

Where to Go and How to Get There

The duration and completion of doctoral studies under DFG Coordinated Programmes

A doctoral project occupies a doctoral student for several years of their life. Exactly how much time is involved and whether the dissertation will ultimately be completed successfully affects the life planning and career path of each and every doctoral student. Information on how long doctorates usually take and how high (or low) the completion rates are is also relevant from the point of view of science policy and funding policy. The relevant data offers clues as to what the framework conditions should be for this qualification phase. This Infobrief summarises quantitative analyses on the duration and completion of doctorates pursued under DFG-funded Coordinated Programmes based on two studies published by the DFG in 2021.

1 Research Question

In its funding programmes, the DFG supports the qualification of early-career researchers. Doctoral students pursue their research in DFG-funded projects, and the supervision they receive gives them an academically demanding education. The obvious goal is completion of the doctoral project: the more quickly this happens, the sooner the researcher achieves academic independence, potentially increasing their competitive capacity both nationally and internationally. The “appropriate” duration of a doctorate is therefore always a topic of discussion, not least with regard to the duration of funding for individual doctoral candidates under the relevant funding programmes. Another key question is how many of the doctoral projects that are started are actually completed – both for the individuals concerned and in terms of science policy.

There is no widely available data on either the duration or discontinuation of doctoral projects

in Germany (Jaksztat et al. 2012, Franz 2018, Brandt and Franz 2020, Buwin 2017, 2021). As a result of the amendment to the Higher Education Statistics Act in 2016, the Federal Statistical Office has compiled a data set that includes projects being pursued by registered doctoral students as reported by the universities and will publish a report on this for the first time in 2021¹. In addition, the German Centre for Higher Education and Science Research (DZHW) launched a first survey wave of the National Academics Panel Study (Nacaps) in 2019. Both of these data sources have only recently become available, however.

Furthermore, the calculation of both the duration and completion of doctoral studies is subject to methodological difficulties: in order to achieve this, both the beginning and the end of a doctoral project (whether by completion

¹ „Statistik der Promovierenden 2020“. www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Hochschulen/Publikationen/Downloads-Hochschulen/promovierendenstatistik-5213501207004

or by discontinuation) must be known – a major challenge facing data collection which, as in the case of Nacaps, is carried out on a voluntary basis. Last but not least, neither the data from Destatis or from the DZHW allow differentiation according to the specific funding programmes under which doctorates are completed.

As far as the DFG is concerned, these two related matters – the duration and the completion of doctoral studies – are also relevant to the impact of the funding it provides. For this reason, the DFG collects its own data on doctorates being pursued by researchers in DFG-funded consortia under the programmes Collaborative Research Centre/CRC, Research Training Group/RTG, Cluster of Excellence/EXC and Graduate School/GSC². Based on this survey data, the DFG is able to shed light on issues for which almost no information is available in Germany. It first published extensive results on the individual and structural factors involved in the duration and completion of doctorates in the reports *“Sprint oder Marathon? Die Dauer von Promotionen in DFG-geförderten Verbänden* (*“Sprint or marathon? Doctoral programme durations in DFG-funded consortia”*) (DFG 2021a) and *Alles hat ein Ende ... oder? Abgeschlossene und nicht-abgeschlossene Promotionen in DFG-geförderten Projekten* (*“All things come to an end ... don’t they? Completed and non-completed doctorates in DFG-funded consortia”*) (DFG 2021b). These results are summarised in this Infobrief.

2 Data basis

The analyses are based on data collected as part of the annual surveys of Coordinated Programmes (CRC, RTG, EXC and GSC). These surveys are carried out once a year and include data on all persons who contribute substantially to research in DFG-funded consortia – from

professors and postdocs to other academic employees, such as heads of laboratories. The analyses of the duration and completion of doctoral studies include information on the doctorates being pursued by all those for whom the status “doctoral student” or “medical doctoral student” was indicated (at least temporarily).

Both the date of submission of the dissertation and the date of the oral examination are recorded in the annual survey. In the case of doctorates that are still in progress in a given year, the follow-up surveys continue until an end date or discontinuation is entered or the consortium is terminated, in other words also after the individual in question has left.

For the purpose of the analyses, the end of the doctorate is taken to be the time at which the oral doctoral examination is held. The duration of a doctorate is calculated as the difference between the start and end of doctoral studies, with the median being the average of this figure. The month when they started work on the dissertation “in their own estimation” is entered as the start of the doctorate. This operationalisation leaves the concrete definition open to individual interpretation. The information is collected in the first year in which the doctoral student is involved in the research consortium. This avoids the kind of systematic bias that is often found in retrospective surveys.

