materials discovery algorithms and materials property predictions. Outside work, I play guitar, sing in a choir, and sometimes draw pictures. More frequently, I love hiking in the midst of nature and am always fascinated about the forces and richness of nature.

Laura Einhorn

Hey there! I am a sociologist by training and I received my BA from Humboldt University and my MA from Free University in Berlin. I moved to Cologne for my PhD and am currently in my third year of research somewhere in between cultural sociology, economic sociology and food studies. I am further interested in political and environmental sociology as well as in studies of social stratification and inequality. Aside from that, I find balance in music and in exercise, in thoughtful conversations, in traveling and in enjoying the mesmerizing details of life. I hope the survey can contribute to making PhDs' voices heard.



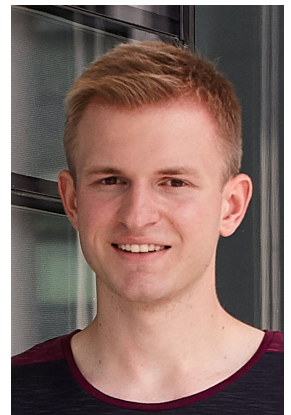


Jana Lasser

I recently finished my PhD in Physics on geophysical pattern formation at the MPI for Dynamics and Self-Organization and the University of Göttingen, where I also did my undergraduate studies. Throughout my PhD, I was involved in the representation of doctoral researchers and became spokesperson of the PhDnet in 2018. In my work I try to combine my diverse interests and skills, ranging from my background in theoretical modelling and quantitative analysis to political activity and science communication.

Martin Vögele

After studying physics at the Universities of Konstanz and Stuttgart, I recently finished my PhD work at the MPI of Biophysics in Frankfurt and now continue my scientific career at Stanford University. In my research, I use statistical physics and supercomputers to understand complex biological phenomena. Most of my work is dedicated to lipid membranes and membrane proteins. In Frankfurt, I served as the PhD representative at our MPI for three years and founded the regional student chapter of the German Physical Society. Besides science, I find joy in reading, running, and photography.

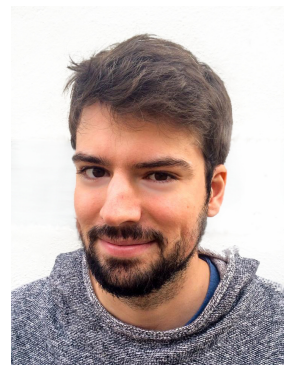


Sofia Elizarova

I was born in the beautiful city of St. Petersburg and moved to Germany in early childhood. After my studies of biology in Hanover and Göttingen, I found that nothing is more fascinating than the brain, which builds the basis for every experience in our lives. In my doctoral research at the MPI of Experimental Medicine I therefore focus on the molecular mechanisms that regulate the secretion of dopamine from neurons. Being involved in PhDnet as representative and survey group member was an exciting experience and I hope the results are going to help new PhD students as much as they helped us!

Felix Bäuerle

Hello to you avid reader! I am Felix Bäuerle and did my PhD in Physics at the MPI for Dynamics and Self-Organisation in Göttingen. While trying myself at the challenges of becoming a scientist I got engaged as a representative locally. Over time I learned to love the PhDnet community and applied my data oriented and collaborative scientific background in the Survey Group. Besides work I enjoy making music, hiking in the mountains or writing down whatever comes to my mind. I truly hope this Survey can help you personally where ever you might stand right now.





Charley Wu

Hello! I'm a PhD student in Berlin, working on the intersection between human and machine learning. My research uses computational models and interactive experiments to uncover the principles behind human intelligence. Everyone involved in this report has sacrificed an incredible amount of time and effort, and I'm very proud of the team for what we have accomplished. PhDnet has been instrumental in creating positive change for students in the MPG and I hope that this report can be used to identify further areas for improvement.

Stefanie Förste

Hi, I am Stefanie. I am a final year PhD student at the Max Planck Institute of Colloids and Interfaces in Potsdam. While my diploma thesis was concerned with experimental work I switched to the theoretical side of biophysics for the PhD. In my research, I am building a theoretical model to analyze the complex formation of proteins. In my free time, I enjoy learning more about martial arts and the food culture of different countries.



Justin Shenolikar

Greetings! My name is Justin Shenolikar, and I am currently a Doctoral Researcher from Glasgow, Scotland. I study atmospheric chemistry at the MPI-Chemistry in Mainz. It was here I became involved with the PhDnet, being elected by my colleagues. My research is focused mainly on understanding pollution molecules, their effects on, and fates within various locations around the world through a series of fieldwork campaigns. My work has given me a deep appreciation for the importance of accurate data analysis for attempting to solve complicated, trans-national problems. Outside of my work, I enjoy football, cooking, travelling to new places as well as being involved in news and politics.

Typeset by the authors with the \LaTeX documentation system.

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Cover art: Sofia Elizarova

Appendix E

The Survey

In the following, the complete PhDnet Survey 2018 is listed, including all its questions, instructions, and possible answers in exact wording as well as the number of responses N for every question.

A. Contracts, salaries, and employment

In this first section, we will ask you about your current employment situation, about contracts, salaries, financial issues, and holiday allowance.

All information is needed to draw a conclusive picture of the PhDs' financial situation at the Max Planck Society, to find and target deficits across research fields, and to discuss solutions together with the Max Planck Society administration.

