

A Path to Professorship: The Emmy Noether Programme of the DFG

Key findings from an evaluation of a DFG programme to promote young researchers

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Since the Emmy Noether Programme was launched in 1999, more than 500 young researchers have benefited from the opportunity to head their own independent junior research group. The Institute for Research Information and Quality Assurance (iFQ) has now conducted the first comprehensive evaluation of the programme's success: Does it reach the target group toward whom the grants are geared? Has it improved the grant recipients' working conditions? Do Emmy Noether alumni have better career opportunities? This newsletter presents some of the results of the evaluation.

1 Background, Data Base and Methodology of the Study

A better career outlook, more autonomy and more generous funding: these are the key requirements for forward-looking support of young researchers in Germany. This is where the DFG's Emmy Noether Programme (ENP) comes in, by funding independent junior research groups. It provides promising young scientists and academics with grants for staff (including the group leader position) and direct project costs for a duration of usually five years. The objective of the Emmy Noether Programme is to enable outstanding researchers to qualify for a professorial appointment by independently leading a junior research group¹.

The evaluation of this funding programme therefore looks for answers to three questions: Does the

programme reach the target group toward whom the grants are geared? Does it improve the grant recipients' working conditions? And lastly: Do Emmy Noether alumni have better career opportunities?

Following the inception of the Emmy Noether Programme in 1999 and several modifications of the programme (the last major one in 2004), the study *Postdocs in Deutschland: Evaluation des Emmy Noether Programms* [Postdocs in Germany: An Evaluation of the Emmy Noether Programme], by authors Susan Böhmer, Stefan Hornbostel and Michael Meuser, now examines, for the first time, the characteristics of applicants, the day-to-day reality of research, the position of Emmy Noether fellows within the research community, and the effects of the programme. This also allows a look beyond the ENP at the factors that influence successful research careers.

The authors employ a combination of socio-scientific methods: a comprehensive online survey of funded and rejected applicants is complemented by qualitative interviews as well as an analysis of proposal reviews and of the applicants' publications. The main focus is on a comparison of those applicants who received grants versus those who did not, which permits conclusions regarding the effects of funding.

Invitations to participate in the online survey were sent to 695 people who had submitted ENP funding proposals (junior research group leadership) between the inception of the programme (1999) and June 2006. The response rate was 66.5 percent, which

1. More information on the Emmy Noether Programme can be found at www.dfg.de/en/research_funding/promoting_young_researchers/emmy_noether/

is high for socio-scientific surveys and is indicative of the special loyalty that applicants feel toward the DFG and the programme².

Respondents were mostly from the life and natural sciences, which reflects the share of these disciplines among funding recipients overall. About 20 percent of grantees are women. Survey participation was disproportionately high among female researchers.

2 Selected Results

2.1 Characteristics of Applicants and Grantees

The Emmy Noether Programme is an excellence programme for outstanding young researchers whose track record and proposed project justifies the expectation of outstanding research achievements. By design it targets especially high-performing applicants, and its acceptance hurdles are correspondingly high. Successful applicants must have completed their academic training swiftly and are usually expected to have at least two and up to four years of subsequent postdoctoral experience³. In addition, they should be able to demonstrate substantial international research experience of at least twelve months of doctoral or postdoctoral training abroad, or equivalent collaborations with researchers in other countries. Ambitious publications in internationally reputable journals or comparable formats should substantiate an applicant's quality as a scientist or scholar.

Survey results show that funded junior research group leaders overwhelmingly meet these standards. The study compares applicant data with non-applicant data, as well as applicants who received funding with those who did not.

The above-average performance of successful applicants was evident early on: Of those who passed

the university qualification (Abitur) in a German secondary school, almost 60 percent achieved grades 4. between 1.0 and 1.5. This places them clearly above the German average of about 2.5 (Kultusministerkonferenz 2006) and the doctorate holders surveyed by Enders & Bornmann (2001), who averaged between 2.2 and 2.4. University graduation grades paint a similar picture: 61 percent of successful ENP applicants finished with 1.0. In the natural sciences, for example, the average university student graduates with 1.8, whereas "Emmys" average 1.1.

