



Young people, science and technology

What surveys tells us about attitudes, interests, values and future plans

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Based on work supported by




**Lifelong perspectives:
More important than high scores at 15**

- In many countries: Students are on top of score leagues, but they hate the subject (TIMSS/PISA)
- Attitudes and values as important **learning goals** as well as **determinants of future behaviour**
- Also important for those who do *not* pursue S&T careers (i.e. the majority)
- When science concepts are forgotten, the 'ethos' or 'atmosphere' of the subject remains
- **Our concerns in**
Promote lasting interest in, appreciation of and respect for S&T
- Understanding the *nature* of S&T, the *values* (and limitations) of S&T, S&T as part of *human culture*, S&T for *democracy*



Sources and evidence

- **Eurobarometer**
on Science and Technology
Attitudes, interests, values, knowledge, priorities etc.
Adults, 32 European countries



- **ROSE-study**
Attitudes, interests etc.
15 year old students, 40+ countries



ROSE and Eurobarometer

- Standard survey methods
- Target populations:
EB: Adults (15+)
ROSE: 15 year-olds in schools
- Representative samples (N> 1000) in each country
- EB and ROSE: appr. 200 items!

ROSE

All ROSE items have the following format:

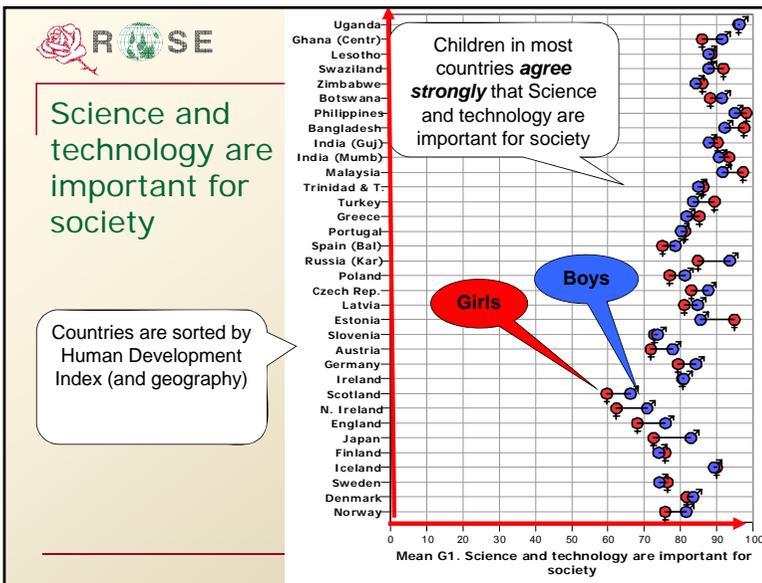
A. What I want to learn about
 How interested are you in learning about the following?
 (Give your answer with a tick on each line. If you do not understand, leave the line blank.)

	Not interested		Very interested
1. Stars, planets and the universe	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>
2. Chemicals, their properties and how they react	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
3. The inside of the earth	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. How mountains, rivers and oceans develop and change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Clouds, rain and the weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The origin and evolution of life on earth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ROSE

Some simple data
Only single variables:

