

Helmholtz Juniors PhD survey 2014

The 2014 Helmholtz Juniors survey group
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for the Helmholtz Juniors 2014

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Impressum

This PDF file is part of an interactive website for evaluation of the survey results. At the time of publication the website is available at www.heju-survey.de

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1 Background and introduction

Initiators of the survey

The 2014 PhD survey was conducted by the Survey Group of Helmholtz Juniors – the umbrella organization of PhD representatives from the 18 Helmholtz Centres. The Helmholtz Juniors currently represent the interests of more than 6000 doctoral candidates. Their primary goals are promoting exchange and networking among their peers, improving PhD working conditions and doctoral education, and ensuring a concerted collaboration between the doctoral candidates of Helmholtz Research Centres.

Aims of the survey

The biannual Helmholtz-wide survey - begun in 2008 - is conducted in order to provide an overview of the situation of doctoral candidates in each Helmholtz Centre. It focuses on the strengths and weaknesses of each centre and Helmholtz Association as a whole with respect to doctoral education. Consequently, it enables Helmholtz Juniors and the PhD representations at the centres, as well as the administrations themselves, to gain a better understanding of current issues. It provides an empirical basis for discussions about the situation of doctoral candidates among the PhD candidates, the administrations and the Helmholtz Association's management.

Preparation of the survey

The selection of the questions is based on former Helmholtz Juniors surveys, to allow time series evaluations. The questions were organized in ten categories with a particular emphasis on funding, supervision, and general satisfaction, including evaluation of the infrastructure and working conditions. A complete list of questions is provided at the end of this document. Furthermore, we focused on the circumstances of foreign PhD candidates and PhDs with children. The entire process of the survey adheres to current data protection guidelines obeying the German federal data protection law (§11 BDSG). The survey was conducted online between July 14th and September 19th 2014, using the platform unipark of the QuestBack AG (running the software EFS Survey 10.3). Participants were primarily invited via the PhD representatives of the 18 Helmholtz Centres by e-mail, flyer and poster. For lack of a formal definition of what a PhD candidate at a centre is, we left it to the PhD representations of each centre to decide whom the survey invitation was distributed to. This often includes both PhDs at the centre and PhDs funded by the centre at surrounding universities, who may face different working contracts and side tasks.

Participation was voluntary, we assume the resulting self-selection bias affects all centres equally. Altogether the survey was completed by 1483 participants of the Helmholtz Centres UFZ, MDC, KIT, IPP, HZI, HZG, HZDR, HZB, HMGU, GSI, GFZ, GEOMAR, FZJ, DLR, DKFZ, DESY, and AWI, representing about 25 % of the total number of PhD candidates within the Helmholtz Association. At most centres participation was sufficient for representative results, and the overall number of participants indicates very accurate results for Helmholtz as a whole¹. The evaluation was exclusively conducted by the Helmholtz Juniors Survey Group 2014. The data were transferred with strict anonymity, the assignment of data to an individual person being neither requestable nor technically possible. Using the statistical software R, aggregated statistical data was derived from the answers of the participants.

This survey report has been distributed to all PhD representatives at the centres as well as the management of the Helmholtz Association. Moreover, the report is published online at www.helmholtz-juniors.de and licensed under a creative commons license. We appreciate individual evaluations and discussions among PhD candidates and authorities within the centres and the Helmholtz Association.

Publication in cleartext

In the 2014 survey report, the names of the centres are stated in cleartext in order to improve the exchange of information between the Helmholtz Centres. For example, if one centre excels in a particular category, it can be contacted by other centres or their PhD representations, which in turn could potentially benefit from the experience. In addition, it is harder for everybody involved to ignore problems that are publicly revealed by the survey data. Online publication makes sure that results remain available for PhDs at the centres, as well as for possible future PhD candidates, which is of great importance due to the high turnover of both PhD candidates and representatives. As we are aware that the interpretation of data can sometimes be ambiguous, we allowed for of both the centres and PhD representatives to comment the results from their point of view prior to online publication. The version published online contains these comments in their entirety.

Result viewer

Several questions reveal notable differences between centres and some questions even show differences between PhD candidates from different demographic backgrounds. It is impossible to cover all these differences in one report. For this reason, the 2014 Helmholtz Juniors survey group will offer an interactive website with the complete evaluation of

¹At several centres the number of participants was perceived as ‘low’. We would like to point out that response rates in the 20% regime are what is expected for voluntary surveys, and these rates are known in the literature to account for little distortion if any. One reference that summarizes studies on the topic is: Holbrook et al. 2007. ‘The Causes and Consequences of Response Rates in Surveys by the News Media and Government Contractor Survey Research Firms.’ in ‘Advances in telephone survey methodology’, Wiley. Additionally we would expect self-selection on the part of the participants to influence all centres alike, thus not influencing relative results.

all questions for each centre and, where applicable, by demographic background. This will allow PhD representations and their centres to obtain a detailed view of the exact situation at their centre and thereby get the most from the data gathered in 2014. The data will be available online at <http://www.heju-survey.de>.

Free text answers

The PhD candidates were offered the opportunity to give their opinion in free text in several places. We took the liberty to adjust their responses grammatically and orthographically without changing the meaning.

2 Results of the survey

2.1 Participation

The 1483 participants were heterogeneously distributed among 17 of the 18 centres, with participant numbers ranging from 7 to 226. The low number of participants at DLR ($N = 7$) – where the invitation could not be distributed via e-mail but was instead kindly forwarded by word of mouth¹ of the DLR Helmholtz Juniors – and IPP ($N = 14$) may lead to a limited accuracy for these two centres. Unfortunately, the distribution of the survey was not possible at DZNE, where contact with a responsible person from the administration (due to a lack of a PhD representation) was only established well into the running of the survey.

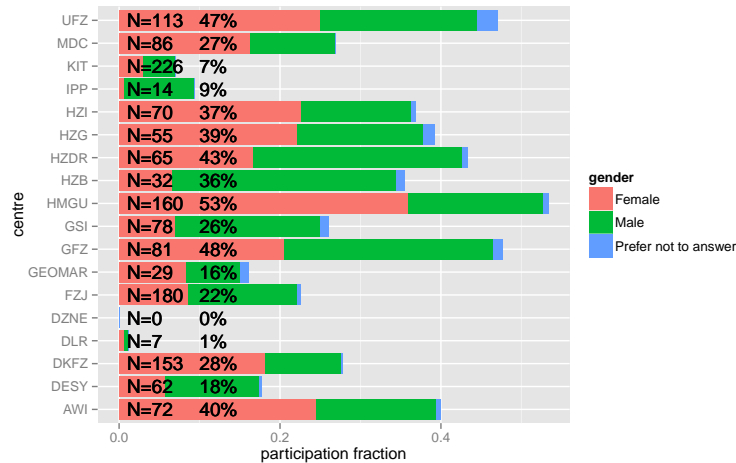


Figure 2.1: Participation of PhD candidates by gender, relative values (total bar length up to 0.4 corresponds to 40 % of PhD candidates at the respective centre participating). The total number of PhD candidates at each centre participating N and the corresponding percentage of the centres PhD candidates is given in the figure.

On average, male and female participation was equal among the total of participants, whereas there are significant differences regarding the individual centres (Figure 2.1). The reader should keep in mind that the absolute number of PhD candidates varies strongly between the centres. The relative participation for each centre was calculated given the best available estimate for the candidate number as given by the centres via their Helmholtz Juniors Representatives. Most centres could not give an exact number

¹and is therefore probably affected by selection bias.

and stated that their total number of doctoral candidates is accurate to about 20 %. It was also communicated multiple times that the number is not specifically recorded and that there seems to be no uniform definition of what is to be considered a doctoral candidate at the centre.

2.2 Demographic background of participants

Most participants were between the ages of 25 and 30 years old, with ages ranging from 21 to >40 as shown in Figure 2.2. The age distribution of male PhD candidates was shifted compared to female PhD candidates by about one year, probably as a result of the time spent in mandatory military/civil service by German PhD candidates before 2011. The majority of PhD candidates are German (71 %), while of the remainder, 13 % and 16 % come from EU and non-EU countries respectively.

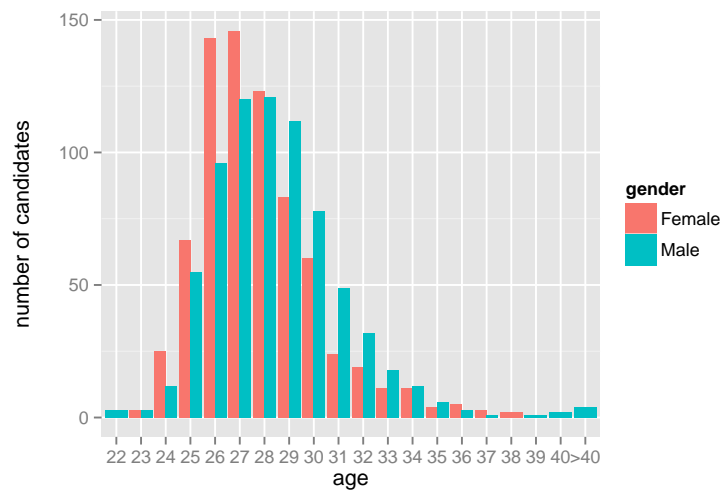


Figure 2.2: Age distribution among the participants of all centres by gender. PhD candidates opting to not disclose their gender are not shown in this figure.

At the time of participation, the majority of the PhD candidates were in their third year or less, which is the official framework for most PhD projects regarding e.g. the funding by third party projects. The distribution over these first three years is quite homogeneous (25-29 %). A significant ratio (approximately 20 %) exceeds the third year line being in the fourth (14 %) or fifth year (4 %) and beyond (2 %).

At the time of participation, the fraction of PhD candidates with child or expecting was varying significantly between centres as shown in Figure 2.3. Possible reasons are discussed in section 2.9 on children and family.

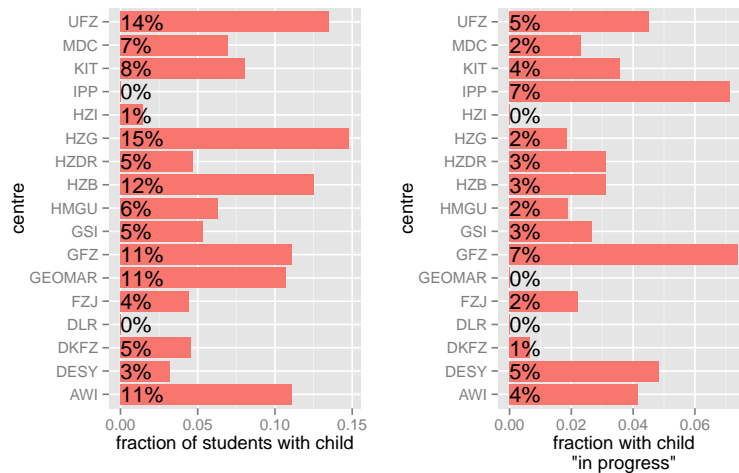


Figure 2.3: The percentage of PhD candidates with children varies greatly between the centres. While at HZI only 1 % of the PhD candidates have children, at GFZ this number is 11 % with a further 7 % expecting a child.

2.3 Funding

Most PhD candidates are funded by regular working contracts that include staff positions (9 %) as well as third party funding (24 %) and special PhD contracts (42 %) that can be either staff or third party funded. Stipend holders represent 22 % of the cohort, which is a relatively high number considering the disadvantages for such PhD candidates when compared to those on contracts. Also worth noting is that at two of the centres, more than 50 % of the PhD candidates are funded via stipends; namely at GSI, with 69 % of 75 responses and DKFZ, with 54 % of 148 responses. Because it is a crucial and widely discussed topic, we tackle the issue of stipends at length in Section 2.3.4. The funding sources of the PhD candidates are shown in Figure 2.4.

Although the contractual working hours are between 50 % (20 h) and 100 % (40 h), most of the PhD candidates are working full time (40 h) up to more than 50 hours per week (Figure 2.6). Because of this, many PhD candidates feel underpaid (as mentioned in free text answers).

2.3.1 Salary distribution

Averaging over all centres, a majority of 75 % of the PhD candidates earn between 1100 and 1700 Euros per month (net income including benefits, but without insurances in case of stipends). However, 6 % receive a raw net income of below 1100 Euro. For stipend holders the raw net salary is not comparable to the net salary of a regular employee, this issue is discussed at length in Section 2.3.4. On the other hand, 19 % earn an amount that is in the range of a full contract position (1700 to >2100 Euro). The income depends very much on the academic background: while humanities and natural sciences

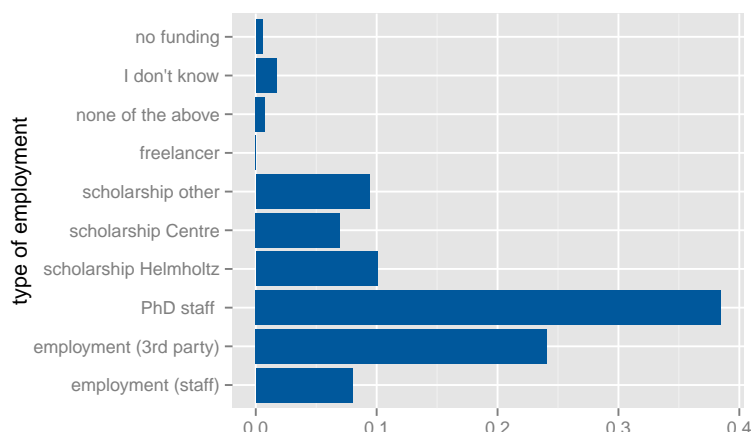


Figure 2.4: Type of funding as reported by the PhD candidates. We are sure the difference between stipend and contract was clear to the PhD candidates but (especially in the case of stipends) the funding source might be misattributed.

(except physics) are in the lower income sector, PhD candidates with backgrounds in computer science/informatics, economy/finance and engineering have the highest ratios in the upper income sector (Figure 2.5). In their recommendations for PhD funding² the German Research Foundation (DFG) tolerates differences between subjects.

2.3.2 Distribution of working time

The vast majority of PhD candidates report working times equivalent to a full time position or more, although the doctoral candidates employed on a full contract are in the minority as seen in Figure 2.6. The average working time (independent of the contract type or the gender) is 42 hours per week. In the light of the majority of PhD candidates (even those on half-time contracts) working full-time, it has to be emphasized that a large proportion of PhD candidates (48 % of PhD candidates on contracts, 16 % of PhD candidates on stipends) report that their contract allows 20 or less days of vacation (Figure 2.7). For comparison: TVÖD offered 30 days of vacation in 2014, which is the German average³. In the free-text supplied at the end of the survey, the enforcement of a contractual maximum 20 days vacation for PhD candidates working full time was explicitly mentioned as unfavourable by many PhD candidates.

The distribution of working time (Figure 2.8) shows that 35 % of working time is spent on tasks beside the PhD project. Major other time investments of PhD candidates in

²Leitlinien zur Bezahlung von Promovierenden, http://www.dfg.de/foerderung/grundlagen_rahmenbedingungen/rechtliche_aspekte/verguetung/leitlinien_bezahlung_promovierenden/index.html,

³numbers from 2010, <http://de.statista.com/statistik/daten/studie/197069/umfrage/urlaubstage-und-feiertage-in-europa>

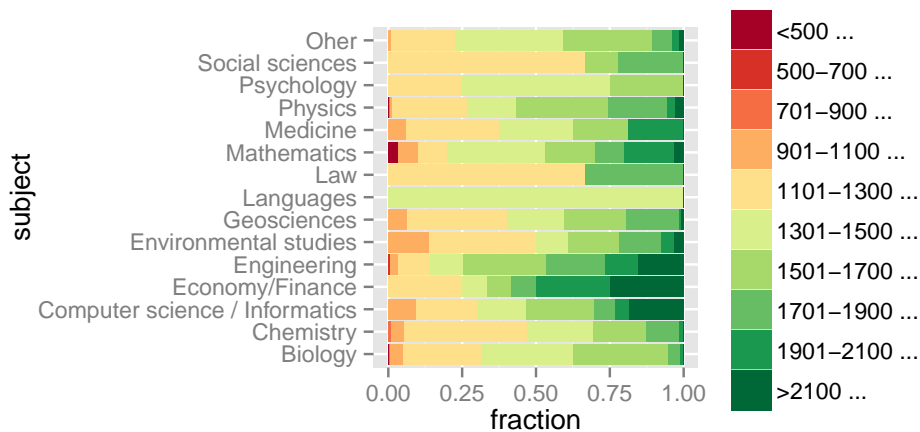


Figure 2.5: Income depending on academic background, PhD candidates preferring not to answer (<5 %) are not shown.

