



Career after your PhD – Academia, Industry or Science Management

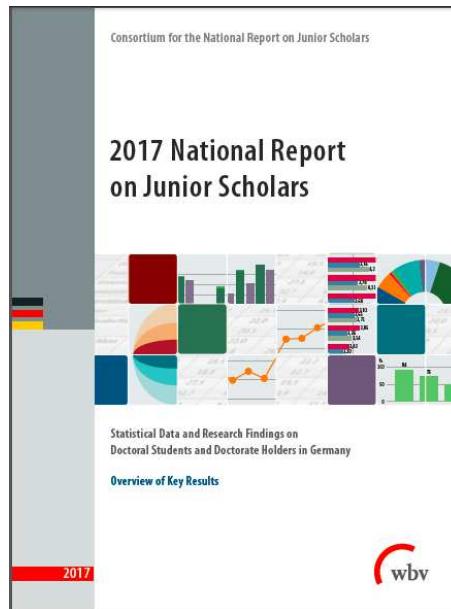
Joint Career Days

Hamburg, 23rd/24th November 2017
Antje Wegner, DZHW

16.02.2017 | PRESSEMITTEILUNG: 015/2017

Wissenschaftliche Karrieren werden immer attraktiver

Dritter "Bundesbericht Wissenschaftlicher Nachwuchs" veröffentlicht / Wanka: "Investitionen in wissenschaftliche Nachwuchskräfte zahlen sich aus"



The Life Scientist Bubble

By Victoria Doronina | Aug. 28, 2013, 1:45 PM

Learning to Live Outside of the Academic Bubble

by Albert May 12, 2014 0 comments

Life at the Bottleneck

By Ruth Müller | Oct. 26, 2012, 8:00 AM

21. März 2017

Ein Flaschenhals, der (vielleicht) gar nicht existiert

Es gebe zu wenige Professorenstellen für qualifizierte Nachwuchswissenschaftler, heißt es immer. Plausible Schätzungen kommen zu einem anderen Ergebnis. Ein Gastbeitrag von Karl Ulrich Mayer.



NICHT ALLE KLAGEN, die über die Arbeitsbedingungen junger Wissenschaftler erhoben werden, sind berechtigt. Zum Beispiel die, dass „Nachwuchs“-WissenschaftlerInnen mehr als acht Stunden am Tag und mehr als 40 Stunden in der Woche arbeiten, und wohl auch nicht, dass Promovierende neben ihrer Dissertationsarbeit noch lehren und Arbeiten in Projekten übernehmen. Andere Beschwerden hingegen kann man gar nicht oft genug wiederholen. Dass die Arbeitsverträge in der Promotions- und Postdocphase immer noch viel zu kurz befristet sind etwa.

Das eigentliche Skandalon wäre jedoch, wenn junge WissenschaftlerInnen, die den mühsamen Weg der Qualifizierung, der Publikationen und Konferenzarbeit hinter

Key questions

- How do careers in and outside academia differ?
- Where are PhD holders employed?
- How common is sectoral mobility in career trajectories?
- Which signals and competencies are required for careers (outside higher education sector)?
- What is a career in science management about?
- How do PhD holders assess jobs in different sectors?

How do careers in and outside academia differ?

- Orientation framework: organisation vs. scientific community/external networks
 - Institutionalized patterns and degree of formalisation of a career pathway
 - Performance measurement and – assessment
 - Employment conditions and autonomy
- Is there a trend towards convergence?

PhD as signaling mechanism

- ~ 28,000 completed dissertations in Germany in 2014
- High proportion of graduates obtains PhD compared to other countries
- Proporation of PhD/labour force and country's R&D intensity only weakly associated (CDH 2013)
- University degree hardly unfolds signal effect on labour market
- In a bureaucracy without elite HEI PhD serves as surrogate (Franck 2005)

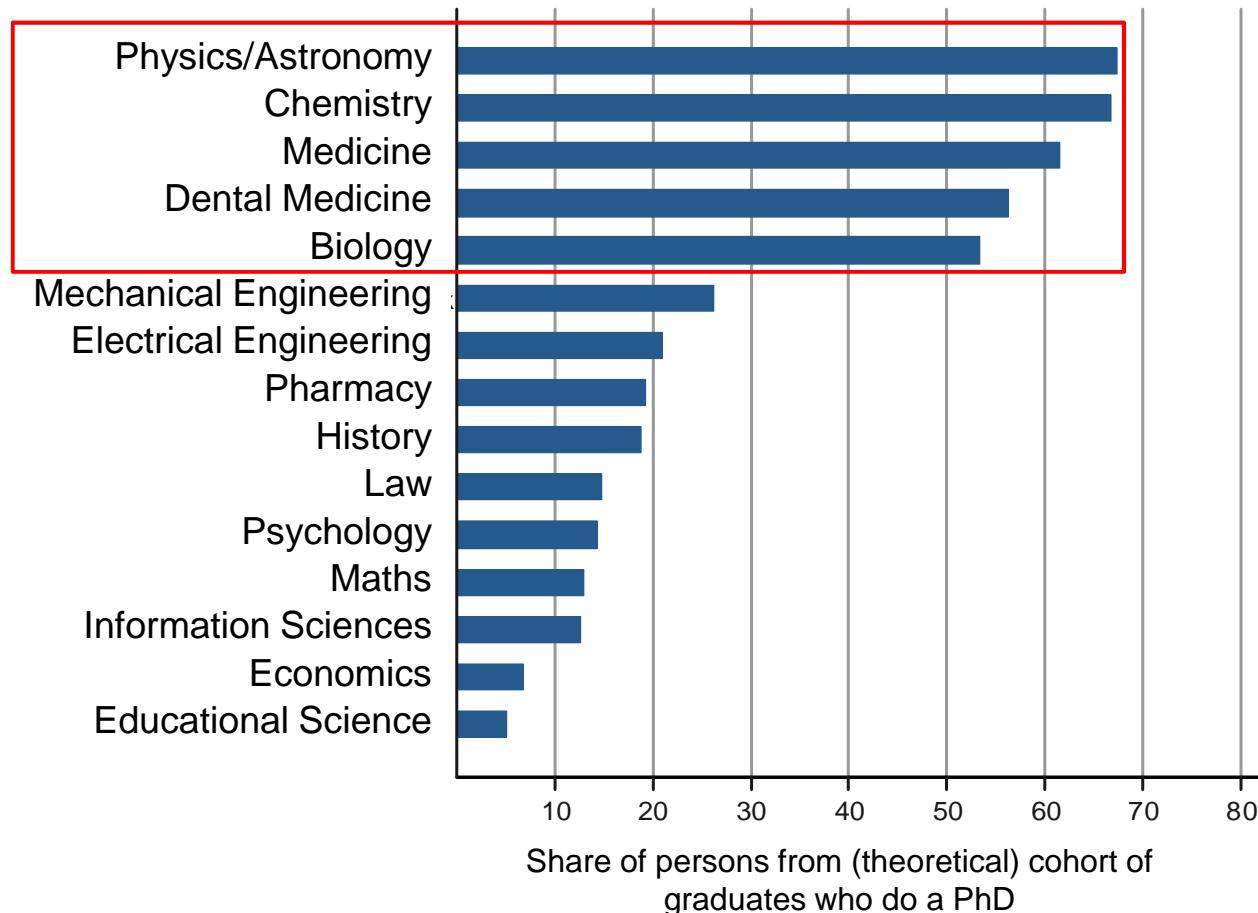
Share of top managers according to educational attainment in %

	US	France	Germany
University degree	98	97	95
PhD	6	4	59

Source: Franck/Opitz 2004

Selection processes differ across research fields

Inclination of graduates to do a PhD across 15 fields of study (2010, in %)

