GENDER ROLES AND GENDER STEREOTYPES IN SCIENCE

AND HOW THEY COULD BE RESOLVED

Ernst Th. Rietschel
acatech, European Affairs Representative
Leibniz-Association, Past-President
Images of Roles – Stereotypical Roles

Housewife and mother

Family upholder and career builder
Are women and men different, and therefore, assume naturally different gender roles

or

Are men and women not so different but nevertheless assume different stereotypic gender roles
Women an men are equal, but women are more equal

Schematic Representation; Scottish Mental Survey

Women

Men

Positive

Negative

Intelligence

Number

70 80 90 100 110 120 130 140

100 110 120

103

Intelligence-Quotient (IQ)
## Women and men are different

<table>
<thead>
<tr>
<th>Category</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobel prize winners</td>
<td>41(^1) (5.4%)</td>
<td>765</td>
<td>806</td>
</tr>
<tr>
<td>Prisoners in Germany</td>
<td>3,800 (5.3%)</td>
<td>67,000</td>
<td>70,800</td>
</tr>
</tbody>
</table>

\(^1\) 24 for Peace and Literature
Images of Roles – Stereotypical Roles

<table>
<thead>
<tr>
<th>Girls</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maniacs for reading</td>
<td>Passion for computer games (10 x more than girls)</td>
</tr>
<tr>
<td>Weakness for glamour</td>
<td>Affection for sports (cars, motor cycles)</td>
</tr>
<tr>
<td>Muscular weakness</td>
<td>Muscular strengths</td>
</tr>
<tr>
<td>Love for animals (horses!)</td>
<td>Violation: actor and victim (50% more than girls)</td>
</tr>
</tbody>
</table>

Development of personality influenced by genes, hormones, education, and environment
## Images of Roles – Stereotypical Roles

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consideration of social environment</td>
<td>Love of adventure (attack mentality)</td>
</tr>
<tr>
<td>Care for common wealth (public welfare)</td>
<td>Competition-oriented and assertiveness</td>
</tr>
<tr>
<td>Less interest in boards or panels</td>
<td>Striving for public recognition (ambition)</td>
</tr>
</tbody>
</table>

- **Housewife and role as mother**
- **Career and top position**
The Myth of the German Mother
(Barbara Vinken)

Religion (Luther), philosophy (Rousseau),
pedagogy (Pestalozzi), politics (Hitler)

- Marriage and family → Mother represents centre
- Focus on mother instead of women
- Rather polarization, no balance between male and female sex
The female post-war heroes

- Incredible accomplishments
- Basis for today's society
- They were everything
  - Mothers
  - Workers
  - Independent
During the post-war period, in particular after 1968 and the birth control pill

Development of a female generation

A sense of entitlement – in a non-revolutionary way – to

- Liberté
- Egalité
- Fraternité
Today’s auto-portrait of young women with examinations qualifying for university studies

> **Not a** successor generation of feminist movement
> **No** bellicose attitude towards men
> **Self-confident** gender identity
> **Consistent pursuit** of own life design
> **Elemental** feeling of equal rights
## Female Students in German Universities

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Number [%] per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1975</td>
</tr>
<tr>
<td>Languages and cultural studies</td>
<td>56</td>
</tr>
<tr>
<td>Law, economics, social sciences</td>
<td>27</td>
</tr>
<tr>
<td>Mathematics and natural sciences</td>
<td>33</td>
</tr>
<tr>
<td>Human medicine</td>
<td>29</td>
</tr>
<tr>
<td>Dental medicine</td>
<td>20</td>
</tr>
<tr>
<td>Veterinary medicine</td>
<td>34</td>
</tr>
<tr>
<td>Forestry, agricultural and nutritional sciences</td>
<td>44</td>
</tr>
<tr>
<td>Engineering</td>
<td>7</td>
</tr>
<tr>
<td>Art, art sciences</td>
<td>52</td>
</tr>
</tbody>
</table>
Career Development of Men and Women in the German Science System
Conclusions for Germany (I)

> The better endowed and the more influential a position, the smaller the percentage of female participation (although the potential of the rising generation is enormous)

> Share of women in scientific top positions is low (14-16%)
  - Actually it increases by about 1% per year - this is unacceptable

> The scandalous position of Germany is - in Europe - only topped by Belgium and Malta
Conclusions for Germany (II)

- Young women do not (wish) to realize the problems of gender inequality and injustice.
- Young women have to be aware of the fact that their professional career plan in life will be met by serious problems.
- This must be realized and analysed in order to develop strategies to overcome these obstacles.
Why do the careers of female scientists crack?

Three essential causes:

> Children and family
> Usances of Science
> Roped parties of men
Dilemma 1 of young women: children and family
“For raising children I would stop working”.

- with small kids (up to 2 years):
  - Men: 6
  - Women: 38
- with kids (2 to 6 years):
  - Men: 6
  - Women: 28
- without kids:
  - Men: 7
  - Women: 29
- total:
  - Men: 7
  - Women: 29

Source: Brigitte (2009)
Dilemma 1 of young women

**Family:** unit of man and woman (in general married) as well as children (not married) under one roof

As **the essence of happiness** instead of

- Independence ➔ Income
- Self-fulfilment ➔ Profession
- Power, honour, respect ➔ Career
Ich weiß überhaupt nicht mehr, wie ich Familie und Karriere vereinbaren soll.
Why do the careers of female scientists crack?

