Where have all the women gone?

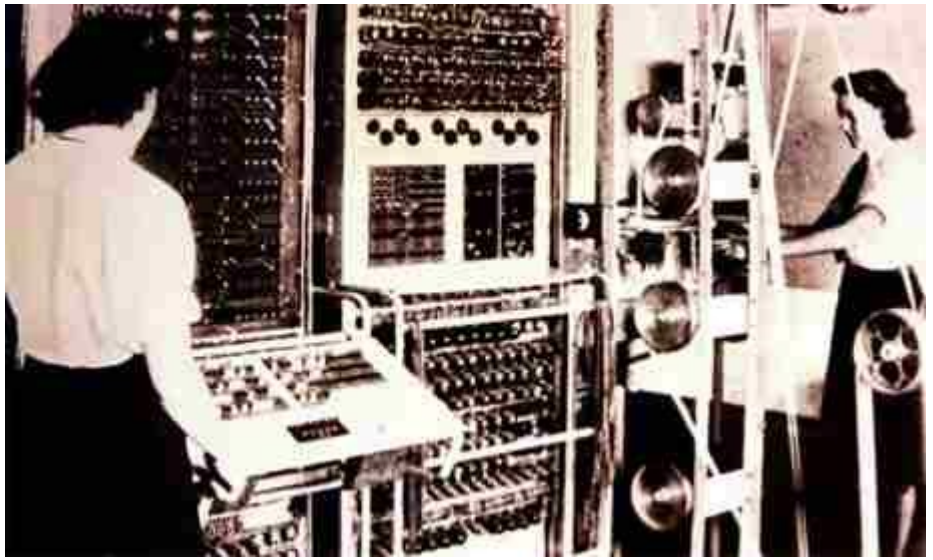
Women in computing:
what's the problem,
why should you be bothered,
and what can we do about it?

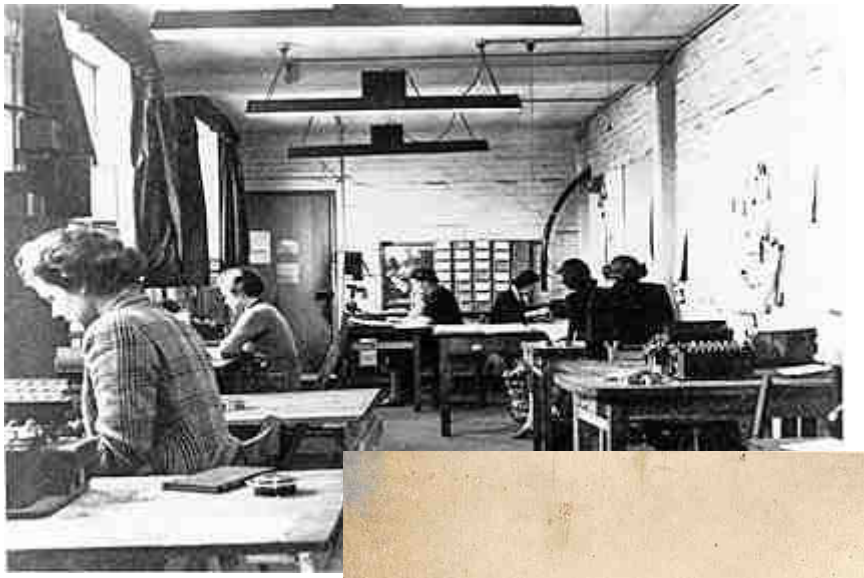
Hannah Dee, EMFCamp, 1 September 2012
hmd@hannahdee.eu | @handee

BCSWomen
Specialist Group

What's the problem?

Women of Bletchley





By the end of the war, of 2000 bombe operators, about 1700 were women.

Obviously there are many reasons for this – but nobody has ever suggested that these women were incapable, or in any way the “bottom of the barrel”. Quite the opposite.