1. **"How is your doctoral research currently financed (multiple answers possible)?"**
($N = 2580$)

Type: Multiple choice

Answers:

- Contract ($N = 2165$)
- Stipend ($N = 320$)
- Unpaid ($N = 36$)
- I don't know ($N = 7$)
- I don't want to answer this question ($N = 4$)
- Other ($N = 48$)

2. **"What kind of contract do you currently have?"** ($N = 2165$)

Description: There are several ways to know what kind of contract you have, in case you are not sure:

– Check which kind of payment you receive under the header 'Basisbezüge' of your pay-

roll (Entgeltabrechnung). 'TVöD Tab. Entgelt' indicates a TVöD contract; 'Verg. Doktorand' indicates a Fördervertrag.

– Check on your payroll whether you can find the point 'VBL-Umlage' under the header 'Bruttoentgelt'. If yes, this indicates a TVöD contract. If not, this indicates a Fördervertrag.

– Check the amount of your yearly vacation days at the end of your payroll, stated in the table 'Urlaubsdaten' under 'Tarifurlaub' + 'Anspruch'. 30 days indicates a TVöD contract; 20 days indicates a Fördervertrag.

Type: Single choice

Answers:

- Fördervertrag from the Max Planck Society ($N = 872$)
- TVöD contract from the Max Planck Society ($N = 1037$)
- I don't know ($N = 112$)
- I don't want to answer this question ($N = 17$)
- Other ($N = 127$)

3. **"What kind of stipend do you currently hold?"** ($N = 320$)

Type: Single choice

Answers:

- Stipend from the Max Planck Society ($N = 163$)
- Third party funding stipend ($N = 127$)
- I don't know ($N = 9$)

- I don't want to answer this question ($N = 0$)
- Other ($N = 21$)

4. **"How much money (net amount in euros) do you receive for your doctoral research work per month?"** ($N = 2522$)

Description: In case you have more than one contract, please choose the one that is your prime source of income.

Type: Single choice

Answers:

- 0-1000 ($N = 43$)
- 1001-1100 ($N = 11$)
- 1101-1200 ($N = 73$)
- 1201-1300 ($N = 252$)
- 1301-1400 ($N = 410$)
- 1401-1500 ($N = 367$)
- 1501-1600 ($N = 234$)
- 1601-1700 ($N = 252$)
- 1701-1800 ($N = 412$)
- 1801-1900 ($N = 139$)
- 1901-2000 ($N = 100$)
- 2001-2100 ($N = 59$)
- 2101-2200 ($N = 27$)
- 2201-2300 ($N = 28$)
- 2301-2400 ($N = 33$)
- 2401 or more ($N = 35$)
- I don't know ($N = 14$)
- I don't want to answer this question ($N = 33$)

5. **"What is the percentage of payment in your contract according to TVöD level 13 (if applicable)?"** ($N = 2165$)

Type: Single choice

Answers:

- Less than 50
- 50
- 65/66
- 75
- 100
- Not applicable ($N = 91$)
- I don't know ($N = 188$)

- I don't want to answer this question ($N = 19$)
- Other ($N = 79$)

6. **"How long was the original duration of your contract or stipend? Please specify the amount of months in the field 'Original duration'."** ($N = 2442$)

Type: Single choice

Answers:

- I don't know ($N = 131$)
- I don't want to answer this question ($N = 52$)
- Original duration in months ($N = 2259$)

7. **"Should you exceed the initially allotted time for your contract or your stipend, how do you expect your doctoral research to be funded?"** ($N = 2447$)

Type: Single choice

Answers:

- Extension of current contract/stipend ($N = 1720$)
- Other Max Planck Society contract ($N = 156$)
- External funding ($N = 96$)
- No funding ($N = 88$)
- I don't know ($N = 331$)
- I don't want to answer this question ($N = 17$)
- Other ($N = 39$)

8. **"How much do you pay for your rent and associated living costs per month in euros (e.g., heating, gas, water, and electricity)?"** ($N = 2522$)

Type: Single choice

Answers:

- 1-200 ($N = 9$)
- 201-300 ($N = 81$)
- 301-400 ($N = 308$)
- 401-500 ($N = 544$)
- 501-600 ($N = 583$)
- 601-700 ($N = 367$)
- 701-800 ($N = 232$)

- 801–900 ($N = 140$)
- 901–1000 ($N = 107$)
- 1000 or more ($N = 106$)
- I do not pay rent or living costs ($N = 13$)
- I don't know ($N = 6$)
- I don't want to answer this question ($N = 26$)

9. **"Do you get external financial support to cover your living expenses? If yes, who is assisting you financially (multiple answers possible)?"** ($N = 2623$)

Type: Multiple choice

Answers:

- I do not get external financial support ($N = 2059$)
- I took up a loan for my time as a doctoral researcher ($N = 17$)
- Parents ($N = 243$)
- Other relatives ($N = 35$)
- Partners ($N = 161$)
- I don't want to answer this question ($N = 31$)
- Other ($N = 77$)

10. **"How many holidays per year can you take according to your contract or stipend? Please specify the number of days in the comment field 'Number of holidays'."** ($N = 2446$)

Type: Single choice

Answers:

- Not specified in the terms of my contract or stipend ($N = 198$)
- I don't know ($N = 124$)
- I don't want to answer this question ($N = 30$)
- Number of holidays ($N = 2094$)

