PhD Survey 2024 Final Report

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1 Background

Through our role as student representatives, the PhD Union constantly learns about the challenges that PhD students are facing at TU Graz. Our aim is to improve study conditions at the university, but it can be hard to distinguish rare from common problems making the allocation of resources challenging.

Based on our experience and prior to this survey, the PhD Union identified themes that we deemed worth investigating more substantially, which include:

- Unrealistic publication expectations not backed by the statutes.
- High work load with an elevated risk for burnout.
- Missing feedback about the study progress.
- High teaching load, which is not sufficiently acknowledged.
- Missing internationalization including unrealistic expectations of language proficiency.
- Unpaid work prior to employment not leading to contracts.

The aim of the PhD Survey was to substantiate personal perceptions with more objective data and to create a repeatable data source owned by the students (see also Section 1.2).

1.1 The PhD Union: Who are we?

The PhD Union is the official representation of all PhD students at TU Graz. This includes all students meaning those employed at the university, those employed at external companies, and those studying self-sustained. Our general goal is to improve the situation of PhD students in personal and study-related matters, while strengthening cooperation between departments and organizing social events. We further participate in committees such as the Curricula Commission and the Senate making sure that the voices of students are heard when important decisions are made.

1.2 The aims of the PhD Survey

The aims of the PhD Survey were manifold. First, we were **seeking to establish a reliable data source for the study conditions and problems** of PhD students at TU Graz. Specifically, our goal was to substantiate our representation work by asking questions that other data sources do not capture. The survey is supposed to be repeatable to extent beyond one generation of student representatives and in the best case to establish longitudinal data. Second, we regard the survey as a means to **establish a closer connection to the many PhD students** at TU Graz. Our survey targets the whole PhD community including self-sustained students, who are not covered by employee surveys. We further laid special emphasis on internationals as a special interest group.

Prior to the survey design and after the stakeholder interviews (see Section 2.1.1), a PhD Union internal brainstorming identified the following, relevant topics: (1) The knowledge of PhD

students about administrative processes, regulations and support systems, (2) the supervisor-PhD-relationship, (3) discrimination and exploitation experiences, (4) mental health, (5) attitudes towards academia and the motivation behind pursuing a PhD, (6) teaching load and student supervision duties, (7) general working conditions, as well as (8) sociodemographic variables for context.

2 Method

The following sections include details on the survey development (Section 2.1), the applied measures (Section 2.2), both standardized and custom, as well as the implementation process (Section 2.3), statistical analysis (Section 2.4) and data protection measures for the survey (Section 2.5).

2.1 Survey development

The survey development was a community effort led by Alina Herderich involving PhD Union members, the Coordination Office for Doctoral Studies, as well as other university internal stakeholders.

2.1.1 Stakeholder interviews

Before the survey development, we conducted stakeholder interviews with the following institutions: the scientific work council, the Deans of study, the DocSchool speakers, the vice president and Mittelbau representatives of the Senate, the International Office, Staff Development, the Rectorate, and the PhD Task Force. The goal of the meetings was to **inform the stakeholders about our rough plans, and to ask for their advice** on how to make the survey a success for us and for them. The stakeholder interviews were conducted from January to March 2023.

We did not formulate the exact questions before the stakeholder interviews and did also not show our survey draft to any of those institutions. Feedback was only given by the Coordination Office for Doctoral Studies (see also Section 2.1.3). Instead, in the stakeholder interviews, we asked about feedback regarding the potential content of the survey (see Section 1.2; "Is there anything you wish to include into the survey?", "Is there information about the situation of our PhDs that you are missing?"), but also about feedback in general ("Is there anything you would like us to keep in mind?", "What concerns do you have regarding the survey?").

Next to concrete suggestions for survey questions, several parties stressed that they welcome the coordination with the stakeholders. They supported the inclusion of non-employed PhD students and expressed interest in the results. The stakeholders further stressed our data protection responsibilities (see also Section 2.5).

2.1.2 Workshop: Crowdsourcing areas of interest

In June 2023, we conducted a **workshop with members of the PhD Union to brainstorm variables of interest** for the survey based on our experiences as student representatives. Each individual collected ideas first, before we sorted and grouped them together in a mind map of survey topics, which later informed the structure of the PhD Survey.

2.1.3 Survey set up and refinement

Survey development was mainly carried out by Alina Herderich (member of the PhD Union from 2022 to 2025), who is a **trained psychologist** with extensive experience in survey design, data collection, and data analysis. The survey was developed in conjunction with other members of the PhD Union active at that time with a diverse set of background and longstanding experience in representation work. The **Coordination Officer for Doctoral Studies**, Sabine Vogl, kindly provided several rounds of feedback to reach the final version of the questionnaire.

The survey included six modules: (1) Administrative procedures, (2) supervisor relationship, (3) work environment, (4) teaching and working conditions, (5) well-being, (6) harassment and discrimination experiences, and (7) demographic and context variables. We applied **standardized measures where possible** (see Section 2.2). However, we developed **customized measures for most of our questions**, because our goal was to collect data specific to TU Graz. All questions were mandatory, except demographic questions and sensitive questions of discrimination and harassment experiences, as well as open ended questions.

At the beginning of the questionnaire, we obtained **informed consent** from the participants. Informed consent included information on who is conducting the survey, the aim of the survey, the content of the survey, data protection measures (see also Section 2.5), as well as contact information of the person responsible for the survey and the head of the PhD Union.

At the end of the survey, participants had the opportunity to give feedback in a free form question. We thanked them for their participation and provided resources for support services (psychological counseling center for students, PhD Union, Coordination Office for Doctoral Studies, ombudsperson) in case of need. The survey was implemented in Lime Survey.

2.2 Measures

In the following, we will shortly explain both the standardized and custom questions included in the PhD Survey.

2.2.1 Standardized measures

Supervisor Relationship Questionnaire (SRQ). For the supervisor relationship, we adapted a questionnaire that was developed to assess the relationship between clinical psychology trainees and their supervisors, the Supervisor Relationship Questionnaire (SRQ; Palomo et al., 2010). The questionnaire assesses all components of successful supervision – facilitative, educative, and evaluative – in six subscales (safe base, commitment, structure, reflective education, role model, formative feedback) and was developed based on qualitative analyses of descriptions of supervisors from trainees and newly qualified clinical psychologists. The original questionnaire was tested on a sample of 284 British trainee clinical psychologists.

Since not all items of the questionnaire were applicable to our setting, that is supervision of PhD students by professors, we screened all items for their applicability. To further reduce the length of the questionnaire, members of the PhD Union rated the items of the questionnaire for their relevance. In the end, we kept the 17 most relevant questions distributed across all subscales except structure. This was mainly due to the fact that we deemed questions on structure (e.g. "Supervision sessions are structured.") as less important compared to the other items.

Apart from the SRQ, we asked participants about dual supervision arrangements, and provided them with a free form question to give general feedback about their supervision.

Depression, Anxiety and Stress (DASS-21). The Depression Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1994; Osman et al., 2012) comprises 21 items and is a screening instrument for depression, anxiety and stress. Each subscale consists of seven items. Items refer to typical depressive, anxiety and stress symptoms. Participants are supposed to indicate how typical they consider those symptoms to be for themselves on a scale from 0 („does not apply at all") to 3 („applies most of the time"). Final scores are obtained by summing over the values of each subscale. Cut-off scores indicate potential psychopathology for depression (c_d=10), anxiety (c_a=6) and stress (c_s=10). The DASS-21 assesses three constructs at a time and is extremely time-saving, while maintaining both reliability and validity.

Harassment and discrimination experiences. For harassment and discrimination experiences, we asked participants both whether they **experienced or witnessed** such. Questions included an option "Prefer not to say" and participants were encouraged to rely on personal impressions rather than what they thought would be a normative or socially desirable answer. Our definition of harassment, which we also provided to participants, reads as follows: "Harassment is unwelcome behavior, conduct or communication based on personal characteristics such as ethnicity or gender. Harassment can include, but is not limited to, verbal remarks, physical actions, or visual displays. Some examples are unwelcome jokes or slurs, or unwanted sexual advances."

People who indicated to have made such experiences were asked a follow-up question inquiring about the perceived nature of the harassment (e.g., whether it was based on their gender or ethnicity). The follow-up question included 11 different characteristics that were based on research about harassment at the workplace (Krieger et al., 2005).

In addition, we asked about threats of job loss and for internationals specifically, whether their background has been used to pressure or threaten them.

2.2.2 Custom measures

Custom measures include university specific measures on administrative processes and teaching, as well as the work environment and demographics. Custom questions can be divided into two categories: (1) Statements to be rated on a six point Likert scale ranging from strongly disagree, disagree, slightly disagree, slightly agree, agree, to strongly agree. We avoided to include a scale midpoint to force tendencies towards positive or negative attitudes. (2) Single or multiple choice questions. For details please see the full questionnaire available on our public repository https://github.com/Hai-Lina/phd-survey-tu-graz-2024.

University specific measures: Questions on administrative processes. Administrative questions included questions on the familiarity with the curriculum and the statutes, the accessibility of information online, the satisfaction with classes, the onboarding process, whether students have signed an educational agreement, whether they have a mentor have, and their familiarity with services provided by several internal institutions (e.g., International Office).

University specific measures: Questions on teaching and work load. Teaching questions included questions about the time spent on teaching per week and whether students give lectures on a regular basis. We further asked to indicate actual working hours and hours specified in the student's contract, as well as personal circumstances affecting the PhD progress (e.g., care work).

