

Networks and Networking. A Question of Women's Professional Success in Engineering

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Research interest

- Several European research projects starting from gender segregation in engineering and investigating the reasons why there is nearly no change over time
- Results showed structural factors to be responsible for the gender imbalance
- In many countries initiatives tried to bring about a more gender balanced situation for educational and professional area
- But focussing most times on individual interventions
- Leaving for example curricula and pedagogy in educational and organisational working culture in professional field unchanged.
- Men's networks as career promoting factor – for men mostly – have not become explicitly the focus of research and politics in SET.

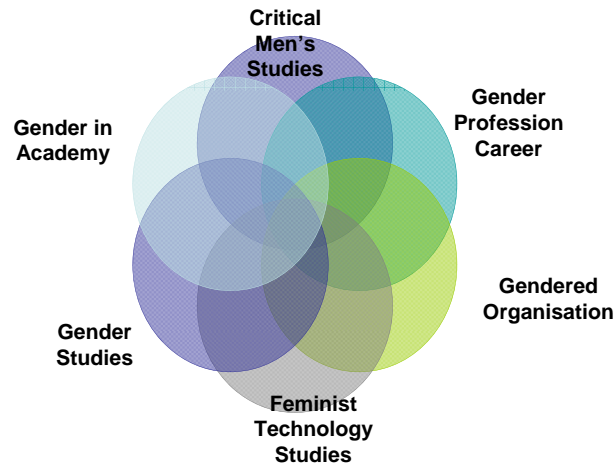
Overview of European research projects, focussing partly on networks in engineering

- **INDECS** proved the *attractiveness and acceptability of interdisciplinary degree courses* on data basis of a one-year explanatory research (Partner countries: Austria, Finland, France, Germany, Greece, Slovakia, Spain, UK, **Coordination:** University of Wuppertal, Prof. Dr. Clivia Sotomayor-Torres) (2001-2002) www.INDECS.uni-wuppertal.de
- **Womeng** “**Creating Cultures of success for women engineers**” Partner countries: Austria, Finland, France, Germany, Greece, Slovakia, Spain, UK, **Coordination:** CDFI, Paris, Dr. Yvonne Pourrat, Dr. Anne-Sophie Godroy-Genin) (2002-2005) www.womeng.net
- **PROMETEA** “**Empowering Women Engineers in Industrial and Academic Research**” Partner countries: Austria, Finland, France, Germany, Greece, Lithuania, Russia, Serbia, Slovakia, Spain, Sweden, UK, and Chile, **Coordination:** CDFI, Paris, Dr. Yvonne Pourrat, Dr. Anne-Sophie Godroy-Genin) (2005-2007) www.prometa.info
- **MOTIVATION:** “**Promoting positive images of SET in young people under gender perspective**” www.motivationproject.com, 7 partner countries: Austria, France, Germany, Netherlands, Slovakia, Spain, Sweden, **Coordination:** University of Wuppertal, Associate Professor Dr. Felizitas Sagebiel, Dipl.Soc.Wiss Jennifer Dahmen (2008-2010)
- **Tender:** “**Meta analysis of Gender and Science Research**” **Coordination:** Cirem (Spain), Maria Caprile (sociologist), 27 participating countries (Europe and Turkey, Israel), University of Wuppertal (Germany) one of 7 partners with responsibility as thematic coordinator, scientific leader: Associate Professor Dr. Felizitas Sagebiel (2008-2010) www.genderandscience.org
- **BMBF and ESF cooperation project** “**Women on Top. The impact of Women in Leadership Positions in Engineering, Science and Environmental Organisations**” **Coordination:** Associate Professor Dr. Felizitas Sagebiel, Cooperation with PD Dr. Uta von Winterfeld (Wuppertal Institute for Climate, Environment and Energy) (2009-2012) www.spitzenfrauen.uni-wuppertal.de

