GENDER EQUALITY ADVANCEMENT IN THE GERMAN RESEARCH LANDSCAPE – AN ASSESSMENT FROM A GERMAN PRACTITIONER

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Fraunhofer-Society Germany

- 67 institutes and independent research units
- more than 23,000 staff
- 7 Alliances:
  - ICT Group
  - Group for Life Sciences
  - Group for Light & Surfaces
  - Group for Microelectronics
  - Group for Production
  - Group for Materials and Components – MATERIALS
  - Group for Defense and Security VVS

Fraunhofer CeRRI
Center for Responsible Research and Innovation

NEED-ORIENTED RESEARCH PLANNING	**PROCESS DESIGN AND TRANSFORMATIVE METHODS**	**DIVERSITY AND CHANGE**	**TECHNOLOGY TRANSFER RESEARCH**

Input from different perspectives drives innovation in a knowledge based society.

The German Research Landscape – An Overview

Non-university research organisations

Helmholtz Association:

- 18 research centers, 38,036 employees, 42% female employees → 33% scientific employees

Fraunhofer Society:

- 67 research institutes and research units, 24,000 employees, 32% female employees → 21% scientific employees

Leibniz Association:

- 89 research institutes and service organizations, 18,144 employees, 53% female employees → 42% scientific employees

Max-Planck Society:

- 83 institutes and research facilities, 17,284 employees, 45% female employees → 29% scientific employees

Universities

- In total 427 higher education institutions in Germany (2014/15); 2,7 Mill. students, 45,749 professors
- 108 universities; 216 universities of applied sciences, 52 art colleges etc.

In Germany a variety of laws and initiatives to promote the equality of men and women exist

German Laws in the field of gender equality

Basic Law for the Federal Republic of Germany (Article 3 – 2) [Equality before the Law] (1958):

Men and women shall have equal rights. The state shall promote the actual implementation of equal rights for women and men and take steps to eliminate disadvantages that now exist.

General Act on Equal Treatment (AGG) (2006):

Purpose of this Act is to prevent or to stop discrimination on the grounds of race or ethnic origin, gender, religion or belief, disability, age or sexual orientation.

Germany sets gender quota in boardrooms (2015):

Act for the equal participation of women and men in leadership positions in the private sector and the public sector

German Initiatives to increase gender balance & diversity

Chefsache:
Sponsor: Dr. Angela Merkel

- 'Chefsache' is a network of leaders from industry and science, the public sector and the media **personally committed** to lead by example to make gender balance a top management priority, exploring new concepts and approaches to promote the **required change of mind-set** throughout society.

Charta der Vielfalt (Diversity Charter):
Sponsor: Dr. Angela Merkel

- The Charta der Vielfalt is a corporate initiative to promote diversity in companies and institutions.
- The initiative aims to promote the recognition, appreciation and integration of diversity into Germany's business culture. Organisations are to create a working environment free of prejudice.

A practitioners perspective – Top-Down initiatives have the most impact to promote more women in academia

Important Top-Down initiatives and programmes in Germany - An Overview:

Pact for Research and Innovation

- Phase I: 2005-2010
- Phase II: 2011-2015
- Phase III: 2016-2020

Impact:

- Greater dynamism and increase in performance in the scientific system
- Sustainable perspectives
- Promote activities for women in science

Excellence Initiative

- Phase I: 2005-2011
- Phase II: 2012-2017

Impact:

- Strengthen Germany as a research location for the long term
- Raise the profile of outstanding accomplishments in the fields of academia & sciences
- Consideration of gender equality policies

Programme for Women Professors

- Phase I: 2008-2012
- Phase II: 2012-2017

Impact:

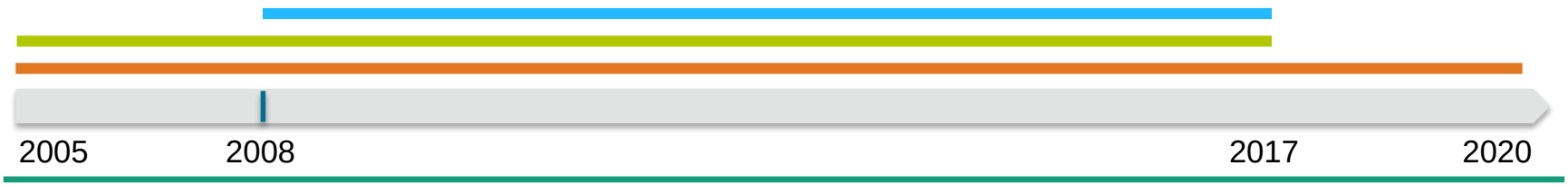
- Increasing number of female professors
- Strengthens the equality structures at universities by specific equality policies
- Creating role models

DFG – Research-Oriented Standards on Gender Equality

- Since 2008

Impact:

- Self-regulation of DFG-Members
- Definition of standards for a long term policy of equality in the German scientific and academic community



How and why should the gender dimension be considered in innovation and technology? “Gender” is more than “pink it & shrink it”!