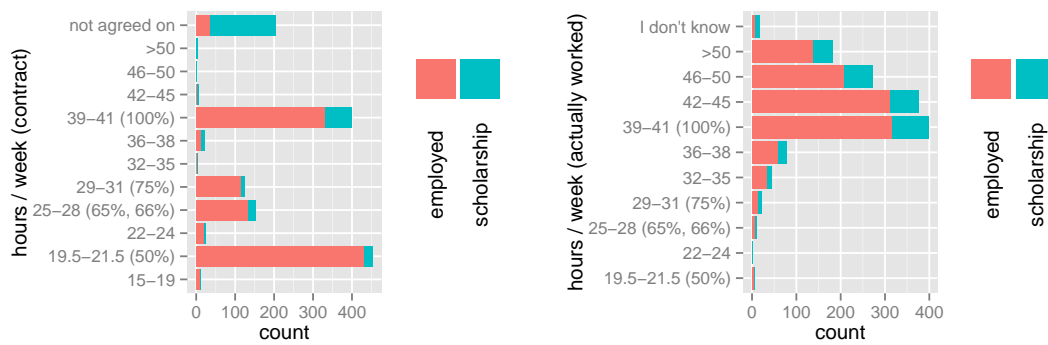


Figure 2.6: Comparison between the working hours of PhD candidates as defined by their contract (or informally agreed on in case of PhD candidates on stipends) and their actual working hours. The PhD candidates who answered 'not agreed on' for the hours/week given in their contract are stipend PhD candidates who did not explicitly discuss working hours with their supervisors and a small number of PhD candidates on regular contracts who apparently did not know the number of working hours in their contract.

Helmholtz Association are unrelated research, their own further education, and equipment maintenance. The fact that the doctoral candidates in the Helmholtz Association work mostly at the centres might be a reason for the low amount of time they contribute to teaching and candidate supervision, which for PhD candidates working at universities could be expected to rank higher among additional duties.

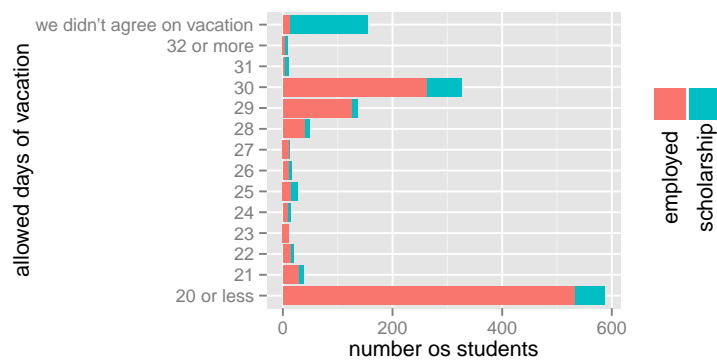


Figure 2.7: Summary of the vacation days as defined in the PhD candidates' contracts. PhD candidates who did not agree on vacation are stipend PhD candidates who did not formally agree (or discuss) the topic of vacation with their supervisor.

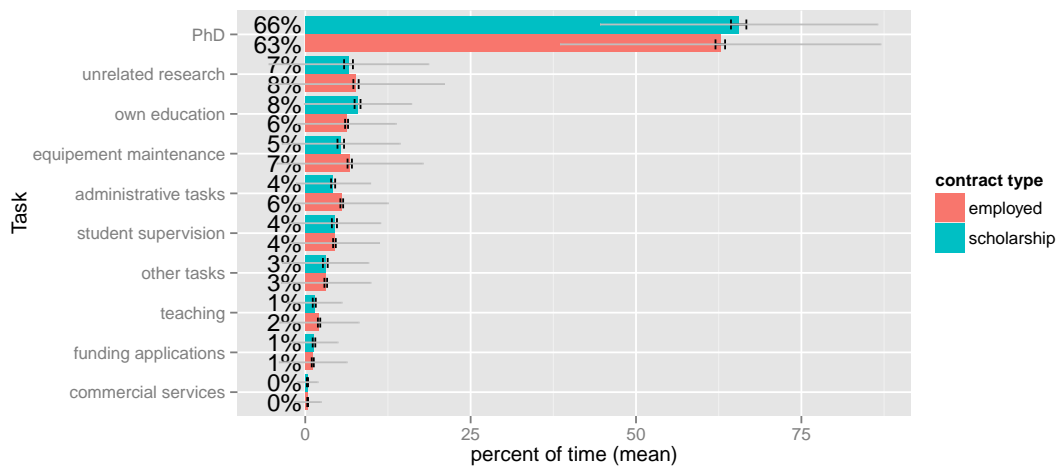


Figure 2.8: Plot of the percentage distribution of working time, comparing stipends and employed PhD candidates. The grey bar indicates one standard deviation around the mean, the two scales indicate the standard error of the mean. The large standard deviation indicates that there is a large spread in the amount of time the PhD candidates spend on the different tasks, nevertheless the sample size is sufficient to keep the error small.

2.3.3 Funding periods

The majority of funding is secured for a period of three years. However, despite the significant amount of PhD candidates needing more than three years to finish their PhD thesis (Figure 2.9), the probability of contract prolongation is ambivalent. In 11 % of cases, an extension of the contract is untenable according to the opinion of the participants. In 22 %, it is possible in the case of a successful progress report, whereas in the majority of potential contract prolongations, 55 % (maybe (40 %) + don't know (15 %)) are of unknown status for the PhD candidates. We assume that the PhDs are not aware of the factors influencing possible contract extension (e.g. budget availability, bridging contracts by the institute etc.), leading to essentially unknown funding situations and thus frustrations that may end in quitting (or at least thinking about quitting their PhD work)⁴. To reduce the PhD candidates' doubts about possible contract extensions, it may suffice to communicate the conditions of an extension clearly and timely. Clarity on this issue would also improve their ability to plan their PhD work accordingly.

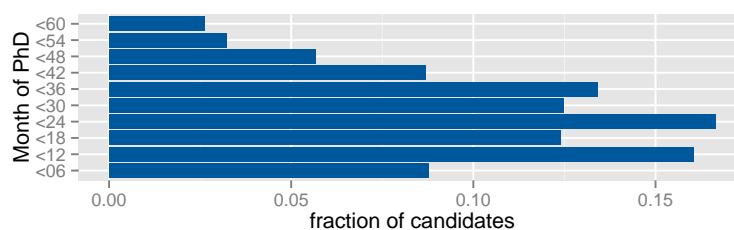


Figure 2.9: Month of the PhD work the PhD candidates currently are in. The result is grouped in 6 month intervals since even though it was possible to answer in one month steps many PhD candidates chose to answer in 6 months stepping.

2.3.4 Average salaries

To investigate whether some demographics might be discriminated against, the average salaries of PhD candidates were garnered. The questionnaire asked PhD candidates to ascribe their net salaries to one of eight possible ranges starting at 500-700 € and increasing in 200 € intervals. The 3.5 % of PhD candidates reporting salaries above 2100 € or below 500 € were regarded as outliers and therefore discarded before the calculation of the averages. Average salaries were calculated by adopting the central values of each interval as a representative of that interval.

Stipend holders If one looks at the raw net salaries⁵, stipend holder's incomes are nearly on a par with those of PhD candidates employed on regular contracts. The net income for standard employees already includes health insurance while stipends don't. In order

⁴As seen in free text answers of the PhD candidates about why they think about quitting.

⁵The Question was 'What is your monthly net income? (Net income: The amount of money transferred to your bank account every month as payment for the work on your PhD project, including benefits)'

Table 2.1: Net salaries (stipends and regular contracts) and the changes when correcting for the health insurance and and pension insurance missing from the stipends. The table also gives standard deviation σ and the standard error of the mean Δ .

	mean (€)	σ (€)	Δ (€)
Regular contracts (reference value)	1477	247	8
Stipends	1403	235	13
Stipends corrected for health insurance	1194	200	11
Stipends corrected for health & pension insurance	929	155	9

to obtain a comparable value, one needs to subtract the 14.5 % health insurance from the stipend’s net salary⁶. Doing so reveals that the stipends represent a significant financial disadvantage in comparison to regular contracts. If one tries to be even more accurate, and includes pension insurance in the stipends by subtracting a further 18.9 %, the picture becomes even worse⁷. The pension insurance is relevant for German PhD candidates and for EU-internationals. However, due to the fact that 56 % of stipend holders are Germans and another 15 % are EU-internationals, we subtracted the fees for pension insurance from the stipends for a fair comparison between stipends and regular contracts. The values for the Helmholtz-wide mean salaries including these considerations are listed in Table 2.1. The mean net salary a stipend holder has left after paying pension and health insurance is below the net somebody working on the new German minimum wage receives when working full time (gross (*brutto*) German minimum wage at 40 h/week: 1360 €, amounts to net for single household and without church tax: 1020 €⁸). Figure 2.10 shows graphically how taking social insurance into account influences the salaries at each centre.

The difference in payment is often justified by the additional non-thesis related work that employed PhD candidates have. According to German law, PhD candidates on a stipend are free to schedule their time as they please and cannot be burdened with additional tasks. We evaluated whether stipend holders do indeed have more time left for their PhD related work. We found that both stipend holders and PhD candidates on regular working contracts spend on average 65 % of their time working on their thesis⁹ (see Figure 2.8). This indicates that having more time for the thesis is not a point that

⁶Stipend holders entering the public social insurance pay the full Arbeitgeber and Arbeitnehmeranteil for the health insurance. This was handled differently in the past when some public insurances accepted stipend holders as ‘University students’, but is nowadays uniformly the 14.5 % are required judging from experience at GSI.

⁷Stipend holders entering the public pension insurance can chose their contribution, but to be comparable to their peers on a regular contract also the amounts paid are relevant. Those on a regular contract pay a total of 18.9 % of their salary (Arbeitgeber and Arbeitnehmeranteil) into the public pension insurance. As our aim is to compare the two types of contracts levelly, with a comparable outcome pension-wise, we assume the stipend holders decide to pay the same 18.9 %.

⁸<http://www.brutto-netto-rechner.info/>

⁹The question was: How do you distribute your working time(mode of answering: table to enter numeric values for different tasks amounting to 100 %), percent of time allocated for PhD Thesis, with all other possible answers being NOT the PhD work of the candidate

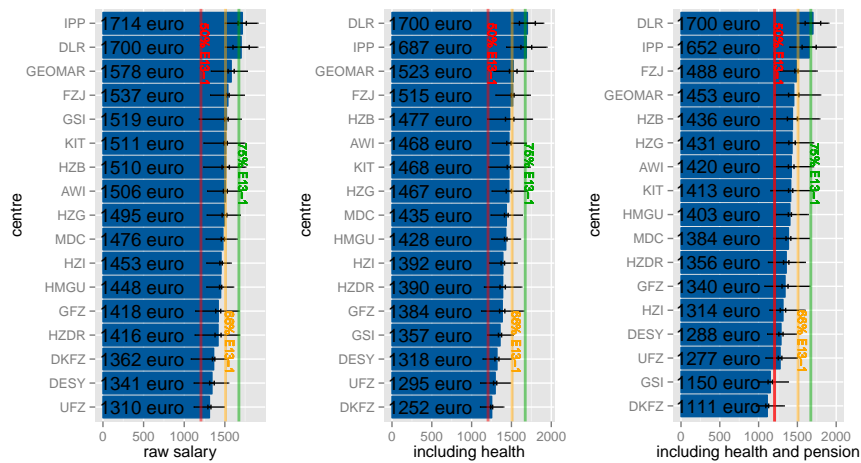


Figure 2.10: Average salaries for each centre, averaged over all participants and thus including regular contracts and stipend holders. The change in centre average salaries between plots reflects the values for stipend holders being corrected in order to also take health and pension insurance contributions into account. Each plot is ordered by salary, so centres with a high fraction of stipends move down as health and pension are included. The errorbar is one standard deviation wide, with one standard error of the mean between the two vertical markings. The reference salaries displayed as vertical lines represent net E13-1 salaries in TVÖD-Bund (Source: <http://oeffentlicher-dienst.info>) for single households (tax class 1) after all taxes and insurances are subtracted (red: 50 % contract, yellow: 66 % contract, green: 75 % contract).

can justify net salary¹⁰ differences between stipend holders and regular contracts. While on paper the stipend holders can arrange their working time by themselves, the survey reflects the fact that their self-reported workload on tasks other than their PhD topic is the same as for PhD candidates on regular contracts.

National differences PhD candidates from the European Union are on a par salary-wise with their German colleagues. However, non-EU international PhD candidates seem to have a slightly lower salary than their European colleagues. The difference is already evident when examining the raw net salaries (overall mean: 1450 €, non-EU nationals: 1405 €) and increases when taking into account health insurance for stipend holders (overall mean: 1413 €, non-EU internationals: 1323 €) and pension insurance (overall mean: 1351 €, non-EU internationals: 1213 €). This is due to the high fraction of stipend recipients among non-EU internationals. However, one should also take into account that for those not planning to stay in Germany or at least the EU, paying into the German pension insurance might make little sense. Mean salaries of different demographics are shown for comparison in Figure 2.11.

Gender differences We found a slight difference of 3 % in average salaries between male and female PhD candidates, which is likely not significant. Neither correcting for the

¹⁰Including social insurances: Health, Pension, Unemployment

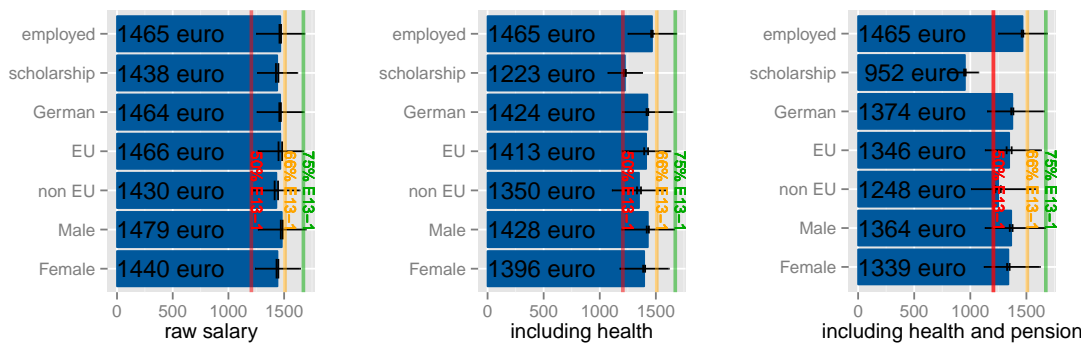


Figure 2.11: Mean salaries of PhD candidates of different demographics. The horizontal black lines indicate one standard deviation around the mean value, the vertical lines (barely separated) one standard error of the mean.

subjects of the survey respondents' university degrees and self-reported working hours nor calculating an hourly wage does change the result. The difference is lower than an estimate¹¹ for the current German subject-corrected gender pay gap estimated by the Statistisches Bundesamt at 7 %, and looking at the major subjects shows that the differences within the subjects are also not higher. Mean salaries of different demographics are shown for comparison in Figure 2.11.

2.4 Supervision

A dedicated and individual supervision is key to successfully finishing a PhD project. Additionally, inadequate supervision is one of the main reasons for thinking about quitting the PhD¹². To properly evaluate the supervision situation, we asked about the supervisor, his/her role at the institution and in the scientific community, as well as the relationship of the PhD candidate with their supervisor, in particular the frequency of meetings and communication, and the possibilities provided by the centres in cases of conflict. Additionally we asked how satisfied PhD candidates were with their supervision, the results were on average positive and are discussed in section 2.10.

The majority of the PhD candidates (>50 %) are supervised by the primary supervisor who is also the primary examiner of the PhD exam. A further 40 % are supervised by other scientists at the institution. A significant minority (4 %) reported that their supervision is either not defined or not existent. Additionally, almost 15 % decidedly disagreed with the statement that the person supervising their work knows a lot about the PhD's area of research. As a matter of course, the nature of a PhD project demands qualified supervision in order to be successfully completed and to meaningfully contribute to research.

