



GENDERED RESEARCH AND INNOVATION - ANY BENEFITS BEYOND JUST BEING FAIR?

ALEKSANDRA DRECUN

MISTRA URBAN FUTURES Gender and Intersectioanality Seminar Gothenborg, January 17, 2018.



AGENDA

- 1. RRI Framework
 - Why RRI?
 - What is RRI?
 - When RRI?
- 2. Gender as one of key components of RRI
- 3. Examples and promising practices



Science-Society Relationship

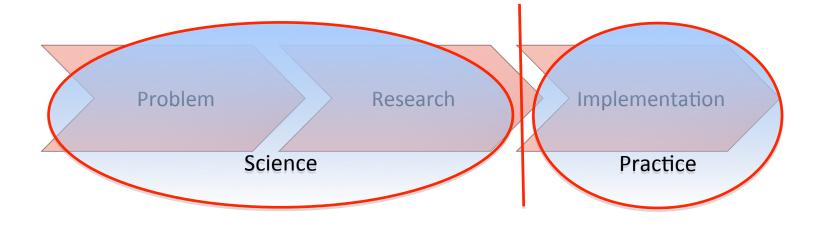
Research and innovation provide important contribution to economic growth, improved health and living standards

> However, there are also some issues:

- Ethical concerns and negative consequences for people and the environment
- Lack of innovation development for certain problems
- Much knowledge is not implemented
- Etc.

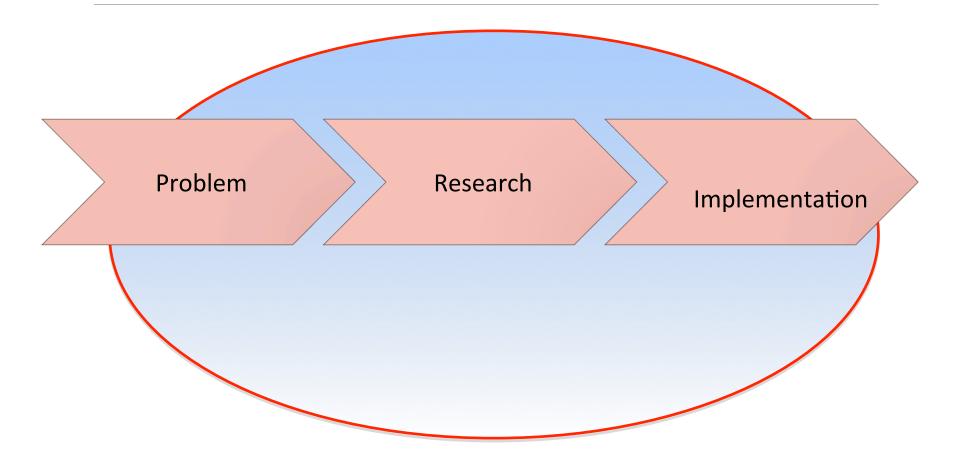


Need for RRI





RRI Approach





Tracing the origin of RRI

Developed as an approach to governance of research and innovation at the European Commission level

- From 2003 on to 2011, an increasing call for interdisciplinary collaboration, socio-technical integration and public engagement
- For Gradually ending up in R&I policies, funding programs, etc...

In 2011 - RRI





Why RRI?







Health and wellbeing



Climate action and resource efficiency



Inclusive and secure societies







What is RRI?

- Research and innovation aimed at sustainability
 - Sensitive to Grand Challenges
 - Diversity as a key to creativity and quality
- Engaging society at large
 - Sensitive to social values
 - Shared responsibility amongst variety of stakeholders



When RRI?



Ongoing, iterative process

> Early engagement is key to fitting solutions



Who?

> Emphasis on collective, shared responsibility:

Anticipatory governance, not only researchers and innovators

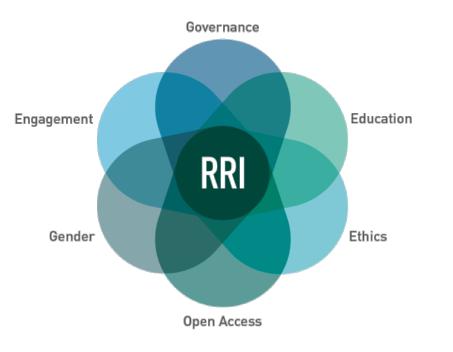
As inclusive as possible: Aligning wide range of actors and activities in the deliberation of values and purposes

- Researchers
- Policymakers
- Educators
- Industry
- CSOs



RRI Framework

- Science and technology do not merely happen to us.
- How do we shape research and innovation as process?



