

## **Abstract**

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### **Monitoring the Career Development of FNP Program Winners and Scholarship Holders (2<sup>nd</sup> Wave). Report from the Second Wave of the Questionnaire Survey of the START and VENTURES Program Winners and the TEAM, WELCOME, and MPD Program Scholarship Holders**

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## Study Purpose and Description

This study aimed to investigate the professional development of researchers supported by the Foundation for Polish Science (FNP) at the beginning of their careers. We sought to explore the determinants of careers of those who endeavor to obtain a doctoral degree. The primary research question concerned the effort devoted to achieve an education in research (a doctorate) and early scientific success (substantiated by an FNP scholarship, among other things). We examined whether this effort was a predictor of an attractive career path and further research work in an academic institution or a research company. To this end, we asked the respondents about their employment market status, plans for the future, international and intersectoral mobility, professional satisfaction, and evaluation of the usefulness of their doctoral studies.

Our study is longitudinal: the respondents who agree to participate in the survey are asked to complete an anonymous questionnaire every three years, with an identifier that allows for the anonymous aggregation of collected data. The present report outlines the results of the second wave of the study.

The survey was sent on September 6, 2019, to 684 respondents who participated in the first wave of the study. 349 respondents completed the survey questionnaire. Next, the responses from both waves were combined with the use of the anonymous identifier. Some subjects misspelled their identifier generated in the first part of the study and, as a result, 53 data sets could not be linked, while 296 data sets were linked correctly.

The survey included young scientists who benefited from the FNP support either directly by participating in its competitions (START, Ventures) or indirectly, as team members in Foundation-funded projects (MPD, Welcome, TEAM). In the former case, the young researchers are winners of FNP programs (for the purposes of the study, we call them “program winners”). In the latter case, they benefit from scholarships/remuneration offered by winners of other FNP programs (“scholarship holders”). The former programs are addressed directly to young people, while the

latter concern more experienced researchers whose task is to manage research teams and educate young people.

## Main Findings

We observed the development of the respondents' scientific careers over three years. Many of the respondents defended their doctoral theses between the first and the second measurement (59.7% of those who held a master's degree at the time of the first measurement), and several doctors received their habilitation (13%).

We detected a positive trend: gaining an improved position in the employment market, demonstrated by securing permanent employment. In the second measurement, 61.4% of the respondents were permanently employed, compared to 44.3% in the first measurement. The second most frequent category is temporary full-time employment (second measurement: 24.6%; first measurement: 34.6%). Noteworthy, the change of employment status is not always in favor of the person surveyed: 23.8% of the respondents who were permanent full-time employees during the first wave of the survey no longer had this status in the second measurement.

We observe some gender differences in employment. In the first measurement, we noted a higher proportion of men in full-time permanent employment. Three years later, responses from the same individuals indicate a reduction of this difference: over time, women gain similar employment stability as men.

Over time, an increasing proportion of the respondents experience career breaks, the majority of whom are women on maternity leave. Most individuals do not report difficulties returning to work after a break. Rather, in the comments, we observe complaints about returning to work from those who experienced health issues.

We find an interesting relationship between stable employment and maternity leave. A relatively high number of women who went on maternity leave also have permanent employment. This correlation seems to indicate that women decide to have children and benefit from a career break only after their professional situation has stabilized.

The possibility of securing permanent employment varies across different fields. In the first measurement, representatives of the technical sciences had a definite advantage in this area. They were permanently employed in 73.2% of cases, while the same was true for representatives of other groups in no more than 36% of cases. In the second measurement, the predominance of technical scientists is still apparent, although differences diminish. Technical scientists are permanent full-time employees in 87.5% of cases, followed by representatives of the life and health sciences and the agricultural sciences who are permanently employed in 64% of cases.

The group under study is dominated by individuals who work in research units. Their percentage is very similar in both waves of our research (first wave: 78.1%, second wave: 77.9%). Very few respondents left the academia or returned to research after a period of work outside of the academia (around a dozen individuals). Individuals who received direct funding from FNP ("winners" of START and Ventures programs) work within the academia more often than those employed in grants awarded under the POIG programs ("scholarship holders"). This finding may be partially due to the fact that the "scholarship holders" received funding at a different point in their careers (beginning of their doctoral studies) than the "winners" (just before or shortly after obtaining their doctorate). Those who apply for direct individual funding from FNP may also have greater motivation to work in

science and more significant scientific achievements. Moreover, we observe certain differences between representatives of different sciences. The academia is most frequently the place of employment of the representatives of the social sciences and the humanities (93.9%). Representatives of the life and health sciences and the agricultural sciences perform such work less often (73.4%).