Emmy Noether grantees approach their careers with determination and thus complete their university training swiftly. This is illustrated especially by short transition periods between secondary school and university as well as between university graduation and doctorate, foregoing vocational training, internships and the like.⁵ Three out of four respondents began doctoral training immediately after graduating from university, at age 25 or 26. Successful applicants worked on their doctorate for an average 40.6 months, rejected applicants for 42.5 months. Time to graduation (5.5 years on average) and time to doctorate are roughly the same for grantees and the general population of university graduates and doctorate holders (Böhmer, Hornbostel & Meuser 2008: 40).

Purposeful orientation toward a career in research was also revealed in answers regarding the reasons for undertaking a doctorate (Fig. 1). All applicants are motivated by a strong scientific interest and the pursuit of an academic career. Expectations of higher earnings or better advancement opportunities in a non-academic professional setting play only a small role. This is as can be expected, considering that the programme is designed to prepare researchers for a career in science and academia, and it also explains the applicants' speedy career progress, without detours and at a high level of performance.

2. The response rate was 76.2 percent among successful applicants and 55.8 percent among rejected applicants.

3. Until 2004, the age limit was 29 years for fellowship applicants and 32 years for junior research group applicants.

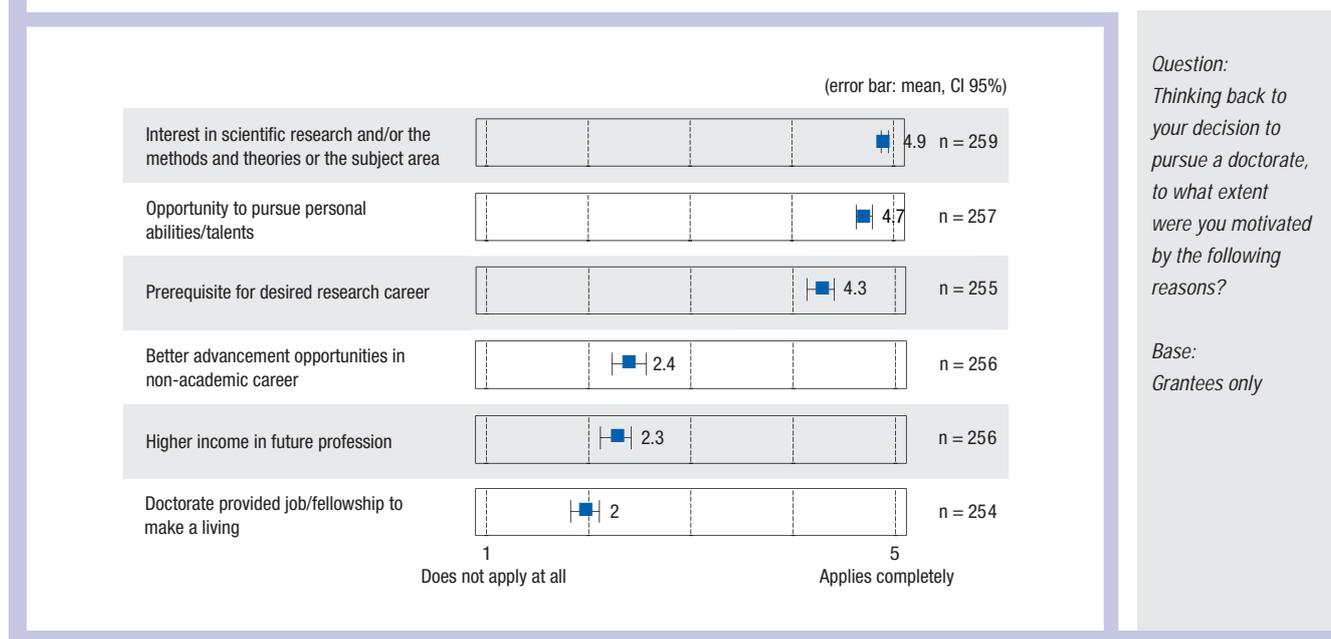
4. Passing grades range from 1.0 (best) to 6.0 (fail).