In order to calculate the duration of the doctorate, data from all those recorded in the survey data who gained a doctorate in 2018 were analysed for the purpose of this report. This includes a total of 2,710 people, of whom 811 were involved in Collaborative Research Centres, 535 in Research Training Groups, 1,010 in Graduate Schools and 354 in Clusters of Excellence.

The analyses of completed doctorates are based on doctorates which started in 2012. For 4,009 people who began their doctorate in this year according to the information drawn from the annual surveys, in addition to the information on completed doctorates from the DFG survey, additional research was conducted to determine whether or not a dissertation pub-

² The Graduate Schools programme was funded up until 2018 as part of the Excellence Initiative financed by the federal and state governments. Funding has since been discontinued.

lication was available in the German National Library (DNB), i.e. whether the doctorate completion was documented. The completion rate was calculated as the difference between the number of doctoral projects started in 2012 and the number of doctoral projects completed by 2020.

3 Results

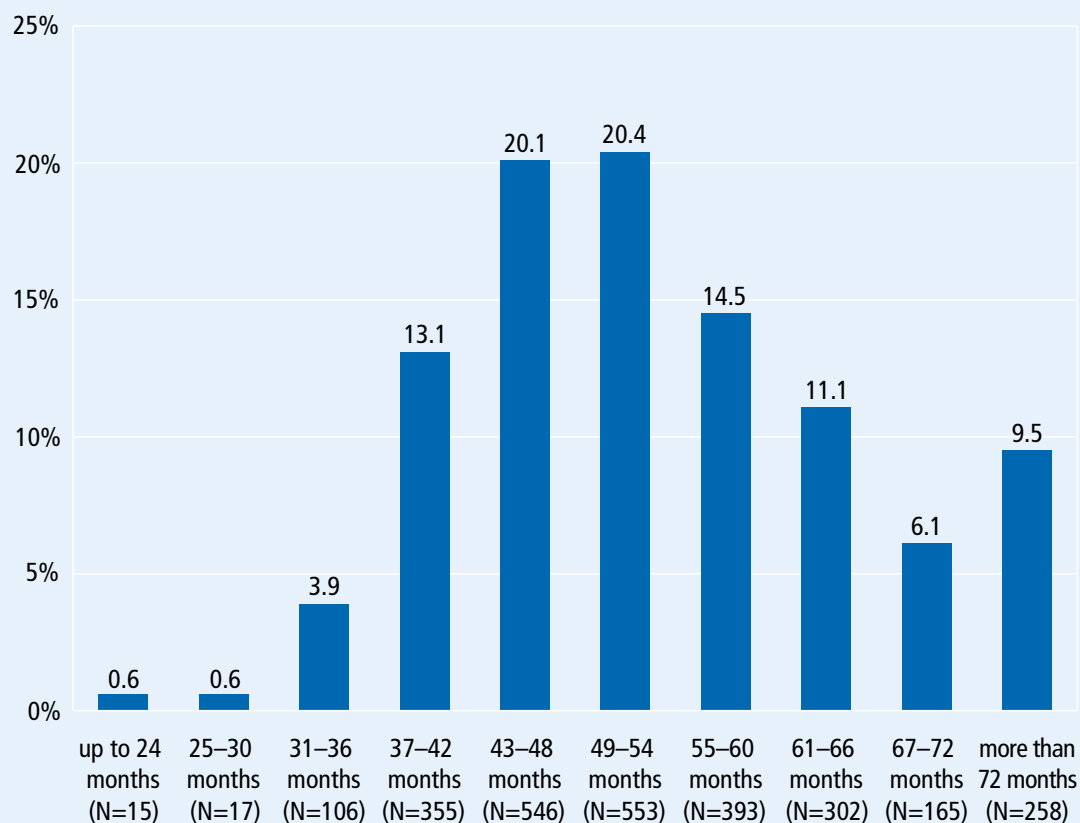
The data available on the duration and completion of doctoral studies can be broken down according to various characteristics. Among other things, the data provides information on the doctoral researchers' subject area, the programme they are involved in, their gender and their funding.

3.1 Duration of doctoral studies

Based on the doctorates completed in 2018, the average (median) duration of a doctorate is 51 months. Some 20 percent of doctorates are completed within 49 to 54 months (i.e. after 4 to 4.5 years), and almost the same number are completed within 43 to 48 months (3.5 to 4 years, see Figure 1). The distributions at the two margins are worth noting: while only just over 5 percent of doctorates are completed in up to three years, almost 10 percent are not completed until after more than six years.