From where research started

- Engineering is still a male domain with low numbers of women in most European countries; (8,9 % women professors in engineering; 8,4 % in mechanics for example)
- Even though it starts with studying,
- The paper focuses on professional field
- Focusing on women managers, women in top research positions and women engineers at top positions
- The samples of three projects from which results are presented contained different types of organisations in different projects:
 - Business enterprises (European project Womeng, PROMETEA, German project)
 - Governmental research organisations (PROMETEA, German project)
 - Universities (PROMETEA, German project)
 - NGOs or governmental organisations (German project)

Research and Theory



Some References from the different projects

- **Gender in academia:** Invisibility of Women stemming from ideology of scientific acceptance based on individual performance, neglecting the informal helping system between men (Bagilhole and Goode 2001; Husu 2005; Metz-Göckel; 1999; Morley 1999)
- **Critical Men's Studies: Masculinities** (Connell 1999, Höyng/Lange 2004) **and Feminist Technology Studies:** Reproduction of dominant masculinity by informal strategies like story telling, fraternisation, fun, (Faulkner 2000, McLean 1996, Sagebiel 2003, 2005c, Sagebiel/Dahmen 2005a, b). Commitment and bonding, exclusion of „otherness“

Hypotheses: Networks and professional success in engineering

- Organisational culture in engineering is traditional masculine with **gendered networks** as central element.
- Women engineers in are **excluded from men's networks** (see Ibarra 1993, on her review most organisation research refers) and cannot rely on a **powerful women's network** (this is an implicit result from Burt 1998, on his research also many authors like Scheidegger and Osterloh 2004 refer)
„Differential access to these (networks) in professional and organizational hierarchies has been cited as a disadvantaging factor for the advancement and career development od women managers“ (Rothstein et al: 4)

Research questions

- Did the professional field of engineering change to a more women friendly? (Womeng)
- Did men's networks change to more openness towards women? (Womeng)
- Do women engineers in research perceive the genderedness of networks? (PROMETEA)
- Are women engineers aware of the importance of networking for success? (PROMETEA)
- Which are excluding characteristics of men's networks and male bonding in engineering research? (PROMETEA)
- Which role does fitting to men's networks play? (PROMETEA, Top women engineers)
- Did the professional organisations change their organisational culture? Are they welcome at the top? (Top women engineers)
- Do top women engineers use networks? (Top women engineers)
- Is mentoring as network introduction gendered? (Top women engineers)
- Does the power of women's networks increase with more top women? (Top women engineers)

Methodologies

- Referring to primary data from different research projects in which I have been participating for
 - Context of investigation
 - quotation of asked women and men
- Secondary analysis of primary data to summarise and interpret the similarities of results
- One research project is still going on

Overview

- Womeng results
- PROMETEA results
- Top women results

Did the professional field of engineering change to a more women friendly?

- **Results from 5th FP project Womeng** in which women engineers in industrial management positions were the focus (Sagebiel 2007) showed:
- Women asked individually and in focus groups talked about a dominance of men's masculine working culture putting them in a minority situation and about men's networks
- **“It is a men's world and women have to accept that it is a men's world.”** (an asked Austrian female engineer).
- Constructed gender differences (**gender stereotypes**) were seen as barriers for **making a career as woman engineer**.
- **“I had to fight to convince the company that as a woman I could make it!”** (an asked French female engineer who quit).

Powerful networks would help women managers to fight against gender stereotypes.

Did men's networks change to more openness towards women?

- Women managers are *aware of men's networks*
 - **But how to do networking successfully was not clear for some of them**
- Their entrance to men's networks was seen as restricted but at the same time as an important career barrier by women engineers, especially in industrial management positions.
- Interestingly *diversity programmes* in some firms seemed to help to weaken the power of traditional old boys' / men's networks,
- especially when top men had been mentors for women with career aspiration. These women get information which they would not have got without mentoring. (Vaske and Schweer 2012 under reference to literature)
- **Women networks**, women told in Womeng project, are not strong enough to further careers of women engineers in an organisation. **“You need someone to push and you need someone to pull”** (a German woman manager).

Do women engineers in research perceive the genderedness of networks?