5. It remains to be seen whether this pattern will change due to the discontinuance of the age limit in 2004.

That the ENP is known for promoting the best and the brightest, and therefore tends to attract highly promising scientists and scholars, is also evident in the applicants' above-average research performance. Both rejected and approved applicants demonstrate high publication activity. That excellence programmes attract especially strong applicants, and there-

But this finding also makes it clear that publication activity is not the only important criterion when a proposal is reviewed. While the ENP is primarily a programme for promoting individual researchers, it is not only an applicant's previous and expected performance that counts but also the envisioned research project. An analysis of reviews shows that great

Fig. 1: Reasons for pursuing doctorate



fore involve a self-selection process, is a phenomenon borne out by studies on similar programmes in other countries as well as theoretical studies on typical distribution patterns (van den Besselaar & Leydesdorff 2007, Larsen & von Ins 2008). The number of publications both before and after the funding decision is not significantly different. A decrease in publication activity among grantees can be noticed around the time the junior research group is established and when funding expires - both transitional periods involving institutional and personal changes as well as organisational challenges. Publication quality, as measured by citation frequency and the publishing journals' impact factor, is also virtually the same (Böhmer, Hornbostel & Meuser 2008: 122). Thus both rejected and approved applicants publish extensively and at a high quality level.

weight is given to the specific project idea, its planning and feasibility, independence from mentors, and the chosen setting.

2.2 Working Conditions

The Emmy Noether Programme aims to provide selected young researchers with working conditions that allow them to investigate independently and put their leadership skills to the test, to a far greater extent than is typical for research careers. One evaluation criterion is therefore that the intended project will be carried out autonomously and in a highly suitable research environment.

Deliberate choice of the best setting possible is evident in the reasons given for selecting a host university for the independent junior research group

(Fig. 2). With multiple answers allowed, the most frequently named reasons were a good fit of the institution's research activities with one's own investigations and the support provided by the institution. Only one in ten grantees was motivated by proximity to their place of residence or by expert recommendations. In line with the programme's intention to encourage mobility as well as independence from previous mentors, only few respondents say they chose their host university because they had previously worked or studied there, even though more than half of all interviewees were motivated by previously established contacts.