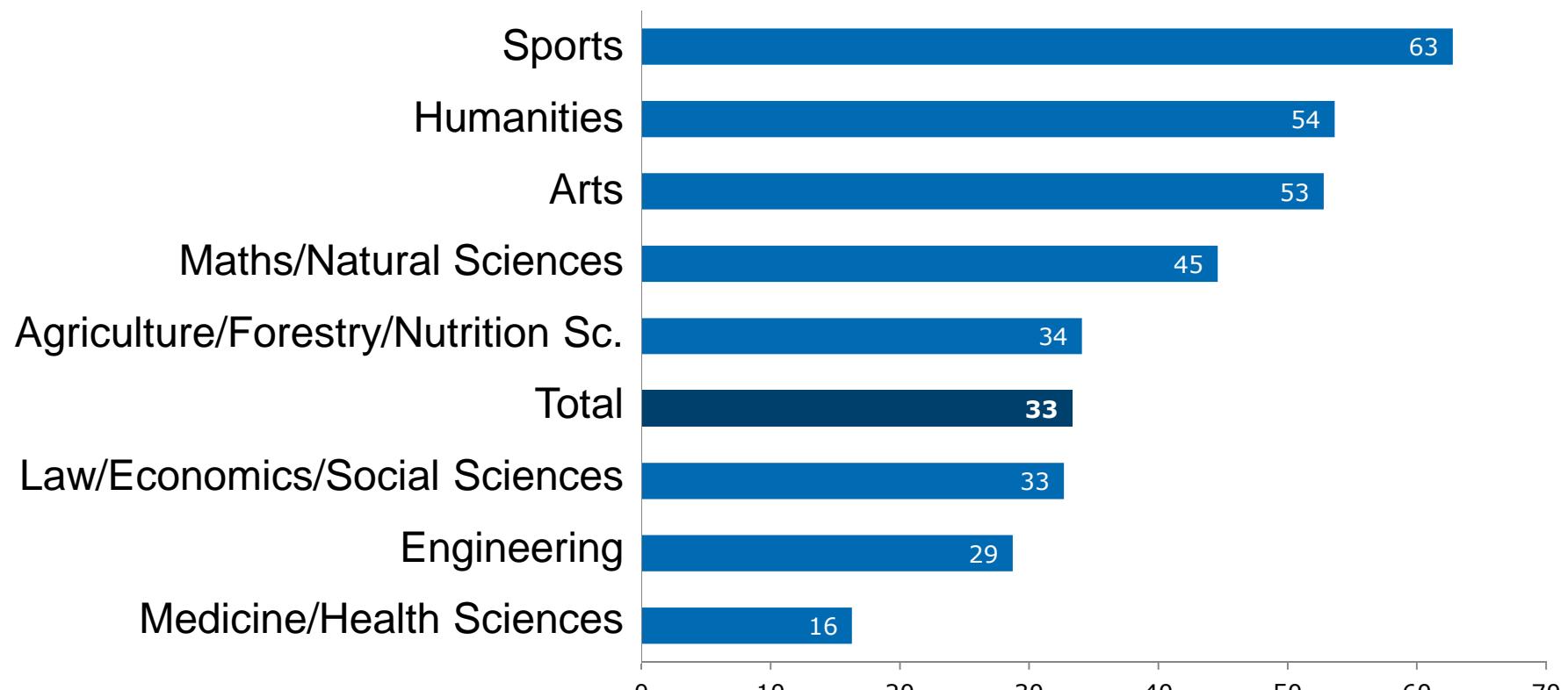


Source: Prüfungsstatistik des
Statistischen Bundesamts,
Fachserie 11 Reihe 4.2., 2010,
own calculation.

Leaving academia is rather the norm than the exception

Share of persons holding a scientific position two years after completion of PhD

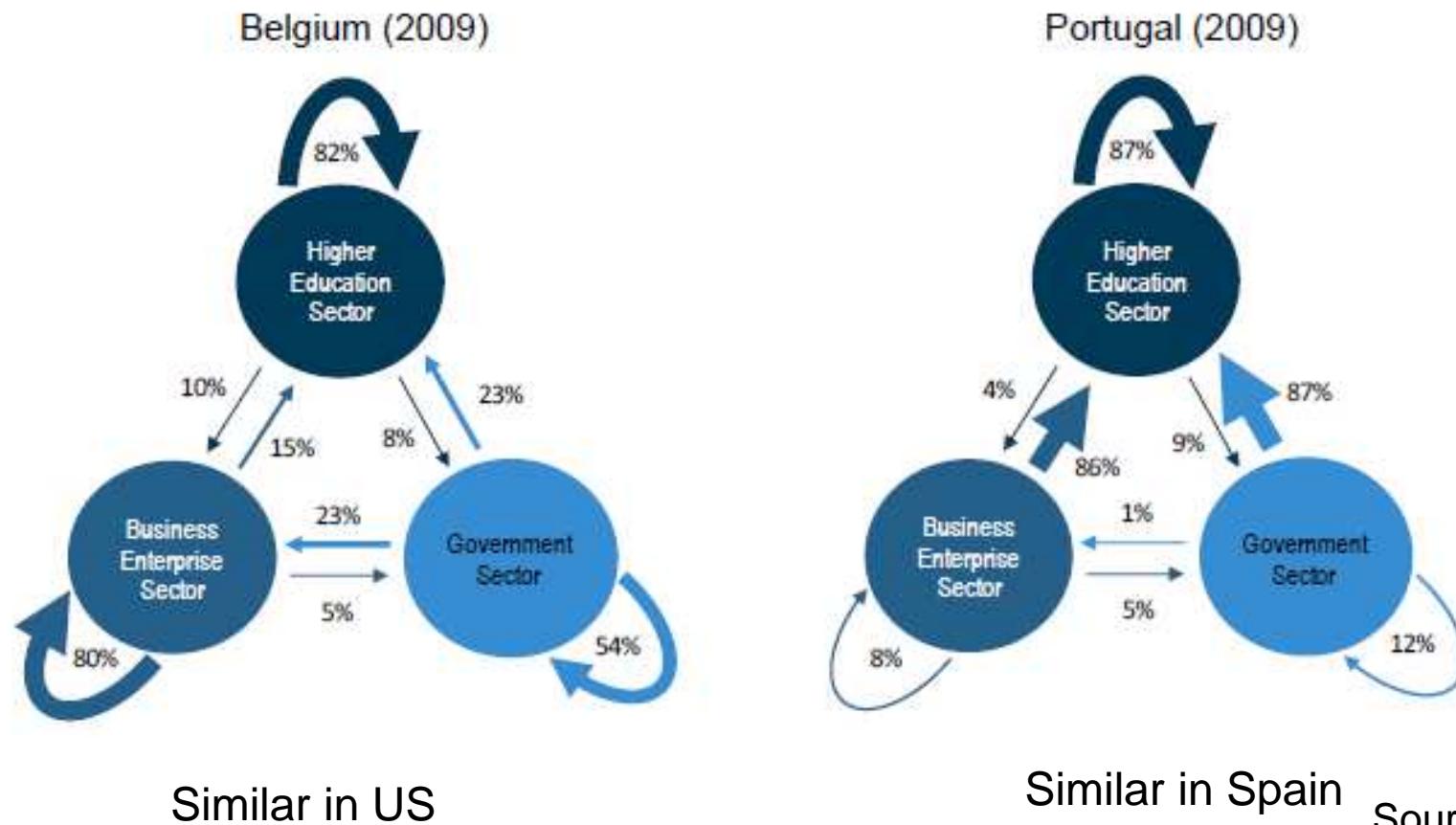
Frage 3.2: Handelt es sich bei Ihrer aktuellen/letzten Stelle um eine Tätigkeit in der Wissenschaft? („ja“/ „nein“),
(n = 2.880)



Quelle: DZHW Promoviertenbefragung 2014, 2. Welle

Job mobility from business to higher education is typically low

Figure 12. Patterns of past job mobility of doctorate holders working as researchers, by sector of activity
Percentage of intra and inter-sectoral job moves, for those having moved jobs in last ten years



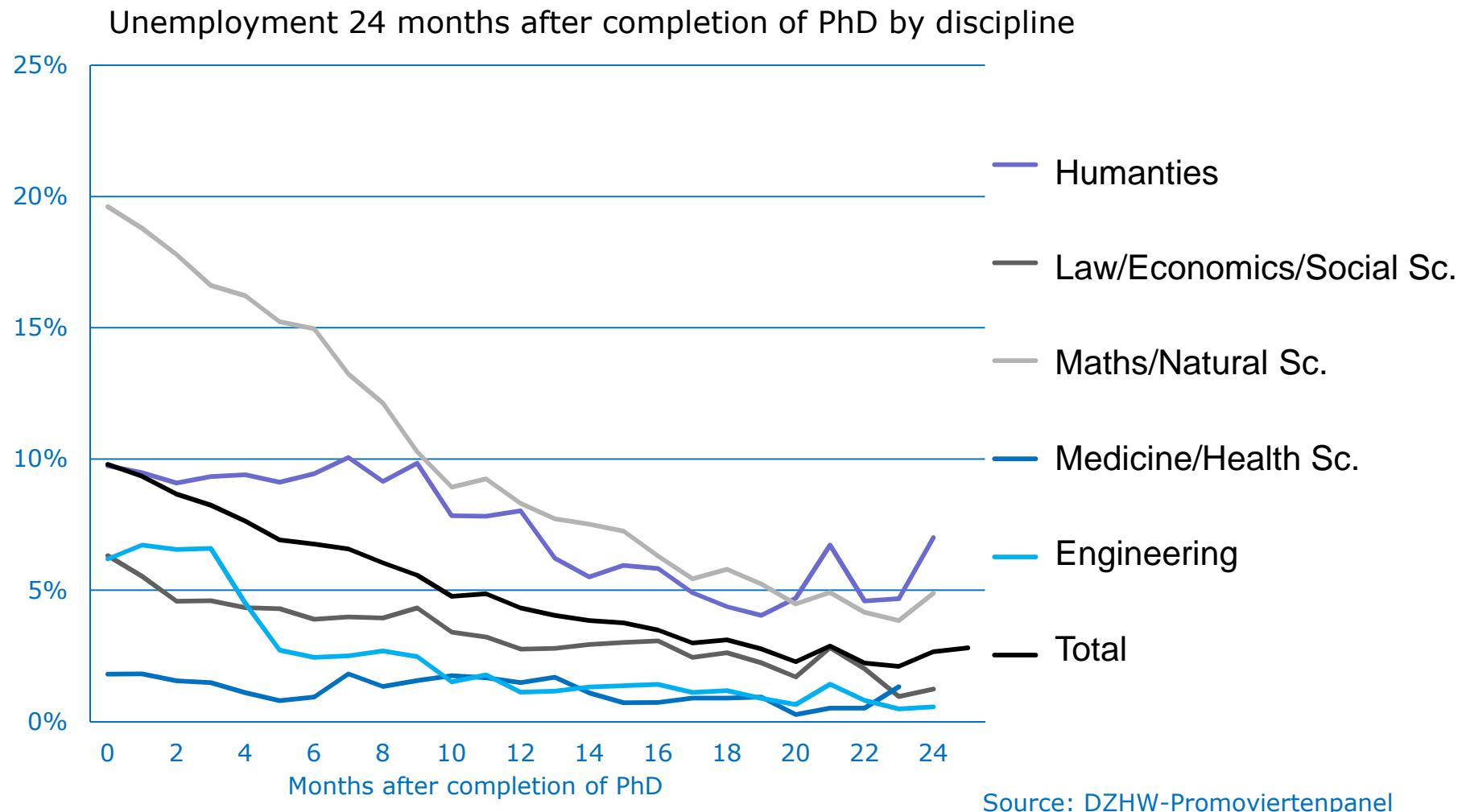
Source: CDH 2013

How does transition to labour market succeed?



