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# Female advantage in German sociology: Does accounting for the "leaky pipeline" effect in becoming a tenured university professor make a difference?

**Abstract:** Recent studies, controlling for publications and other observable career signals, suggest that women have a higher chance of becoming tenured sociology professors in German universities than men. In this paper, we replicate one such study using the same data, plus two follow-up waves, as well as new data on parenthood. This allows us to consider gender-specific leaving rates, which may have led to an overestimation of female advantage in the original study. However, the replication does not indicate a lower female advantage. On the contrary, Cox regressions show that women have a 48 percent higher chance of obtaining a tenured professorship once parenting is additionally controlled for. Further findings reveal that women leave academia predominantly at the predoc stage, while men leave academia more often at the postdoc stage. This, however, is not a relevant explanation for why women have a higher chance than men of obtaining tenure.

**Keywords:** gender bias; female advantage; academic careers; leaky pipeline; German sociology

# Chancenvorteil für Frauen in der Soziologie: Berücksichtigung des „Leaky Pipeline"-Effekts bei der Erlangung einer Lebenszeitprofessur in Deutschland

**Zusammenfassung:** Aktuelle Studien, die Publikationen und weitere sichtbare Karrierefaktoren berücksichtigen, zeigen eine höhere Chance für Frauen, Soziologieprofessuren an deutschen Universitäten zu erhalten. In diesem Beitrag replizieren wir eine solche Studie und erweitern diese um zusätzliche Datenerhebungspunkte und Angaben zur Elternschaft. Dies ermöglicht Rückschlüsse auf geschlechtsspezifische Ausstiegsraten aus dem Wissenschaftssystem, die in der ursprünglichen Studie zu einer Überschätzung des Chancenvorteils von Frauen geführt haben könnten. Die Replikation deutet jedoch nicht auf eine Abschwächung des Effekts hin: Cox-Regressionen zeigen, dass Frauen eine um 48 Prozent höhere Chance auf eine

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Lebenszeitprofessur haben, wenn Elternschaft berücksichtigt wird. Weitere Ergebnisse zeigen, dass Frauen häufiger ohne Promotionsabschluss die Wissenschaft verlassen (Pre-Doc-Phase), während Männer häufiger in der Post-Doc-Phase die Wissenschaft verlassen. Diese geschlechtsspezifischen Ausstiegsraten tragen allerdings nicht zur Erklärung des Chancenvorteils von Frauen bei der Berufung auf eine Lebenszeitprofessur bei.

**Stichworte:** Geschlechter Bias; Chancenvorteil für Frauen; akademische Karrieren; Leaky Pipeline; Soziologie

## Introduction

Recent studies on German academia suggest that female sociologists have a higher chance than male of becoming tenured as sociology professors (Lutter/Schröder 2016; Jungbauer-Gans/Groß 2013). Jungbauer-Gans and Groß (2013), based on a survey of academics who wrote their habilitation, find that women are 2.17 times as likely to be promoted to associate/full professors compared to men when publications and other observable career signals are controlled for. Lutter and Schröder (2016), based on manually coded Curriculum Vitae (CV) and publication data from German sociologists, show that female professors become tenured approximately two years earlier than men, having published 23–44 percent less than men. Overall, when controlling for the number and types of publications, as well as other career milestones, such as scholarly awards or international experience, female sociologists have a 44 percent higher chance of being appointed to a university professorship.

An important critique of these studies is that their documented female advantage might be a methodological artifact due to gender-specific survivorship bias. Both studies collected their data at one point in time. Lutter and Schröder's (2016) results are based on retrospective data, namely manually-collected information on career trajectories (CV and publication records) from websites of academics at all sociology departments in Germany in the year 2013. By design, academics who had already left academia when the data was collected were not included. It has been firmly established that women leave academia disproportionately compared to men (e.g., Blickenstaff, 2005; Hancock et al., 2013; Joecks et al., 2014; Leemann et al., 2009; Leemann et al., 2010; Pell, 1996). Due to this "leaky pipeline", only the most qualified or motivated women may remain in academia, while less career-orientated women may leave and consequently be unobservable in academia. This survivorship effect would lead to a gender-specific selection bias that could explain the female advantage effect found by both Lutter and Schröder (2016) and Jungbauer-Gans and Groß (2013). If this is true, their result would overestimate the female advantage in gaining tenure.

In this paper, we replicate Lutter and Schröder's (2016) study, using their original 2013 data plus two newly collected follow-up waves from the years 2016 and 2019. These two follow-up waves (1) add and update the new publication and CV data of academics in the original 2013 dataset, (2) identify who left academia since 2013, and (3) add the data of those academics who entered academia after 2013. This allows us to investigate whether women leaving academia disproportionately causes a survivorship bias that affects their chances of attaining tenure. Our hypothesis is that the female advantage should be less than in the original study, since taking into account the two additional waves reduces a potential survivorship bias. Improving upon the original study, we also examine the possibly gendered effect of having children on gaining tenure, as children may be one of the main reasons that women leave academia. We expected the female advantage to reduce further after controlling for parenthood. Our results show, however, that the advantage of women still occurs and even slightly increases after accounting for parenthood. None of the additional determinants explains women's significantly higher chances of becoming sociology professors.

To become a tenured professor in Germany, academics are required to author a doctoral thesis, followed by a habilitation (comparable to a second thesis) or publications that are equivalent to a habilitation (such as several journal articles). In 2002, junior professorships (similar to assistant professorships in the US) were introduced.[1] Most junior professorships have no tenure track (this changed recently to some degree), which means that virtually all positions prior to tenured professorships are temporary. German legislation (*WissZeitVG*), however, prohibits the employment of academics on the basis of temporary contracts for longer than 12 years, after which they must either leave academia or have secured one of the few permanent positions, which is usually a tenured professorship. The effect is that qualified academics are forced to leave academia if they fail to obtain one of the few tenured positions. This becomes especially crucial for women, as the "race for tenure" takes place during the same period as starting a family typically also does, which is likely to impact women more than men (Dorenkamp/Weiß, 2018). Thus, if women are more likely to leave academia, this may have implications for the results of previous studies that observed only the remaining, and thus possibly the most committed women (e.g., Auspurg et al., 2017; Jungbauer-Gans/Gross, 2013; Lutter et al., 2022; Lutter/Schröder, 2016). The results of our study therefore have relevance for higher education and science policies. As previous studies might suffer from selectivity bias, their results are possibly misleading. Incorporating the leaky pipeline in our panel design enables us to show that this is not the case for the academic field of German sociology.

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1  In Germany, a distinction has been made since 2002 between W1 junior professorships (assistant professorships), W2 tenured professorships (associate professorships) and W3 tenured professorships (full professorships), according to the salary scheme.

## Survivorship bias in academia

To explain how survivorship bias can lead to an overestimation of female advantage, one must first understand how it occurs. Figure 1 illustrates that in 2019, fewer women than men remained in academia at successive career stages. The first bar shows the share of female sociologists among those who do not yet have a doctorate ("predocs"), the second bar indicates the share of female sociologists among those who have already obtained a doctorate ("postdocs"), and the third bar shows the percentage of female sociologists among those with a habilitation, followed by junior professors. The last bar shows the share of female sociologists among tenured associate/full professors. As one can see, the share of women decreases with each successive career stage up to tenured professorships; the only exception is that women are appointed more often as junior professors. Among professors, the share of women is slightly greater in the lower position (40 percent among associate professors vs. 37 percent among full professors). However, comparing these figures with the 2013 data from Lutter and Schröder (2016) shows that the proportion of women among associate professors fell slightly (from 46 percent in 2013) while the proportion of women among full professors almost doubled (it was 21 percent in 2013).

**Figure 1. Share of female sociologists at each career stage in 2019 in Germany.**
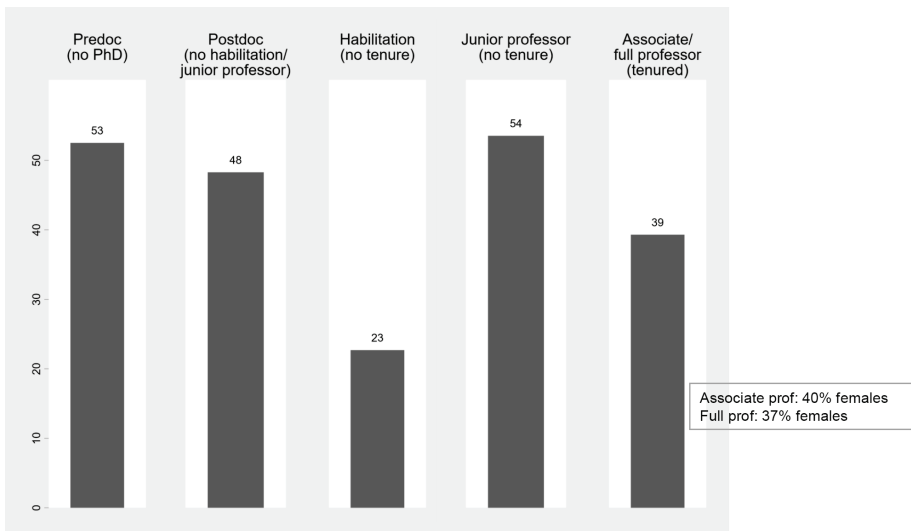


*Note:* Own data collection of sociologists at German universities. N = 2,290; $N_{pre\text{-}doc}$ = 699; $N_{post\text{-}doc}$ = 903; $N_{habil}$ = 143; $N_{junior}$ = 59; $N_{tenured}$ = 486.

Similar to sociology, research in the fields of psychology and political science in Germany has shown that fewer women hold professorships, while there is near par-

ity at the beginning of academic careers (Lutter et al., 2022; Schröder et al., 2021). In 2019, 44 percent of predocs in political science were women but only 31 percent of tenured professorships were held by women (39 percent of those who obtained a PhD were women, as were 31 percent of those who obtained a habilitation or held a junior/assistant professorship). In the same year, 64 percent of predocs in psychology were women but only 37 percent of all tenured professorships were held by women (61 percent among those who obtained a PhD, 49 percent among those who obtained a habilitation or held a junior/assistant professorship).

The described self-selection of women in academia is plausible based on theories and empirical research: Studies agree that women leave academia disproportionately because of work-family conflicts (Goulden et al., 2011; Hancock et al., 2013, p. 524; Leemann et al., 2009; Mason et al., 2013), poorer integration in academic networks (Leemann et al., 2009; Leemann et al., 2010), or lower productivity (Cole/Zuckerman, 1984; Schubert/Engelage, 2011; Schucan Bird, 2011). If exits are systematic, then the remaining women may also share systematic characteristics; for example, women remaining in academia may be particularly committed to an academic career (Xie/Shauman, 2003, pp. 13, 135). Their higher career orientation may lead them to subordinate other goals, which increases their scientific output relative to their less-committed peers. Because scientific output is related to academic resources, such as research grants or access to academic networks (Habicht et al., 2021), it is likely that high-performing women also have above-average scientific capital, producing accumulative advantages throughout the career pipeline (DiPrete/Eirich, 2006). These selection processes may lead to overestimated female advantages in studies that address women's applications for higher positions (e.g., Auspurg et al., 2017; Jungbauer-Gans/Gross, 2013; Lutter/Schröder, 2016).

Self-selection processes matter at several levels. For instance, if less-committed women become parents and leave academia, this inversely leads to positively selected remaining female scholars. Career-oriented women are probably better able to handle both working on an academic career and having a family at the same time. Studies indeed show that high-performing mothers tend to stay in academia (Joecks et al., 2014), and that low-performing mothers face stronger motherhood penalties than high-performing mothers (Lutter/Schröder, 2020).

Apart from care work, other reasons may also help to explain women's lower levels of productivity. For example, women differ in their research styles (Fox/Mohapatra, 2007), so they might publish fewer but qualitatively better papers. Women also spend more time on teaching and/or service activities (for the US, see, e.g., Bird et al., 2004), which may impair their research. They exhibit less confidence in their academic performance than men (Buser et al., 2014), which could explain why they publish less. Women are also less productive at the beginning of their careers, which may lead to larger cumulative differences over time, as early success yields resources for later success (for political science in Germany, see, e.g., Habicht et al., 2021).

However, all these explanations refer to "remaining" scientists in academia. How, then, can we reduce survivorship bias in studies of academia? Problems of selectivity can only be reduced by observing the data of non-survivors and gathering data at multiple points in time over a sufficiently long period. We therefore supplement the career data of Lutter and Schröder (2016) with six more years of data. Our hypotheses are the following:

*Hypothesis 1*: If the assumption of the survivorship bias is true, i.e., if female advantage is artificial because Lutter and Schröder (2016) sampled a selective group of extraordinarily qualified and motivated women, then the effect of female advantage must be substantially lower if we use data that also includes non-survivors.

*Hypothesis 2:* If we further control for parenting dynamics (whether academics have children or not), the effect must be further reduced because we additionally control for a main factor of the leaky pipeline.

## Data and methods

We used a dataset that covers career data on virtually all sociology scholars (doctoral students, postdocs, and tenured faculty) at German universities, based on all 75 sociology or social science departments that exist in German universities.[2] Lutter and Schröder's original study collected the CVs and publication lists of sociologists in 2013. We added two additional waves of data, collected three and six years later (in 2016 and 2019). Both waves updated the publication lists and career profiles of all those included in the original 2013 wave[3] and identified who had left academia since 2013 ("leavers")[4], while also adding publications and CV information for all who entered academia after 2013 ("new sociologists", for an overview, see Table A1). Sociologists, according to the study design, are academics currently working in a sociology department. If a university does not have an exclusive sociology department, it usually has a "social science" department that includes sociology, political science or related sub-disciplines. In this case, we searched the department for professors with "sociology" in their denomination and coded the professor's full team (only those with at least one publication to avoid coding administrative staff, etc.).

Using three waves of data collection, the complete dataset includes 2,290 sociologists (1,063 female, or 46 percent), of whom 486 are tenured professors (these of

2   In 2019, Germany had 112 universities (Statistisches Bundesamt 2020, p. 10). In addition, we used the websites of sociologists from two research institutes in Germany: Max Planck Institute for the Study of Societies and the WZB Berlin Social Science Center.

3   Even though (sur)names may have changed through marriage, we were able to identify the person through their publications (scientists usually also include their birth name in the CV, presumably because they are interested in being recognized by others).

4   We assumed this to be the case if they can no longer be found on the web at any university or research institute either in Germany or abroad.

whom 191 are female, or 39 percent) with 50,457 publication years. We use Cox regressions to capture influences throughout their career until being *tenured*, which is the outcome variable. By design, we only consider career data up till the first appointment to a tenured position. Due to the panel design, right-censoring occurs if someone left academia, retired, passed away, or until the observation period runs out (the year 2019).

For the second hypothesis, we examined whether *parenting* affects the chances of becoming a professor. Based on collected email addresses, we conducted two email surveys, asking whether academics had children and when their children were born (including biological, adopted and stepchildren). The first email survey took place in 2014, immediately after the first wave of data collection; a second survey took place in 2019 after the third wave. We gathered information on children for 70 percent of female and 67 percent of male scholars.

As independent variables, we use career information from CVs and control the same variables as Lutter and Schröder (2016). However, we added new variables not included in the original study to test the robustness of the results. First, we count *DFG funding* grants, as these may increase the chance of attaining tenure. We used the "Gepris" database of the German Research Foundation (DFG) to collect funding information for each academic in our dataset. We also considered sociologists' *entry cohorts*.[5] Due to labor market changes and the introduction of gender equality policies, effects may reflect the past but not be indicative of what happened to more recent cohorts of researchers. To account for this, we captured cohort effects by the years when sociologists entered academia through their first publication, measured in intervals of ten years (1980–1990, 1991–2000, 2001–2010 and 2011–2019). For a descriptive overview of all variables, see Table 1. If career information was not provided on CVs, we assumed it did not happen. For example, if no information about scientific awards could be found, we assumed that the person had not received any such awards.[6]

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5 As an alternative to academic entry cohorts, we use a dummy variable for years after 2013 (*post 2013*). Because we assumed the group of women to be more heterogeneous after 2013 (when we tagged sociologists leaving academia, as well as sociologists who entered academia), we see in this reason to also assume that gender-specific leaving rates may have contributed to the positive female effect of the original study design. However, the results hardly change (see Table A4, Model 2b).

