Analysis of female and male applicants to the EMBO Long-Term Fellowship Programme

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EMBO Young Investigator Programme
EMBO Women in Science

Women in Science: The Way Forward
9 - 11 May 2007, Heidelberg

Figure 1: The mean competence score given to male (red squares) and female (blue squares) applicants by the MRC reviewers as a function of their scientific productivity, measured as total impact. One impact point equals one paper published in a journal with an impact factor of 1. (See text for further explanation.)

<table>
<thead>
<tr>
<th>Success Rate (IF cost)</th>
<th>Men</th>
<th>25.8%</th>
<th>70%</th>
<th>64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>7.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Men: 25.8%  IF: 70%  Cost: 64
Success rate is defined as the proportion of awards given to applicants within each sex.
Committee scores based on

- Proposed research project
- Applicant’s publication record
- Host laboratory
- Interview report
- Letters of reference
Gender-blinding in 2006

<table>
<thead>
<tr>
<th>Total applicants</th>
<th>Success rate</th>
<th>#</th>
<th>%</th>
<th>overall</th>
<th>after</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td></td>
<td>593</td>
<td>48%</td>
<td>14.7%</td>
<td>28%</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td>644</td>
<td>52%</td>
<td>20.6%</td>
<td>34.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1237</td>
<td></td>
<td>Α: 29%</td>
<td>Α: 19%</td>
</tr>
</tbody>
</table>

Factors influencing the results

- Interview reports
- Choice of host laboratory
- Children
- Publication record
Full bibliometric analysis of the EMBO Fellowship applicants 1998

<table>
<thead>
<tr>
<th></th>
<th>Applicants</th>
<th>Awards</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>416</td>
<td>89</td>
<td>21.4%</td>
</tr>
<tr>
<td>Women</td>
<td>264</td>
<td>41</td>
<td>15.5%</td>
</tr>
<tr>
<td>Total</td>
<td>680</td>
<td>130</td>
<td>19.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28%</td>
</tr>
</tbody>
</table>

Bibliometric data from all 680 applicants from 1993 - 2006:

10740 publications: 15.8 pub/applicant
- 8494 articles
- 1316 meeting abstracts
- 630 reviews
- 95 letters
- 205 miscellaneous

3135 journal impact factors

Calculated for each applicant:
- Number of publications
- Type of publication
- Authorship rank
- Total impact factor
- Year of publication
- Cumulative citations
Median values for all applicants until 1998

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>Number of publications</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Number of articles</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of first author articles</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total impact factor of all publications</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>Total impact factor of all articles</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Total impact factor of first author articles</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Total number of citations of articles</td>
<td>99</td>
<td>130</td>
</tr>
<tr>
<td>Total number of citations of first author articles</td>
<td>45</td>
<td>60</td>
</tr>
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</table>
### Median values for all applicants until 1998

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<tbody>
<tr>
<td></td>
<td>Women</td>
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<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>Number of publications</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Number of articles</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Number of first author articles</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total impact factor of all publications</td>
<td>21</td>
<td>26</td>
<td>43</td>
<td>45</td>
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<td>41</td>
<td>39</td>
</tr>
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<td>267</td>
<td>249</td>
</tr>
<tr>
<td>Total number of citations of first author articles</td>
<td>45</td>
<td>60</td>
<td>157</td>
<td>118</td>
</tr>
</tbody>
</table>

### Why this difference in publication record quality?

- due to
  - age and experience
  - children
  - % of females from scientifically weaker countries?
Applicants from Greece, Italy, Portugal and Spain

<table>
<thead>
<tr>
<th>Applicants from countries that spend less than 1.2% of GDP on R&amp;D</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People</td>
</tr>
<tr>
<td>Women</td>
<td>62</td>
</tr>
<tr>
<td>Men</td>
<td>76</td>
</tr>
</tbody>
</table>

In summary we investigated the influence of

- Gender bias: no influence in 2006
- Children: negatively effected women’s success rates
- Host laboratory: no difference
- Age and experience: no difference
- Home laboratory: some influence
- Publication record
Why this persistent difference in success rate?