- **Quality of research** – gender mixed teams can lead to greater team performance
- **Market potential** – women address different markets and targets than men
- **Pool of talents** – in Science, Industry, and Entrepreneurship

Pool of talents: the following hypotheses are often represented in Germany to explain why few women remain in science

Hypothesis I:

The Leaky Pipeline: The more women fill the academic base, the more women will get into high positions (e.g. professorship) in academia.

Hypothesis II:

Necessity of Mobility: Most of the women are not mobile enough to get into high positions in academia.

Hypothesis III:

Cultural Aspects in Science: Framework conditions and stereotypes exclude women from reaching top-level positions in academia.

Hypothesis I – The Leaky Pipeline: It is not enough to simply fill the Pipeline

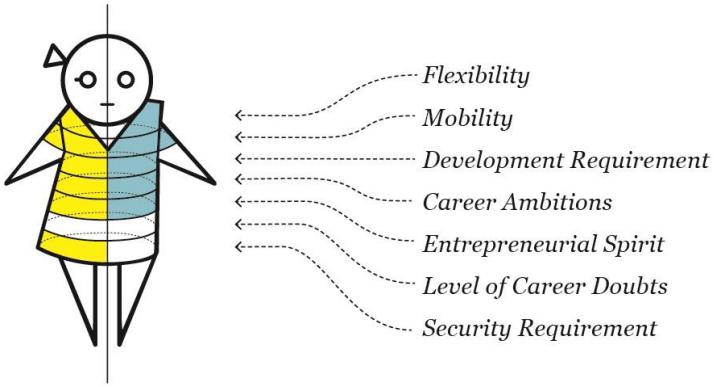
- Studies and experiences show:
  - In US in some humanities there is a high proportion of female PhD students, but women are still underrepresented in top-level positions. (Leslie et al., 2015)

Example: Study at Max-Planck-Society

- MPG is divided into three different sections: BM-Section , CPT-Section ; GSH-Section
- The largest gender differences can be observed in the GSH-Section which has a traditionally high share of female scientists:
  - Women more often report an overload through pressure, the lack of recognition of achievements and compatibility
  - 20% of the women see - with regard to equal opportunities and compatibility -disadvantages for their own gender.
  - Men assess the overall situation significantly better than women.

Source: Schraudner et al. (2015): Chancengleichheit und Nachwuchsförderung.

Hypothesis II – Necessity of Mobility: life stages are more decisive than gender

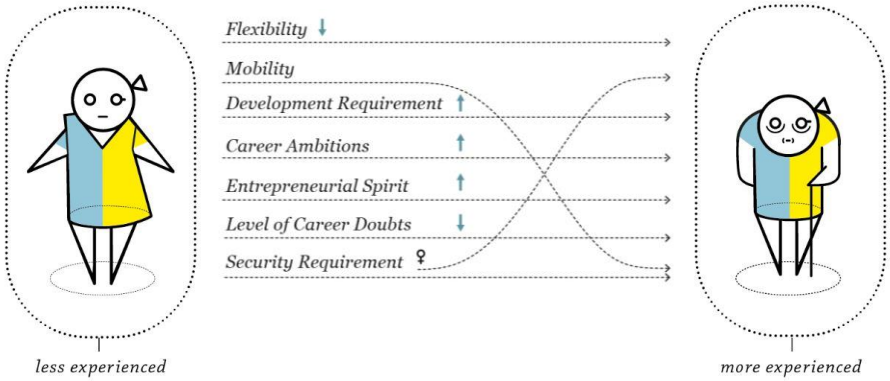


The results of the UNITECH International Study demonstrate:

- At the beginning of their professional career both women and men are very mobile and flexible
- Depending on different stages of life the mobility of both women and men decreases

→ Whether people are mobile or not, does not depend on their gender, their life stages is more important