Mean values
for girls and boys in
different countries



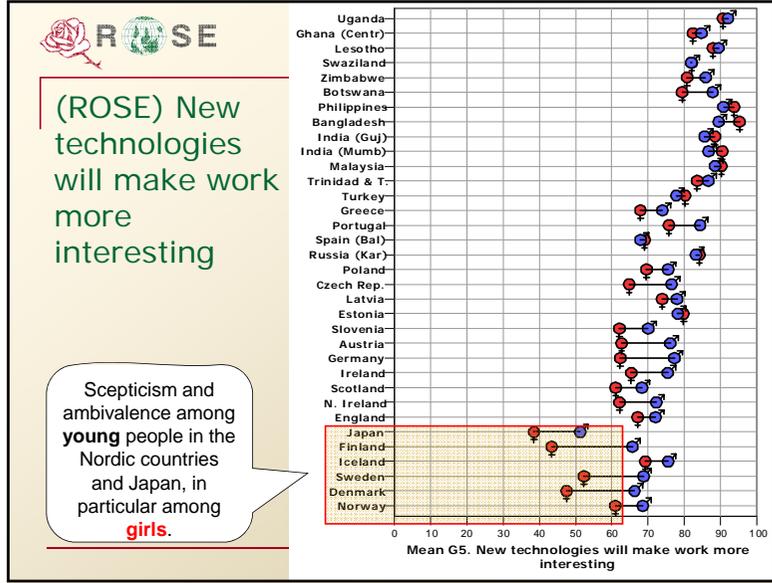
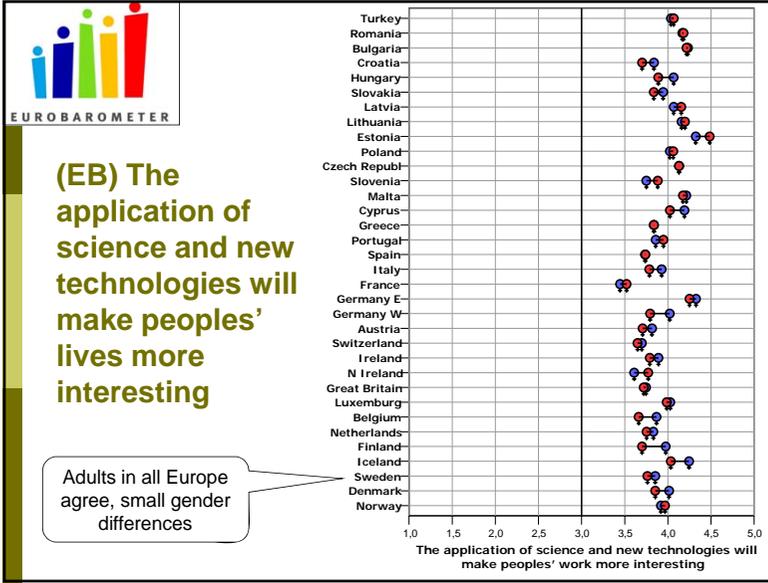
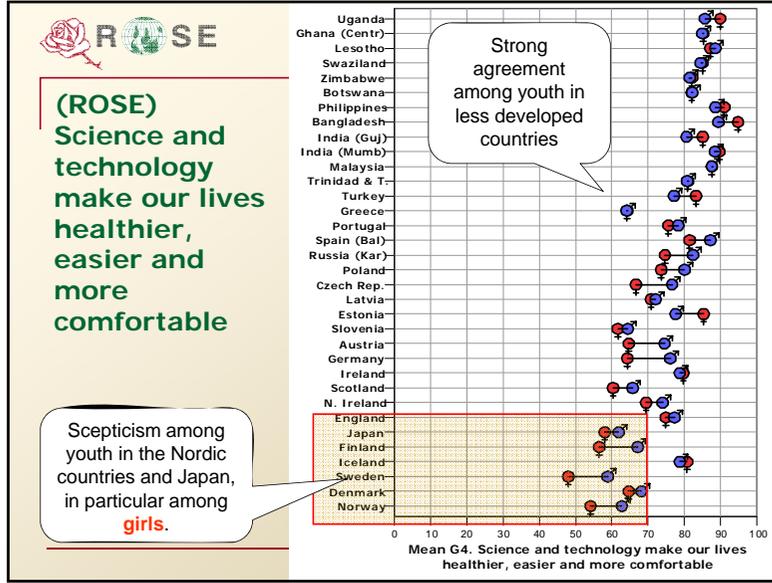
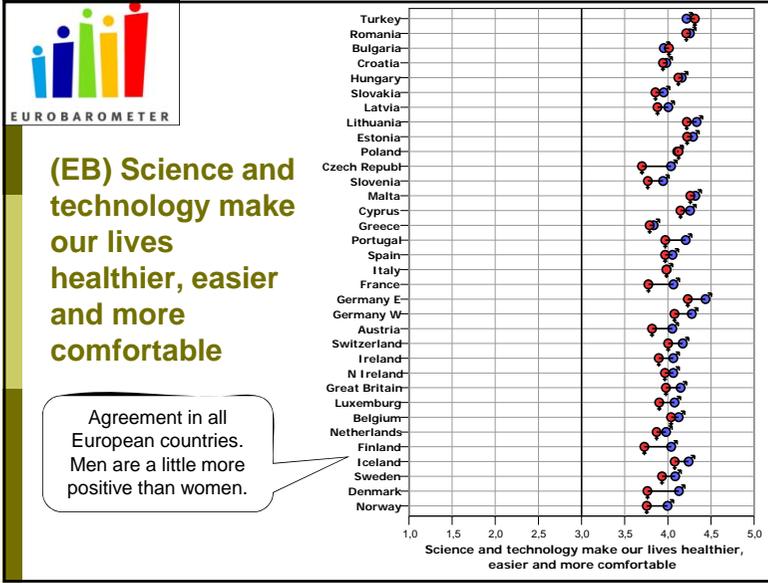
EUROBAROMETER

