Zugänge, Barrieren und Potentiale für die internationale Mobilität von Wissenschaftlerinnen

Länderbericht Niederlande

GESIS – Leibniz-Institut für Sozialwissenschaften

Kompetenzzentrum Frauen in Wissenschaft und Forschung CEWS

Country dossier The Netherlands

Dr. Claartje J. Vinkenburg

CJ Vinkenburg Advies / Research & Consultancy, Amsterdam

Table of Contents

1 Introduction

In this country dossier, the higher education and research system in the Netherlands is described, both in general and in terms of gender. As Germany's neighbor and important economic and innovation partner, it is interesting to uncover subtle underlying differences and similarities in terms of both representation and segregation. The main sources of "potential" (in terms of the goal of this project) lie in the scare conditions and limited career opportunities in research in the Netherlands, in general and for women in academia in particular. Germany can be promoted as an attractive alternative for researchers from the Netherlands, both for the short and the long term. The physical proximity of the countries can be capitalized upon in terms of flexible and customized mobility options, including support for dual-career couples.

2 Context Analysis of the Higher Education and Research System

In this section, the relevant structures of the higher education and research system in the Netherlands are described in order to increase the understanding of the system characteristics, the academic qualifications, and career structures in relation to the participation and representation of women and to international mobility.

2.1 Key figures on the size and importance of R&D and on participation in tertiary education

The higher education and research system in the Netherlands is not often described or reflected on holistically. **Higher education** is quite strictly divided into higher professional or vocational education (HBO), internationally referred to as *universities of applied sciences*, and research-oriented education (WO) at *research universities*. While efforts have been made in the recent past to strengthen the connection between these two types of institutions in terms of bridging educational programs, research capacity, and governance, to date they remain very separate worlds.

In terms of the **research system or knowledge infrastructure** in the Netherlands, a comprehensive descriptive overview is provided by the Rathenau Institute.[1] While the separate institutions and parties are described here in detail (including the funding structure), the actual connections and collaborations between these players remain largely invisible and are not quantified. Therefore, the (actual or potential) bidirectional knowledge transfer between research and development or innovation activities performed inside and outside universities is difficult to capture and appears to be based on personal rather than institutional networks.

[1] https://www.rathenau.nl/en/science-figures/policy-and-structure/infrastructure-knowledge/dutch-knowledge-infrastructure

While public and private research institutions and R&D departments outside universities employ PhD holders, joint research efforts are difficult to find. The existing interinstitutional collaborative "pacts" signed to work on research and innovation together are either sectoral (e.g., technology, agriculture) or regional (e.g., Friesland). While the gross domestic expenditure on R&D (GERD) has been increasing, it remains relatively low and under the agreed 3%. Indeed, the percentage of GERD performed in *higher education* is higher than in other countries, meaning the percentage of GERD spent on the public research sector is relatively small.

At the same time, government expenditure on education as a percentage of GDP, and expenditure on tertiary education in particular, is (relatively) high, which also means that participation in tertiary education, and (ultimately) the number of PhD (doctorate) holders, is similarly high. While the relative numbers of R&D personnel are comparable to other countries, the percentage of researchers is relatively low (60% among total R&D staff). While the number of researchers working in the business enterprise sector has grown significantly (at 70% in 2018; CEWS Template/UIS, Tab 1.3.3), the overall picture for the Netherlands remains that there is a limited future for researchers. Both the size of and the limited connections between the separate worlds as described above limit the career opportunities and potential mobility of PhD holders as researchers within the Netherlands.

Table 1 Indicators for the Netherlands (2018, with qualifying statement)

	Indicator	**Percentages**
1	Gross domestic expenditure on R&D (GERD) as a percentage of GDP	2.16374 (increasing, still relatively low)
2	GERD by sector of performance	0.58783 = Higher Education (higher than other countries) Business Enterprise = 1.4%, Government: 0.12%,
3	Government expenditure on education as a percentage of GDP	4.9 (similar to Germany)
4	Expenditure for tertiary education as a percentage of total government expenditure on education	31 (relatively high?)
5	Population (25+ years) by at least Bachelor’s or equivalent (ISCED 6 or higher)	30 (quite high, men = women)
6	Doctoral degrees (ISCED 8) as percentage of all graduates from tertiary education	3.05 (quite high)
7	Total R&D personnel per millions inhabitants, per thousand labor force and/or per thousand total employment	9225.85 total R&D per million inhabitants (FTE)
8	Researchers as percentage of R&D personnel	60.8

9	Total R&D personnel by sector of employment		Researchers % FTE	Total R&D pers % FTE
		Business ent.	70.02	72.23
		Government	6.13	5.97
		Higher ed.	23.85	21.79

Source: CEWS Template/UIS

2.2 Basic characteristics of the higher education and research system

The key players in research and science are all clustered at the national level in the Netherlands. The Ministry for Education, Culture and Science (OCW; the W stands for *Wetenschap* as in German) works together intensively with the VSNU (Association of Universities in the Netherlands), the KNAW (Royal Netherlands Academy of Arts and Sciences, including the Young Academy), and NWO (Dutch Research Council), who have the formal role of employer, advisory body, and research funder, respectively. Both KNAW and NWO also employ researchers in research institutes. There are fourteen large Dutch research universities, all with the same basic public funding and organizational structure, as laid down in the laws on higher education and research and on university governance. Four of these have a disciplinary focus (e.g., technological, agricultural), the other ten are general. In addition, there are a very small number of accredited private universities, and there are four small denominational universities. Only the fourteen research universities have the legal right to award academic degrees (Master's and PhD).