6 Replication files can be found at https://osf.io/vzych/ (DOI 10.17605/OSF.IO/VZYCH).

**Table 1. Descriptive statistics of all variables used in this study.**

| Variable | N | Mean/Prop | SD | Min | Max | Operationalization | | Variable type |
|---|---|---|---|---|---|---|---|---|
| SSCI/SCIE articles | 2290 | 1.86 | 3.02 | 0 | 31.68 | # of SSCI/SCIE articles, co-author adjusted: 2/(number of authors+1) | continuous | time-varying |
| Non-SSCI/SCIE articles | 2290 | 3.21 | 5.07 | 0 | 79.80 | # of Non-SSCI/SCIE articles (co-author adjusted) | continuous | time-varying |
| Books | 2290 | 1.15 | 1.52 | 0 | 22.50 | # of books (co-author adjusted) | continuous | time-varying |
| Edited volumes | 2290 | .70 | 1.41 | 0 | 15.40 | # of edited volumes (co-author adjusted) | continuous | time-varying |
| Book chapters | 2290 | 7.01 | 9.93 | 0 | 121.67 | # of book chapters (co-author adjusted) | continuous | time-varying |
| Grey literature | 2290 | 3.85 | 7.05 | 0 | 87.87 | # of grey literature (co-author adjusted) | continuous | time-varying |
| Female | 2290 | .46 | | 0 | 1 | 1=female, 0=male | dichotomous | time-constant |
| Prestige graduation | 2290 | .30 | | 0 | 1 | 1=graduation at a German university of excellence, 0=graduation at other German university or abroad | dichotomous | time-constant |
| Prestige doctorate | 2290 | .20 | | 0 | 1 | 1=doctorate at a German university of excellence, 0=doctorate at other German university or abroad | dichotomous | time-constant |
| Prestige habilitation | 2290 | .06 | | 0 | 1 | 1=habilitation at a German university of excellence, 0=habilitation at other German university or abroad | dichotomous | time-constant |
| Awards | 2290 | .22 | .66 | 0 | 9 | # of scholarly awards | continuous | time-varying |
| Months abroad | 2290 | 11.90 | 25.18 | 0 | 246 | # months spent abroad | continuous | time-varying |
| Studied abroad | 2290 | .31 | | 0 | 1 | 0=studied in Germany, 1=(parts of) studies spent abroad | dichotomous | time-constant |
| Doctorate abroad | 2290 | .09 | | 0 | 1 | 0=doctorate in Germany, 1=doctorate abroad | dichotomous | time-constant |
| International publications | 2290 | 5.49 | 8.75 | 0 | 92 | 0=published not in English (e.g., in German), 1=in English | continuous | time-varying |
| Mobility | 2290 | 1.96 | 1.75 | 0 | 11 | # of moves to another university | continuous | time-varying |
| Interim professor | 2290 | .31 | .82 | 0 | 9 | # of substituted professorships | continuous | time-varying |
| Department size | 2290 | 9.77 | 7.39 | 1 | 37 | # of tenured professors per department where the person was recently employed | continuous | time-constant |
| Incomplete[1] | 2290 | .12 | | 0 | 1 | 1=only selected publications, 0=complete publication lists | dichotomous | time-constant |
| Co-authors | 2290 | 18.30 | 27.49 | 0 | 390 | # of co-authors per publication | continuous | time-varying |

| Variable | N | Mean/Prop | SD | Min | Max | Operationalization | | Variable type |
|---|---|---|---|---|---|---|---|---|
| Open positions | 2290 | 18.36 | 7.93 | 4 | 34 | # of tenured professors per year (vacant positions), lagged by one year | continuous | time-varying |
| Years since habilitation | 2290 | .86 | 2.62 | 0 | 27 | Year(s) since habilitation was obtained | continuous | time-varying |
| Years since habilitation (sq.) | 2290 | 7.62 | 38.11 | 0 | 729 | Year(s) since habilitation was obtained (squared term) | continuous | time-varying |
| Years since assistant professor | 2290 | .23 | 1.07 | 0 | 12 | Year(s) since assistant professorship | continuous | time-varying |
| Childless | 2290 | .35 | | 0 | 1 | Childless | categorical | time-varying |
| With children | | .33 | | 0 | 1 | Having children | | |
| No info on children | | .31 | | 0 | 1 | Did not participate in our survey | | |
| DFG funding | 2290 | .20 | .56 | 0 | 6 | # of DFG research grants acquired | continuous | time-varying |
| Entry cohort before 1990 | 2290 | .08 | | 0 | 1 | Scientists who started their careers before 1990 | categorical | time-constant |
| 1990–1999 | | .15 | | 0 | 1 | Scientists who started their careers between 1990–1999 | | |
| 2000–2009 | | .36 | | 0 | 1 | Scientists who started their careers between 2000–2009 | | |
| after 2009 | | .41 | | 0 | 1 | Scientists who started their careers after 2009 | | |

*Note*: Based on 2.290 academics with 50,457 publications; sq = squared.
[1] The share of males/females with incomplete publication lists is almost equal (13 % of males and 11 % of females; chi-squared test not significant).

## Results

We start by describing sociology professors who just got their first tenured position, including data from all three waves (2013, 2016 and 2019) and all variables (see Table 2). We then present a descriptive overview of those who left academia since 2013 and compare their characteristics (such as publications or children) with those who stayed in academia (see Tables 3.1 and 3.2). We then run Cox regressions on who becomes a sociology professor using three waves (Table 4) and present several robustness tests (Table 5 plus appendix).

### *Descriptive findings on who gains tenure*

Table 2 presents descriptive statistics for all independent variables when sociologists receive their first tenured professorship. Different from the descriptive statistics of 2013 (Lutter/Schröder, 2016, p. 1005), women in sociology are no longer appointed significantly earlier than men. It now takes about 15 years from first publication to tenure for both women and men who actually received tenure.

**Table 2. What characterizes male and female sociologists who just gained tenure (including waves 2013, 2016, 2019)?**

|  | Overall | | Men | | Women | | dif | sig. |
|---|---|---|---|---|---|---|---|---|
|  | Mean/ Prop | SD | Mean/ Prop | SD | Mean/ Prop | SD |  |  |
| Years to professorship | 15.4 | 4.84 | 15.65 | 4.77 | 15.01 | 4.94 | .64 |  |
| SSCI/SCIE articles | 4.43 | 4.24 | 5.09 | 4.65 | 3.43 | 3.31 | 1.66 | *** |
| Non-SSCI/SCIE articles | 7.25 | 7.18 | 8.46 | 8.13 | 5.41 | 4.91 | 3.05 | *** |
| Books | 2.43 | 1.99 | 2.76 | 2.26 | 1.94 | 1.36 | .82 | *** |
| Edited volumes | 1.67 | 1.94 | 1.75 | 1.88 | 1.55 | 2.03 | .20 |  |
| Book chapters | 15.89 | 12.03 | 17.23 | 11.70 | 13.85 | 12.27 | 3.38 | ** |
| Grey literature | 7.69 | 9.78 | 8.77 | 10.77 | 6.04 | 7.78 | 2.74 | ** |
| Prestige graduation | .31 |  | .31 |  | .31 |  | .01 |  |
| Prestige doctorate | .30 |  | .30 |  | .29 |  | .00 |  |
| Prestige habilitation | .19 |  | .24 |  | .11 |  | .12 | ** |
| Awards | .39 | .96 | .35 | 1.01 | .45 | .87 | -.10 |  |
| Months abroad | 21.94 | 34.07 | 19.9 | 30.53 | 25.06 | 38.75 | -5.16 |  |
| Studies abroad | .27 |  | .23 |  | .33 |  | -.09 | * |
| Doctorate abroad | .13 |  | .11 |  | .16 |  | -.05 |  |
| International publications | 11.10 | 12.89 | 11.30 | 13.07 | 10.80 | 12.65 | .50 |  |
| Mobility | 3.25 | 1.77 | 3.28 | 1.78 | 3.2 | 1.76 | .08 |  |
| Interim professor | .83 | 1.04 | .85 | 1.02 | .81 | 1.07 | .04 |  |
| Department size | 10.87 | 8.99 | 11.01 | 9.21 | 10.66 | 8.66 | .35 |  |
| Co-authors | 31.96 | 32.94 | 34.34 | 33.03 | 28.34 | 32.59 | 6.00 | + |
| Habilitation | .64 |  | .70 |  | .54 |  | .16 | ** |
| Years since habilitation | 2.02 | 2.63 | 2.46 | 2.85 | 1.35 | 2.09 | 1.11 | *** |
| Assistant professor | .17 |  | .12 |  | .25 |  | -.13 | *** |
| Years since assistant professor | .78 | 1.92 | .52 | 1.57 | 1.17 | 2.31 | -.64 | ** |

| | Overall | | Men | | Women | | dif | sig. |
|---|---|---|---|---|---|---|---|---|
| | Mean/ Prop | SD | Mean/ Prop | SD | Mean/ Prop | SD | | |
| Childless | .26 | | .22 | | .31 | | -.09 | * |
| With children | .48 | | .52 | | .43 | | .09 | + |
| No info on children | .26 | | .26 | | .26 | | .00 | |
| DFG funding | .56 | .84 | .53 | .85 | .60 | .82 | -.08 | |
| Entry cohort before 1990 | .29 | | .35 | | .19 | | .16 | *** |
| 1990–1999 | .40 | | .40 | | .41 | | -.02 | |
| 2000–2009 | .29 | | .24 | | .36 | | -.12 | * |
| after 2009 | .03 | | .02 | | .04 | | -.02 | |

*Notes:* Cases with incomplete publication lists (n = 90) were dropped. $N_{male}$ = 239, $N_{female}$ = 157. SD = standard deviation.

Mean differences between men and women significant at + p <.1, * p <.05, ** p <.01, *** p <.001; two-sided tests).

Gender differences in publications mostly resemble the 2013 results. Men still publish significantly more when getting their first tenured professorship (except for a nonsignificant difference in edited volumes). Compared to female sociologists, men have 1.5 times as many articles appearing in the Social Science Citation Index/ Science Citation Index Expanded (SSCI/SCIE) when they are tenured, 1.6 times as many non-SSCI/SCIE articles, 1.4 times as many books and 1.2 times as many book chapters. Men completed their habilitation at a university of excellence about twice as often. No significant difference in the average number of academic awards exists anymore, contrary to the 2013 data, where women had significantly more awards than men (at the 10 percent level).

Of all tenured sociologists, 64 percent obtained a habilitation (75 percent in the original study). Among men, this figure is 70 percent, while only 54 percent of tenured women obtained a habilitation. Conversely, only 12 percent of all men but 25 percent of all women had a junior professorship before they got tenured, indicating that the junior professorship has become increasingly important as an alternative to the habilitation, particularly for women.

Forty-eight percent of tenured professors have children. Twenty-six percent are childless and a further 26 percent did not respond to this survey question. While 52 percent of male professors have children, this is only true for 43 percent of female professors. Twenty-two percent of male professors are childless, compared to 31 percent of female professors. There are no gender differences in the nonresponse rate to this survey question.

In 2019, women acquired non-significantly more DFG grants up to the time they received tenure. While 40 percent of all female tenured professors started their careers after the year 2000, this is only true for 26 percent of all male tenured

professors. This reflects an increase of women in academia in the last two decades, so that men are overrepresented in older cohorts.

*Who has left academia since 2013?*

Because we hypothesize a gendered selection effect as a bias in the original study, we now take a closer look at who left academia. Table 3.1 shows that 263 sociologists left academia between 2013 and 2019, of which 55 percent were women and 45 percent men. There is a trend of gender-specific leavers by career stage; at early career stages (doctoral students), leaving rates are higher for women than for men (65 percent vs. 35 percent in the first wave; 60 percent vs. 40 percent in total). In contrast, leaving rates are higher for men in the postdoc phase (69 percent vs. 31 percent in the first wave; 52 percent vs. 48 percent over all waves). These results show that women leave disproportionately during the early stages of their career, before completing their PhD, while men tend to leave disproportionately after completing their PhDs.

**Table 3.1. Absolute numbers of academic leavers, separately by gender and career stage (in parentheses: %).**

|  | Career stage | | |
|---|---|---|---|
|  | Pre-doc | Post-doc | Total |
|  | **Leavers 1st wave (2013 – 2016)** | | |
| Male | 31 (35) | 20 (69) | 51 (44) |
| Female | 57 (65) | 9 (31) | 66 (56) |
| Total | 88 (100) | 29 (100) | 117 (100) |
|  | **Leavers 2nd wave (2016 – 2019)** | | |
| Male | 39 (46) | 27 (44) | 66 (45) |
| Female | 46 (54) | 34 (56) | 80 (55) |
| Total | 85 (100) | 61 (100) | 146 (100) |
|  | **Total leavers (2013–2019)** | | |
| Male | 70 (40) | 47 (52) | 117 (45) |
| Female | 103 (60) | 43 (48) | 146 (55) |
| Total | 173 (100) | 90 (100) | 263 (100) |

According to our theoretical discussion, lower productivity and having children could affect whether academics—particularly women—abandon an academic career. Table 3.2 compares how academic "leavers" and "remainers" differ in terms of SSCI/SCIE publications, book chapters and parenthood after an average of six years in academia.[7] Most strikingly, it is the number of SSCI/SCIE publications

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7   On average, sociologists leave academia after six years. We therefore compare the numbers of publications and also the number of children when they left academia with those of remainers after six years in academia. Table 3.2 does not include academics who had been in academia for less than six years, which reduces the number of remainers.

that differs most significantly between those who left and those who remained in academia. Those who abandon an academic career have published 42 percent less than their counterparts who remain (among women: 45 percent). Female leavers also write fewer book chapters than female remainers, a difference that is only significant at the 10 percent level. Female and male sociologists who have left academia are equally likely to have children as sociologists who remain (36 percent vs. 38 percent were parents). Female leavers tend to have slightly more children than female remainers (0.61 vs. 0.52 children on average), while male leavers have fewer children than their counterparts who stayed (0.52 vs. 0.59). However, these differences are not significant.

**Table 3.2. T-tests on academic leavers versus remainers (matched at equal years).**

|  | Remainers | Leavers | Mean | Mean | ratio | dif (%) | sig. |
|---|---|---|---|---|---|---|---|
|  | (R) | (L) | (R) | (L) | (L/R) | 1-(L/R) |  |
| **Overall** |  |  |  |  |  |  |  |
| SSCI/SCIE articles (ln) | 1305 | 241 | .73 | .42 | .58 | -42 % | *** |
| Book chapters (ln) | 1305 | 241 | 2.35 | 2.09 | .89 | -11 % |  |
| % Parents | 957 | 123 | .38 | .36 | .95 | -5 % |  |
| # of children | 957 | 123 | .56 | .57 | 1.02 | +2 % |  |
| **Only women** |  |  |  |  |  |  |  |
| SSCI/SCIE articles (ln) | 568 | 130 | .65 | .36 | .55 | -45 % | *** |
| Book chapters (ln) | 568 | 130 | 2.27 | 1.80 | .79 | -21 % | + |
| % Parents | 427 | 71 | .36 | .37 | 1.03 | +3 % |  |
| # of children | 427 | 71 | .52 | .61 | 1.17 | +17 % |  |
| **Only men** |  |  |  |  |  |  |  |
| SSCI/SCIE articles (ln) | 737 | 111 | .79 | .49 | .62 | -38 % | * |
| Book chapters (ln) | 737 | 111 | 2.42 | 2.42 | 1.00 | 0 % |  |
| % Parents | 530 | 52 | .39 | .35 | .90 | -10 % |  |
| # of children | 530 | 52 | .59 | .52 | .88 | -12 % |  |

*Notes:* Cases with incomplete publication lists were dropped. Numbers of remainers after six years in academia (as the average time when sociologists leave academia).