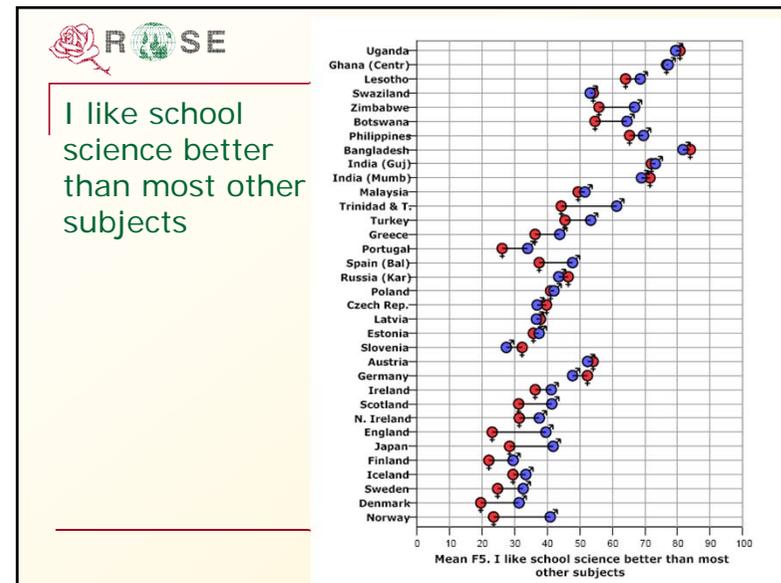
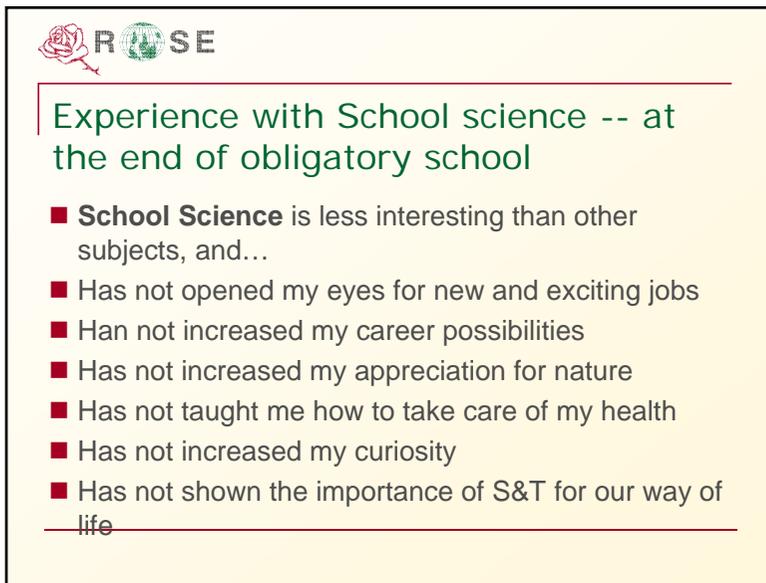
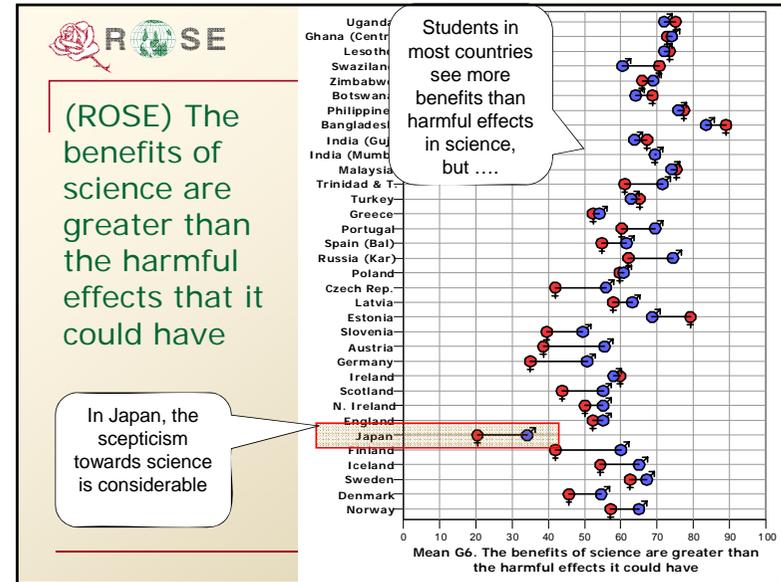
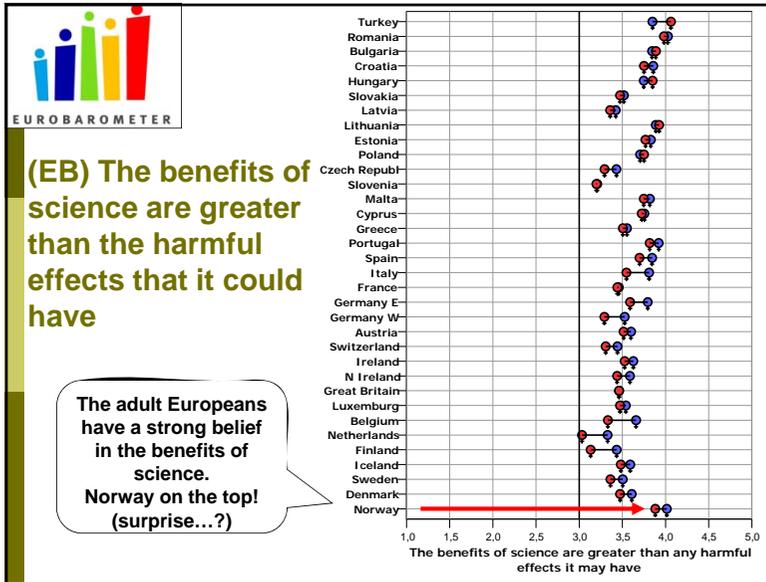
Attitudes to science and technology among adults and young people:
Mainly positive!