The government's vision for research was elaborated in the "Wetenschapsbrief" in 2019, which highlights strategic priorities and budget allocations between 2020 and 2025. [2] An important player in realizing this vision is the so-called "Kenniscoalitie". This Knowledge Coalition is a fairly recent and informal collaboration of parties in Dutch research and innovation and consists of the universities (VSNU), universities of applied sciences (associated in the VH), University Medical Centers (NFU), KNAW, NWO, private sector employer associations (VNO-NCW, MKB) and the institutes for applied research (TO2 federation). The Knowledge Coalition jointly strives for optimal conditions for research and innovation in the Netherlands to flourish, and acts as a discussion partner for the government. In 2014, the Knowledge Coalition coordinated the development of the National Science Agenda (NWA) on behalf of the Ministry of OCW. In December 2020, the Knowledge Coalition published a pamphlet[3] urging the government to raise the GERD to at least 3% and to dedicate a larger part of this budget to basic research. While the National Science Agenda is based on an extensive public inventory of possible questions, issues, and challenges, the inherent question-driven approach may preclude scientific discovery and theory development.

[2] https://www.rijksoverheid.nl/documenten/kamerstukken/2019/01/28/aanbiedingsbrief-bij-wetenschapsbrief-nieuwsgierig-en-betrokken-de-waarde-van-wetenschap

[3] https://www.nwo.nl/investeringsagenda-kenniscoalitiepartners

With a proposed annual investment of 300 to 380 million euros, the pamphlet advocates that the Netherlands should try to keep up with countries such as Germany in terms of innovation potential, research capacity, and impact. Researchers based in the Netherlands increasingly depend on research income through third parties, including the European Commission framework programs (e.g., Horizon Europe) and contract research. The government's budget for research has been significantly and increasingly allocated via NWO over the last decades, reducing the universities' budgets for research and making researchers dependent on competitions for external and temporary funds.[4] This movement has been criticized, as it puts a lot of pressure on researchers (both individually and in consortia) to apply for funding, with growing precariousness as a result. Across the board, researchers based in, or from, the Netherlands are very successful in terms of publication impact and visibility[5], but keeping this leading position is not sustainable under conditions of scarcity.

2.3 Qualification and career structures for academic careers

The university degree structure in the Netherlands follows the Bologna Declaration (1999), with the main distinctions being Bachelor's degrees (BA or BSc depending on the discipline, typically three years), Master's degrees (MA or MSc, typically one year), and PhD or doctorate. Some research-oriented Master's degree programs offer a two-year research Master's (M.Res), the second year of which is the initial year of the typical four-year PhD trajectory. PhD candidates are not considered students but are effectively employees on a fixed-term contract of three or four years. They receive employee benefits (social security, pension, health insurance). Since 2016, as an experiment, some universities have paid **stipends** to some PhD candidates and given employment contracts to others.[6] This has resulted in a legal debate, and in some universities dropping out of the experiment, because stipend candidates rightfully claim they are being treated as "second tier."[7]

Earning a PhD serves as an entry requirement for **post-doc positions** (often outside the Netherlands) and the start of an academic career. The expectation and thus occurrence of holding a post-doc position has increased sharply over the past decades,[8] but is not equally common across disciplines. This also means that the average time needed (and chances) from PhD to reaching an assistant professor position differs strongly among disciplines.[9] The precarious position of post-docs in terms of job security and future prospects is further exacerbated by the fact that in the collective labor agreement (as negotiated by the VSNU) and the universities' joint job appraisal system, the post-doc is not an official category. It is therefore not possible to isolate post-docs as a unique dataset in the personnel information

[4] https://www.rathenau.nl/en/knowledge-ecosystems/spinning-plates

[5] https://www.ocwincijfers.nl/verantwoord-begroten/internationaal/internationale-positie-in-de-wetenschap

[6] https://www.rijksoverheid.nl/documenten/rapporten/2020/04/20/critical-review-tussenevaluatie-experiment-promotiestudenten-2019-final

[7] https://hetpnn.nl/en/2020/04/20/kanttekeningen-bij-critical-review-ocw-experiment-promotieonderwijs/

[8] https://www.rathenau.nl/sites/default/files/Feiten_en_Cijfers_Academische_Carrieres_2013.pdf

[9] https://www.rathenau.nl/nl/wetenschap-cijfers/wetenschappers/personeel-aan-de-universiteiten-en-umcs/de-postdoc

system,[10] and it is difficult to identify career issues for post-docs as distinct from those that are relevant to researchers in academia in general.

As elsewhere, academic careers are basically structured along the Grade D-A / R1-R4 typology of steps on the career ladder. After post-doc, the main steps are labelled assistant professor (*universitair docent*, or UD), associate professor (*universitair hoofddocent*, or UHD), and full professor (*hoogleraar*).[11] Only full professors are allowed to use the legal title "professor", wear full robes during academic ceremonies, and have the "**ius promovendi**", which means they hold the legal right to grant a PhD as promotor. Because in many if not most cases, associate professors actually supervise PhD candidates, the law has recently been changed to (and some universities are experimenting with) giving the "ius promovendi" to associate professors.[12]

In a related vein, the universities of applied sciences have requested that the "ius promovendi" be extended to **lectors**, the most senior research position in HBO institutions which requires having a PhD. This request follows from an international comparison of similar positions and rights,[13] and would be beneficial in broadening career perspectives for PhD candidates and holders as well as helping remove the outdated distinction between university types in the Netherlands.