Mean differences between men and women significant at + p <.1, * p <.05, ** p <.01, *** p <.001; two-sided tests.

*Cox regression results*

Table 4 shows hazard ratios for the chances of gaining a tenured professorship in sociology. Testing our first hypothesis, Model 1 replicates the main results of the original study (see Model 6 of Table 3 in Lutter/Schröder 2016) including all waves.[8] Models 2 and 3 split the results by gender (replicating Models 5 and 6 of Table 4 in Lutter/Schröder 2016). To test our second hypothesis, we added parenthood in Model 4, and split it by gender in Models 5 and 6.

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8  For detailed results on the stepwise regression models, see Table A3 in the appendix.

**Table 4.** Cox regression models: gaining tenure (including waves 2013, 2016, 2019).

| | Test hypothesis 1 (replication) | | | Test hypothesis 2 (children) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Full Model | Only Women | Only Men | Full Model | Only Women | Only Men |
| SSCI/SCIE journal articles (ln) | 1.67*** (6.16) | 1.36* (2.16) | 2.01*** (6.41) | 1.66*** (6.16) | 1.36* (2.22) | 1.98*** (6.24) |
| Non-SSCI/SCIE articles (ln) | 1.20* (2.38) | 1.29+ (1.87) | 1.16 (1.56) | 1.19* (2.33) | 1.27+ (1.77) | 1.16 (1.49) |
| Books (ln) | 1.63*** (4.20) | 1.59* (2.16) | 1.57** (3.26) | 1.59*** (3.99) | 1.58* (2.15) | 1.53** (3.06) |
| Edited volumes (ln) | 1.36** (3.11) | 1.29 (1.41) | 1.42** (2.89) | 1.35** (3.08) | 1.29 (1.41) | 1.38** (2.68) |
| Book chapters (ln) | 1.10 (1.05) | 1.26 (1.50) | 1.05 (.40) | 1.10 (1.03) | 1.29 (1.63) | 1.04 (.35) |
| Grey literature (ln) | .89+ (-1.84) | .92 (-.70) | .86* (-2.23) | .90+ (-1.80) | .92 (-.69) | .86* (-2.30) |
| Female | 1.46** (3.21) | | | 1.48*** (3.44) | | |
| Prestige graduation | .63*** (-3.73) | .72 (-1.62) | .57*** (-3.41) | .63*** (-3.68) | .71+ (-1.65) | .58*** (-3.32) |
| Prestige doctorate | 1.18 (1.23) | 1.25 (1.12) | 1.06 (.32) | 1.20 (1.41) | 1.33 (1.42) | 1.08 (.44) |
| Prestige habilitation | 1.38* (2.06) | 1.46 (1.48) | 1.40+ (1.80) | 1.36+ (1.93) | 1.40 (1.27) | 1.41+ (1.81) |
| Awards (ln) | 1.24 (1.60) | 1.43+ (1.69) | 1.04 (.22) | 1.23 (1.55) | 1.45+ (1.79) | 1.04 (.20) |
| Months abroad (ln) | 1.13** (3.14) | 1.14* (2.16) | 1.16** (2.93) | 1.12** (3.13) | 1.15* (2.26) | 1.16** (2.91) |
| Studied abroad | .89 (-.96) | 1.05 (.26) | .76 (-1.63) | .90 (-.86) | 1.05 (.27) | .77 (-1.50) |
| Doctorate abroad | 1.50* (2.39) | 2.28** (3.02) | 1.08 (.32) | 1.49* (2.36) | 2.35** (3.21) | 1.07 (.30) |
| International publications (ln) | 1.14+ (1.86) | 1.02 (.20) | 1.14 (1.44) | 1.13+ (1.82) | 1.03 (.25) | 1.14 (1.41) |
| Mobility (ln) | 2.45*** (8.71) | 2.56*** (5.65) | 2.47*** (7.12) | 2.49*** (8.81) | 2.53*** (5.56) | 2.50*** (7.16) |
| Interim professor (ln) | 1.21 (1.55) | 1.07 (0.32) | 1.25 (1.49) | 1.24+ (1.83) | 1.09 (.41) | 1.29+ (1.68) |
| Department size (ln) | 1.07 (0.74) | .92 (-.55) | 1.21+ (1.85) | 1.08 (.86) | .92 (-.56) | 1.22+ (1.91) |
| Co-authors (ln) | 1.11+ (1.75) | 1.19+ (1.88) | 1.10 (1.15) | 1.12+ (1.85) | 1.20* (1.99) | 1.11 (1.21) |
| With children (ref. childless) | | | | 1.33* (2.18) | 1.17 (.73) | 1.40* (2.04) |

| | Test hypothesis 1 (replication) | | | Test hypothesis 2 (children) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | Full Model | Only Women | Only Men | Full Model | Only Women | Only Men |
| No info on children (ref. childless) | | | | 1.30[+] (1.82) | 1.46[+] (1.74) | 1.24 (1.13) |
| Incomplete | 2.06[***] (4.88) | 2.42[**] (3.28) | 1.96[***] (4.06) | 2.11[***] (5.19) | 2.60[***] (3.64) | 1.96[***] (4.12) |
| Open positions (ln) | .83[+] (-1.76) | .72[*] (-2.03) | .89 (-.87) | .83[+] (-1.80) | .72[*] (-2.00) | .90 (-.84) |
| Years since habilitation | 1.48[***] (5.55) | 2.00[***] (5.82) | 1.33[***] (3.71) | 1.47[***] (5.46) | 1.98[***] (5.72) | 1.32[***] (3.66) |
| Years since habilitation (sq.) | .97[***] (-4.22) | .94[***] (-3.94) | .97[**] (-3.04) | .97[***] (-4.20) | .94[***] (-3.91) | .98[**] (-3.04) |
| Years since assistant prof. (ln) | 2.28[***] (7.85) | 2.71[***] (7.08) | 2.26[***] (5.82) | 2.25[***] (7.74) | 2.69[***] (7.20) | 2.26[***] (5.74) |
| Pseudo r² | .13 | .17 | .14 | .13 | .17 | .14 |
| Log-likelihood | -2643.51 | -854.01 | -1450.23 | -2640.13 | -852.25 | -1447.84 |
| Degrees of freedom | 24 | 23 | 23 | 26 | 25 | 25 |
| Chi² | 702.52 | 356.59 | 453.51 | 731.01 | 383.27 | 463.17 |
| AIC | 5335.03 | 1754.02 | 2946.45 | 5332.27 | 1754.50 | 2945.67 |
| BIC | 5546.92 | 1933.63 | 3139.23 | 5561.82 | 1949.73 | 3155.21 |
| Number of events (tenure) | 486 | 191 | 295 | 486 | 191 | 295 |
| N (persons) | 2,290 | 1,063 | 1,230 | 2,290 | 1,063 | 1,230 |
| N (persons-publications) | 50,457 | 18,197 | 32,260 | 50,457 | 18,197 | 32,260 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.
+ p <.1, * p <.05, ** p <.01, *** p <.001.

According to the first hypothesis, the female advantage should be less than in the original study, as we employ a longer timeframe which should reduce the survivor bias. In the original study, women had a 41 percent greater chance of gaining tenure than did men. Contrary to Hypothesis 1, this effect is now 46 percent, all else being equal (Model 1 in Table 4). The female advantage even increases to 48 percent when controlling for parenthood in Model 4. This also contradicts the second hypothesis, which assumes that the female advantage decreases after controlling for parenthood as an important reason to leave academia, especially for women.

The effects of publishing on becoming a professor remain similar to the original study (see Models 1–3). SSCI/SCIE publications are still more beneficial for men (similar to the results with data from 2013); the effect even increases slightly. For women, it decreases but remains significant. Publishing books similarly affects both women's and men's chances of gaining tenure in the new analysis, increasing the chances of gaining tenure by about 1.6, while it had an effect of 3.27 for women in the original data in 2013. Contrary to 2013, publishing edited volumes is more advantageous for men. Moreover, non-SSCI/SCIE articles have increased the

chances of gaining tenure by about 20 percent in recent years, while this effect was insignificant in the original study.

Interestingly, the enormous impact of scholarly awards on a woman's chance of obtaining tenure in the original study (it was the strongest predictor for women) is now weaker; it is now only significant at the 10 percent level (Model 2), although receiving awards is still more advantageous for women than for men. Academics who obtained their habilitation at a university of excellence have a 38 percent higher chance of obtaining tenure (Model 1), an effect that is stronger in the current data (particularly for men). Having graduated from such a university, however, still reduces the chance of gaining tenure, as it did in the 2013 sample.

None of the variables measuring transnational capital were statistically significant in the 2013 data. In Model 1 of the updated data, however, months spent abroad and having a doctorate from abroad significantly increase the chances of obtaining tenure. The positive effect of a doctorate abroad is due to the subsample of women: Women who earned their doctorate abroad have a 2.28 times greater chance of gaining tenure, while there is no significantly greater chance for men. This could indicate that international experience has become more important in sociology, especially for women.

As in 2013, mobility, i.e., the number of different institutions academics were linked to over their careers, is still a main predictor for gaining tenure. In the current study, the effect is stronger than using the earlier data (among both women and men, see Models 1 to 3). The effect of the number of co-authors also increased slightly, especially for women.

Having children is positively associated with the chance of obtaining tenure (Model 4). The effect seems to be driven by fathers having a 40 percent higher chance of gaining tenure (Model 6), while mothers only have a 17 percent (and insignificantly) greater chance of gaining tenure (Model 5). Women who refused to respond whether they had children have a 46 percent higher chance (at 10 percent significance level) of gaining tenure than did childless women.

To sum up, our analysis largely replicates the results of Lutter and Schröder's (2016) previous study. Negating our first hypothesis, we did not find that women appear less advantaged after accounting for a longer timeframe that takes into account the leaky pipeline effect. The effect also did not decrease when we controlled for parenthood, contrary to what we expected with the second hypothesis.

*Robustness tests*

Table 5 uses Model 4 in Table 4 as a baseline, adding independent variables absent in the original study, to test the robustness of the results. First, we added the number of research grants acquired from the DFG in Model 1 of Table 5. However, with the same quantity of acquired research grants, women still have a 47 percent

higher chance of gaining tenure, similar to our general results. Thus, research grants do not explain why women are advantaged in reaching tenure, although they do increase the chance for tenure, net of other variables.

Model 2 adds when sociologists entered academia, grouped into 10-year brackets. This indicates whether specific academic cohorts are more likely to gain tenure, also indicating whether results reflect academic structures of the past. The results show that the models remain robust; this means that our results do not depend on some cohorts of academics who collectively have a higher chance of gaining tenure.

Model 3 excludes the observation years of sociologists who spent more than 15 years in academia without being tenured as W2 or W3 professors. This applies to observations of 126 sociologists, 70 percent of whom are men. Among the 126 sociologists are 25 adjunct professors. These so-called "außerplanmäßige" or "APL" professors are similar to "adjunct professors" in the US, of whom 84 percent are men. The other 101 sociologists (of whom 66 percent are men) may hold one of the rare permanent positions in academia below a tenured professorship, such as being a tenured lecturer (the German position of "*Lehrkraft für besondere Aufgaben*" or *"Akademischer Rat"*).[9] Sociologists with one of these rare permanent positions may not be in the "risk set" for becoming a full professor or may even never have been on this track. These positions are more often held by men. This suggests that men have found other ways towards non-temporary positions, however, the advantage of women in obtaining tenured professorships remains.

Model 4 excludes scholars who were appointed at a university of applied sciences (*Fachhochschule*), which applies to 17 professors (10 women, or 59 percent). However, even after accounting for tenure at universities of applied sciences, the female advantage effect is still clearly visible, if all other variables are held constant.

Model 5 restricts the sample to academics appointed as W2 professors (tenured associate professors), dropping 65 of 486 professors who obtained a W3 professorship (tenured full professor) directly. Of course, this was only possible if the respective information was given in the CV. This leads to a marginal increase in the female advantage effect. Women show a 48 percent higher chance of becoming a non-W3 professor than do men.

Finally, Models 6 to 8 restrict the sample to sociologists who had already obtained a PhD (Model 6), a habilitation or assistant/W1 professorship (Model 7), or only uses those who did eventually get a (W2/W3) tenured professorship (Model 8). Among the sample of tenured professors, women's chances of becoming professors

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9  Academics are obliged to attain permanent employment after 12 years in academia due to the German fixed-term law, so that we assume academics who work in academia for longer than 15 years have permanent positions other than professorships. We opted for 15 years instead of 12 years because of parental leave, which extends the period by law. However, the German fixed-term law does not apply if further temporary contracts are funded by third-party grants, so academics can still be employed at universities after 12 years.

decrease to 30 percent. This means that women also have an advantage among those who actually became a tenured professor, but it is not as high as in the overall sample.

**Table 5. Cox regression models on getting tenure for robustness tests (including waves 2013, 2016, 2019).**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | DFG funding | Entry cohorts | Other academic positions | Universities of applied sciences | W3 professors | PhD | Habil./ assist. prof. | Tenured professors |
| Female | 1.47*** | 1.47*** | 1.40** | 1.44** | 1.48** | 1.46*** | 1.52*** | 1.30* |
| | (3.41) | (3.38) | (2.98) | (3.15) | (3.16) | (3.32) | (3.35) | (2.42) |
| DFG funding | 1.40*** | 1.39*** | 1.28*** | 1.39*** | 1.43*** | 1.41*** | 1.40*** | 1.02 |
| | (5.50) | (5.35) | (4.30) | (5.28) | (4.83) | (5.69) | (5.15) | (.36) |
| before 1990 (ref.) | | | | | | | | |
| 1990–1999 | | | 1.02 | 1.17 | 1.00 | 1.02 | 1.02 | .99 | 2.04*** |
| | | | (.11) | (.99) | (-0.02) | (.10) | (.13) | (-.03) | (4.73) |
| 2000–2009 | | | 1.07 | 1.18 | 1.06 | 0.97 | 1.11 | 1.20 | 3.91*** |
| | | | (.39) | (.94) | (0.36) | (-.17) | (.64) | (.96) | (6.93) |
| after 2009 | | | 1.33 | 1.48 | 1.37 | 1.25 | 1.65+ | 2.10* | 24.09*** |
| | | | (.92) | (1.27) | (1.01) | (.69) | (1.67) | (1.97) | (11.11) |
| Pseudo r² | .13 | .13 | .14 | 0.14 | .13 | .13 | .12 | .10 |
| Log-likelihood | -2625.41 | -2624.97 | -2552.85 | -2511.92 | -2255.00 | -2613.54 | -1839.41 | -2270.48 |
| Degrees of freedom | 27 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Chi² | 803.37 | 813.38 | 797.61 | 807.17 | 702.68 | 807.91 | 608.36 | 763.69 |
| AIC | 5304.81 | 5309.94 | 5165.71 | 5083.83 | 4570.00 | 5287.09 | 3738.82 | 4600.95 |
| BIC | 5543.19 | 5574.81 | 5429.07 | 5348.33 | 4833.07 | 5549.13 | 3983.40 | 4839.00 |
| Number of events (tenure) | 486 | 486 | 486 | 469 | 421 | 486 | 377 | 486 |
| N (persons) | 2,290 | 2,290 | 2,283 | 2,273 | 2,225 | 1,591 | 579 | 487 |
| N (persons-publications) | 50,457 | 50,457 | 47,989 | 49,843 | 47,525 | 45,922 | 25,662 | 20,636 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

*Note:* Controlling for all independent variables used in Model 4 of Table 4 (but not shown here). For the full models, see Table A4.