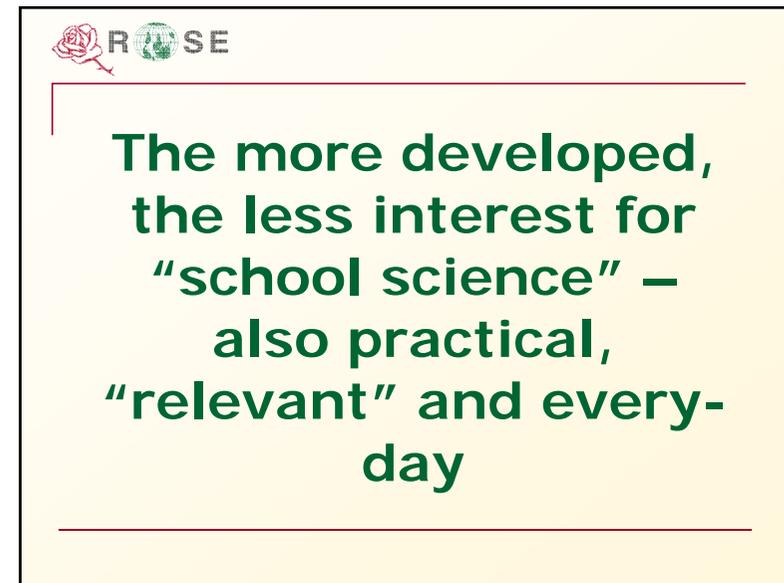
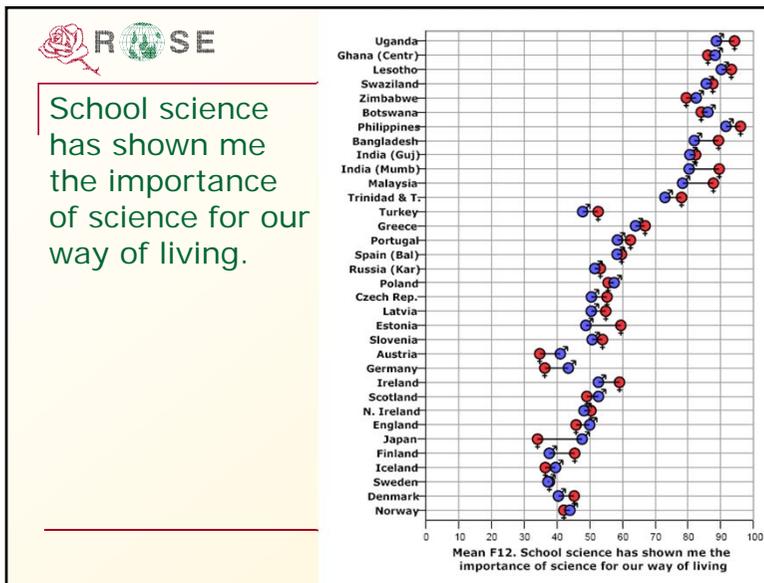
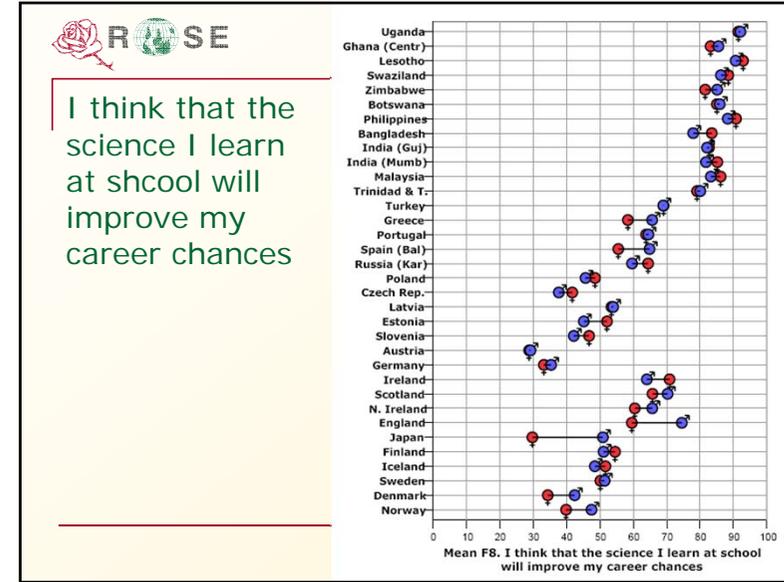
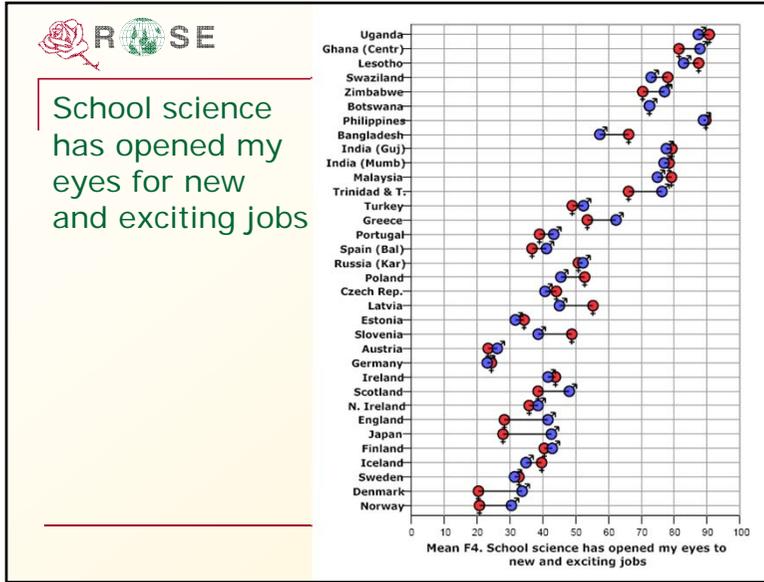
But in rich countries **young people** are more ambivalent..
 And there is growing **gender difference**