¹¹Statistisches Bundesamt, Wirtschaft und Statistik, August 2014 https://www.destatis.de/DE/Publikationen/WirtschaftStatistik/Arbeitsmarkt/WegZurGleichstellung_82014.pdf

¹²as seen in free text answers

The vast majority (>90 %) meet their supervisor at least once a month, which from the experience of the survey group can be seen as an adequate basis for communication of the work's progress and of potential problems. However, 8 % of the surveyees see their supervisor biannually or less, which might lead to unnecessary problems concerning time schedule and the content of the thesis. In those cases, communication is probably very limited regarding the average of three to four years to finish a PhD thesis, which translates into six to eight meetings or less in the entire PhD period.

We observe a high dependence of the PhD candidates on their supervisor. As mentioned above, for almost 60 % of the PhD candidates the primary supervisor is also the examiner. Therefore, scientific success and a timely graduation, as well as everyday work (and the possibilities of contract prolongation) depend on one single person over the entire PhD period. Additionally, 40 % stated that there is no help from the centre in case of conflicts with the supervisor.¹³

Apart from the supervisor himself/herself, we tried to establish more objective criteria for successful supervision within a PhD project - in particular, whether a higher degree of the supervisor's participation, a more reliable structure, and more than one scientific contact person may increase the happiness and the success of the work. We therefore integrated four of the main issues relating to those factors to investigate the origins of a subjective feeling of insufficient supervision. To facilitate comparison, we calculated a supervision index in accordance with previous surveys, including the existence of a progress report, a thesis committee, a project outline, and a supervision agreement¹⁴. These four parameters indicate the status of associated communication, consensus, and appreciation for each other's positions during the PhD project. We consider it evident that merely signing a supervision agreement does not improve supervision but usually following its directives does. A 'yes' is counted as one, while a 'no' or 'I don't know' count as zero¹⁵. The points are averaged for the variable of interest, e.g. centre or satisfaction. The supervision index S_i is then calculated as follows:

$$S_i = P_r + T_c + P_o + S_a$$

P_r regular progress reports (written or oral)

P_o project outline

T_c thesis committee

S_a supervision agreement

¹³ Answer 'no' to the question 'Does your center provide help at conflicts with your supervisor?'

¹⁴ We asked for the implementation of each of these explicitly, asking PhD candidates to answer *yes*, *no*, or *I don't know*, the questions can be found on the PhD project and Supervision pages of the survey questions

¹⁵ We received a comment stating that a 'don't know' should be neglected instead of being grouped together with 'no'. We count 'don't know' and 'no' together because we maintain: If a candidate honestly does answer 'don't know' to the question whether he delivers regular written progress reports, he does not deliver them. All of the measures mentioned require the active participation of the candidate. We consider it very unlikely that there could be a candidate who, for example, regularly writes progress reports but does not know about the fact that he writes them.

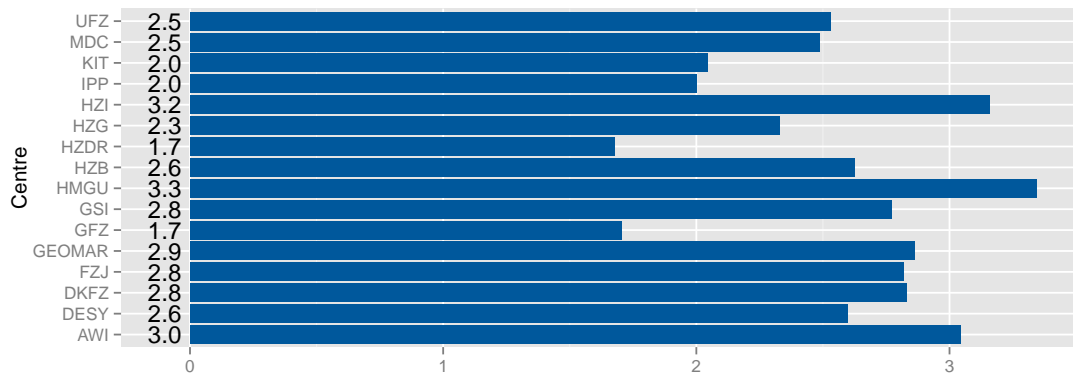


Figure 2.12: Average supervision index S_i in each centre, the calculation is explained in the text, the values indicated in the plot are rounded to the last digit. The theoretical maximum is 4, and would be reached if all PhD candidates from a centre had all supervision measures mentioned above in place.

Figure 2.12 shows that the average supervision indices differ between 1.7 (HZDR, GFZ) and 3.0 (AWI) depending on the centre, presumably due to individual traditions in doctoral education and the legal situation in the federal states (e.g. implementation of an obligatory supervision agreement by the latest changes in university legislation).

To evaluate whether the supervision index S_i has actual influence on the supervision quality, namely the subjective feeling of satisfaction by the PhD candidates, we determined the relationship between the SI and the satisfaction concerning supervision amongst all centres. Figure 2.13 shows that there is a highly significant correlation. The ratio of persons whose S_i are between 2 and 4 is higher the more satisfied the PhD candidates are with their supervision, whereas SIs between 0 and 2 dominate in the cohort of unsatisfied people. The vast majority of those who are completely unsatisfied have an SI less than 1. Parameters that are directly dependent on the supervision, such as satisfaction with the entire PhD project and with the primary supervisor, show similar correlations, contrary to factors that do not directly depend on supervision, e.g. payment.

The data indicate that the tools included in the supervision index are suitable as a means of identifying areas for potential improvement to in turn increase the satisfaction of the doctoral candidates and thus the success of the PhD projects. The satisfaction scores within the individual centres can be viewed via the web-based result viewer introduced in chapter 1.

The supervision situations at the Helmholtz Centres vary significantly. The majority of PhD candidates have good supervision conditions and therefore a realistic chance of finishing their PhD successfully and on time. On the other hand, 291 PhD candidates (18.5 %) have a supervision index of 1 or 0 meaning that none or only one of the aforementioned measures are in place. Such conditions lead to feelings of insecurity and frustration and therefore to a higher likelihood of (thinking about) quitting¹⁶. As our data

¹⁶Visible in free text answers and correlation between supervision index and frequency with which the

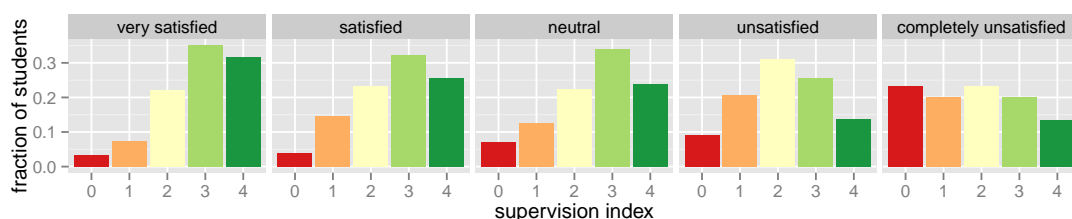


Figure 2.13: Distribution of the supervision index for PhD candidates depending on their satisfaction with their supervision. The lower the satisfaction, the higher the fraction of PhD candidates with low S_i in the group.

indicate, the implementation of the measures (supervision agreement, regular meetings, a thesis committee providing independent scientific advice and a written project outline) can significantly improve the satisfaction of the PhD candidates. Furthermore help for conflict resolution might be offered to the PhD candidates.

2.4.1 Free text on supervision

One third of all participants (480 out of 1484) commented on their supervision and how it could be improved¹⁷. The PhD candidates have a clear idea of what their supervision should be like. Many took the opportunity to describe the tasks of a supervisor and what they think a supervisor should epitomise. They also made suggestions how PhD supervision could be improved. (Exemplary comments: ‘formal agreement on the steps of my PhD at the start’, ‘referee in case of conflicts with the supervisor’, ‘training for the supervisor’, ‘clear guidance and feedback’, ‘supervision could be improved by a lower workload’) Figure 2.14 summarizes and groups the contents of all 480 comments. Overall, what the PhD candidates want is what is commonly agreed to as normal supervision tasks.

The most frequently given responses are summarized in Figure 2.15. By far the most common desire was for more time from the supervisor and more regular meetings: (Exemplary comments: ‘The supervisor is sometimes hard to reach and usually very busy.’, ‘Meet more often’, ‘Spend more time in discussion with me’, ‘Regular meetings should be fixed.’)

The second most frequent answer was that PhD candidates are completely happy and satisfied with their supervision and the person behind it (PhD candidates write: ‘Completely satisfied’, ‘Very good already’, ‘My supervisor is great!’). Many PhD candidates specifically ask for more post-docs and senior scientists (with a permanent contract) in the working groups, especially compared to the number of PhD candidates: (Exemplary comments: ‘A post-doc in the lab who knows the actual work’, ‘My supervisor is the head of institute and his time is very limited, I would like to have another post-doc or junior professor to supervise or at least support me’, ‘Less PhD candidates at the same

PhD candidates think about quitting.

¹⁷Question: ‘How could your supervision be improved?’

time’, ‘I’m really content with my postdoc, but the professor could be more interested’.)

A surprising number of people commented that they would like their supervisor to be more interested in their topic or project, which should be one of the first prerequisites for supervision. A few people wrote about problems arising from supervisors leaving the centre or taking parental leave without having a substitute. Many problems arising from dependency on one single supervisor could be countered by having a PhD committee, which is increasingly common and sometimes even mandatory for the PhD candidates. (Exemplary comments: ‘Several persons, not just one’, ‘I woul[d] appreciate to have not just two supervisors but a committee of scientists that I can choose and invite to feel committed to me and my work’.)

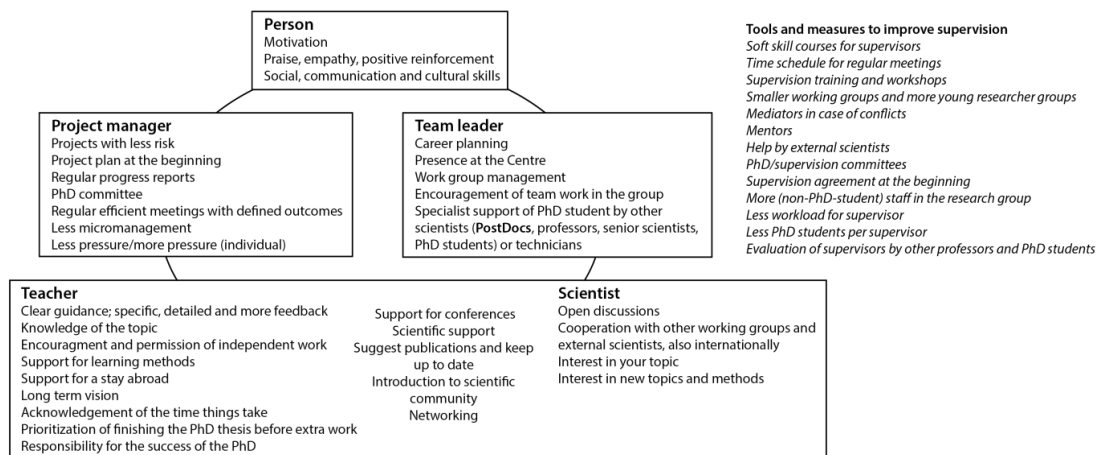


Figure 2.14: Summary of tasks and requirements of supervision named by the PhD candidates, including suggested tools and measures to improve supervision.

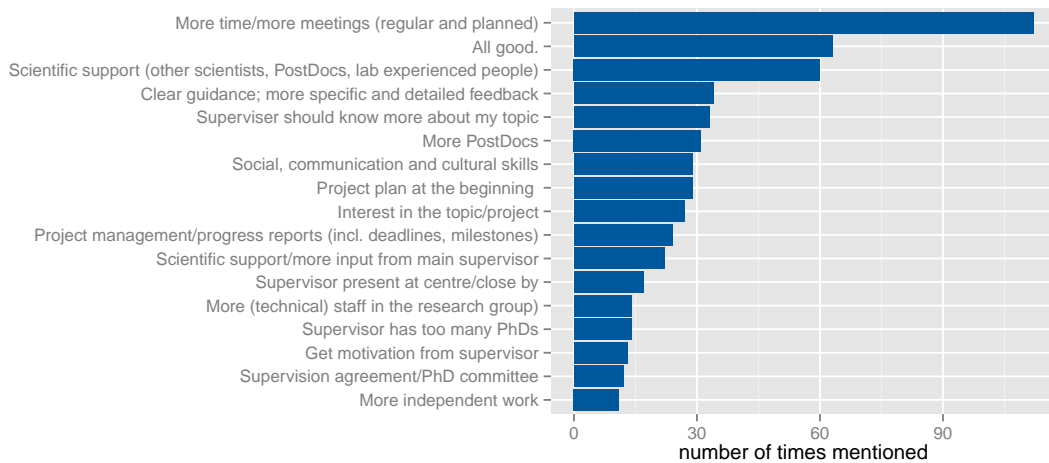


Figure 2.15: Categorized summary of the most frequent answers

2.5 Graduate schools

Graduate schools are a main provider of structured doctoral education. They offer courses for technical and professional training and provide platforms for networking as well as financial benefits. For this reason, the PhD candidates were asked questions about the graduate schools at their centres or elsewhere, such as at a local university.

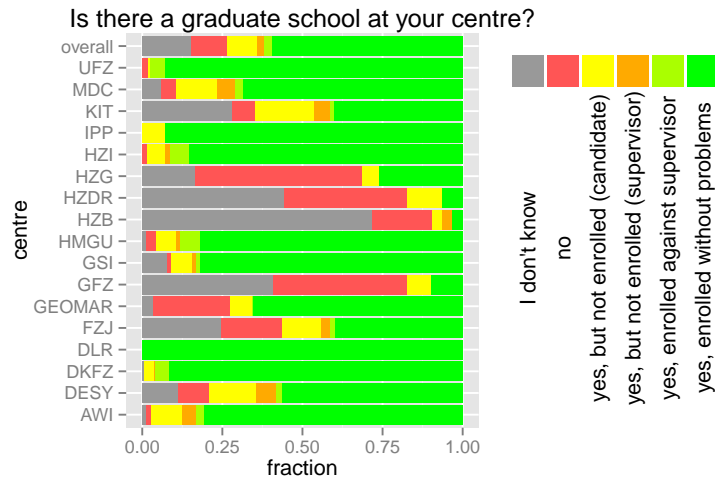


Figure 2.16: PhD candidates' answers about the existence of a graduate school at their centre. Explanation of the legend: 'not enrolled (candidate)': PhD candidates not enrolled because they do not want to; 'not enrolled (supervisor)': PhD candidates not enrolled because their supervisor does not support the graduate school; 'enrolled against supervisor': PhD candidates who are enrolled against the wish of their supervisor. Not all PhD candidates agree about the existence of a graduate school, likely information about the graduate schools did not reach every candidate. For centres without graduate school but enrolled PhD candidates this might be due to misattribution of an external graduate school as the school of the centre.

We were interested in the presence of a graduate school at the centres. More than 70 % of the participants across all Helmholtz Centres know about the existence of a graduate school at their centre and are usually enrolled without problems (Figure 2.16). However, there are significant differences between the individual centres. In particular at FZJ, GFZ, HZB, HZDR, and HZG, where the number of unaware or unenrolled PhD candidates is above the average (above 70 % for the latter 4 centres). Reasons for the higher numbers may lie in the absence of a graduate school at the centre or in the limited admission. At the moment, the Helmholtz Centres DLR, DZNE, GEOMAR¹⁸, GFZ, HZB, and HZDR

¹⁸We received a comment from GEOMAR explaining the situation at GEOMAR: *The notion that 'GEOMAR [does] not have [its] own graduate school' (cf. p. 20) is correct as far as graduate schools funded by the Helmholtz Association are concerned. However, all GEOMAR PhD students have the possibility to join the local 'Integrated School of Ocean Sciences' (ISOS). ISOS is part of the Cluster of Excellence 'Future Ocean', a joint endeavor with the University of Kiel and GEOMAR as main pillars, established in 2006 within the framework of the German Excellence Initiative. As a matter of fact, the majority of students enrolled at ISOS have PhD supervisors affiliated with GEOMAR. While*

do not have their own graduate school¹⁹. In addition to the absence of a graduate school, there may be an inadequate distribution of information and/or a refusal of accession by the supervisor. The negative attitude of some supervisors is unfortunately evident in the reply of the PhD candidates: 70 PhD candidates answered that their supervisors do not support a participation in a graduate school and consequently 34 participants are not enrolled because of the absent support. Unfortunately, we could observe that no significant improvement in the graduate school situation has been made within the last 4 years. Only 9 Helmholtz Centres afford well-established graduate schools that appeal to the majority of the PhD candidates (evaluation for DLR, DZNE and IPP are not possible because of the low number of participants).