Early computing pioneers weren't always male

ENIAC team

Really, they weren't

ENIAC programmers

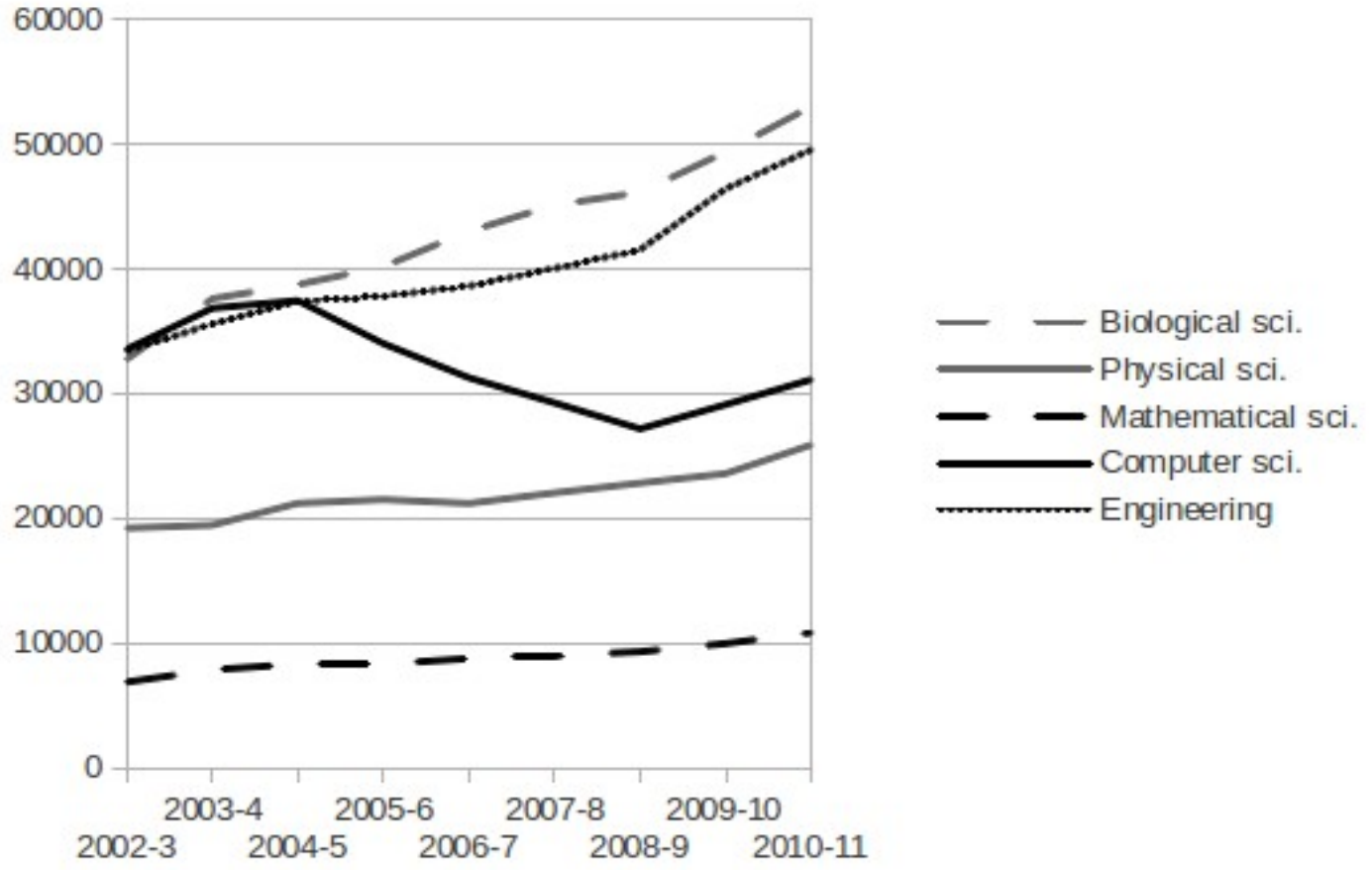
Women are (still) needed in the tech workplace

Currently women make up just 18.7% of those employed in SET despite making up 44.5% of the total workforce.