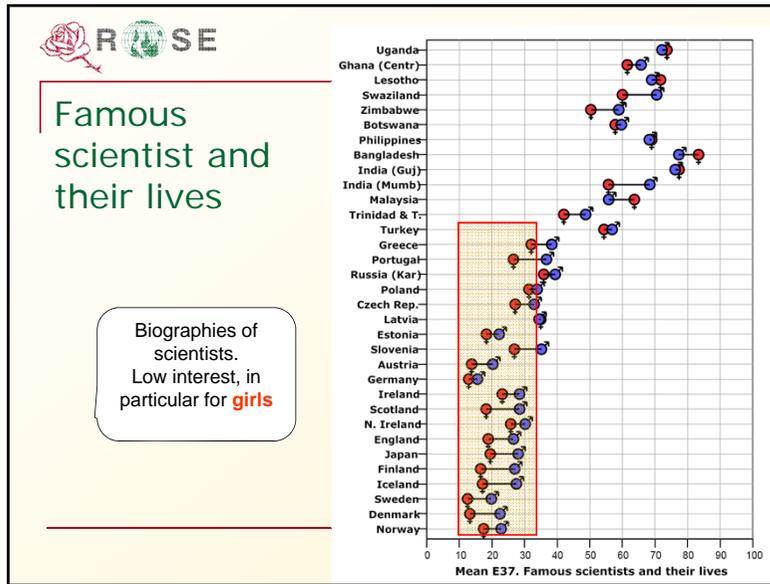
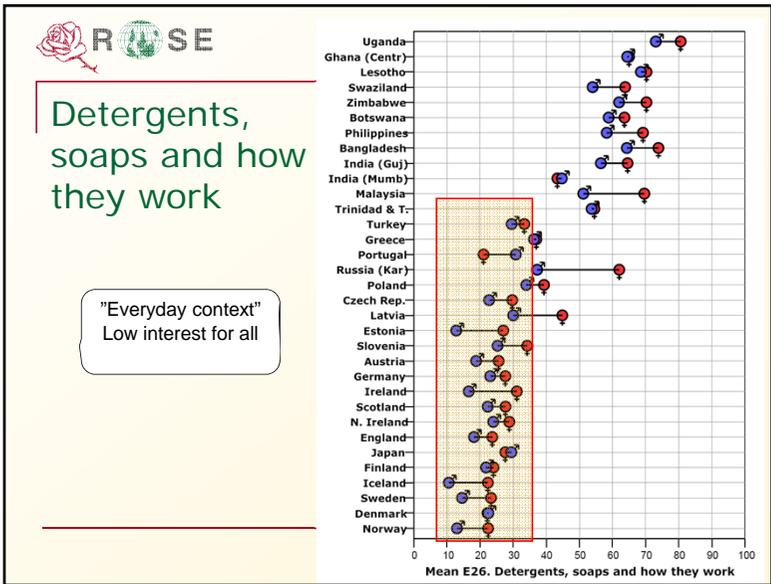
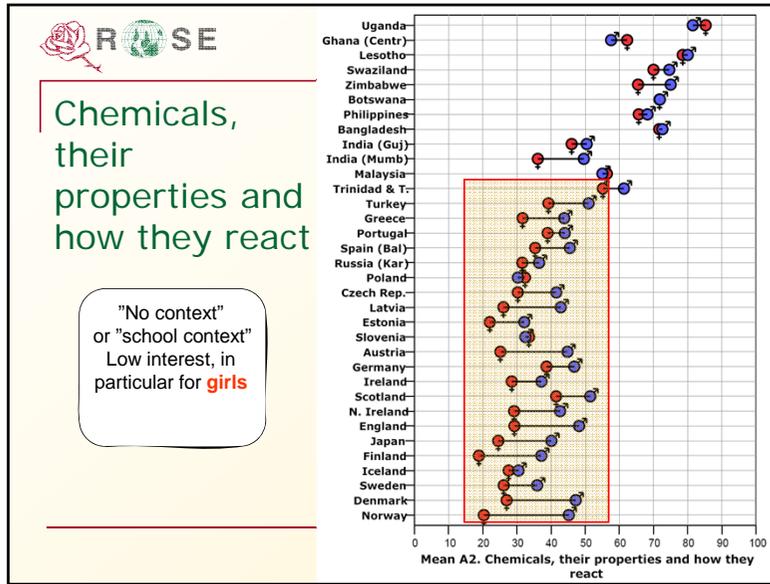
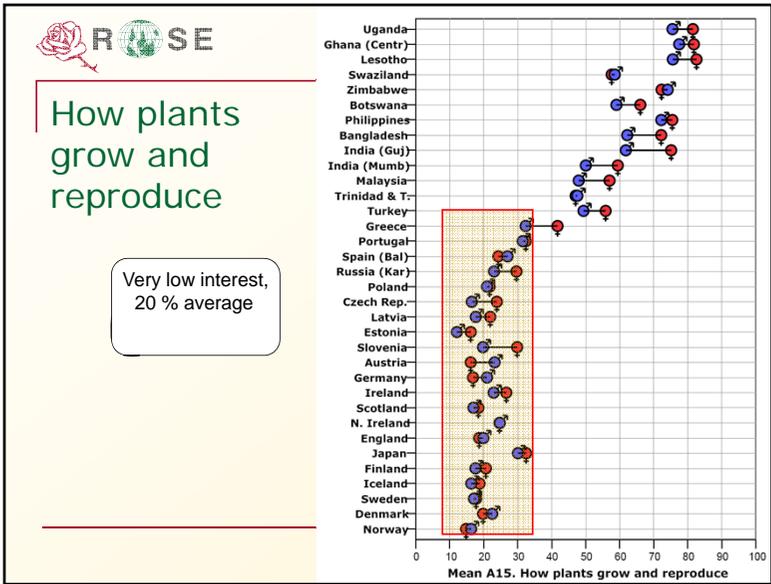
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Global Chinese Conference on Science Education 2010