11. **"How many days of your entitled holidays did you take in the past year? Please specify the number of days in the comment field 'Number of holidays I took last year'"** ($N = 2093$)

Type: Single choice

Answers:

- I don't know ($N = 224$)
- I don't want to answer this question ($N = 146$)
- Number of holidays I took last year ($N = 1723$)

12. **"If you did not take all of the holidays available to you last year, what was the reason to only take part of it (multiple answers possible)?"** ($N = 1733$)

Type: Multiple choice

Answers:

- Pressure from supervisor(s) ($N = 127$)
- High workload ($N = 662$)
- Saving up holidays for the future ($N = 503$)
- No special reason ($N = 291$)
- I don't want to answer this question ($N = 22$)
- Other ($N = 128$)

13. **"How often have you worked during weekends or public holidays in the past year?"** ($N = 2522$)

Type: Single choice

Answers:

- Never ($N = 100$)
- Less than once per month ($N = 408$)
- Once per month ($N = 547$)
- Twice per month ($N = 657$)
- Three times per month ($N = 473$)
- Every weekend ($N = 261$)
- I don't know ($N = 47$)
- I don't want to answer this question ($N = 29$)

B. Working conditions

In this section, we ask you about your current satisfaction with your doctoral research, the working conditions, and the quality of your supervision.

We hope to identify key features that contribute to PhDs' satisfaction and dissatisfaction. We want to understand some of the problems you face in your everyday work, and how we can potentially address them.

Note: In the following, "direct supervisor" refers to the person you consider to be your direct research supervisor or advisor. This is the person you are talking to most of the time. The "formal supervisor" refers to a second person who is affiliated with your work, but maybe supervises you less extensively. For some of you, they may of course be the same person.

15. **"Please rate your overall satisfaction with the following aspects of your PhD:"**

- Overall satisfaction ($N = 2522$)
- Laboratory equipment ($N = 2522$)
- Work environment/ atmosphere ($N = 2522$)
- Workload ($N = 2522$)
- Scientific support ($N = 2522$)
- Administrative support ($N = 2522$)
- Salary/benefits ($N = 2522$)
- Amount of holidays ($N = 2522$)
- Social life at the institute/ campus ($N = 2522$)
- Office equipment (e.g., computer, software, own desk etc.) ($N = 2522$)

Type: Single choice

Answers:

- Very satisfied
- Satisfied
- 50-50
- Unsatisfied
- Very unsatisfied
- Not applicable
- I don't want to answer this question

16. **"Please rate how much the following applies to your direct supervisor. My supervisor..."**

- ...has excellent knowledge of my field of research ($N = 2522$)
- ...is available when I need help ($N = 2522$)
- ...is open to and respects my research ideas ($N = 2522$)
- ...is informed about the current state of my doctoral research ($N = 2522$)
- ...gives me helpful feedback on my research ($N = 2522$)

- ...supports my professional development (establishing contacts, recommending conferences...) ($N = 2522$)
- ...teaches me how to write papers ($N = 2522$)
- ...teaches me how to write grant proposals ($N = 2522$)

Description: The "direct supervisor" refers to the person you consider to be your direct research supervisor or advisor. Please read the explanation at the top of the section for further information.

Type: Single choice

Answers:

- Strongly agree
- Agree
- 50-50
- Disagree
- Strongly disagree
- Not applicable
- I don't want to answer this question

17. **"Do you have a thesis committee? If yes, how often do you meet or expect to meet them?"** ($N = 2522$)

Description: For some doctoral researchers, the work on the doctoral thesis is guided by a thesis committee consisting of several internal and/or external people who give advice and supervise the results and future steps of the thesis work.

Type: Single choice

Answers:

- Yes, I meet them once per semester or more frequently ($N = 204$)
- Yes, I meet them once per year ($N = 1060$)
- Yes, I meet them once during my PhD ($N = 127$)
- Yes, but there are no regulations to meet them ($N = 173$)
- No, I do not have a thesis committee ($N = 753$)
- I don't know ($N = 141$)
- I don't want to answer this question ($N = 64$)

18. **"Are you currently enrolled in any of the following institutions (multiple answers possible)?"** ($N = 3404$)

Type: Multiple choice

Answers:

- University ($N = 1820$)
- An International Max Planck Research School (IMPRS) ($N = 1225$)
- None of the above ($N = 273$)
- I don't want to answer this question ($N = 32$)
- Other ($N = 54$)

19. **"How many hours per week do you usually work for your doctoral research, the institute or the university (courses, teaching, etc. included)? Please specify the number of hours in the comment field 'Hours per week'."** ($N = 2517$)

Type: Single choice

Answers:

- I don't know ($N = 242$)
- I don't want to answer this question ($N = 69$)
- Hours per week ($N = 2206$)

20. **"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'."** ($N = 2164$)

Type: Single choice

Answers:

- I don't know ($N = 417$)
- I don't want to answer this question ($N = 49$)
- Hours per week ($N = 1698$)

21. **"Are there regular social activities in your group or at your institute (e.g., sports events, going out for dinner/drinks, discussion forums, movie nights, etc.)?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, weekly ($N = 555$)

- Yes, monthly ($N = 797$)
- Yes, about once every 3 months ($N = 411$)
- Yes, about once every 6 months ($N = 209$)
- Yes, about once a year ($N = 100$)
- There are no regular social activities in my group/at my institute ($N = 299$)
- I don't know ($N = 102$)
- I don't want to answer this question ($N = 49$)

22. **"How often do you attend these activities?"** ($N = 2072$)

Type: Single choice

Answers:

- Everytime I can make it ($N = 639$)
- Most of the time ($N = 544$)
- From time to time ($N = 578$)
- Rarely ($N = 265$)
- Never ($N = 42$)
- I don't want to answer this question ($N = 4$)

23. **"Have you ever thought about giving up your PhD?"** ($N = 2522$)

Description: If you started a PhD before, this question only refers to your current PhD.