Tenure as used in the context of academic careers in the Netherlands typically refers to the decision to turn a fixed-term contract into a permanent (indefinite) contract, usually upon promotion from assistant to associate professor after about 5–7 years. This moment is a critical juncture or **bifurcation point** in academic careers. In their comparative analysis of research career patterns, Vinkenburg et al. (2020) therefore recommended making a distinction between Grade B1 and B2 (or R3a and R3b) to pinpoint this moment and differentiate between those in precarious positions and those not. The **time** needed to reach tenure and ultimately become a full professor differs per discipline, and the optimal calculation of the average time needed (around 17–19 years since PhD) is debated among experts (see section on gender-specific aspects of academic careers below, p. 10). Most universities offer a "**tenure track**," which most often means an assistant professor position for a limited period of five years with standardized performance evaluation criteria and the promise of a permanent contract if those criteria are met. Some tenure tracks relate to all three steps on the academic ladder, assistant, associate, and full professor.

When first introduced, the tenure track was met with a positive response, as it adds a formal process and transparent criteria, including clear expectations for all involved, on the often-obscure promotion process in academic careers. However, in many cases the transparency of and accountability for academic promotions ends after receiving tenure. This means that in the Netherlands the (internal) **promotion from associate to full professor** is not based on a formal process or a fixed schedule. This also often means that the burden of proof (e.g.,

[10] https://www.vsnu.nl/f_c_personeel_downloads.html
[11] https://www.rathenau.nl/en/science-figures/personnel/university-staff/academic-careers-researchers
[12] https://www.eerstekamer.nl/toezegging/evaluatie_wetswijziging_34_355
[13] https://www.lectoren.nl/activiteiten/overzicht/60-promotie-aan-de-hogescholen

building a portfolio) and the responsibility for setting the wheels in motion lies with the candidate. There is no formal requirement of an external offer, but an external upward mobility strategy is often suggested or even pursued surreptitiously (see Teelken et al., 2021 for a gendered illustration). Only in recent years have some universities started developing criteria and procedures to formalize these important steps on the academic ladder.

In order to maximize flexibility and mobility, Dutch employers are allowed to offer only a **fixed number of limited-time contracts** to one individual consecutively. However, the standard period in terms of years for these kind of contracts in academia is the subject of debate. This debate is also informed by the fact that many in a post-doc position or on a tenure track (would like to) take **parental leave** (including maternity or paternity leave), for which the contract should formally be extended but in the recent past often was not. [14] Universities have recently (because of legal claims and petitions to parliament) formalized the extension procedures for these situations, but in cases where external funders pay (in part) for the position, standardization is lacking, and rules are unclear. Statutory rights for paid maternity leave are 16 weeks and for paid paternity leave 5 days (up from 2 days before 2019). More parental leave is unpaid: 26 weeks in total if employed full time. Employers, including the VSNU, supplement income, but because it is not a statutory right and dependent on contract size and duration, uptake is problematic.

International mobility is difficult to measure but very common and expected, with a balance between in- and outflow.[15] Interinstitutional mobility within the Netherlands is even more difficult to measure but is generally valued over "staying in one place" and sometimes even enforced by not (officially) allowing internal promotions from post-doc to assistant professor or from assistant to associate professor.[16]

In the ERCAREER report,[17] Vinkenburg et al. (2014) highlighted the normalization of mobility and showed that among a selective sample of 2012 applicants and grantees of the European Research Council (ERC) Starting Grant, although doing a PhD in their own country was quite common, many spent parts ("spells") of their career abroad, especially in the USA. Compared with the overall sample, this pattern was quite pronounced in the Netherlands. Among the ERCAREER sample, women were somewhat less likely than men to have spent time in the USA and may thus benefit less from the signaling effect of such a spell (also called the .edu bonus; Zippel, 2017) in their grant applications.

Table 2 Mobility events in the ERCAREER data (2012 Starting Grant applicants)

ERCAREER (in %)	**PhD in own country**	**1st spell in own country**	**Any spell outside own country**	**1st spell in USA**	**Any spell in USA**
ERC Domain					
LS	84.6	47.9	74.4	22.3	33.3

14 https://zoek.officielebekendmakingen.nl/ah-tk-20152016-3284.html
15 https://www.rathenau.nl/en/vitale-kennisecosystemen/international-mobility-researchers
16 https://www.lnvh.nl/a-1237/belemmeringen-in-de-doorstroom-van-vrouwen-tu-delft
17 https://cordis.europa.eu/project/id/317442

PE	75.9	49.3	69.4	17.7	29.9
SH	72.1	54.8	66.1	8.8	16.1
GENDER					
W	77.4	48.3	70.0	15.0	25.8
M	79.1	50.8	71.0	19.4	30.1
Grant					
No	80.4	52.1	66.1	15.0	23.7
Yes	69.5	39.3	91.1	30.5	50.0
NL	100.0	53.3	53.3	20.0	33.3