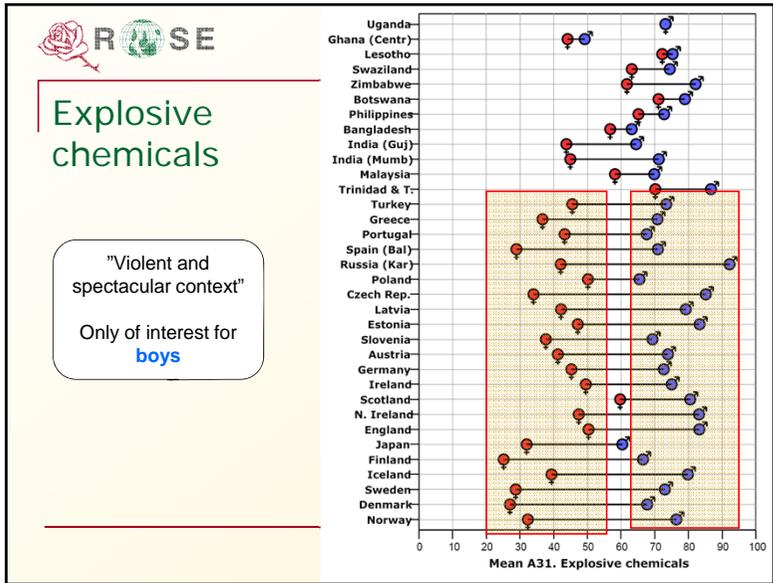
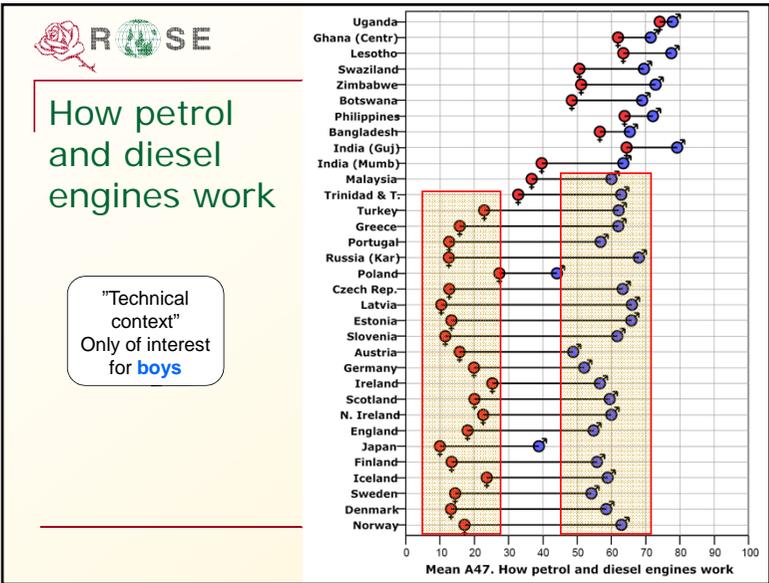
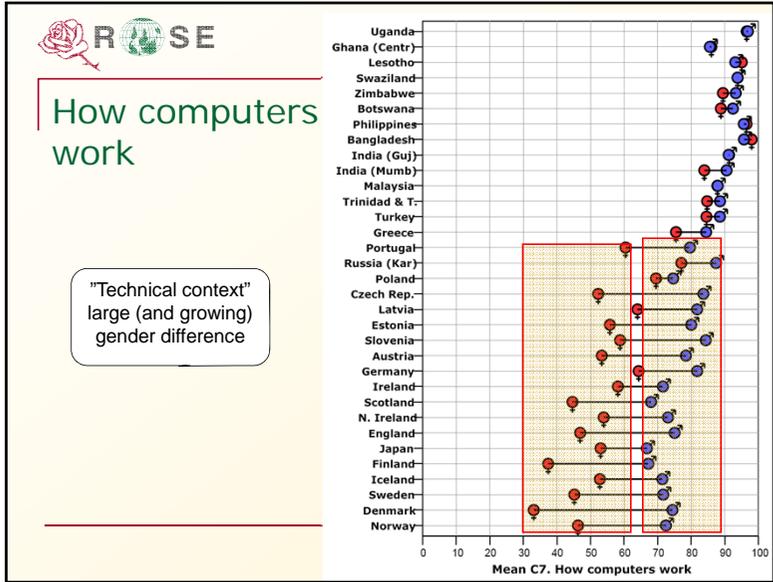