- Results from 6th FP project **PROMETEA** (Sagebiel 2010) showed on basis of separated focus discussion groups with female and male engineers in research from 12 different European countries:
- Networks were embedded in gendered working cultures
 - by traditional gender division of labour,
 - gender stereotypes and
 - gender awareness.
- Networks are gendered
 - by definition
 - by starting processes
 - by common rituals
 - by excluding women
- Women were not always aware of this genderedness of networks and their exclusion

Are women engineers aware of the importance of networking for success?

There were controversial opinions about the priority of performance versus networking for a successful career as an engineer working in research. But overall men knew more definitely about the relevance of learning and doing networking.

“I think it's the hardest part of the scientists job” (m-UK)

“With the habilitation at the latest you notice that political influence starts to work, which you can't compare with performance ...” (m-Austria)

“It's the ability to sell you! The scientific network will allow you to reach a certain visibility...” (m-France)

“Scientists are more defined by their performance...” (m-Austria)

“Informal networks are just for those who are not skilled enough in doing research” (f-Slovakia)

“Networks are the nuts and bolts - privately and professionally. Without (private) networks I could not have worked in that way. But also in a professional way, networking means communication.” (f-Germany)

Which are excluding characteristics of men's networks and male bonding in engineering research?

- Male engineers could tell much about characteristics which are appropriate to exclude many women engineers implicitly or explicitly:
“Networking starts already during study time and continues on conferences or while preparing together a project proposal.”
“If you want to be successful in raising funds or getting project partners, you have to get once drunken with your future cooperation partner!”
“Inhibitions get weak and you can talk more frank and free about cooperation structures.” (m-Germany)
“...virtually everybody is doing one of these relatively dangerous sports and there people find together in communities.” (m-Austria)

By which means are women engineers excluded from men's networks?

- By the men's networks' space, time, media, rituals and activities
– restrooms, meeting at unpredictable times, phoning, drinking at night, doing extreme sports.
- Exclusion is not always perceived by women engineers in research
- No explicit access barriers exist to men's networks – but,
“[Women] are excluded from this network, because in this basketball team women can't join” (m-Austria)
“I was never invited to the sauna evenings...” (f-Finland)
“Networks are hard to get in since it often implies going for drinks someplace you don't particularly care about...” (m-Chile)
- One woman manager in an industrial company told how difficult it is to real join a men's network under equal conditions:
“And nevertheless men will phone with themselves and you have hardly any chance for entry in this network. They bargain with each other and at the end they laugh about their success.”

Which role does fitting to men's networks play?

Women engineers feel that they are somehow not fitting in men's networks. Indeed Rothstein et al (2001) found in their quantitative research of networks in organisations that men managers had a higher proportion of same-sex members in their networks than women managers. Gail M. McGuire (2002) found in her research informal discrimination of women: „Women may have been perceived by network members as poor or risky investments because of cultural beliefs that ranked them below that of white man according to status characteristics theory“ (316) Another factor is trust; men seem to trust other men more: „Trust is important in network relationships because it enables member to take risks, to get honest feedback, to ask sensitive questions, and to achieve some predictability“ (Gail M. McGuire 2002: 317; see also Vaske/ Schweer 2012).

“The men are maybe afraid to damage their reputation with a woman as a network partner. And men probably see there are more common characteristics among themselves. Are women defined as the "others"?” (f-Germany)

“I cannot tell another man „I can do something for your career, it is useful for you to be befriended with me, because you will have advantages some days for your career. I cannot. I don't have the chance because I am not high enough on the career ladder.” (industrial company, young female engineer and leader)

Did the professional organisations change their organisational culture? Are women welcome at the top?

- An on going German research project about the impact of women scientists /engineers in leadership positions on change of organisational cultures and power structures shows
- that the main organisational culture is still traditional masculine in the view of women engineers:
- ***“This being always in the here and now situation means they can attack you and you must bear this. Every day you must start again fighting and shelter yourself.”*** (woman engineer and leader in an industrial company)
- ***“And I have the feeling that people thought they look for an easy handling woman which will subordinate herself who will agree to all and make no problems... This was a fight, which I had to do. I wanted to clear the situation.”*** (woman professor in a university and leader in a governmental research organisation)

Do top women engineers use networks?