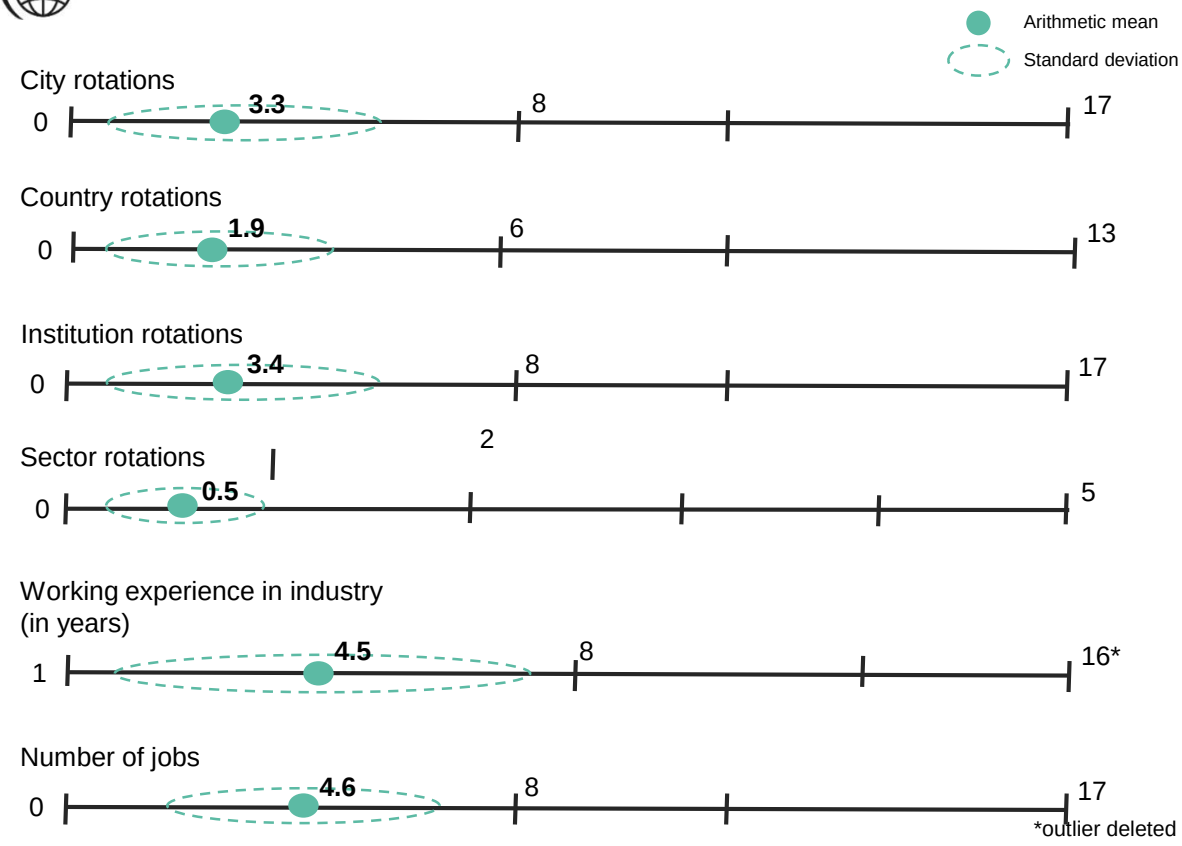
→ Other studies show similar results (Hüttges & Fay 2013; Jaksztat et al. 2010)



Source: Angelika Trübswetter et al., 2015, Corporate Culture Matters, publica.fraunhofer.documente/N-328470.html

Hypothesis II – Necessity of Mobility : different patterns of mobility exist

Results based on short CVs from the AcademiaNet Platform:



Mobility patterns of AcademiaNet scientists vary:

- AcademiaNet women do not show uniform mobility behavior regarding geographical and institutional mobility.
- 24.4% of AcademiaNet women never left the country where they did their PhD.
- Only 6.6% of women in the AcademiaNet network have worked in industry.
- AcademiaNet women who have worked at research organizations show greater (inter-)national and institutional mobility.

Source: Schraudner, 2015, Von Academia Role Models lernen, publica.fraunhofer.documente/N-332327.html

Hypothesis III – Cultural Aspects: Framework conditions and stereotypes lead women to leave academia

The results based on interviews with exit-candidates:

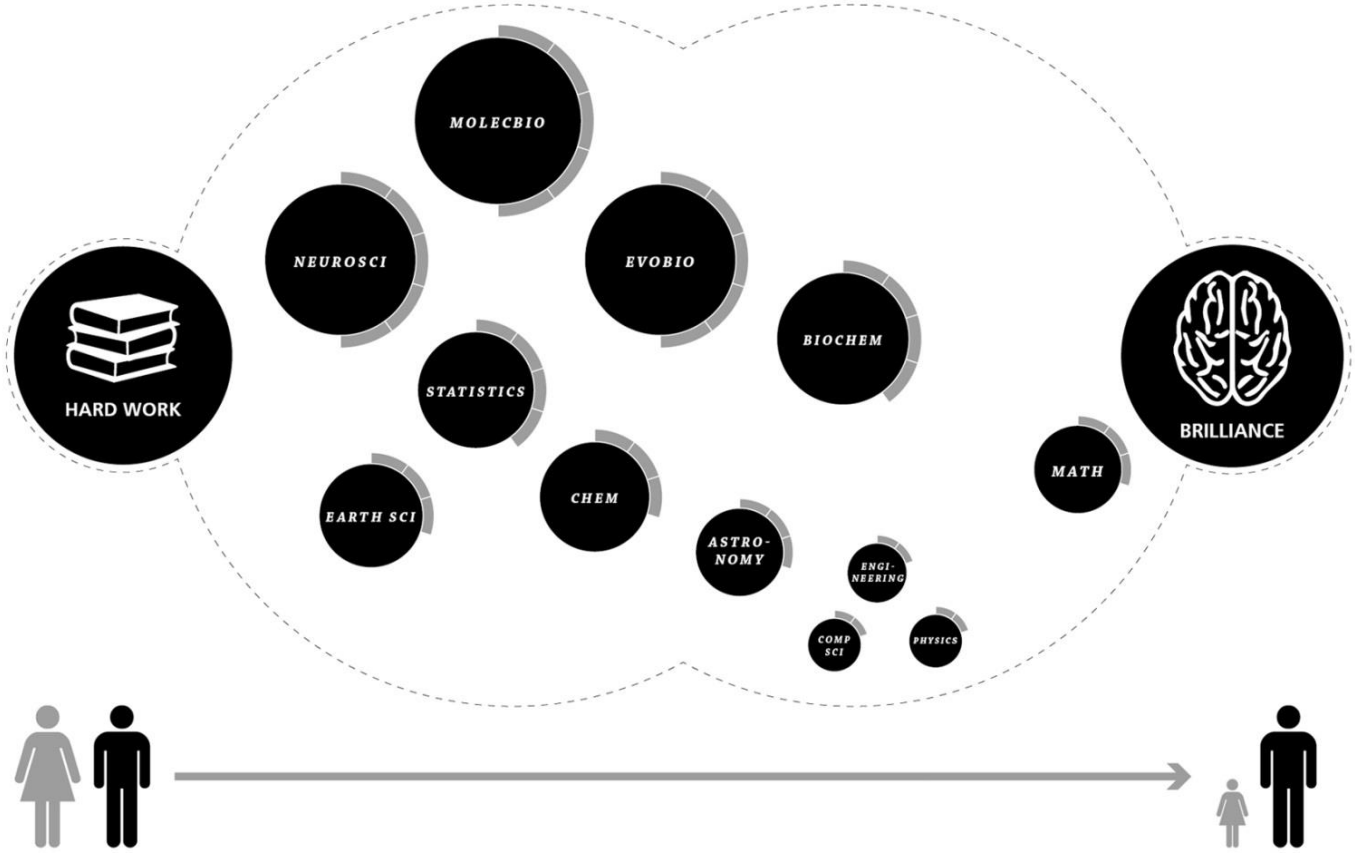
Gender	9 Female | 9 Male
Nationality	German: 11 | Others: 7
Employment	TVöD: 11 | Scholarship: 7
Awards	11 (ca. 60%)
Research and development reference	existing: 10 | non existing: 8
Current employer: Industry | Public sector	15 | 3

N=18

Five major types of reasons describe why women and men no longer pursued an academic career:

- **More Women** criticized the **working culture** and the working climate in the scientific field – Four main aspects lead to frustration:
  - Performance pressure
  - Isolation
  - Visibility
  - Male-dominated culture
- More women than men also criticized the level of appreciation and recognition from their supervisor, which also lead to frustration.