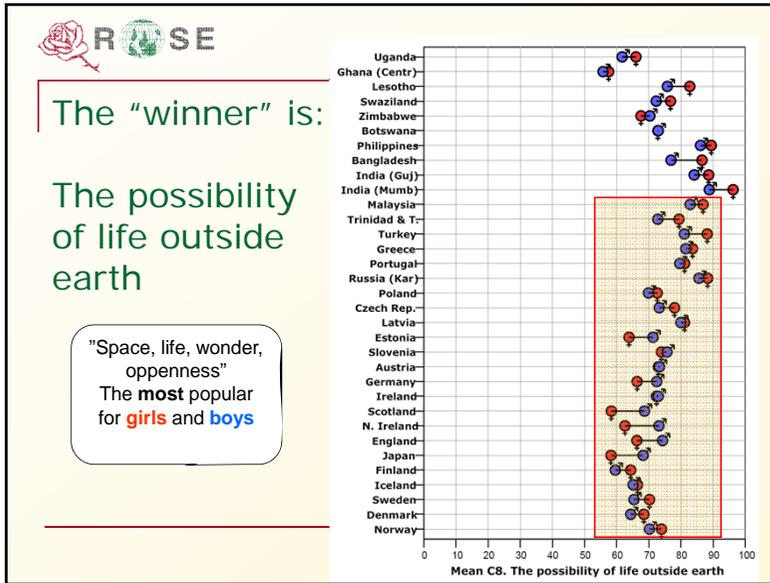
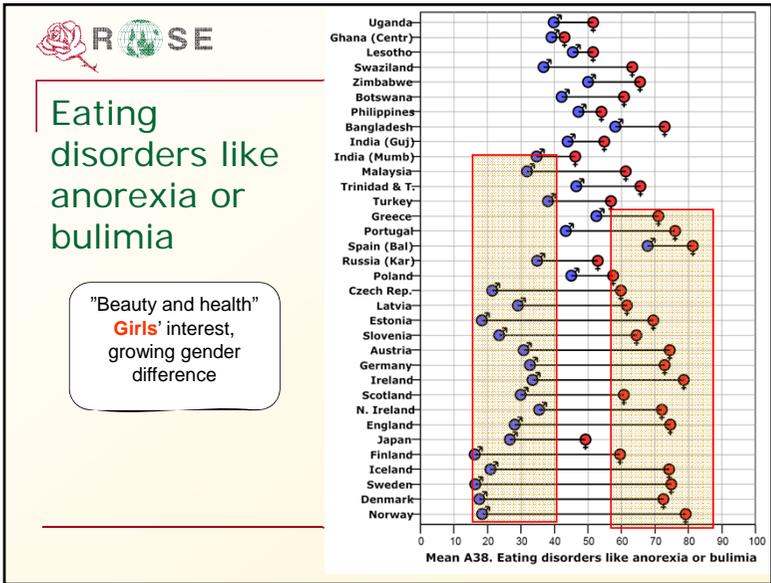
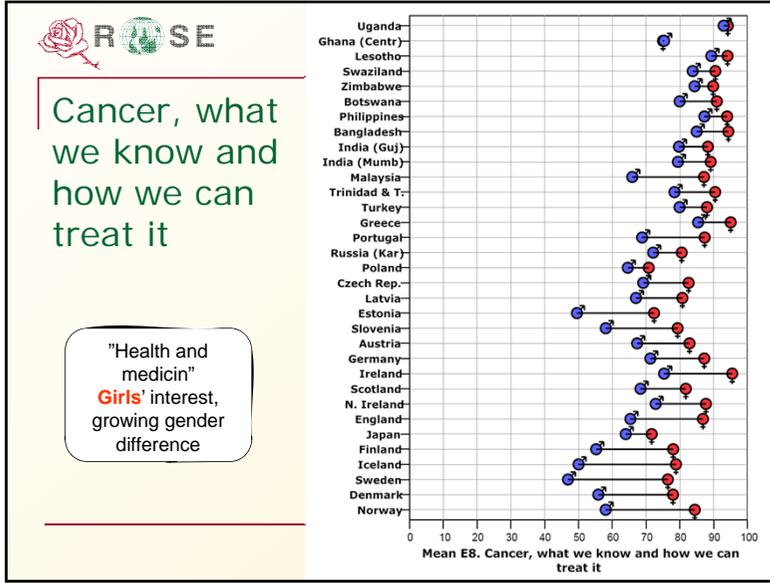
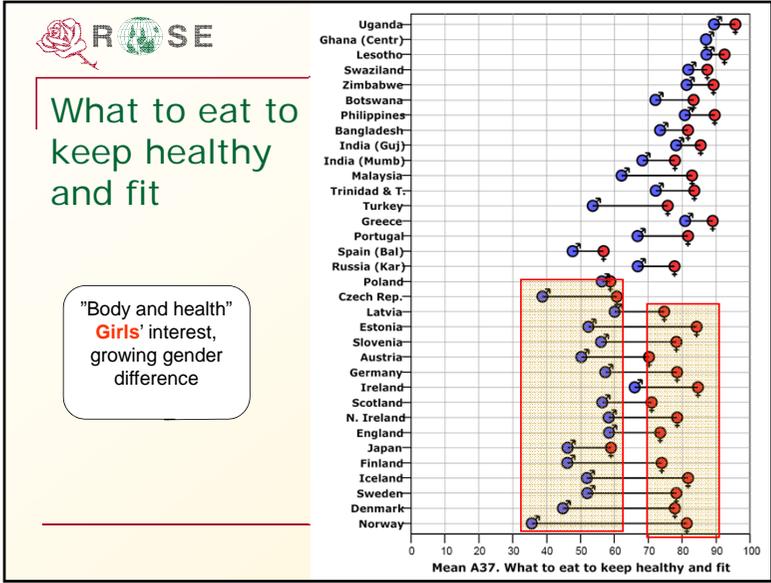