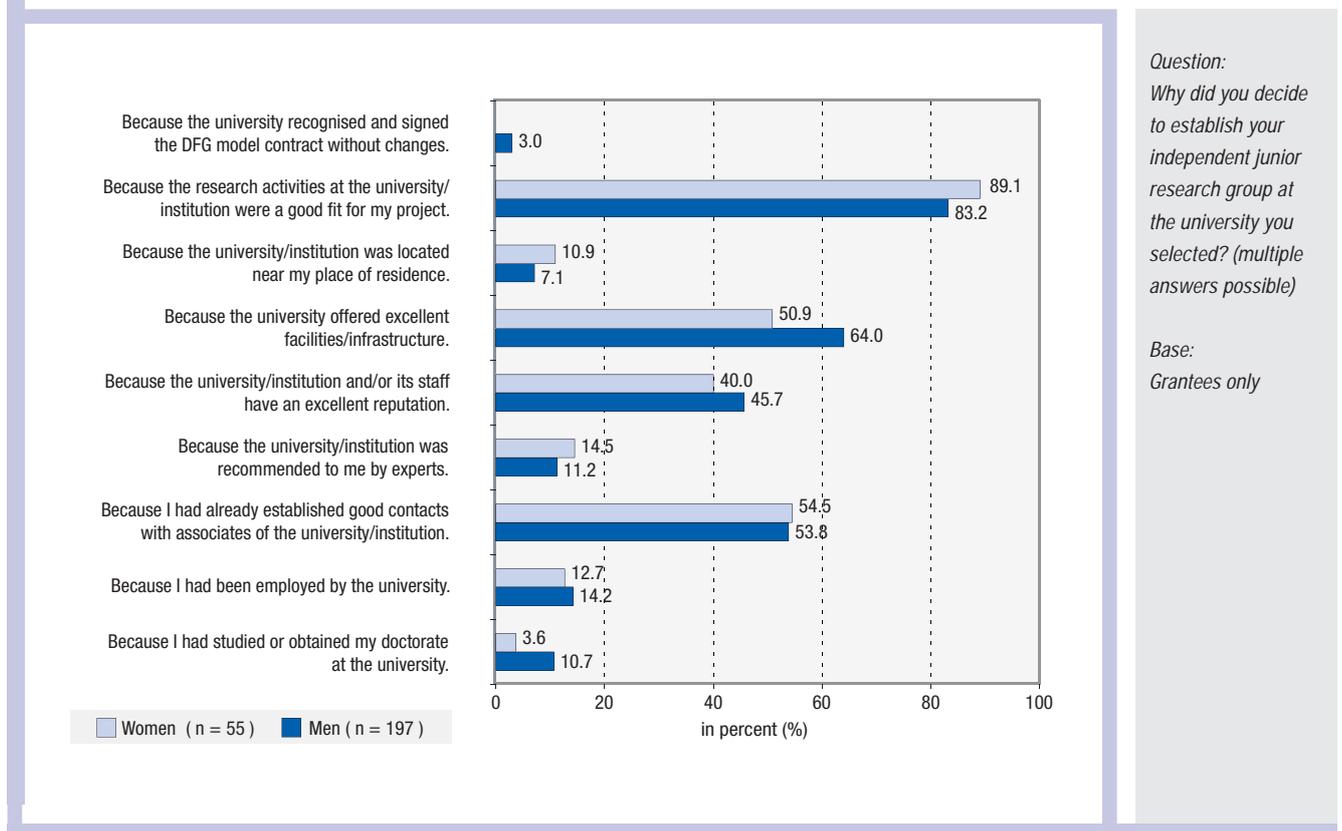
The programme's goal to strengthen the independence of junior research group leaders is somewhat at odds with the benefits these young researchers can derive from existing professional relationships and from support by colleagues who are well established in science and academia. Grantees must learn to find the right balance. Placing

a premium on research autonomy, they frequently express a "strong desire for independence" in interviews (Böhmer, Hornbostel & Meuser 2008: 64). Nonetheless, they tend to see collaboration with former superiors or doctoral advisors as scientifically productive.

Wherever a junior research group is embedded in a chair holder's area of responsibility, group leaders emphasise the benefits of collaboration as equals, e.g. when it comes to using laboratories and instruments, as well as the positive influence of professors and research assistants. However, being embedded in a department may also entail various additional responsibilities, most often teaching. Twenty-two percent of respondents state that they were required to teach, but most of them did not experience this as burdensome.

The institutional integration of junior research group leaders into Germany's universities is still a work in progress. Currently the autonomy of grantees

Fig. 2: Reasons for choice of university



is mostly a result of conducting independent research on the projects they choose, along with good facilities and support. Compared to junior professors, independent junior research group leaders have more resources available and enjoy more creative freedom in research and teaching, but they feel less involved in decision making and also less respected.