2010: less than 20% of the workforce were white male and under 45

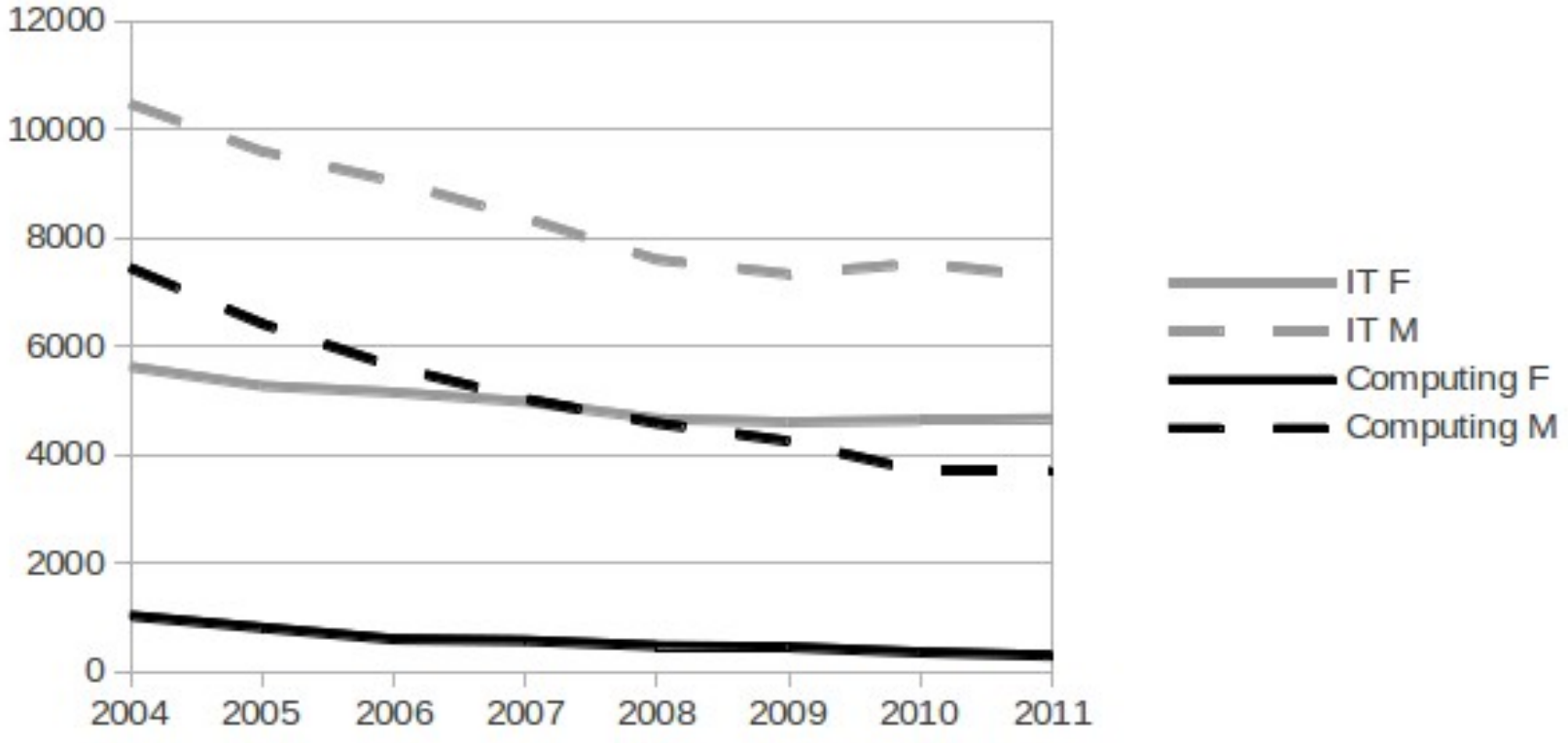
If the employment rate for women remains constant, Europe can expect a shortfall of 24 million people in the active workforce by 2040 (the shortfall can be raised to only 3M if the number of women employed can be brought up to that of men)

But surely it can't be that bad?



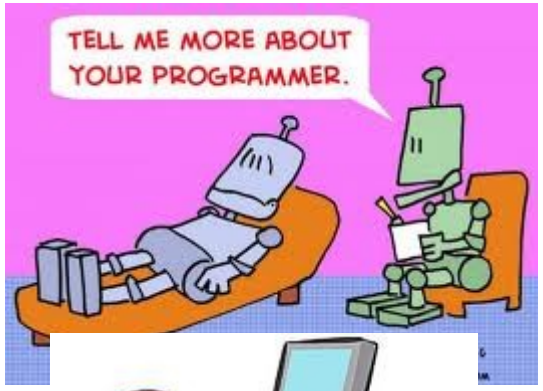
University entrance numbers, male & female:
source: HESA 2012

OMG!

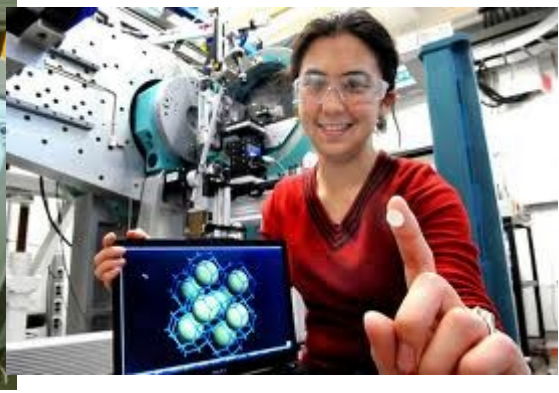


Soon – around 2015/2016 – there will be **NO** women doing A-level computing

There's an image problem



Top 5 (humanoid) images for programmer and computer scentist



So?

Maybe we don't need women in technical roles.

We're not good at sums.

All the jobs are going to India anyway.

We're over-emotional.