Work environment. We were interested in whether students perceived their work environment as collaborative or competitive. We hypothesized that both factors are independent from each other. That said, work environments can be both collaborative and competitive, but also non-collaborative and competitive, collaborative and non-competitive, and non-collaborative and non-competitive. We therefore developed **three items to assess both collaborative and competitive work environments**. For example, for collaboration we asked "In my primary research group, we leverage each member's expertise to overcome individual research challenges"; and for competitiveness, we asked "In my primary research group, one member's success feels like another's loss".

In addition, we asked questions about requested projects that are however irrelevant to the PhD, whether collaborations are encouraged, and the perceived integration into various levels within the university from students' primary research group to the university as a whole.

Demographics. We collected data on the age, gender, and country of origin of the participants. We further asked the month and year of their enrollment, their anticipated month and year of graduation, which doctoral school they are enrolled in, as well as their employment status. Those context variables were used to provide a **basic sample description**, which can be **compared against characteristics of the population** of all PhD students, as well as to **compare groups within PhD students** (e.g. internationals versus locals).

2.3 Procedure

We **invited all PhD students** at TU Graz to participate in the survey directly **through their student email** addresses. We requested the full list of student email addresses from the Oesterreichische Hochschueler:innenschaft. Invitations included one email at the beginning of the survey, as well as three carefully timed **reminders**. Reminders were only targeted at students who have not participated in the survey previously. Reminders were sent after a little more than three weeks, six weeks and three days prior to the end of the survey. The survey was launched on **October 28, 2024** and was active for a little less than eight weeks **until December 20, 2024**. Emails included a personalized invitation link (responses were still anonymous), which was necessary to be able to participate in the survey.

We further advertised the survey via our social media channels (i.e., Facebook, Instagram, LinkedIn, and WhatsApp), as well as over TU4U, Studo and the university's points of interest. Public postings included a call to action asking students to look out for their invitation via email should they be interested in participating.

2.4 Statistical analysis

We provide **descriptive analysis** for all items like follows: For Likert scale items, we provide means and/or medians and 95% confidence intervals. For single or multiple choice items, we provide

percentage values. Where applicable, we calculated **mean scores of subscales**, specifically, for the SRQ, the DASS-21, and our custom scale on work environment. We further calculated **internal consistencies** (i.e., Cronbach's alpha) for all scales with multiple items.

Where interesting, we performed **group comparisons**. Comparisons involved contrasting locals and internationals, men and women, university and project assistants, as well as the different doctoral schools. For the comparison between locals and internationals, we put Austrians and Germans into one, and other students into another group. The reasoning behind this is that Germans and Austrians share the same language and thus, Germans have considerable advantages navigating the Austrian university landscape. We tested group differences with a non-parametric **Mann-Whitney-U test**, since normality assumptions were violated for most of the items. We did not use statistical tests to compare Doctoral Schools, because it was unfeasible to compare 14 groups. We performed 18 Mann-Whitney-U tests in total and thus **Bonferroni adjusted** the significance level to $p = 0.05/18 = 0.0028$ to account for Type I error inflation.

We further computed **Spearman correlations**, specifically between the subscales of the SRQ, competitive and collaborative work environments, and among depression, anxiety, stress. For the correlation between giving lectures and hours spent on teaching, we used a pointbiserial correlation.

Open ended questions were analyzed by reading through the comments to find prevalent or common themes.

2.5 Data processing and data protection

The raw data is stored in a protected folder on the cloud of the Oesterrichische Hochschueler:innenschaft, where only the current head of the PhD Union and the current member responsible for the survey have access. We also store an anonymized version of the data, where all people within the PhD Union have access. This version of the data is k4-anonymized meaning that for each combination of (employment status, gender, and nationality) there are at least four instances. In this anonymized form of the data, we omitted the variables doctoral school and age. **The data protection regulations we imposed prevent us from sharing the raw data outside of the PhD Union**. Results are only ever made public in an aggregated manner through this report accompanied by public analysis code and mock data (see Section 5).

3 Results

In the following, we will describe the results along the six modules of the survey: administrative procedures (Section 3.2), the supervisor relationship (Section 3.3), the work environment (Section 3.4), teaching and working conditions (Section 3.5), well-being (Section 3.6), and harassment and discrimination experiences (Section 3.7).

3.1 Sample description

We received $n = 204$ full responses, which amounts to **15% of the population**. Median completion time of our survey was 13 minutes. Of our sample, 143 (70%) were male, 58 (28%) were female, and 3 (2%) indicated another gender or preferred not to say. Median age was 29 years ($Q_1 = 27$, $Q_3 = 31$). Regarding nationality, 136 (67%) were Austrian citizens, 18 (9%) German citizens, and 50 (25%) of other nationality. Our survey included participants from all continents except Australia. Figure 1 displays our sample characteristics.

Our sample included participants from all 14 doctoral schools. For employment status, 100 (49%) people were project assistants, 57 (28%) university assistants, 21 (10%) indicated to have a second job, 8 (4%) received a scholarship, 6 (3%) were employed at another universities, 5 (2%) used personal funds for their PhD, and 11 (5%) preferred not to say or other. Please note that percentages will not sum up to one, since more than one employment status might apply. Figure 2 shows the distribution of doctoral schools and employment status in our sample.

Most students enrolled between the years of 2019 and 2024 and anticipate gradating between 2025 and 2027 (Figure 3).

3.2 Administrative procedures and institutional support system

In general, **participants indicated to be sufficiently familiar with administrative processes**. On average, people indicated to be familiar with the content of the curriculum ($\bar{x} = 3.97$), and the statutes ($\bar{x} = 3.44$), they found information about the PhD to be accessible online

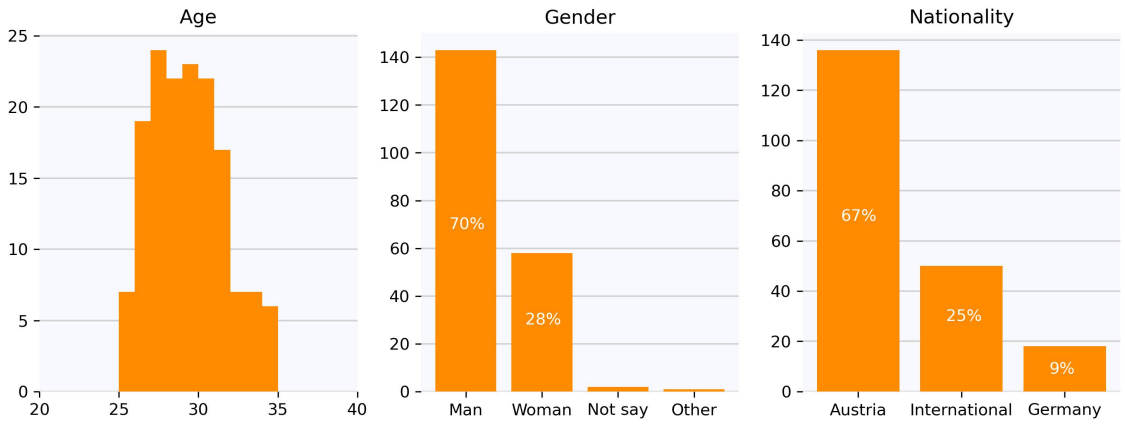

Figure 1: Age, gender, and nationality of the sample.

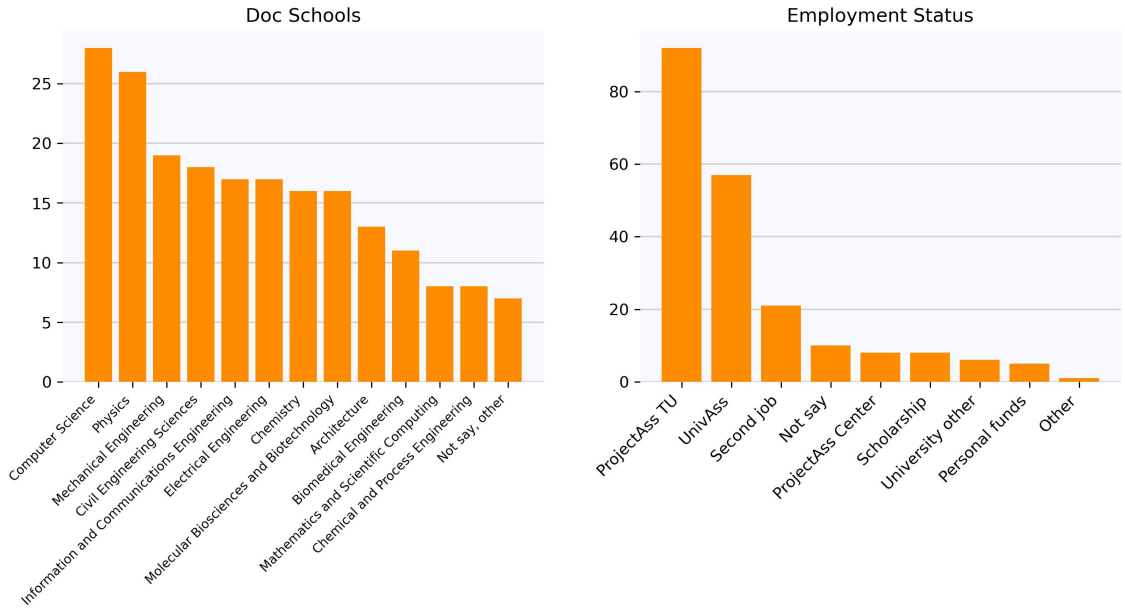

Figure 2: Distribution of doctoral school affiliation and employment status in the sample.