There are clear differences by academic discipline (not shown). While a doctorate in the humanities and social sciences takes an average of 56 months, the figure is 51 months for the life sciences and 57 months for the engineering sciences. On average, the discipline

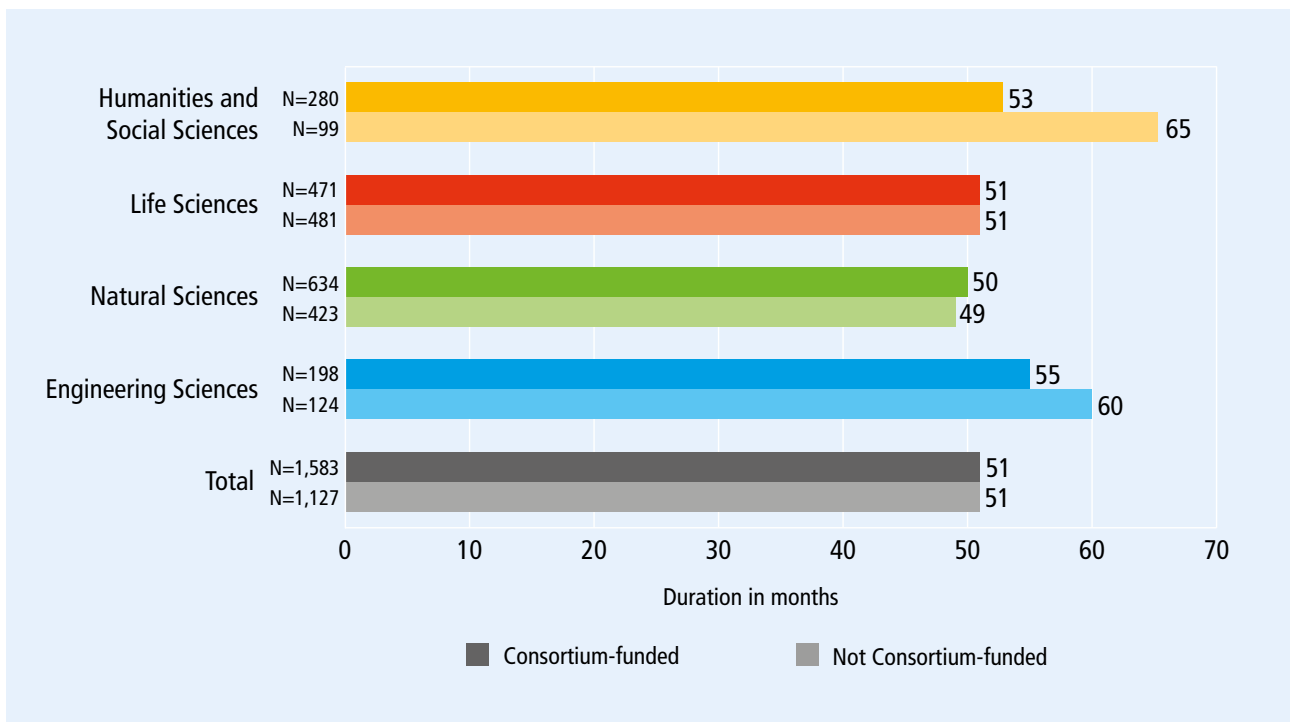
Figure 1:
Distribution of the duration of doctoral studies among doctorates completed in 2018 (in percent)



Data basis and source:

Annual survey of Coordinated Programmes 2018 and 2019. Includes all those who completed their doctorate in 2018 (N=2,710).

Figure 2:
Duration of doctoral studies by academic discipline and type of funding (median, in months)



Data basis and source:

Annual survey of Coordinated Programmes 2018 and 2019. Includes all those who completed their doctorate in 2018 (N=2,710). Those doctoral candidates defined as consortium-funded received at least 50 percent of their funding through a consortium for a period of at least one month during their involvement in the project.

in which doctorates are completed within the shortest time is the natural sciences. Here, half of doctorates are completed in less than 50 months.

Whether the doctorate is funded through the DFG-consortium or not, only makes a difference in the duration in two academic disciplines. In the humanities and social sciences, and also in the engineering sciences, the duration of doctorates is 12 and 5 months less respectively if the doctorate is funded by the consortium, though in these academic disciplines the vast majority of the people involved in the projects are also funded through the consortium. In the life sciences and natural sciences, the funding sources of the doctoral students involved are more diverse. As a result, it makes no difference to the duration of a doctorate in these academic disciplines whether funding is provided through the DFG-consortium or from another source (see Figure 2).