There are no hard and fast rules, but ...

Transition to labour market



Signalling: First employment has formative influence ...

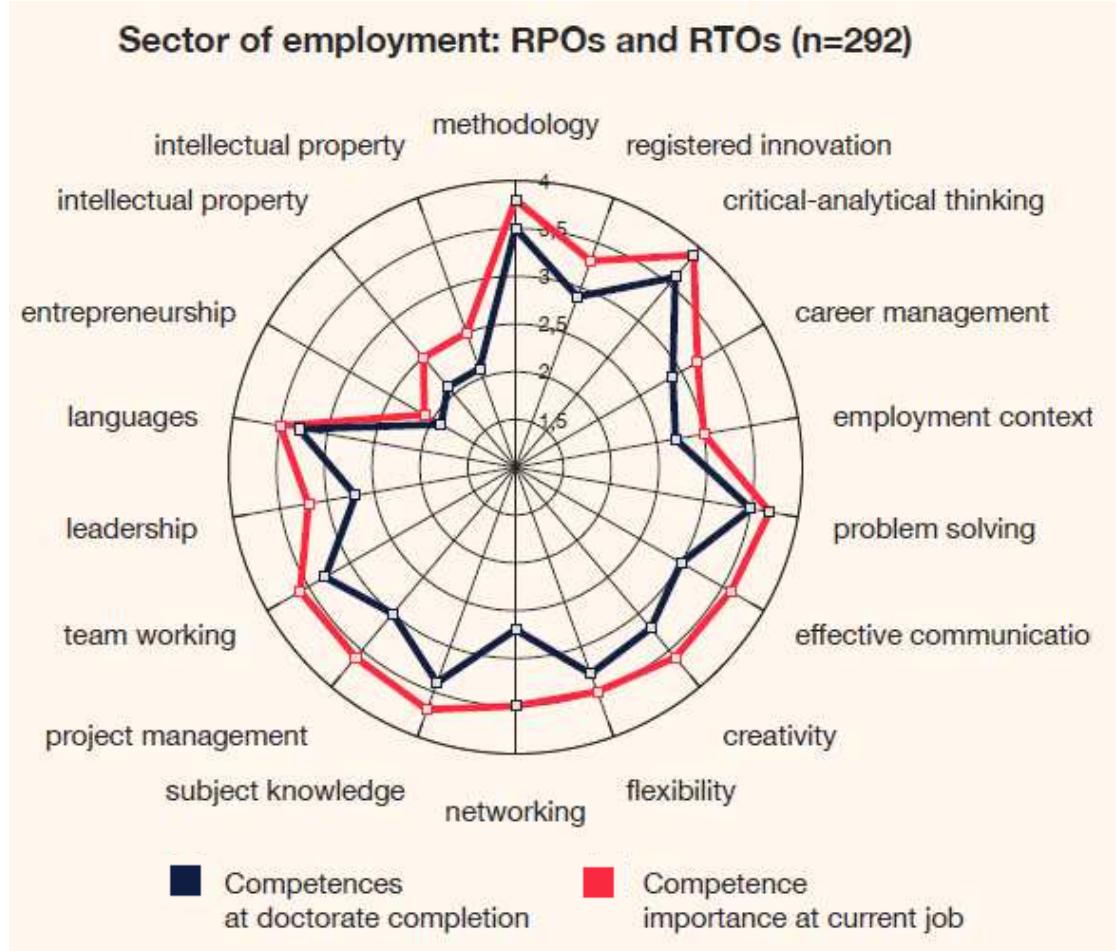
Stepping stone or entrapment?

- Initial disadvantage due to status-inadequate jobs is not fully overcome despite greater mobility in future career (Scherer 2004)
- Temporary contracts do not have negative effects (Scherer 2004)
- Overqualification leads to lower wage increases compared to adequately employed (Büchel & Mertens 2007)

Signals for transition to non-academic labour market

- During PhD rarely cooperation with partners outside academia
- Practical applicability of PhD thesis is irrelevant for (adequate) job placement outside academia
- Positive effect
 - High theoretical and methodological quality of PhD thesis
 - High publication performance (Top 25 percent)

Competences: PhD holders at RPOs and RTOs

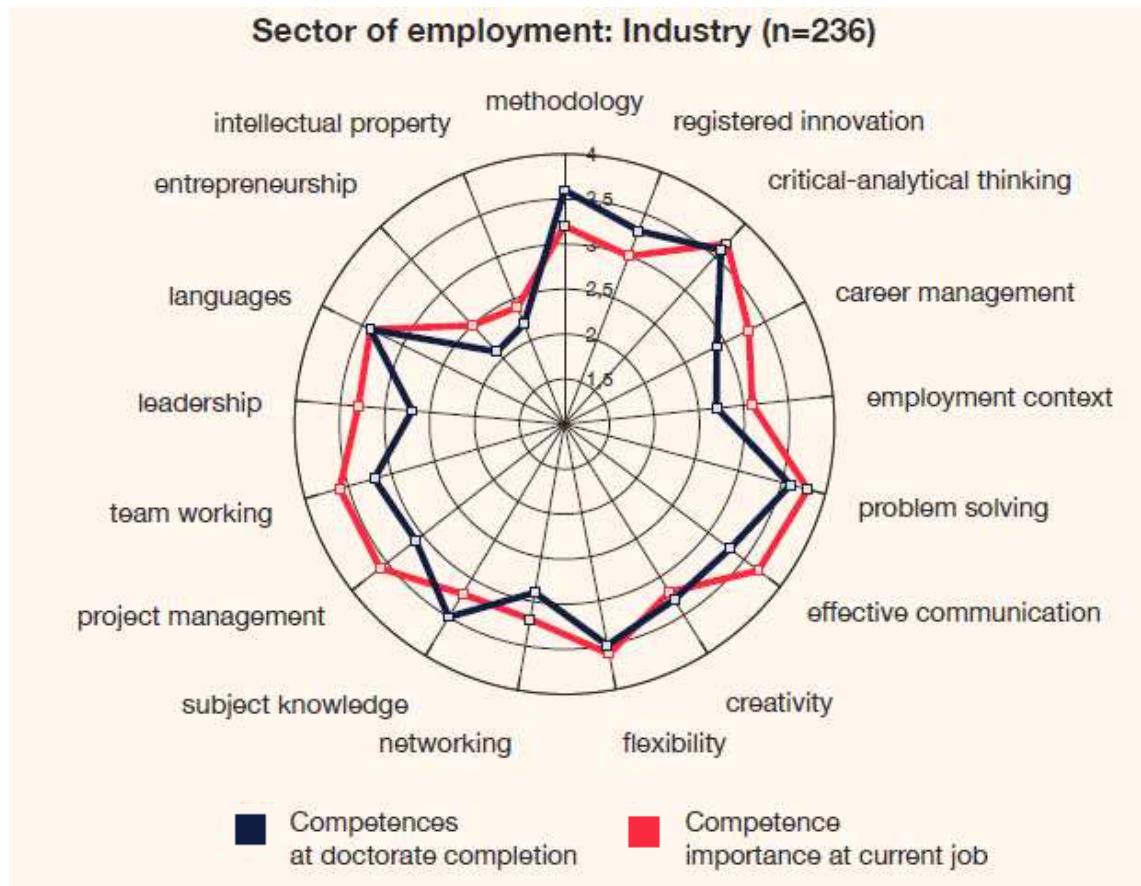


Comparison of self-reported level of competences at the time of the doctorate completion and their importance in the current job

Scale: 1=Not at all important;
5=Very important

Source: http://www.esf.org/fileadmin/user_upload/esf/Career_Tracking_Survey_2017_Final_Project_Report.pdf, p. 42

Competences: PhD holders in industry



Comparison of self-reported level of competences at the time of the doctorate completion and their importance in the current job

Scale: 1=Not at all important;
5=Very important

Personal tip:

<http://www.ingenieur.de/Arbeit-Beruf/Heiko-Mell>

Source: http://www.esf.org/fileadmin/user_upload/esf/Career_Tracking_Survey_2017_Final_Project_Report.pdf, p. 42

Science management or „HoPros“

Areas of activity

- Strategy making
- Studien counselling/Student service centre
- Capacity- und development planning
- Quality assurance and development
- Monitoring/Evaluation
- PR/Marketing
- HR development/HE didactics
- Early career researchers
- Gender equality
- Library
- Knowledge- und technology transfer
- International affairs/Mobility
- Management of departments
- Financial management
- Controlling

„Labour market potential“ in Germany

Number of professors per HEI	Average number of HoPros per HEI	Relation HoPro per professor
< 199	125	1,06
200-399	201	0,73
400-599	289	0,57
> 600	385	0,55