Source: http://www.rri-tools.eu/



Conceptualizing RRI

Responsible and an antime transformer and a state of the state of the

The European Commission website:

"RRI is an inclusive approach to research and innovation (R&I), to ensure that societal actors work together during the whole research and innovation process."

Not one definition, but many definitions

> Aims to better align both the process and outcomes of R&I,

with the values, needs and expectations of European society.



How exactly?

Source: http://www.rri-tools.eu/

1. Learning outcomes	2. R&I outcomes	3. Solutions to societal challenges
Engaged publics	Ethically acceptable	• 7 Grand Challenges (EU)
Responsible actors	• Sustainable	
Responsible institutions	Socially desirable	

Source: http://www.rri-tools.eu/



RRI Process Requirements

1. Diversity & inclusion 2. Anticipation & reflection

3. Openness & transparency

4. Responsiveness & adaptive change



INTERSECTION and Intersectionality

(lucky coincidence)



Intersection's experience in RRI topics

- DG R&D H2020 Program Committees:
 - PC for Strategic Configuration with SwafS, and
 - PC for Societal Challenge 6 Europe in a Changing World inclusive, innovative and reflective societies
- Helsinki Group on Gender in Research (EC advisory body)
- EIT Board
- EUSEA Board
- Cost GenderSTE Action
- Ericsson GE Award for Gender Equality



Our participation in RRI related projects (exempli causa)



Debate science!



The questions to be reflected on

- 1. What are the opportunities and challenges deriving from the adoption of RRI principle of Gender Equality (GE)?
- **2.** Are there common models for the implementation of GE?

in the context of MISTRA URBAN FUTURES



Three analytical approaches to GENDER issues of science and technology:

1. 'Fix the Numbers of Women'

focuses on increasing women's participation.

2. 'Fix the Institutions'

promotes gender equality in careers through structural change in research organizations.

3.'Fix the Knowledge' or 'gendered innovations'

stimulate excellence in science and technology by integrating gender-based analysis into research.



GE in Research and Innovation in Europe



https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf

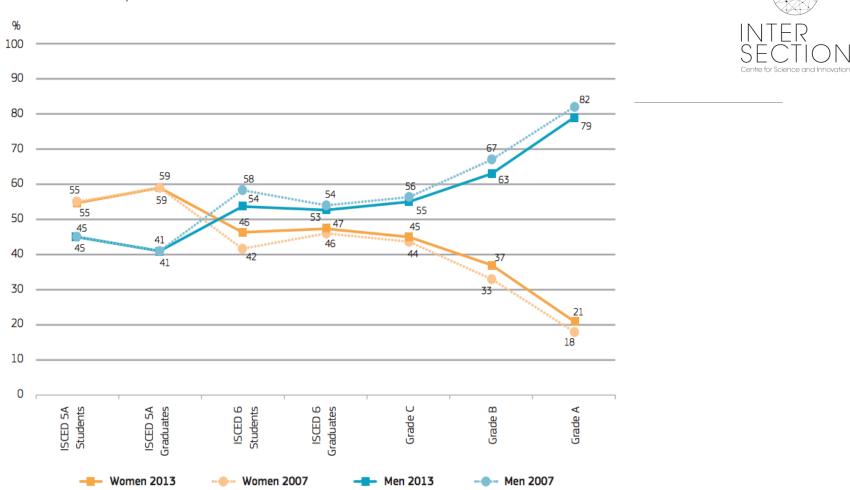


Figure 6.1. Proportion of women and men in a typical academic career, students and academic staff, EU-28, 2007–2013

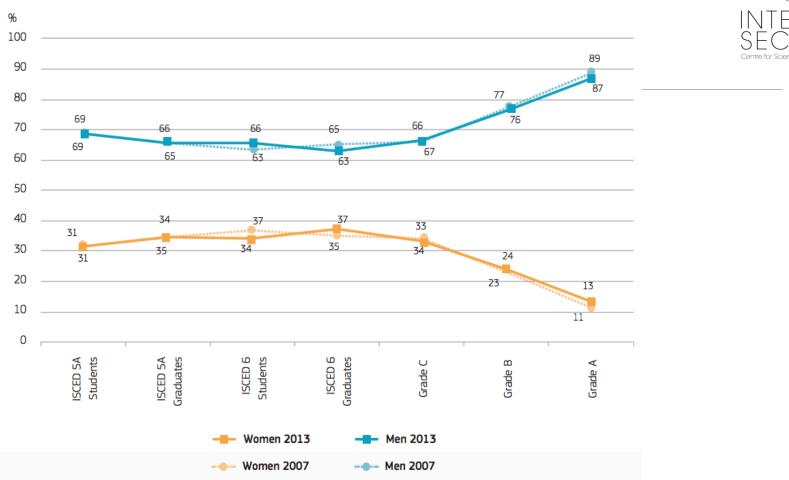


Figure 6.2. Proportions of women and men in a typical academic career in science and engineering, students and academic staff, EU-28, 2007–2013



Technical products for women – shrink it and pink it?