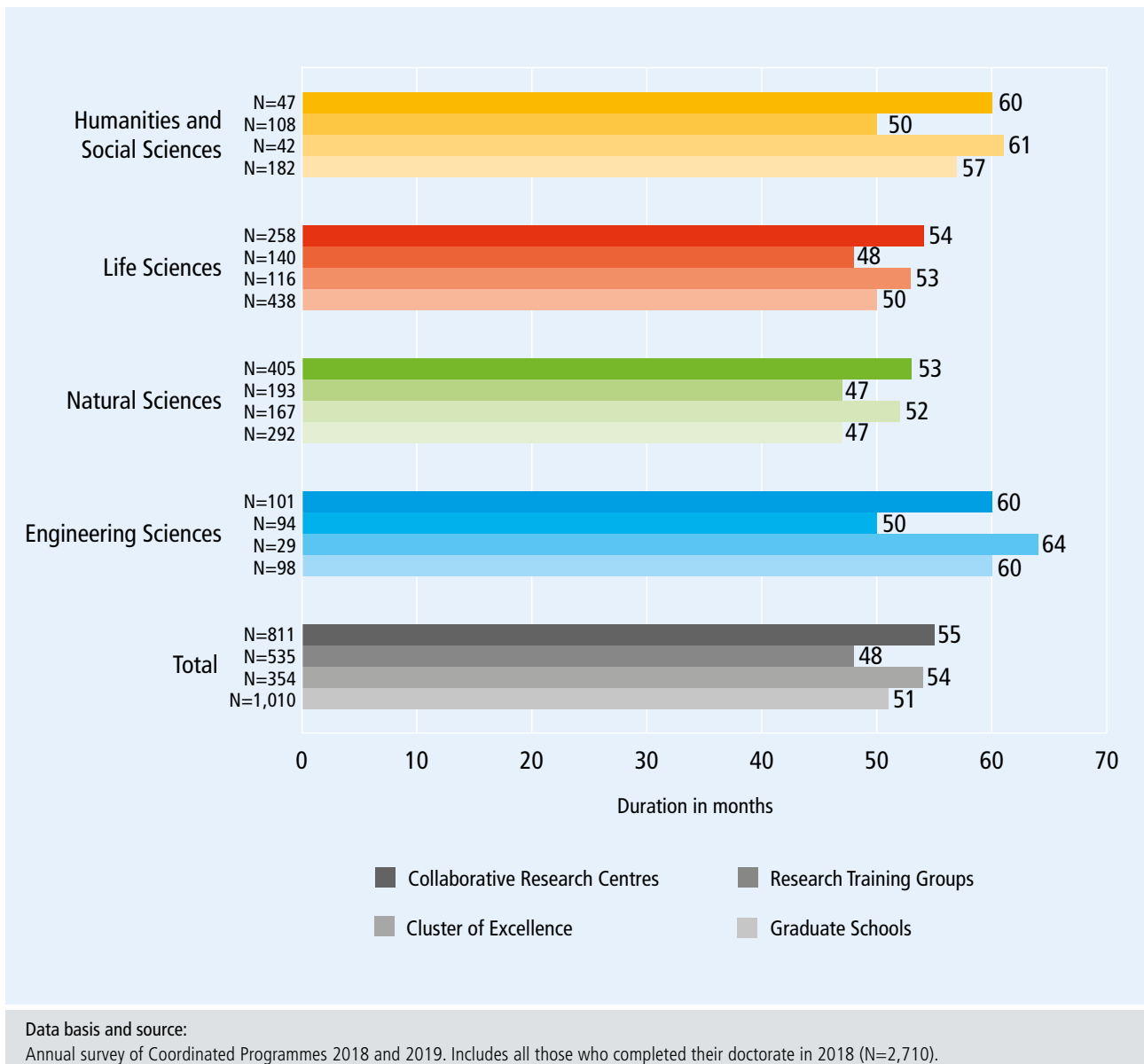
Only minor differences between men and women are to be observed in terms of the du-

ration of doctorates. In the life sciences, natural sciences and engineering sciences, male doctoral students take one to three months longer; in the humanities and social sciences, female doctoral students take one month longer. In total, men complete their doctorates within 52 months and women within 51 months.

There are considerable variations in the duration of doctorates completed under the various DFG funding programmes, however (see Figure 3). While under Collaborative Research Centre and Cluster of Excellence programmes, a doctorate is completed in 55 and 54 months respectively, doctorates pursued as part of programmes that specifically aim to support doctoral researchers are completed within a significantly shorter period of time. In Graduate Schools, doctorates are completed on average within 51 months and in Research Training Groups within 48 months.