We investigated the frequency with which the subjects undertake activities such as teaching, science communication, and implementation and commercialization of research. The most popular activity is teaching, performed by 47.7% of the respondents who work in science (59.3% in the first wave). A slightly inferior number of subjects devote their time to science communication (first wave: 37.7%, second wave: 46.1%) or research implementation and commercialization (first wave: 24.7%, second wave: 24.2%). Moreover, we checked how often the subjects undertook or abandoned a certain activity between measurements. In each category, slightly more than 10% of respondents undertook a new activity. Teaching was the least frequently abandoned activity (21.3%), followed by science communication (34.2%). With the development of their careers, the respondents most often abandoned the implementation and commercialization of research (47.9%). Teaching seems to be a relatively permanent element of scientific work. At the same time, research implementation and commercialization may be stimulated by a specific source of funding or a particularly interesting project (one may expect that these conditions are not always in place). Furthermore, we observed a difference between men and women in terms of involvement in research implementation and commercialization, where the percentage of men involved in this activity is twice as high as women (30.8% and 15.9% respectively). We also find considerable differences between the representatives of different fields. The representatives of the social sciences and the humanities most frequently engage in teaching (73.3%) and science communication (56.7%) but very rarely in implementation and commercialization of research (3.7%). Technical scientists relatively often undertake teaching (69.7%) and science communication (48.5%), whereas out of all the groups surveyed, they most frequently engage in the implementation and commercialization of research (42.4%). A relatively large number of representatives of the life and health sciences, the agricultural sciences, and the exact sciences performed none of the above activities.

The work of a large majority of respondents (88%) is to some extent financed by external funds, such as grants. A considerable percentage (31%) is fully financed from these sources, which has its drawbacks (employment instability) and advantages (verification in an open competition). We do not observe any gender differences in using external funds (grants). However, we can see such differences between the representatives of different fields. Namely, grants are more accessible to the representatives of the exact sciences, the life and health sciences, and the agricultural sciences as compared to the representatives of the technical sciences, the social sciences, and the humanities. This state of affairs may affect the satisfaction with the remuneration received, which is higher for the representatives of the exact sciences as compared to the representatives of the technical sciences, the social sciences, and the humanities (there are no significant differences in life and health sciences and the agricultural sciences). The level of satisfaction may translate into the assessment of one's material situation, which is lower for the representatives of the social sciences and the humanities than for the representatives of the exact sciences.

We asked the respondents who work outside of research institutions about the reasons for changing their work setting. Among many different responses, the most important ones concerned greater stability of employment, higher salaries, and greater promotion opportunities. Noteworthy, these factors seemed to motivate women more than men. Women leave research units more often than men do. Moreover, they are less convinced that a doctoral degree was important for their career.

From an individual's perspective, leaving the academia may prove beneficial. The subjects continue to use the skills acquired during their doctoral studies (26.3% regularly, 63.2% sometimes). Almost half of those who work outside of the academia are strongly convinced that their research education allowed them to find employment quickly. A common view is that research education is good preparation for future work. The respondents evaluate commercial science-related work very positively compared to work in research units.

Those who leave the academia most frequently find employment in the private/commercial sector. Among the respondents who do not work in research, the percentage of those employed in this sector increased between the first and second measurements from 58.9% to 76%.

Slightly more than half of the subjects had one employer in the past three years. A large proportion (38%) had two employers.

In the past three years, the majority of the respondents were employees of a university or a research institute (87.6%). Half of those employed in this area did not change employers in the last three years, and 29% changed employers within the same sector.

A large proportion of the respondents did not change their country of residence in the last three years (66.9%). The others lived in two (27.4%) or three (5.4%) countries. Men, more often than women, declare that they changed their country of residence within the last three years. At the time of the study, Polish people live outside of their homeland less frequently (22.3%) than foreigners (60%). However, we do not observe any gender differences in this respect. 17.5% of the respondents plan to move to another country (fewer than in the first measurement: 29%). Career development is the most frequently reported reason for their desire to move abroad.

The respondents positively evaluate their workplace. Also noteworthy are the very high ratings of work in research companies. Those who work abroad give their workplaces slightly better ratings than those who work in Poland.

The subjects view their financial situation as fairly good (50.1%) or very good (23.5%). Similarly, professional life satisfaction also receives high ratings: fairly high (57%) or very high (18.9%). The differences observed over time are statistically insignificant. Scientific work, especially performed in a commercial environment, brings more satisfaction to the respondents than non-scientific work. However, the assessment of one's financial situation is best for those who work in a commercial environment (both within science and outside of science). There are no gender differences in the assessment of one's financial situation. However, women rate their professional life satisfaction slightly lower than men.