Source: <u>www.femaleinteraction.com</u>



Sex analysis in research is still new?

Vol 465 | Issue no. 7299 | 10 June 2010

Journals can insist that authors document the sex of animals in published papers — the Nature journals are at present considering whether to require the inclusion of such information. Funding agencies should demand that researchers justify sex inequities in grant proposals and, other factors being equal, should favour studies that are more equitable". ... *Nature, vol. 465, p. 665*

THE LANCET

"The Lancet encourages researchers...to plan to analyse data by sex, not only when known to be scientifically appropriate, but also as a matter of routine."

See Editorial page 1826



Is scientific knowledge objective?

- Gender theory has done much to transform the humanities and social sciences, yet it has had little success in the natural sciences and engineering.
- Efforts to increase women's participation will not succeed without mainstreaming the methods of sex and gender analysis into knowledge production
- Taken together these objectives support the twin goals of diversity and excellence in science.
- Gendered Innovations have developed practical methods of sex and gender analysis specifically for science and engineering in collaboration with scientists and engineers ().

Source: Gendered Innovations, Schiebinger et al. https://genderedinnovations.stanford.edu/



Serbia ...



Harvard Business Review

Women Respond Better Than Men to Competitive Pressure



by Alison Beard

STRESS

FROM THE NOVEMBER-DECEMBER 2017 ISSUE

➡ SAVE ➡ SHARE ➡ COMMENT HH TEXT SIZE ➡ PRINT \$6 BUY COPIES

n analyzing more than 8,200 games from Grand Slam tennis matches, Alex Krumer of the University of St. Gallen and his colleagues found that the male players' performance showed a larger drop in high-stakes games (relative to low-stakes games) than the female players' performance did. Their conclusion: Women respond better than men to competitive pressure.



Women respond better than men to competitive pressure.

Krumer:

"We looked at the performance of servers in every first set played at the 2010 French, U.S., and Australian Opens and at Wimbledon, and **we found that the men's performance deteriorated more than the women's when the game was at a critical juncture**.

For example, in sets that went to 4–4, the number of men's serves that were broken rose more than seven percentage points after the players had reached the tie. Among women, we saw barely any difference between pre- and post-tie performance.

We can confidently say that in the world of elite tennis, women are better under pressure than men are. They choke less. Whether that translates to other competitive settings remains to be seen."



How do you explain it?

"We don't know, but it could be biological. If you look at the literature on cortisol, the stress hormone, you'll find that levels of it increase more rapidly in men than in women—in scenarios from golf rounds to public speaking—and that those spikes can hurt performance.

We also published some research suggesting that men are more affected by psychological momentum than women are. We looked at bronze medal judo fights from 2009 to 2013 and found that men who had prevailed in their previous contests were more likely to win in bronze medal rounds than men who had just lost, whereas female competitors' prior-fight record had no effect on their probability of victory.

Testosterone, a proven performance enhancer, spikes after triumph and ebbs after defeat in men, but not in women. While winners who keep winning might sound like a good thing to you, outside the athletic world, there's a risk it leads to overconfidence.

Physically speaking, men are still stronger than women, on average. But if you're talking about mental toughness, maybe in certain circumstances it's women who have the edge."



Gendered Innovations

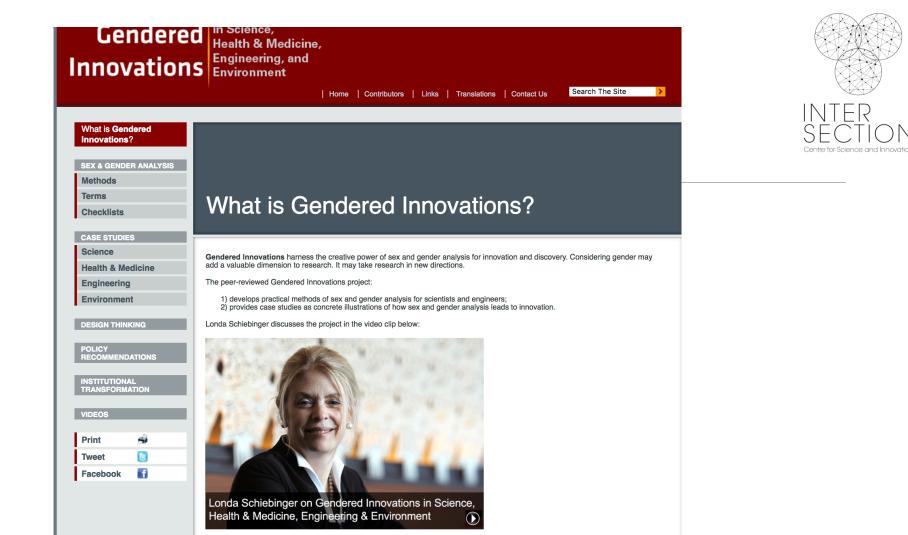
How Gender Analysis Contributes to Research