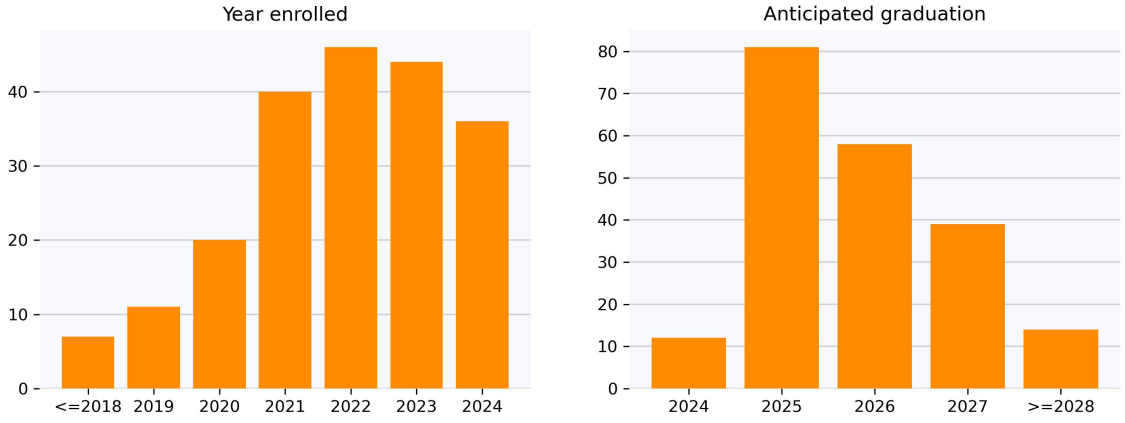

Figure 3: Date of enrollment and date of anticipated graduation of our sample.

($\bar{x}$ = 2.72), were satisfied with the selection of courses ($\bar{x}$ = 3.34), and their onboarding process ($\bar{x}$ = 2.82). We tested for differences between the group of Austrians and Germans (hereafter referred to as locals) and other nationalities (hereafter referred to as internationals). There were **no differences between the two groups of internationals and locals**. For details, please

refer to Figure 4.

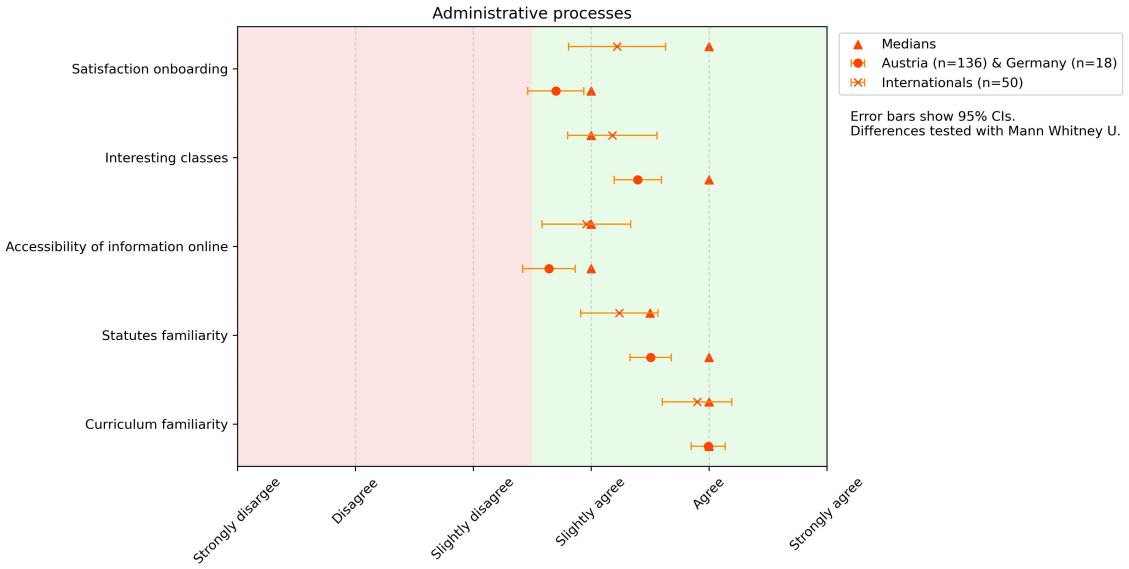

Figure 4: Means and medians for statements on administrative processes seperated by locals (Austrians/Germans) and internationals (other nationalities).

We additionally asked students to tell us about their personal onboarding process in an optional, open-ended question. A common theme was that "there was no onboarding process." Others mentioned that their onboarding has been affected by the pandemic. In general, people expected their supervisor to be their main point of contact. For some, the supervisor provided good information, for others colleagues buffered the lack of availability or knowledge of the supervisor regarding structural processes. Multiple students explicitly mentioned official onboarding events such as the Meeting Point Dissertation, the staff introduction day, or the Welcome Days to be especially helpful. Students also mentioned the International Office and Welcome Center to be very supportive. On the other hand, some students perceived administrative personnel to be harsh, when new students were unfamiliar with processes and responsible officers.

Regarding the educational agreement, **a large majority of the sample had already signed an agreement** (88%, Figure 5), even within their first year (75%). 14 (7%) people indicated that they are just in year one of their PhD and still need to sign an educational agreement. Only 5 (2%) participants were unaware this was needed for graduation or of its existence ($n = 2$, 1%). For 2 (1%) students, the educational agreement was missing a signature from their supervisor. We did not inquire about the reasons for the missing signature. However, supervisors should generally be aware of the necessity to provide a signature on the educational agreement and should also be willing to do such.

For mentoring, **only one third of students indicated to have a mentor** ($n = 61$, 30%, Figure 6). Importantly, **72 (35%) participants saw no need** to establish a relationship with a mentor. Moreover, **almost every tenth participant** ($n = 18$, 9%) said that they refrained from getting a mentor, because they were **afraid of conflicts** with their supervisor. We will discuss implications of this finding in detail in the discussion (Section 4).

Finally, we asked students whether they were aware of the services that a range of institutions within TU Graz offer. Figure 7 shows how many students indicated to be familiar with the services provided by each institution. Study related institutions like the Registrar's Office and the Dean's Office were the most known. Although all students necessarily go through registration at the Registrar's Office, only around 70% of students indicated to be familiar with its services. This might be attributed to the fact that registration is perceived as an administrative process rather than a service and students are unaware of other tasks that the Registrar's Office covers. More than 60% of students indicated to be familiar with the services of the PhD Union. A bit less known are institutions that are potentially only relevant to a subgroup of students like the International Office and the Welcome Center. Service institutions mainly targeted at employees (F&T House, Staff Development) receive yet less attention. Since the Coordination Office for Doctoral Studies is considerably new, the least amount of students (less than 20%) was familiar with its services.

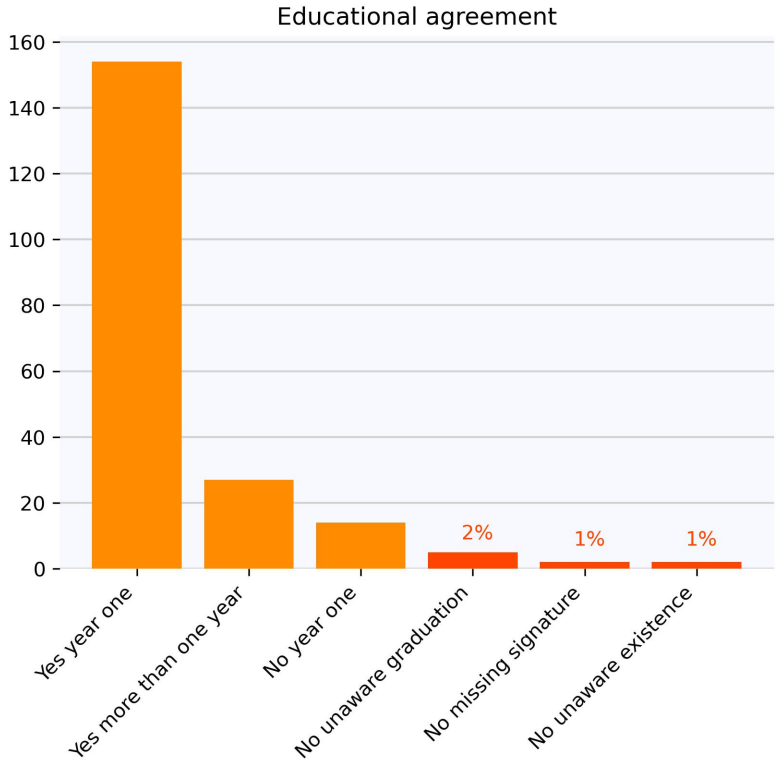

Figure 5: Agreement with statements on the educational agreement. The question was, whether students signed an educational agreement.

