

Staying in Research

Research funding and career paths: an update

The DFG offers specific funding programmes for researchers in early career phases. This Infobrief examines to what extent those who submitted a proposal under these programmes a few years ago have since remained attached to the German research system on a long-term basis. There are two dimensions involved here. Firstly, we look at whether and to what extent this group of people is currently active in terms of DFG proposals, reviews and committees. Secondly, we determine whether they have obtained the title of professor or private lecturer in pursuing their activities, since this indicates whether or not they have remained in the German research system.

The monitoring approach presented here, based on DFG data, was first used for the DFG study “Forschungsförderung und Karrierewege” published in 2017. As such, this Infobrief is particularly dedicated to a comparison over time, allowing conclusions to be drawn as to whether different cohorts of applicants remain in the German research system to varying degrees. In addition to describing changes over time, these analyses also distinguish between gender, scientific discipline and the individual DFG programmes.

1 Question

The DFG offers various funding programmes that, in addition to pure project funding, also aim to support applicants’ career development. These include the Walter Benjamin Programme, which has since absorbed the former research fellowship, the Emmy Noether Programme and the Heisenberg Programme. In addition, within the context of project-related funding, Temporary Positions for Principal Investigators are used in particular as a module under the Research Grants Programme, Priority Programmes and Research Units to further raise applicants’ research profile in early career phases.

To what extent and under which general conditions applicants remain in the Ger-

man research system in the long term was first described in detail by the DFG in its study *Forschungsförderung und Karrierewege* (DFG 2017). One key finding of that study was that funding recipients have stronger links with research, and in particular research in Germany, than those who do not. But is this still the case? In which disciplines do most funding recipients remain in the research system? Are there differences between the genders? And in which programmes does funding most often lead to individuals pursuing a research career?

The DFG’s funding decision can be a key factor in career development in two ways. Firstly, it may be the case that those researchers are selected who demonstrate high career potential anyway: even if this group of people had not received funding, they would probably have

achieved a better career position than the researchers whose proposals were rejected. Secondly, a person's career can be given a boost by the funding itself, i.e. the financial support received or the gain in reputation. Various studies indicate that both mechanisms are effective (Laudel 2017, Reimer et al. 2019, Schröder et al. 2021, Habicht et al. 2021).

The 2017 study looked at career trajectories for the 2007 and 2008 cohort of applicants based on a dataset of 1,133 individuals. Information from these individuals' curriculum vitae was processed and analysed. In addition, this study was the first to test a monitoring system based exclusively on structured information in the DFG's proposal database, e.g. information on proposal submissions and review activities as well as people's registered titles.

This instrument appears to be well suited to observing long-term integration in the German research system:

1. essentially, anyone who has ever approached the DFG as an applicant under a funding programme for career support can be included in the analysis. In terms of carrying out a more in-depth analysis of biographies, however only a sample can be taken into account due to the amount of work this involves.
2. Since the rules for recording data in the DFG proposal database have largely remained stable over time, the analysis can be repeated at any time and focus on any (subsequent) year. Secondly, this means the database also fulfils the requirement of a monitoring instrument for use on a permanent basis.

On the one hand, it is possible to look at whether applicants submitted proposals to the DFG again after submitting their original proposal, and whether they were invited by the DFG to carry out at least one review or participate in its decision-making bodies. In addition to this "DFG activity indicator", the DFG proposal database also yields information on whether the academic status of former appli-

cants has changed. Here, reference is made to the title rather than the academic degree (including doctoral degree). A distinction is drawn between professor¹, private lecturer (Privatdozent) and no professor/private lecturer title. All in all, this results in a typology that distinguishes four groups: professor, private lecturer, DFG-active person (but no professor/private lecturer title), and non-DFG-active person. In this way, conclusions can be drawn as to whether a person is still active in the German research system and whether they have since taken a career step that can be gleaned from their academic title.

2 Data basis and methodology

The starting point for the analysis is provided by all 32,334 proposals decided on in connection with the DFG funding instruments research fellowship², Emmy Noether Programme and Heisenberg Programme, as well as the Temporary Positions for Principal Investigators module in the years 2007 to 2021. Both approved and rejected proposals are included. Proposals were submitted by 24,061 persons, which means that some researchers applied for funding under different programmes or in the same programme after being rejected, for example, so they are covered more than once in the analyses.

The 19,518 proposals in the Temporary Positions for the Principal Investigators module account for the largest share of the data base, followed by the research fellowship with 6,440 proposals, the Emmy Noether Programme with 4,011 proposals and the Heisenberg Programme (including the Heisenberg professorship and, from 2017, the Heisenberg position

1 The title of professor does not differentiate between a professorship and a junior professorship.

2 The last research fellowship grants were awarded in 2020. The Walter Benjamin Programme was introduced in 2019 to replace the research fellowship, and proposals were received for it on a larger scale for the first time in 2020: this programme is therefore not considered here because an insufficient period of time has lapsed since 2019.

or Heisenberg temporary substitute position for clinicians) with 2,365 proposals.

DFG activity and title are examined for all those who submitted these proposals. In the following analysis, individuals are considered to still be DFG-active in 2022 if at least one of the following three criteria applied to them in 2020 and 2021:

1. After the original proposal was submitted, decisions were issued on one or more other DFG proposals submitted by this person (either approved or rejected).
2. The person was active in an ongoing funding programme (various participatory roles were included here, as were other programmes).
3. The person was involved in a review meeting (oral review), submitted a written review or was a member of a DFG statutory body (including review boards).

The fact that DFG activity can be regarded as a fairly good indicator of whether a person remained attached to the research system results from the considerable breadth and coverage of DFG funding. If we compare the number of people with the title of professor and a university address who were active as applicants or reviewers over a five-year period with the number of professors reported to the Federal Statistical Office for German universities, this shows that 82 percent of them are DFG-active individuals (DFG, 2022a, p. 5). This focus on DFG-active individuals largely excludes those working in research abroad, however. At best, the latter will include researchers who have been requested by the DFG to submit a review.

The academic title of a researcher is recorded in the DFG database so that it can be used to send automated letters to the individual in question. It is always adapted when a contact occurs, e.g. if the person submits a proposal or the DFG Head Office requests a review. This analysis is based on the status of titles as recorded by the DFG in January 2022.

In the 2017 study, the quality of the title data recorded in the DFG database was assessed for

the sample of 1,133 persons searched by CV analysis. In terms of those applicants following DFG career support programmes whose proposal was rejected, the current status in the DFG proposal database was under-reported by about 20 percent. In the case of persons who did receive funding, there was a very high degree of correspondence between the titles listed in the DFG database and those that appeared in the individuals' current curricula vitae. This difference should be taken into account when interpreting the following findings.