Furthermore, we asked the PhD candidates about their access to a graduate school elsewhere Figure 2.17. On average, 25 % of the PhDs are enrolled in a graduate school independent of their Helmholtz Center. Only at HMGU and GEOMAR does the ratio of enrolled participants exceed 50 %. Among the centres with no graduate school/a graduate school found wanting, GFZ, HZDR, and HZG do at least offer 25 % of the PhDs the opportunity to enroll in a graduate school elsewhere.

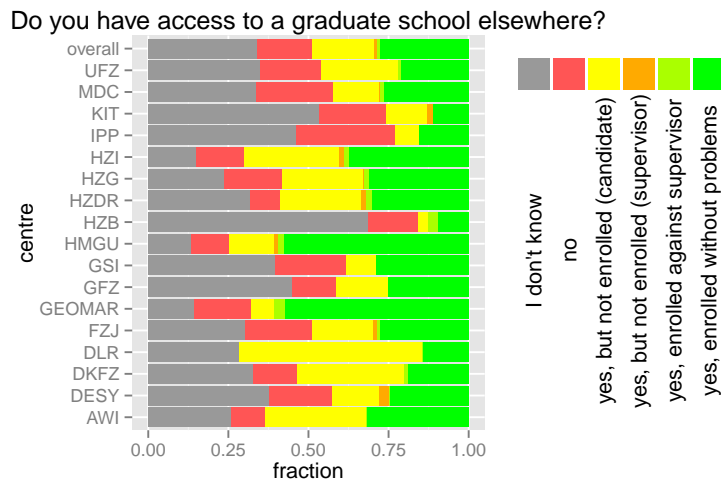


Figure 2.17: PhD candidates' answers about access to a graduate school outside their centre. For explanation of the legend refer to the caption of Figure 2.16.

We also asked those PhD candidates that attend a graduate school, which aspects of the graduate school they use. Most of the PhDs go to soft skill courses and PhD retreats (Figure 2.18). About half of the participants benefit from financial support for conferences/travel or are registered in training programs. A smaller number (~30 %) of PhDs participate in summer schools and take advantage of general advice and/or financial

puzzling at first sight, the combination of GEOMAR survey results in figure 2.16 and 2.17 becomes plausible keeping in mind this peculiar approach of graduate student support in marine sciences as practiced in Kiel.

¹⁹Information from Helmholtz Geschäftsstelle Berlin

support for equipment or publication, as well as career fairs and conflict resolution by a graduate school. Note that each graduate school offers different services and that the PhD candidates' knowledge about the graduate schools vary strongly. Nevertheless, the distribution of utilized offers may provide a hint as to which aspects may be improved or which require more publicity. The results can be reviewed on a per-centre basis in the result viewer provided with this report. In general, the number of foreign PhD candidates is high (28 % of participants) and therefore it is important to provide enough courses in English.

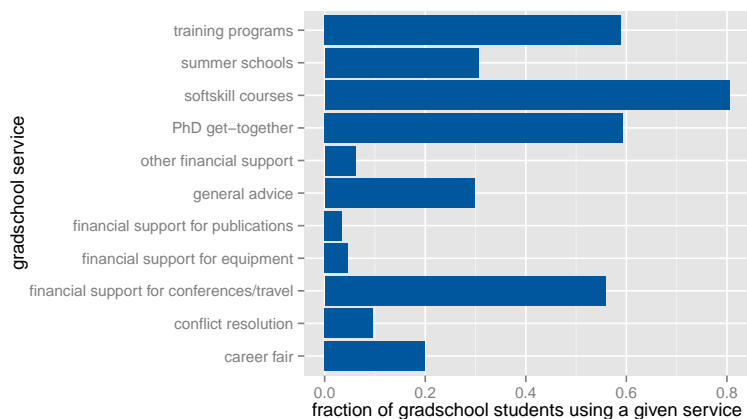


Figure 2.18: Overall use of graduate school services.

We inquired about whether the PhD candidates think they personally benefit from their graduate school and, separately, whether their thesis benefits (Figure 2.20). Broadly speaking, PhD candidates generally believe that they personally benefit more than their thesis does. This observation may be a result of the rather low number of courses available which are relevant for the theses due to the high diversity in each center and university. Additionally, it may be seen as a consequence of the fact that soft skill courses are the most utilized aspect that graduate schools offer. Substantially more PhD candidates of the Helmholtz Centres HZI, HZG, HZDR, GFZ, and GSI are of the opinion that their PhD thesis does not benefit from a graduate school. Three of these centres do not have an associated graduate school, there the answers refer to a graduate school elsewhere. A graduate school elsewhere probably matches the centres' topics less than an associated one, therefore it is unsurprising that the benefit for the thesis is lower.

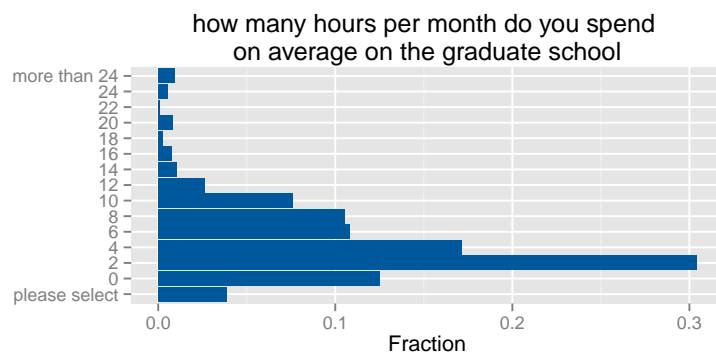


Figure 2.19: Time spent on the events and courses of the graduate schools.

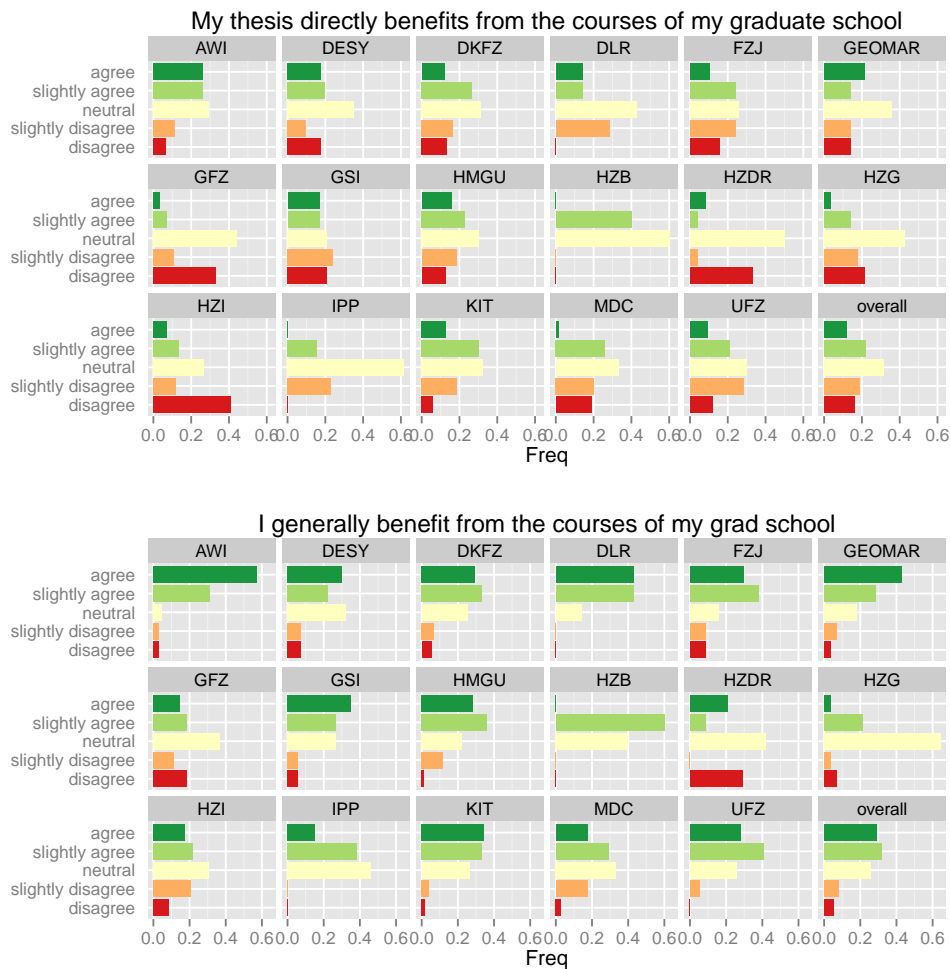


Figure 2.20: Enrolled PhD candidates' opinions concerning their graduate school courses are heterogenous. Generally the PhD candidates find that they profit personally (e.g. soft skill courses, career courses, scientific events not specific to the thesis topic) rather than with respect to their thesis.

In order to evaluate the time spent by PhD candidates on participating in graduate school-run courses/events, we asked about the average time in hours each month spent on them. We found that the majority of PhDs spend about 2 hours per month on such events, while a few individuals are spending more than 24 hours per month (Figure 2.19).

2.6 Project

2.6.1 Types of PhD theses

Among the 18 Helmholtz Centres, two main forms of PhD theses are common. The monograph is considered the more traditional type, whereas a thesis by publication is

increasingly targeted by PhD candidates, supervisors and institutions. 66 % of the PhD candidates aim to write a monograph and 23 % are preparing a thesis by publication. The remaining 11 % are unsure, do not know, or use a different form altogether. The situation in each centre is mostly uniform, either PhD candidates graduate primarily by monograph or by thesis by publication (Figure 2.21).

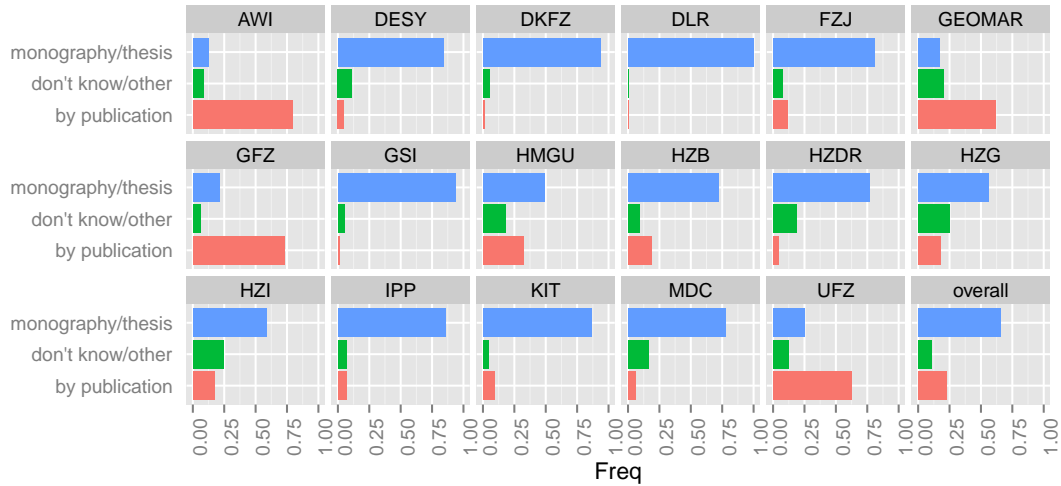


Figure 2.21: Thesis by publication or monography

Required number of publications The number of publications required for obtaining a doctoral degree varies. Of the PhD candidates who state they need publications to graduate, 54 % specify 3 publications as the required number, while 22 % and 18 % say they need 1 and 2 publications respectively. About 4 % of participants indicate that they need 4 or 5 publications. The percentage of PhD candidates specifying they need more than 5 publications in order to graduate is below 2 %. These values are shown in Figure 2.22 and can be compared to the actual number of publications the PhD candidates had at the time of the survey. The variation in answers to this question points to a certain degree of uncertainty as to the requirements for obtaining a doctoral degree. It also reflects the large number of different regulations within universities and faculties. Changes in regulations may further increase uncertainties for PhD candidates.

Actual current number of publications Of all participants, 69 % do not have a first-author peer-reviewed journal article yet, 21 % have one, 6 % have two, 3 % have 3 such publications and 0.9 % have more than that. The number of co-author peer-reviewed journal articles is slightly higher: 60 % of all participants have no such publication, 22 % have one, 9 % have two, 4 % have three, and 5 % have more than three.

These percentages include participants at all stages of their PhD project. As one might expect the number of publications rises the longer PhD candidates have been working on

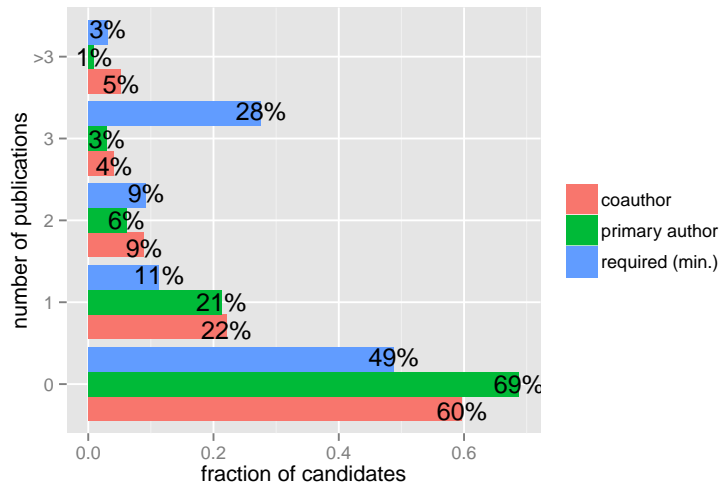


Figure 2.22: Required number of publications for graduation, and actual number of primary and co-author publications of all PhD candidates. Percentages given are of all PhD candidates, those answering 0 for the required number write a monography with no required publications.

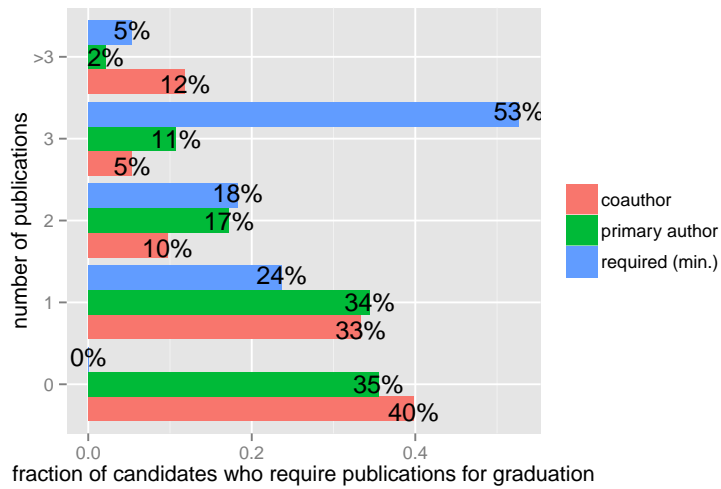


Figure 2.23: Required number of publications for graduation and actual number of primary and co-author publications of PhD candidates working 3 or more years on their PhD. The plot takes only PhD candidates into account who indicated they are required to have a mandatory number of publications, the percentages shown are percentages of those PhD candidates who are required to write at least one publication.

their PhD (Figure 2.24) and after three years the fraction of PhD candidates without first-author publications drops to 47 %. Looking at the PhD candidates currently finishing their PhD (those who have been working on their project for three or more years) reveals that the vast majority has not yet reached their required number of publications. The numbers are shown in detail in Figure 2.23. Their interpretation is dependent on whether co-authored publications count for the thesis by publication, unfortunately we failed to anticipate this when compiling the questions and therefore do not have this information for our set of PhD candidates.