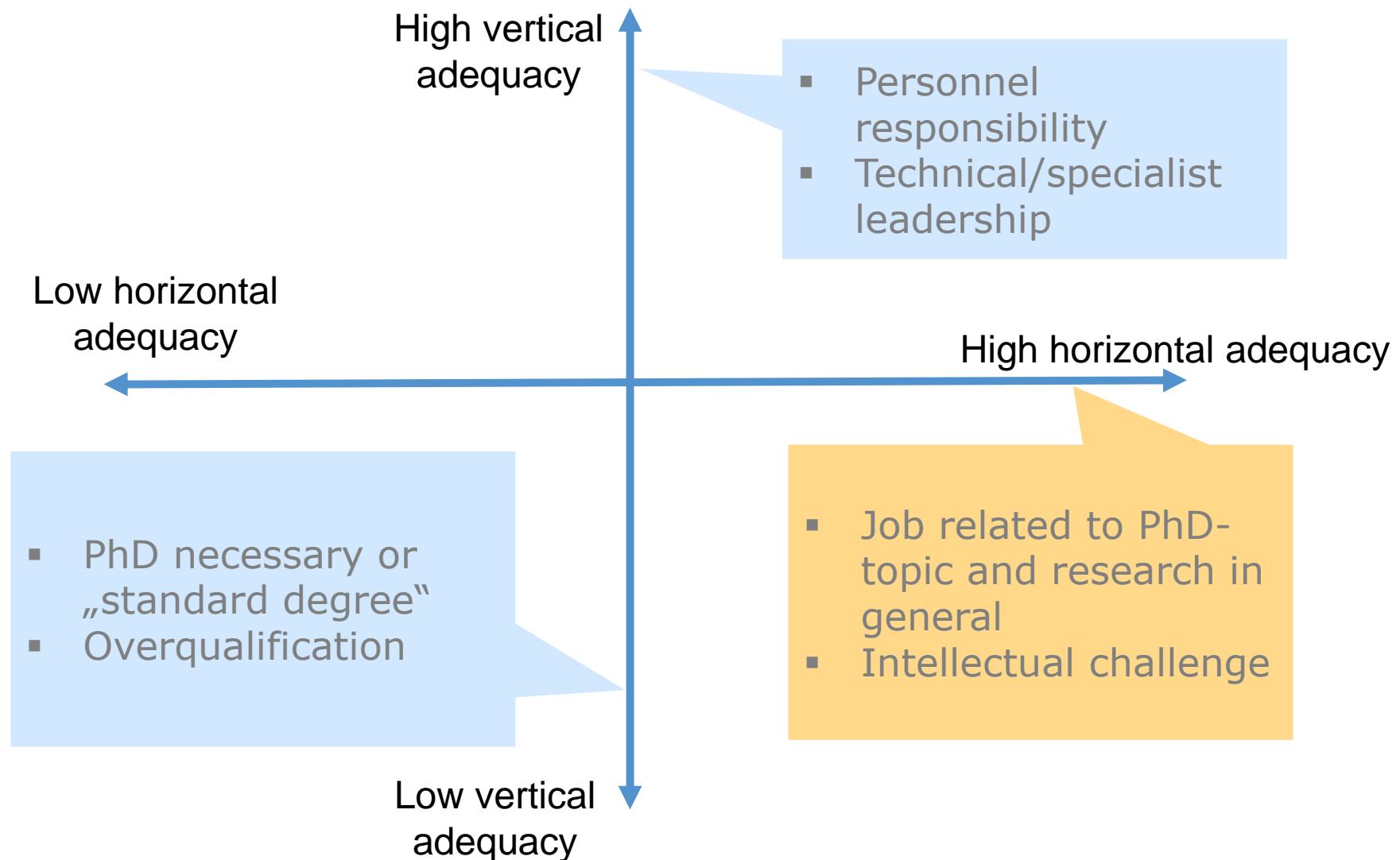
Source: Schneijderberg et al. 2014

Career pathway: Science management

- Qualification and recruitment
 - Primary pathways: conventional vacancies + personal relationship, formal qualification less relevant
 - Half of persons reached positions via lateral entry, mostly directly from academic position
 - Non-university research institutes offer more systematic recruiting, staff development, opportunities for advancement
- Potential disadvantages:
 - Negative connotation „Second-best-option“
 - Low backward mobility to research
 - Training often requires self-initiative

Source: Nickel (2013)

Are PhD holders adequately employed?



Are PhD holders adequately employed?

	Research	Research & Teaching	R&D	Teach-ing	Science mange-ment	None-research related
PhD necessary (in %)	82	85	39	58	40	2
Strongly related to PhD topic (in %)	55	67	28	33	24	9
Not related to PhD topic (in %)	5	4	18	23	39	52

Source: ProFile Follow Up

How attractive are jobs outside academia?

	University	University of applied sciences	Non- university RO	Public sector (Ministry/ Federal agency)	Business sector with R&D	Business sector without R&D
Temporary contract (in %)	84	39	86	36	12	12
Percentage of PhD-holders who is satisfied/very satisfied, in %						
Salary	67	66	69	63	76	65
Working conditions	70	52	72	72	78	68
Job security	30	61	34	68	80	81
Degree of responsibility	70	68	66	64	71	69
Autonomy	83	73	76	70	78	67
Intellectual challenge	82	59	84	63	72	57

Source: ProFile Follow Up 2015-2017, N=2.202-2.278

References & Further reading

2017 National Report on Junior Scholars (GER/EN)

- <http://www.buwin.de/>

ESF -2017 Career Tracking Survey of Doctorate Holders (EN)

- http://www.esf.org/fileadmin/user_upload/esf/Career_Tracking_Survey_2017_Final_Project_Report.pdf

Careers of doctorate holders (OECD) – (EN)

- <http://www.oecd.org/sti/inno/CDH%20FINAL%20REPORT-.pdf>

Careers in industry (personal tip):

- <http://www.ingenieur.de/Arbeit-Beruf/Heiko-Mell>

Science management (GER)

- https://www.che.de/downloads/Studie_Karriereförderung_im_Wissenschaftsmanagement_Band_1.pdf
- https://www.che.de/downloads/Neue_Hochschulprofessionen_Artikel_Nickel2013.pdf
- https://www.uni-kassel.de/einrichtungen/fileadmin/datas/einrichtungen/incher/PDFs/140922HOPRO_Brosch%C3%BCre_Text.pdf

Career options outside academia – A resume of facts

- Already two years after completion of PhD, two of three PhD holders have left academia
- Autonomy concerning how to organise work provided inside and outside academia
- Close relationship to topic of PhD study more likely at HEI or public research organisations, but there is no guarantee

I wish you inspiring
talks and workshops!

Questions or
comments?

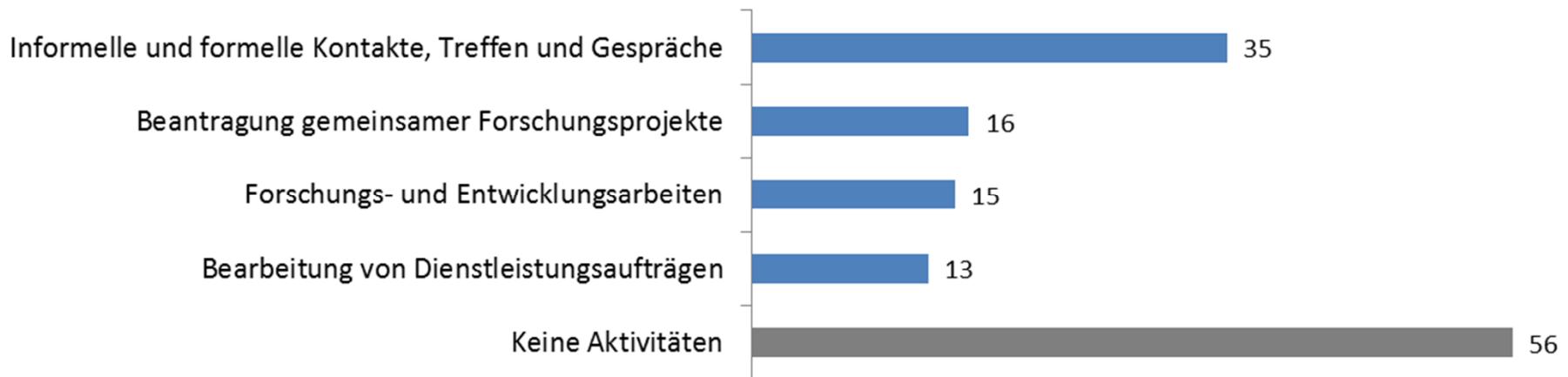
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Signale: Geringe Berührungspunkte außerhalb der Wissenschaft

Kooperation mit Partnern außerhalb der Wissenschaft in Form von ... (Anteil in %)



Quelle: ProFile Eval 2015/2016 (nur Promovierte, N=374)

Signale: Geringe Sichtbarkeit außerhalb der Wissenschaft

Sichtbarkeit außerhalb der Wissenschaft in Form von ... (Anteil in %)



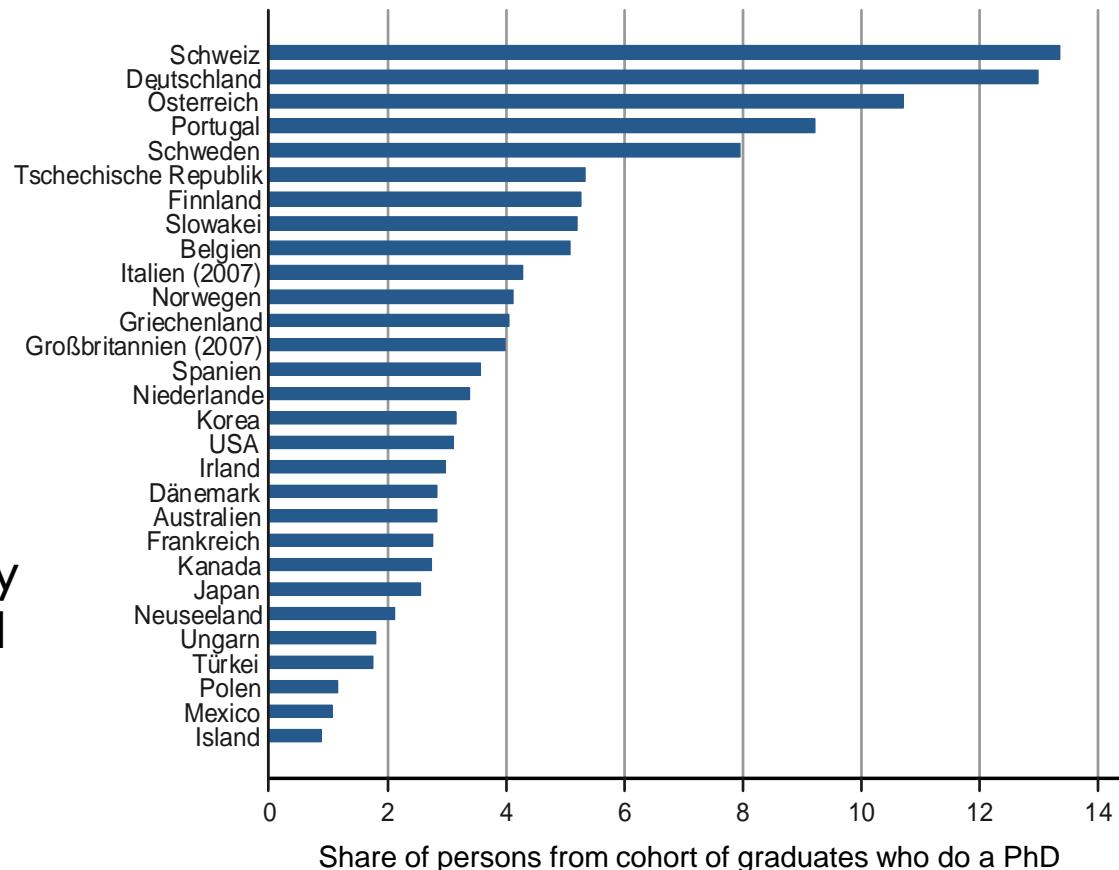
Quelle: ProFile Eval 2015/2016 (nur Promovierte, N=374)