Source: ERCAREER data, available upon request from Vinkenburg; Note: LS = Life Sciences, PE = Physical Sciences and Engineering, and SH = Social Sciences and Humanities

3 Gender Participation in Tertiary Education and Academic Careers

In this section, an overview is provided of the participation of men and women in higher education and academic careers in the Netherlands. The participation of women as students in tertiary education in the Netherlands is high and equivalent to that of men. Women in tertiary education outperform men in terms of grades, speed, and "staying power" in most university fields.[18]

Table 3 Indicators for the Netherlands (2018, with qualifying statement)

Indicator	Percentages
10 Tertiary graduates (ISCED 6+7) by sex and level of education	About 50% women for all three levels
11 Tertiary graduates: women by field of study	23% in both business, administration and law and in health and welfare; other fields lower
12 Gender parity index (GPI) at least bachelor's or equivalent (ISCED 6 or higher), population 25+ years, gender parity index (GPI)	0.9 (quite high)
13 Female doctoral graduates (ISCED 8)	47.9%

Source: CEWS Template/UIS

[18] https://www.advalvas.vu.nl/nieuws/vrouwelijke-studenten-doen-het-beter-dan-de-mannen

Table 4 **Percentages of university graduates (ISCED level 7) within field of study, by sex, 2018**

Field	Women	Men
Education	81.0	19.0
Arts and humanities	59.7	40.3
Social sciences, journalism and information	67.2	32.8
Business, administration and law	52.2	47.8
Natural sciences, mathematics and statistics	45.3	54.7
Information and Communication Technologies	28.9	71.1
Engineering, manufacturing and construction	32.5	67.5
Agriculture, forestry, fisheries and veterinary	61.2	38.8
Health and welfare	71.2	28.8
Services	45.6	54.4

Source: OECD: http://www.oecd.org/education/database.htm

3.1 Representation of women among STEM students

Despite almost reaching gender parity in tertiary education, horizontal segregation is strong. Women students are underrepresented in STEM fields (especially in ICT and engineering) in comparison to men. This is due partly to the relatively early moment of selection or differentiation between pre-vocational and academic-oriented secondary education in the Netherlands (which generally exacerbates inequalities and promotes segregation).

The fact that growing numbers of girls chose a "nature and science" profile in secondary pre-academic education or VWO (up from 51% in 2010 to 59% in 2020)[19] means that they are reaching entry level qualifications for STEM fields to a larger extent than before. However, this increase is still mainly translated into an overrepresentation of women students in medicine, compared with the natural sciences or engineering disciplines.

The absolute number of women among science, technology, engineering and mathematics (STEM) students in the Netherlands increased over the eight years from 2010 to 2018. In 2010, approximately 16,500 women studied a STEM subject; this number increased to 30,000 women in 2018. Of all students in STEM in 2018, 35% were women.[20]

[19] https://www.vhto.nl/kennis/cijfers/cijfers-havo/vwo/

[20] https://www.rijksoverheid.nl/documenten/publicaties/2019/09/26/diversiteit-in-de-wetenschap-in-nederland

3.2 Representation of women among PhD candidates

While the absolute number of women among PhD candidates across all fields continues to increase, their total *percentage* fluctuates and showed a slight decline in the past decade: from 46.5% in 2010 to 44% in 2019.[21] This pattern is probably due to the relative increase in available PhD positions in STEM disciplines (in which men are overrepresented). Also, medicine is often not included in the numbers (as PhD candidates in medicine are employed by academic hospitals rather than HE institutions). In 2019, the percentage of women in PhD positions in medicine was 63.4%.[22] Despite fluctuations, the numbers remain close to 50/50. Indeed, among all doctoral degree holders (PhDs) in 2018, 47.9% were women. Additionally, the percentage of women PhD candidates in STEM has increased over the last years, with a 10% increase between 2010 and 2017 (from 1,700 to 1,840 candidates).

3.3 Representation of ethnic minorities

While there are ample data on the representation or share of women among tertiary education students, graduates, and PhD candidates overall and by field of study, information on the numerical representation of ethnic minority students (men and women) is difficult to collect and to find, partly due to data privacy regulations. This makes it complex to monitor progress and see the effects of implemented policies on increasing the numbers of students and PhD candidates with an ethnic minority and especially a migrant or refugee background. Many universities are extending their efforts to increase the participation of "first generation" students from such socio-economic backgrounds.

3.4 Representation of women in higher education and research

Table 5 Indicators for the Netherlands (2018, with qualifying statement)

Indicator		Percentages
14	Percentage of female teachers in higher education	45.9
15	Percentage of female researchers by sector of employment	18.24 in business enterprise (higher elsewhere), quite low
16	Percentage of women among academic staff by grade or postdoctoral researcher in academia (R2 or Grade C)	41
17	Senior academic staff (grade A/R4), by field of science and sex	19 overall, between 11.6 in engineering and 29.2 in the humanities; quite low

Source. CEWS Template/UIS and She Figures 2018

While women are very well represented as teachers in higher education in the Netherlands, the share of women researchers in the business sector in 2017 was only 18.24%. In fact,

[21] VSNU: https://www.vsnu.nl/f_c_onderzoek_downloads.html

[22] LNVH: https://www.lnvh.nl/monitor2020/EN.html

according to the She Figures 2018, the Netherlands had the *lowest* proportion (25.4%) of women in research overall out of the 28 EU countries in 2015. With a small public research sector outside higher education, it appears that there is limited opportunity for women PhD holders to continue working as a researcher. While limited opportunities for researchers outside academia are a general characteristic of the Dutch system, this plays out more negatively for women. The business research sector may be particularly inhospitable to women on account of their larger care responsibilities and matching need for flexibility (see chap. 4).