Research and

novation

European Commission

EUR 25848



Why Gendered Innovations?

Doing research wrong costs lives and money. For example, between 1997 and 2000, 10 drugs were withdrawn from the U.S. market because of life-threatening health effects. Eight of these posed "greater health risks for women than for men" (U.S. GAO, 2001). Not only does developing a drug in the current market cost billions—but when drugs failed, they caused human suffering and death.

Gender bias also leads to missed market opportunities. In engineering, for example, considering short people (many women, but also many men) "out-of-position" drivers leads to greater injury in automobile accidents (see <u>Pregnant Crash Test Dummies</u>). In basic research, failing to use appropriate samples of male and female cells, tissues, and animals yields faulty results (see <u>Stem</u> <u>Cells</u>). In medicine, not recognizing osteoporosis as a male disease delays diagnosis and treatment in men (see <u>Osteoporosis</u> <u>Research in Men</u>). In city planning, not collecting data on caregiving work leads to inefficient transportation systems (see <u>Housing and Neighborhood Design</u>). We can't afford to get the research wrong.



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Doing research right can save lives and money. An analysis of the U.S. Women's Health Initiative Hormone Therapy Trial, for example, found that for every \$1 spent, \$140 were returned to taxpayers in health care savings. The study also saved lives, adding 145,000 more quality-adjusted life years (Roth et al., 2014).

It is crucially important to identify gender bias. But analysis cannot stop there: Gendered Innovations offer state-of-the-art methods of sex and gender analysis. Integrating these methods into basic and applied research produces excellence in science, health & medicine, and engineering research, policy, and practice. The methods of sex and gender analysis are one set of methods among many that a researcher will bring to a project.

Gendered in Science, Health & Medicine, Innovations Engineering, and Environment

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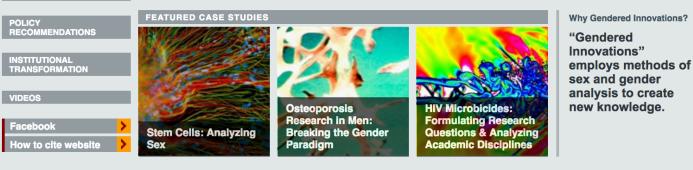
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ENVIRONMENT



What is Gendered HEALTH & MEDICINE SCIENCE ENGINEERING Innovations? SEX & GENDER ANALYSIS Methods Terms Checklists CASE STUDIES Science **Health & Medicine HEALTH & MEDICINE** Engineering Sex and Gender Methods for Research | Gendered Innovations Environment

DESIGN THINKING



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SEX & GENDER ANALYSIS Methods

Terms Checklists

Health & Medicine Case Studies

Demonstrate Gender Methods In Basic And Applied Research

CASE STUDIES



DESIGN THINKING

POLICY RECOMMENDATION

INSTITUTIONAL TRANSFORMATION



This page provides practical examples of how sex and gender analysis leads to gendered innovations.



Colorectal Cancer: Analyzing How Sex and Gender Interact De-Gendering the Knee: Overemphasizing Sex Differences as a Problem

Dietary Assessment

Method: Analyzing How Sex and Gender Interact



Nanotechnology-Based Screening for HPV: **Rethinking Research** Priorities



Osteoporosis Research in Men: Rethinking Standards and **Reference Models**

Nutrigenomics





Gender differences in coronary heart disease

A.H.E.M. Maas¹ and Y.E.A. Appelman²

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This article has been cited by other articles in PMC.