In Table A5 (appendix), we additionally test whether the determinants for becoming a sociology professor differ between women and men by calculating interaction terms. That women are rewarded more for their scientific achievements could explain why they have a higher chance of becoming sociology professors. For instance, Lutter et al. (2022) show that SSCI/SCIE articles are more beneficial for women aspiring to become psychology professors. However, according to Table A5, none of the determinants used in our models significantly differ statistically

between women and men, except that SSCI/SCIE publications have a less positive influence for women ($p <.1$).

We also tested interaction effects separately for women and men with variables that measure career achievements. Table A6 shows interaction effects between SSCI/SCIE articles and DFG research grants (Models 1 and 2) separately for women and men. This tested whether the effect for women (or men) of SSCI/SCIE articles on becoming a professor is higher with more research grants (or vice versa). The interaction effect is insignificant in subsamples for both women and men, which means there is no particular advantage from publishing while having more grants, for either gender. We also tested whether sociologists who received their doctorate at a German university of excellence profit more from publishing SSCI/SCIE articles (Models 3 and 4). This is not the case for men but it is for women (see Model 3 of Table A6). Women benefit more strongly from publishing in SSCI/SCIE journals and increase their chances of becoming a professor significantly if they have received their doctorate from a university of excellence.

We also tested the proportional hazard assumption for Cox regressions by interacting gender with analysis time (as a time-dependent covariate). The interaction of gender and analysis time is nonsignificant, supporting the proportionality assumption for gender (0.99 at $p >.7$) that the chance of obtaining tenure does not differ for women and men with years in academia. This finding can be further seen by the Kaplan-Meier observed survival curves (Figure 2) and the Cox predicted survival curves (Figure 3), which fall proportionally. As an alternative robustness test to assess the proportional hazard assumption, we also conducted a log minus log (LML) plot (see Figure 4). The LML plot does not properly satisfy the PH assumption, as the curves are not genuinely parallel in the first six years in academia. This might mirror that women are particularly prone to leaving academia during the predoc stage—which our new panel design can take into account—while the chance of becoming a professor does not differ across the careers of female and male sociologists after about six years. This suggests that accounting for the leaky pipeline is likely important, though it did not change our substantial result.

**Figure 2. Kaplan-Meier curves (without covariates).**
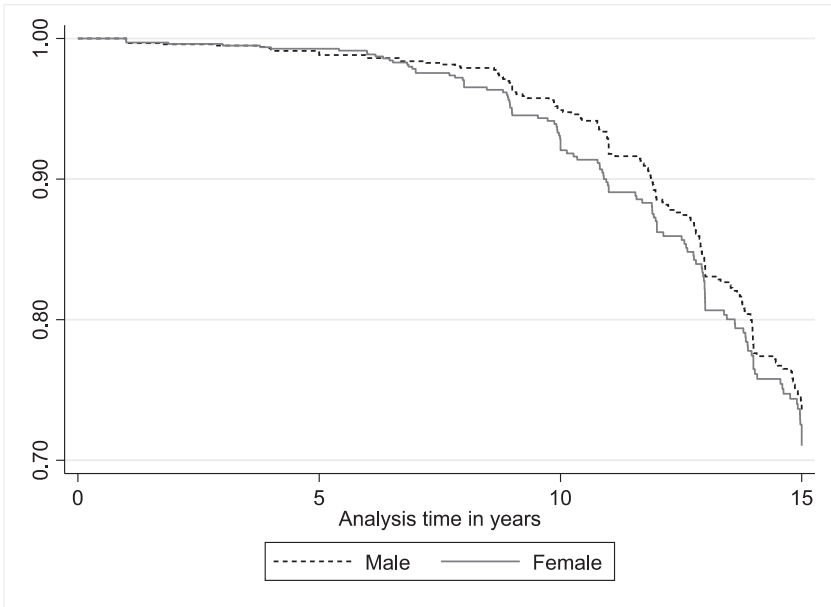


**Figure 3. Survival curve (including covariates).**
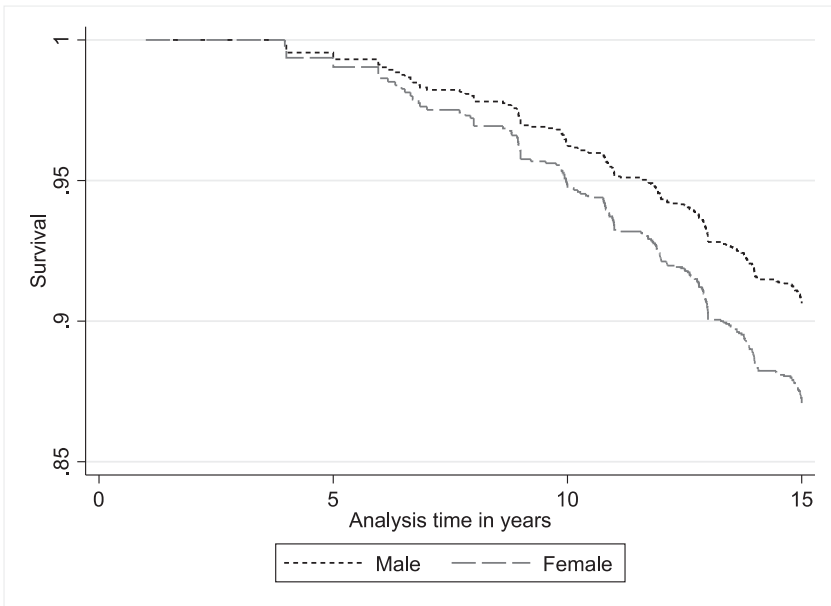
**Figure 4. Log-log plot (LML).**
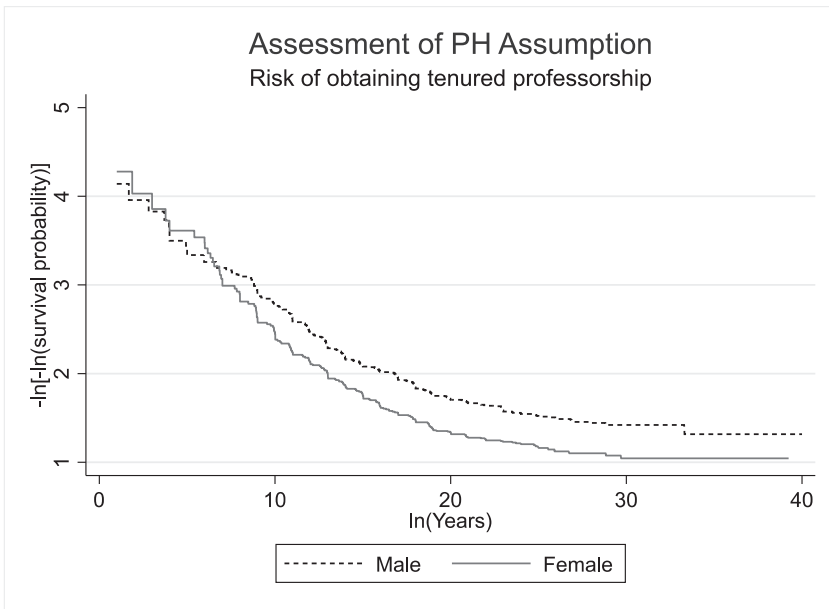


Conclusions

This study examined the chances of becoming a sociology professor in Germany. We replicated the study of Lutter and Schröder (2016), which merely used data collected in 2013. We based our analysis on their original dataset, adding two follow-up waves from 2016 and 2019. We hypothesized that the original study design was biased by neglecting academia's gendered leaky pipeline, with notably less productive or committed women leaving academia disproportionately.

Based on these assumptions, we expected that the female advantage effect of the original study was overestimated. However, our results show that the leaky pipeline cannot explain women's higher chances of gaining tenure in sociology, and nor does parenthood. Further robustness tests, which incorporated research grants, cohort effects and different types of professorships and career stages also did not lead to a significant decline of the female advantage effect. We therefore reject both of our hypotheses and conclude that selection bias is not a relevant explanation for the female advantage effect found by earlier studies. What does this mean for the current state of research?

Other studies neglected to account for a leaky pipeline effect and sampled only the remaining scientists in academia (e.g., Auspurg et al., 2017; Jungbauer-Gans/ Gross, 2013; Lutter et al., 2022). This could lead to a survivorship bias of particu- larly career-committed women. We improve on existing studies by showing that

accounting for the leaky pipeline does not change the female advantage in the German academic landscape. It remains open as to whether more extended observational periods would give us more information on this result, and whether a female advantage in hiring decisions is visible in other disciplines as well. However, the female advantage we find confirms findings from recent experimental and observational research. Besides studies on German academia (Jungbauer-Gans/Gross, 2013; Lutter/Schröder, 2016; Solga et al., 2022), Carlsson et al. (2021) and also Moratti (2021) document a higher chance for women to achieve professorship in Scandinavian countries; Ceci (2018) and Williams and Ceci (2015) found similar results for women in the natural sciences in the United States, and Bol et al. (2022) report higher funding chances for women in the Netherlands.

Our study, to the best of our knowledge, is the only one that covers comprehensive data on academic leavers in addition to successful or ongoing academic careers. Our results support the leaky pipeline hypothesis as such (Blickenstaff, 2005; Hancock et al., 2013; Joecks et al., 2014; Leemann et al., 2009; Leemann et al., 2010; Pell, 1996), yet unlike much of the preceding literature, we can show that leaving academia mainly happens at the predoc stage. Supporting our results, Jaksztat et al. (2021) have also shown that in Germany, women are more likely than men to leave academia while pursuing doctoral degrees. However, we did not find a decrease in the share of women among junior professors, a position that is relatively new in the German academic system.

While women publish less than men (e.g., Cole/Zuckerman, 1984; Schubert/Engelage, 2011; Schucan Bird, 2011), the systematic opting out of less-productive women seems not to reduce women's higher chances of becoming sociology professors, probably because male leavers are also less productive. By the time they obtain tenure, women have published less than men. One possibility for why this might be the case is that they author fewer, but more high-quality publications. This would support the claims of Fox and Mohapatra (2007), who conclude that women might be more cautious in their publishing behavior. Another explanation seems less likely, however. Some have argued that women's work is devalued relative to men's (Cohen/Huffman, 2003; Magnusson, 2008; Ochsenfeld, 2014), yet none of the interaction effects of our career variables indicate that women's achievements indeed count less than men's (similarly, see Lutter et al., 2022). The only exception is SSCI/SCIE articles, which benefit male sociologists more than female sociologists, though the difference is only significant at the 10 percent level.

It is unsurprising that women with children leave academia due to family responsibilities (e.g., Ginther/Kahn, 2009; Mason et al., 2013; Preston, 2004), while children are less of an obstacle to male careers (Lutter/Schröder, 2020; Mason et al., 2013, pp. 28, 35; Schubert/Engelage, 2010; Wolfinger et al., 2009, p. 1611). Rather than concluding that mothers have a lesser chance of gaining tenure at the time of hiring, our data suggest that mothers have an insignificantly higher and

fathers a significantly higher chance of obtaining tenure. However, our study is limited, as we cannot rely on different family types and partnership forms or on whether potential partners have children. Differences in these compositions can affect childcare and supportive factors, which in turn can affect jobs and research productivity (due to part-time positions, for example). However, our data also indicates that women leave academia disproportionately at the predoc stage, while men leave academia rather at the postdoc stage. Silander et al. (2013, pp. 184–185) draw a similar conclusion for Swedish social sciences, although more women leave academia initially, "the relationship is reversed after 10 years when more men than women in the social sciences have left academia." If this result is generalizable, and our results suggest that it is, then selectivity issues would generally be a lesser problem for studies than is commonly assumed, even in studies that rely only on one coding wave or a specific cohort of academics who already obtained their doctorate or habilitation. While future research should consider the critical question of who opts out of academia, we can conclude that it does not affect women's greater chances of becoming tenured sociology professors when they have the same characteristics as men.

Research grants increase the chances of gaining tenure, similar to related fields such as political science (Schröder et al., 2021). However, they cannot explain why women have a higher chance of reaching tenure, net of other influences. Studies have shown that women in German academia submit research proposals as often as men do, but receive less funding (Allmendinger/Hinz, 2002, but see Bol et al., 2022). According to our analyses in 2019, female professors have acquired slightly more research grants than male professors by the time they receive tenure (see Table 2). However, our results do not show that research grants affect women's chances of becoming professors differently. That our results differ from previous results may be due to our more recent data. While Allmendinger and Hinz used data from 1993 to 1999, our dataset extends to 2019. According to Allmendinger and Hinz, women's applications are concentrated in sub-disciplines, mostly gender studies. Our study is limited in that we cannot filter out sub-disciplines or consider disparities in funding volume. The specialization of women can also play a role beyond research grants; women may have a higher chance of being appointed to gender studies chairs (see also Jungbauer-Gans/Gross, 2013, p. 86). Due to multiple data collection points, we cannot test this retrospectively, but the original study suggests that accounting for gender studies chairs does not alter the female advantage (Lutter/Schröder, 2016, p. 1007).

Why then do we still find a greater chance for women to become tenured sociology professors? Possible explanations for the female advantage are affirmative action practices, the encouragement of women to apply for higher positions, mentoring programs or women's representatives. Gender equality is an explicit goal in German higher education, reflected in institutionalized and informal practices and explicitly used as a selection criterion. That universities strive for gender equality by hiring

women and men equally—irrespective of the gender proportion of applicants—might also explain why women are advantaged in getting professorships when they have the same characteristics as men. Although there are still fewer women in higher academic positions nowadays, their percentage has noticeably increased from 20 percent female professors in the social sciences in 2003 to 29 percent in 2008 and to 40 percent in 2018 (Statistisches Bundesamt, 2004, p. 81; 2009, p. 102; 2019, p. 107). The rising share of women may encourage more women to enter the academic labor market. However, little is known regarding whether social homophily is at work, i.e., whether the increasing share of women on the hiring committee leads to a higher preference for female candidates. One recent experimental study for Germany shows that women are preferred by both male and female professors when evaluating other applicants for professorships (Solga et al., 2022). A further limitation of our study is that we cannot measure what is invisible in CVs. For example, women may spend more time on administrative duties (for the US, see, e.g., Bird et al., 2004). Such administrative engagement might be considered favorably in hiring decisions. Another limitation is that our data is based on observations from university websites that may not be updated regularly. Our panel design with multiple data collection points and additional data sources at least offsets this. While there are a number of explanations that we cannot rule out, our results indicate that neither the leaky pipeline nor having children are sufficient explanations for why women are more likely to get professorships when they have the same observable characteristics as men.