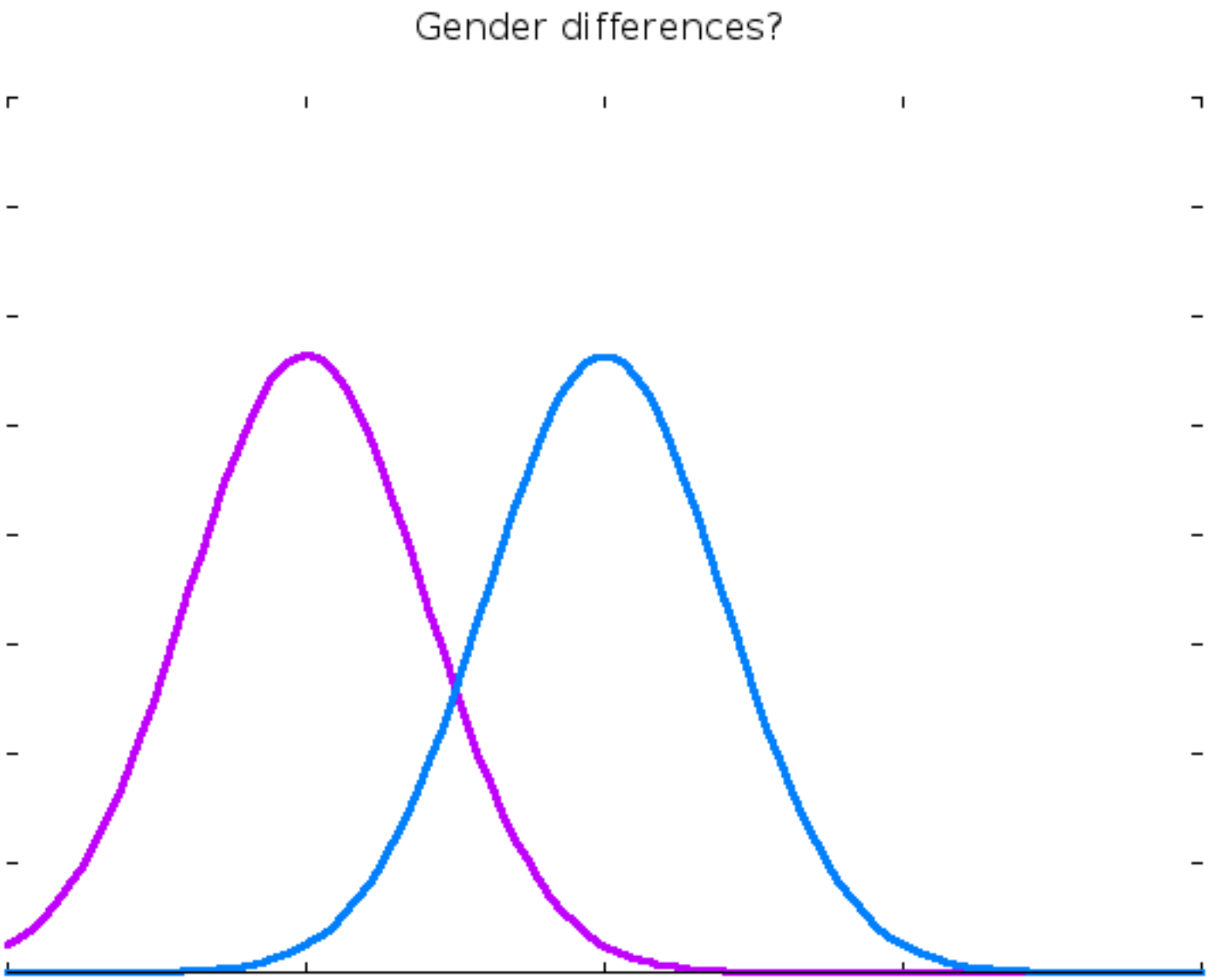
We don't have that analytical mindset.

We'll disappear to have babies.