Hypothesis III : persistent stereoptypes – in STEM

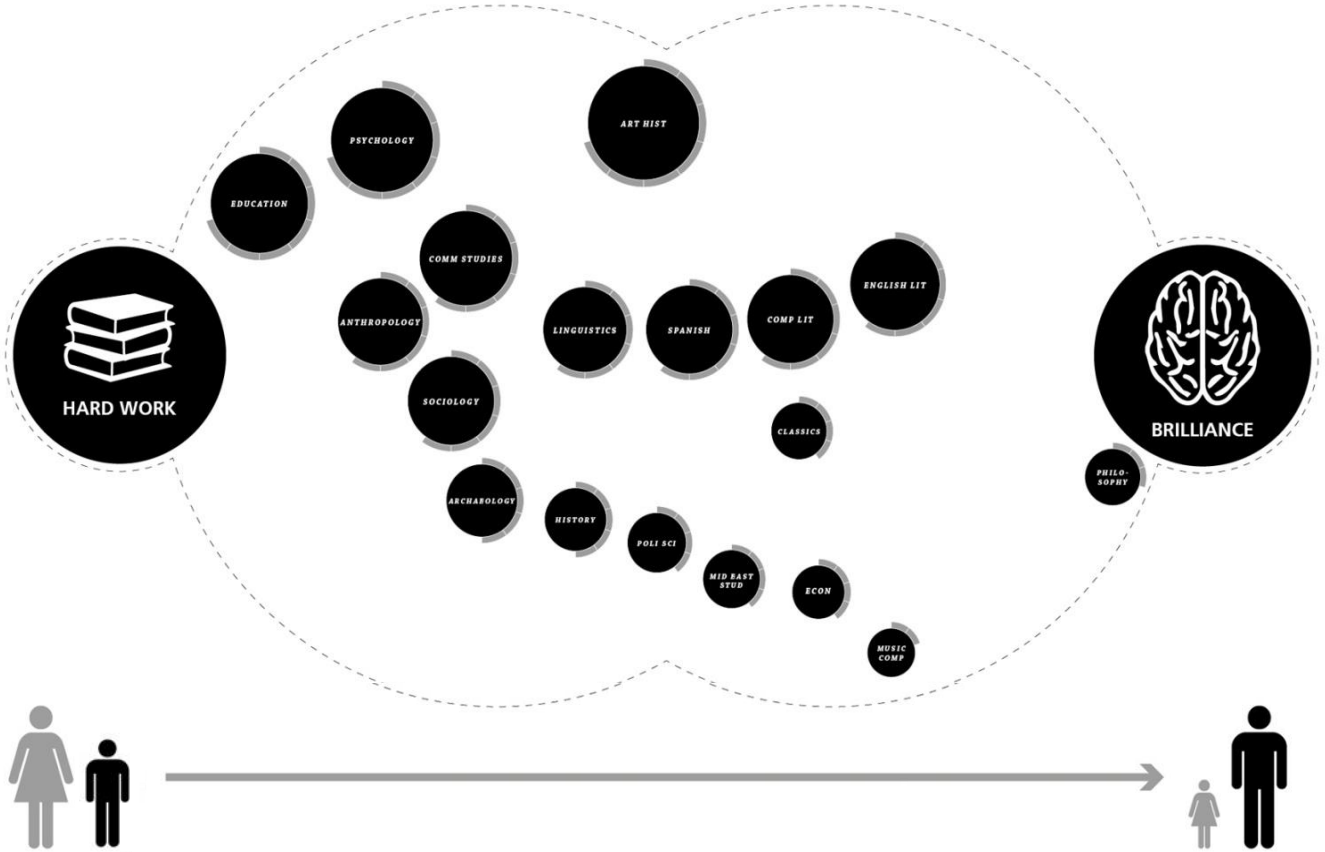


A larger circle indicates a higher percentage of U.S. Ph.D.'s who are female

Source: Leslie, S. J., *Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science, 347*(6219), 262–265
Visualization © Fraunhofer 2015

Survey: Faculty, postdoctoral fellows, and graduate students (N = 1.820) from 30 disciplines (12 STEM, 18 SocSci / Hum) at geographically diverse high-profile public and private research universities across the United States

Hypothesis III : persistent stereoptypes – in humanities and social sciences



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Quality of research: Evidence based results show the necessity to promote women in science

Current studies underline the importance of women in the field of academia and the scientific system:

- „In subject areas with more balanced gender distributions, women tend to focus on different topics“ (Elsevier, 2015)
- „For Germany, female-only publications are the most internationally collaborative – Mixed-gender publications are more interdisciplinary but less internationally collaborative than mono-gender publications“(Elsevier, 2015)
- „An equal gender representation can help to expose the innovation potential of teams.” (Gratton et al., 2007)
- „The presence of women in a group increases the problem-solving skills of the group as a whole.” (Woolley et al., 2010)

There is still a lot to do:

- Germany is ranked 5th for patents worldwide (WIPO 2014), only 5% are from women
- Germany is ranked 4th for publications worldwide (SJR Ranking 2015), only 20% are from women

Studies show that women are less represented in the innovation system and less technophile than men

- Women researchers are particularly under-represented in engineering, technology and natural sciences.
- In 2014, women‘s participation in early stage entrepreneurial activity lay at 35%. In Hightech, only 8% of new businesses are founded by women.
- Men are more likely to be interested in and feel informed about developments in science and technology than women are (64% vs. 44%).