It should be noted that there is significant variation within programmes and particularly

Figure 3:
Duration of doctoral studies by academic discipline and programme (median, in months)

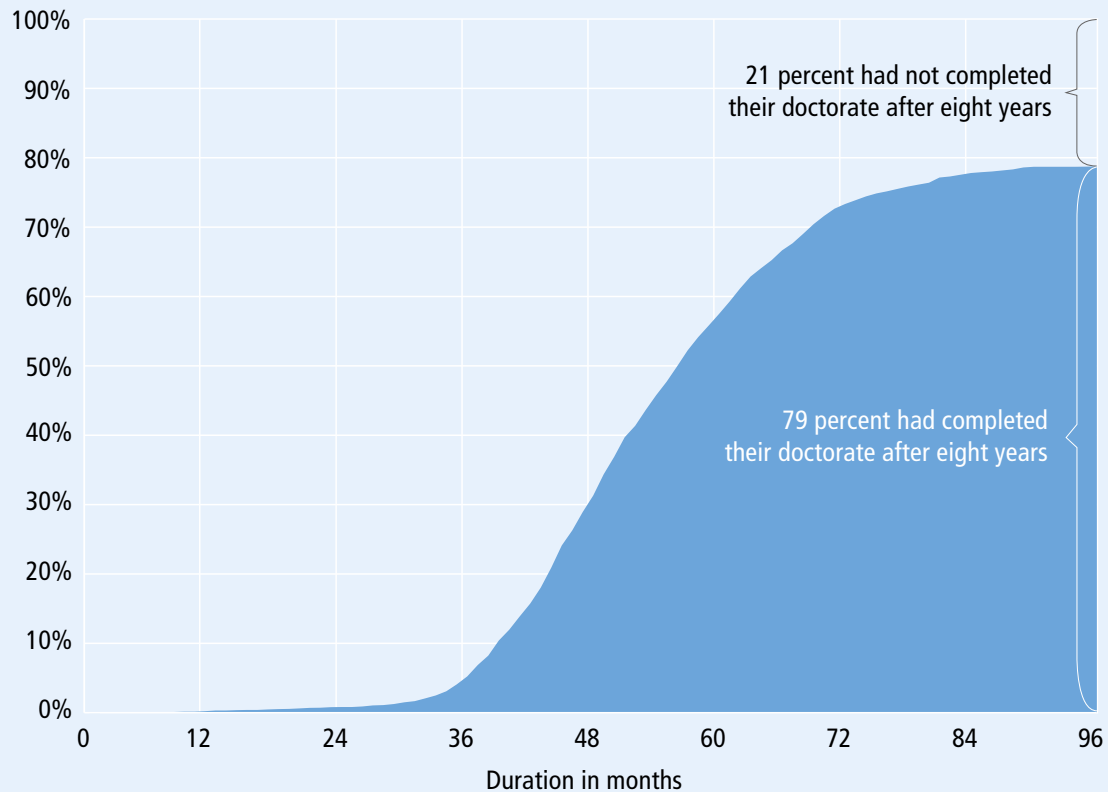


within consortia. The duration of a doctorate depends largely on individual factors that are not recorded in DFG programme monitoring. These can include personal factors such as motivation and goal orientation, factors to do with the nature of the project itself such as complexity, and also other circumstances such as the quality and intensity of academic support or indeed personal circumstances. These factors are highly significant in terms of the difference in the duration of a doctorate. They also affect whether a doctoral project is completed at all (Franz 2018, Brandt and Franz 2020).

3.2 Completed and non-completed doctorates

As in the case of the duration of doctorates, the question of whether a doctorate is completed or not is subject to varying individual reasons. Nevertheless, certain patterns can be discerned that suggest that in certain disciplines and DFG programme types doctoral projects tend to be completed less frequently. In conducting the analyses, as described above, a check was carried out in 2020 for doctorates started in 2012 as to whether either a doctorate was recorded in the surveys

Figure 4:
Cumulative share of completed doctorates by duration of doctorate (2012 cohort)



Data basis and source:

Annual survey of Coordinated Programmes in 2018 and dissertations in the DNB (status: 2020).