Aims of presentation

- Discuss the function of a PhD against the background of
- Provide some basic figures about careers of PhD holders
- Enable reflection about career pathways after PhD
- Dispel some myths
- Provide

Relevance of PhD in Germany

- ~ 28,000 completed dissertations in Germany in 2014
- High proportion of graduates obtains PhD compared to other countries
- Proportion of PhD/labour force and country's R&D intensity only weakly associated (CDH 2010)
- Despite increasing supply of doctorates, still labour market premium (CDH 2010)

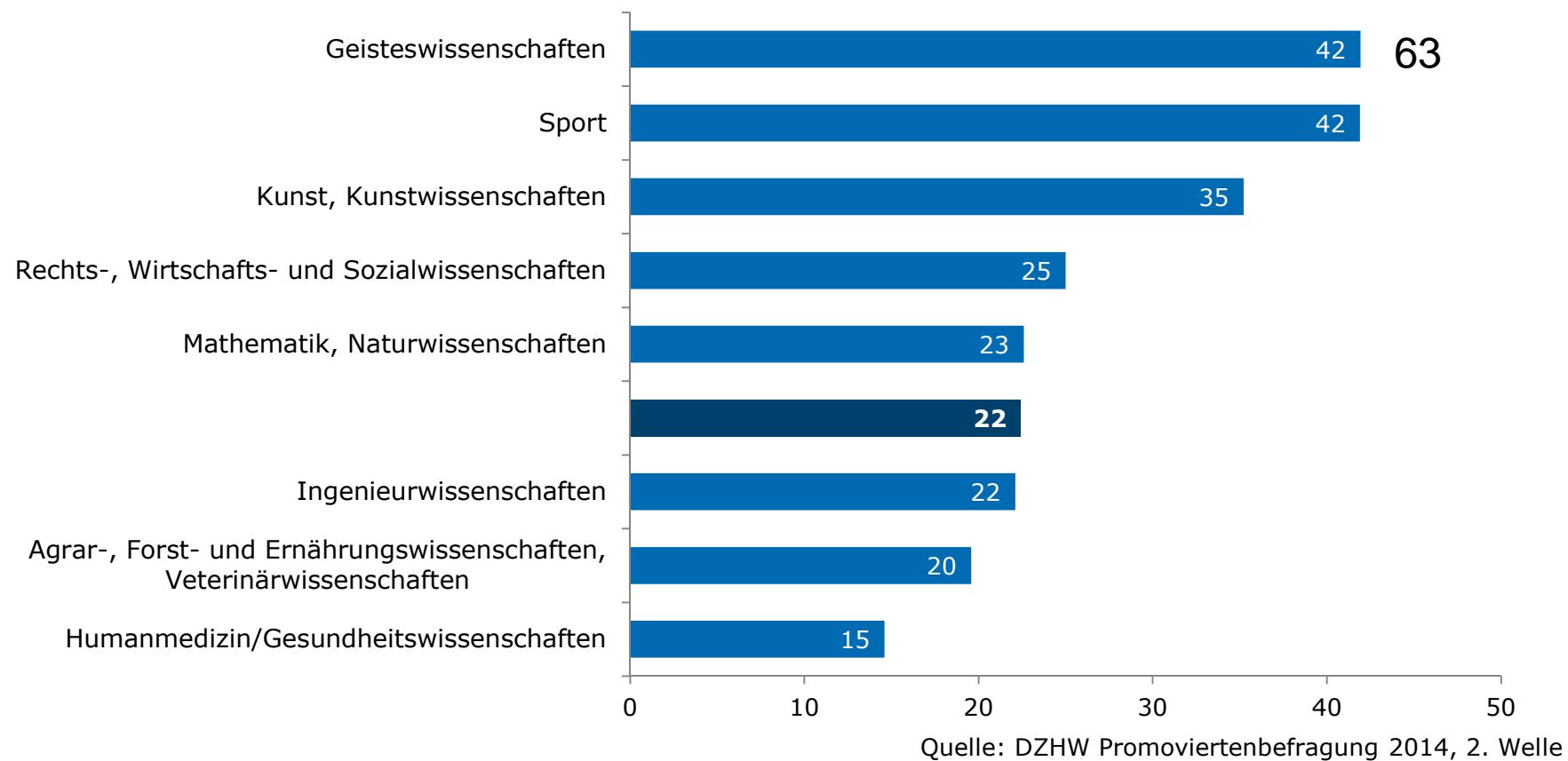


Source: Own calculation based on Online Education Database - OECD (27.7.2011)

Leaving academia is rather the norm than the exception.

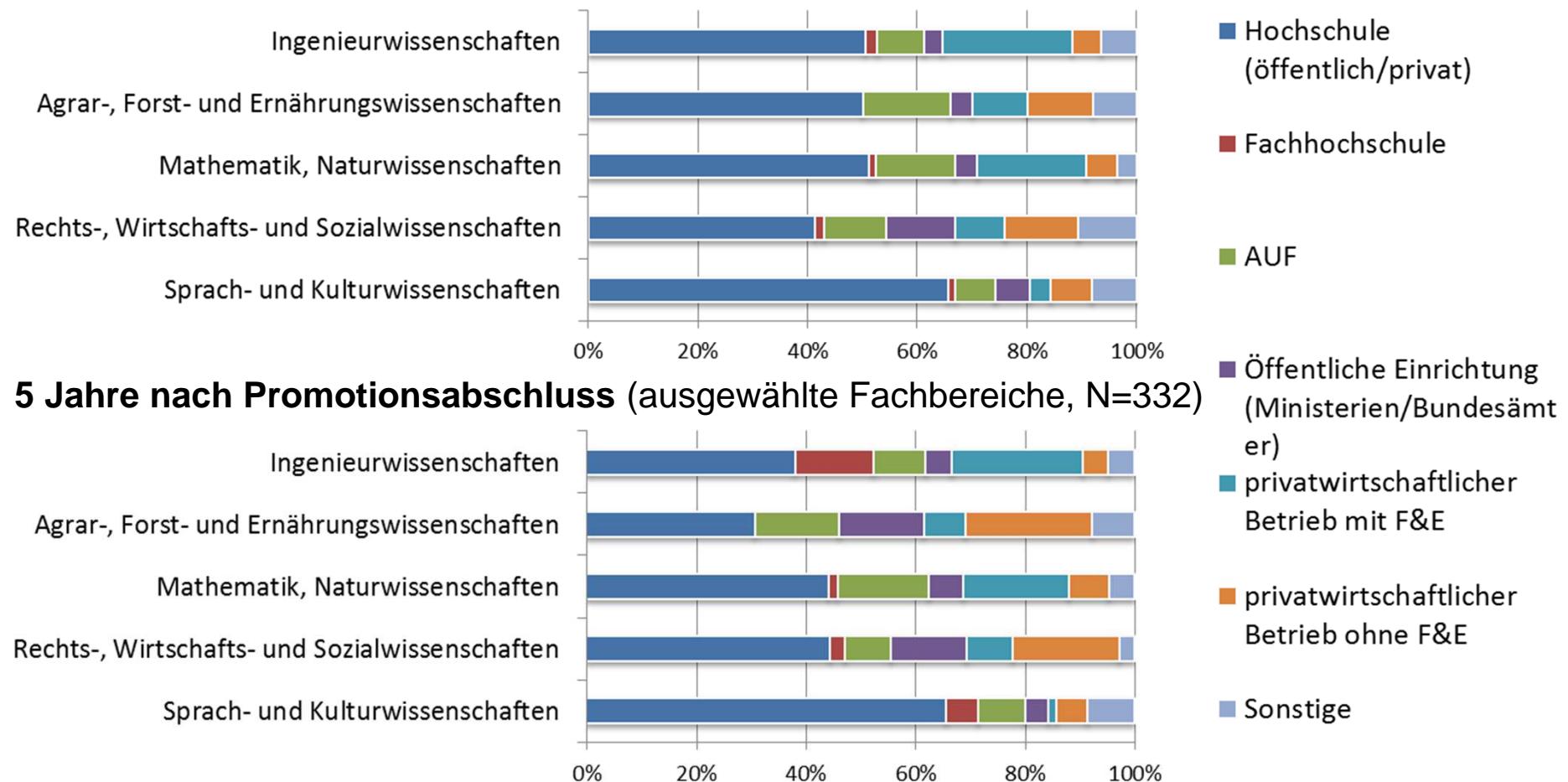
Share of persons stating that they want to stay in academia 1 year after completion of PhD