3.5 Representation of women in academic positions

According to the LNVH (Dutch Network of Women Professors), who monitor these figures annually, the proportion of women full professors (Grade A) was 20,9% in 2017 and 24.2% in 2019.[23] In 2010, this proportion was approximately 13%. According to the OECD and the VSNU, the percentage of women among academic staff in the Netherlands increased considerably in the past decade, from 35% in 2005 to 45% in 2016. Despite this growth – third highest of all OECD countries – only five other EU countries had a lower percentage of women full professors in 2016, according to the She Figures 2018 report.[24]

Drawing on data from the latest LNVH Women Professors Monitor, which collects data from the VSNU and supplements this dataset with departmental or institutional data, the percentages of women and men at different steps on the academic ladder are visualized in Figure 1 below. The bifurcation point between assistant and associate professor is especially pronounced for women, making this the place where the GCI (Glass Ceiling Index) is the highest. In addition, a more detailed analysis of earlier data from the Rathenau Institute[25] looking at

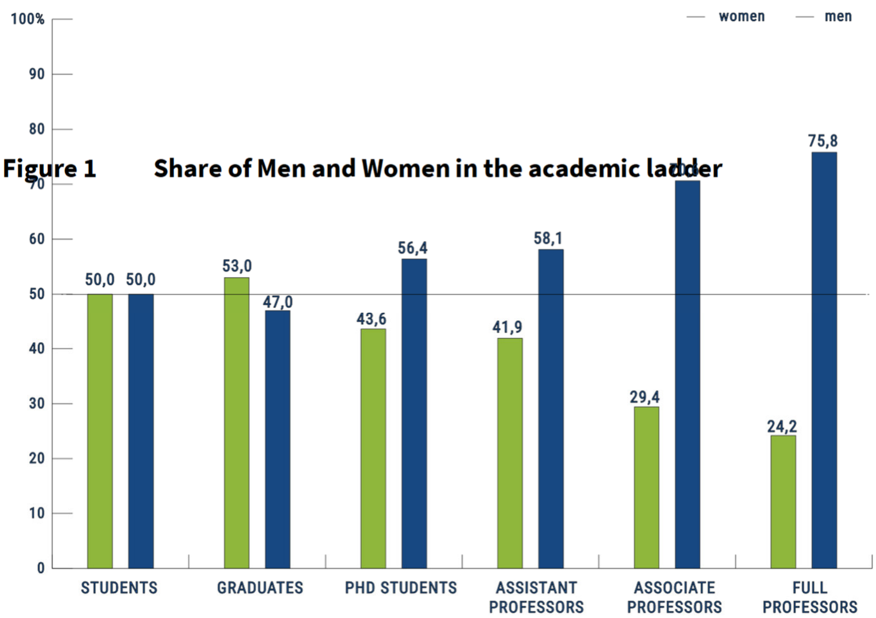

Figure 1 Share of Men and Women in the academic ladder

[23] LNVH: https://www.lnvh.nl/monitor2020/EN.html
VSNU: https://vsnu.nl/en_GB/f_c_ontwikkeling_aandeel_vrouwen.html
[24] She Figures: https://ec.europa.eu/info/publications/she-figures-2018_en
[25] https://www.rathenau.nl/nl/wetenschap-cijfers/wetenschappers/vrouwen-de-wetenschap

disciplinary differences shows that it is *not* just a matter of time until the increase of women graduates will result in a matching increase of women full professors in the Netherlands.[26]

Source: LNVH Women Professors Monitor 2020, green = women, blue = men

To compensate for the low numbers and the slow progress, some universities have established dedicated chairs for women, which are not always counted as Grade A positions. Other universities have (more or less) successfully created special tenure track programs or career fellowships for women to boost the numbers. The Ministry of Education, Culture and Science has recently funded 100 extra Grade A positions, a one-off program called the Westerdijk Talent Impulse (after the first Dutch woman full professor, who was appointed in 1918).[27] In addition, the VSNU and the Ministry have agreed that each university will set their own target, and this will be monitored annually by the LNVH (ibid).

Interestingly, the LNVH Women Professors Monitor also shows that once institutional numbers reach a critical mass of around 30%, the growth rate curve flattens out. Evidently, decision-makers and policy advisors underestimate the number of women that needs to be appointed as well as the time needed to reach their ambitious targets. Such classical estimation errors are a typical stock and flow problem of complex systems (Bleijenbergh et al., 2016).

The expectation is that, in the near future, institutional-level data on ethnic minority representation among academic staff (possibly disaggregated by gender or rank) will become available through the Barometer Culturele Diversiteit.[28] Until then, data can be disaggregated by gender, field, institution, rank, age/birthyear, contract type, and contract size (in FTE). Detailed breakdowns can be downloaded as CSV files and turned into visuals at the VSNU website using Tableau software (ibid). The Rathenau website (ibid) also offers various disaggregated options.