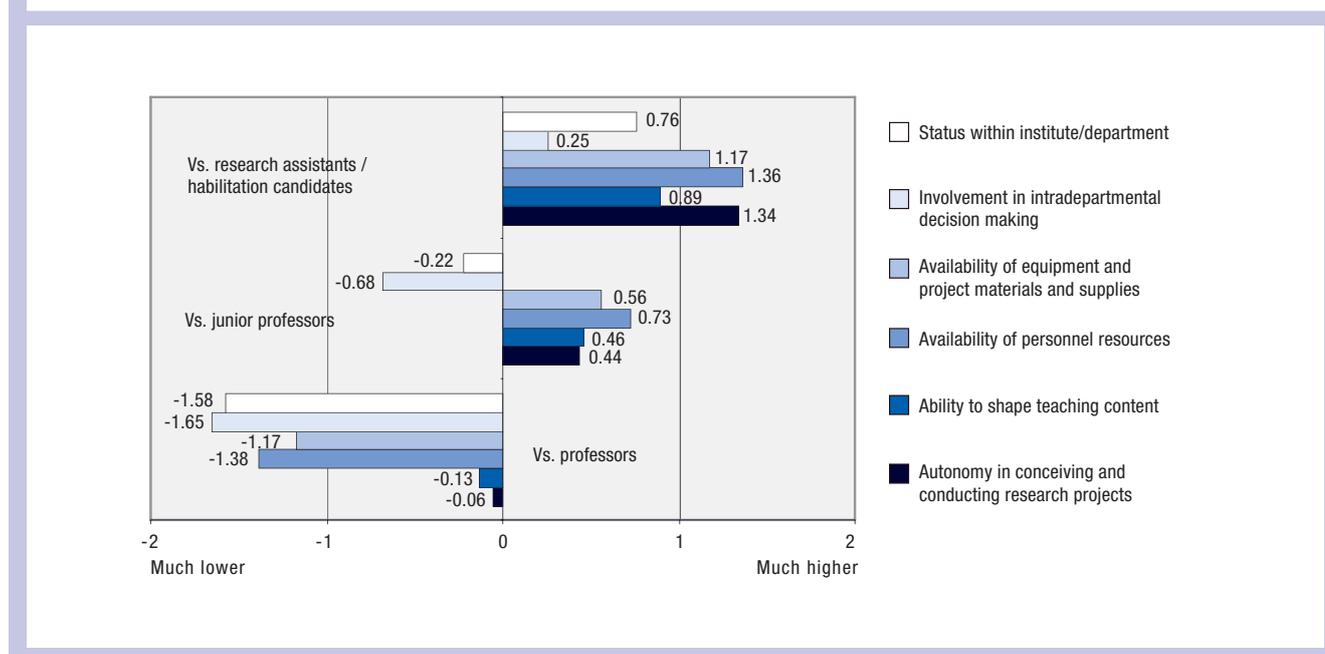
As a consequence of feeling insecure about their status, many grantees fail to actively engage their university in negotiations about working conditions, rights and obligations. This might concern space issues, which more than half of all funding recipients negotiate, or resources, self-government, integration into the university, and the right of examination, which is only negotiated by one in four grantees.

The DFG provides junior research group leaders with a model contract that regulates these issues, particularly examination rights, involvement in teaching activities, and access to the university's research infrastructure. However, only about one-quarter of respondents conclude this contract with their university. About two-thirds have not signed

this model contract, and another nine percent were not familiar with it at the time of the survey. An important point to discuss, and one that may be contentious between the university and the group leader, is the right to supervise doctoral researchers and hold exams. While four out of five ENP grantees are allowed to supervise the content of dissertations, less than two-fifths are authorised to act as doctoral examiners.

Leading a junior research group and doing the research this entails enables one to become eligible for professorship. But more than half of all Emmy Noether grantees want to secure their chances of becoming professor by pursuing a habilitation as well. This is especially the case in the humanities and social sciences, where 85.0 percent express a desire to habilitate and another five percent are considering it. In the engineering sciences, habilitation plays a smaller role; here, only 34.5 percent are definitely and another 31.0 percent possibly pursuing their habilitation⁶.

Fig. 3: Comparison with groups of similar status



6. Life sciences: 44.6 percent pursue habilitation; 27.7 percent are undecided. Natural sciences: 55.4 percent pursue habilitation; 22.3 percent are undecided.

Habilitation is also a way to cope with status insecurities, e.g. when it comes to the right to award doctorates. Habilitation is perceived as requiring relatively little additional effort. Heading an independent junior research group provides both a time frame and a topical frame for conducting habilitation-related research. Moreover, cumulative habilitation is quite common and facilitates the decision for providing this additional proof of qualification (Fig. 4).