Frage 6.4: Beabsichtigen Sie, dauerhaft in der Wissenschaft tätig zu sein?
(Werte 4+5 einer 5-stufigen Skala von 1 = „nein, auf keinen Fall“ und 5 = „ja, auf jeden Fall“), (n = 5.257)

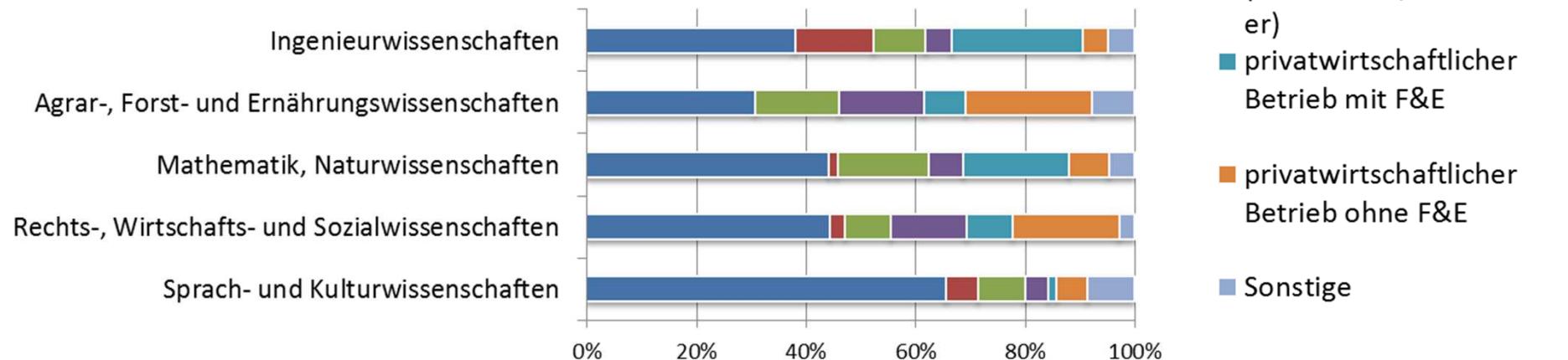


Wo sind Promovierte tätig?

2 Jahre nach Promotionsabschluss (ausgewählte Fachbereiche, N=1.774)

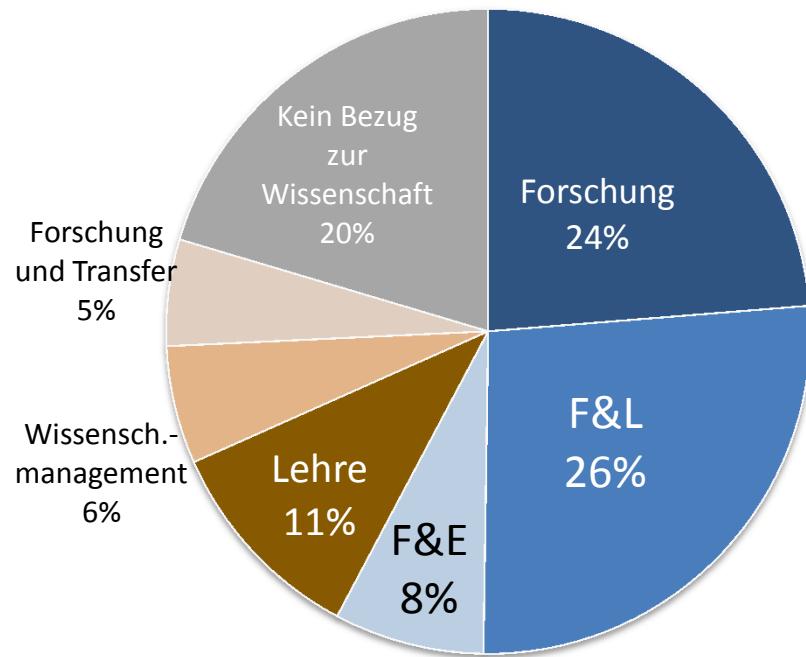


5 Jahre nach Promotionsabschluss (ausgewählte Fachbereiche, N=332)



Quelle: ProFile 2009-2017

Tätigkeitsfelder Promovierter

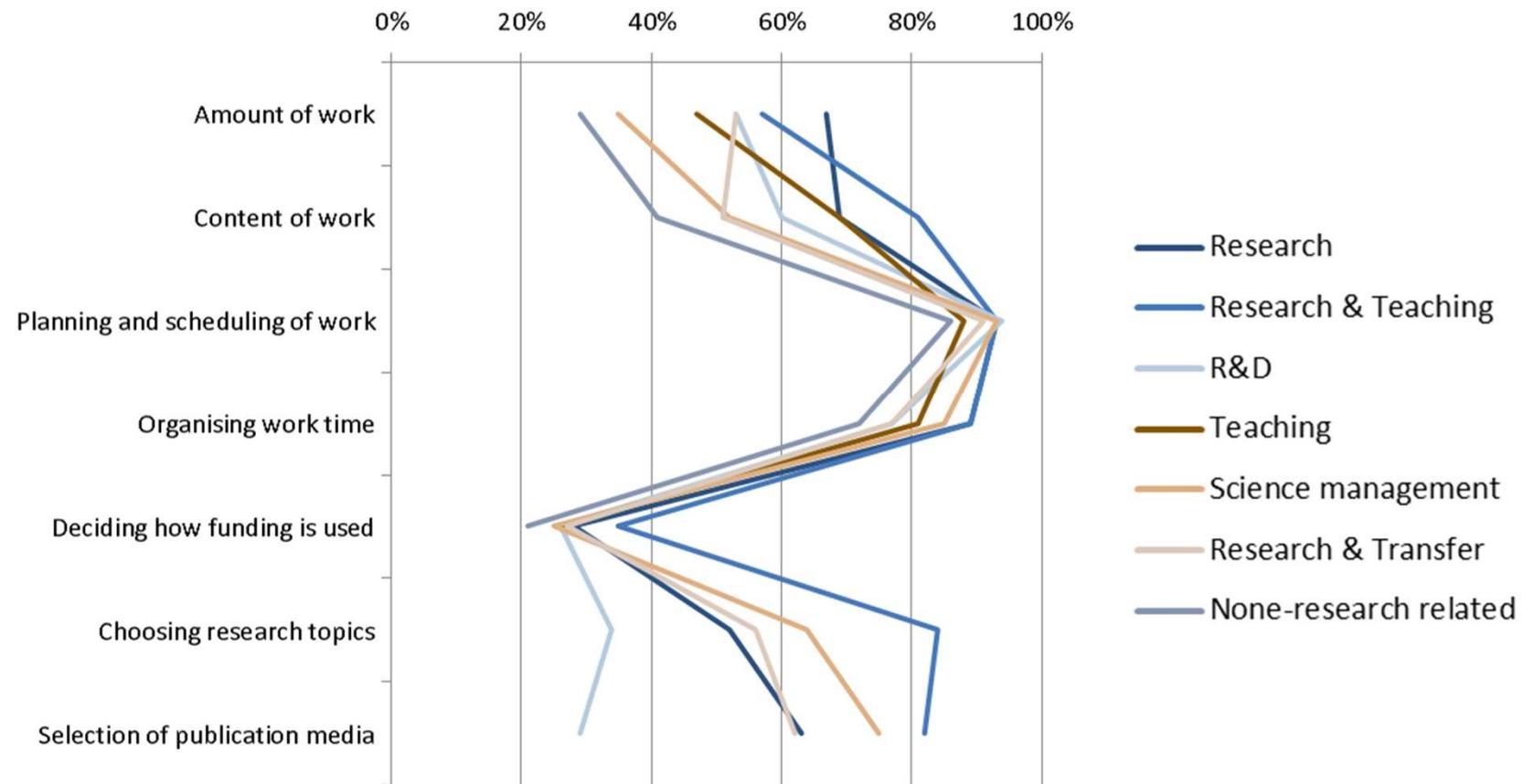


- 80% üben Tätigkeit mit Bezug zur Wissenschaft aus
- Bei Gruppierung nach Tätigkeiten ergeben sich 6 Typen
- Betreuung wissenschaftl. Großgeräte kein eigenständiges Berufsfeld

Quelle: ProFile Follow Up,
N=1.049

Degree of autonomy across research fields

Proportion of PhD holders, who assess autonomy high or very high (in %)



Source: ProFile Follow Up, N=612-1.011

Attractiveness of fields of activity

	Research	Research & Teaching	R&D	Teaching	Science management	Transfer and research	None-research related
Temporary contract (in %)	88	81	32	54	60	45	13
Share of PhD holders, which ist satisfied or highly satisfied (in %)							
Job security	30	32	70	50	52	63	80
Salary	61	67	78	65	64	56	68
Working conditions	75	70	80	64	70	68	74
Degree of responsibility	65	73	70	71	69	72	75
Autonomy	79	83	79	78	80	81	75
Intellectual challenge	85	86	78	73	73	87	63