Type: Single choice

Answers:

- Never ($N = 994$)
- Rarely ($N = 667$)
- Occasionally ($N = 558$)
- Often ($N = 273$)
- I don't want to answer this question ($N = 30$)

24. **"Why did you think about giving up your PhD (multiple answers possible)?"** ($N = 4124$)

Type: Multiple choice

Answers:

- Research topic (e.g., not motivating/interesting) ($N = 407$)
- Salary ($N = 395$)

- Results (e.g., expectations not met) ($N = 666$)
- High pressure ($N = 625$)
- Supervision ($N = 492$)
- Future career options ($N = 581$)
- Working conditions ($N = 357$)
- Personal reasons ($N = 489$)
- I don't want to answer this question ($N = 15$)
- I don't know ($N = 7$)
- Other ($N = 90$)

25. **"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?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, but I do not know or do not want to disclose the amount ($N = 366$)
- No ($N = 1750$)
- I don't want to answer this question ($N = 83$)
- Yes, I spent the following amount ($N = 323$)

26. **"How many hours per week do you currently spend on average on the following tasks?"** ($N = 2316$)

Description: Leave "..." if not applicable, you don't know or you don't want to answer this particular field.

Type: Free text

27. **"How many hours per week do you currently spend on average on the following tasks?"** ($N = 2218$)

Description: Leave "..." if not applicable, you don't know or you don't want to answer this particular field.

Type: Free text

28. **"How many hours per week do you currently spend on average on the following tasks?"** ($N = 2193$)

Description: Leave "..." if not applicable, you don't know or you don't want to answer this particular field.

Type: Free text

29. **"How many hours per week do you currently spend on average on the following tasks?"** ($N = 1995$)

Description: Leave "..." if not applicable, you don't know or you don't want to answer this particular field.

Type: Free text

30. **"How many hours per week do you currently spend on average on the following tasks?"** ($N = 2096$)

Description: Leave "..." if not applicable, you don't know or you don't want to answer this particular field.

Type: Free text

C. Career plans and PhDnet

In this section, we ask you about your career plans and some questions about PhDnet.

We hope to find out how well doctoral researchers are integrated in the local and scientific community and where most of the doctoral researchers are planning to go after completing their thesis.

32. **"Do you know PhDnet?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, I have heard something about PhDnet before ($N = 1578$)
- Yes, I know about their local and national events ($N = 303$)
- Yes, I am involved in PhDnet ($N = 197$)
- No, not at all ($N = 423$)
- I don't want to answer this question ($N = 21$)

33. **"Do you know your current internal and external PhD representatives at your institute?"** ($N = 2522$)

Description: Here, the external PhD representative is the PhD elected to represent your institute's doctoral researchers to other institutes, at the Max Planck Society, and

the PhDnet General Meeting. Every institute should have one. Internal PhD representatives can be elected in addition to external PhD representatives, but do not possess official representation rights outside the institute.

Type: Single choice

Answers:

- Yes ($N = 1454$)
- Yes, I know some PhDnet representative(s), but I don't know if they are internal or external ($N = 677$)
- No ($N = 304$)
- I don't know ($N = 72$)
- I don't want to answer this question ($N = 15$)

34. **"Have you participated in any of the following events in the past (multiple answers possible)?"** ($N = 2778$)

Type: Multiple choice

Answers:

- Visions in Science/Career Fair ($N = 148$)
- N2 Science Communication Conference ($N = 38$)
- PhDnet General Meeting ($N = 187$)
- Regional PhDnet hub event ($N = 132$)
- Soft-skills seminars or workshops organized by the MPS or by PhDnet ($N = 456$)
- None of the above ($N = 1735$)
- I don't want to answer this question ($N = 48$)
- Other ($N = 34$)

35. **"Why did you start your work on your doctoral thesis at the Max Planck Society (multiple answers possible)?"** ($N = 7093$)

Type: Multiple choice

Answers:

- Scientific excellence of the Max Planck Institute or my specific group ($N = 1915$)
- Interest in joining a structured PhD program such as IMPRS ($N = 593$)
- Interest in working with a specific scientist ($N = 882$)

- Continuing previous scientific project (internship, Master's thesis, etc.) ($N = 654$)
- Equipment and working facilities ($N = 1124$)
- Attractiveness of pay and benefits ($N = 392$)
- Interest in the research being carried out at the institute ($N = 1493$)
- I don't want to answer this question ($N = 40$)
- Other ($N = 0$)

36. **"Which of the following types of scientific output have you published so far during your doctoral research (multiple answers possible)?"** ($N = 4400$)

Type: Multiple choice

Answers:

- Scientific talks at a conference ($N = 1169$)
- Posters at a conference ($N = 1551$)
- Articles in peer reviewed journals ($N = 942$)
- Book chapters ($N = 103$)
- Patent applications ($N = 35$)
- None of the above ($N = 550$)
- I don't want to answer this question ($N = 50$)