3 Findings

3.1 Integration in the German research system by the year in which a decision was issued

The extent to which DFG applicants for whose original proposal a decision was issued in the years 2007 to 2021 are currently integrated in the German research system depends primarily on the time that has lapsed since the submission of the proposal. If, for example, a person only obtained a research fellowship or funding under the Walter Benjamin Programme a few years ago, it is unlikely that they will have attained a professorship, simply because it will not have been possible in that time to gain the research experience usually required for such an appointment. A breakdown of applicant career status by the year in which the decision on their original proposal was issued is shown for the research fellowship programme in Figure 1.

In distinguishing between approved and rejected research fellowship proposals, this figure shows how the shares of the four different groups shift with the time lapse since the original funding decision.

What is striking is the drop in DFG activity among applicants whose funding decision was issued about two to three years ago – a period of time that corresponds to the duration of the research fellowship. This sudden decline indicates that many research fellowship holders are

Figure 1: Title or DFG activity in 2022 of applicants of proposals approved under the research fellowship programme based on the time lapse since the original funding decision (2007 to 2020)

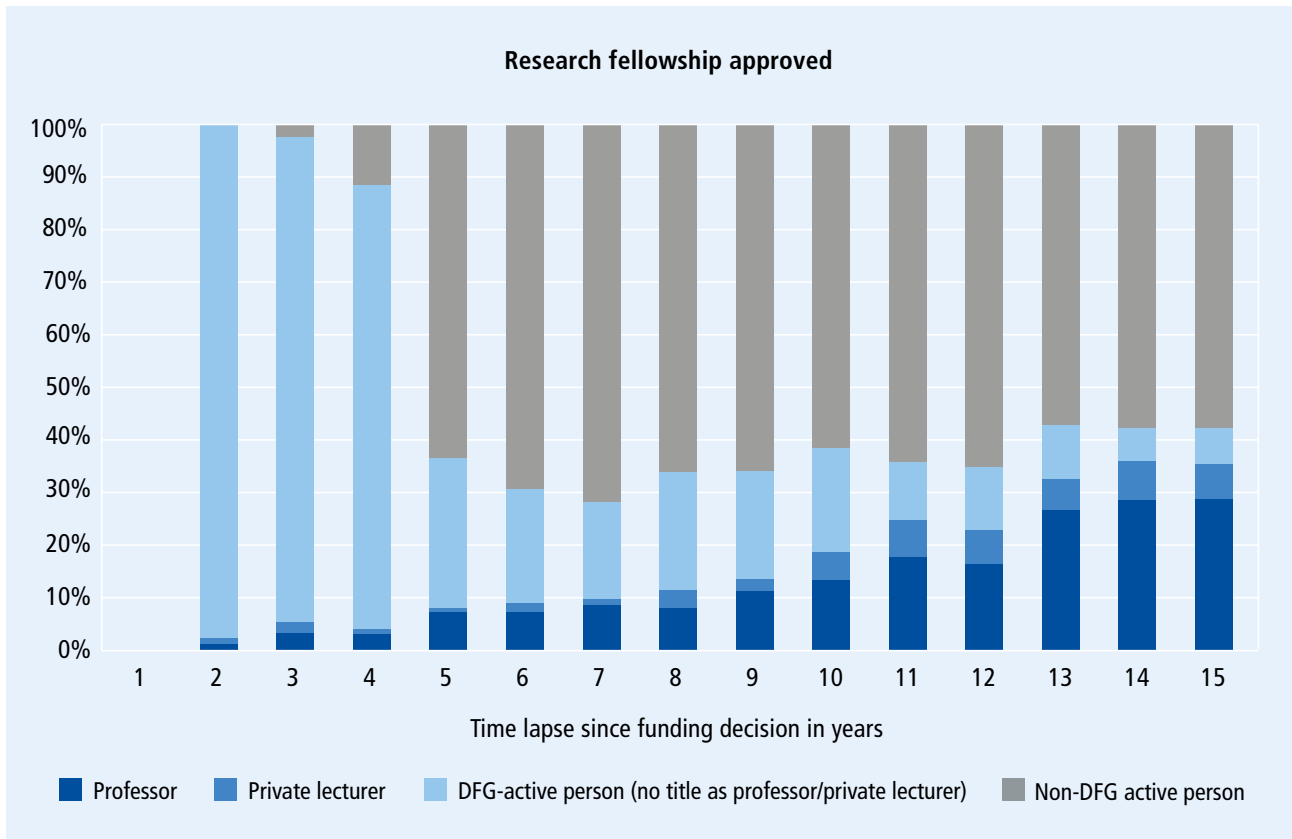
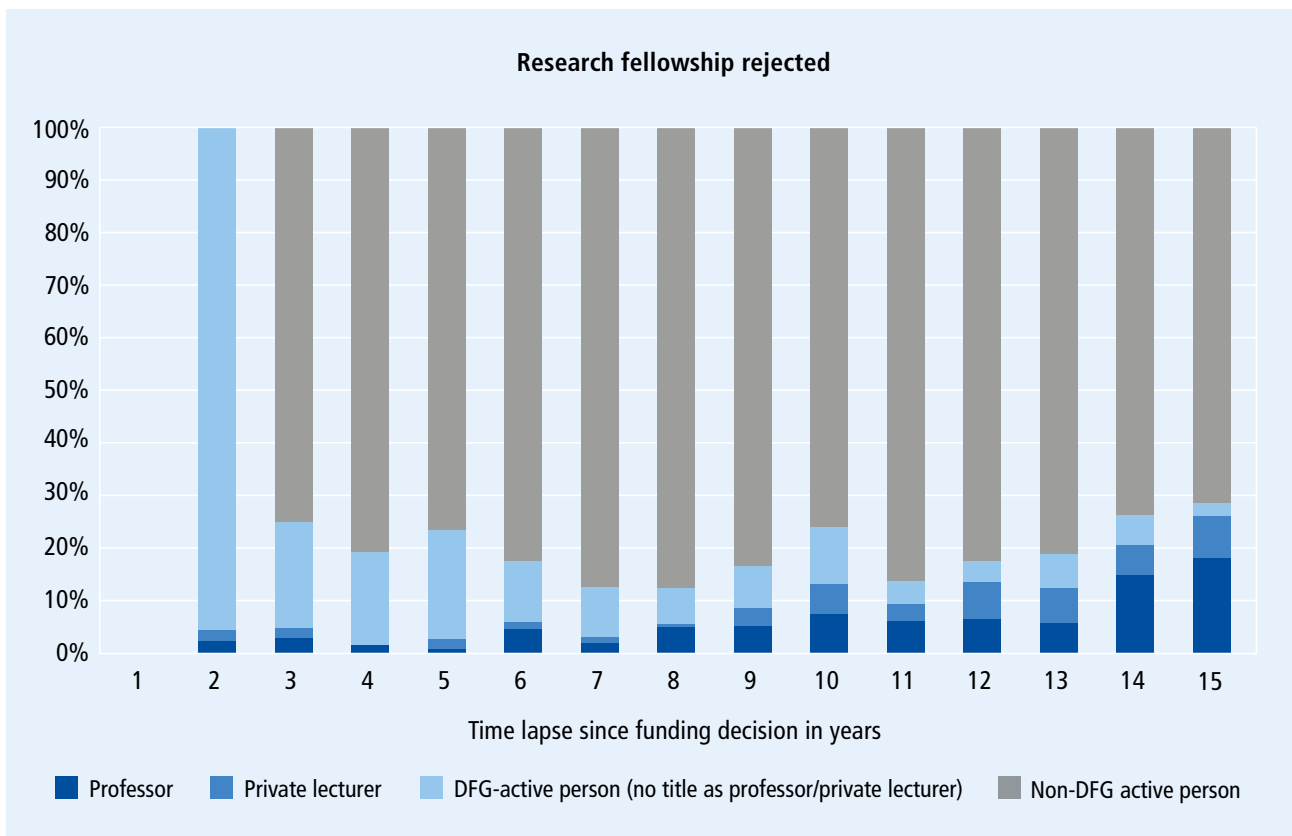