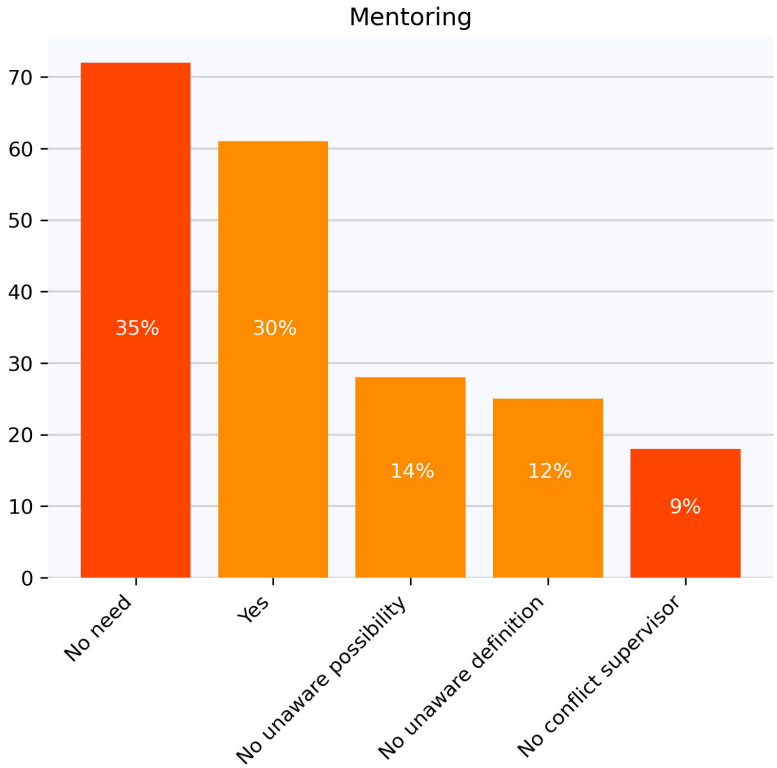

Figure 6: Agreement with statements on mentoring. The question was, whether students have a mentor.

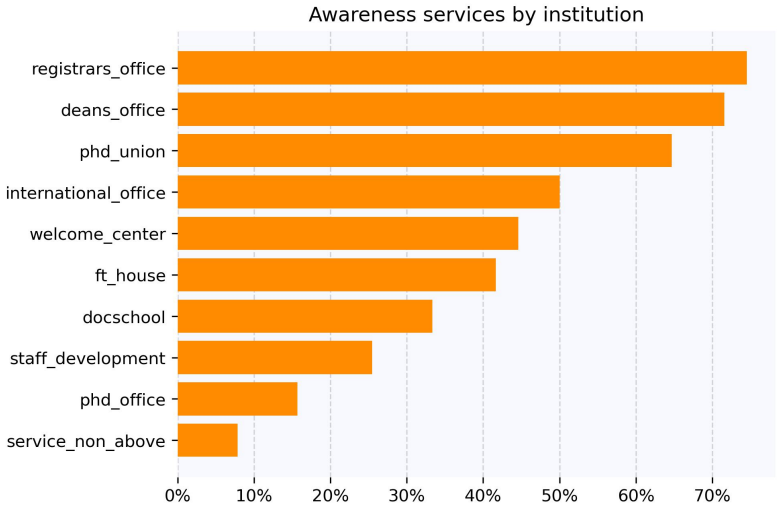

Figure 7: Awareness of services by university internal institutions.

3.3 Supervisor relationship

We used 17 items of the Supervisor Relationship Questionnaire (SRQ; Palomo et al., 2010) to measure the relationship between professors and their PhD students. A good relationship was operationalized with the supervisor making the student feel safe for exchanging ideas, feeling committed to the supervision process, stimulating self-reflection, being perceived as a positive role model, and providing constructive feedback on the student's performance. All subscales showed good internal consistency (safe base: $\alpha = .92$, commitment: $\alpha = .90$, reflective education: $\alpha = .78$, role model: $\alpha = .73$, formative feedback: $\alpha = .73$), and were highly correlated ($r = .72 - .82$). We thus found it adequate to compute the average of all 17 items in the questionnaire to indicate overall supervisor relationship quality.

Figure 8 shows values indicating good supervisor relationship quality from "strongly disagree" to "strongly agree" for the entire sample, separated by gender, and separated by nationality. 17% of participants indicated overall values less than 2.5 ("slightly disagree" or worse), which means that **roughly 1 in 6 students is dissatisfied with the relationship to their supervisor**. We further tested for differences between groups. **Women tend to have worse relationships with their supervisors** ($U = 4910.0$, $p = .04$), although when Bonferroni adjusted, the difference is not significant. For locals and internationals we did not find any difference ($U = 3315.5$, $p = .14$).

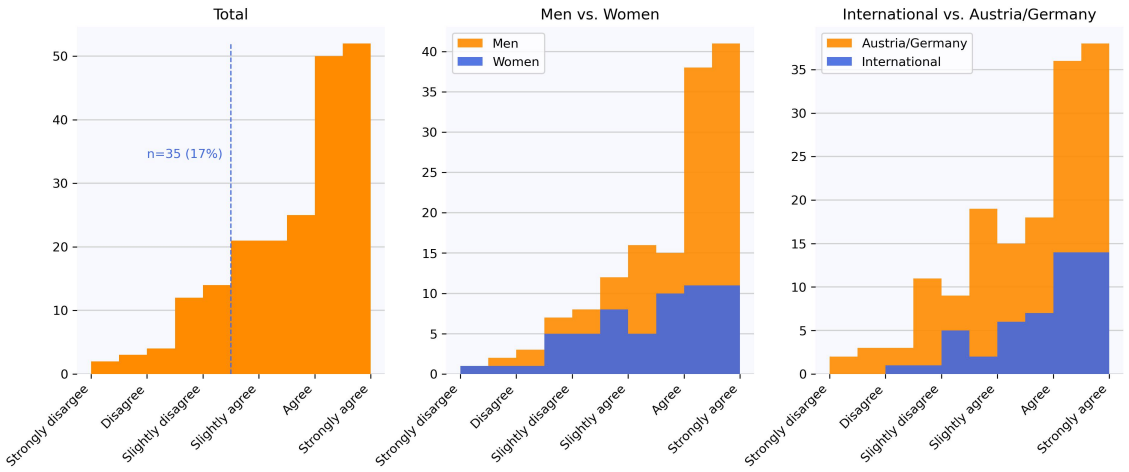

Figure 8: Values indicating supervisor relationship quality ($min = 0$, $max = 5$). The left panel shows relationship quality over the entire sample, the panel in the middle for men and women separately, and the panel on the right for locals and internationals separately. Overall supervisor relationship was measured over 17 items from 5 subscales (safe base, committment, relfective education, role model, formative feedback). See Method for details.

Between doctoral schools, supervisor relationship quality is roughly equal ranging between 3 ("slightly agree") and 4.5 (between "agree" and "strongly agree") as shown in Figure 9.

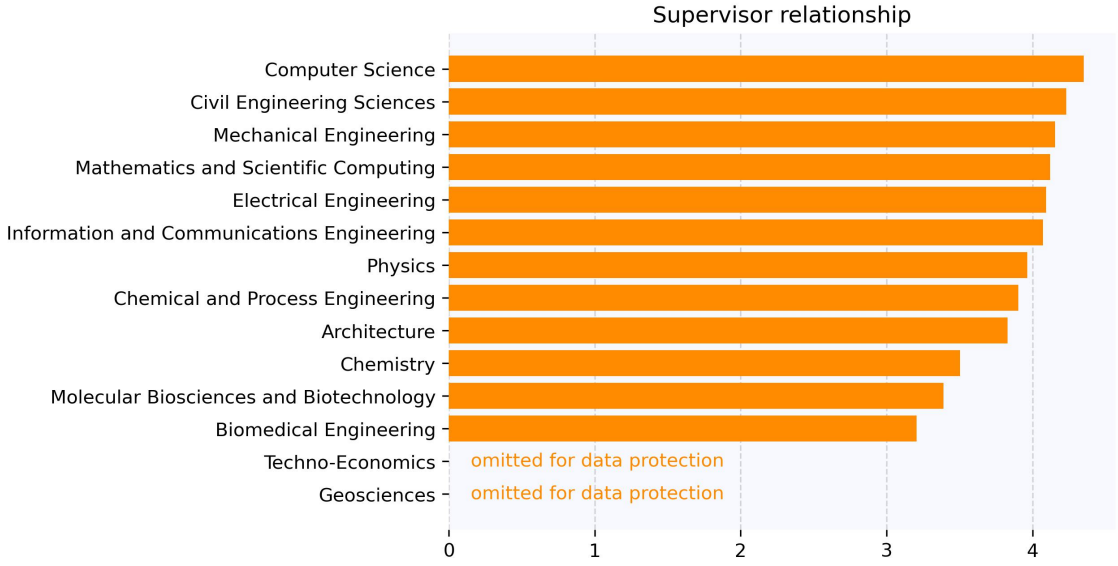

Figure 9: Supervisor relationship means separated by doctoral schools. Values for Techno-Economics and Geosciences are omitted due to low sample sizes. Overall supervisor relationship was measured over 17 items from 5 subscales (safe base, committment, relfective education, role model, formative feedback). See Method for details.

When rating the relationship with their supervisor, students were supposed to refer to the person effectively providing most of the supervision independent of that person being the student's official supervisor. In general, 54% of students indicated that most of their supervision was provided by their official supervisor, 35% said that most supervision was provided by their unofficial supervisor, and 10% indicated to have a dual supervision agreement where both supervisors contribute equally (see Figure 10).