37. **"Which field would you like to work in after completing your PhD (multiple answers possible)?"** ($N = 5989$)

Type: Multiple choice

Answers:

- Public scientific research ($N = 1477$)
- Private scientific research ($N = 1256$)
- Public science-related job (e.g., public relationships or science management) ($N = 785$)
- Private science-related job (e.g., public relationships or science management) ($N = 783$)
- Public non-scientific job ($N = 439$)
- Private non-scientific job ($N = 692$)
- I don't know yet ($N = 543$)

- I don't want to answer this question ($N = 14$)
- Other ($N = 0$)

38. **"Which field do you expect to work in after your PhD (multiple answers possible)?"** ($N = 4703$)

Type: Multiple choice

Answers:

- Public scientific research ($N = 1138$)
- Private scientific research ($N = 906$)
- Public science-related job (e.g., public relationships or science management) ($N = 456$)
- Private science-related job (e.g., public relationships or science management) ($N = 528$)
- Public non-scientific job ($N = 327$)
- Private non-scientific job ($N = 657$)
- I don't know yet ($N = 671$)
- I don't want to answer this question ($N = 20$)
- Other ($N = 0$)

39. **"Where do you see yourself living after your time as a doctoral researcher?"** ($N = 2522$)

Type: Single choice

Answers:

- Germany ($N = 967$)
- Europe, but not Germany ($N = 368$)
- Outside of Europe ($N = 266$)
- I don't know ($N = 901$)
- I don't want to answer this question ($N = 20$)

40. **"In general, how do you judge the following aspects of an academic research career?"**

- Salaries in academia ($N = 2522$)
- Availability of permanent positions ($N = 2522$)
- Teaching ($N = 2522$)
- Applying for and obtaining funding ($N = 2522$)
- Service to society ($N = 2522$)
- Workload ($N = 2522$)
- Mobility (i.e., work in different countries or cities) ($N = 2522$)

- Compatibility of own career plans with career plans of partner ($N = 2522$)
- Compatibility of own career plans with having children ($N = 2522$)

Type: Single choice

Answers:

- Attractive
- Neutral
- Unattractive
- Not applicable
- I don't want to answer this question

41. **"Do you know about the Max Planck Alumni Association (MPAA)?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes ($N = 762$)
- No ($N = 1741$)
- I don't want to answer this question ($N = 19$)

D. General information

In this section, we ask you which Max Planck Institute you are affiliated with as well as some general information about yourself to put your replies in a greater context.

43. **"Which Max Planck Institute are you associated with?"** ($N = 2522$)

Description: Please note: This question asks for personal data that may allow us to identify you.

Type: Single choice

Answers:

[List of all Max Planck institutes] ($N = 2522$)

44. **"When did you start your doctoral research?"** ($N = 2522$)

Description: 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. Please note: This question asks for

personal data that may allow us to identify you.

Type: Single choice

Answers:

- Before 2005 ($N = 1$)
- 2006 ($N = 1$)
- 2007 ($N = 0$)
- 2008 ($N = 0$)
- 2009 ($N = 2$)
- 2010 ($N = 4$)
- 2011 ($N = 15$)
- 2012 ($N = 35$)
- 2013 ($N = 99$)
- 2014 ($N = 309$)
- 2015 ($N = 491$)
- 2016 ($N = 577$)
- 2017 ($N = 625$)
- 2018 ($N = 205$)
- I don't want to answer this question ($N = 158$)

45. **"What is your year of birth?"** ($N = 2522$)

Description: Please note: This question asks for personal data that may allow us to identify you.

Type: Single choice

Answers:

- After 1999 ($N = 2$)
- 1999 ($N = 0$)
- 1998 ($N = 1$)
- 1997 ($N = 0$)
- 1996 ($N = 2$)
- 1995 ($N = 19$)
- 1994 ($N = 70$)
- 1993 ($N = 143$)
- 1992 ($N = 257$)
- 1991 ($N = 344$)
- 1990 ($N = 367$)
- 1989 ($N = 313$)
- 1988 ($N = 254$)
- 1987 ($N = 166$)
- 1986 ($N = 95$)
- 1985 ($N = 71$)
- 1984 ($N = 35$)

- 1983 ($N = 24$)
- 1982 ($N = 18$)
- 1981 ($N = 11$)
- 1980 ($N = 10$)
- 1979 ($N = 4$)
- 1978 ($N = 2$)
- 1977 ($N = 3$)
- Before 1977 ($N = 5$)
- I don't want to answer this question ($N = 306$)

46. **"What is your nationality? Should you have multiple nationalities, please select the one you feel best represents you."** ($N = 2522$)

Description: Please note: This question asks for personal data that may allow us to identify you.

Type: Single choice

Answers:

[List of all countries] ($N = 2522$)

47. **"What was your assigned sex at birth?"** ($N = 2522$)

Description: Please note: This question asks for personal data that may allow us to identify you.

Type: Single choice

Answers:

- Female ($N = 1040$)
- Male ($N = 1307$)
- Intersex ($N = 3$)
- I don't want to answer this question ($N = 170$)
- Other ($N = 2$)

48. **"To which gender identity do you identify most?"** ($N = 2522$)

Description: Please note: This question asks for personal data that may allow us to identify you.