Figure 2: Title or DFG activity in 2022 of applicants whose proposals were rejected under the research fellowship programme by time lapse since original funding decision (2007 to 2020)



no longer or will no longer be active in the DFG once their funding expires. This applies even more clearly to applicants whose proposal was rejected. For them, DFG activity is reduced at an earlier stage.

Looking at the other end of these two graphs, we see that over a quarter of those with approved research fellowships from the earliest years, 2007 to 2009, are listed by the DFG as holding a professorship. The fact that the share of proposals with the longest time lapse since fellowship funding does not increase further indicates that the maximum level may have been reached.

A comparison shows that the greater the time lapse since the funding decision, the greater the share of professors among the rejected fellowship proposals. Here, an increase to a level of over 10 percent only follows for the cohorts of 2008 (15 percent) and 2007 (18 percent). On the other hand, the share of private lecturers is somewhat higher among these individuals. For persons with approved fellowships, the share of private lecturers levels off at 5 to 7 percent from the decision year 2012 onwards, and at 6 to 8 percent for rejected fellowships from the decision year 2010 onwards. Finally, for between 57 and 65 percent of all applicants from 2007 to 2011, the status remains “without DFG activity”. This figure is significantly higher for rejected fellowships in the same cohorts, at 71 to 86 percent.

3.2 Integration in the German research system by programme and funding decision

In order to compare the level of attachment to the research system between applicants to different career development programmes, the following analyses offer a summary for those who originally submitted proposals in the years 2007 to 2011. In the case of these cohorts, proposals were submitted at least ten years ago, so the analysis reflects longer-term attachment and career status.

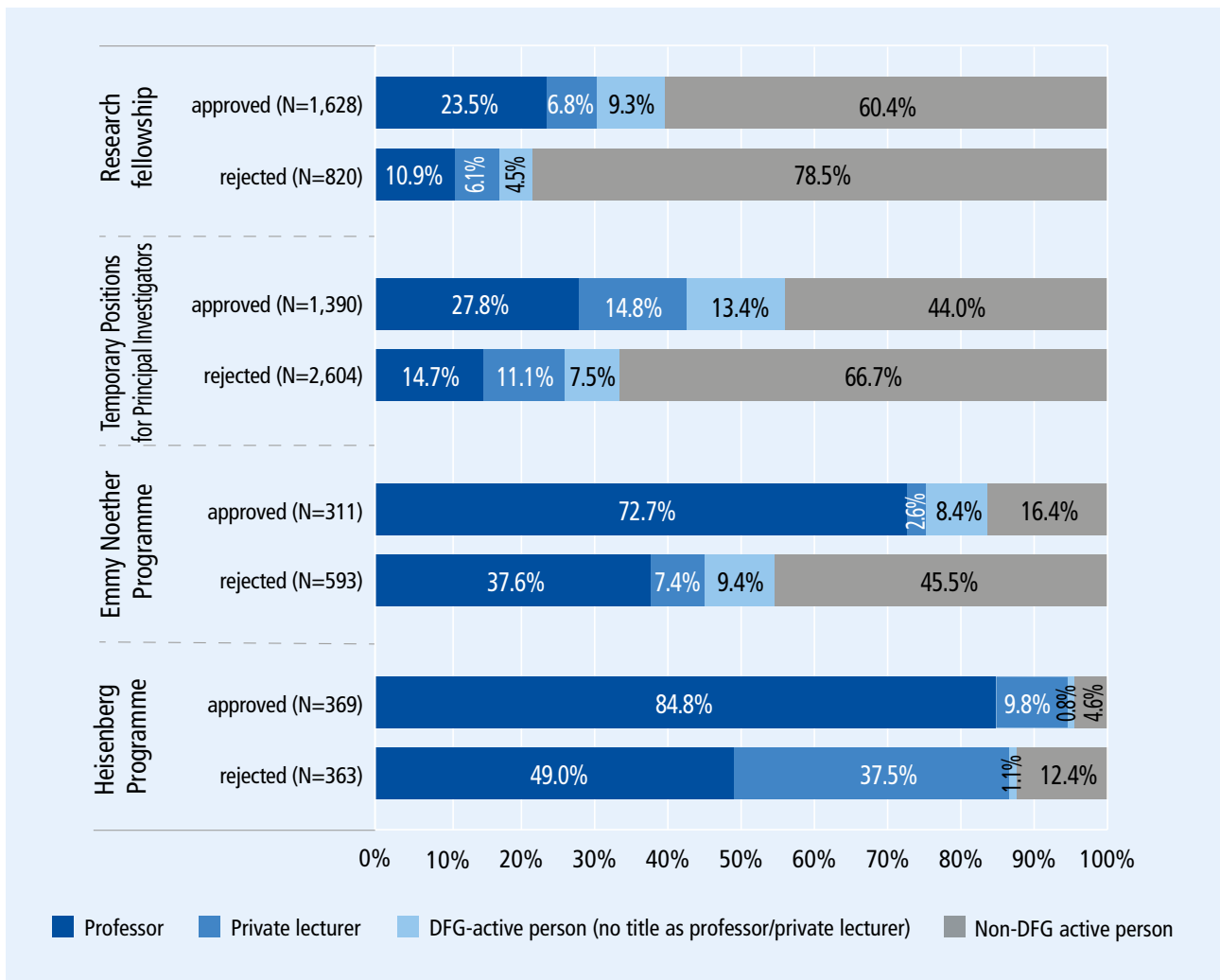
The summary analysis shown in Figure 2 compares the shares of the groups defined above according to the four programmes, distinguishing between approved and rejected proposals. There are differences between the programmes that can be accounted for by the logic of the programmes themselves: for those who applied for research fellowships, the share of professorships achieved 11 to 15 years later is the lowest among those funded, at 24 percent, followed by 28 percent in the Temporary Positions for Principal Investigators module. The percentages are significantly higher for funding recipients under the Emmy Noether and Heisenberg Programmes, where 73 and 85 percent, respectively, are documented in the DFG database as holding a professorship after receiving their DFG funding. For all four programmes, this title is recorded significantly less frequently in the case of those whose proposals were rejected. This pattern is consistent with the findings of the 2017 study.