Table 6 Percentage of women in Grade A (full professors from VSNU data 2019, total and by field

BEHAVIOR	35%
HUMANITIES	35%
LAW	31%
HEALTH	26%
VARIOUS	24%
TOTAL	24%
AGRI	19%
TECH / ENG	17%
NATURAL SC	16%

[26] https://gender-summit.com/portia_web/assets/GS17ppts/Besselaar.pdf
[27] https://www.nwo.nl/onderzoeksprogrammas/westerdijk-talentimpuls
[28] https://www.cbs.nl/nl-nl/arbeid-en-inkomen/arbeid-en-sociale-zekerheid/barometer-culturele-diversiteit

ECO	14%

Downloaded from https://www.vsnu.nl/f_c_personeel_downloads.html, total n 3500

4 Gender-Specific Aspects of Scientific Careers

In this final section, an analysis is provided of the gender-specific aspects of scientific or research careers in the Netherlands, especially with regard to structural barriers for women scientists, and the needs for support and structural changes, especially for participation in international mobility.

4.1 Structural barriers for women scientists

As noted before, it is difficult to find comparable data on gender differences in the **international mobility** of researchers from or currently based in the Netherlands, not least because of the lack of a strict definition of what international mobility means. Sabbatical leave, fellowships, visiting professorships, field research, and large-scale collaborations take place while remaining formally employed in the Netherlands, and are thus not (always) counted as a mobility event. In a 2012 report on the mobility of individual researchers funded by the NWO, men had been employed outside the Netherlands more often than women (54.0% versus 41.4%).[29] At the same time, these findings (as well as those described in the ERCAREER data report, ERCAREER data / Vinkenburg ea, 2014) show that a large percentage of Dutch academics are at some point in their career internationally mobile. It is clear that mobility is a complicated issue for women in academia, first, because it is so normative or prescriptive, and second, because it is generally *assumed* to be more difficult for women to meet the expectation of mobility because of their greater share of care responsibilities compared with men (Rivera, 2017).

This underlying assumption of **care responsibilities** requires a more detailed exploration, as it affects women's careers in academia disproportionately compared with the effects of parental status on men, and even more than the basic facts or numbers can explain. Here, three such disproportionate effects are described: of part-time work, in terms of stereotypes, and for dual careers.

Working **part-time** is very common in the Netherlands, which has the highest incidence of part-time work among OECD-countries.[30] This holds for both women and men, but across the entire labor market, only 26% of women work full-time compared with 72% of men. The high incidence of part time work across the labor market is a combined effect of the high-quality conditions of part time work (pro rata benefits, etc.) and the comparatively **short length of parental leave**. This means that for many working parents, part-time work is the most likely solution for **combining work and care**. It is therefore common across all career

[29] https://www.rensvandeschoot.com/mobiliteitsonderzoek-vernieuwingsimpuls-laureaten/

[30] https://www.oecd.org/social/part-time-and-partly-equal-gender-and-work-in-the-netherlands-204235cf-en.htm

levels, including the most senior, in many organizations. Interestingly, the pattern of part-time work as typical for women is not repeated in academia, with more women than men full professors in a full-time contract (see Table 7). Only slightly more women than men are employed part-time in other academic positions.[31] However, the myth that “all Dutch women work part-time” and that this harms their academic or research careers is consistently reproduced in both individual as well as societal explanations for the low rates of women in full professorships and other senior positions.

Table 7 **Average FTE contract size (1.0 = full time) by academic rank by sex in the Netherlands (2017)**

FTE	Men	Women
Full professor	0.83	0.87
Associate prof.	0.90	0-89
Assistant prof.	0.90	0.88
Post-doc	0.89	0.83
PhD candidate	0.97	0.95
Average	0.90	0.88

Based on 2018 VSNU data; Also published in

https://www.rijksoverheid.nl/documenten/publicaties/2019/09/26/diversiteit-in-de-wetenschap-in-nederland

Since July 2020, **paternity leave** (or partner leave, more correctly) has been changed from five days to three weeks partly paid. The uptake of this leave among new fathers in academia has not yet been studied, but is expected to have been positively affected by the **COVID-19 pandemic**. It is obvious that presenteeism and the flexibility stigma (which disproportionately affect men in academia) have been decimated on account of working from home. In fact, studies of Dutch parents of young children in general show that they have started to share care responsibilities more equally because of the pandemic.[32] Whether this is also true for parents in academia is currently being investigated as part of a larger study of the impact of COVID-19 on academic careers in the Netherlands that is being conducted by the LNVH and the KNAW’s Young Academy.