Type: Single choice

Answers:

- Woman ($N = 1012$)
- Man ($N = 1272$)
- Transwoman ($N = 3$)

- Transman ($N = 3$)
- Genderqueer ($N = 16$)
- I don't want to answer this question ($N = 201$)
- Other ($N = 15$)

E. Family Planning

In this section, we ask you about your family planning and want to find out how the Max Planck Society supports or can support you in your plans (if you have some).

49. **"Do you have or are you currently expecting children?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes ($N = 207$)
- No ($N = 2252$)
- I don't want to answer this question ($N = 63$)

50. **"Would you like to have children?"** ($N = 2252$)

Type: Single choice

Answers:

- Yes, I want to have children during my PhD ($N = 136$)
- Yes, but not during my PhD ($N = 1434$)
- No ($N = 208$)
- I don't know ($N = 394$)
- I don't want to answer this question ($N = 80$)

51. **"What are the reasons that you don't want to have children during your PhD (multiple answers possible)?"** ($N = 2950$)

Type: Multiple choice

Answers:

- Personal reasons ($N = 654$)
- I don't have the money to support children ($N = 821$)
- My working conditions are not family-friendly ($N = 772$)
- I fear jeopardizing my career ($N = 564$)

- None of the above ($N = 59$)
- I don't want to answer this question ($N = 25$)
- Other ($N = 55$)

52. **"How much do you agree with the following statements? I have..."**

- ...enough money to support my children ($N = 207$)
- ...family-friendly working conditions ($N = 207$)
- ...worries about my academic career because of having children ($N = 207$)

Type: Single choice

Answers:

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree
- I don't want to answer this question

53. **"Does your institute offer support in child-care services (e.g., access/financial support for daycares, child-friendly environment, reimbursements for daycares during business travel, etc.)?"** ($N = 343$)

Type: Single choice

Answers:

- Yes ($N = 204$)
- No ($N = 31$)
- I don't know ($N = 102$)
- I don't want to answer this question ($N = 6$)

54. **"Do you feel that there is sufficient support (financial and organizational) from your institute for raising a child?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, both ($N = 280$)
- Yes financially, but not enough organizational support ($N = 120$)
- Yes organizationally, but not enough financial support ($N = 329$)
- No, neither ($N = 445$)

- I don't know ($N = 1298$)
- I don't want to answer this question ($N = 50$)

55. **"If you are or were to have children during your doctoral research, would you take parental leave?"** ($N = 343$)

Type: Single choice

Answers:

- Yes, in full ($N = 102$)
- Yes, partially ($N = 175$)
- No, I wouldn't take parental leave ($N = 33$)
- I don't know ($N = 30$)
- I don't want to answer this question ($N = 3$)

56. **"Why would you not take (or have not taken) the full parental leave (multiple answers possible)?"** ($N = 317$)

Type: Multiple choice

Answers:

- Pressure from supervisor ($N = 27$)
- Workload ($N = 93$)
- I don't feel it's necessary ($N = 36$)
- I want to finish my PhD ($N = 154$)
- I don't want to answer this question ($N = 7$)
- Other ($N = 0$)

57. **"Is there an Equal Opportunities office/r at your Institute?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, he/she was appointed ($N = 616$)
- Yes, he/she was elected ($N = 843$)
- No ($N = 46$)
- I don't know ($N = 982$)
- I don't want to answer this question ($N = 35$)

F. Supervision

This section is a continuation of the working conditions section, with a focus on the quality of supervision throughout your PhD.

Note: As before, we use the term "direct supervisor" to refer to the person you consider to be your direct research supervisor or advisor. This is the person you are talking to most of the time. The "formal supervisor" refers to a second person, who is affiliated with your work, but is supervising you more or less intensely. For some of you, they may of course be the same person.

59. **"How much do you agree with the following statements: My Thesis Committee significantly contributes to...."**

- ...planning my doctoral research ($N = 1564$)
- ...improving the scientific quality of my research project ($N = 1564$)
- ...improving the quality of communication with my supervisor ($N = 1564$)
- ...completing my PhD on time ($N = 1564$)
- ...ensuring the completion of my doctoral research in case one supervisor cannot continue supervising me ($N = 1564$)

Type: Single choice

Answers:

- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree
- I don't want to answer this question

60. **"Is your formal supervisor your direct supervisor?"** ($N = 2522$)

Description: The "direct supervisor" refers to the person you consider to be your direct research supervisor or advisor. Please read the explanation at the top of the section for further information.

Type: Single choice

Answers:

- Yes ($N = 1545$)
- No, but I had the option to choose her/him as my direct supervisor ($N = 318$)
- No, and I was not able to choose my direct supervisor ($N = 490$)
- I don't want to answer this question ($N = 169$)

61. **"What's your direct supervisor's position?"**
($N = 2522$)

Description: The "direct supervisor" refers to the person you consider to be your direct research supervisor or advisor. Please read the explanation at the top of the section for further information.