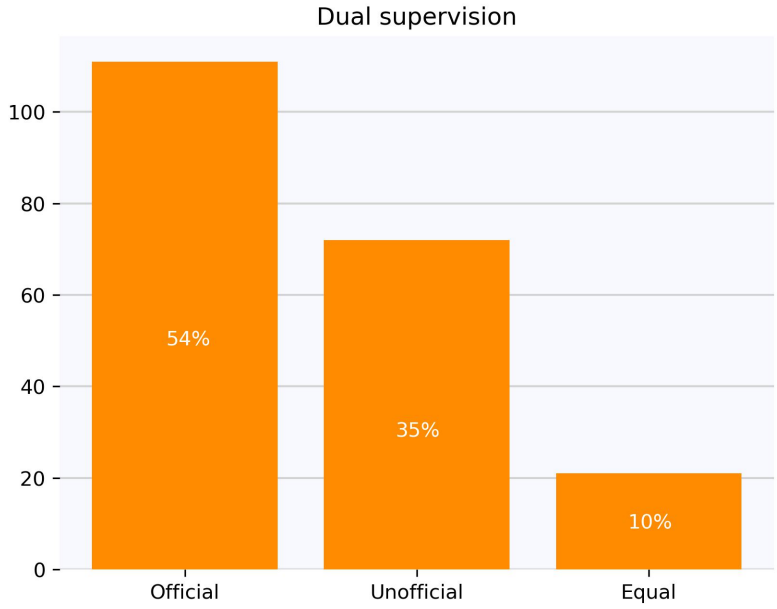

Figure 10: Percentage of students indicating that most of their supervision is provided by their official or unofficial supervisor, or equally by more than one supervisor.

3.4 Work environment

First, we asked the students, a) whether their supervisor encourages collaboration, b) whether they collaborate with researchers outside of TU Graz, and c) whether they often get projects assigned that are irrelevant to their PhD. **Most of the students "slightly agreed" or "agreed" that collaborations are encouraged** and pursued, and **"slightly disagreed" or "disagreed" about irrelevant projects** being assigned to them. See Figure 11 for details.

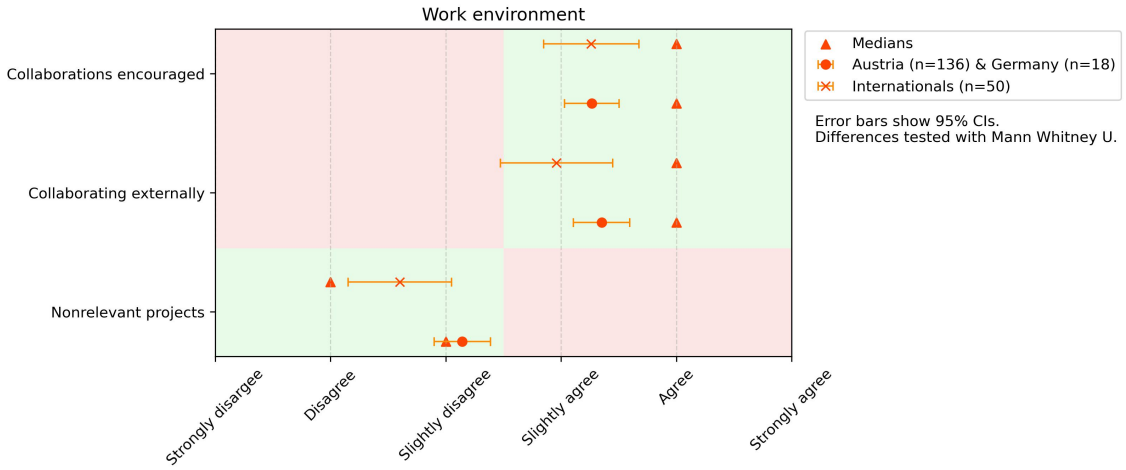

Figure 11: Average, median and confidence intervals for questions about collaboration and irrelevant projects. Results separated by locals and internationals.

We tested differences between local and international students for those questions, but did not find any significant differences between groups.

We then applied our custom six item measure to assess how collaborative or competitive the students perceive their work environment to be. Figure 12 shows four quadrants, each indicating collaborative/non-competitive, collaborative/competitive, non-collaborative/non-competitive, and non-collaborative/competitive environments. Each participant is located with a dot in that grid based on their average answers to the three items measuring collaboration and the three items measuring competition. **Most students indicate to have a healthy work environment that is both collaborative and non-competitive**. Only few people fall into the other groups. In fact, **answers to both subscales were highly correlated** with $r = -.48$. That said, people with collaborative environments also tended to have less competitive environments and vice versa. Internal consistencies were good with $\alpha = .78$ for collaboration and $\alpha = .75$ for competition. We further correlated supervisor relationship with values for collaborative and competitive work environments. **The better the supervisor relationship, the more collaborative** ($r = .53$) **and the less competitive** ($r = -.23$) the student perceived their environment to be.

Finally, we were interested in students' perceived integration into their primary research group, institute, doctoral school, the PhD community, and the university as a whole. As expected and can be seen in Figure 13, **identification with the institution declines the higher the level**. An exception is the university level, where on average students feel more integrated compared to their doctoral school or the PhD community. That said, students only "agree" to feel integrated into their own research group on average. We did not observe any differences between men and women, as well as between locals and internationals.

We further analyzed whether students feel integrated into their doctoral school separated by school, which is shown in Figure 14. There are **considerable differences between the schools** with more than 1.5 points difference on the Likert scale on average between the lowest rating (Information and Communications Engineering) and the highest rating (Chemical and Process Engineering). Still, **overall students do not "agree" or "strongly agree" to feeling integrated into their school**.

3.5 Teaching and working conditions

We evaluated the average time PhD students spend on teaching per week including all teaching activities from preparation, over lectures, to student communication. Figure 15 shows that **the vast majority of PhDs spends 20 hours or less teaching**. As expected, project assistants

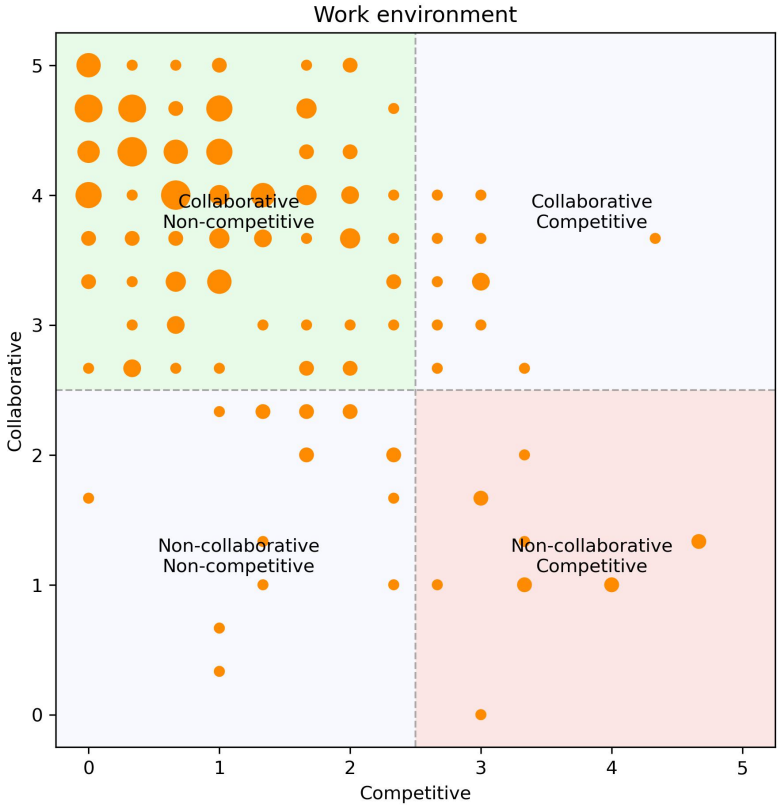

Figure 12: Combinations of collaborative and competitive work environments. Dot size is adjusted by the amount of students indicating the same values. Collaboration and competition was assessed with three items each and scale values were computed separately.

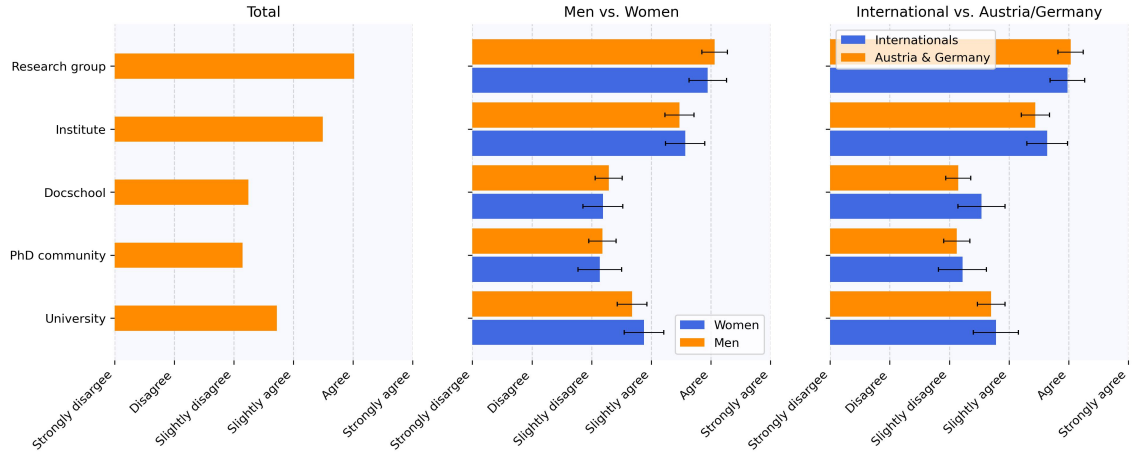

Figure 13: Answers to the question "At TU Graz, I feel integrated in..." over all students (left), for men versus women (middle), and for locals versus internationals (right). Bars denote 95% confidence intervals.

spend less time on teaching than university assistants (see middle panel of this figure). We did not weigh hours spend on teaching against the hours specified in the student's contract, however, as shown in Figure 17, most university assistants indicated to have full-time contracts (i.e., 31 to 40 hours).