Median values for all applicants between 1999 and 2006; from time of application and onwards

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<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>Number of publications</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Number of articles</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Number of first author articles</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total impact factor of all publications</td>
<td>37</td>
<td>55</td>
</tr>
<tr>
<td>Total impact factor of all articles</td>
<td>31</td>
<td>46</td>
</tr>
<tr>
<td>Total impact factor of first or last author articles</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Total number of citations of articles</td>
<td>81</td>
<td>117</td>
</tr>
<tr>
<td>Total number of citations of first or last author articles</td>
<td>31</td>
<td>45</td>
</tr>
</tbody>
</table>
Summary from the bibliometric analysis:

- The female applicants lose out scientifically compared to the male applicants, as time goes by.

Why do female applicants lose out?

- Difference in career choices between male and female applicants?
- Due to children?
- Difference in motivation between male and female applicants?
- Other factors?
Questions need answers...

<table>
<thead>
<tr>
<th>Total applicants</th>
<th>E-mailed</th>
<th>Responded</th>
<th>Declined</th>
<th>True responses</th>
<th>Responses from all applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>680</td>
<td>577</td>
<td>444</td>
<td>46</td>
<td>398</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>85</td>
<td>77</td>
<td>8</td>
<td>59</td>
</tr>
</tbody>
</table>

The answers are representative to the applicant group
80% of all respondents are still in academia
- no difference between female and male respondents career choices

Most of the respondents work more than 36 hours/week
- a slight difference between male and female respondents
Partners....

- 90% of both men and women have a partner
- Women more often have a partner who also has a PhD: 60% vs. 45%
- Also, women more often moved due to their partner’s work: 50% vs. 19%
- And regarding the family income...

Cash is king....
Children!

- 60% of the female respondents have children vs 70% of the male respondents
- For women, the average maternity leave was 2-3 months per child, whereas paternity leave does not seem to be common at all
- Regarding parenting and working hours ...

Female respondents’ partners work more:

- Female respondents with children more frequently have a partner who work more than 46 hours/week
Children’s impact on publications:

- most respondents have children
- children have a positive effect to male respondents’ publication record, in contrast to the female respondents

Summary from the “8-years-after-study”:

✓ Gender gap in publication quality increase as time goes by

✓ Women more frequently have a partner with an equivalent education

✓ Women more frequently move due to their partners’ career

✓ The female respondents work on average fewer hours then men/their partners

✓ Women frequently earn less then 50% of the total family income

✓ Children do not boost women’s publication lists....
...but what about the 28% gap in 1998?

Bibliometry!

- influenced by group composition:
  - Home laboratory/country
  - Children
  - Field of study?

Other possible factors

- move for partner influences choice of host lab
- discrimination (12-22% of questioned)
- lack of networking/mentoring

Recommendations

- Committee must be aware of gender bias
- Committees must clearly define their criteria
- Institutes/universities/organizations should offer junior faculty support and develop gender policy
- Women must take their careers seriously. *If women do not respect their own careers - why should anyone else?*
"Merit and talent are not sufficient conditions to become a successful scientist. Resources, time, social networks, encouragement - unevenly distributed between the sexes - are necessary prerequisites."

"Gender and Excellence in the Making", EC
31% of the females have not published since 2003
19% of the males have not published since 2003
Why?

Do female respondents stand back due to their partners’ careers?

- 80% of all female and male respondents work at least full-time
- 65% of all female respondents < 50% of family income; 77% of the male respondents > 50% of family income
- However, 50% of the female respondents’ with children have a partner who work more than 46 hours/week compared to 19% of the male’s partners
- Female respondents more often have a partner with a PhD-degree than the male respondents (60% vs. 45%)
- Female respondents more often moved due to their partner than the male respondents (50% vs. 19%)
Summary of the - 8 years after - study:

- Gender gap in publication quality has increased
  Why?
- Women more frequently have a partner with an equivalent education
  - More frequently move for their partners
  - Work on average fewer hours then men/their partners
  - Frequently earn less then 50% of the family income
- Children are not good for a woman’s career

Male and female respondents agree on career motivation:

- What personal characteristics or factors have helped you most during your career?
  80% of both male and female respondents marked:
  - Persistence and endurance
  - Self-motivation
  - Curiosity
  - Ambition and determination

- Three factors stood out when the respondents were asked to rank the importance of a variety of factors important for their motivation:
  - Inventing or discovering something significant
  - Being successful at work
  - Living close to family and relatives