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## Appendix

### Table A1: Summary of data collection

| Wave | 1 | 2 | 3 |
|---|---|---|---|
| Year | 2013 | 2016 | 2019 |
| Population | 75 sociology departments and two research institutes (sociology departments at the Max Planck Institute for the Study of Societies and the WZB Berlin Social Science Center) | 75 sociology departments and two research institutes (sociology departments at the Max Planck Institute for the Study of Societies and the WZB Berlin Social Science Center) | 75 sociology departments and two research institutes (sociology departments at the Max Planck Institute for the Study of Societies and the WZB Berlin Social Science Center) |
| Data collection from CVs | 1) Hand-coded career and publication data from CVs | 1) Updating of publications and CV data from wave 1<br><br>2) Identifying who left academia after wave 1, marking them as "leavers"<br><br>3) Identifying new academics since 2013, adding their publications and CV data to wave 2 | 1) Updating publications and CV data from wave 2<br><br>2) Identifying who left academia after wave 2, marking them as "leavers"<br><br>3) Identifying new academics since wave 2, adding their publications and CV data to wave 3 |
| Data collection of information about children | Email survey (in 2014): response rate: 60 % |  | Replication of email survey from 1st wave (response rate: 54 %; valid information for 69 % of sociologists in the data) |

| Wave | 1 | 2 | 3 |
|---|---|---|---|
| Data collection about grants | Gepris website (hand-coded data): https://gepris.dfg.de/gepris/ | Gepris website: https://gepris.dfg.de/gepris/ | Gepris website: https://gepris.dfg.de/gepris/ |
| Data collection to identify SSCI/SCIE articles | Journal Citation Report of Clarivate Analytics | Journal Citation Report of Clarivate Analytics | Journal Citation Report of Clarivate Analytics |
| Data collection to identify German universities of excellence | Ranking by the German Council of Science and Humanities in 2005 | Excellence Strategy: https://www.dfg.de/en/research_funding/excellence_strategy/index.html<br><br>14 universities (up to 2017): Rheinisch-Westfälische Technische Hochschule Aachen, Freie Universität Berlin, Humboldt-Universität zu Berlin, Universität Bremen, Technische Universität Dresden, Albert-Ludwigs-Universität Freiburg, Georg-August-Universität Göttingen, Ruprecht-Karls-Universität Heidelberg, Karlsruher Institut für Technologie (KIT), Universität zu Köln, Universität Konstanz, Technische Universität München, Ludwig-Maximilians-Universität München and Eberhard Karls Universität Tübingen. | Excellence Strategy: https://www.dfg.de/en/research_funding/excellence_strategy/index.html<br><br>14 universities (up to 2017): Rheinisch-Westfälische Technische Hochschule Aachen, Freie Universität Berlin, Humboldt-Universität zu Berlin, Universität Bremen, Technische Universität Dresden, Albert-Ludwigs-Universität Freiburg, Georg-August-Universität Göttingen, Ruprecht-Karls-Universität Heidelberg, Karlsruher Institut für Technologie (KIT), Universität zu Köln, Universität Konstanz, Technische Universität München, Ludwig-Maximilians-Universität München and Eberhard Karls Universität Tübingen. |

We adjusted the data across the data collection points. The reason for this is the "dynamic structures" of CVs. While updating CV information in 2016 and 2019, some CVs were more or less comprehensive than in 2013. While we previously included a few political scientists at social science institutes in the original study design, we made a clearer distinction between sociologists and political scientists in 2019 so that numbers of academics differ slightly.

Instead of including only articles from journals ranked in the Web of Science Social Science Citation Index (SSCI) in our measurement, we extended this category to also include those ranked in the Science Citation Index Expanded (SCIE). Although the latter is not ideal-typical for the social sciences but rather for the natural sciences (and therefore only takes into account 4 percent of the number of articles within the Web of Science), it should not be neglected.

Lutter and Schröder (2016) operationalized symbolic capital according to the prestige of the faculty to which the scientists belonged during their career, as indicated by the German Council of Science and Humanities in 2005. We used another operationalization in the new study design in 2019. In 2005, the Excellence Initiative was introduced in Germany to increase competitiveness and international visibility in German research so that certain universities were ranked as having "excellence", and got financial support. In the new analyses, we used this university status

to generate variables for "prestige graduation", "prestige doctorate", and "prestige habilitation".

Instead of coding only "*Juniorprofessuren*" introduced in Germany in 2002, we also coded equivalent assistant professorships according to US academic system.

**Table A2.1. Summary statistics (including waves 2013, 2016, 2019) at time of first appointment.**

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| Time to professorship | 396 | 15.40 | 4.84 | 3.97 | 33.31 | 12.06 | 14.98 | 18.40 |
| SSCI/SCIE articles | 396 | 4.43 | 4.24 | 0 | 28.67 | 1.15 | 3.42 | 6.33 |
| Non-SSCI/SCIE articles | 396 | 7.25 | 7.18 | 0 | 79.80 | 2.83 | 5.12 | 10 |
| Books | 396 | 2.43 | 1.99 | 0 | 22.50 | 1 | 2 | 3 |
| Edited volumes | 396 | 1.67 | 1.94 | 0 | 14.97 | 0 | 1.07 | 2.59 |
| Book chapters | 396 | 15.89 | 12.03 | 0 | 112.70 | 7.50 | 13.33 | 20.88 |
| Grey literature | 396 | 7.69 | 9.78 | 0 | 68 | 1 | 4.64 | 9.73 |
| Female | 396 | .40 | | 0 | 1 | 0 | 0 | 1 |
| Prestige graduation | 396 | .31 | | 0 | 1 | 0 | 0 | 1 |
| Prestige doctorate | 396 | .30 | | 0 | 1 | 0 | 0 | 1 |
| Prestige habilitation | 396 | .19 | | 0 | 1 | 0 | 0 | 0 |
| Awards | 396 | .39 | .96 | 0 | 9 | 0 | 0 | 0 |
| Months abroad | 396 | 21.94 | 34.07 | 0 | 216 | 0 | 10 | 26 |
| Studied abroad | 396 | .27 | | 0 | 1 | 0 | 0 | 1 |
| Doctorate abroad | 396 | .13 | | 0 | 1 | 0 | 0 | 0 |
| International publications | 396 | 11.10 | 12.89 | 0 | 75 | 2 | 7 | 16 |
| Mobility | 396 | 3.25 | 1.77 | 0 | 10 | 2 | 3 | 4 |
| Interim professor | 396 | .83 | 1.04 | 0 | 7 | 0 | 1 | 1 |
| Department size | 396 | 10.87 | 8.99 | 1 | 37 | 5 | 8 | 13 |
| Co-authors | 396 | 31.96 | 32.94 | 0 | 205 | 11.50 | 23 | 38.50 |
| Habilitation | 396 | .64 | | 0 | 1 | 0 | 1 | 1 |
| Years since habilitation | 396 | 2.02 | 2.63 | 0 | 17 | 0 | 1 | 3 |
| Assistant professor | 396 | .17 | | 0 | 1 | 0 | 0 | 0 |
| Years since assistant professor | 396 | .78 | 1.92 | 0 | 12 | 0 | 0 | 0 |
| Childless | 396 | .26 | | 0 | 1 | 0 | 0 | 1 |
| With children | 396 | .48 | | 0 | 1 | 0 | 0 | 1 |

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| No info on children | 396 | .26 | | 0 | 1 | 0 | 0 | 1 |
| DFG funding | 396 | .56 | .84 | 0 | 4 | 0 | 0 | 1 |
| Entry cohort before 1990 | 396 | .29 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort 1990–1999 | 396 | .40 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort 2000–2009 | 396 | .29 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort after 2009 | 396 | .03 | | 0 | 1 | 0 | 0 | 0 |

**Table A2.2. Only men: Summary statistics (including waves 2013, 2016, 2019) at time of first appointment.**

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| Time to professorship | 239 | 15.65 | 4.77 | 3.97 | 33.31 | 12.61 | 15.66 | 18.47 |
| SSCI/SCIE articles | 239 | 5.09 | 4.65 | 0 | 28.67 | 1.67 | 4 | 7.33 |
| Non-SSCI/SCIE articles | 239 | 8.46 | 8.13 | 0 | 79.8 | 3.4 | 6.83 | 11.29 |
| Books | 239 | 2.76 | 2.26 | 0 | 22.5 | 1 | 2.33 | 3.65 |
| Edited volumes | 239 | 1.75 | 1.88 | 0 | 11 | .40 | 1.17 | 2.90 |
| Book chapters | 239 | 17.23 | 11.70 | 0 | 55.33 | 7.83 | 15.83 | 23 |
| Grey literature | 239 | 8.77 | 10.77 | 0 | 68 | 1.67 | 5.33 | 11 |
| Prestige graduation | 239 | .31 | | 0 | 1 | 0 | 0 | 1 |
| Prestige doctorate | 239 | .30 | | 0 | 1 | 0 | 0 | 1 |
| Prestige habilitation | 239 | .24 | | 0 | 1 | 0 | 0 | 0 |
| Awards | 239 | .35 | 1.01 | 0 | 9 | 0 | 0 | 0 |
| Months abroad | 239 | 19.9 | 30.53 | 0 | 180 | 0 | 10 | 26 |
| Studied abroad | 239 | .23 | | 0 | 1 | 0 | 0 | 0 |
| Doctorate abroad | 239 | .11 | | 0 | 1 | 0 | 0 | 0 |
| International publications | 239 | 11.30 | 13.07 | 0 | 73 | 2 | 7 | 15 |
| Mobility | 239 | 3.28 | 1.78 | 0 | 10 | 2 | 3 | 4 |
| Interim professor | 239 | .85 | 1.02 | 0 | 5 | 0 | 1 | 1 |
| Department size | 239 | 11.01 | 9.21 | 1 | 37 | 5 | 8 | 13 |

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| Co-authors | 239 | 34.34 | 33.03 | 0 | 205 | 14 | 25 | 42 |
| Habilitation | 239 | .70 | | 0 | 1 | 0 | 1 | 1 |
| Years since habilitation | 239 | 2.46 | 2.85 | 0 | 17 | 0 | 2 | 4 |
| Assistant professor | 239 | .12 | | 0 | 1 | 0 | 0 | 0 |
| Years since assistant professor | 239 | .52 | 1.57 | 0 | 8 | 0 | 0 | 0 |
| Childless | 239 | .22 | | 0 | 1 | 0 | 0 | 0 |
| With children | 239 | .52 | | 0 | 1 | 0 | 1 | 1 |
| No info on children | 239 | .26 | | 0 | 1 | 0 | 0 | 1 |
| DFG funding | 239 | .53 | .85 | 0 | 4 | 0 | 0 | 1 |
| Entry cohort before 1990 | 239 | .35 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort 1990–1999 | 239 | .40 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort 2000–2009 | 239 | .24 | | 0 | 1 | 0 | 0 | 0 |
| Entry cohort after 2009 | 239 | .02 | | 0 | 1 | 0 | 0 | 0 |

**Table A2.3. Only women: Summary statistics (including waves 2013, 2016, 2019) at time of first appointment.**

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| Time to professorship | 157 | 15.01 | 4.94 | 4 | 29.70 | 11.90 | 14.76 | 18 |
| SSCI/SCIE articles | 157 | 3.43 | 3.31 | 0 | 22.16 | 1 | 2.95 | 5.17 |
| Non-SSCI/SCIE articles | 157 | 5.41 | 4.91 | 0 | 30.50 | 2.20 | 4 | 7.33 |
| Books | 157 | 1.94 | 1.36 | 0 | 10.57 | 1 | 1.67 | 2.67 |
| Edited volumes | 157 | 1.55 | 2.03 | 0 | 14.97 | 0 | 1 | 2.33 |
| Book chapters | 157 | 13.85 | 12.27 | 0 | 112.70 | 6.50 | 11 | 17.33 |
| Grey literature | 157 | 6.04 | 7.78 | 0 | 55 | 1 | 4 | 7.83 |
| Prestige graduation | 157 | .31 | | 0 | 1 | 0 | 0 | 1 |
| Prestige doctorate | 157 | .29 | | 0 | 1 | 0 | 0 | 1 |
| Prestige habilitation | 157 | .11 | | 0 | 1 | 0 | 0 | 0 |
| Awards | 157 | .45 | .87 | 0 | 5 | 0 | 0 | 1 |

| | N | Mean/Prop | SD | Min | Max | p25 | Median | p75 |
|---|---|---|---|---|---|---|---|---|
| Months abroad | 157 | 25.06 | 38.75 | 0 | 216 | 0 | 11 | 26 |
| Studied abroad | 157 | .32 | | 0 | 1 | 0 | 0 | 1 |
| Doctorate abroad | 157 | .16 | | 0 | 1 | 0 | 0 | 0 |
| International publications | 157 | 10.80 | 12.65 | 0 | 75 | 2 | 7 | 16 |
| Mobility | 157 | 3.20 | 1.76 | 0 | 9 | 2 | 3 | 4 |
| Interim professor | 157 | .81 | 1.07 | 0 | 7 | 0 | 0 | 1 |
| Department size | 157 | 10.66 | 8.66 | 1 | 37 | 5 | 8 | 13 |
| Co-authors | 157 | 28.34 | 32.59 | 0 | 197 | 9 | 19 | 32 |
| Habilitation | 157 | .54 | | 0 | 1 | 0 | 1 | 1 |
| Years since habilitation | 157 | 1.35 | 2.09 | 0 | 10 | 0 | 0 | 2 |
| Assistant professor | 157 | .25 | | 0 | 1 | 0 | 0 | 0 |
| Years since assistant professor | 157 | 1.17 | 2.31 | 0 | 12 | 0 | 0 | 0 |
| Childless | 157 | .31 | | 0 | 1 | 0 | 0 | 1 |
| With children | 157 | .43 | | 0 | 1 | 0 | 0 | 1 |
| No info on children | 157 | .25 | | 0 | 1 | 0 | 0 | 1 |
| DFG funding | 157 | .61 | .82 | 0 | 4 | 0 | 0 | 1 |
| Entry cohort before 1990 | 157 | .19 | | 0 | 1 | 0 | 0 | 0 |
| Entry cohort 1990–1999 | 157 | .41 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort 2000–2009 | 157 | .36 | | 0 | 1 | 0 | 0 | 1 |
| Entry cohort after 2009 | 157 | .04 | | 0 | 1 | 0 | 0 | 0 |

**Table A3. Stepwise Cox regression models on getting tenure (including waves 2013, 2016, 2019).**

| | (1) Controls | (2) Publications | (3) Gender | (4) Symbolic capital | (5) Transnational capital | (6) Social capital |
|---|---|---|---|---|---|---|
| SSCI/SCIE journal articles (ln) | | 1.96*** | 2.00*** | 1.94*** | 1.75*** | 1.67*** |
| | | (9.40) | (9.26) | (8.64) | (6.79) | (6.16) |
| Non-SSCI/SCIE articles (ln) | | 1.10 | 1.13 | 1.14+ | 1.15+ | 1.20* |
| | | (1.23) | (1.56) | (1.77) | (1.92) | (2.38) |
| Books (ln) | | 1.51*** | 1.59*** | 1.55*** | 1.64*** | 1.63*** |
| | | (3.57) | (3.83) | (3.60) | (4.19) | (4.20) |
| Edited volumes (ln) | | 1.40*** | 1.41*** | 1.44*** | 1.38*** | 1.36** |
| | | (3.44) | (3.45) | (3.65) | (3.42) | (3.11) |
| Book chapters (ln) | | 1.26** | 1.25** | 1.26** | 1.32** | 1.10 |
| | | (2.84) | (2.71) | (2.81) | (3.23) | (1.05) |
| Grey literature (ln) | | .90+ | .91 | .92 | .89+ | .89+ |
| | | (-1.77) | (-1.49) | (-1.44) | (-1.87) | (-1.84) |
| Female | | | 1.54*** | 1.54*** | 1.50*** | 1.46** |
| | | | (3.68) | (3.74) | (3.65) | (3.21) |
| Prestige graduation | | | | .70** | .69** | .63*** |
| | | | | (-2.80) | (-2.99) | (-3.73) |
| Prestige doctorate | | | | 1.13 | 1.17 | 1.18 |
| | | | | (.93) | (1.21) | (1.23) |
| Prestige habilitation | | | | 1.24 | 1.24 | 1.38* |
| | | | | (1.40) | (1.46) | (2.06) |
| Awards (ln) | | | | 1.29+ | 1.25+ | 1.24 |
| | | | | (1.82) | (1.66) | (1.60) |
| Months abroad (ln) | | | | | 1.19*** | 1.13** |
| | | | | | (5.04) | (3.14) |
| Studied abroad | | | | | .87 | .89 |
| | | | | | (-1.13) | (-.96) |

| | (1) Controls | (2) Publications | (3) Gender | (4) Symbolic capital | (5) Transnational capital | (6) Social capital |
|---|---|---|---|---|---|---|
| Doctorate abroad | | | | | | 1.50* (2.39) |
| International publications (ln) | | | | | 1.26 (1.50) | 1.14+ (1.86) |
| Mobility (ln) | | | | | 1.10 (1.50) | 2.45*** (8.71) |
| Interim professor (ln) | | | | | | 1.21 (1.55) |
| Department size (ln) | | | | | | 1.07 (.74) |
| Co-authors (ln) | | | | | | 1.11+ (1.75) |
| Incomplete | 1.66*** (3.74) | 2.21*** (5.59) | 2.34*** (5.59) | 2.31*** (5.51) | 2.27*** (5.83) | 2.06*** (4.88) |
| Open positions (ln) | .87 (-1.44) | .95 (-.45) | .92 (-.76) | .93 (-.66) | .88 (-1.17) | .83+ (-1.76) |
| Years since habilitation | 1.90*** (8.47) | 1.53*** (5.95) | 1.56*** (6.13) | 1.54*** (6.07) | 1.54*** (6.38) | 1.48*** (5.55) |
| Years since habilitation (sq.) | .95*** (-5.16) | .96*** (-4.11) | .96*** (-4.18) | .97*** (-4.18) | .97*** (-4.34) | .97*** (-4.22) |
| Years since assistant prof. (ln) | 3.41*** (13.15) | 2.51*** (8.72) | 2.39*** (7.88) | 2.34*** (7.33) | 2.22*** (7.29) | 2.28*** (7.85) |
| Pseudo r² | .06 | .10 | .10 | .10 | .11 | .13 |
| Log-likelihood | -2839.35 | -2737.12 | -2728.05 | -2720.38 | -2694.70 | -2643.51 |
| Degrees of freedom | 5 | 11 | 12 | 16 | 20 | 24 |
| Chi² | 280.79 | 422.22 | 410.07 | 454.43 | 618.78 | 702.52 |

| | (1) Controls | (2) Publications | (3) Gender | (4) Symbolic capital | (5) Transnational capital | (6) Social capital |
|---|---|---|---|---|---|---|
| AIC | 5688.70 | 5496.24 | 5480.11 | 5472.77 | 5429.41 | 5335.03 |
| BIC | 5732.85 | 5593.36 | 5586.06 | 5614.03 | 5605.99 | 5546.92 |
| Number of events (tenure) | 486 | 486 | 486 | 486 | 486 | 486 |
| N (persons) | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 |
| N (persons-publications) | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ p <.1, * p <.05, ** p <.01, *** p <.001.