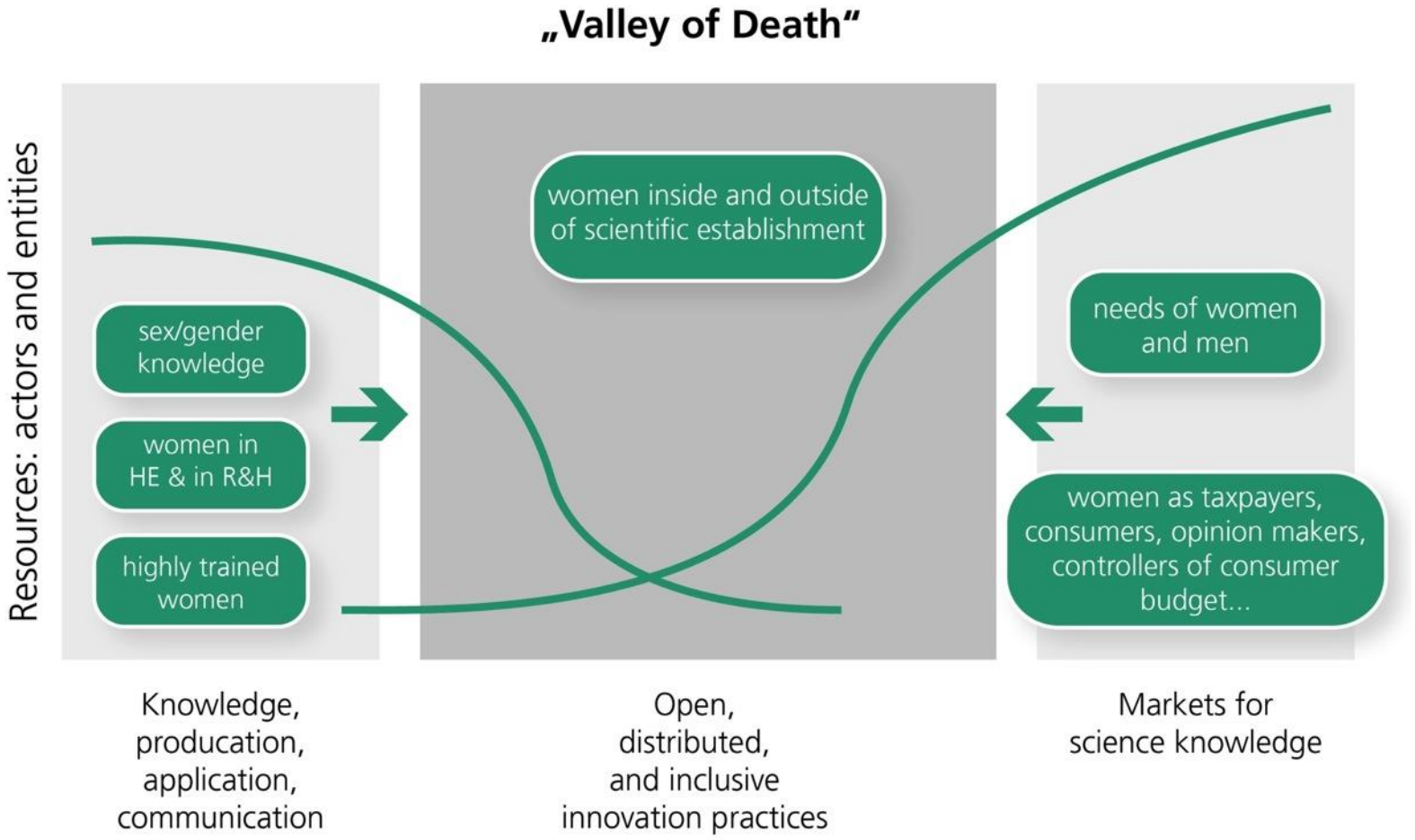
European Commission (2015): She Figures; Gender in Research and Innovation
European Commission (2013): Responsible Research and Innovation (RRI), Science and Technology; Special Eurobarometer 401 Global Entrepreneurship Monitor 2015; Metzger et al. 2008

Market potential: the technology sector, however, is increasingly turning into a women's market

Canon Ixus

SUV
Renault Sandero

The next step: gender dynamics in innovation ecosystems



Source: Elisabeth Pollitzer, Martina Schraudner (2015): Gender dynamics and women´s careers in innovation ecosystems and knowledge practises; The 2015 Annual Conference of the EU-SPRI Forum in Helsinki, Finnland, Tagungsband S. 25-29

Societal acceptance is essential for the success of innovation

Discussion about technologies

The Scientific community

Industry

The Public

Socially shared vision

The Scientific community

Industry

The Public

Policy Priorities of the European Commission

From “Science in Society” to “Science for Society, with Society”

1. **Engagement** - Choose together
2. **Gender Equality** - Unlock the full potential
3. **Science Education** - Creative learning fresh ideas
4. **Ethics** - Do the right “thing” and do it right
5. **Open Access** - Share results to advance
6. **Governance** - Design science for and with society

European Commission (2012): Responsible Research and Innovation. Europe’s ability to respond to societal challenges. Luxembourg: Publications Office of the European Union. URL: http://ec.europa.eu/research/science-society/document_library/pdf_06/responsible-research-and-innovation-leaflet_en.pdf.