Abstract

Cardiovascular disease develops 7 to 10 years later in women than in men and is still the major cause of death in women. The risk of heart disease in women is often underestimated due to the misperception that females are 'protected' against cardiovascular disease. The under-recognition of heart disease and differences in clinical presentation in women lead to less aggressive treatment strategies and a lower representation of women in clinical trials. Furthermore, self-awareness in women and identification of their cardiovascular risk factors needs more attention, which should result in a better prevention of cardiovascular events. In this review we summarise the major issues that are important in the diagnosis and treatment of coronary heart disease in women. (Neth Heart J 2010;18:598–603.)

Keywords: Coronary Heart Disease, Gender Differences, Menopause, Women, Risk Factors

Go to: 🖂



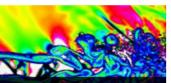
Engineering & Technology Case Studies

Demonstrate Gender Methods In Design

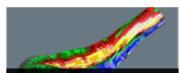
This page provides practical examples of how sex and gender analysis leads to gendered innovations.



Assistive Technologies for the Elderly



HIV Microbicides: Rethinking Research Priorities and Outcomes



Human Thorax Model: Rethinking Standards and Reference Models



Information for Air Travelers: Participatory Research and Design





Making Machines Talk: Analyzing Gender Assumptions

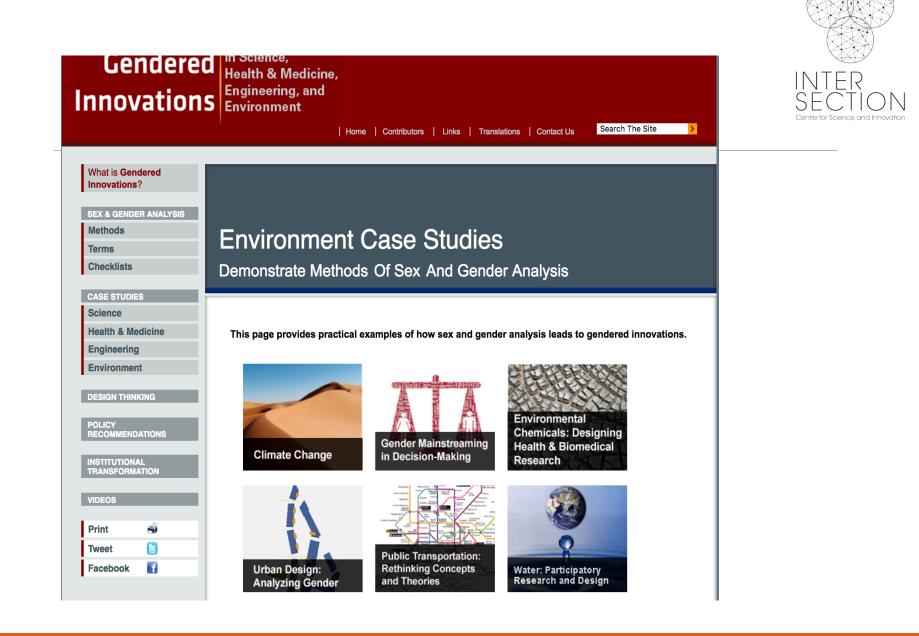


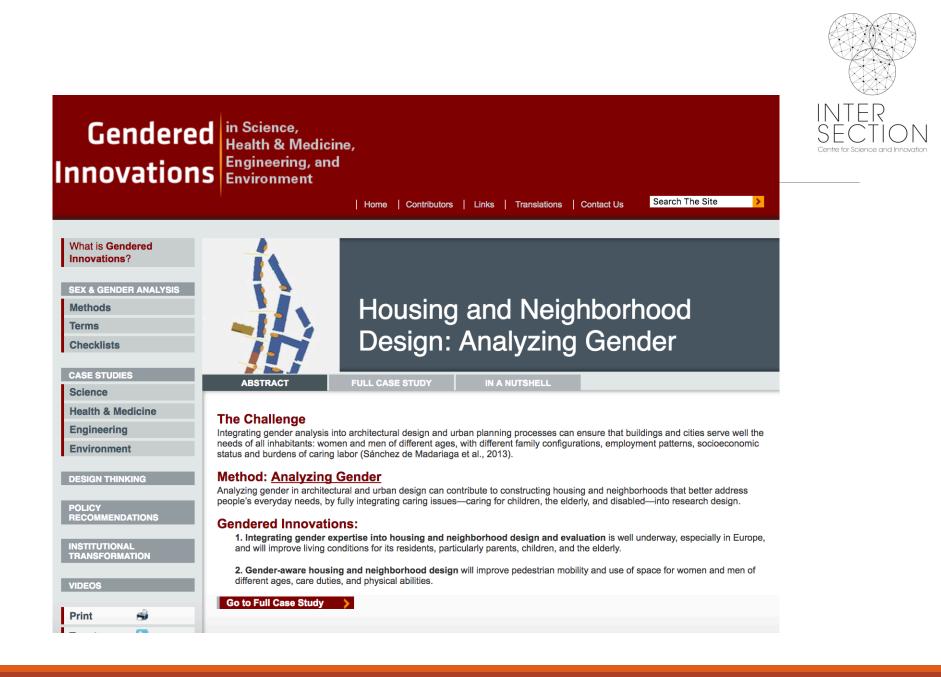
Pregnant Crash Test Dummies: Rethinking Standards and Reference Models