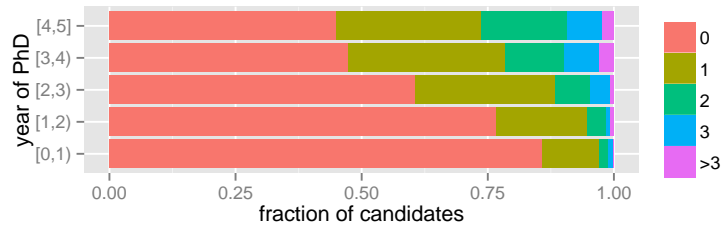


Figure 2.24: Number of publications by year of the PhD work.

2.6.2 Conferences

The participation in international conferences is considered an important part of PhD training, and the participation in at least one international conference is recommended to most PhD candidates in order to promote their scientific careers. 76 % of all participants have attended at least one international conference. Of those, 32 % have been to one international conference, 26 % attended two, and 18 % attended three. 25 % of the PhD candidates attended more than three international conferences.

Conference participation also rises with the amount of time PhD candidates have been working on their project (Figure 2.25). Three or more years into their PhD studies, 95 % of PhD candidates have been to at least one international conference.

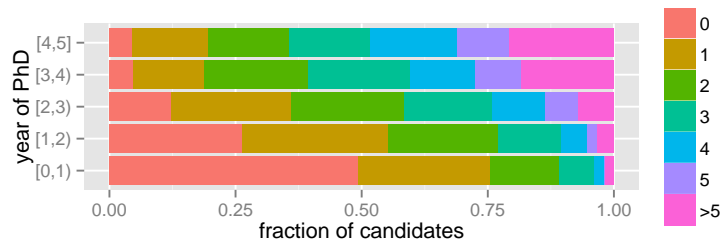


Figure 2.25: Participation in international conferences by time working on the PhD project.

2.6.3 Cooperation partners

69 % of participants say that they are in active cooperation with at least one external scientist for their project. Of these, most have one (25 %), two (33 %) or three (18 %) external cooperation partners, while 14 % have four or five and 10 % have more still. Figure 2.26 shows the number of collaborators as a function of nationality.

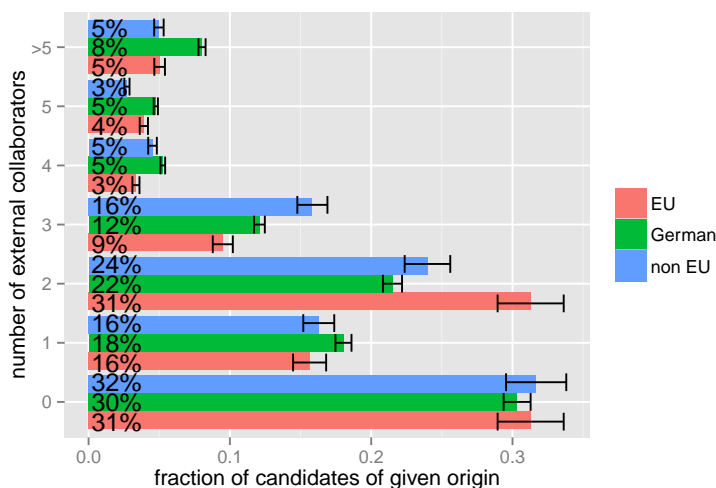


Figure 2.26: Fraction of participants of German, EU and non-EU origin with number of external cooperation partners. Read as: 30 % of German PhD candidates have no external collaborators. Error bars indicate the standard error. The origin-dependent difference seems to be marginally significant.

2.7 Career plans

When asked about their career plans after their PhD, 64 % answered they would like to do something related to science (of this, 47 % would like to stay in academia as a PostDoc, while 53 % would like a science-related position in industry, economy, or administration). A considerable number (21 %) are undecided. This reflects the PhD candidates' enthusiasm for and commitment to science, but also the job and career planning uncertainties in science and the lure of often better paid and/or more secure jobs in industry, economy, or administration.

Most of the participants (62 %) would prefer working in Germany (33 % would like to work in Germany 'very much') after finishing their PhD. In contrast, 10 % would consider leaving Germany (2 % definitely do not want to continue working in Germany), and 28 % are undecided. A graphical representation of these results can be found in Figure 2.27.

Non-German EU citizens are more inclined to leave Germany than non-EU citizens or Germans. Indecision is high in all groups, but more so in non-German EU citizens.

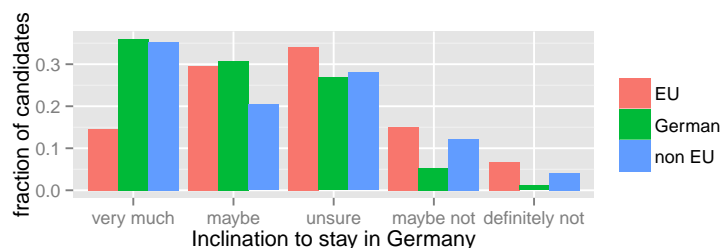


Figure 2.27: Answers to the question 'do you want to work in Germany after finishing your PhD'.

2.8 Infrastructure

The satisfaction of PhD candidates and their successful graduation are, next to the quality of supervision, mainly dependent on the infrastructure which is provided by the employers. Most of the PhD candidates evaluate the infrastructure at their centres as very good or good (Figure 2.28). On average, the PhD candidates are very satisfied with the laboratory equipment as well as the library/journal access. Moreover, they were generally satisfied with their workspace, the technical and administrative support, and other amenities (e.g., bike stands, canteen, showers, and sporting opportunities). Dissatisfaction regarding administrative support and other amenities depends on the centre. Free text answers of this survey often point out problems with the communication between foreign PhD candidates and the administration as well as a huge number of documents which are only available in German.

2.9 Children and family

In recent years the decline of the birth rate in Germany and in particular the high number of academics without children has received a lot of attention. It is often discussed whether this is issue of reconcilability between founding a family and pursuing a career, especially for women. The vast majority of PhD candidates are in their late twenties, biologically a good time for a low-risk pregnancy. This was also the average age of women at first birth for a long time, but recently the average age at first birth increased to about 30²⁰. We therefore asked about the situation within the Helmholtz Association. As we look at having children from a gender perspective, we decided to consider only the data of the 1450 surveyees (total number of participants 1483) who gave their gender.

2.9.1 Having children

About 35 % of PhD candidates (277 of 725 males and 256 of 725 females) can imagine having children during their PhD time. The fraction of PhD candidates with children is

²⁰ Statistisches Bundesamt http://www.demografie-portal.de/SharedDocs/Informieren/DE/Statistiken/Deutschland/Durchschnittsalter_Muetter_Geburt.html

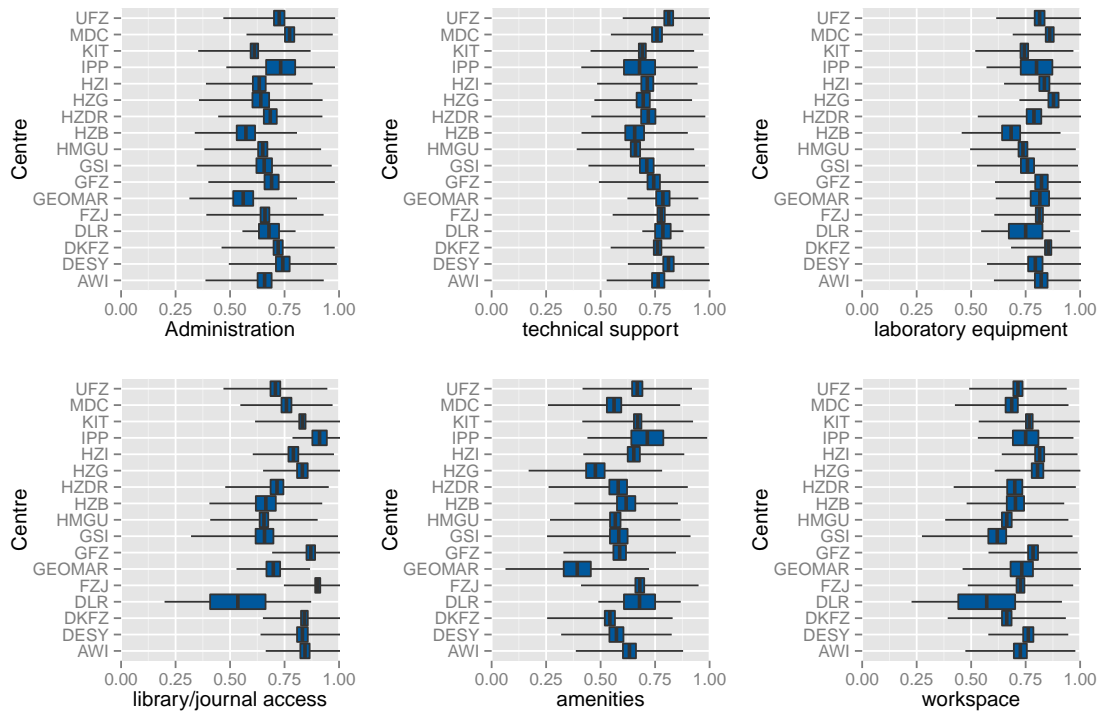


Figure 2.28: Mean satisfaction of the students with the infrastructure at their centre, with 0 corresponding to 'very poor' and to 1 'very good'. The sticks cover the mean \pm one standard deviation and give the spread of answers. The blue boxes cover the mean \pm one standard error of the mean and give an estimate for the accuracy of the calculated mean value.

7.2 % (105), with another 2.8 % (40) currently preparing for childbirth²¹. The number of PhD candidates with children is consistent with the results from 2012 (7 %), 2010 (7 %) and 2008 (8.6 %). This number varies noticeably between the centres as shown earlier in Figure 2.3. The fraction of PhD candidates considering children during their PhD varies between 22 % and above 50 % at the individual centres. Additionally, the fraction of PhD candidates who refrain from their wish to have children because they expect problems²² varies significantly. While only 3 % of PhD candidates in their first year have children, in the second year the fraction rises to 6 %, and levels off at around 10 % for 3rd- and 4th year PhD candidates, before rising again to 12 % for 5th year PhD candidates, the results are shown in 2.29.

²¹Answers 'yes' or 'in progress' to the question 'Do you have Children'

²²Answer 'I would like to but the situation does not permit it' (lack of money, lack of time, lack of support) to the question 'Do you consider having children during your PhD time.'

2.9.2 Gender differences

Of the 35 % of PhD candidates considering having children during their PhD time, about 50 % of the males and 68 % of females answered²³ that they would like to have children during their PhD but that the situation does not permit it (in the following we refer to this answer as problems). The situation is shown in Figure 2.30.

The significant difference between the male and female is likely due in part to the higher absence from work female PhD candidates expect due to pregnancy. On top of that, traditional role models might come into play leading female PhD candidates to be expected to take longer parental leave than their male peers. We tried to find out if there is a gender bias in contract extension as compensation for the time spent on parental leave. A bias could not be found with statistical certainty. If there were any bias, it would be in favour of women (female PhD candidates are marginally more likely to receive an extension after parental leave according to the answers of the PhD candidates). Finally, apart from the possibly of increased risk of additional absence due to pregnancy and childcare for women, there might be a contribution of female PhD candidates on experimental topics that will be barred from lab and field work for safety reasons during pregnancy. One could think of offering lab/candidate assistants to pregnant experimenters to compensate for the drawback they face compared to their male colleagues.

²³ Answer 'I would like to but the situation does not permit it (lack of money, lack of time, lack of support)' to the question 'Do you consider having children during your PhD time?'

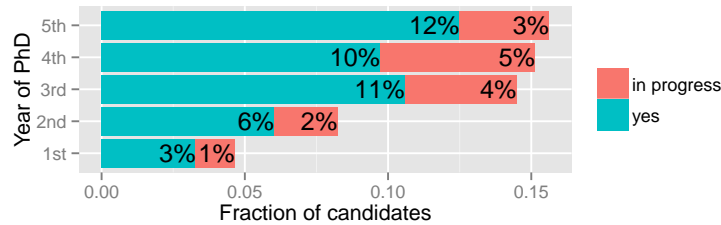


Figure 2.29: Answers to the question 'do you have children'.

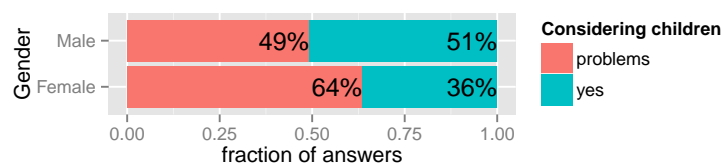


Figure 2.30: Comparison of the fraction of males and females expecting who answered 'I would like to but the situation does not permit it' to the Question 'Do you consider having children during your PhD Time?'. Percentages given are percentage of those PhD candidates who consider children at all.

Variables influencing the ability to raise children We investigated how several measures commonly implemented by the centres in the field of childcare and parental support influence the amount of PhD candidates citing problems as a reason for abstaining from their explained wish for offspring during their PhD.²⁴ For each centre, we used the number of PhD candidates considering children during their PhD n_{yes} and the number of PhD candidates wanting children but refraining from having them due to problems²⁵, n_{problems} to compute the fraction of PhD candidates interested in children and not expecting problems $q_{\text{happiness}}$. We assume $q_{\text{happiness}}$ to be a reasonable measure for the success of childcare and support measures. As a measure for the degree in which a measure is implemented at a centre we used the fraction $q_{\text{implemented}}$ of PhD candidates who said a measure would be available to them (a centre where 50 % of the PhD candidates interested in children checked “yes” for “childcare” therefore has $q_{\text{implemented}}=0.5$). It should be noted that in order to improve on both $q_{\text{implemented}}$ and $q_{\text{happiness}}$, it is not sufficient to only implement a measure, but also to communicate it to interested PhD candidates. We compiled the values for each centre in a scatterplot, displaying $q_{\text{implemented}}$ on the horizontal and $q_{\text{happiness}}$ on the vertical axis. We did a linear regression fit on the points weighted by the $n_{\text{yes}} + n_{\text{problems}}$ to account for the different numbers of PhD candidates at the centres wanting children. Experimentally, we also tried weighting by the number of PhD candidates that knew about the implementation of the measure or the total number of PhD candidates at the centre, but qualitatively this did not change the results.

We investigated these numbers for seven possible measures:

- [Does the centre offer] an extension of contract after parental leave of mothers? (Parental leave is guaranteed by law. But that does not help PhD candidates on a time limited contract. Therefore, the question ‘can the PhD candidates extend by the time they take parental leave?’ For stipend holders: can mothers on the contract receive an extension for caring for a child of at least six months (on top of what is possible for everyone))?
- The same as above, but for fathers
- Do parents get child benefits (some contracts, especially stipends, increase the salary for people with children, for example those modeled after DFG stipend regulations)?
- Is there a childrens office (an office PhD candidates can use from time to time when they need to bring their child to work)?
- Is home office allowed for parents?
- Is there financial support for childcare during conferences (from centre or graduate school)?
- Do the PhD candidates think they could get a place in childcare at their centre?

Results The results are shown in Figure 2.31. The measures most strongly correlated with $q_{\text{happiness}}$ are parental leave without loss of working time for the PhD project (hence

²⁴The number of answers from PhD candidates with or wishing children from DLR and IPP were too low to give meaningful results

²⁵Answer I would like to but the situation does not permit it (lack of money, lack of time, lack of support) to the question ‘Do you consider having children during your PhD time.’