Support from the European commission: Responsible research and innovation is defined as sine-qua-non feature of current research

"Responsible research and innovation' is 'a transparent, interactive process by which societal actors and innovators become mutually responsive to each other regarding the ethical acceptability, sustainability and social desirability of the innovation process and its marketable products."

von Schomberg, 2013

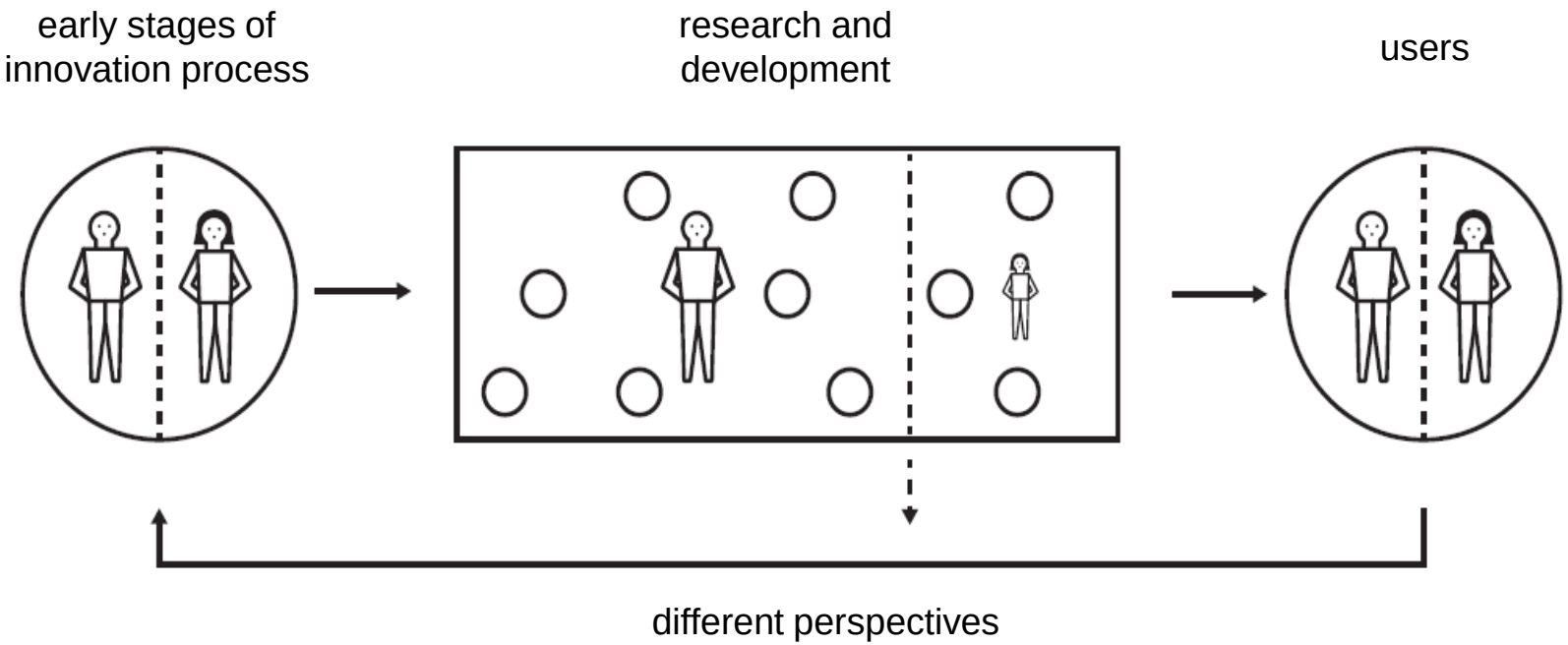
Von Schomberg, René (2013): A Vision of Responsible Innovation. In: Owen, Richard; Heintz, Maggy & Bessant, John (Eds.), Responsible Innovation. Managing the Responsible Emergence of Science and Innovation in Society . John Wiley: London, p.19.

"Public engagement is needed in order to test and contest the framing of the issues that experts are to resolve. Without such critical supervision, experts have often found themselves offering irrelevant advice on wrong or misguided questions."

Jasanoff, 2003

Jasanoff, Sheila (2003): Breaking the waves in science studies: comment on H.M. Collins and Robert Evans,'The Third Wave of Science Studies'. *Social studies of science 33(3)*, pp. 389-400.

The CeRRI-concept unites multiple perspectives and (gender-) diversity aspects at early stages of innovation and business modelling



»Discover Markets« includes users, engineers and stakeholders at early stages of the innovation process

MARKETS

- identifying
- exploring
- describing

IDEAS

- generating
- refining
- converting into specific projects

➔ **designers**

➔ professionals (diverse specializations)

➔ **prospective end-users and stakeholders**

DEVELOPMENT

- establishing feasibility
- identifying specifics
- prototyping

➔ **designers and engineers**

➔ diverse other professionals

PROTOTYPE

- identifying application areas
- testing application areas
- determining specifics

➔ **stakeholders**

➔ professionals (diverse specializations)