**Table A4. Cox regression models on getting tenure, including all independent variables and additional robustness tests (including waves 2013, 2016, 2019).**

| | (1) DFG funding | (2a) Entry cohorts | (2b) Post 2013[1] | (3) Other academic positions | (4) Universities of applied sciences | (5) W3 prof. | (6) PhD | (7) Habil./ assist. prof. | (8) Tenured Professors |
|---|---|---|---|---|---|---|---|---|---|
| Female | 1.47*** (3.41) | 1.47*** (3.38) | 1.49*** (3.48) | 1.40** (2.98) | 1.44** (3.15) | 1.48** (3.16) | 1.46*** (3.32) | 1.52*** (3.35) | 1.30* (2.42) |
| DFG funding | 1.40*** (5.50) | 1.39*** (5.35) | 1.40*** (5.52) | 1.28*** (4.30) | 1.39*** (5.28) | 1.43*** (4.83) | 1.41*** (5.69) | 1.40*** (5.15) | 1.02 (.36) |
| Entry cohorts *(ref. before 1990)* | | | | | | | | | |
| 1990–1999 | | 1.02 (.11) | | 1.17 (.99) | 1.00 (-.02) | 1.02 (.10) | 1.02 (.13) | .99 (-.03) | 2.04*** (4.73) |
| 2000–2009 | | 1.07 (.39) | | 1.18 (.94) | 1.06 (.36) | .97 (-.17) | 1.11 (.64) | 1.20 (.96) | 3.91*** (6.93) |
| after 2009 | | 1.33 (.92) | | 1.48 (1.27) | 1.37 (1.01) | 1.25 (.69) | 1.65+ (1.67) | 2.10* (1.97) | 24.09*** (11.11) |

| | (1) DFG funding | (2a) Entry cohorts | (2b) Post 2013[1] | (3) Other academic positions | (4) Universities of applied sciences | (5) W3 prof. | (6) PhD | (7) Habil./ assist. prof. | (8) Tenured Professors |
|---|---|---|---|---|---|---|---|---|---|
| Post 2013 | | | .71** (-3.06) | | | | | | |
| SSCI/SCIE journal articles (ln) | 1.61*** (5.82) | 1.63*** (5.79) | 1.55*** (5.24) | 1.52*** (4.90) | 1.67*** (5.95) | 1.61*** (5.21) | 1.63*** (5.88) | 1.41*** (3.81) | 1.29*** (3.31) |
| Non-SSCI/SCIE articles (ln) | 1.25** (2.98) | 1.25** (2.93) | 1.27** (3.12) | 1.24** (2.86) | 1.24** (2.80) | 1.30** (3.17) | 1.26** (3.05) | 1.25** (2.64) | 1.12 (1.48) |
| Books (ln) | 1.55*** (3.82) | 1.56*** (3.78) | 1.51*** (3.58) | 1.54*** (3.49) | 1.52*** (3.49) | 1.56*** (3.51) | 1.51*** (3.50) | 1.28+ (1.90) | 1.32* (2.26) |
| Edited volumes (ln) | 1.35** (3.06) | 1.35** (3.06) | 1.34** (3.04) | 1.36** (3.01) | 1.30** (2.65) | 1.28* (2.30) | 1.39*** (3.34) | 1.33** (2.59) | 1.29* (2.57) |
| Book chapters (ln) | 1.05 (.54) | 1.06 (.63) | 1.02 (.17) | .99 (-.06) | 1.09 (.98) | 1.06 (.61) | 1.05 (.55) | 1.10 (.92) | .91 (-1.13) |
| Grey literature (ln) | .90+ (-1.75) | .90+ (-1.77) | .90+ (-1.73) | .87* (-2.22) | .89* (-2.00) | .93 (-1.20) | .90* (-1.87) | .91 (-1.52) | .95 (-.90) |
| Prestige graduation | .63*** (-3.70) | .63*** (-3.71) | .65*** (-3.53) | .67*** (-3.28) | .64*** (-3.64) | .62*** (-3.61) | .64*** (-3.62) | .63*** (-3.47) | .87 (-1.15) |
| Prestige doctorate | 1.14 (1.06) | 1.14 (1.03) | 1.17 (1.23) | 1.20 (1.46) | 1.17 (1.23) | 1.05 (.33) | 1.10 (.79) | 1.04 (.24) | 1.12 (.93) |
| Prestige habilitation | 1.37* (1.99) | 1.38* (2.04) | 1.31+ (1.74) | 1.59** (2.98) | 1.37+ (1.95) | 1.36+ (1.77) | 1.41* (2.17) | 1.37* (1.94) | 1.44** (2.83) |
| Awards (ln) | 1.23 (1.58) | 1.21 (1.47) | 1.27+ (1.78) | 1.19 (1.33) | 1.22 (1.53) | 1.21 (1.27) | 1.20 (1.40) | 1.22 (1.38) | 1.06 (.51) |
| Months abroad (ln) | 1.13** (3.28) | 1.13** (3.26) | 1.12** (2.92) | 1.12** (2.86) | 1.14*** (3.41) | 1.12** (2.64) | 1.13** (3.20) | 1.15** (3.13) | 1.01 (.29) |
| Studied abroad | .89 (-.92) | .89 (-.96) | .92 (-.69) | .93 (-.66) | .89 (-.95) | .89 (-.87) | .88 (-1.01) | .78+ (-1.77) | 1.14 (1.18) |

| | (1) DFG funding | (2a) Entry cohorts | (2b) Post 2013[1] | (3) Other academic positions | (4) Universities of applied sciences | (5) W3 prof. | (6) PhD | (7) Habil./ assist. prof. | (8) Tenured Professors |
|---|---|---|---|---|---|---|---|---|---|
| Doctorate abroad | 1.49* | 1.49* | 1.47* | 1.31 | 1.51* | 1.47* | 1.43* | 1.12 | 1.20 |
| | (2.35) | (2.35) | (2.24) | (1.60) | (2.44) | (2.18) | (2.15) | (.59) | (1.13) |
| International publications (ln) | 1.10 | 1.09 | 1.15* | 1.21* | 1.10 | 1.11 | 1.08 | 1.04 | 1.15+ |
| | (1.43) | (1.25) | (2.01) | (2.52) | (1.30) | (1.32) | (1.05) | (.50) | (1.91) |
| Mobility (ln) | 2.53*** | 2.52*** | 2.58*** | 2.40*** | 2.50*** | 2.49*** | 2.45*** | 2.49*** | 2.07*** |
| | (8.99) | (8.98) | (9.14) | (8.48) | (8.73) | (8.12) | (8.75) | (7.81) | (6.94) |
| Interim professor (ln) | 1.22 | 1.21 | 1.23+ | 1.31* | 1.19 | 1.19 | 1.18 | 1.02 | 1.20 |
| | (1.63) | (1.61) | (1.71) | (2.20) | (1.42) | (1.39) | (1.39) | (.12) | (1.53) |
| Department size (ln) | 1.08 | 1.08 | 1.07 | 1.08 | 1.05 | 1.08 | 1.07 | 1.01 | 1.10 |
| | (.84) | (.84) | (.79) | (.86) | (.50) | (.78) | (.77) | (.11) | (1.16) |
| Co-authors (ln) | 1.11+ | 1.11+ | 1.14* | 1.13* | 1.10 | 1.07 | 1.10 | 1.05 | 1.11+ |
| | (1.80) | (1.70) | (2.17) | (2.03) | (1.53) | (1.14) | (1.63) | (.67) | (1.71) |
| With children (ref. childless) | 1.30* | 1.29* | 1.32* | 1.25+ | 1.30* | 1.32* | 1.26+ | 1.27+ | 1.04 |
| | (2.00) | (1.99) | (2.16) | (1.72) | (2.03) | (1.98) | (1.83) | (1.66) | (.31) |
| No info on children (ref. childless) | 1.32+ | 1.32* | 1.37* | 1.33* | 1.36* | 1.39* | 1.34* | 1.33+ | 1.20 |
| | (1.95) | (1.95) | (2.18) | (2.04) | (2.11) | (2.18) | (2.06) | (1.77) | (1.38) |
| Incomplete | 2.01*** | 2.01*** | 2.03*** | 2.29*** | 1.96*** | 2.08*** | 2.04*** | 1.96*** | 2.18*** |
| | (4.85) | (4.89) | (4.82) | (6.02) | (4.63) | (4.84) | (5.05) | (4.06) | (5.51) |
| Open positions (ln) | .78* | .77* | .78* | .76* | .78* | .78* | .77* | .71** | .66*** |
| | (-2.43) | (-2.33) | (-2.29) | (-2.39) | (-2.17) | (-2.08) | (-2.32) | (-2.83) | (-3.74) |
| Years since habilitation | 1.44*** | 1.44*** | 1.42*** | 1.39*** | 1.47*** | 1.47*** | 1.43*** | 1.54*** | 1.32*** |
| | (5.41) | (5.39) | (5.29) | (7.16) | (5.45) | (4.94) | (5.36) | (5.54) | (6.53) |
| Years since habilitation (sq.) | .97*** | .97*** | .97*** | .98*** | .97*** | .97*** | .97*** | .96*** | .98*** |
| | (-4.28) | (-4.26) | (-4.24) | (-5.75) | (-4.23) | (-3.79) | (-4.27) | (-4.34) | (-5.55) |
| Years since | 2.19*** | 2.18*** | 2.27*** | 2.19*** | 2.20*** | 2.14*** | 2.15*** | 2.31*** | 1.62*** |

|  | (1) DFG funding | (2a) Entry cohorts | (2b) Post 2013[1] | (3) Other academic positions | (4) Universities of applied sciences | (5) W3 prof. | (6) PhD | (7) Habil./ assist. prof. | (8) Tenured Professors |
|---|---|---|---|---|---|---|---|---|---|
| assistant prof. (ln) | (7.76) | (7.71) | (8.25) | (7.51) | (7.74) | (6.77) | (7.70) | (7.62) | (5.29) |
| Pseudo r² | .13 | .13 | .13 | .14 | 0.14 | .13 | .13 | .12 | .10 |
| Log-likelihood | -2625.41 | -2624.97 | -2620.36 | -2552.85 | -2511.92 | -2255.00 | -2613.54 | -1839.41 | -2270.48 |
| Degrees of freedom | 27 | 30 | 28 | 30 | 30 | 30 | 30 | 30 | 30 |
| Chi² | 803.37 | 813.38 | 812.27 | 797.61 | 807.17 | 702.68 | 807.91 | 608.36 | 763.69 |
| AIC | 5304.81 | 5309.94 | 5296.73 | 5165.71 | 5083.83 | 4570.00 | 5288.09 | 3738.82 | 4600.95 |
| BIC | 5543.19 | 5574.81 | 5543.93 | 5429.07 | 5348.33 | 4833.07 | 5549.13 | 3983.40 | 4839.00 |
| Number of events (tenure) | 486 | 486 | 486 | 486 | 469 | 421 | 486 | 377 | 486 |
| N (persons) | 2,290 | 2,290 | 2,290 | 2,283 | 2,273 | 2,225 | 1,591 | 579 | 487 |
| N (persons-publications) | 50,457 | 50,457 | 50,457 | 47,989 | 49,843 | 47,525 | 45,922 | 25,662 | 20,636 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ p <.1, * p <.05, ** p <.01, *** p <.001.

[1] Alternate to entry cohorts.