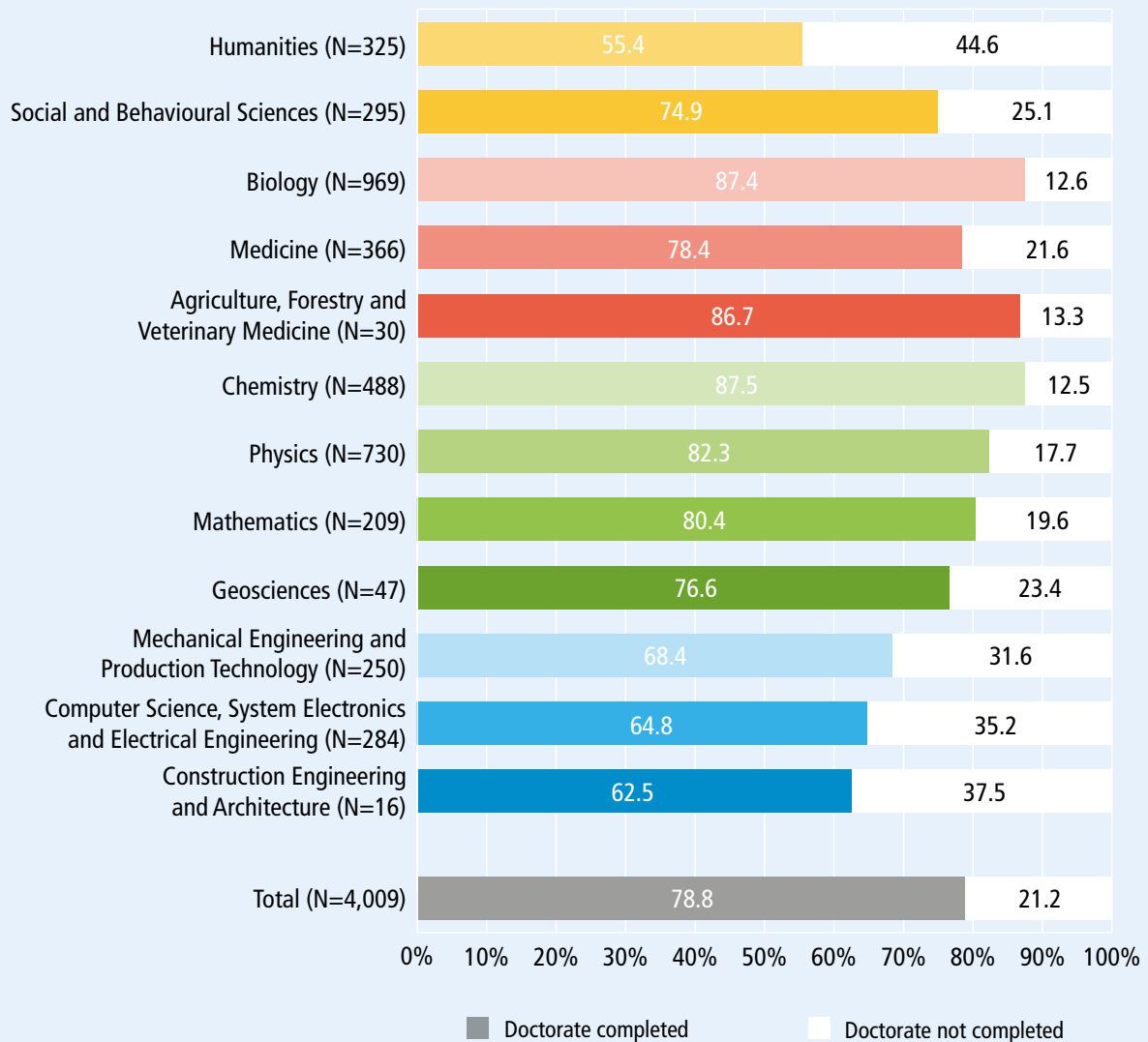
or the relevant dissertation thesis was available in the German National Library. Once again, the sample only includes doctorates pursued in a DFG-funded consortium under the programmes Research Training Group, Graduate School, Cluster of Excellence and Collaborative Research Centre.

All in all, 79 percent of doctoral students demonstrably completed their doctorate after eight years (see Figure 4). For 21 percent, no end of the doctorate was documented, so it can be assumed that the doctoral project was not completed. In individual cases, a doctorate may since have been submitted abroad due to a change of institution, or the doctorate may still be completed after more than eight years. However, the saturation curve indicates that most doctorates are completed after about six years, with only a few being completed later.

This order of magnitude is consistent with that of other studies. In the “HIS-Absolventenpanel”, Brandt and Franz (2020) report 72 percent completed doctorates and 18 percent explicitly discontinued doctorates.

Differences can be found in particular when subject areas are compared (see Figure 5). The highest completion rates are achieved by doctoral students in chemistry, where the rate is almost 9 out of 10. Approximately the same doctorate completion rate is to be seen in biology as well as in the agricultural sciences, forestry and veterinary medicine (87 percent each). In the engineering disciplines, on the other hand, only slightly more than two-thirds of doctoral projects are followed through to completion. The humanities have the lowest share of completed doctorates: here the rate is only 55 percent, i.e. slightly more than half

Figure 5:
Completed doctorates by subject area (2012 cohort, in percent)



Data basis and source:

Annual survey of Coordinated Programmes in 2018 and dissertations in the DNB (status: 2020).