➔ **prospective end-users**

BUSINESS MODEL

- marketing strategy
- financial plan
- partnerships

➔ Fraunhofer Venture

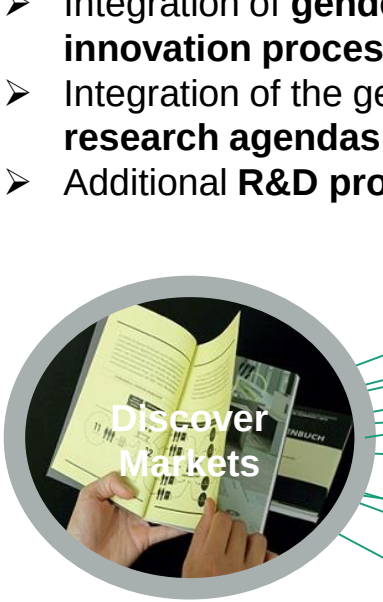
➔ start-ups

➔ professionals (diverse specializations)

DISCOVER MARKETS' APPROACH

Impact of Discover Markets – a project that units perspectives from diverse users, engineers, and other relevant stakeholders

- **Four start-ups**
- Integration of **gender** aspects in **innovation processes**
- Integration of the gender dimension in **research agendas**
- Additional **R&D projects** with industry



Wissenspool

World Café Biokunststoffe

SIRIA

Care Jack I

Pharma

Reha-Interact

Care Jack II

Zellfreie Bioproduktion

Innovations-Akademie

Pharma

Forschungs-blog

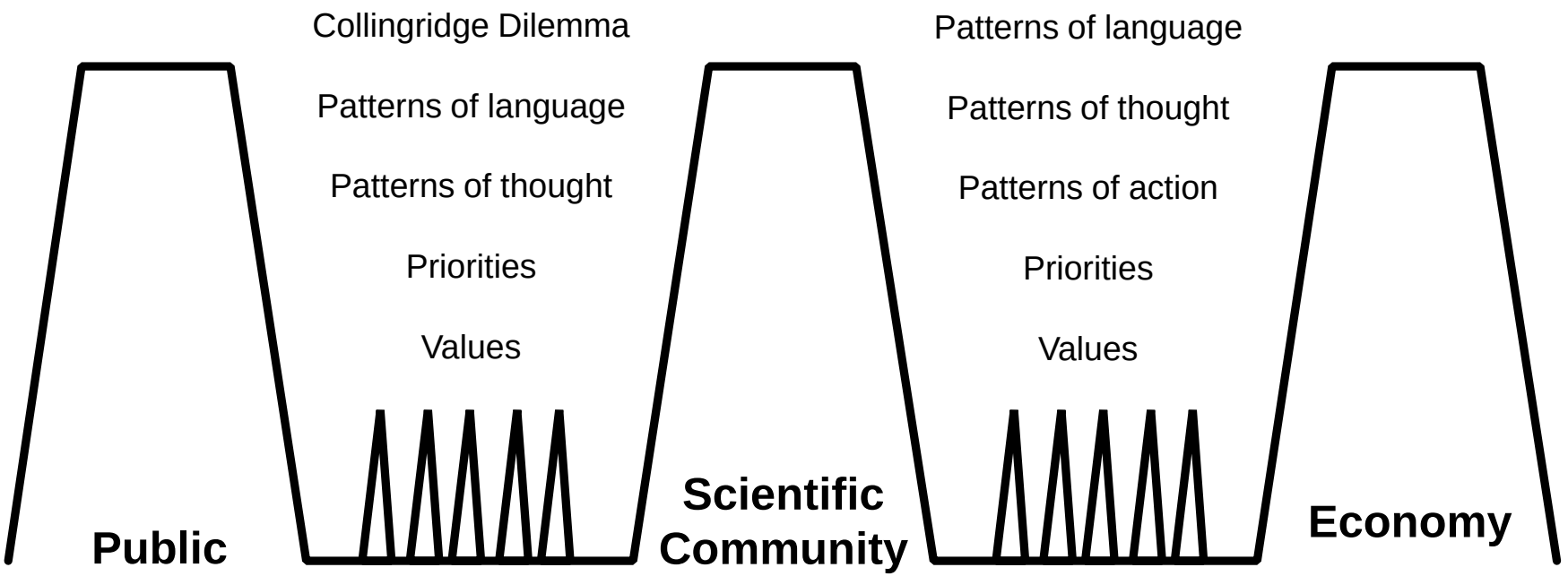
Transfer-plattform

Shaping Future Sondierung

Shaping Future Hauptphase

2009 2010 2011 2012 2013 2014

However, the demand for a participative and interdisciplinary dialogue raises large problems



Participant – feedback

“The morning after the workshop, ideas and visions kept going through my mind. It is important to be able to envision future challenges as manageable and to shape them into desirable outcomes. It is this approach, I believe, that makes your project so appealing.” (women)

Concluding remarks

Developing Leadership for socio-economic improvement

- through a common – women including - understanding of science as an enabler for a socially shared vision of the future which include women´s perspectives and interests.

Do we have further starting points to create the change?

THANK YOU

contact

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