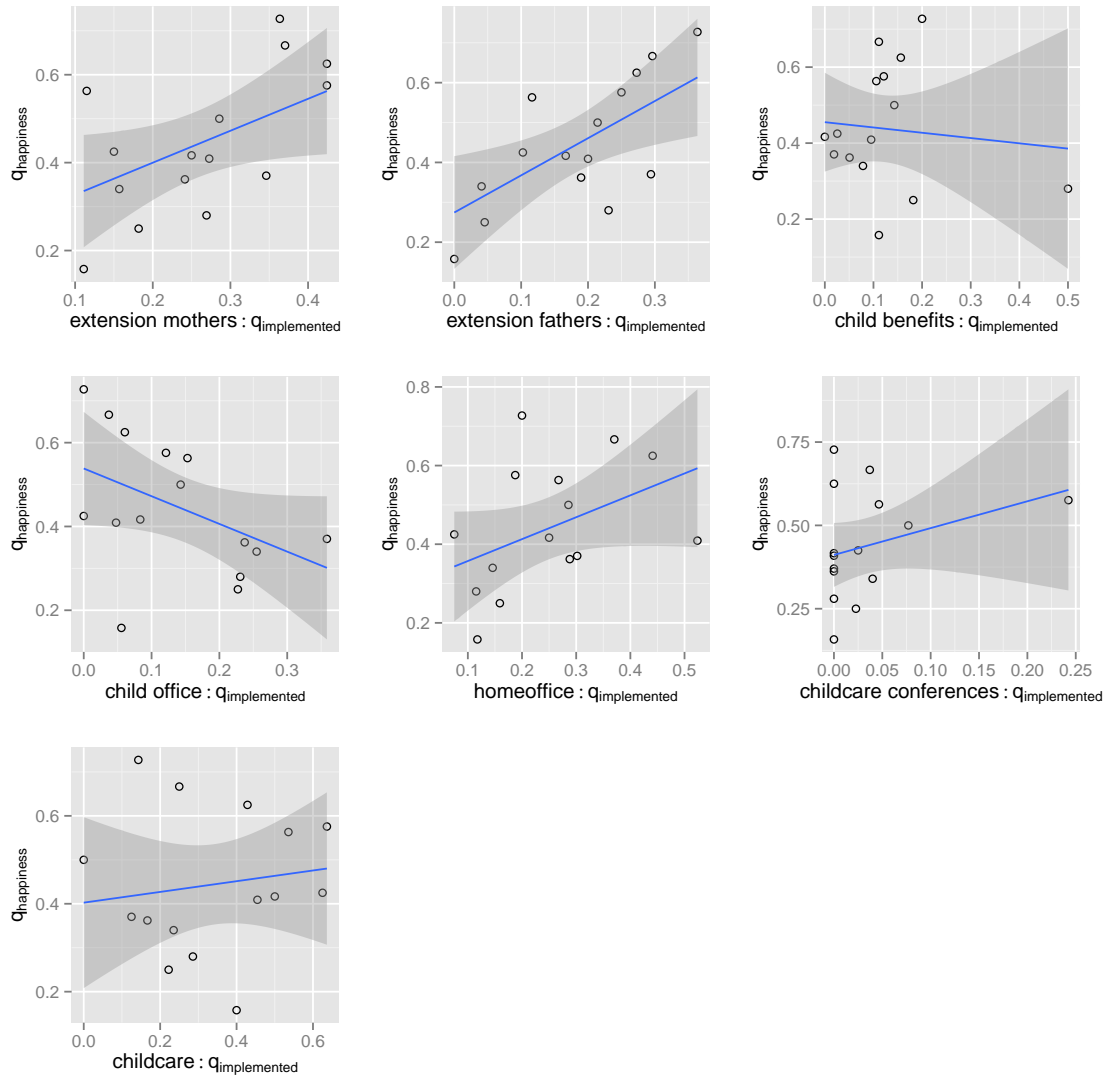


Figure 2.31: Weighted linear regression fits on $q_{\text{happiness}}$ as a function of $q_{\text{implemented}}$ for different child support measures. Each point corresponds to the state at one Helmholtz Centre.

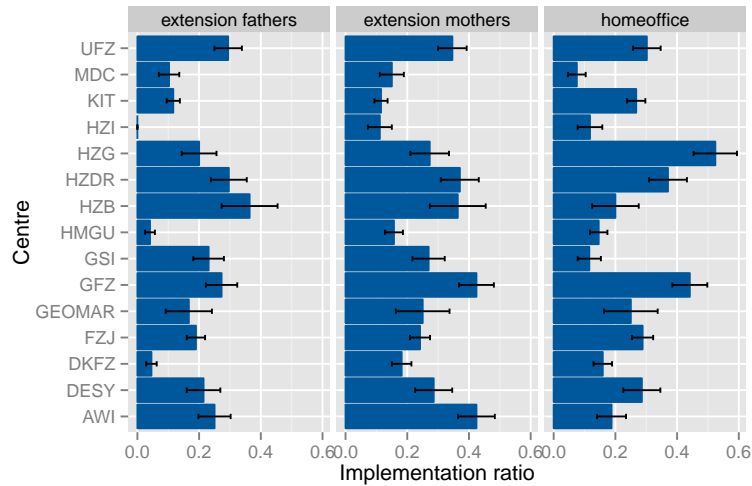


Figure 2.32: $q_{\text{implemented}}$ for the three child support measures most strongly correlated with $q_{\text{happiness}}$. The errorbar spans the mean \pm one standard error of the mean.

extension of contract after parental leave) for either gender and the possibility of working in home office.

We would like to reiterate that the perceived child friendliness is not only dependent on the implementation of these measures, but also on how readily available information regarding the measures is. Also, we would like to emphasize that there is a high probability that a ‘maybe’ or a non-binding commitment to a measure of support, say contract extension, is not necessarily considered a ‘yes’ by the PhD candidates²⁶. If PhD candidates are to base their decisions in family planning on the availability of child-care/support measures, they will feel safest when, for example, the PhD guidelines of the centre guarantee (as opposed to recommend) contract extension for compensation of parental leave or the permission of home office.

The implementation ratio per centre $q_{\text{implemented}}$ of the three most important measures is shown in Figure 2.32. We reiterate that this implementation ratio does not depend solely on the availability but also on the spreading of information regarding the availability. A centre with perfect child support will still rank low if nothing is done to let the PhD candidates know about this support.

2.9.3 Opinions of the PhD candidates

We provided a free text field for comments from all PhD candidates with children or interested in having children. According to the free text answers, a strong factor that was not taken into account for the choice of the questions is the attitude of supervisors,

²⁶This is argued from the fact that at one centre publicly available documentation recommend (but not guarantee) the extension of contract after parental leave, but still a large fraction of PhD candidates at said centre stated that extension would not be available to them.

colleagues and the centres towards having children during a PhD project. A positive attitude helps as much as a perceived negative attitude can prevent PhD candidates from thinking it possible to have children at all: ‘Our working group is very nice and it is no problem if I work from home for two days. Therefore, we (my son, wife and me) manage quite well.’; ‘I would appreciate it if having children during the PhD time was supported and not viewed negatively’; ‘Supervisor told me that he does not support having a child during PhD’.

Suggestions for improving the situation for parents and those who would like to be parents include ‘contract extension’, ‘more flexible working hours’, ‘more information about the support for parents’, ‘a financially secure position’, ‘a home office option’, ‘a guaranteed work load reduction’, ‘better acceptance of mothers as researchers’, and ‘(lab) support by a technician’.

Child care options are requested to be more accessible, closer to either work or home, with longer hours and more places. Holiday programs at the centre are being requested or, if present, are regarded as useful.

One of the most mentioned requests and probably the easiest to fulfil relates to information and reliable agreements: ‘I was lucky to be able to take parental leave. This is not required by my contract and I wasn’t completely sure I would get it. This should be made clear from the start.’; ‘Information about possible support is very unclear to me and most other PhD candidates I know. I think that such information should be made available to PhD candidates at the beginning of their contract.’

2.10 Satisfaction of PhD candidates

We asked the PhD candidates about their satisfaction with their supervision. The PhD candidates rated their satisfaction for different topics on a 5 point scale from completely unsatisfied to very satisfied. Satisfaction about the five topics was surveyed, namely: *Primary supervisor*, *General supervision*, *Payment*²⁷, *PhD project* and *Work-life balance*.

In Figure 2.33 we display the satisfaction in these variables on a scale with 0 corresponding to ‘completely unsatisfied’ to 1 corresponding to ‘very satisfied’. The variance within each centre is usually bigger than the difference of the means of different centres (the width of the horizontal line is one standard deviation, the width of the blue box is one standard error). A likely reason is that the answer to most of these questions probably relates more to the supervisor or PhD work than to the centre itself. It might be noteworthy that while the two centres with the lowest values are both working in the medical sector, their PhD candidates do not share the same reasons for their unhappiness.

²⁷We received a comment from the GSI PhD representation: *The high satisfaction with respect to the payment at GSI where the payment, after inclusion of insurance was among the lowest might come at a surprise. The reasons were discussed among PhD candidates at GSI and a follow-up survey was conducted. According to the follow-up study, the primary reason for the puzzling result was that most of the students on GSI stipends were lacking information on the amount of insurance missing in the stipends. The follow-up survey showed that PhDs, after reading general information about the differences between stipends and regular contracts became less satisfied and more than 80% would prefer a 2/3 position to their scholarship.*

We display the results for all these questions and the overall average (theoretical optimum: 1).

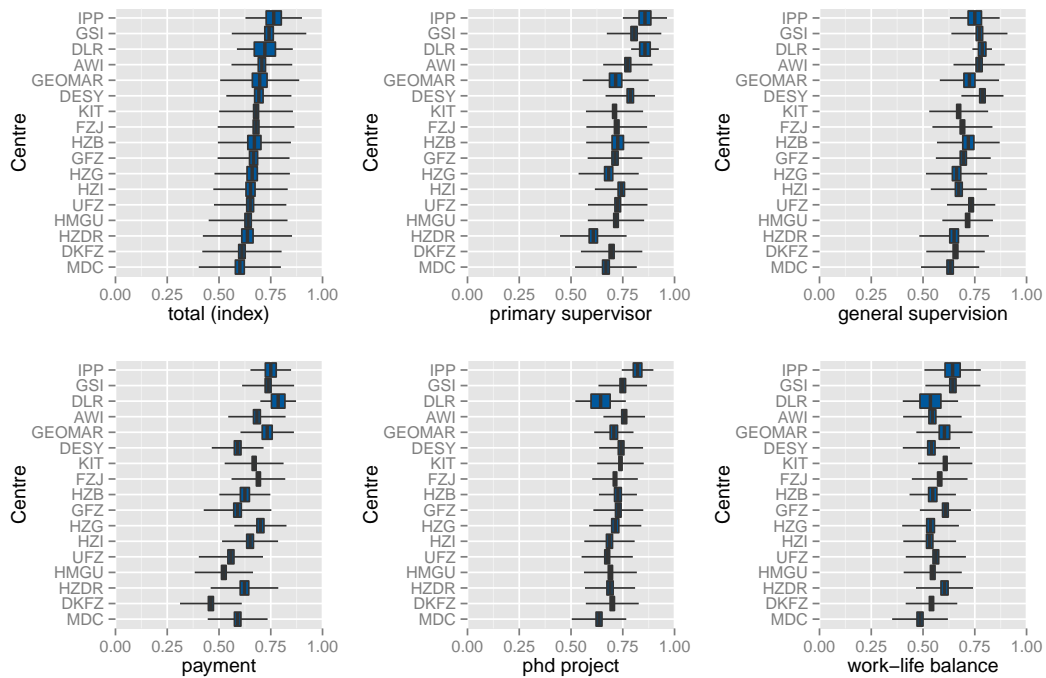


Figure 2.33: Satisfaction of the students, overall and for the five aforementioned points. The spans the mean \pm one standard deviation and indicates the variability of answers. The blue box spans the mean \pm one standard error and indicates the uncertainty of the mean value.

2.10.1 Quitting

Questions that some of the PhD candidates ask themselves at some point during their doctoral thesis is: Was it a mistake starting this? Should I maybe quit my PhD? Talking to PhD candidates, we found that while many have at some point thought about it, most seem to think that it is a rather rare phenomenon. We were interested in how common it is to think about quitting the PhD and therefore asked the PhD candidates to rate how often they consider it on a subjective scale from never to very often. Additionally, those PhD candidates answering something other than ‘never’ were presented a conditional (but optional) text field asking the PhD candidates for their reasons for considering quitting their PhD.

While about 50 % of PhD candidates never think about quitting their PhD in their first year, the number decreases with the time the PhD candidates spend in their PhD, until in the third year about 30 % of PhD candidates think at least ‘medium often’ to ‘very often’ about quitting their PhD. In the fourth year there is a slight dip, possibly due to PhD candidates seeing the end of their thesis approach and being more positive

as a result. The results are shown graphically in Figure 2.34.

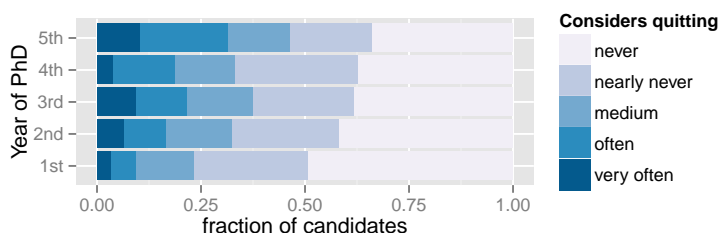


Figure 2.34: Distribution of answers to the question ‘How often do you consider quitting your PhD?’ depending on the year of the PhD project.

Reasons for quitting

An astonishing 519 people took the opportunity to write down in an optional text field the reasons for which they thought about abandoning their PhD. This is slightly more than one third of the overall responses, and more than half of those presented with the text field, indicating that this is a very important matter, even for those PhD candidates who nearly never think about quitting. The majority of all responses mention a lack of supervision, structure and/or scientific support and guidance: ‘vague project description, which sounded more concrete in the interview’; ‘my professor had no real plan for my PhD’; ‘too many supervisors who do not like to supervise’; ‘it is often that I just don’t know what to do’.

Another major problem is the workload and work-life-balance. The PhD candidates feel too much pressure, high demands in producing and publishing data and little time for free experimental work (trial and error) which is often essential in progressive scientific work. They spend a lot of time working as some supervisors obviously expect a high level of working hours per day and a voluntary reduction of holiday and free time in favor of the PhD project: ‘my PhD requires a lot of work (more than 12 hours a day on average and at least 1 weekend day), and I have to manage a family with child + 1 child in arrive too’.

Compared to that, the payment is felt to be much too low. Some PhD candidates even proclaimed that their income is hardly sufficient for living, especially if they have children. These claims are also reflected in the data we gathered about salaries. A problem that was mentioned even more often is the financial insecurity due to short-term contracts and intransparency regarding prolongation: ‘[My professor] promised contract prolongation that did not work out due to lack of money’; ‘until now I have no financing thus I have two obligations until I get a financing’.

In spite of being highly motivated concerning research, some of the young scientists worry about their future perspectives and doubt that finishing the PhD makes any sense if they would not get a job in science. Other aspects mentioned are the problematic scientific environment, the lack of proper communication and the infrastructure (e.g. little budget for analytical instruments).

There is a small number of nonetheless important cases, in which the high dependence on one person is obviously abused leading to long-term discontent, psychological problems and existential fear despite of high scientific motivation: ‘Whenever I talk to [my professor] he is threatening me that my visa is in his hands, I became sick and visited a psychologist out of anxiety, loneliness. . . I continue only because it was my dream to do my PhD and I am now fighting to fulfill my dream although all my expectations and rights have been lost’

Even though the nature of our survey does not allow us to draw meaningful conclusions about the number of people actually abandoning their PhD projects, we think these statements indicate that there is a noticeable probability for highly motivated and excellent young scientists to fail on structural problems that are not connected to science and that would be otherwise solvable. Making funding more secure and transparent, offering structure and reducing the dependence on one person for example by introduction of a mediator or the implementation of a thesis committee, are possible ways to substantially increase satisfaction of the PhD candidates. There are concepts at least for some of the problems mentioned that have already proven to be successful (compare section 2.4 about supervision).

2.11 Integration of foreign PhD candidates

From the freetext field offered to foreign PhD candidates to comment on integration of foreign PhD candidates at their centre, the key issues seem to be language issues: The communication with the administrative body of some centres seems to be impossible in English, and sometimes no English translation is given for key documents, for example the contracts, as one candidate writes: ‘I signed a contract in German although I did not know German. They even had no informal translation for me to know what I am signing’.

Also, the fact that safety-instructions were only available in German was mentioned as an issue by some PhD candidates.

The language was mentioned to a lesser extent as a problem in scientific communication, but some PhD candidates still mentioned problems with team meetings and seminars in German only. Interpreting the quantitative results in this section, one should keep in mind that the numbers of non-German PhD candidates were limited, the numbers are shown in Figure 2.35. Since the results are mostly positive we did not remove centres with a low number of non-German participants in this section.

The language issues are also reflected in the quantitative survey data: At most centres, a notable fraction of foreign PhD candidates state that not all necessary information is available to them in a language they understand (Figure 2.36). Typically 75 % to 100 % of foreign PhD candidates state that they primarily communicate with their peers in English, while apart from a negligible minority, the remainder communicates in German.