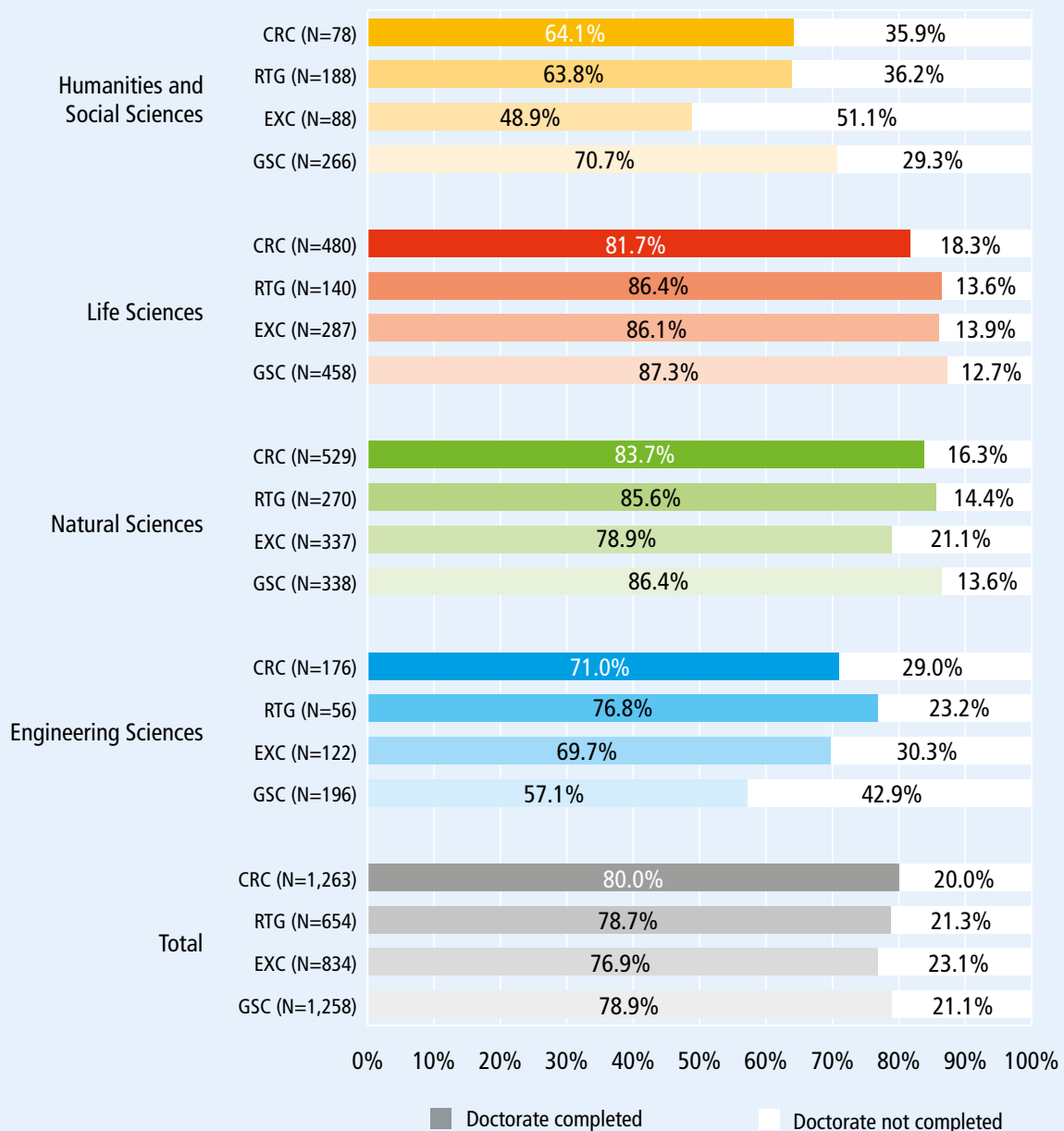
A concordance table is used to assign the Destatis subject areas recorded in the survey to the DFG subject areas. The subject areas Mechanical Engineering and Production Engineering, Thermal Engineering/Process Engineering and Materials Science and Engineering have been grouped under Mechanical Engineering, Process Engineering and Materials Science.

of doctoral projects started are actually completed.

Doctorate completion rates do not differ significantly based on a comparison of the DFG's various funding programmes (see Figure 6). Rates here range from 77 percent in the Clusters of Excellence to 80 percent in the Collaborative Research Centres, with the Research Training Groups and Graduate Schools (which were discontinued after 2018) being positioned in between at 79 percent each.