2.3 The Path to Professorship

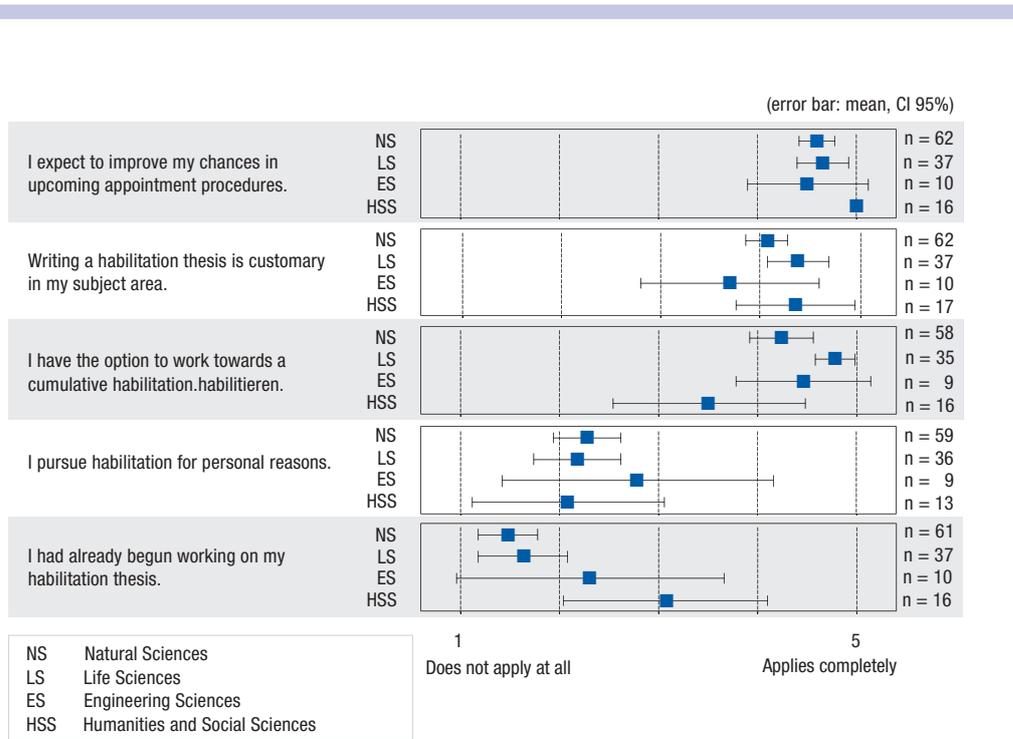
The Emmy Noether Programme aims to prepare researchers for professorship. Consequently, the most obvious indicator of the programme's success would be if ENP alumni were offered permanent academic positions or professorships. So do grantees indeed

have significantly better chances than those who were not accepted into the programme?

To compare the professional development of grantees versus non-grantees, the study compared cohorts whose funding decision was made at least three years prior, who stated a current occupation, and (for grantees) whose funding has been completed. These criteria were met by 79 approved and 82 rejected applicants.

Fig. 5 shows that even the vast majority of non-grantees continue to work in research⁷. Over 80 percent are still active in academic research, even though more rejected (17.3 percent) than approved applicants (10.1 percent) have made a transition to non-academic research. A distinct difference can be observed when it comes to employment status. While almost two-thirds of grantees hold permanent