One interesting detail emerges with regard to the status group of private lecturers. While their share in most of the comparison groups shown in Figure 2 ranges in a relatively narrow corridor of between 3 and 15 percent, the group of applicants with rejected proposals under the Heisenberg Programme stands out in particular: of these, 38 percent still belong to the group of private lecturers 11 to 15 years after receiving funding, so their status is presumably the same as it was for the majority of the researchers at the time of submitting their Heisenberg proposal.

3.3 Integration in the German research system by gender

As in the present analysis, the DFG study of 2017 examined gender-specific differences in relation to the German research system, however based on an analysis of curricula vitae. There were notable differences only for the Temporary Positions for Principal Investigators

Figure 3: Title or DFG activity in 2022 among applicants who originally submitted proposals in 2007 to 2011, by programme and funding decision



and the research fellowships (cf. DFG 2017, p. 54–55), but not for the Emmy Noether Programme and funding recipients under the Heisenberg Programme.

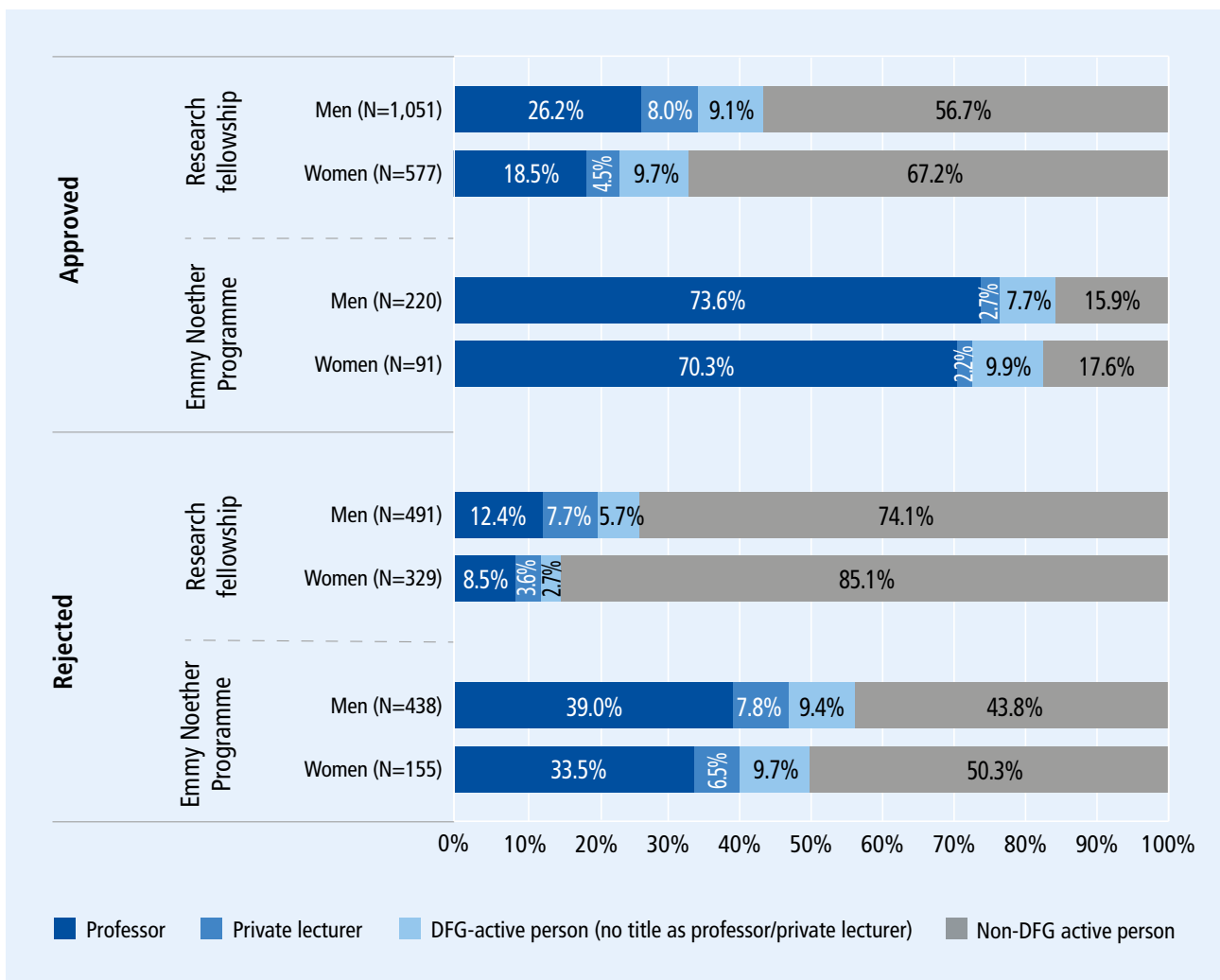
Figure 4 below compares the results for the research fellowship and the Emmy Noether Programme³. Once again, this confirms that fewer women than men hold the title of professor or remain in contact with the DFG following a DFG research fellowship. This difference is evident for both rejected and approved proposals. Female researchers who have applied for a research fellowship are also more likely to leave the (German) research system

than men. Another partial finding that can be highlighted here is that a lower share of female researchers fall into the category of “private lecturer”.

The differences are smaller for Emmy Noether funding recipients. Here, 74 percent of men and 70 percent of women whose funding proposals were approved between 2007 and 2011 had obtained a professorship by 2022. Among those whose funding proposals were rejected, 39 percent of men and 34 percent of women still went on to obtain the title of professor. The difference is also smaller in the “DFG-active” category than for the research fellowship. Nonetheless, some 50 percent of women whose proposals were rejected, but only 44 percent of men, are no longer registered with the DFG as applicants,

³ In this analysis, 32 percent (men) and 22 percent (women) of funding recipients with a Temporary Position for Principal Investigators attained a professorship by 2022. For the Heisenberg Programme, the shares are roughly equal at 85 percent men and 86 percent women.