At some centres good German courses seem to be available (they were specifically mentioned positively in the freetext by PhD candidates), while at others there were complaints in the freetext about there being no free courses, no well-structured courses, or not at the level required by the PhD candidates.

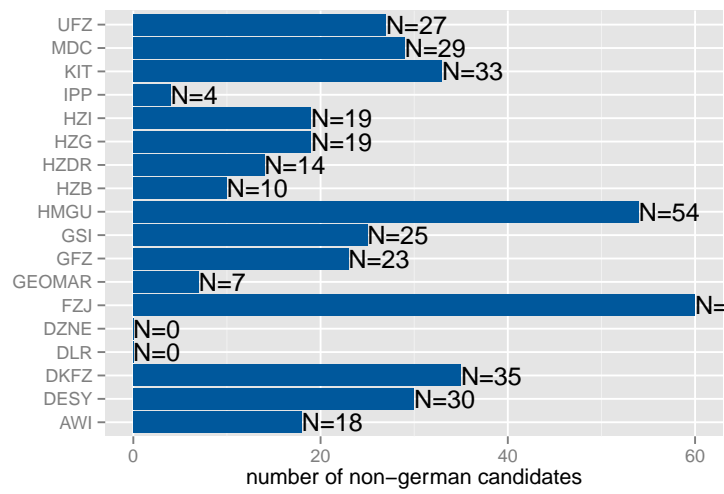


Figure 2.35: Number of non-German PhD candidates at the centres.

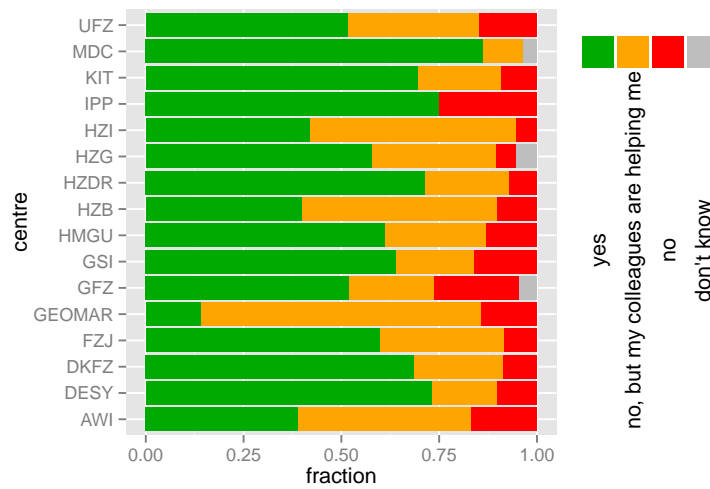


Figure 2.36: Answers by non-German PhD candidates to the question 'Do you get all the important information (group internal problems, administrative information) in a language you understand?'. 'no, but my colleagues are helping me' is represented by orange.

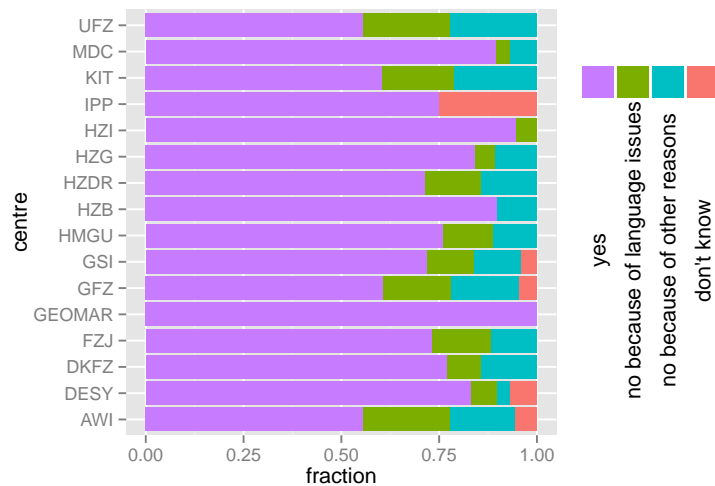


Figure 2.37: Non-German PhD candidates' answers to the question 'do you feel integrated into your working group/ at your centre?'

Additionally, we asked the foreign PhD candidates about the feeling of integration (Do you feel integrated into your working group/at your centre? answers: 'yes', 'no because of language issues', 'no because of other issues', 'don't know'). Most PhD candidates feel integrated, but a significant fraction do not (Figure 2.37).

At most centres the majority (over 75 %) of international PhD candidates answer 'no' when asked 'Do you have problems communicating with people at your centre?'. The results are shown in Figure 2.38.

We naively expected to find a correlation between the feeling of integration the PhD candidates experience and the implementation of integration measures at the centre. Specifically, we asked in the survey about the implementation of a welcome office for foreign PhD candidates, language courses and information available in a language the PhD candidates understand. Surprisingly, we could not find significant correlation between the measures and subjective feeling of integration. We assume that the feeling of integration stems more from the openness of the colleagues than from integration measures. Since the centres show significant differences in the fraction of PhD candidates feeling integrated, there is likely some underlying reason causing some centres to be more integrative than others, but we were unable to find it within our data.

Independent from the missing correlation, we still consider it worthwhile to present the implementation of measures at the different centres in (Figure 2.39).

2.12 Final comments

At the end of the survey the PhD candidates were offered a free-text field in which to state their two main wishes or mention major problems. Many took the opportunity.

'Doing science is hard but interesting and exciting. Working in science (as a PhD

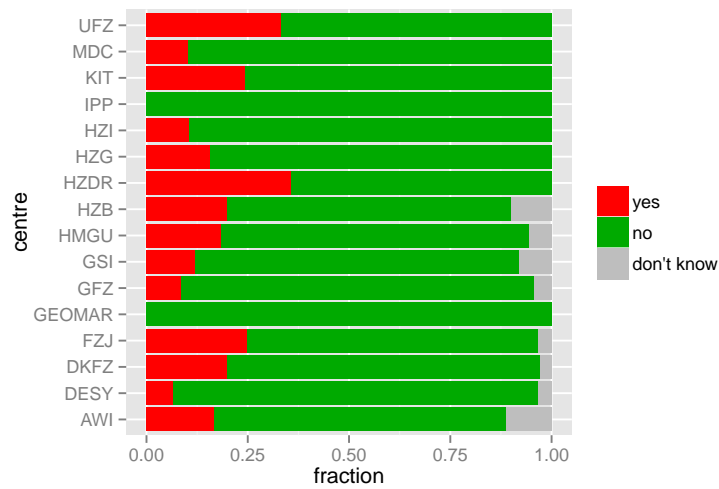


Figure 2.38: Non-German PhD candidates' answers to the question 'Do you have problems communicating with people at your centre'.

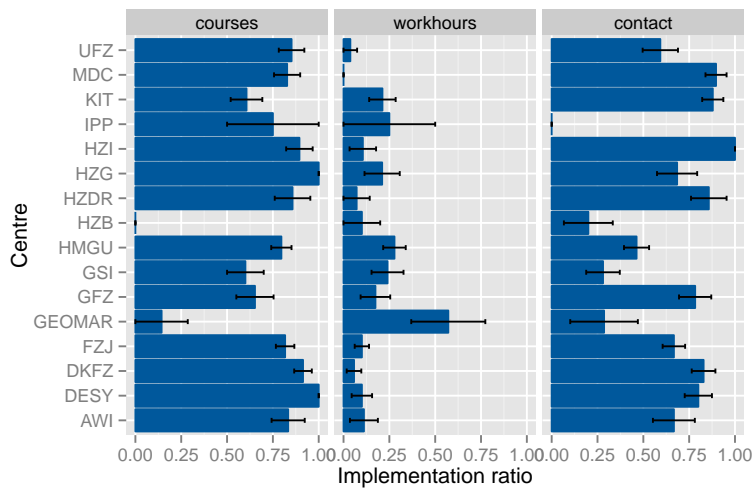


Figure 2.39: Summary of measures implemented at the centres to help PhD candidates from abroad. We asked for the existence of a measure in the form of a yes/no question. The plots above show the fraction of non-German PhD candidates indicating a measure would be available to them.
courses: Courses are offered at the centre or visiting courses elsewhere is supported financially
workhours: Courses may be visited during office hours
contact: There is a welcome office / contact person available

or in more advanced positions) is challenging already content-wise. Institutions and politics need to arrange job circumstances that make working in science attractive. Most important: non-temporary positions, higher payment (that is justified by education and working hours), compatibility with having a family.'

2.12.1 Main wishes

The main wishes participants expressed for their PhD time were varied and often very specific. The more frequently named wishes are summarized in figure. Most answers were directly related to the PhD candidates' PhD projects and further careers. By far the most frequent wish was to finish their PhD projects successfully and in time. The wish to do good research and to gain knowledge was closely followed by the demand of fair and equal salaries. The practice of paying 50 % salary and expecting 100 % or more work is being rejected as unfair and degrading: 'I would wish that PhD candidates were be paid as what they are: well-studied, highly-qualified, and motivated people with a university degree.' Proper supervision, work-life balance, publishing in peer-reviewed journals and finding a job after the PhD are roughly equally important to the participants. Other demands include networking, a future career in science, contracts instead of stipends, family support, a realistic goals and workloads, doing research abroad, or personal wishes such as learning German, having children or simply enjoying their work and feeling that they are doing something useful. The graphical summary of the results is shown in Figure 2.40.

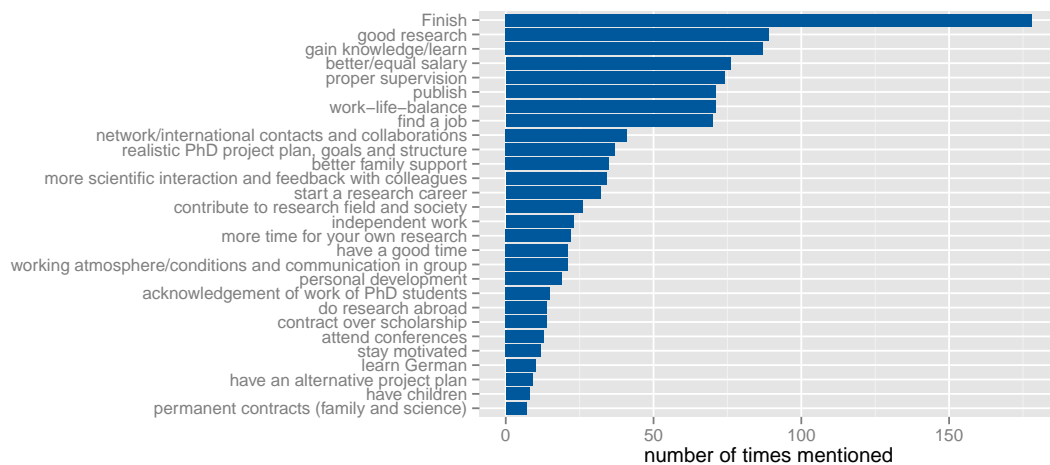


Figure 2.40: What are your two main wishes for your time as a PhD candidate? – summarized and categorized answers. 'Family support' gathers wishes regarding more permanent contracts in science, part-time options, home office, funding for lab assistance.

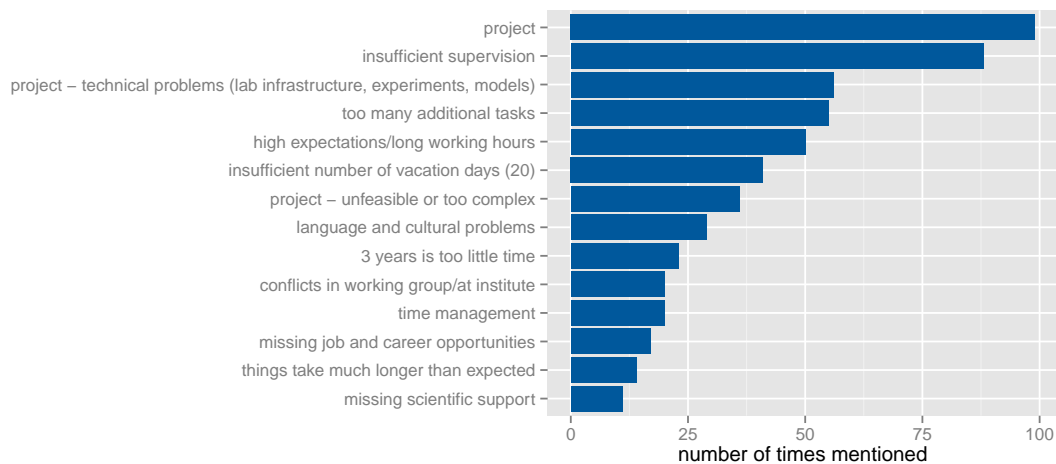


Figure 2.41: What are major problems you experienced? - summarized and categorized answers.

2.12.2 Major problems

In the same question we asked what major problems the surveyees faced or have been facing while doing their PhD. Again, personal and individual answers highlighted many different sources of problems (see figure). The most mentioned problems were related to their project and supervision: ‘Many things went wrong but there was never a change of the plan’, ‘Bad data and moderate supervision’. A lack of clear goals and a structured plan is often mentioned. The PhD candidates also feel that they have to perform too many additional tasks (e.g. technician work, work for the supervisor or administrative tasks), are expected to work overtime and fear taking days off. The 20 days vacation rule that still exists in many part-time PhD contracts and compare poorly to the 30 days of TVÖD is seen as highly problematic, especially in the context of frequent overtime and weekend work. A number of PhD PhD candidates state that language and cultural barriers are their most important problems during their time as a PhD: ‘All administrative meetings or strategy meetings are in German’, ‘Safety instructions provided only in German’. Other problems mentioned include conflicts in the working group or the institute, dependence on the main supervisor, staff fluctuation due to non-permanent contracts or the long and unpredictable peer-review process. The graphical summary of the results is shown in Figure 2.41.

3 Conclusion

Most of the PhD candidates evaluate the infrastructure at their centres as very good or good. The majority of PhD candidates are very satisfied with the laboratory equipment as well as the library/journal access, generally satisfied with their workspace, the technical and administrative support, and other amenities (e.g., bike stand, canteen, showers, and sport opportunities). The things they are least content with on average are work-life-balance and payment but on both of these the average opinion is still ranking slightly better than neutral.

The financial situation of the PhD candidates is heterogenous. The majority of PhD candidates are paid on stipends (23 %) or half positions (30 %). Virtually every candidate (88 %) still works a full position, and most even work overtime for a full position (more than 40 hours/week). PhD candidates on stipends, often barred from taking a position on the side, on average have so little left (952 € net including social insurance) that they fall below subsistence level (Pfändungsfreies Existenzminimum: 1045.04 € net/month, German Mindestlohn for 40 h/week with 8,50 €/h: 1020 € net without church tax for a single household). Keeping in mind that all of these PhD candidates are already among the most highly trained workers in Germany when they start their PhD, the lower end of PhD payment seems hard to justify even taking into account the additional qualification gained during the PhD work. Uncertainty about contract extensions due to short term funding and a lack of transparency about the conditions of extension are among the factors that leave the majority of PhD candidates to rethink their decision of doing a PhD at some point or another during their PhD studies.

For family planning, the PhD candidates prefer guaranteed extension of contract in compensation for time spent in parental leave and the possibility of working in home office to other measures of family support. We think the centres could improve their support for academics with children by putting some funds away to offer guaranteed extension after Elternzeit. Extrapolating from the numbers of PhD candidates who actually become parents during their PhD (about 7.5 %), and the fact that parents in Elternzeit are not paid by the centres, the increase of costs for PhD candidates should be marginal (the centre would only have to pay extra for those PhD candidates that are on a 3rd party funded project that cannot be extended). Additionally, the conditions of extension have to be communicated clearly and timely.

Regarding the quality of supervision, the results are heterogenous. While many PhD candidates are more or less satisfied, there are very problematic cases of PhD candidates who are virtually unsupervised, with none of the formal supervision measures (supervision agreement, project outline, progress reports, thesis committee) in place. PhD candidates with little or no supervision measures are more often also unsatisfied with their situation, emphasizing that these measures indeed have a positive influence on the PhD. The

heterogeneity, even within the centres, points to the fact that the supervision conditions depend more on the supervisors than on the culture at the centre. In our opinion, the individual centre's administration is responsible for the homogenization of supervision conditions.