Type: Single choice

Answers:

- Director/Professor ($N = 855$)
- Group leader ($N = 1209$)
- Research scientist ($N = 337$)
- I don't want to answer this question ($N = 63$)
- Other ($N = 58$)

62. **"How many other doctoral researchers (yourself not included) does your direct supervisor have? Please specify the number of doctoral researchers in the field 'Number of other doctoral researchers'."** ($N = 2520$)

Type: Single choice

Answers:

- I don't know ($N = 340$)
- I don't want to answer this question ($N = 145$)
- Number of other doctoral researchers ($N = 2035$)

63. **"How many other doctoral researchers does your formal supervisor have? Please specify the number of doctoral researchers in the field 'Number of other doctoral researchers'."** ($N = 806$)

Type: Single choice

Answers:

- I don't know ($N = 316$)
- I don't want to answer this question ($N = 28$)
- Number of other doctoral researchers ($N = 462$)

64. **"If necessary, are you able to change your supervisor(s)?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes ($N = 321$)
- Yes, but only the formal supervisor ($N = 39$)
- Yes, but only the direct supervisor ($N = 125$)
- No, I cannot change my supervisor(s) ($N = 702$)
- I don't know ($N = 1275$)
- I don't want to answer this question ($N = 60$)

65. **"Did you ever consider changing any of your supervisors?"** ($N = 2522$)

Type: Single choice

Answers:

- Never ($N = 1715$)
- Rarely ($N = 312$)
- Occasionally ($N = 230$)
- Often ($N = 128$)
- I don't want to answer this question ($N = 137$)

66. **"On average, how often do you meet your direct supervisor to talk about your project?"** ($N = 2522$)

Type: Single choice

Answers:

- Daily ($N = 276$)
- Weekly ($N = 1219$)
- Monthly ($N = 565$)
- Less than once a month ($N = 396$)
- I don't want to answer this question ($N = 66$)

67. **"On average, how often do you meet and talk about your project with your formal supervisor?"** ($N = 808$)

Type: Single choice

Answers:

- Daily ($N = 10$)
- Weekly ($N = 66$)
- Monthly ($N = 182$)
- Once per semester ($N = 314$)
- Less than once per semester ($N = 209$)

- I don't want to answer this question ($N = 27$)
68. **"For which of the following aspects did you receive help from your institute (multiple answers possible)?"** ($N = 4475$)

Type: Multiple choice

Answers:

- University enrollment ($N = 985$)
 - Application to a graduate school ($N = 568$)
 - Finding accommodation ($N = 612$)
 - Registering at the local Resident Registration Office ($N = 703$)
 - Visa for my residency ($N = 568$)
 - None of the above ($N = 846$)
 - I don't want to answer this question ($N = 129$)
 - Other ($N = 64$)
69. **"Do you feel informal exchanges with other people contribute to your work? If yes, what kind of exchanges (multiple answers possible)?"** ($N = 6626$)

Type: Multiple choice

Answers:

- Yes, talking to colleagues in my group ($N = 2104$)
 - Yes, talking to colleagues at my institute ($N = 1764$)
 - Yes, talking to other researchers ($N = 1696$)
 - Yes, talking to friends and/or family ($N = 867$)
 - No, informal exchanges are not important for my work ($N = 43$)
 - I don't talk to others about my research ($N = 33$)
 - I don't know ($N = 59$)
 - I don't want to answer this question ($N = 47$)
 - Other ($N = 13$)
70. **"Who is, in your opinion, mainly in control of the following aspects? You, your supervisor(s), both, or a third party (e.g., your institute's director, your Thesis Committee)?"**

- My daily routine ($N = 2522$)
- My working hours per day ($N = 2522$)
- My studies/ the classes I attend ($N = 2522$)
- My teaching/ the classes I host ($N = 2522$)
- The seminars and/or conferences I attend ($N = 2522$)
- My research topic ($N = 2522$)
- When my work is ready for publication ($N = 2522$)
- Where my work is going to be published ($N = 2522$)
- The duration of my total doctoral research work ($N = 2522$)

Type: Single choice

Answers:

- Me
- My supervisor(s)
- Me and my supervisor(s) in agreement
- My institute's director(s)
- My Thesis Committee
- Other
- I don't want to answer this question

G. Good Scientific Practice

In this section, we will ask you about your experiences with good scientific practice and its violation. Your responses will be confidential. These data will be analysed in aggregated form only and no information that may reveal your identity will be transmitted to third parties. If you feel you require help with issues concerning scientific misconduct, you may get in touch with the respective ombudsperson.

72. **"Have you been involved in or observed plagiarism (multiple answers possible)?"** ($N = 2547$)

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 29$)
- Yes, observed without direct consequences for my work ($N = 63$)

- Yes, I've been told by colleagues ($N = 134$)
- No ($N = 2261$)
- I don't want to answer this question ($N = 60$)

73. **"Have you been involved in or observed data manipulation, fabrication, or theft (multiple answers possible)?"** ($N = 2554$)

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 27$)
- Yes, observed without direct consequences for my work ($N = 84$)
- Yes, I've been told by colleagues ($N = 167$)
- No ($N = 2214$)
- I don't want to answer this question ($N = 62$)

74. **"Have you been involved in or observed 'honorary' authorship (multiple answers possible)?"** ($N = 2642$)

Description: An 'honorary' authorship occurs when a person is listed as an author who has not provided any significant assistance to the study.