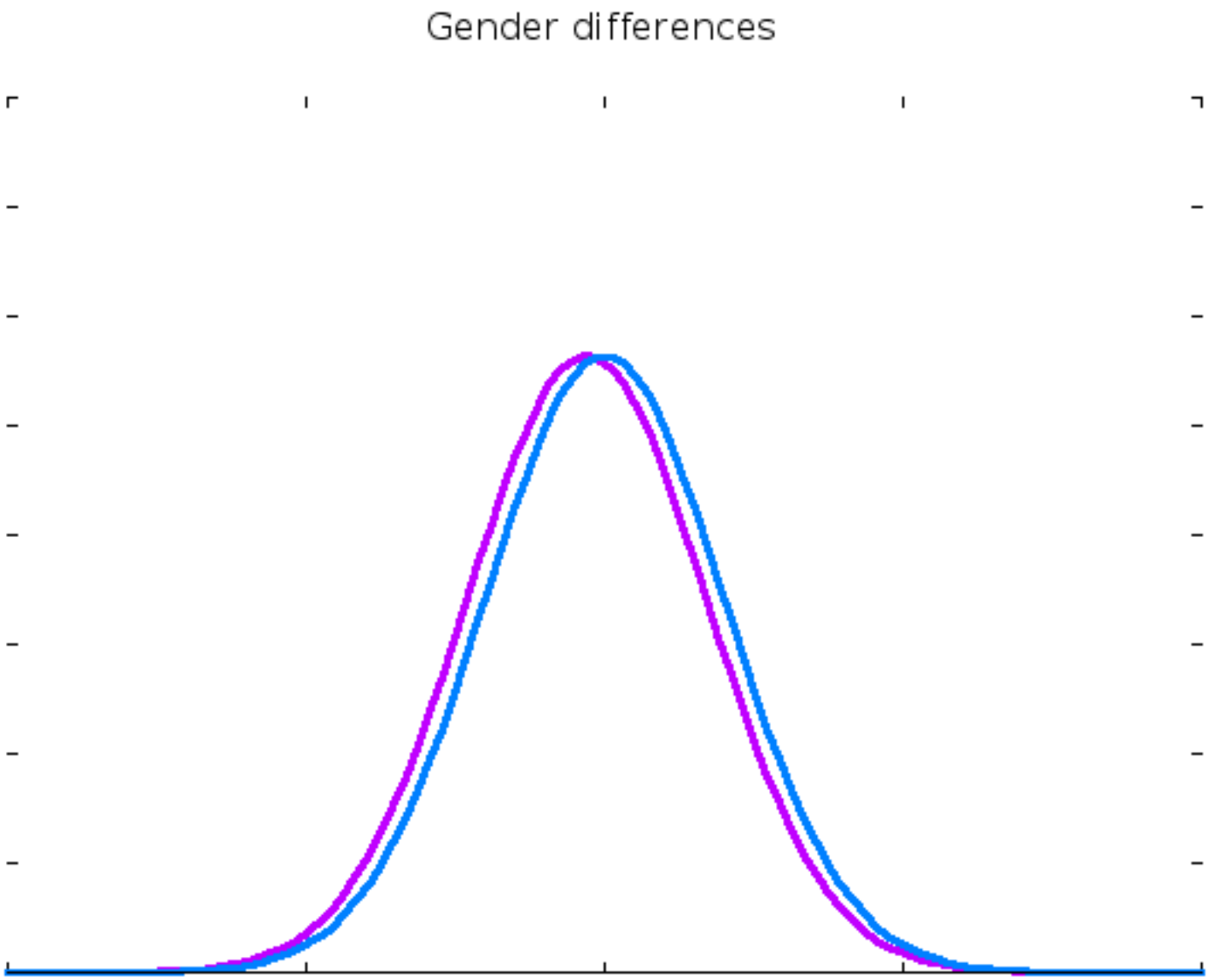
There aren't enough jobs for guys anyway.

Our arms are too short to reach round the back to the network socket

Gender differences



Gender differences in ability



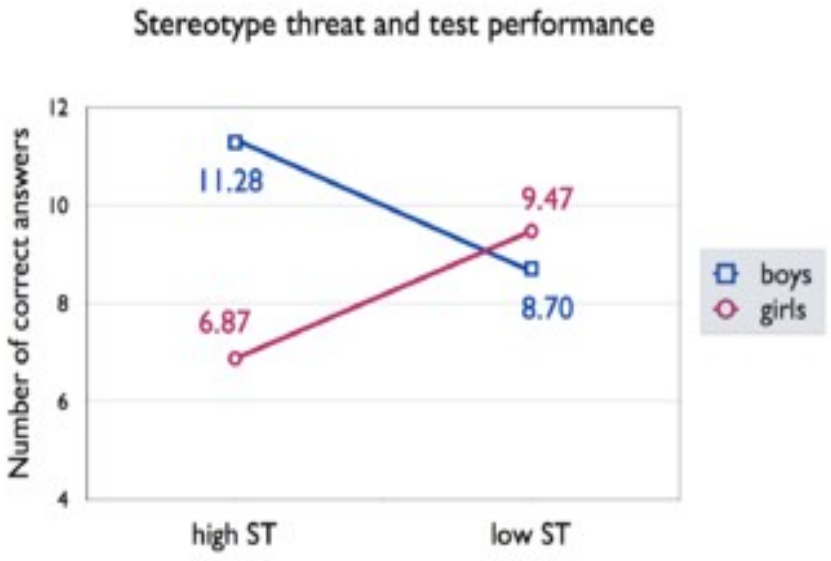
Gender differences in performance

"Stereotype threat" is an idea introduce by Claude Steele, in 1995. Now *widely* researched.