**Table A5.1 Cox regression models on getting tenured (including waves 2013, 2016, 2019), including interaction terms with gender (models 1–11).**

|  | (1) Female × SSCI/SCIE publications | (2) Female × non-SSCI/SCIE publications | (3) Female × books | (4) Female × edited volumes | (5) Female × book chapters | (6) Female × grey literature | (7) Female × prestige graduation | (8) Female × prestige doctorate | (9) Female × prestige habilitation | (10) Female × awards | (11) Female × months abroad |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 1.94*** | 1.21 | 1.20 | 1.42* | 1.23 | 1.34+ | 1.39* | 1.36* | 1.40** | 1.46** | 1.42* |
|  | (3.73) | (.90) | (.80) | (2.32) | (.83) | (1.67) | (2.49) | (2.31) | (2.82) | (2.95) | (2.05) |
| SSCI/SCIE journal articles (ln) | 1.78*** | 1.63*** | 1.63*** | 1.63*** | 1.63*** | 1.63*** | 1.63*** | 1.62*** | 1.64*** | 1.63*** | 1.63*** |
|  | (5.96) | (5.78) | (5.80) | (5.78) | (5.78) | (5.80) | (5.81) | (5.73) | (5.87) | (5.79) | (5.79) |

| | (1) Female × SSCI/SCIE publications | (2) Female × non-SSCI/SCIE publications | (3) Female × books | (4) Female × edited volumes | (5) Female × book chapters | (6) Female × grey literature | (7) Female × prestige graduation | (8) Female × prestige doctorate | (9) Female × prestige habilitation | (10) Female × awards | (11) Female × months abroad |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-SSCI/SCIE articles (ln) | 1.23** | 1.20* | 1.26** | 1.25** | 1.25** | 1.25** | 1.24** | 1.25** | 1.25** | 1.25** | 1.25** |
| | (2.75) | (2.13) | (3.01) | (2.92) | (2.96) | (2.94) | (2.88) | (2.98) | (2.95) | (2.94) | (2.92) |
| Books (ln) | 1.56*** | 1.57*** | 1.46** | 1.57*** | 1.56*** | 1.56*** | 1.56*** | 1.54*** | 1.55*** | 1.56*** | 1.56*** |
| | (3.81) | (3.82) | (2.90) | (3.80) | (3.78) | (3.76) | (3.81) | (3.71) | (3.75) | (3.78) | (3.80) |
| Edited volumes (ln) | 1.36** | 1.34** | 1.36** | 1.33* | 1.35** | 1.35** | 1.35** | 1.36** | 1.35** | 1.35** | 1.35** |
| | (3.10) | (2.95) | (3.14) | (2.47) | (3.02) | (3.04) | (3.06) | (3.12) | (3.04) | (3.06) | (3.06) |
| Book chapters (ln) | 1.06 | 1.06 | 1.05 | 1.06 | 1.03 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| | (.64) | (.68) | (.55) | (.62) | (.29) | (.60) | (.67) | (.64) | (.63) | (.63) | (.63) |
| Grey literature (ln) | .89* | .90+ | .90+ | .90+ | .90+ | .88+ | .90+ | .90+ | .90+ | .90+ | .90+ |
| | (-1.87) | (-1.75) | (-1.80) | (-1.76) | (-1.75) | (-1.95) | (-1.76) | (-1.74) | (-1.68) | (-1.77) | (-1.77) |
| Prestige graduation | .63*** | .63*** | .63*** | .63*** | .63*** | .63*** | .59*** | .63*** | .62*** | .63*** | .63*** |
| | (-3.77) | (-3.74) | (-3.69) | (-3.71) | (-3.69) | (-3.72) | (-3.40) | (-3.73) | (-3.78) | (-3.69) | (-3.71) |
| Prestige doctorate | 1.14 | 1.15 | 1.13 | 1.14 | 1.15 | 1.14 | 1.14 | 1.03 | 1.14 | 1.14 | 1.14 |
| | (1.05) | (1.09) | (.97) | (1.05) | (1.08) | (1.06) | (1.07) | (.19) | (1.02) | (1.02) | (1.04) |
| Prestige habilitation | 1.37+ | 1.38* | 1.39* | 1.38* | 1.38* | 1.39* | 1.39* | 1.40* | 1.28 | 1.38* | 1.38* |
| | (1.95) | (2.05) | (2.06) | (2.04) | (2.05) | (2.06) | (2.08) | (2.14) | (1.38) | (2.01) | (2.04) |
| Awards (ln) | 1.20 | 1.22 | 1.20 | 1.21 | 1.21 | 1.21 | 1.21 | 1.20 | 1.19 | 1.19 | 1.21 |
| | (1.40) | (1.55) | (1.43) | (1.48) | (1.50) | (1.46) | (1.49) | (1.40) | (1.29) | (1.05) | (1.47) |
| Months abroad (ln) | 1.14*** | 1.14** | 1.14** | 1.13** | 1.13** | 1.14** | 1.13** | 1.14*** | 1.14*** | 1.13** | 1.13** |
| | (3.36) | (3.27) | (3.33) | (3.26) | (3.27) | (3.28) | (3.25) | (3.30) | (3.30) | (3.26) | (2.63) |
| Studied abroad | .87 | .89 | .88 | .89 | .89 | .88 | .88 | .88 | .88 | .89 | .89 |
| | (-1.10) | (-.96) | (-.99) | (-.95) | (-.95) | (-1.03) | (-1.00) | (-1.02) | (-1.07) | (-.96) | (-.93) |
| Doctorate abroad | 1.48* | 1.46* | 1.48* | 1.49* | 1.49* | 1.47* | 1.49* | 1.48* | 1.51* | 1.49* | 1.49* |
| | (2.36) | (2.23) | (2.31) | (2.36) | (2.35) | (2.28) | (2.37) | (2.34) | (2.43) | (2.36) | (2.35) |
| International publications (ln) | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 |
| | (1.17) | (1.17) | (1.19) | (1.22) | (1.20) | (1.19) | (1.23) | (1.22) | (1.13) | (1.24) | (1.24) |

| | (1) Female × SSCI/SCIE publications | (2) Female × non-SSCI/SCIE publications | (3) Female × books | (4) Female × edited volumes | (5) Female × book chapters | (6) Female × grey literature | (7) Female × prestige graduation | (8) Female × prestige doctorate | (9) Female × prestige habilitation | (10) Female × awards | (11) Female × months abroad |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobility (ln) | 2.50*** | 2.51*** | 2.52*** | 2.52*** | 2.53*** | 2.53*** | 2.52*** | 2.51*** | 2.54*** | 2.52*** | 2.51*** |
| | (8.96) | (8.93) | (9.01) | (8.96) | (8.97) | (9.03) | (8.99) | (8.93) | (9.06) | (8.98) | (8.88) |
| Interim professor (ln) | 1.23+ | 1.20 | 1.20 | 1.21 | 1.20 | 1.21 | 1.21 | 1.22 | 1.21 | 1.22 | 1.21 |
| | (1.70) | (1.49) | (1.49) | (1.60) | (1.50) | (1.58) | (1.56) | (1.63) | (1.59) | (1.62) | (1.61) |
| Department size (ln) | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.07 |
| | (.87) | (.91) | (.88) | (.84) | (.85) | (0.89) | (.85) | (.89) | (.89) | (.83) | (.82) |
| Co-authors (ln) | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ | 1.11+ |
| | (1.77) | (1.70) | (1.73) | (1.70) | (1.72) | (1.68) | (1.68) | (1.77) | (1.70) | (1.69) | (1.66) |
| With children (ref. childless) | 1.29* | 1.31* | 1.31* | 1.30* | 1.30* | 1.30* | 1.29* | 1.29* | 1.29+ | 1.29* | 1.29* |
| | (2.00) | (2.06) | (2.07) | (2.02) | (2.05) | (2.04) | (1.99) | (1.98) | (1.95) | (1.99) | (1.99) |
| No info on children (ref. childless) | 1.32* | 1.32+ | 1.32* | 1.32* | 1.33* | 1.32* | 1.32* | 1.32* | 1.31* | 1.32* | 1.32* |
| | (1.96) | (1.95) | (1.97) | (1.95) | (1.97) | (1.94) | (1.93) | (1.96) | (1.92) | (1.95) | (1.96) |
| DFG funding | 1.39*** | 1.40*** | 1.40*** | 1.39*** | 1.39*** | 1.39*** | 1.39*** | 1.40*** | 1.40*** | 1.39*** | 1.40*** |
| | (5.32) | (5.45) | (5.42) | (5.34) | (5.37) | (5.37) | (5.33) | (5.40) | (5.49) | (5.30) | (5.36) |
| Entry cohorts (ref. before 1990) | | | | | | | | | | | |
| >1991–1999 | 1.02 | 1.02 | 1.00 | 1.02 | 1.02 | 1.03 | 1.02 | 1.02 | 1.00 | 1.02 | 1.02 |
| | (.16) | (.15) | (.03) | (.14) | (.13) | (.17) | (.16) | (.11) | (.03) | (.11) | (.13) |
| 2000–2009 | 1.07 | 1.08 | 1.06 | 1.07 | 1.07 | 1.07 | 1.08 | 1.07 | 1.07 | 1.07 | 1.07 |
| | (.39) | (.43) | (.36) | (.42) | (.41) | (.42) | (.44) | (.40) | (.39) | (.39) | (.41) |
| after 2009 | 1.34 | 1.36 | 1.34 | 1.34 | 1.35 | 1.34 | 1.34 | 1.35 | 1.34 | 1.33 | 1.33 |
| | (.96) | (.99) | (.96) | (.95) | (.97) | (.95) | (.95) | (.98) | (.95) | (.92) | (.93) |
| Incomplete | 2.01*** | 1.99*** | 2.00*** | 2.01*** | 2.00*** | 2.00*** | 2.03*** | 2.03*** | 2.01*** | 2.01*** | 2.01*** |
| | (4.98) | (4.77) | (4.79) | (4.90) | (4.80) | (4.83) | (5.02) | (5.00) | (4.93) | (4.91) | (4.89) |
| Open positions (ln) | .77* | .77* | .77* | .77* | .77* | .77* | .77* | .77* | .77* | .77* | .77* |
| | (-2.37) | (-2.30) | (-2.31) | (-2.33) | (-2.33) | (-2.33) | (-2.29) | (-2.29) | (-2.33) | (-2.33) | (-2.33) |

| | (1) Female × SSCI/SCIE publications | (2) Female × non-SSCI/SCIE publications | (3) Female × books | (4) Female × edited volumes | (5) Female × book chapters | (6) Female × grey literature | (7) Female × prestige graduation | (8) Female × prestige doctorate | (9) Female × prestige habilitation | (10) Female × awards | (11) Female × months abroad |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Years since habil. | 1.43*** | 1.45*** | 1.44*** | 1.44*** | 1.45*** | 1.44*** | 1.44*** | 1.44*** | 1.44*** | 1.44*** | 1.44*** |
| | (5.34) | (5.47) | (5.43) | (5.40) | (5.46) | (5.43) | (5.41) | (5.39) | (5.44) | (5.39) | (5.40) |
| Years since habil. (sq.) | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** | .97*** |
| | (-4.24) | (-4.32) | (-4.28) | (-4.25) | (-4.30) | (-4.27) | (-4.28) | (-4.28) | (-4.31) | (-4.25) | (-4.26) |
| Years since assistant prof. (ln) | 2.23*** | 2.19*** | 2.19*** | 2.18*** | 2.18*** | 2.18*** | 2.20*** | 2.21*** | 2.21*** | 2.18*** | 2.18*** |
| | (7.99) | (7.69) | (7.88) | (7.67) | (7.68) | (7.67) | (7.93) | (7.98) | (7.94) | (7.70) | (7.70) |
| Female × SSCI/SCIE journal articles (ln) | .79+ | | | | | | | | | | |
| | (-1.83) | | | | | | | | | | |
| Female × non-SSCI/SCIE articles (ln) | | 1.13 | | | | | | | | | |
| | | (1.04) | | | | | | | | | |
| Female × books (ln) | | | 1.24 | | | | | | | | |
| | | | (1.03) | | | | | | | | |
| Female × edited volumes (ln) | | | | 1.05 | | | | | | | |
| | | | | (.28) | | | | | | | |
| Female × book chapters (ln) | | | | | 1.08 | | | | | | |
| | | | | | (.71) | | | | | | |
| Female × grey literature (ln) | | | | | | 1.07 | | | | | |
| | | | | | | (.56) | | | | | |
| Female × prestige graduation | | | | | | | 1.21 | | | | |
| | | | | | | | (.82) | | | | |
| Female × prestige doctorate | | | | | | | | 1.28 | | | |
| | | | | | | | | (1.11) | | | |
| Female × prestige habilitation | | | | | | | | | 1.37 | | |
| | | | | | | | | | (1.08) | | |
| Female × awards (ln) | | | | | | | | | | 1.04 | |
| | | | | | | | | | | (.15) | |

| | (1) Female × SSCI/SCIE publications | (2) Female × non-SSCI/SCIE publications | (3) Female × books | (4) Female × edited volumes | (5) Female × book chapters | (6) Female × grey literature | (7) Female × prestige graduation | (8) Female × prestige doctorate | (9) Female × prestige habilitation | (10) Female × awards | (11) Female × months abroad |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female × months abroad (ln) | | | | | | | | | | | 1.02 |
| | | | | | | | | | | | (.26) |
| Pseudo r² | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 |
| Log-likelihood | -2623.09 | -2624.36 | -2624.37 | -2624.93 | -2624.69 | -2624.76 | -2624.56 | -2624.29 | -2624.32 | -2624.96 | -2624.94 |
| Degrees of freedom | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Chi² | 823.07 | 813.18 | 823.45 | 817.77 | 813.80 | 814.56 | 820.27 | 816.03 | 829.56 | 815.32 | 815.33 |
| AIC | 5308.17 | 5310.72 | 5310.74 | 5311.85 | 5311.38 | 5311.51 | 5311.13 | 5310.58 | 5310.64 | 5311.92 | 5311.87 |
| BIC | 5581.87 | 5584.42 | 5584.44 | 5585.55 | 5585.07 | 5585.21 | 5584.82 | 5584.27 | 5584.34 | 5585.61 | 5585.57 |
| Number of events (tenure) | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 |
| N (persons) | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 |
| N (persons-publications) | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ p <.1, * p <.05, ** p <.01, *** p <.001.

**Table A5.2 Cox regression models on getting tenured (including waves 2013, 2016, 2019), including interaction terms with gender (models 12–21).**

| | (12) Female × studied abroad | (13) Female × doctorate abroad | (14) Female × international publications | (15) Female × mobility | (16) Female × interim professorships | (17) Female × department size | (18) Female × co-authors | (19) Female × children | (20) Female × DFG funding | (21) Female × entry cohorts |
|---|---|---|---|---|---|---|---|---|---|---|
| Female | 1.41** | 1.41** | 1.82** | 1.51 | 1.45** | 1.94 | 1.61+ | 1.42 | 1.42** | 1.41 |
| | (2.69) | (2.76) | (3.08) | (1.54) | (2.83) | (1.59) | (1.90) | (1.60) | (2.77) | (1.29) |
| SSCI/SCIE journal articles (ln) | 1.63*** | 1.63*** | 1.62*** | 1.63*** | 1.63*** | 1.62*** | 1.63*** | 1.63*** | 1.63*** | 1.63*** |
| | (5.81) | (5.79) | (5.75) | (5.79) | (5.79) | (5.75) | (5.79) | (5.81) | (5.79) | (5.76) |

| | (12) Female × studied abroad | (13) Female × doctorate abroad | (14) Female × international publications | (15) Female × mobility | (16) Female × interim professorships | (17) Female × department size | (18) Female × co-authors | (19) Female × children | (20) Female × DFG funding | (21) Female × entry cohorts |
|---|---|---|---|---|---|---|---|---|---|---|
| Non-SSCI/SCIE articles (ln) | 1.25** (2.95) | 1.24** (2.80) | 1.25** (2.90) | 1.25** (2.94) | 1.25** (2.93) | 1.24** (2.89) | 1.25** (2.91) | 1.25** (2.90) | 1.25** (2.96) | 1.25** (2.92) |
| Books (ln) | 1.56*** (3.78) | 1.56*** (3.79) | 1.55*** (3.76) | 1.56*** (3.78) | 1.56*** (3.78) | 1.56*** (3.76) | 1.56*** (3.79) | 1.56*** (3.79) | 1.56*** (3.78) | 1.55*** (3.72) |
| Edited volumes (ln) | 1.35** (3.08) | 1.35** (3.04) | 1.36** (3.11) | 1.35** (3.06) | 1.35* (3.06) | 1.36** (3.12) | 1.35** (3.06) | 1.34** (2.98) | 1.35** (3.03) | 1.35** (3.09) |
| Book chapters (ln) | 1.06 (.63) | 1.06 (.65) | 1.06 (.63) | 1.06 (.62) | 1.06 (.60) | 1.06 (.63) | 1.06 (.61) | 1.06 (.68) | 1.05 (.59) | 1.06 (.63) |
| Grey literature (ln) | .90+ (-1.86) | .90* (-1.82) | .90+ (-1.75) | .90+ (-1.77) | .90+ (-1.76) | .90+ (-1.79) | .90* (-1.77) | .90+ (-1.80) | .90+ (-1.76) | .90+ (-1.76) |
| Prestige graduation | .63*** (-3.72) | .63*** (-3.66) | .63*** (-3.72) | .63*** (-3.72) | .63*** (-3.70) | .63*** (-3.66) | .63*** (-3.69) | .63*** (-3.74) | .63*** (-3.72) | .63*** (-3.68) |
| Prestige doctorate | 1.14 (1.03) | 1.13 (.97) | 1.13 (.95) | 1.14 (1.03) | 1.14 (1.03) | 1.14 (1.00) | 1.13 (.99) | 1.15 (1.07) | 1.14 (1.04) | 1.14 (1.03) |
| Prestige habilitation | 1.37* (1.97) | 1.40* (2.09) | 1.40* (2.09) | 1.38* (2.04) | 1.38* (2.05) | 1.38* (2.01) | 1.39* (2.05) | 1.39* (2.05) | 1.39* (2.06) | 1.38* (2.01) |
| Awards (ln) | 1.21 (1.48) | 1.21 (1.48) | 1.21 (1.49) | 1.21 (1.46) | 1.21 (1.49) | 1.22 (1.54) | 1.21 (1.47) | 1.21 (1.49) | 1.20 (1.41) | 1.21 (1.46) |
| Months abroad (ln) | 1.14*** (3.34) | 1.13** (3.28) | 1.14*** (3.31) | 1.13** (3.25) | 1.13** (3.28) | 1.13** (3.27) | 1.14** (3.26) | 1.13** (3.29) | 1.14** (3.28) | 1.13** (3.26) |
| Studied abroad | .83 (-1.20) | .89 (-.91) | .88 (-1.02) | .89 (-.97) | .89 (-.97) | .89 (-.95) | .89 (-.97) | .89 (-.99) | .89 (-.96) | .89 (-.96) |
| Doctorate abroad | 1.49* (2.36) | 1.30 (1.24) | 1.48* (2.34) | 1.49* (2.35) | 1.48* (2.35) | 1.48* (2.32) | 1.48* (2.35) | 1.50* (2.42) | 1.49* (2.37) | 1.49* (2.37) |
| International publications (ln) | 1.09 (1.24) | 1.10 (1.27) | 1.15+ (1.69) | 1.10 (1.25) | 1.09 (1.22) | 1.10 (1.28) | 1.09 (1.24) | 1.10 (1.26) | 1.09 (1.23) | 1.09 (1.24) |