Figure 4: Title or DFG activity in 2022 among applicants who originally submitted proposals in 2007 to 2011, by gender, programme and funding decision



reviewers or in a committee function 11 to 15 years after submitting their original proposal.

Researchers of both genders leave the German research system even at this advanced career stage, especially women. It is not possible here to determine whether or not they are increasingly migrating to foreign research systems, as was found in the 2017 study.

3.4 Integration in the German research system by scientific discipline

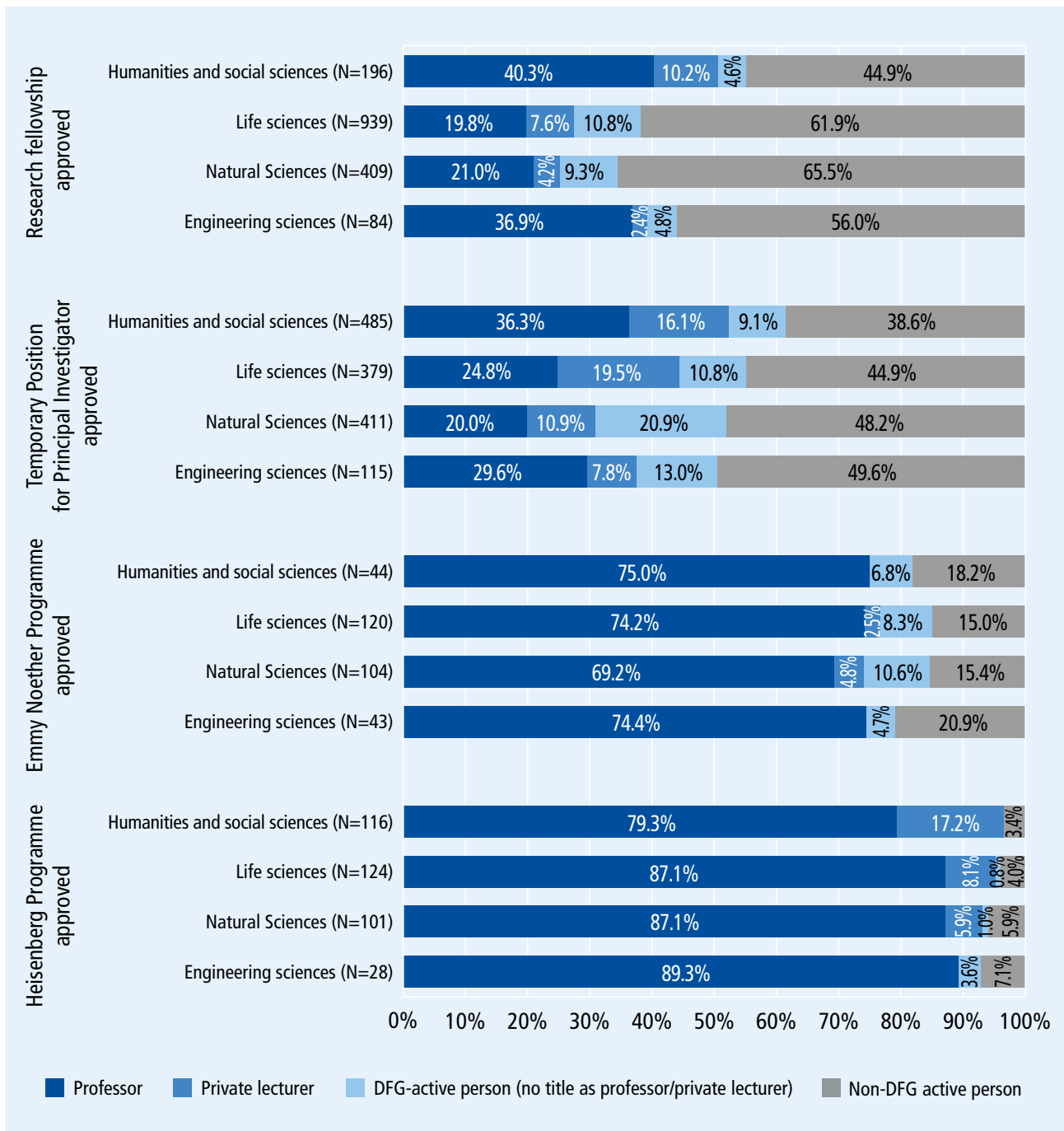
The share of researchers who leave the research system after completing their doctorate varies considerably from one subject to another. There are also varying degrees of competitive pressure to obtain a professorship, depending

on the discipline (Wirth, 2019; Reimer, Witte, Lenz & Banschbach, 2019).

Figure 5 shows the extent to which funding recipients of the cohorts 2007 to 2011 differ in terms of their attachment to the German research system across the four funding programmes under review here, broken down according to the four major scientific disciplines⁴. What is striking here is first of all the slight difference in the programmes aimed at researchers in the advanced postdoc phase: in the Emmy Noether Programme, the shares of those who later receive the title of professor is roughly equal in all four scientific disciplines, with a slight decline in the case of the natural sciences.

⁴ The scientific disciplines represent the highest level of the DFG subject classification system, see: www.dfg.de/en/dfg_profile/statutory_bodies/review_boards/subject_areas

Figure 5: Title or DFG activity in 2022 among applicants who originally submitted proposals in 2007 to 2011, by programme and scientific discipline



In the Heisenberg Programme, the shares of professors in the humanities and social sciences are somewhat lower than in the other three scientific disciplines; for the other three there are almost no differences.

For the two other programmes, a comparison of the four scientific disciplines yields a somewhat more differentiated picture.

In the case of the research fellowship and the Temporary Positions for Principal Investigators,

the data are similar for the humanities and social sciences and for the engineering sciences. Both have the highest shares of funding recipients who went on to obtain professorships. The findings suggest that people who apply for postdoctoral funding in this range of subjects are more likely than those in the life and natural sciences to associate this decision with long-term career prospects in research.