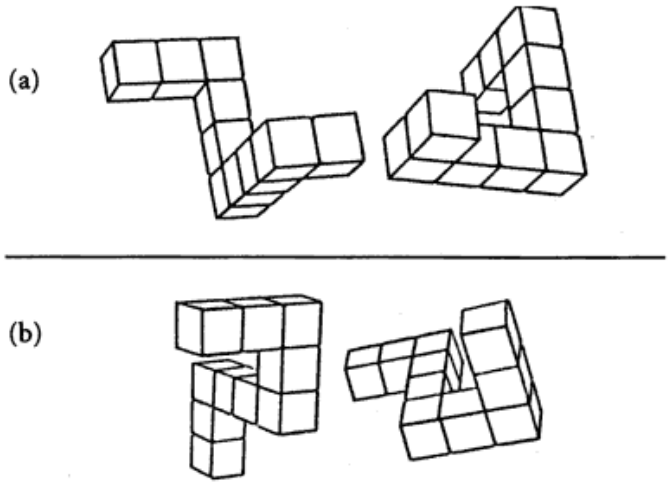
This causes reduced performance in individuals who belong to negatively stereotyped groups

If you think girls are bad at sums, and you're a girl, watch out...

Data from Osborne, 2007; test involves a simple maths test.



Gender differences in performance



Mental Rotation Test—Are these two figures the same except for their orientation?

Success in mental rotation is probably linked with success in tasks such as “in flight and carrier based aviation engineering... nuclear propulsion engineering, undersea approach and evasion … navigation.”

Success in mental rotation is probably linked with success in tasks such as “clothing and dress design, interior decoration and interior design … decorative creative needlepoint, creative sewing...”

Sharps, Price and Williams 2004, quoted in Cordelia Fine 2010

Gender differences in experience

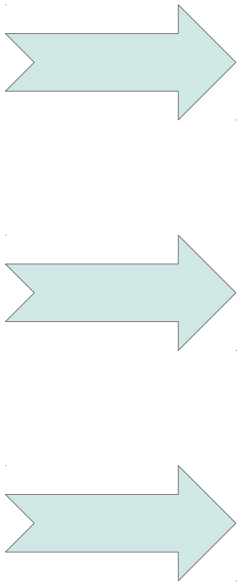
"While most of the women say that all but a few of their male peers are nice and helpful, 22 percent of the women we interviewed mention having heard that they only got in because of their gender, and an additional 11 percent wonder if this may be true. Some women, although a minority, say they are completely comfortable in the program and that the small number of women is irrelevant to their experiences. Some even enjoy feeling unique and take pride in being one of a special few. Other women struggle with their doubts but emerge stronger, their self-confidence resistant to such concerns."

p85, "Unlocking the clubhouse: women in computing"
Jane Margolis and Allan Fisher, MIT Press, 2002

Why should you be bothered?

Monocultures aren't fun to work in

"Sex-role spillover" refers to the way that gendered traits become workplace traits in situations where the workplace is gendered. An example from outside tech:



Female accountants were more likely than other groups to have high anxiety scores on the Hospital Anxiety and Depression Scales

Male nurses had the highest rates of sickness absence.

Male nurses and female accountants also reported more work-related hassles than did female nurses and male accountants.

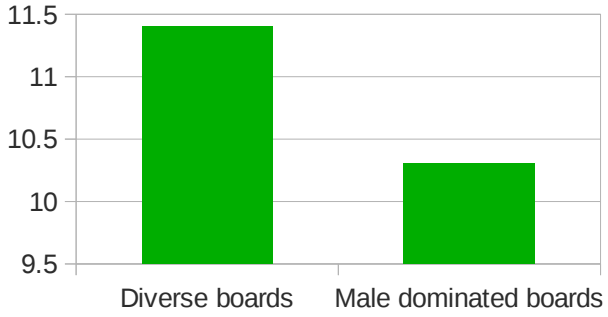
Evans and Steptoe, 2002, Journal of social science and medicine

Diversity drives up profit and revenue

The companies where women are most strongly represented at board or top-management levels are also the companies that perform best, both on organizational and financial measures.

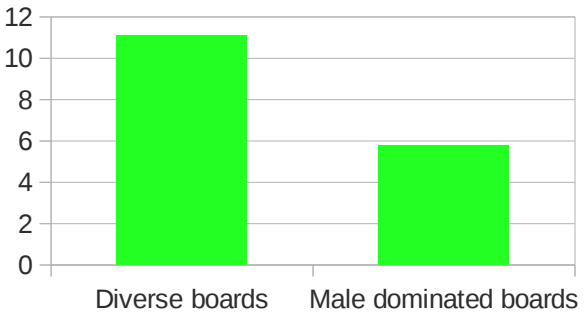
Average ROE

2003-2005

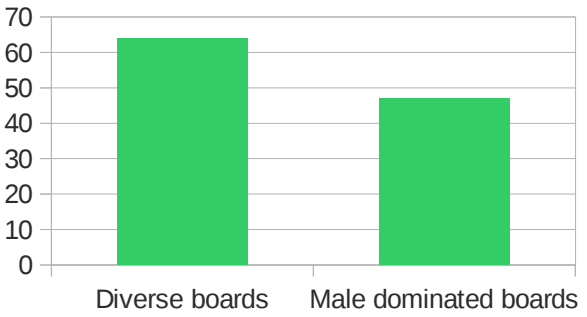


EBIT

2003-2005



Stock Price Growth



Sources: McKinsey, Women Matter Report October 2007 & European Commission

Women give a different perspective to a company or brand

69% of companies who implement gender diversity policies report an improvement in brand image

57% of companies who implement gender diversity policies report an improvement in customer satisfaction

Women are the driving force of over 70% of the purchasing decisions in Europe (although they make up only 51% of the population) therefore a company's sales people might be usefully women.