Video Games: Engineering Innovation Processes







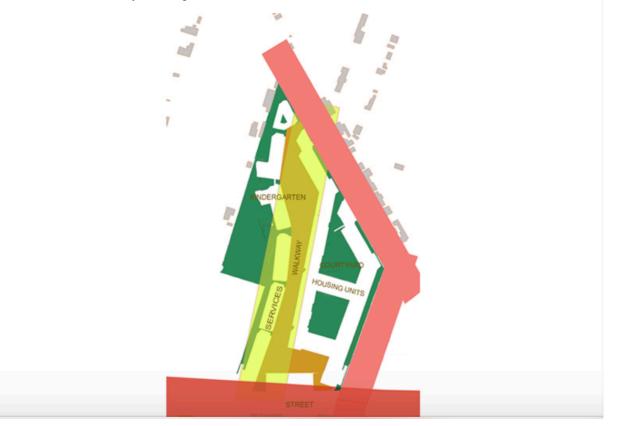


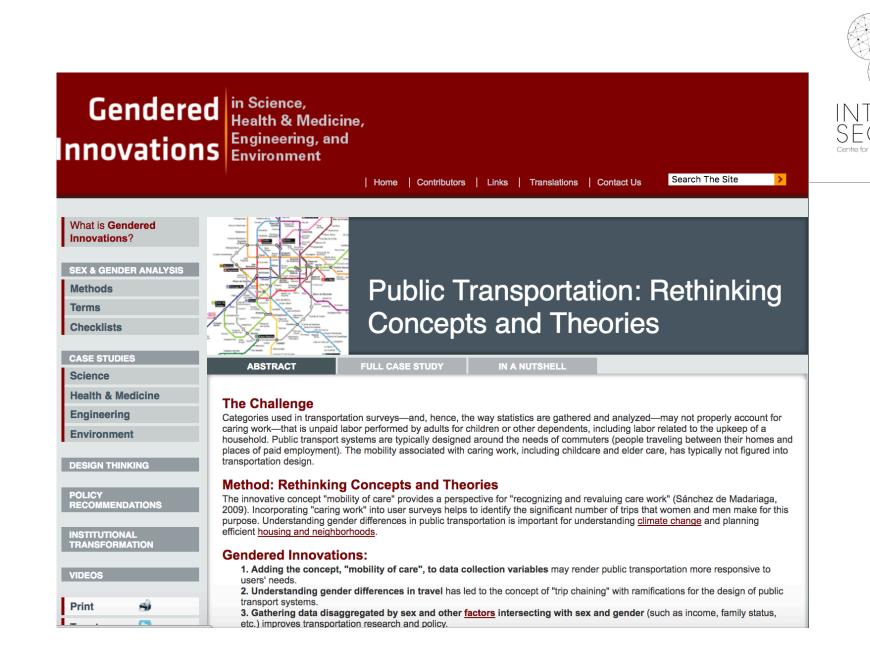
Gendered Innovation 2: Gender-Aware Housing and Neighborhood Design

Urban designers applying gender analysis have undertaken projects that coordinate design for housing, parks, and transportation to improve the quality of "everyday life." Innovations in this field include:

A. Housing to Support Child- and Eldercare: Designers recognized that traditional urban design separated living spaces and commercial spaces into separate zones, resulting in large distances between homes, markets, schools, etc. These distances placed significant stress on people combining employment with care responsibilities (Sánchez de Madariaga, 2013). In addition, such design practices often make cars the most practical means of transportation, creating environmental challenges (Blumenberg, 2004)—see Case Study: <u>Climate Change</u>. In response, urban designers have created housing and neighborhoods with on-site child- and elderly-care facilities, shops for basic everyday needs, and often primary-care medical facilities.