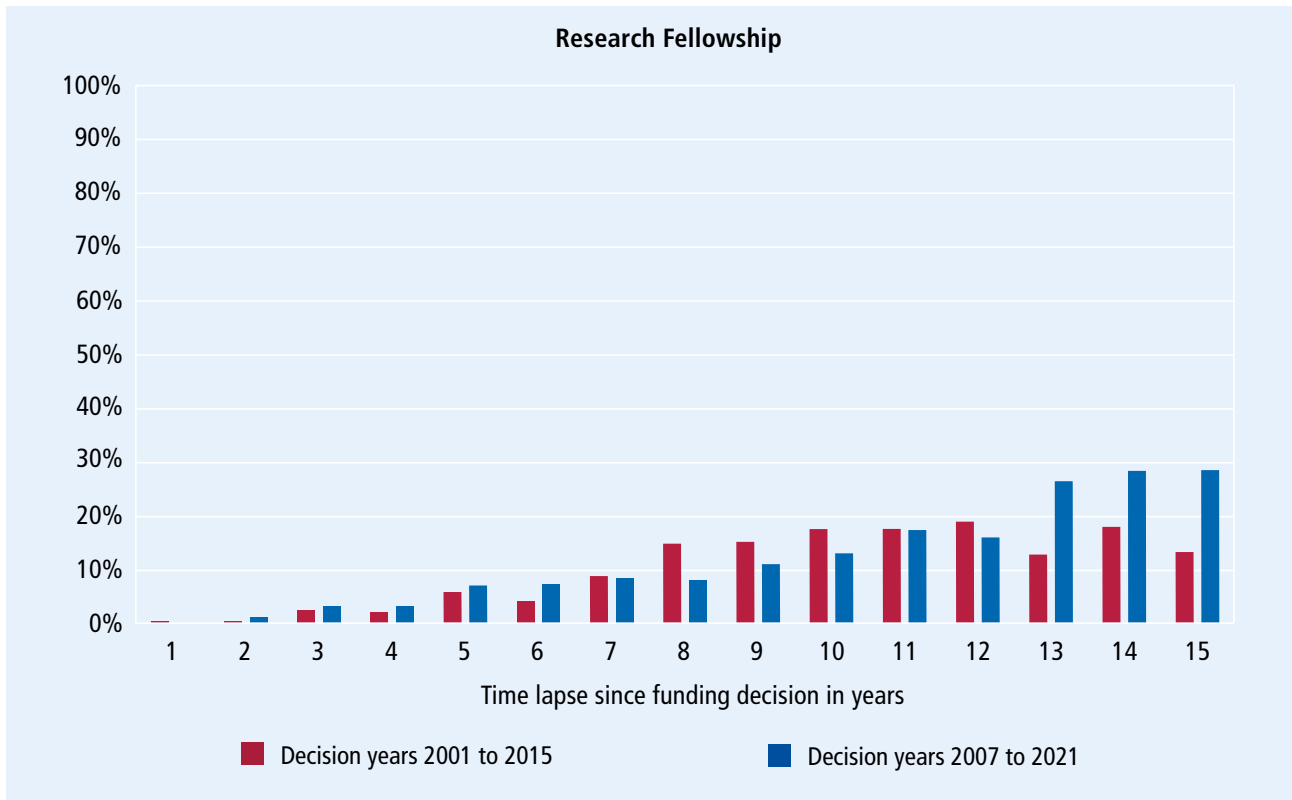
3.5 Professor titles: comparison of the decision years 2001 to 2015 and 2007 to 2021

Finally, a question is addressed which we can now answer for the first time due to the monitoring system presented here: how do the findings change over time? To be specific: are there differences to be seen in the shares of those who attain a professorship if we compare those funding recipients in the cohorts analysed in the 2017 DFG study for the first time and those in later cohorts?

Figures 6 to 9 provide an answer to this question. The share of those who are registered with the DFG with the title of professor is compared based on an equal time lapse since the year in which the decision on the proposal was submitted under these programmes. The blue columns indicate the percentage of professors at the beginning of 2022 in the applicant years 2007 to 2021. The red columns contrast the comparative figure six years ago (titles as of the beginning of 2016 for the decision years 2001 to 2015). Here is an example to illustrate how this works: of the former Emmy Noether funding recipients in 2007, 60.5 percent were listed as holding the title of professor in the DFG database nine years later (2016). For the former funding recipients of the year 2013, given the same time lapse since the funding (after nine years, i.e. in 2022), the share of those who hold such a title is 61.2 percent. Even though the pillars show differing characteristics in individual years, there is a very high degree of correspondence overall. No clearly discernible shortening of the columns is to be discerned in later years. For the research fellowship there is a higher share of professors than there was in the comparative analysis six years earlier, especially for applicants in the decision years 13 to 15 years ago. In the case of the Temporary Positions for Principal Investigators, on the other hand, a higher share of applicants from the decision years 2011 to 2015 hold the title of professor (Figure 7) than from the decision years

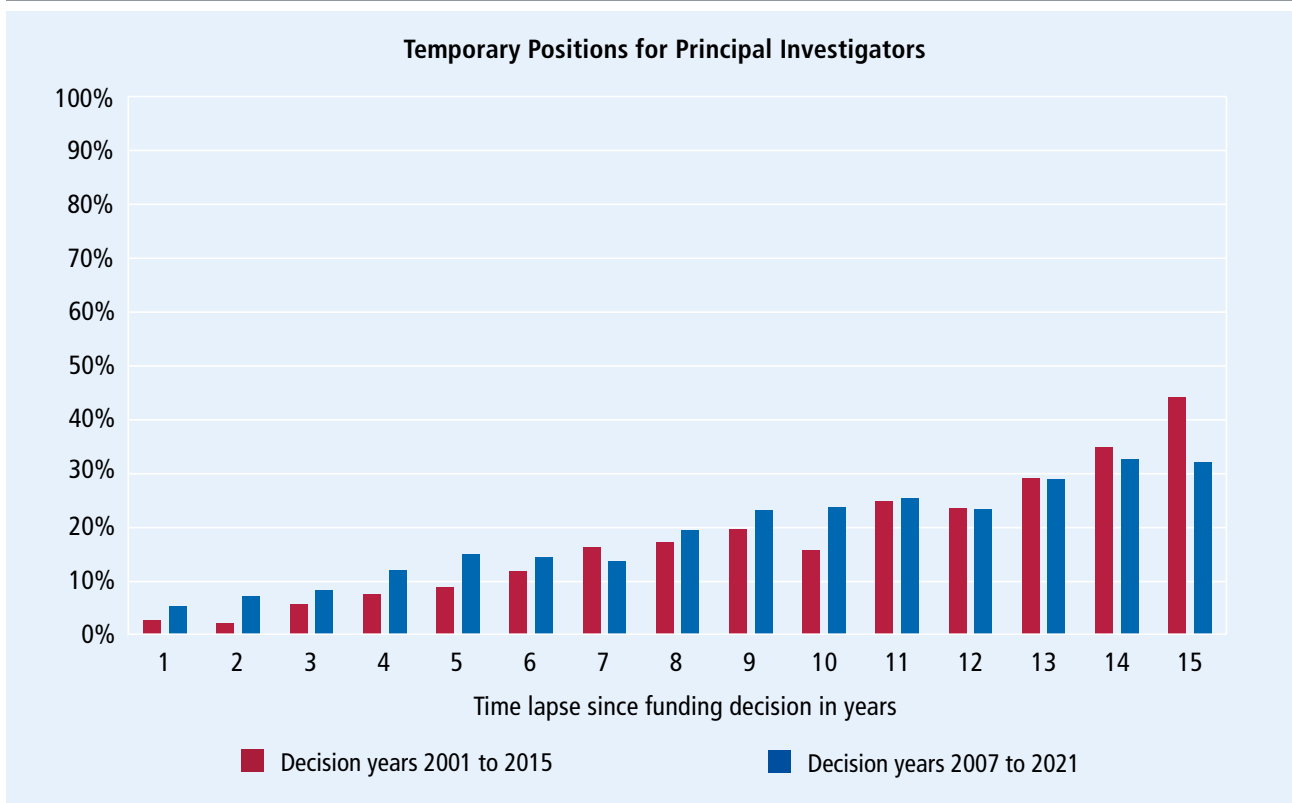
2017 to 2021 in 2022. In the Emmy Noether Programme, the columns for the cohort of 11 to 15 years ago are somewhat shorter today. In the Heisenberg Programme, more people in the most recent cohorts in 2020 and 2021 hold the title of professor than was the case in earlier cohorts two years after the funding decision was made (Figure 6).