International PhD candidates mostly feel well integrated, but the results and free text comments show that most centres do not provide all required information in English. In most cases the PhD candidates rely on help from their colleagues, but some lack important information due to language issues. In free text answers, safety information and contracts were mentioned among the problematic material where a translation would be important.

70 % of the participants are aware whether or not there is a graduate school at their centre and most are enrolled without problems. The situation has not changed a lot in comparison to the last surveys, there are still PhD candidates that state that their supervisors do not agree with their participation in the graduate school. The most-used offers of the graduate schools are soft skill courses and PhD-get-togethers, followed by financial support for conferences/travel or training programmes. PhD candidates feel they profit noticeably more personally than with respect to their thesis.

4 List of questions

Background

The name of your Helmholtz Centre
v_7 *answers:* Please select your centre | DLR | DZNE | FZJ | GEOMAR | GSI | HZB | HZDR | HZI | UFZ | HZG | HMGU | GFZ | KIT | IPP | AWI | DESY | DKFZ | MDC | I am a curious official, not a PhD candidate, so disregard my answers

Your age
v_9 *answers:* Please select your age | <18 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | >40

Your gender
v_11 *answers:* Male | Female | Prefer not to answer

What's your nationality
v_254 *answers:* German | non-German EU | non EU | skip question

Do you have children?
v_253 *answers:* yes | in progress | no | skip question

Do you consider having children during your PhD time?
v_216 *answers:* yes or already have | I would like to but the situation does not permit it (lack of money, lack of time, lack of support) | no | I don't consider it

University

What subject did you major in before you started your PhD?? main subject of your last university degree.
v_12 *answers:* Please select the subject of your university degree | Biology | Chemistry | Computer science / Informatics | Economy/Finance | Engineering | Environmental studies | Geosciences | Languages | Law | Mathematics | Medicine | Physics | Psychology | Social sciences | Other

Which university are you enrolled at / registered with?
university v_13 *answers:* Select your University | Aachen (RWTH) | Berlin (FU) | Berlin (HU) | Berlin (TU) | Bonn (RFWU) | Bochum (Ruhr-Universität) | Darmstadt (TU) | Dortmund (TU) | Dresden (TU) | Duisburg-Essen (U) | Düsseldorf (HHU) | Erlangen-Nürnberg (Friedrich-Alexander-Universität) | Essen (FOM Hochschule) | Frankfurt am Main (Johann Wolfgang Goethe-Universität) | Freiburg (ALU) | Gießen (U) | Göttingen (GAU) | Halle-Wittenberg (MLU) | Hamburg (U) | Hannover (GWL) | Heidelberg (RKU) | Karlsruhe (KIT) | Kassel (U) | Kiel (CAU) | Köln (FH) | Köln (Uni) | Leipzig (Uni) | Mainz (Johannes Gutenberg-Universität) | Marburg (PU) | München (LMU) | München (TU) | Münster (Westfälische Wilhelms-Universität) | Potsdam (U) | Stuttgart (Duale Hochschule BW) | Stuttgart (U) | Tübingen (EKU) | Würzburg (JMU) | Other | Not enrolled
Other v_23 Input for data type varchar

Are you in active cooperation with your university? Please specify what you do there.
teaching v_14 *answers:* no | yes
taking classes v_15 *answers:* no | yes
use of Laboratories v_16 *answers:* no | yes
use of Libraries v_17 *answers:* no | yes
use of Offices v_18 *answers:* no | yes
cooperating with partners v_19 *answers:* no | yes
supervision of PhD candidates v_20 *answers:* no | yes
other activities v_21 *answers:* no | yes
I don't spend time at the university v_22 *answers:* no | yes

Does your primary supervisor/professor also work at your Helmholtz Centre?? primary supervisor: Think of the primary reviewer of your thesis.
v_255 *answers:* yes | no | don't know | don't have one

PhD Project

For how many months have you been working on your PhD project?? Include all months since the start of your contract. If you are working without a contract, select months spent working on your thesis in total.

v_25 Input for data type int

How much time do you think your PhD thesis will take (from start of first contract to disputation)? If you had no contract or had significant breaks in your contracts: Include all months spent actively pursuing your PhD after receiving your qualifying degree.

v_26 Input for data type int

Is there a written project outline for your time as a PhD candidate?

v_256 answers: yes | no | don't know

Is there a regular progress report in written and / or oral form?

v_257 answers: written and oral | only oral | only written | no | don't know

Do you write a monography (= PhD Thesis / Doktorarbeit) or do you graduate by publication (= cumulative Dissertation)?

v_258 answers: monography/thesis | by publication | don't know/other

How many publications are required for you to graduate?

v_30 answers: 0 (I write a monography with no required number of publications) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | more than 15

How many publications do you have of the types below (published, submitted and accepted altogether)?

peer reviewed journals (as primary/first author) v_76 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

peer reviewed journals (as co-author) v_77 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

conference talks (as primary/first author) v_78 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

conference talks (as co-author) v_79 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

conference posters (as primary/first author) v_80 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

conference posters (as co-author) v_81 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

other (as primary/first author) v_82 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

other (as co-author) v_83 answers: 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | >15

In how many international conferences/workshops did you participate until now?

v_98 answers: 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | >14 | please select

In how many other (non international) conferences/workshops did you participate until now?

v_115 answers: please select | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | >14

What do you hope to do after successfully finishing your PhD?

v_116 answers: stay in academia (e.g. postdoc) | non-science position in industry / economy / administration | science related position in industry / economy / administration | take a break (children, travel) | get more education (e.g. in a different area of science) | start my own business | don't know yet | other

Do you want to work in Germany after finishing your PhD?

v_118 answers: very much | maybe | unsure | maybe not | definitely not

With how many external scientists do you cooperate for your thesis (in reality)? external: not from your institute in reality: you actually cooperate, and are not just coauthors on a 150-author-paper

v_123 answers: 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 or more | I don't know

Tell us about your cooperation with other Helmholtz Centres

Do you think your research would benefit from collaboration with other Helmholtz Centres?? If you already cooperate: Does your research benefit from the existing collaboration. v_125 answers: missing | yes | no | don't know

Would you like to participate in a two day national event within Helmholtz for improving research collaboration & networking?? The event could be set up as follows: Helmholtz PhD candidates would meet for lectures and talks about topics of general interest. The speakers would be high-level scientists from within or also outside the Helmholtz society. You would be given the opportunity to present your own work on a poster. There would also be the chance to get in touch with sponsors who may be potential future employers. v_126 answers: missing | yes | no | don't know

cooperationExists v_304 answers: no | yes

How often do you consider quitting your PhD project? (you can skip this question if you want to)

v_129 answers: very often | often | medium | nearly never | never

Free text Quitting (page only shown if quitting is considered more often than *never*)

Would you care to tell us briefly why you consider quitting?

v_134 text field

Contract

What type of funding do you have?

v_144 answers: employment (staff) | employment (3rd party) | PhD staff | stipend Helmholtz | stipend Centre | stipend other | freelancer | none of the above | I don't know | no funding

How many days of vacation per year are defined in your contract?

v_143 answers: 20 or less | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 or more | we didn't agree on vacation | please select

How many working hours per week are defined in your contract?

v_305 answers: 15-19 | 19.5-21.5 (50 %) | 22-24 | 25-28 (65 %, 66 %) | 29-31 (75 %) | 32-35 | 36-38 | 39-41 (100 %) | 42-45 | 46-50 | >50 | we didn't agree on working hours | please select

How many hours a week do you actually work?

v_142 answers: 15-19 | 19.5-21.5 (50 %) | 22-24 | 25-28 (65 %, 66 %) | 29-31 (75 %) | 32-35 | 36-38 | 39-41 (100 %) | 42-45 | 46-50 | >50 | I don't know | please select

How do you distribute your working time? (input values in % totalling 100%)

PhD thesis v_147 input field for a number
equipment maintenance v_148 input field for a number
candidate supervision v_149 input field for a number
teaching v_150 input field for a number
own education (e.g. classes, workshops, grad school) v_151 input field for a number
applications for funding v_152 input field for a number
administrative tasks v_153 input field for a number
research projects unrelated to PhD thesis v_154 input field for a number
commercial service v_263 input field for a number
other tasks v_155 input field for a number

What is your monthly net income? Net income is the amount of money transferred to your bank account every month as payment for the work on your PhD project, including benefits. (with benefits)?

v_156 answers: please select | don't want to disclose | 0500 € and less | 0500-700 € | 0701-900 exteuro | 0901-1100 exteuro | 1101-1300 exteuro | 1301-1500 exteuro | 1501-1700 exteuro | 1701-1900 exteuro | 1901-2100 e | >2100 exteuro and more

Do you (personally) receive the following extra payments?

performance bonus v_286 answers: no | yes
christmas bonus v_287 answers: no | yes
marriage bonus v_288 answers: no | yes
child support (via contract, not from the state) v_289 answers: no | yes
other v_290 answers: no | yes

If you receive these benefits enter their approximate amounts. Leave empty where you don't know.

performance bonus (per month) v_157 input field for a number
christmas bonus v_158 input field for a number
marriage bonus (per month) v_159 input field for a number
child support (per month) v_160 input field for a number
other (per month) v_161 input field for a number

For how many years is your financial support guaranteed in total?

contractMinTime v_292 answers: 0.5 and less | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | more than 4 | don't know | no support
contractConditional v_293 answers: no | yes

In case you cannot finish in the expected time, does your centre or supporting agency prolong your contract?

v_163 answers: yes, in any case | only after a successful progress report | no | don't know | maybe

Have you done a research stay abroad during your PhD thesis? (minimum 4 weeks).

v_259 answers: yes | no | don't know

Would your centre support you for a research stay abroad? (4 weeks and above)

I have access to funding for research abroad at the center v_297 answers: no | yes
I have access to funding for research abroad the graduate school v_298 answers: no | yes
I have access to moral support (letter of support, finding of funding sources, etc.) v_299 answers: no | yes
I am not allowed to leave for a research stay on my contract (e.g. your contract / employer does not allow for research abroad) v_300 answers: no | yes
I am allowed to go for research abroad without interruption of contract. v_301 answers: no | yes
I don't know v_302 answers: no | yes

Supervision

Are supervision agreements in use at your Helmholtz Centre?

v_179 answers: yes and I signed one | yes but I did not sign one | I don't know | there aren't any

Do you have a thesis committee?

v_174 answers: yes | no | don't know

Does your centre provide help in case of conflicts with your supervisor?

v_282 answers: yes | no | don't know

Who supervises your project?

v_171 answers: my primary supervisor | another professor | a post-doc | another PhD candidate | someone else (non-postdoc resident scientist/wimi etc.) | nobody | I don't know

How often do you meet with your supervisor on average?

v_172 answers: please select | more than once per week | once per week | once per month | biannually | annually | less than annually | every second week

My supervisor knows a lot about my area of research!

v_173 answers: completely agree | agree | neutral | disagree | completely disagree

How could your supervision be improved?

v_180 text field

Is there a graduate school at your centre?

v_187 answers: yes, and I am enrolled without problems | yes, and I am enrolled but my supervisor does not support it | yes but I am not enrolled because my supervisor does not support it | yes but I am not enrolled because I don't want to | no | I don't know

Do you have access to a graduate school elsewhere (e.g. university, other centre)?

v_188 answers: yes, and I am enrolled without problems | yes, and I am enrolled but my supervisor does not support it | yes but I am not enrolled because my supervisor does not support it | yes but I am not enrolled because I don't want to | no | I don't know

Infrastructure

How do you rate the amenities at your centre?

administrative support (Centre administration) v_181 answers: very good | good | neutral | poor | very poor | not applicable

technical support v_182 answers: very good | good | neutral | poor | very poor | not applicable

laboratory equipment v_183 answers: very good | good | neutral | poor | very poor | not applicable

library and journal access v_184 answers: very good | good | neutral | poor | very poor | not applicable

amenities v_185 answers: very good | good | neutral | poor | very poor | not applicable

workspace v_186 answers: very good | good | neutral | poor | very poor | not applicable

Children (page only shown to those with children or considering children not *no, I don't consider it*)

Does your center offer you childcare (kita)?

v_217 answers: yes, and I could get / have a place | yes, but it's overbooked so I can't use it | yes, but I am not sure if I could get a place | no | don't know

What other support have you got / could you get at your centre (or the graduate school of your centre) regarding children?

extension of contract after parental leave of mothers?parental leave guaranteed by law. But that does not help you if you have a time limited contract. Therefore: can you extend by the time you take parental leave? stipend holders:can mothers on your contract get an extension for caring for a child of at least six months (on top of what is possible for everyone)? v_220 answers: yes | no | don't know

extension of contract after parental leave of fathers?parental leave guaranteed by law. But that does not help you if you have a time limited contract. Therefore: can you extend by the time you take parental leave? stipend holders: can fathers on your contract get an extension for caring for a child of at least 6 months (on top of what is possible for everyone)? v_221 answers: yes | no | don't know

childrens benefits v_222 answers: yes | no | don't know

childrens office? childrens office can office you can use from time to time if you need to bring your child, e.g. it's sick, babysitter is unavailable, your spouse is on a conference etc. v_223 answers: yes | no | don't know

home office allowed for parents v_224 answers: yes | no | don't know

financial support for childcare during conferences, research abroad, courses... v_283 answers: yes | no | don't know

other (specify below) v_226 answers: yes | no | don't know

Do you have any additional comments regarding children+PhD at your centre?

v_225 text field

GraduateSchool (page only shown to those enrolled in a graduate school)

How do you benefit from the graduate school?

My thesis directly benefits from the courses of my graduate school v_189 answers: agree | slightly agree | neutral | slightly disagree | disagree
I generally benefit from the courses of my grad school v_190 answers: agree | slightly agree | neutral | slightly disagree | disagree

What offers from the graduate school do you use?

financial support for conferences/travel v_205 answers: no | yes
financial support for equipment v_206 answers: no | yes
financial support for publications v_207 answers: no | yes
other financial support v_208 answers: no | yes
soft skill courses v_209 answers: no | yes
training programs v_210 answers: no | yes
summer schools v_211 answers: no | yes
PhD get-together v_212 answers: no | yes
career fair v_213 answers: no | yes
conflict resolution v_284 answers: no | yes
general advice v_285 answers: no | yes

How many hours per month do you spend on average on the graduate school?

v_214 answers: please select | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | more than 24

ForeignPhD candidates (page only shown to PhD candidates not from Germany)

Is there a contact person (e.g. welcome centre) at your centre for people from abroad?

v_229 answers: yes | no | don't know

In what language do you communicate with your colleagues primarily?

v_230 answers: English | German | other

Do you have problems communicating with people in your centre?

v_261 answers: yes | no | don't know

Do you get all the important information (group internal problems, administrative information) in a language you understand?

v_232 answers: yes | no, but my colleagues are helping me | no | don't know

Does your center support you in learning German?

They offer courses v_234 answers: no | yes
They offer monetary support for external courses v_235 answers: no | yes
They permit attendance of courses during working hours v_236 answers: no | yes
no v_237 answers: no | yes
don't know v_238 answers: no | yes

Do you feel integrated into your working group / at your centre?

v_239 answers: yes | no because of language issues | no because of other reasons | don't know

Do you have additional comments regarding the integration of foreign colleagues at your centre?

v_240 text field

Satisfaction

How satisfied are you with the following...

your primary supervisor v_241 answers: very satisfied | satisfied | neutral | unsatisfied | completely unsatisfied
your general supervision v_242 answers: very satisfied | satisfied | neutral | unsatisfied | completely unsatisfied
your payment v_243 answers: very satisfied | satisfied | neutral | unsatisfied | completely unsatisfied
your PhD project v_244 answers: very satisfied | satisfied | neutral | unsatisfied | completely unsatisfied
your work-life balance v_245 answers: very satisfied | satisfied | neutral | unsatisfied | completely unsatisfied

Final questions

What are your two main wishes for your time as a PhD candidate? What are major problems you experienced?

v_249 text field

Would you recommend doing a PhD at your centre to a friend?

v_250 answers: yes, to all my friends | yes, but only to German-speaking friends | yes, but only to non-German speaking friends | with reservations | no

Any comments on the survey or the questions?

v_251 text field