Vienna's Frauen-Werk-Stadt I (FWS-I), created by architect and professor Franziska Ullmann, includes 359 housing units with childcare facilities in order to minimize the distance parents travel to take their children to daycare. This supports working parents as well as the environment by minimizing travel.









ences can improve almost everything. In safety engineering, ergonomic differences between men and women are important. Conventional seatbelts do not fit pregnant women properly, and motor vehicle crashes are the leading cause of fetal death related to maternal trauma. Analyses of sex differences have led to the development of pregnant crash test dummies that enhance safety in automobile testing and design.

In medicine, osteoporosis has been conceptualized primarily as a women's disease, yet after a certain age men account for nearly a third of osteoporosis-related hip fractures. Tragically, when men break their hips, they tend to die. We don't know why. Analyzing the interaction between sex and gender in osteoporosis research has developed new diagnostics for men, and the search for better treatments is underway.

Let's take another example where gender analysis has a potential for innovation in machine learning, natural language processing and algorithms. Ever use Google Translate? What if you are a woman and the article is about you? The machine defaults to "he," for example: Londa Schiebinger, "he" wrote, "he" thought, occasionally, "it" said. How can such a forward-thinking company as Google —that explicitly supports gender equality make such a fundamental error?

Google Translate defaults to the masculine pronoun because "he said" is more commonly found on the web than "she said". This is where gender analysis kicks in. We know from NGram (another Google product) that the ratio of "he said" to "she said" has fallen dramatically from a peak of 4:1 in the 1960s to 2:1 since 2000. This exactly parallels Gendered Innovations have developed practical methods of sex and gender analysis specifically for science and engineering in collaboration with scientists and engineers (Schiebinger et al.).



IRIS BOHNET

WHAT WORKS

GENDER EQUALITY

BY DESIGN

"Gender equality is a moral and a business imperative. But **unconscious bias holds us back** and de-biasing minds has proven to be difficult and expensive. Behavioral design offers a new solution."



The Boston Symphony Orchestra case

- As late as 1970, only 5 percent of musicians performing in the top five orchestras in the US were women.
- Today, women are 35% of the most acclaimed orchestra.
 It did not happen by chance!

- Goldin, Claudia and Cecilia Rouse. "Orchestrating Impartiality: The Impact Of 'Blind' Auditions On Female Musicians," American Economic Review, 2000, v90(4, Sep), 715-741.

- Chia-Jung Tsay, "Sight over sound in the judgment of music performance", PNAS 2013 110 (36) 14580-14585



What works?

Not a great technological feat was required for that change, just awarennes, a curtain, and a decision

Nudge – Behavioral Design



What Works - examples

- OECD Business case for GE (Japan)
- Howard v. Heidi IAT (Implicit Association Test, Harvard)
- Lean in Lean Out (negotiations, guessing, taking risk ...)
- Seeing is believing
- Collective Intelligence diversity increases productivity
 - (Carnegie Mellon team)
- Ranking as "soft power"

> NOT ONLY RIGHT, BUT ALSO SMART THING TO DO!



Useful resources on unconscious bias

Harvard Implicit Association Test

https://implicit.harvard.edu/implicit/takeatest.html

Google's Unbiasing

https://rework.withgoogle.com/subjects/unbiasing/

EIGE Gender in Research Repport







GE in Business Enterprise Sector

Women researchers are two times less likely than men to work in BES.

Despite positive growth in the number of women conducting research in BES, the low presence of women here is particularly acute and has changed little since 2009.

➢ Women in the EU represented 19.4 % of researchers in the BES in 2009, and 19.7 % in 2011).

Within the economic activities of the BES, the highest proportion of women researchers can be found in the pharmaceutical manufacturing industry.

The proportion of women researchers relative to men is also relatively low in the remaining sectors of the economy, with **women making up a higher proportion than men in only seven countries in the manufacturing of chemicals and chemical products**.



GE in Patent Inventions

Women are heavily under-represented as patent inventors.

In EU-28, a mere 8.9 % of patent applications between 2010 and 2013 registered a woman inventor.

Nevertheless, the gap in inventorship (women to men ratio of 0.1 for the EU-28) is more pronounced than would be expected based on the underrepresentation of women researchers in the BES (women to men ratio of 0.2 for the EU-28).

This may suggest that besides being under-represented amongst BES researchers, women produce, on average, fewer inventions than their men colleagues.



World Economic Forum – GE in Biotech

There are on average **10 men for every woman in biotech boardrooms**, and **over half of all biotech companies have exclusively male boards**.

While the biomedical talent pipeline is gender equal, there are significant barriers for women to reach senior leadership positions.

The sector employs a relatively young workforce, and **some of the major challenges relate to the attributes valued in the start-up culture within the sector**.