| | (12) Female × studied abroad | (13) Female × doctorate abroad | (14) Female × international publications | (15) Female × mobility | (16) Female × interim professorships | (17) Female × department size | (18) Female × co-authors | (19) Female × children | (20) Female × DFG funding | (21) Female × entry cohorts |
|---|---|---|---|---|---|---|---|---|---|---|
| Mobility (ln) | 2.52*** (9.04) | 2.50*** (8.91) | 2.51*** (8.99) | 2.54*** (7.41) | 2.52*** (8.97) | 2.52*** (8.98) | 2.51*** (8.96) | 2.51*** (8.89) | 2.52*** (8.96) | 2.51*** (8.86) |
| Interim professor (ln) | 1.21 (1.59) | 1.21 (1.56) | 1.23+ (1.72) | 1.21 (1.62) | 1.20 (1.29) | 1.22+ (1.65) | 1.22 (1.64) | 1.21 (1.59) | 1.21 (1.60) | 1.22 (1.63) |
| Department size (ln) | 1.07 (.82) | 1.08 (.83) | 1.08 (.89) | 1.08 (.85) | 1.08 (.84) | 1.13 (1.24) | 1.08 (.84) | 1.08 (.84) | 1.08 (.85) | 1.08 (.85) |
| Co-authors (ln) | 1.11+ (1.71) | 1.11+ (1.67) | 1.11+ (1.73) | 1.11+ (1.69) | 1.11+ (1.70) | 1.11+ (1.68) | 1.12 (1.63) | 1.11+ (1.69) | 1.11+ (1.69) | 1.11+ (1.69) |
| With children (ref. childless) | 1.29* (1.99) | 1.29+ (1.94) | 1.30* (2.04) | 1.29* (1.98) | 1.30* (2.00) | 1.29* (1.98) | 1.29* (1.99) | 1.30 (1.62) | 1.30* (2.02) | 1.29* (1.99) |
| No info on children (ref. childless) | 1.32+ (1.94) | 1.33* (1.99) | 1.32* (1.96) | 1.32* (1.96) | 1.32* (1.97) | 1.31+ (1.91) | 1.32* (1.96) | 1.23 (1.13) | 1.33* (1.98) | 1.32* (1.95) |
| DFG funding | 1.40*** (5.36) | 1.40*** (5.42) | 1.39*** (5.29) | 1.40*** (5.37) | 1.39*** (5.33) | 1.39*** (5.30) | 1.40*** (5.35) | 1.39*** (5.34) | 1.37*** (3.89) | 1.39*** (5.35) |
| Entry cohorts (ref. before 1990) | | | | | | | | | | |
| 1991–1999 | 1.02 (.13) | 1.03 (.18) | 1.01 (.05) | 1.02 (.12) | 1.02 (.13) | 1.02 (.11) | 1.02 (.11) | 1.01 (.09) | 1.02 (.14) | 1.00 (.00) |
| 2000–2009 | 1.07 (.40) | 1.08 (.45) | 1.06 (.36) | 1.07 (.39) | 1.07 (.41) | 1.06 (.37) | 1.07 (.38) | 1.07 (.39) | 1.07 (.41) | 1.05 (.26) |
| after 2009 | 1.33 (.93) | 1.32 (.90) | 1.32 (.91) | 1.33 (.92) | 1.33 (.93) | 1.33 (.93) | 1.33 (.92) | 1.33 (.92) | 1.34 (.95) | 1.39 (.84) |
| Incomplete | 2.01*** (4.85) | 2.01*** (4.90) | 2.05*** (5.05) | 2.01*** (4.89) | 2.01*** (4.89) | 2.03*** (4.96) | 2.02*** (4.94) | 2.02*** (4.97) | 2.02*** (4.91) | 2.01*** (4.96) |
| Open positions (ln) | .77* (-2.36) | .77* (-2.33) | .77* (-2.37) | .77* (-2.33) | .77* (-2.32) | .77* (-2.31) | .77* (-2.33) | .77* (-2.30) | .77* (-2.30) | .77* (-2.31) |

| | (12) Female × studied abroad | (13) Female × doctorate abroad | (14) Female × international publications | (15) Female × mobility | (16) Female × interim professorships | (17) Female × department size | (18) Female × co-authors | (19) Female × children | (20) Female × DFG funding | (21) Female × entry cohorts |
|---|---|---|---|---|---|---|---|---|---|---|
| Years since habil. | 1.44*** (5.38) | 1.44*** (5.42) | 1.44*** (5.36) | 1.44*** (5.37) | 1.44*** (5.37) | 1.44*** (5.40) | 1.44*** (5.38) | 1.44*** (5.37) | 1.44*** (5.38) | 1.44*** (5.42) |
| Years since habil. (sq.) | .97*** (-4.23) | .97*** (-4.28) | .97*** (-4.24) | .97*** (-4.26) | .97*** (-4.25) | .97*** (-4.27) | .97*** (-4.25) | .97*** (-4.25) | .97*** (-4.24) | .97*** (-4.27) |
| Years since assistant prof. (ln) | 2.17*** (7.67) | 2.19*** (7.66) | 2.21*** (7.94) | 2.18*** (7.75) | 2.19*** (7.71) | 2.18*** (7.63) | 2.18*** (7.72) | 2.19*** (7.75) | 2.18*** (7.70) | 2.18*** (7.69) |
| Female × studies abroad | 1.17 (.67) | | | | | | | | | |
| Female × doctorate abroad | | 1.33 (.95) | | | | | | | | |
| Female × international publications (ln) | | | .89 (-1.28) | | | | | | | |
| Female × mobility (ln) | | | | .98 (-.12) | | | | | | |
| Female × interim professor (ln) | | | | | 1.03 (.16) | | | | | |
| Female × department size | | | | | | .88 (-.69) | | | | |
| Female × co-authors (ln) | | | | | | | .97 (-.38) | | | |
| Female × with children | | | | | | | | .97 (-.13) | | |
| Female × no info on children | | | | | | | | 1.21 (.65) | | |
| Female × DFG funding | | | | | | | | | 1.06 (.51) | |

| | (12) Female × studied abroad | (13) Female × doctorate abroad | (14) Female × international publications | (15) Female × mobility | (16) Female × interim professorships | (17) Female × department size | (18) Female × co-authors | (19) Female × children | (20) Female × DFG funding | (21) Female × entry cohorts |
|---|---|---|---|---|---|---|---|---|---|---|
| Female × entry cohorts | | | | | | | | | | |
| *(ref. before 1990)* | | | | | | | | | | |
| 1990–1999 | | | | | | | | | | 1.06 |
| | | | | | | | | | | (.17) |
| 2000–2009 | | | | | | | | | | 1.06 |
| | | | | | | | | | | (.18) |
| after 2009 | | | | | | | | | | .94 |
| | | | | | | | | | | (-.12) |
| Pseudo r² | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 | .13 |
| Log-likelihood | -2624.71 | -2624.43 | -2624.09 | -2624.96 | -2624.95 | -2624.61 | -2624.89 | -2624.50 | -2624.85 | -2624.92 |
| Degrees of freedom | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 32 | 31 | 33 |
| Chi² | 818.11 | 817.27 | 813.34 | 812.73 | 819.39 | 813.00 | 812.93 | 816.63 | 824.89 | 825.32 |
| AIC | 5311.43 | 5310.85 | 5310.19 | 5311.93 | 5311.91 | 5311.23 | 5311.79 | 5312.99 | 5311.71 | 5315.84 |
| BIC | 5585.12 | 5584.55 | 5583.88 | 5585.62 | 5585.60 | 5584.92 | 5585.48 | 5595.51 | 5585.40 | 5607.20 |
| Number of events (tenure) | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 |
| N (persons) | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 | 2,290 |
| N (persons-publications) | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 | 50,457 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ p <.1, * p <.05, ** p <.01, *** p <.001.

**Table A6. Cox regression models on getting tenured (interactions between important tenure criteria, separately for women and men).**

| | (1) SSCI/SCIE article × DFG funding (women) | (2) SSCI/SCIE article × DFG funding (men) | (3) SSCI/SCIE article × Prestige doctorate (women) | (4) SSCI/SCIE article × Prestige doctorate (men) |
|---|---|---|---|---|
| **Conditional effect** | | | | |
| SSCI/SCIE journal articles (ln) | 1.50* | 2.00*** | 1.13 | 1.81*** |
| | (2.47) | (5.66) | (.77) | (4.97) |
| DFG funding | 1.94** | 1.58* | 1.56*** | 1.34*** |
| | (3.23) | (2.29) | (4.36) | (3.48) |
| Prestige doctorate | 1.28 | 1.03 | .62 | .75 |
| | (1.22) | (.16) | (-1.43) | (-.92) |
| **Interaction effect** | | | | |
| DFG funding × | .85 | .91 | | |
| SSCI/SCIE journal articles (ln) | (-1.28) | (-.95) | | |
| Prestige doctorate × | | | 1.96** | 1.26 |
| SSCI/SCIE journal articles (ln) | | | (2.70) | (1.14) |
| Non-SSCI/SCIE articles (ln) | 1.40* | 1.18+ | 1.45** | 1.17+ |
| | (2.36) | (1.70) | (2.64) | (1.65) |
| Books (ln) | 1.57* | 1.51** | 1.57* | 1.55** |
| | (2.07) | (2.85) | (2.06) | (3.08) |
| Edited volumes (ln) | 1.30 | 1.40** | 1.25 | 1.39** |
| | (1.38) | (2.79) | (1.25) | (2.71) |
| Book chapters (ln) | 1.19 | 1.01 | 1.16 | 1.03 |
| | (1.08) | (.07) | (.94) | (.28) |
| Grey literature (ln) | .91 | .86* | .93 | .86* |
| | (-.72) | (-2.36) | (-.57) | (-2.26) |
| Prestige graduation | .67+ | .60** | .71 | .60** |
| | (-1.92) | (-3.18) | (-1.61) | (-3.17) |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | SSCI/SCIE article × DFG funding | SSCI/SCIE article × DFG funding | SSCI/SCIE article × Prestige doctorate | SSCI/SCIE article × Prestige doctorate |
| | (women) | (men) | (women) | (men) |
| Prestige habilitation | 1.55 | 1.39+ | 1.64+ | 1.39+ |
| | (1.53) | (1.75) | (1.77) | (1.71) |
| Awards (ln) | 1.22 | 1.07 | 1.26 | 1.09 |
| | (.91) | (.36) | (1.07) | (.49) |
| Months abroad (ln) | 1.18* | 1.16** | 1.19** | 1.16** |
| | (2.47) | (2.84) | (2.68) | (2.89) |
| Studied abroad | 1.02 | .77 | 1.01 | .77 |
| | (.11) | (-1.54) | (.03) | (-1.50) |
| Doctorate abroad | 2.44*** | 1.09 | 2.46*** | 1.12 |
| | (3.39) | (.38) | (3.53) | (.47) |
| International publications (ln) | .98 | 1.11 | 1.01 | 1.11 |
| | (-.18) | (1.07) | (.05) | (1.11) |
| Mobility (ln) | 2.38*** | 2.57*** | 2.27*** | 2.57*** |
| | (5.13) | (7.22) | (4.87) | (7.25) |
| Interim professor (ln) | 1.10 | 1.25 | 1.03 | 1.28 |
| | (.43) | (1.48) | (.13) | (1.63) |
| Department size (ln) | .92 | 1.21+ | .90 | 1.19+ |
| | (-.55) | (1.82) | (-.74) | (1.66) |
| Co-authors (ln) | 1.16 | 1.10 | 1.19+ | 1.10 |
| | (1.57) | (1.17) | (1.86) | (1.16) |
| Incomplete | 2.61*** | 1.82*** | 2.83*** | 1.86*** |
| | (3.57) | (3.71) | (4.06) | (3.92) |
| Open positions (ln) | .67* | .83 | .66* | .82 |
| | (-2.34) | (-1.34) | (-2.43) | (-1.43) |
| Years since habilitation | 1.97*** | 1.31*** | 1.94*** | 1.31*** |
| | (6.12) | (4.03) | (5.92) | (3.76) |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | SSCI/SCIE article × DFG funding | SSCI/SCIE article × DFG funding | SSCI/SCIE article × Prestige doctorate | SSCI/SCIE article × Prestige doctorate |
| | (women) | (men) | (women) | (men) |
| Years since habilitation (sq.) | .94*** | .98*** | .94*** | .98** |
| | (-4.52) | (-3.70) | (-4.28) | (-3.24) |
| Years since assistant prof. (ln) | 2.55*** | 2.15*** | 2.66*** | 2.13*** |
| | (7.17) | (5.34) | (7.78) | (5.15) |
| With children | 1.14 | 1.32+ | 1.17 | 1.32+ |
| (ref. childless) | (.63) | (1.69) | (.73) | (1.70) |
| No info on children | 1.54* | 1.24 | 1.53+ | 1.24 |
| (ref. childless) | (1.97) | (1.17) | (1.95) | (1.17) |
| 1990–1999 | 1.25 | 1.01 | 1.24 | 1.03 |
| (ref. <1990) | (.76) | (.05) | (.73) | (.15) |
| 2000–2009 | 1.44 | 1.02 | 1.30 | 1.03 |
| (ref. <1990) | (1.13) | (.11) | (.83) | (.14) |
| >2009 | 1.92 | 1.31 | 1.74 | 1.34 |
| (ref. <1990) | (1.38) | (.64) | (1.16) | (.70) |
| Pseudo r² | .18 | .14 | .18 | .14 |
| Log-likelihood | -842.94 | -1439.19 | -840.01 | -1438.82 |
| Degrees of freedom | 30 | 30 | 30 | 30 |
| Chi² | 419.08 | 517.75 | 428.66 | 507.04 |
| AIC | 1745.89 | 2938.38 | 1740.01 | 2937.63 |
| BIC | 1980.16 | 3189.82 | 1974.28 | 3189.08 |
| Number of events (tenure) | 191 | 295 | 191 | 295 |
| N (persons) | 1,063 | 1,230 | 1,063 | 1,230 |
| N (persons-publications) | 18,197 | 32,260 | 18,197 | 32,260 |

Exponentiated coefficients (hazard ratios); t statistics in parentheses; ln = logged values; sq = squared.

+ p <.1, * p <.05, ** p <.01, *** p <.001.