When viewed together with the duration of doctoral studies as discussed above, it can be seen that a longer duration of doctoral studies does not necessarily result in a higher discontinuation rate. There is a correlation between these figures, however. Just as doctorates in the Clusters of Excellence in the humanities and social sciences take longer than average, only less than half of doctoral projects started in this programme and these academic disciplines are completed within eight years. At the

Figure 6:
Completed doctorates by academic discipline and funding programme (2012 cohort, in percent)



Data basis and source:

Annual survey of Coordinated Programmes in 2018 and dissertations in the DNB (status: 2020).

same time, doctoral researchers in Research Training Groups working in the same academic discipline take an average of 10 months less to complete their doctorate as compared to those in Collaborative Research Centres. Completion rates are almost the same, however, at just above and just below 64 percent respectively.

The highest doctorate completion rates are achieved in Graduate Schools in the natural sciences and in Research Training Groups in

the life sciences. All in all, however, differences between the programmes are minor.

4 Conclusion

All in all, in DFG-funded consortia in the programmes Collaborative Research Centre, Research Training Group, Cluster of Excellence

and Graduate School four out of five doctoral projects started are completed. Half of doctoral researchers complete their doctorate within 51 months. The duration of a doctorate can of course vary greatly, both from one individual to the next and within the same consortium.

Nonetheless, the overall duration of doctorates and the share of completed doctorates vary according to different distinguishing criteria. Similar factors correlate with the duration and discontinuation of doctoral studies. This firstly includes the subject area. For example, there are both differing durations and completion rates between the life sciences and the humanities and social sciences. By contrast, analyses by gender and by consortium funding do not show any differences neither in terms of duration nor completion rate. Looking at the data as a whole, analyses by funding programme show significant differences in duration, though not in terms of the probability of completion.

Further analyses based on factors such as institution type and age are offered in the reports *Sprint oder Marathon? Die Dauer von Promo-*

tionen in DFG-geförderten Verbänden (“Sprint or marathon? Doctoral programme durations in DFG-funded consortia”) (DFG 2021a) and *Alles hat ein Ende ... oder? Abgeschlossene und nicht-abgeschlossene Promotionen in DFG-geförderten Projekten* (“All things come to an end ... don’t they? Completed and non-completed doctorates in DFG-funded consortia”) (DFG 2021b). In addition to their more detailed analyses, these reports also present the data in the context of the overall data situation and the state of research in these subjects.

The information used here is based on full surveys of all doctoral researchers working on funded projects under the four DFG Coordinated Programmes in question. As a result, the database is large, with several thousand doctoral students per year. Continuous data collection throughout the funding cycle of the consortia prevents the data from being reported retrospectively in a biased manner. By presenting these analyses, the DFG therefore seeks to help close the gap in terms of quantitative information relating to doctorates. Further analyses will follow.

Literature

Brandt, Gesche; Franz, Anja (2020): Promotionsabbrecher*innen in Deutschland. Stand der Forschung und Perspektiven. In: Die Hochschule. Journal für Wissenschaft und Bildung, 29. Jahrgang, 1/2020, pp. 16–28.

Deutsche Forschungsgemeinschaft (2021a): Sprint oder Marathon? Die Dauer von Promotionen in DFG-geförderten Verbänden.

<https://doi.org/10.5281/zenodo.5520751>

Deutsche Forschungsgemeinschaft (2021b): Alles hat ein Ende ... oder? Abgeschlossene und nicht abgeschlossene Promotionen in DFG-geförderten Verbänden, Bonn.

<https://doi.org/10.5281/zenodo.5520850>

Franz, Anja (2018): Symbolischer Tod im wissenschaftlichen Feld – Eine Grounded-Theory-Studie zu Abbrüchen von Promotionsvorhaben in Deutschland. Springer VS.

Jaksztat, Steffen; Preßler, Nora; Briedis, Kolja (2012): Promotionen im Fokus – Promotions- und Arbeitsbedingungen Promovierender im Vergleich. HIS: Forum Hochschule, 15.

www.ruhr-uni-bochum.de/chancengleich/pdf/downloads/HIS%20%282012%29%20-%20Promotionen%20im%20Fokus.pdf

Konsortium Bundesbericht wissenschaftlicher Nachwuchs (2017): Bundesbericht Wissenschaftlicher Nachwuchs 2017. Statistische Daten und Forschungsbefunde zu Promovierenden und Promovierten in Deutschland.

Konsortium Bundesbericht wissenschaftlicher Nachwuchs (2021): Bundesbericht Wissenschaftlicher Nachwuchs 2021. Statistische Daten und Forschungsbefunde zu Promovierenden und Promovierten in Deutschland

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