- They know the central role and benefits of networking
- **to get information**
- **to increase their power to implement their ideas,**
- for successful acquisition of projects
- To get qualified staff members
- And they know how it worked with men's networks

But the connection between networks and success which is true for men does not exist for women, that means women cannot succeed with the same networks like men. And more over seeing networks as part of social capital Burt (1998) interprets his results about networks in organisations that for women it is better to borrow networks with central men included.

Is mentoring as network introduction gendered?

Network juniors are traditionally introduced by seniors (mentors).

A male professor talked about having been introduced by his professor when he was a young scientist:

- ***„I was just a fresh graduate ... then he took me to France for a week with him. ... Well, you have to get to know the people. ... He wouldn't have had to go there and he couldn't have sent me alone there, I would have been a little helpless, but like that, it matched quite well. ... Because with networks one has to start at some time, they typically don't fall as a net over oneself“*** (a male university professor)

A female University vice chancellor talked about a contrast experience because she was not introduced to any network when she started her career as an engineer:

- ***„Conference visits or something similar. That was not yet as established as today. And I did not come inside so very much, was not introduced, and when I later ... had the travel resources, ... I practised it myself more intensively and noticed for myself, how important it is. I was ... so very much left alone with it in that respect and I also had to discover the necessity of such things for myself“*** (a female university professor).
- Women need longer mentoring because even when on top they cannot rely on established powerful networks. Vaske and Schweer think they need strategic Protégés.

Does the power of women's networks increase with more women at the top?

- **Women's networks exist and they are useful.**

Contacting women with each other is experienced as less complicated by some of the asked women leaders:

- ***„I think that sometimes women engineers handle problems more impartial, also in case of technical one I can handle it more personally and collegial.“*** (woman professor in a university and leader in a governmental research organisation)

One woman engineer used an elite women's network which has been created by male top manager and has been sponsored by industry. This is amazing because here the male dominated industry is helping to weaken the power of men's networking

- ***“I personally appreciate most the network 'Generation CEO', which is a women's to the top network.“*** (woman professor in a university and leader in a governmental research organisation)

Does the power of women's networks increase with more women at the top?

Another kind of women's networks a woman leader talked about in a company has been created by herself and another woman engineer:

- ***„To counter to these informal men's networks and creating a formal public women's network and to say ‚We can do so the same‘. Men protesting and being confused said that now they will found a men's network. And some male managers said, you only want to make a career, you want the women's quota“ and we answered ‘No we don't want that at first.’ ... We didn't create the network because of pure power politics, even though this is included. But this has not been the first reason.“*** (woman engineer and leader in an industrial company)
- The power of the described women network is experienced as limited, because most of the women do not cooperate directly. That limits opportunities for supporting each other:
- ***„We deal together from time to time, but chances or possibilities were not as big. If we can support each other we do so, we make an arrangement in the run-up, but we are limited because we do not work in the same enterprise.“*** (woman engineer and leader in an industrial company)

This women network even though a formal one gives at the same time opportunities for informal cooperation, even though this is restricted because they are working in different branches.

Summary and conclusion

- In summary men's networks still exist and they seem to be more important than performance for career and successful working life in science and engineering.
- High networking awareness exists among leading women and men and this **networking awareness is a question of power**. Only women in influential management positions had plenty of own experiences with networking.
- Women at the top are more aware of their importance and when being excluded from men's network they look for their own gender separated new elite networks.
- Networks in engineering research are gendered (Burt 1998; Funken 2011; Sagebiel 2010).

Summary and conclusion

- Defined gender differences (gender stereotypes) (Wajcman 1996; Knight/Kerfoot 2004) and men's networks are taken to manipulate women's career chances.
- Direct competition strengthens informal activities of men's networks excluding women (Ohlendiek 2003; Miller 2002).
- Women's networks help but they are of limited importance for career because they have less power.
- Genderedness of organisational cultures (Gheradil 1994) and genderedness of research organisations in engineering seem to correspond with the pattern of equality in the societies (Sagebiel 2010).
- Discrimination and excluding processes are more open (manifest) in very traditional societies and more tacit (latent) in more equal societies (Sagebiel 2010)

Thank you for your attention!

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