On the other hand, **around two thirds (35 out of 55) of university assistants indicated to give lectures on a regular basis**. Since PhD students do not have a venia docendi, this is per default prohibited. Further analysis revealed that **time spent on teaching correlated significantly with giving lectures** on a regular basis (pointbiserial: $r = .38$, $p = .004$; see also Figure 16). Time spent on lectures might therefore be one of the reasons inhibiting PhD students' research progress.

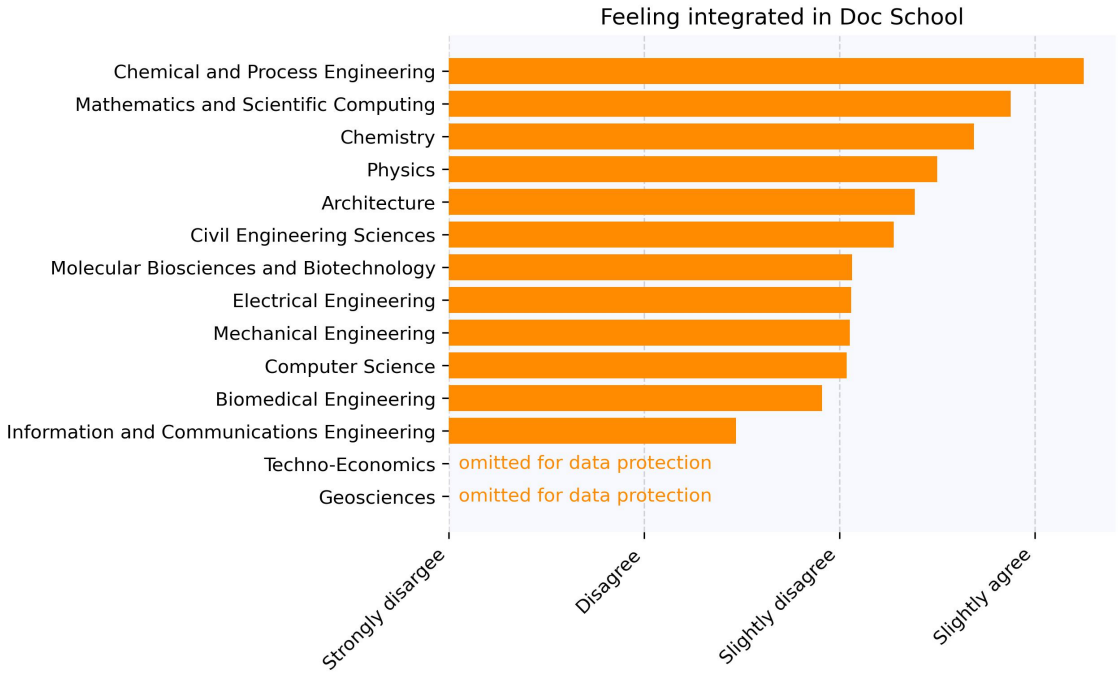

Figure 14: Answers to the question "At TU Graz, I feel integrated in my Doctoral School." separated by schools.

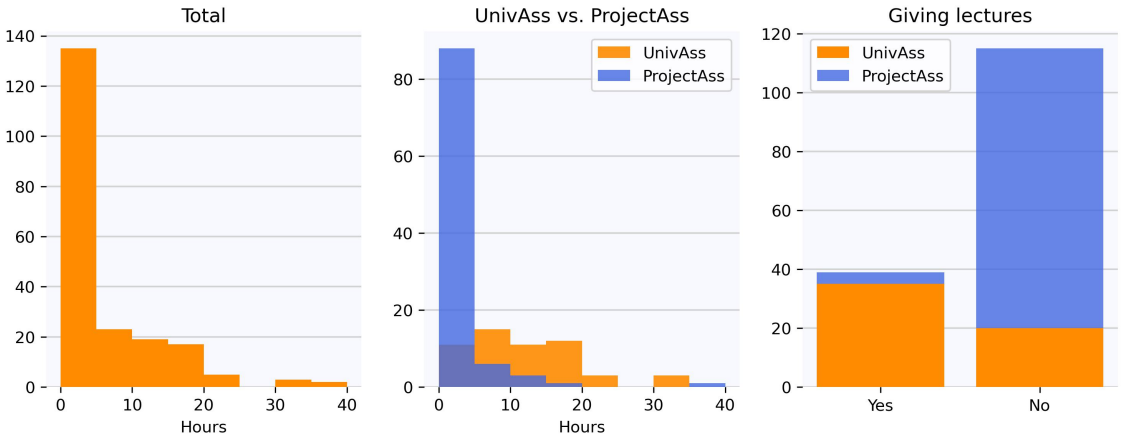

Figure 15: Hours spent on teaching on average per week over all students (left), and separated by type of contract (middle). The right panel depicts whether students indicated giving lectures on a regular basis.

Next to the hours specified in the contract, we asked for the actual working hours per week on average (Figure 18). We then contrasted the actual working hours to the hours in the contract to compute overtime. Since answers on the hours in the contract were specified in ranges (i.e., < 20, 21-30, 31-40), we used the upper bound of the respective interval to arrive at a conservative estimate of overtime. Figure 18 shows that **the vast majority of students exceeds 40 working hours per week**, and that this is independent from being a university or project assistant, male or female, local or international.

Along the same lines, **it is not uncommon for students to work 5-10 hours overtime every week**, with average overtime going up as high as 40 hours. There were no differences in overtime between project and university assistants, as well as between men and women ($U = 3037.5$, $p = .99$), locals and internationals ($U = 3060.5$, $p = .71$).

Finally, we investigated whether there are any circumstances compromising the progress of a student's PhD. Figure 20 depicts the percentage of students being affected by a range of different circumstances overall, separated by gender, and by nationality. Among **the top two conditions affecting the PhD progress were personal circumstances** (i.e., social relationships) **and**

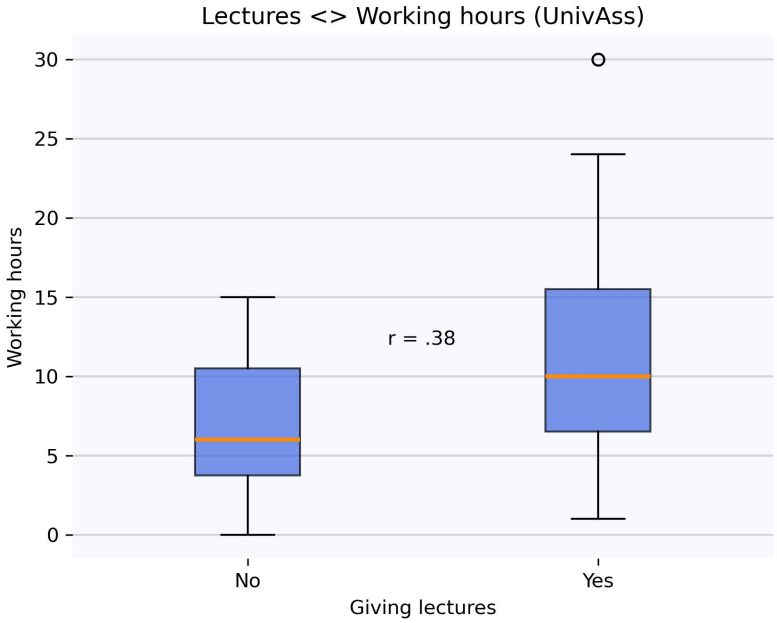

Figure 16: Pointbiserial correlation between hours spent on teaching and giving lectures on a regular basis in university assistants.

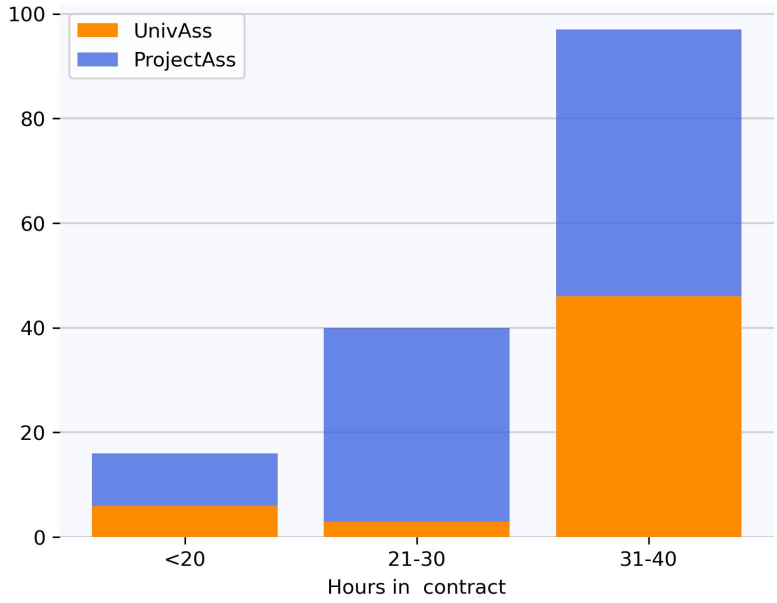

Figure 17: Hours specified in a student's contract separated by project and university assistants.

compromised health with over 1 in 5 students indicating being affected by one or both conditions (left panel of the figure). Notably, **compromised health is much more common in women than men with more than 1 in 3** women being affected. Women are also generally more affected by any of the circumstances as indicated by "None of the above" (middle panel of the figure). Similarly, internationals are more affected by any of these circumstances than locals, and being an international student comes with its own challenges: Compared to locals, **internationals are more often affected by precarious living conditions and financial situations** (right panel of the figure). Further influencing factors that our list did not consider, but were specified as free-form text by participants included external jobs, teaching load, extreme workload of additional projects, and lacking guidance for the PhD. Many students additionally mentioned mental health challenges.