Gender stereotypes about science are strong in the Netherlands, showing that people tend to implicitly associate science more with men than with women. These stereotypes are stronger in the Netherlands than in 65 other countries, according to a 2015 meta-analysis (Miller et al., 2015). That analysis used data from Harvard's Project Implicit on both implicit and explicit associations between gender and science versus liberal arts. The stereotype is of

[31] VSNU: https://www.vsnu.nl/universiteit-als-werkgever.html#derde
OECD: https://data.oecd.org/emp/part-time-employment-rate.htm
CBS: https://www.cbs.nl/nl-nl/visualisaties/dashboard-arbeidsmarkt/werkenden

[32] https://www.uu.nl/en/opinion/the-gendered-impact-of-the-covid-19-pandemic-on-divisions-of-work-care-and-wellbeing

course strongly tied to the relatively low representation of women in the natural sciences in the Netherlands, especially in full professor positions, and can help explain both horizontal and vertical segregation. Similarly, gender stereotypes about work and care are equally strong in the Netherlands, showing that people tend to (implicitly) associate work more with men and care more with women. Again, comparative analyses of stereotypes and language (Lewis & Lupyan, 2020) from the Project Implicit data show that the Netherlands stands out in this respect. This more general stereotype helps to explain horizontal segregation (as men are not expected to be burdened with care) and shapes the gendered division of labor, with care activities and emotional labor falling disproportionately to women, both at home and at work. Due to these stereotypes, women in Dutch academia (regardless of whether or not they have children) experience a **"lack of fit"** with the prototypical ideal academic or researcher, with men perceived as (slightly) more competent and thus (somewhat) favored in any situation that requires performance evaluation (Van Veelen & Derks, 2020). Even a little bit of bias can lead to cumulative disadvantage over the course of a career (Vinkenburg, 2017). Bending stereotypes and mitigating the negative effects of bias on academic careers is an effort that requires continued attention, both in research producing and research funding organizations.

Taken together, the structural and cultural factors described above create a self-reinforcing mechanism that tends to reproduce low representation of women in (business sector) research, professorial positions and STEM fields, and low participation of men in care responsibilities and formal leave. This cycle is visualized in a 2018 McKinsey Global Institute report on the "Power of Parity" in the Netherlands, which specifically mentions bending norms, expanding parental leave and stimulating STEM participation as levers for targeted intervention and catalysts for change.[33]

A final important gender-specific aspect of scientific careers is the growing number of **dual careers** as a direct consequence of women's growing labor force participation. While numbers on the situation in the Netherlands for science are not available, it is safe to assume that similarly to other university graduates in the population, academics and researchers in the Netherlands are part of a dual-career couple. From the ERCAREER data report (ibid) we know that among the selective sample of ERC Starting Grant applicants, the percentage of those in **dual careers in science** (both partners in an academic career) is around 50%, which we consider unexpectedly large.

[33] https://www.mckinsey.com/featured-insights/europe/the-power-of-parity-advancing-gender-equality-in-the-dutch-labor-market?cid=eml-web

Table 8 Dual careers among ERC Starting Grant Applicants

ERCAREER data 2012 (Starting Grant applicants)	All	Grantees
Partner (%) n=339	87%	93%
Also working in science n=295	46%	55%
Parental leave n=339	22%	22%
Ever worked part-time n=309	13.6%	10.2%

ERCAREER data 2014 (https://cordis.europa.eu/project/id/317442)

However, dual-career concerns are rarely addressed in terms of offering an opportunity to promote women's careers in academia and support career mobility. In practice, couples approach the issue and its complexities as something personal that they must resolve among themselves (Rivera, 2017). This personal issue becomes very pronounced with care responsibilities, when applying for funding, and when considering mobility events. Employers and funders can and should support dual-career couples much more actively than they commonly do, without making assumptions about partner and parental status or preferred work and care arrangements.[34] The COVID-19 pandemic has shown that much more is possible in terms of online and flexible work in academia. There is also evidence on how to successfully increase funding applications from women with extra care responsibilities during COVID-19 (Witteman et al., 2021). The signaling effects of providing pro-active and supportive dual-career policies will have long-term benefits in terms of employer branding and employee engagement for funders and research institutions alike. Showing that couples sometimes both win individual fellowships at the same time could be an inspiration to potential applicants who have concerns in this area, as well as highlighting housing and placement services with other (non-)academic employers and international schools.

Beyond signaling dual-career support, *flexibility in terms of time and place* of fellowships could be emphasized more (especially after COVID-19). Due to the short distance, there is a whole range of options between physically bringing partner and family to Germany or leaving them behind in the Netherlands for the duration of the fellowship.

[34] https://vpge.stanford.edu/resources/dual-career-academic-couples-what

4.2 Sectoral issues and initiatives with gendered impact

Some of the more **general sectoral issues** in the Netherlands described earlier in this report, such as growing workloads, application pressures, and precariousness following from conditions of scarcity and low structural funding, have **gendered consequences**. Women are more likely than men to be in temporary contracts (Herschberg et al., 2018a; 2018b), women's chances when applying for a position and for funding are often (but not always) lower than men's (van der Lee & Ellemers, 2015), and we can deduce the lower advancement rates of women from their lower representation at higher levels and from the GCI.

In addition to its annual monitoring, the LNVH has published a series of commissioned research reports on **particular problems in academia** that affect women more than men, including the pay and resource gap in academia, scientific and sexual harassment, and the mixed blessings of the tenure track.[35] These reports serve to inform science policy at the national level and have inspired the development of a **National Action Plan for Diversity & Inclusion in higher education and research**,[36] which is supported by all members of the Knowledge Coalition and was launched in September 2020. In this plan, a collection of dedicated actions and priorities are laid out, with the ultimate goal of making the sector more inclusive. While intersecting aspects of diversity are part of the plan and on the agenda, it is also evident that one of the main goals is to improve women's representation and the ranked position of the Netherlands in the She Figures.