What can we do?

Don't dumb it down

Don't make it all pink

Don't make it all pink (please)

Inbox (12) - handee20(| Facebook | Inbox - Outlook Web Ac | science it's a girl thing

https://www.google.co.uk/search?sourceid=chrome&ie=UTF-8&q=science+it's+a+girl+thing#q=science+it's+a+girl+th

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Science 'girl thing' video branded offensive
Telegraph.co.uk - 3 days ago
The video went viral on Friday after being released on Thursday as part of a series of films listed under the "**Science**: **it's a girl thing**!" YouTube **...**

Telegraph.co.uk

'Breathtakingly sexist' video backfires on the EU Globe and Mail
Science needs more women says EU, as it launches '**Science**: **it's a ...**
Siliconrepublic.com
Science: Good **Thing**, Bad **Thing**, or **Girl Thing**? PhysicsCentral.com (blog)
Salon - Discovery News
all 74 news articles »

"Science: It's a Girl Thing" Campaign Backfires
Wall Street Journal (blog) - 2 days ago
Women **scientists** are often portrayed as driven, but socially inept.It seems like the beginning of a porn movie. A serious man with a microscope **...**

"Science: It's a Girl Thing" Says Controversial Ad
Escapist Magazine - 1 day ago
An advert designed to get the fairer sex into **science** has drawn harsh criticism from men and women alike. The ad to the right, published as part **...**

'Girls in Science' Campaign Has Lipstick, But No Lab Coats [VIDEO]
Mashable - 19 hours ago
The video above, created by the European Commission, was part of the "**Science**: **It's a Girl Thing**!"

mckinsey_2007....pdf

Show all downloads...

Don't make it all pink (pretty please)

“Feel safe in the unfortunate event of an auto emergency.”