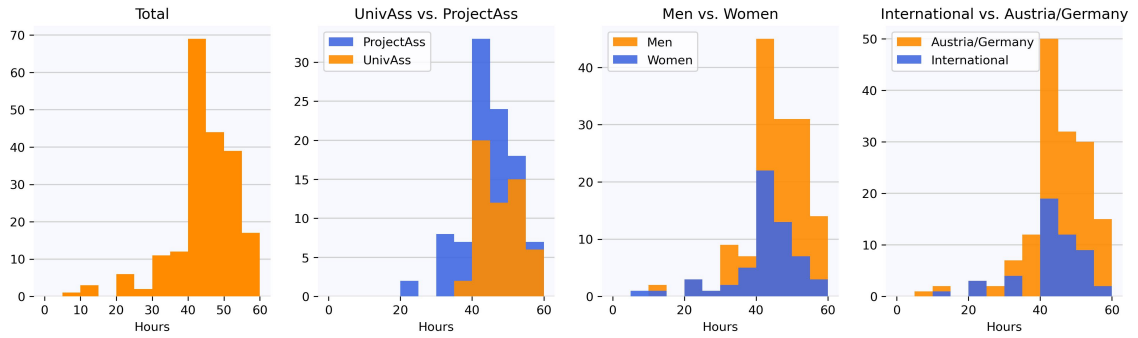

Figure 18: Average working hours per week over all students, for university and project assistants, men and women, locals and internationals (from left to right).

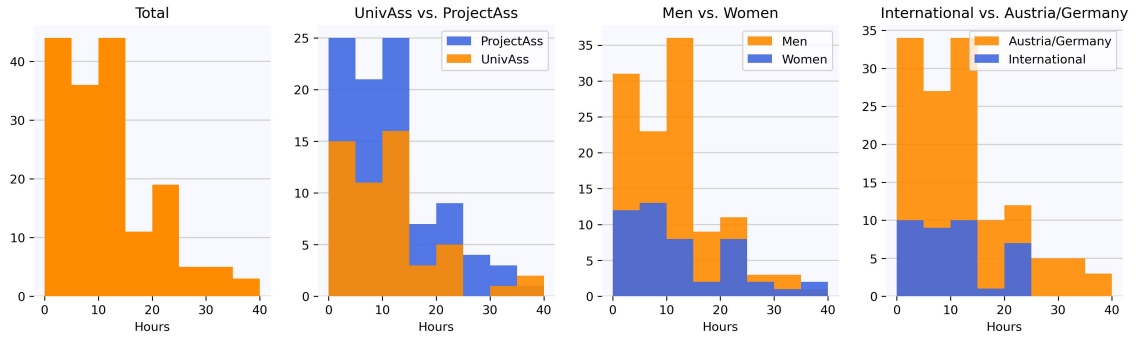

Figure 19: Average overtime per week over all students, for university and project assistants, men and women, locals and internationals (from left to right).

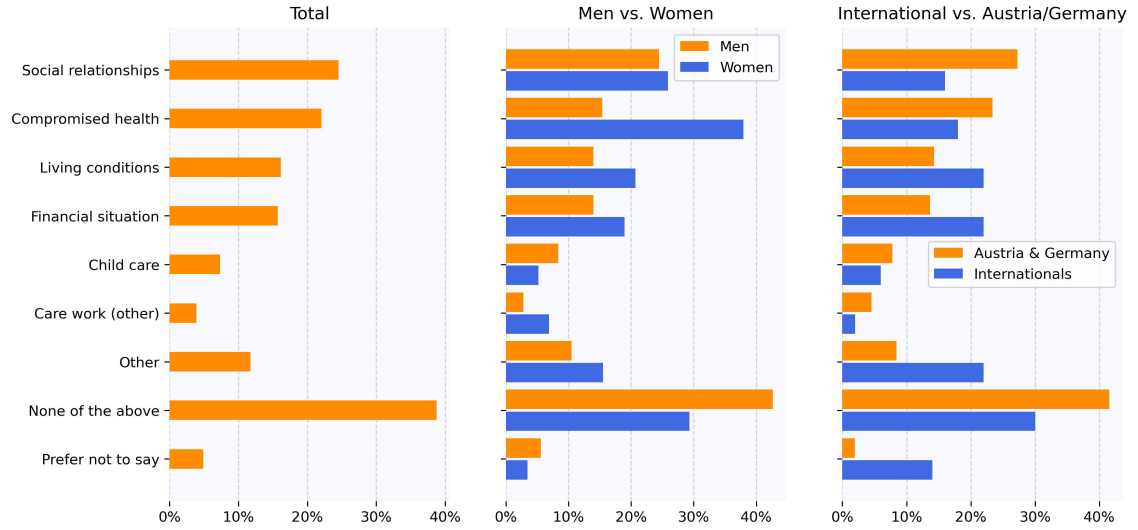

Figure 20: Circumstances affecting a student's PhD progress overall (left), per gender (middle), and nationality (right). This was a multiple choice question.

3.6 Well-being

We used the Depression Anxiety and Stress Scale (DASS-21) to evaluate the levels of depression, anxiety, and stress in our sample. Each concept was measured with seven items and a Likert scale ranging from 0 to 3. For each concept, points were summed up for all seven items to arrive at the final score with greater values indicating greater levels of depression, anxiety, and stress, respectively. The DASS-21 allows to adjust the relevant time frame in the instructions. Here, participants were supposed to refer to the past six months. The DASS-21 is a screening questionnaire and specifies cut-off levels for each subscale. For depression values greater than 10 likely indicate clinical relevance, for anxiety values greater than 6, and for stress values greater

than 10. Internal consistencies were good for all subscales with depression: $\alpha = .90$, anxiety: $\alpha = .82$, and stress: $\alpha = .85$.

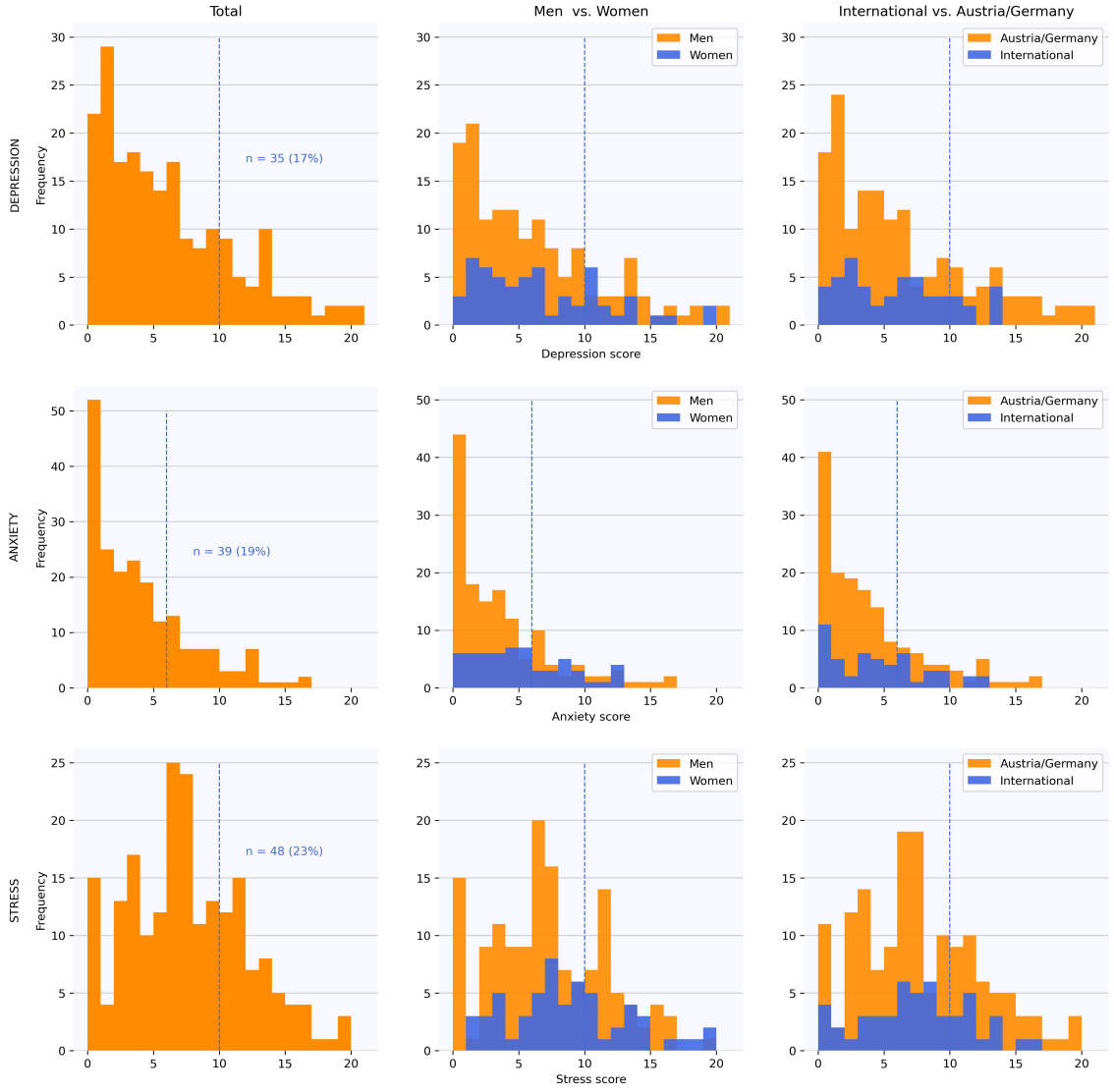

Figure 21: Values for depression (upper row), anxiety (middle row), and stress (lower row), for all students, separated by gender, and nationality (columns one to three, respectively).