Three essential causes:

> Children and family
> Usances of Science
> Roped parties of men
Dilemma 2 of young women

Unrealistic expectations towards female scientists

> **Competence and performance** vs. recognition by male colleagues (nurse and doctor)

> **Physical presence and flexibility** vs. regular child care

> **Career and leadership** vs. multioptionality (children, marriage, employment)
Dilemma 3 of young women

Power and male dominated networks

University nomination committees for 900 Professors in the Netherlands between 1999 und 2005 *

> 36% appointed after open advertisement of position, 64% appointed in closed procedures (thereof 63%: only one candidate)

> Nomination committees without women (>50%): 7% of the nominees were female.

> Nomination committees with only one female member: 14% of the nominees were female.

> Nomination committees with two or more women: 22% of the nominees were female.

*Gender and Excellence, NL, 2006, van den Brink M and Brouns M
Three Essential Obstacles for Women in Science

- **Power of men and roped parties of men**
  - a *cultural* problem, can only be resolved politically (quota and laws)

- **Science immanent habits**
  - a *structural* problem, can be resolved organisationally (dual career etc.)

- **Family inadequate working conditions**
  - a *practical* problem, can be resolved financially (university, kindergarten, etc.)
The Quota: a terrible term

- **Alternative terms**
  - Quantitative agreement
  - Model of cascade (Wissenschaftsrat, DFG)

- **Introduction of a quota**
  - Legal regulation
  - Voluntary commitment
We live with Quotas without objecting to (and without realizing) them

> Special research areas (SFBs)
  - 2/3 projects of university origin
  - 1/3 projects of non-university institutions
    - “quota projects” \textit{\( \rightarrow \)} therefore less quality?

> ZVS, quota for citizens of a federal state

> Quota for radio music: 35% German musicians (DB, 17/12/2004)
Arguments against quotas (seemingly)

- Constitutional aspects
- Science criteria are exclusively quality and originality oriented
- Quota are an insult for successful women
- If a quota for support of women would be introduced, other social groups would also claim the right for a quota
- If female scientists do not reach top positions despite a quota, they are marked as deadbeats

Proposal: a men and women quota (40 ± 10 %)
Examples for gender adequate nominations (40 ± 10 %)

> Executive and supervisory boards (curatorial, senate)
> University nomination committees
> Evaluation committees
> External peer reviewers of publications
> Scientific advisory boards
> Discussion fora
> Speakers list of symposia
Examples for institutional quotas (40 ± 10 % men or women)

> Leaders of projects of special research areas (SFB)

> Leading positions (directorates, department heads, university chairs) (C4, C3, W3, W2)
Conclusion

> A temporary quota has to be introduced until gender equality in top positions is achieved

> During this phase, women have to build up their own female networks

> These female networks will later mix with male networks rendering quotas obsolete
Institutions respond to pressure ....... MIT

The increases in the representation of women and minorities don’t just “happen” but result from specific pressures, policies and positive initiatives designed to increase the hiring of women or minorities: and that when these pressures abate or expire hiring progress stops or even reverses.

Nancy Hopkins MIT Faculty Bulletin 2006
A possible path to resolve gender roles and gender stereotypes

The new multi-optionality of women
The new multi-optionality of women (I)

> Women refuse to match traditional roles
> They want to decide for themselves how to plan and construct their life on the basis of their individual intelligence, talent, energy and education
> …with the option to combine
>  - Family (partnership) and
>  - Profession (financial independence)

in a sometimes - not always - different way than men
The new multi-optionality of women (II)

> The duty of society and politics is to establish conditions which allow the development of female multi-optionality

> Today´s decision-makers of society and politics are males who do not act voluntary in the fulfilment of this duty

> Therefore, society and politics have to be gently guided in the “right” direction.

> Quotas are the most efficient means to guarantee this right direction
Gender parity (40 ± 10%) in science and female multi-optionality presuppose

- Gender parity as a civil obligation (constitution)
- Gender parity as a directorate priority issue of a scientific institution (university, institute)
- Gender parity is different from subsidy politics for women
- Gender parity as criterion of quality (evaluation)
- Gender models (mentoring)
The importance of role models

Marie Skłodowska Curie
1867-1934

1903 Nobel Prize for physics
1911 Nobel Prize for chemistry
“Discovery of Radium and Polonium, Isolation of Radium”

Irène Joliot-Curie
1897-1956

1935 Nobel Prize for chemistry “Discovery of Artificial Radioactivity”
The importance of role models

William Henry Bragg
1862-1942

William Lawrence Bragg
1890-1971

1915 Nobel Prize for physics for the “Investigation of Crystal Structures by means of X-ray Spectroscopy”
Progress in respecting the scientific achievements of female scientists

> Nobel Prize 2008 (Medicine) Luc Montagnier and Francoise Barré-Sinoussi

*in contrast to*

> Physics 1944 Otto Hahn without Lise Meitner
> Medicine 1962 Watson, Crick, Wilkins without Rosalind Franklin
Recognition of achievements of female and young female scientists

Nobel price Medicine 2009: These U.S. biologists have discovered that the ends of chromosomes (telomeres) play an important role in ageing.

Elisabeth Blackburn  Carol Greider
Thank you for your attention!
Problem:

Young women do not (wish to) realize:

That in reality an equalization has not yet been achieved!