Source: ProFile Follow Up, N=1.002-1.009

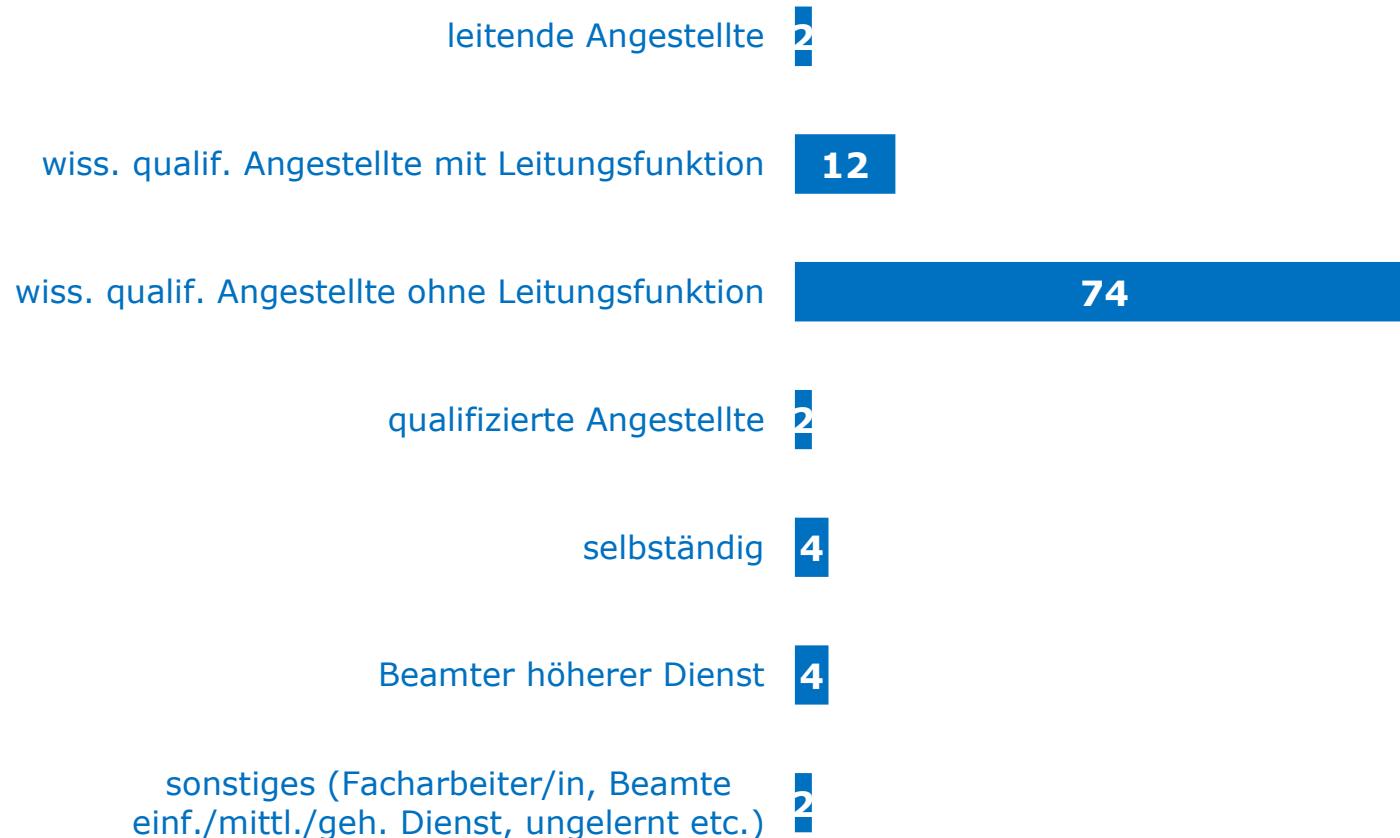
Are PhD holders adequately employed?

	Research	Research & Teaching	R&D	Teaching	Science management	Transfer and research	None-research related
PhD necessary (in %)	82	85	39	58	40	42	2
Personnel management (in %)	22	29	22	21	29	36	21
Technical/professional management (in %)	20	34	41	24	29	34	31
Strongly related to PhD topic (in %)	55	67	28	33	24	16	9
Not related to PhD topic (in %)	5	4	18	23	39	18	52

Source: ProFile Follow Up

Berufliche Position ca. ein Jahr nach Promotionsabschluss

(Verteilung in %)



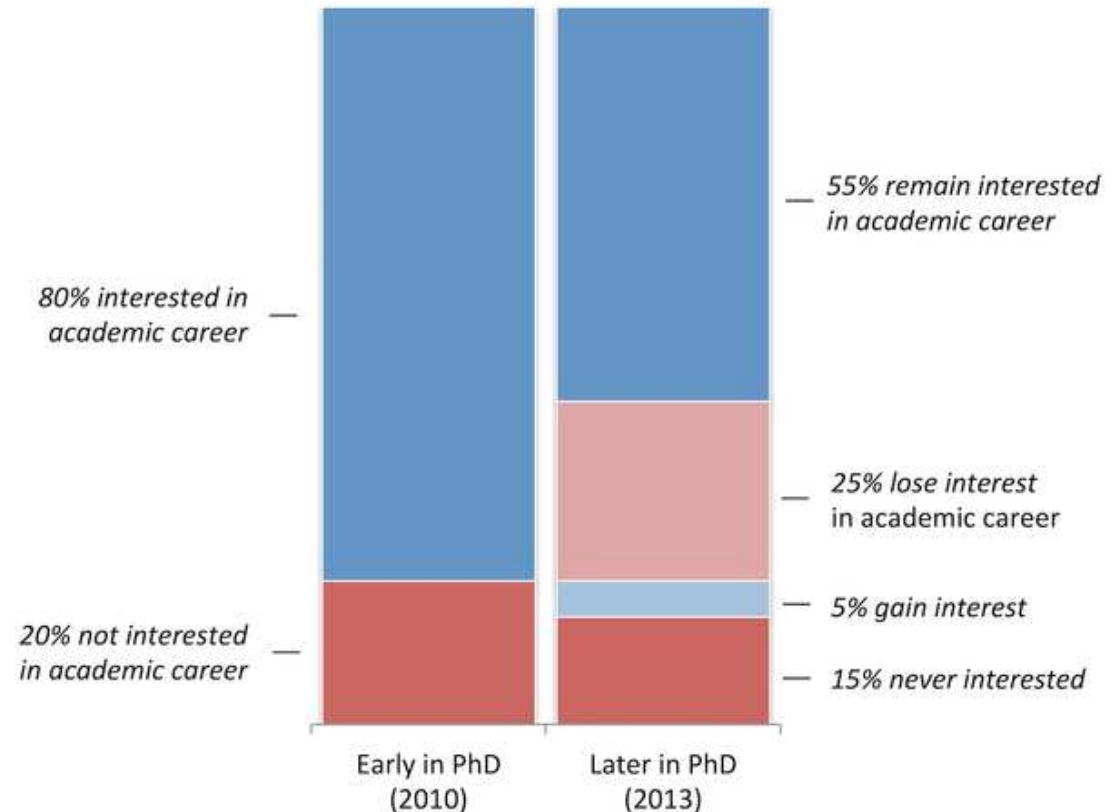
Quelle: DZHW-Promoviertenpanel

Structure

- **INTENTIONS:**
 - How does „taste for science“ change?
- **DECISION & SELECTION:**
 - Which personal and contextual factors do affect choice for career options?
 - Career chances
- **EXPERIENCES:**
 - How do PhD holders assess ...

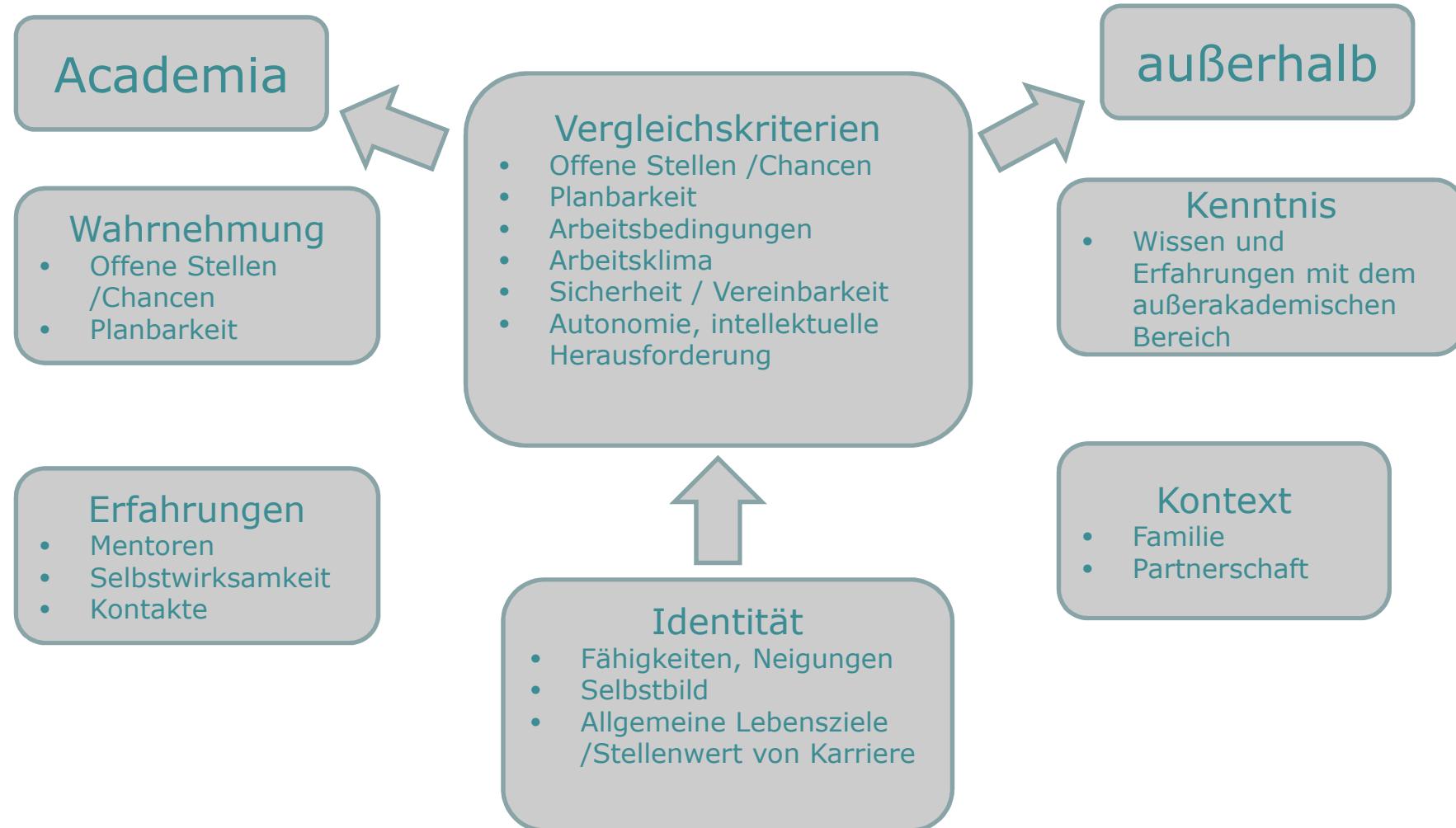
First there was an intention ...