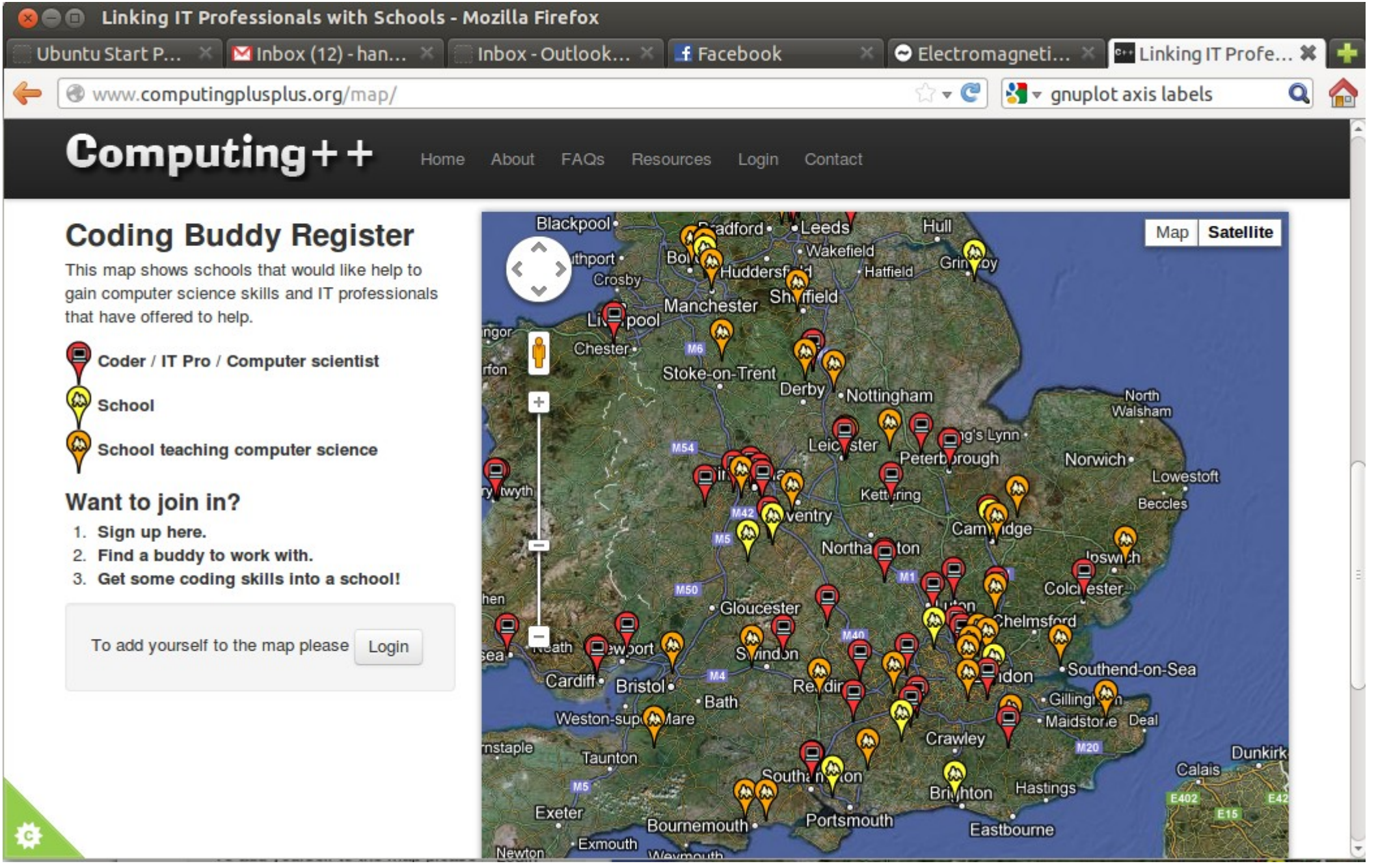
Do encourage networking

- Computing is not a solo pursuit
  - “Lone geek” is a stereotype, and a problematic one
- Women-led events help loads
  - Networking, role models, advice, support
  - We always welcome men along (bcswomen, womenintechnology, & girlgeekdinners do anyway)
- Research suggests that women role models can be very important
  - Role model influence added to the prediction of career choice over and above women students self-perceived ability (Quimby & DeSantis, 2006)

Do engage with mentoring

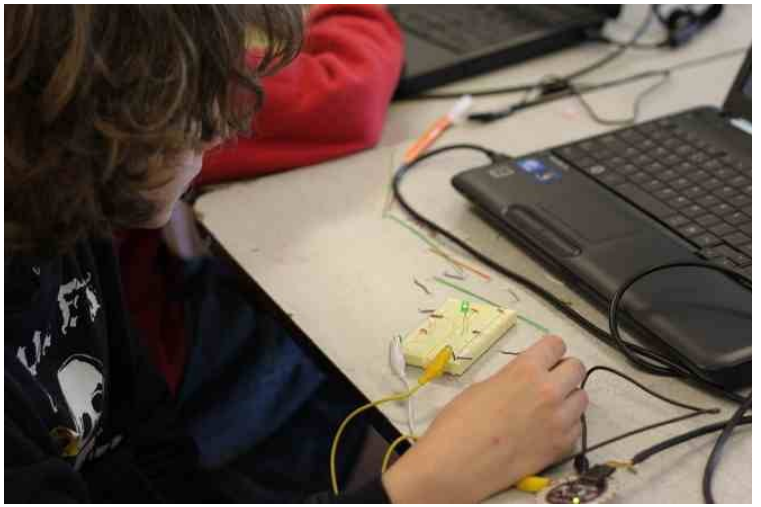
- A mentor is someone you can discuss your career (and life) choices with, who's a bit further on than you.
- MentorSET is a great organisation that finds women mentors for women in SET
- Mentoring doesn't have to be same sex...
- It also doesn't have to be formal
  - Think about the women and girls you know – particularly the girls – and encourage them to engage with technology as creators, not just users.

Do visit your local school



What do schools want?

- Help with classes
- After-school clubs
  - Arduino
  - Raspberry Pi
  - Scratch/Greenfoot
  - General programming



- Talks (e.g. speaking at a school assembly on what computing careers can be like)
- This isn't just about the girls!

Do think about retention

- According to the UKRC, around 70% of women with degrees in STEM subjects aren't currently working in STEM jobs
- Why?
  - Culture (long hours, macho environment)
  - Career gaps (maternity, caring)
  - Remember stereotype threat?
- **“A profession that's better for women is better for all”**

  - Rebecca George OBE, Deloitte

Do get in touch

- If you want to get involved then we'd love to hear from you
- You can contact me on hmd@hannahdee.eu or on twitter (@handee)
- If you're a woman, join BCSWomen
- We don't have all the answers but we've read a lot of papers and been to a lot of meetings:-)
  - http://www.bcs.org/bcswomen
  - http://girlgeekdinners.com/
  - http://www.womenintechnology.co.uk/

And finally, remember...

THERE HAS ALWAYS BEEN A PLACE FOR WOMEN IN COMPUTING.