Fig. 4: Reasons for pursuing habilitation

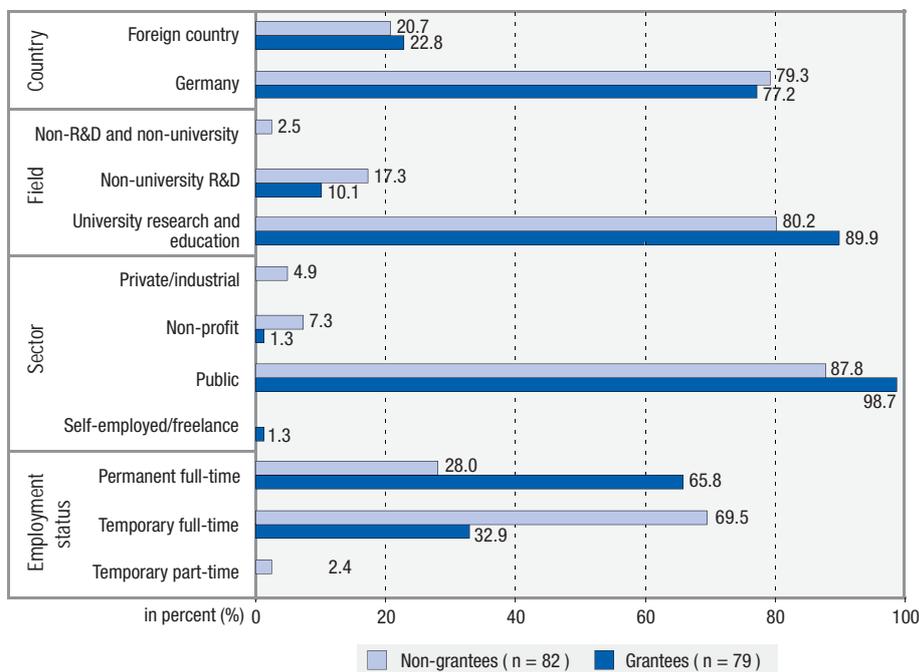


Question:
 What motivated you to pursue habilitation?

Base:
 Grantees only

7. Most applicants whose ENP proposal was rejected were even able to realise their proposed research projects by other means (15.8 percent fully and 55.7 percent in a scaled-down form).

Fig. 5: Employment at time of survey



Base:
Persons whose funding decision was made at least three years ago, who stated a current occupation, and (for grantees) whose funding has been completed

positions, this is true for less than one-third of non-grantees. During or immediately following their funding period, a high number of grantees were offered tenured professorships: 48.1 percent of ENP alumni accomplished this three years after the decision date, compared to only 9.8 percent of rejected applicants.

This professional success is also reflected in satisfaction ratings. Grantees and non-grantees express similar job satisfaction when it comes to the tasks and content of their work, the time commitment, and balancing work and family. But grantees are more satisfied with their position, income, and career outlook. This is a clear indication of the success of the programme, which explicitly seeks improvements in these areas.

3 Summary and Outlook

Based on the study *Postdocs in Deutschland: Evaluation des Emmy Noether-Programms* by Susan Böhmer, Stefan Hornbostel and Michael Meuser from the Institute for Research Information and Quality Assurance, the results presented in this newsletter show that the ENP proposal process identifies excellent young researchers to be funded as independent junior research group leaders. However, the group of applicants as a whole is highly qualified. This indicates the existence of a self-selection process before the submission of proposals. Working as junior research group leaders, grantees benefit from good working conditions and experience a high degree of autonomy, even though status insecurity goes along with it. The great similarity of the two groups suggests that the success of grantees on the path to professorship is at least in part a result of ENP funding (Böhmer, Hornbostel & Meuser 2008).

The primary focus of the study is the documentation and evaluation of the programme's outcomes and successes. Examining in many aspects the characteristics and situation of approved and rejected applicants, and citing other studies with similar themes, the working paper permits general conclusions on the situation of young researchers in Germany, beyond the Emmy Noether Programme. The report of more than one hundred pages (plus a comprehensive appendix of charts) contains numerous detailed analyses. Differentiating by the four major scientific disciplines, it takes subject-specific characteristics into consideration and thus explains why the programme's attractiveness varies between disciplines. An upcoming iFQ working paper will further explore these issues by comparing Emmy Noether fellows with junior research group leaders at the Max Planck Society, the Fraunhofer Society, the Helmholtz Society and the Volkswagen Foundation. Another iFQ working paper will take a closer look at the bibliometric findings.

Promoting outstanding postdoctoral researchers by enabling them to lead an independent junior research group is becoming an established alternative to the traditional academic career path via research assistantships. Some practical challenges, such as the rights and status of junior research group leaders, have yet to be solved. The study provides the DFG with important ideas for further monitoring the Emmy Noether Programme. The DFG Head Office will issue a statement to address the study's key findings and explain what conclusions it draws from them. The results of the programme evaluation thus provide a basis for decisions on the further development and optimisation of the programme.

4 Literature

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