- Decreasing „taste for science over“ time
- Cooling out
- Reasons for adaptation of preferences?
- Declining interest not a results of

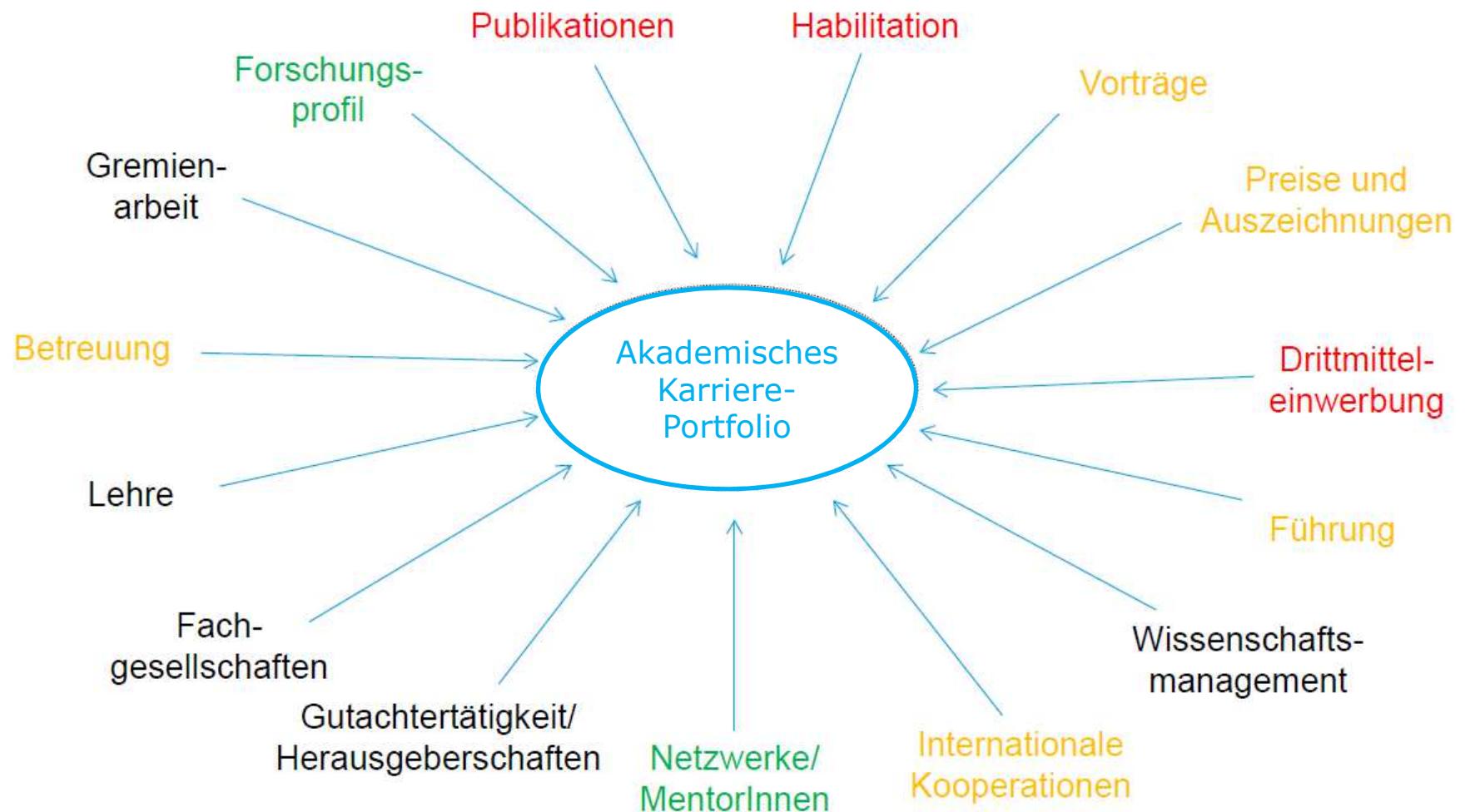


Roach, M. and Sauermann, H. (2017). The Declining Interest in an Academic Career. *Close One*

Decision Frame

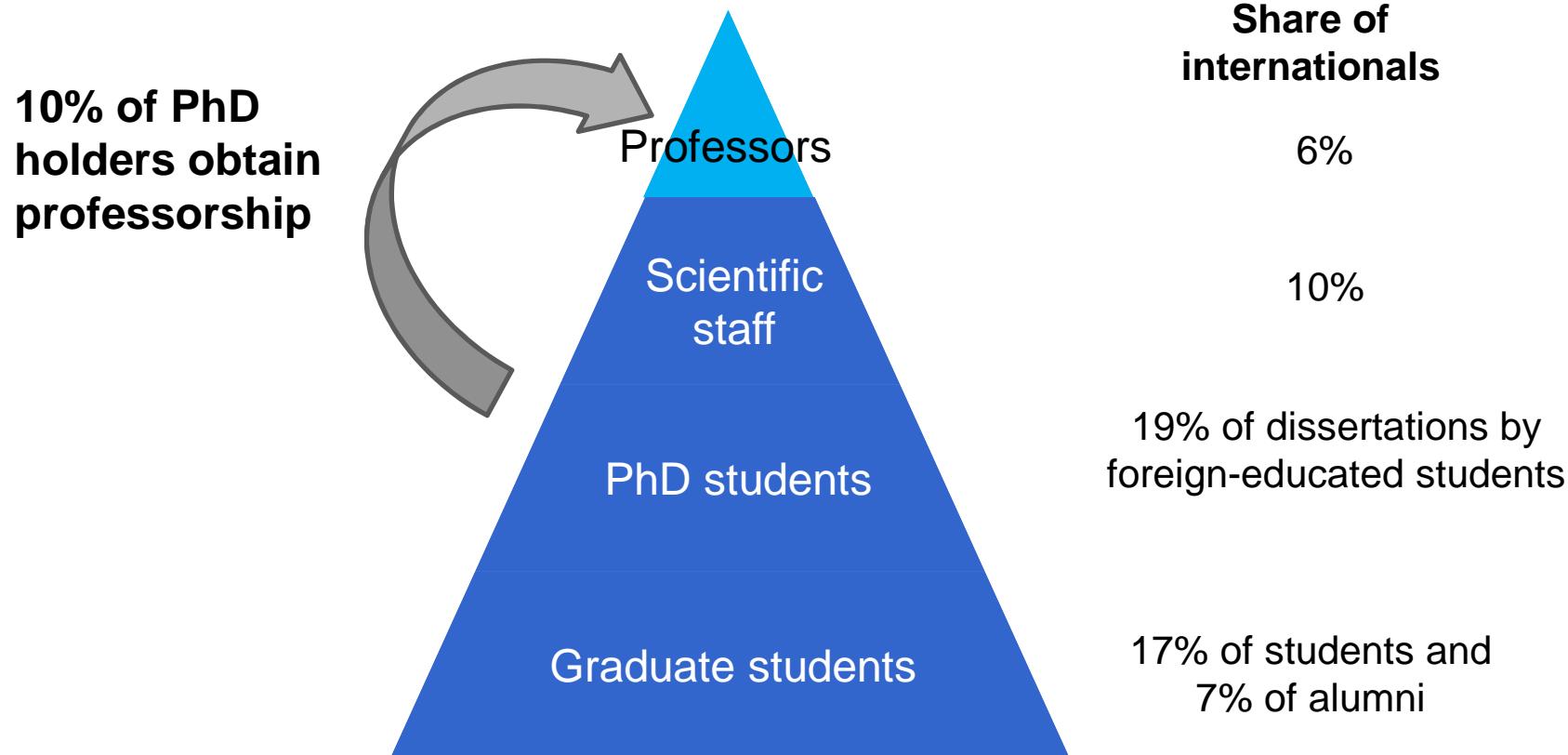


Academic portfolio



Quelle: Müller, Mirjam (2014), Promotion, Postdoc, Professur, Frankfurt/New York, S. 20.

Career chances in academia



Statistical chances to become a professor are low!

Why do PhD holders leave academia?



Source: Statistisches Bundesamt, Hochqualifizierte in Deutschland, 2011

Überblick Karrierewege

- Hybrid & Mixed careers einfügen
- Decision frame: welche Faktoren sind (statistisch gesehen) entscheidend dafür, dass a) jemand in der Wissenschaft bleibt, b) in die Industrie wechselt, c) eine Tätigkeit ohne jeglichen Bezug zur Wissenschaft ausübt

- Stepping-Stones or Traps? The Consequences of Labour Market Entry Positions on Future Careers in West Germany, Great Britain and Italy