Figure 6: Title of professor in 2022 or 2016 among applicants whose proposals were approved under the Research Fellowship programme by time lapse since the funding decision (2007 to 2021 / 2001 to 2015)



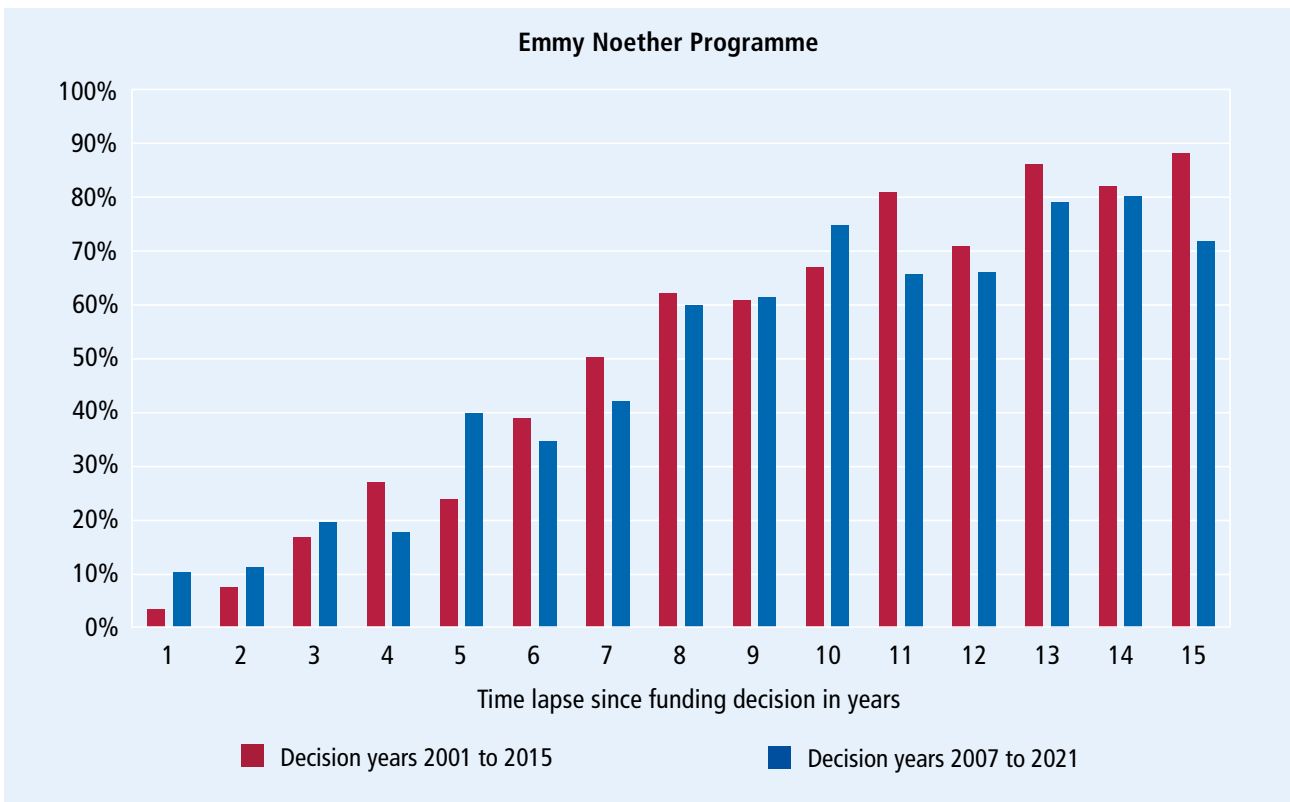
N=3,222 in 2016, N=4,333 in 2022. No more research fellowships were approved in 2021.

Figure 7: Title of professor in 2022 or 2016 among applicants whose proposals were approved for Temporary Positions for Principal Investigators by time lapse since the funding decision (2007 to 2021 / 2001 to 2015)