The VSNU is supporting a movement called **Recognition and Rewards**, with the purpose of broadening the individualistic and hypercompetitive reward systems currently in place in most institutions.[37] Collaboration, education, and societal impact are becoming more important than publications and citations in the evaluation protocols for individuals, programs, and institutions. Potentially, this movement is very important for making the system more inclusive, but there is a risk that existing gender stereotypes as described above are "baked in" when it comes to policy design, improvement, implementation, and evaluation. Showing that there are in fact multiple career patterns in research, and that men and women in academia increasingly tend to share work and care responsibilities equally, are important and "myth busting" messages to repeat.

However, not all news is good news. The extreme measure taken by Eindhoven University of Technology to hire only women for a limited period of time was not completely supported by the Netherlands Institute for Human Rights (the former Equal Opportunity Commission),[38] and some of the actions outlined in the National Action Plan for Diversity & Inclusion were opposed in parliament. While public opinion around quota in the business sector may have shifted, for the higher education and research sector the main argument so far remains "merit only."

---

[35] https://www.lnvh.nl/lnvh-reports

[36] https://www.rijksoverheid.nl/actueel/nieuws/2020/09/01/nieuw-nationaal-actieplan-voor-diversiteit-en-inclusie

[37] https://vsnu.nl/recognitionandrewards/recognition-and-rewards/index.html

[38] https://www.lnvh.nl/a-3418/ruling-of-the-netherlands-institute-for-human-rights-in-tu-eindhovens-irene-curie-fellowship-case

Bibliography

Bleijenbergh, Inge, Jac Vennix, Eric Jacobs, & Marloes van Engen (2016). Understanding decision making about balancing two stocks: The faculty gender balancing task. *System Dynamics Review*, *32*(1), 6–25. https://doi.org/10.1002/sdr.1548

Herschberg, Channah, Yvonne Benschop, & Marieke van den Brink (2018a). Selecting early-career researchers: The influence of discourses of internationalisation and excellence on formal and applied selection criteria in academia. *Higher Education*, *76*(5), 807–825. https://doi.org/10.1007/s10734-018-0237-2

Herschberg, Channah, Yvonne Benschop, & Marieke van den Brink (2018b). Precarious postdocs: A comparative study on recruitment and selection of early-career researchers. *Scandinavian Journal of Management*, *34*(4), 303–310. https://doi.org/10.1016/j.scaman.2018.10.001

Lewis, Molly, & Gary Lupyan (2020). Gender stereotypes are reflected in the distributional structure of 25 languages. *Nature Human Behavior*, *4*(10), 1021–1028. https://doi.org/10.1038/s41562-020-0918-6

Miller, David I., Alice H. Eagly, & Marcia C. Linn (2015). Women's Representation in Science Predicts National Gender-Science Stereotypes: Evidence From 66 Nations. *Journal of Educational Psychology*, *107*(3), 631–644. https://doi.org/10.1037/edu0000005

Rivera, Lauren A. (2017). When Two Bodies Are (Not) a Problem: Gender and Relationship Status Discrimination in Academic Hiring. *American Sociological Review*, *82*(6), 1111–1138. https://doi.org/10.1177/0003122417739294

Teelken, Christine, Yvette Taminiau, & Claire Rosenmöller (2021). Career mobility from associate to full professor in academia: Micro-political practices and implicit gender stereotypes. *Studies in Higher Education, 46(4),* 836-850. https://doi.org/10.1080/03075079.2019.1655725

Van der Lee, Romy, & Naomi Ellemers (2015). Gender contributes to personal research funding success in The Netherlands. *Proceedings of the National Academy of Sciences*, *112*(40), 12349–12353. https://doi.org/10.1073/pnas.1510159112

Van Veelen, Ruth, & Belle Derks (2020). *Academics as Superheroes: Female academics' lack of fit with the masculine stereotype of success limits their career advancement*. PsyArXiv. https://doi.org/10.31234/osf.io/c3k56

Vinkenburg, Claartje J. (2017). Engaging Gatekeepers, Optimizing Decision Making, and Mitigating Bias: Design Specifications for Systemic Diversity Interventions. *The Journal of Applied Behavioral Science*, *53*(2), 212–234. https://doi.org/10.1177/0021886317703292

Vinkenburg, Claartje J., Sara Connolly, Stefan Fuchs, & Channah Herschberg (2014). Capturing career paths of ERC grantees and applicants: Promoting sustainable excellence in research careers (ERCAREER ERC-Support-2012-1 317442). Short report: https://cordis.europa.eu/project/id/317442

Vinkenburg, Claartje J., Sara Connolly, Stefan Fuchs, Channah Herschberg, & Brigitte Schels, (2020). Mapping career patterns in research: A sequence analysis of career histories of ERC applicants. *PLOS ONE*, *15*(7), e0236252. https://doi.org/10.1371/journal.pone.0236252

Witteman, Holly, Jenna Haverfield, & Cara Tannenbaum (2021). COVID-19 gender policy changes support female scientists and improve research quality. *Proceedings of the National Academy of Sciences*, *118*(6). https://doi.org/10.1073/pnas.2023476118

Zippel, Kathrin S. (2017): Women in Global Science. Advancing Academic Careers Through International Collaboration. Stanford, California: Stanford University Press.