Figure 21 depicts the results for the DASS-21. Rows refer to the three subscales of depression, anxiety, and stress. Columns refer to all students in total (left), separated by gender (middle), and by nationality (right). Dashed lines denote the respective cut-off scores.

For depression, 17% of students showed clinically relevant levels, for anxiety 19% of students, and for stress 23% of students. We found no differences between groups, except for anxiety in men versus women with women proportionally suffering from higher levels of anxiety ($U = 2908.5$, $p = .001$, second row and column in Figure 21). **Levels of depression, anxiety and stress were generally highly correlated**: anxiety-depression $r = .63$, anxiety-stress $r = .74$, depression-stress $r = .75$. That said, students suffering from one condition, likely suffer from the other two as well.

3.7 Harassment and discrimination experiences

We asked people whether they have *experienced* or *witnessed* any form of harassment at TU Graz during the past six months. 1 in 14 people indicated to have experienced harassment in our sample. The **numbers diverge dramatically when separated by gender**: For women it is 1 in 5, for men 1 in 47. It is important to note that those were only the people who had the courage to indicate that they had been harassed. This is also apparent in the number of **people who had witnessed harassment, which was 1 in 6**, and as such more than twice as much as people who

indicated to have experienced harassment. Perceived reasons for the harassment by the victims included (in descending prevalence): gender, age, nationality, physical appearance, socioeconomic status, and race.

We further asked students to indicate whether they had ever been **threatened with job loss** during their PhD. Overall 1 in 12 people indicated to have been subject to this threat. While numbers across gender are fairly similar, differences become apparent for internationals and locals: 1 in 17 locals indicated "Yes" for that statement, while **for internationals it was 1 in 7**. Three international students even explicitly mentioned that their international background had been used to pressure them.

To be absolutely clear: All those numbers should be zero!

4 Discussion and political implications

With the PhD Survey 2024, we have examined the challenges that PhD students are facing at TU Graz today. Our survey comprised six sections: administrative procedures, the supervisor relationship, the work environment, teaching and working conditions, students' well-being (specifically levels of depression, anxiety, and stress), and harassment and discrimination experiences. In the following, I will briefly highlight three key findings of the survey along potential political implications: mentoring, mental health, and harassment experiences.

First, questions on the state of **mentoring** at TU Graz showed that even if students are aware of the concept, they are hesitant to pursue mentorship. This can be traced back to two reasons: Students either do not see the benefits that mentoring could give them; or students are afraid that supervisors might be unpleased by the fact that the student receives advice from another person. That said, an important goal for TU Graz should be to not only make mentoring known. It is also vital to explain the benefits of mentoring to both students and supervisors. Furthermore, it has to be made clear that students have a right to get a mentor and more so, that the university wishes every student to have one.

Second, **mental health** is a common and prominent theme within the student body. Almost 1 in 4 students suffers from pathological stress, 1 in 5 from anxiety, and 1 in 6 from depression, with high comorbidity. It is important to note that mental health interventions on an individual level will fail should the environment be set up in a way to foster mental health conditions. For example, our survey has shown that students regularly work overtime with 5 to 10 hours per week being very common. Mental health risks can also be gender specific. Our survey shows that women are subject to greater risks, for example by being more likely to have worse relationships with their supervisor or by being harassed. Likewise, and as shown in our question on circumstances hindering the PhD progress, international students are also subject to risk factors, such as precarious living and financial conditions. Several students even explicitly mentioned mental health related issues in the free text question on limiting circumstances. TU Graz has to develop strategies to mitigate risk factors for mental illness within students' working conditions.

Third, our survey provides numbers for **harassment and discrimination experiences** within the student body. We clearly show that different populations are subject to different risks. Women are far more likely to experience harassment than men. On the other hand, internationals are pressured based on their vulnerable position as foreigners in Austria. We stress that the numbers found in our survey are very likely underestimating the prevalence of harassment! These are only the cases that dared to come forward. Even if this survey is anonymous, victims of harassment often fear severe repressions should their case become known. As a result, victims stay silent. Our survey further did not shine light on cross-sectionality. While we examined numbers separated by gender and nationality, simultaneous members of both groups are often at even higher risk to experience harassment. If taken seriously, a zero tolerance policy should ultimately lead to those numbers being zero. The PhD Union asks TU Graz to provide more rigorous concepts for the mitigation of harassment at the university with a strong commitment to enforcing those rules and with consequences for the predators.

The PhD Survey is a professional and thorough examination of PhD students' environment at TU Graz. We shed light on common challenges and provided calls for action. We hope to continue to do so in the future.

5 Declarations

5.1 Data availability

Due to the data containing sensitive information and to protect our participants, we do not share the data outside of the PhD Union. The raw data can only be accessed by the head of the PhD Union and the responsible member for the survey. Other PhD Union members have access to a k4-anonymized version of the data. To run the code (see below), we provide randomly generated mock data.

5.2 Code availability

The analysis code is publicly available at https://github.com/Hai-Lina/phd-survey-tu-graz-2024. Due to our data protection regulations, we do not share the raw data publicly, however, we provide randomly initialized mock data to run the code.

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6 Appendix

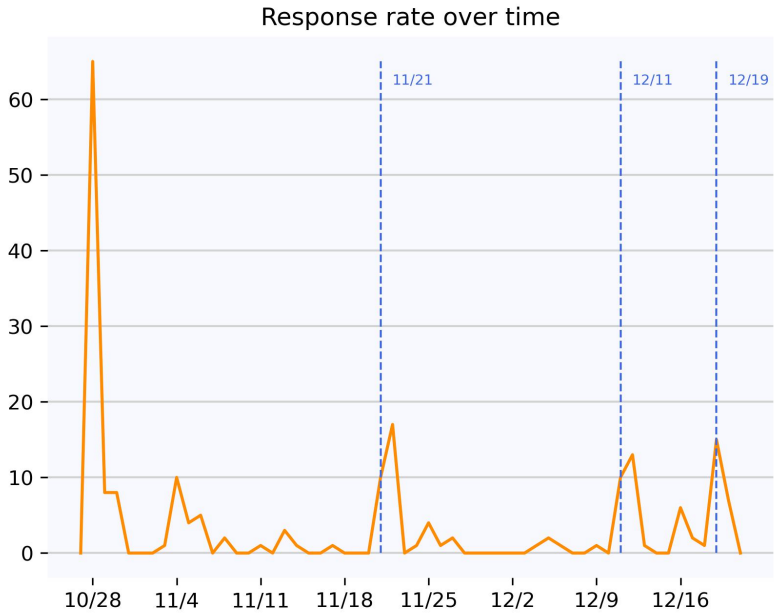

Figure 22: Response rate over time. Blue dashed lines indicate the dates reminders were sent to the participants. x-axis: date. y-axis: number of participants.

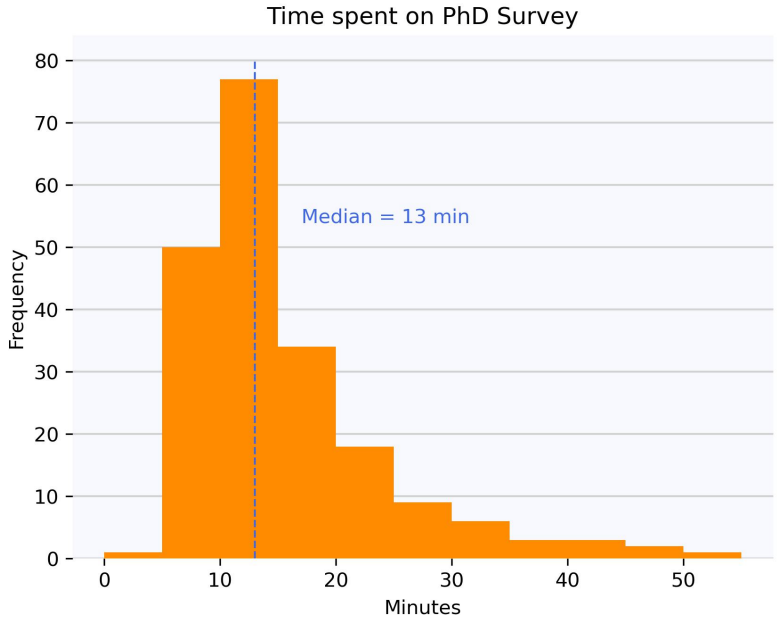

Figure 23: Distribution of completion times. Median completion time was 13 minutes as indicated by the blue dashed line.