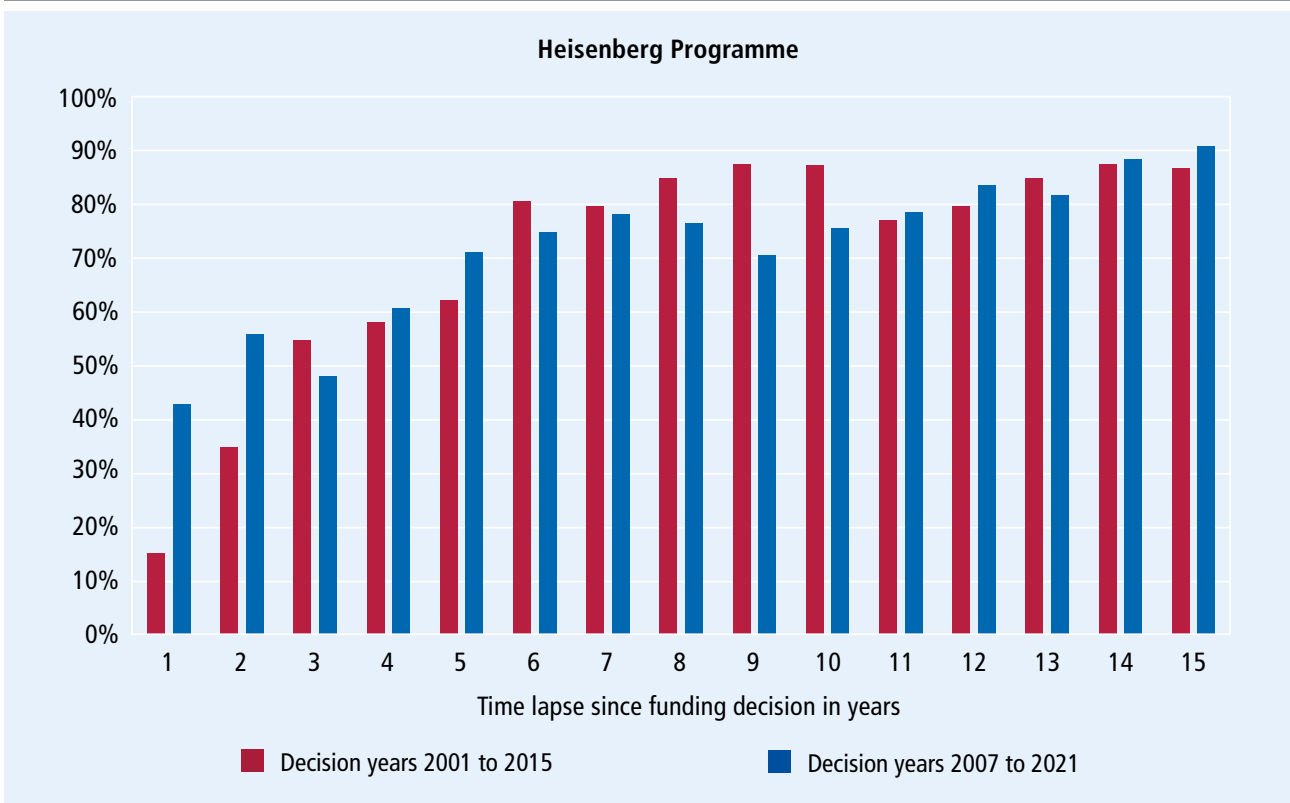
N=3,314 in 2016, N=5,809 in 2022.

Figure 8: Title of professor in 2022 or 2016 among applicants whose proposals were approved under the Emmy Noether Programme by time lapse since the funding decision (2007 to 2021 / 2001 to 2015)



N=854 in 2016, N=931 in 2022.

Figure 9: Title of professor in 2022 or 2016 among applicants whose proposals were approved under the Heisenberg Programme by time lapse since the funding decision (2007 to 2021 / 2001 to 2015)



N=958 in 2016, N=1,065 in 2022.

4 Conclusion and future perspectives

The available data was used to look at how applicants under the four programmes mentioned showed changes in terms of their status within the German research system. This was measured based on DFG activity as well as on whether or not they hold an academic title of professor or private lecturer.

When compared to the findings of the 2017 study, where the far more complex method of CV analysis was used, a largely consistent pattern emerges:

- those whose proposals are rejected leave the German research system earlier and in larger numbers.
- Female researchers are less involved in the German research system than male researchers, regardless of whether their proposals are approved or rejected.
- In the humanities and social sciences, as well as in the engineering sciences, funding under the research fellowship programme is more strongly associated with an orientation towards a research career in Germany than is the case in the life and natural sciences. A share of 40 percent (humanities and social sciences) and 37 percent (engineering sciences) of those who received funding under this programme hold the title of professor 11 to 15 years after receiving funding. A comparable pattern can be discerned in the case of the Temporary Positions for Principal Investigators.
- When compared directly, the career prospects of former recipients of funding under the Emmy Noether and Heisenberg Programmes have remained largely stable. Among those who formerly received funding, many go on to obtain professorships, but many also remain in the German research system in general and continue to be involved with the DFG.

The DFG will continue to monitor to what extent funding recipients remain in the Ger-

man research system in the long term. One question to look at might be whether the changes caused by the coronavirus pandemic (DFG, 2022b) have had an impact on research careers. For those who completed their doctorate right in the middle or at the beginning of the pandemic, as well as for funding recipients under the Walter Benjamin Programme, it will only be visible in a few years from now whether they have remained in the research system. Similarly, the success of efforts to retain doctoral researchers in academia in the long term can only be answered over time. The present monitoring system creates the basis to further investigate these issues in the future.

Literature

DFG (2017). Forschungsförderung und Karrierewege. Bonn: Deutsche Forschungsgemeinschaft.

DFG (2022a). Pakt für Forschung und Innovation – Monitoring-Bericht 2022. Bonn: Deutsche Forschungsgemeinschaft.

DFG (2022b). DFG Funding Activities in the Context of the COVID-19 Pandemic. Bonn: Deutsche Forschungsgemeinschaft.

Habicht, I. M., Lutter, M., & Schröder, M. (2021). How Human Capital, Universities of Excellence, Third Party Funding, Mobility and Gender Explain Productivity in German Political Science. *Scientometrics* 126.

Laudel, G. (2017). How do National Career Systems Promote or Hinder the Emergence of New Research Lines? *Minerva*, S. 1–29.

Reimer, M., Witte, J., Lenz, T., & Banschbach, V. (2019). Fachkulturen und wissenschaftliche Karrieren. München: Bayerisches Staatsinstitut für Hochschulforschung und Hochschulplanung (IHF).

Schröder, M., Lutter, M., & Habicht, I. M. (2021). Publishing, signaling, social capital, and gender: Determinants of becoming a tenured professor in German political science. *PLOS ONE*.

Wirth, A. (2019). Positive Signale. Angebot und Nachfrage – der Stellenmarkt für Professuren. *Forschung & Lehre* 12|19.

(Last revised: 29.03.2023)

DFG infobrief

Legal information

Deutsche Forschungsgemeinschaft e. V.

Kennedyallee 40 · 53175 Bonn, Germany
 Postal code: 53170 Bonn, Germany
 Phone +49 228 885-1
 Fax +49 228 885-2777
 postmaster@dfg.de
 www.dfg.de/en

The text of this publication is licensed under the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) Licence. For the full text of the licence, see:

creativecommons.org/licenses/by-sa/4.0/legalcode



DFG infobrief, issue 1.23

The DFG Infobrief is published by the Information Management Group of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), Bonn.

Contact:

Richard Heidler
 Phone +49 228 885-2925

Contributors:

Jürgen Güdler
 Anke Reinhardt
 Judith Wagner
 Ina von der Beck

Basic layout: besscom, Berlin; Tim Wübben, DFG
 Typesetting and design: Olaf Herling, Warstein

Download address:

www.dfg.de/infobrief/en

DOI: 10.5281/zenodo.8036896