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 110$)
- Yes, observed without direct consequences for my work ($N = 333$)
- Yes, I've been told by colleagues ($N = 321$)
- No ($N = 1757$)
- I don't want to answer this question ($N = 121$)

75. **"Have you been involved in or observed other conflicts on authorship (multiple answers possible)?"** ($N = 2656$)

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 179$)

- Yes, observed without direct consequences for my work ($N = 344$)
- Yes, I've been told by colleagues ($N = 450$)
- No ($N = 1579$)
- I don't want to answer this question ($N = 104$)

76. **"Have you been involved in or observed duplicate publication (multiple answers possible)?"** ($N = 2538$)

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 9$)
- Yes, observed without direct consequences for my work ($N = 61$)
- Yes, I've been told by colleagues ($N = 64$)
- No ($N = 2331$)
- I don't want to answer this question ($N = 73$)

77. **"Have you been involved in or observed problems with ambiguous data ownership (multiple answers possible)?"** ($N = 2577$)

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 53$)
- Yes, observed without direct consequences for my work ($N = 123$)
- Yes, I've been told by colleagues ($N = 164$)
- No ($N = 2143$)
- I don't want to answer this question ($N = 94$)

78. **"Have you been involved in or observed sloppy work (multiple answers possible)?"** ($N = 2689$)

Description: Sloppy work is when one intentionally skips necessary checks or steps in a study, e.g., for time reasons or to not endanger results that fit one's hypothesis.

Type: Multiple choice

Answers:

- Yes, involved (e.g., as a victim) with direct consequences for my work ($N = 134$)
- Yes, observed without direct consequences for my work ($N = 483$)
- Yes, I've been told by colleagues ($N = 337$)
- No ($N = 1623$)
- I don't want to answer this question ($N = 112$)

79. **"Are you aware of the regulations on good scientific practice by the Max Planck Society?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, and I know them quite well ($N = 1228$)
- Yes, but I don't really know what they say ($N = 991$)
- No ($N = 239$)
- I don't want to answer this question ($N = 64$)

80. **"Is there a neutral person to turn to in case you observe severe misconduct (ombudsperson)?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes ($N = 1614$)
- No ($N = 136$)
- I don't know ($N = 722$)
- I don't want to answer this question ($N = 50$)

81. **"Have you ever reported scientific misconduct?"** ($N = 1358$)

Type: Single choice

Answers:

- Yes, by a peer or junior colleague ($N = 22$)
- Yes, by a supervisor or senior colleague ($N = 31$)
- Yes, by both a junior and a senior colleague (may be on different occasions) ($N = 10$)
- No ($N = 1264$)

- I don't want to answer this question ($N = 31$)

82. **"What was the outcome of your report?"** ($N = 53$)

Type: Single choice

Answers:

- The problem was resolved without negative consequences of reporting ($N = 21$)
- The problem was resolved but I suffered negative consequences ($N = 7$)
- Nothing happened ($N = 16$)
- The case is not settled yet ($N = 3$)
- I did not follow up on the report ($N = 4$)
- I don't want to answer this question ($N = 2$)

83. **"Do you think you would face negative consequences for reporting misconduct in your group?"** ($N = 1264$)

Type: Single choice

Answers:

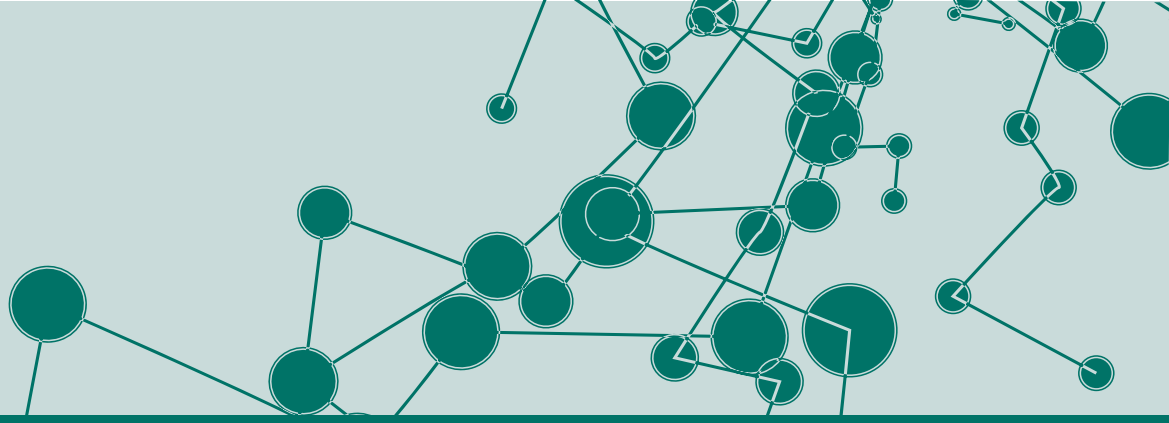
- Not if it was by a peer or junior colleague ($N = 350$)
- No, not even if it was by my supervisor or a senior colleague ($N = 263$)
- Yes, in any case ($N = 315$)
- I don't want to answer this question ($N = 336$)

84. **"Do you have a workshop on good scientific practice at your institute?"** ($N = 2522$)

Type: Single choice

Answers:

- Yes, and it's obligatory ($N = 492$)
- Yes, but it's not obligatory ($N = 495$)
- No ($N = 568$)
- I don't know ($N = 921$)
- I don't want to answer this question ($N = 46$)



"Thank you for doing this survey.
I'm looking forward to seeing your results."

"Thanks PhDnet for pushing
these demands forward."

"I hope this survey helps us to
improve. Thank you very much."

"First of all, I really thank you for
opening up questions on financial issues
for doctoral students. It is a great opportunity
for us to speak up about our concerns."

"Otherwise, nice survey :D"