This is reflected in the cognitive bias in which stereotypically masculine traits are frequently sought after in entrepreneurs, managers and executives.

There are also **misconceptions that women have a lower risk tolerance than men**

In a risk-embracing culture such as a biotech start-up that may also influence recruitment and evaluation.



Gender Equality Plans – An example for Physics Institutions



2017

GENERA

Fields of Action⁹ and sub-fields





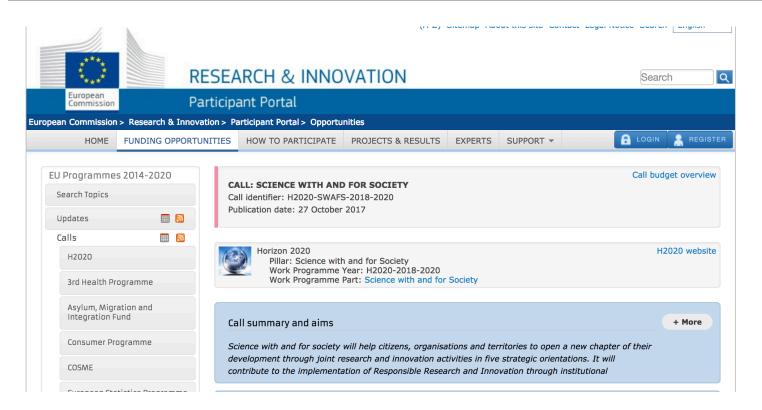


Structural Integration of Gender Equality

Title:	Advice by international gender experts ¹⁰
Field of Action:	 Structural Integration of Gender Equality Gender-inclusive/Gender-sensitive Organisational Culture
Objectives:	 Addressing gender equality issues regularly in the organization Raising awareness on bias and stereotypes and their impact
Target group(s):	Management and Leadership
Description:	The Swiss National Science Fund has an international advisory board for gender equality. The members are internationally known gender experts and distinguished researchers. This committee meets twice a year at SNSF and makes sure that gender equality issues are addressed in the organisation on a regular basis. Committee members have given presentations on biases and stereotypes and their impact on the evaluation process to the SNSF Research Council members in 2015 and 2016.
More	Swiss National Science Fund (SNSF) (Swiss) Website: http://www.snf.ch/en/Pages/default.aspx
information:	website. http://www.shiteli/Fages/default.aspx



H2020 Calls focused on Gender Topics - SwafS





Topic: SwafS-09-2 equality pla Publication date:	018-2019: Supporting research organis ns 27 October 2017	sations to impler	ment gender Forthcoming
Types of action: DeadlineModel: Opening date:	CSA Coordination and support action single-stage 11 December 2018	Deadline:	02 April 2019 17:00:00
			Time Zone : (Brussels time
Topic: SwafS-09-2 plans	018-2019: Supporting research organis	sations to impler	ment gender equality Open
Publication date:	27 October 2017		
Types of action: DeadlineModel: Opening date:	CSA Coordination and support action single-stage 05 December 2017	Deadline:	10 April 2018 17:00:00
			Time Zone : (Brussels time
opic: SwafS-10-2	018: Analysing gender gaps and biases	in the allocation	n of grants Open
Publication date:	27 October 2017		
Types of action: DeadlineModel: Dpening date:	RIA Research and Innovation action single-stage 05 December 2017	Deadline:	10 April 2018 17:00:00
			Time Zone : (Brussels time



Topic: SwafS-11-2019: Scenarios for an award/certification system for gender equality in research organisations and universities in Europe Forthcoming Publication date: 27 October 2017 27 October 2017 Types of action: RIA Research and Innovation action single-stage Deadline: 02 April 2019 17:00:00 Time Zone : (Brussels time) Time Zone : (Brussels time)

Topic: Swafs (STI)	Forthcoming			
Publication d	ate: 27 October 2017			
Types of action	n: RIA Research and Innovation action			
DeadlineMod Opening date		Deadline:	02 April 2019	17:00:00
			Time Zor	ne : (Brussels time)

Topic: SwafS-13-2018: Gender Equality Academy and dissemination of gender knowledge across Europe				
Publication date:	27 October 2017			
Types of action: DeadlineModel:	CSA Coordination and support action single-stage	Dendliner	10 April 2010 17:0	20.00
Opening date:	05 December 2017	Deadline:	10 April 2018 17:00:00	
			Time Zone :	(Brussels time)



How to make use of different perspectives?

- **1**. Link Gender to Excellence
- 2. Make women visible
- 3. Secure top level support
- 4. Increase the number of women in decision making bodies
- 5. Take the societal shift into account





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