ROSE

The more developed, the larger gender difference in interests (Context is the key word):

- **Boys' interests (and NOT the girls')**:
 - The technical, mechanical, electrical, spectacular, violent, explosive...
- **Girls' interests (and NOT the boys')**
 - Health and medicine, beauty and the human body, ethics, aesthetics, wonder, speculation (and the paranormal..)

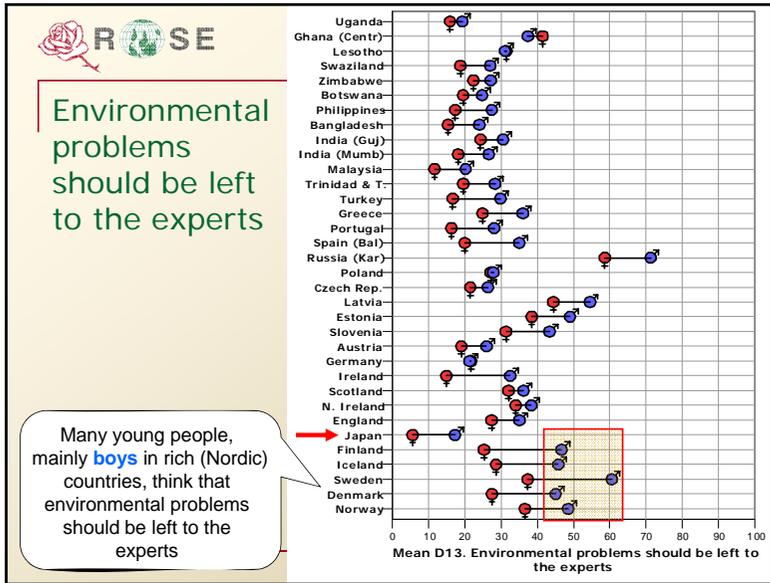
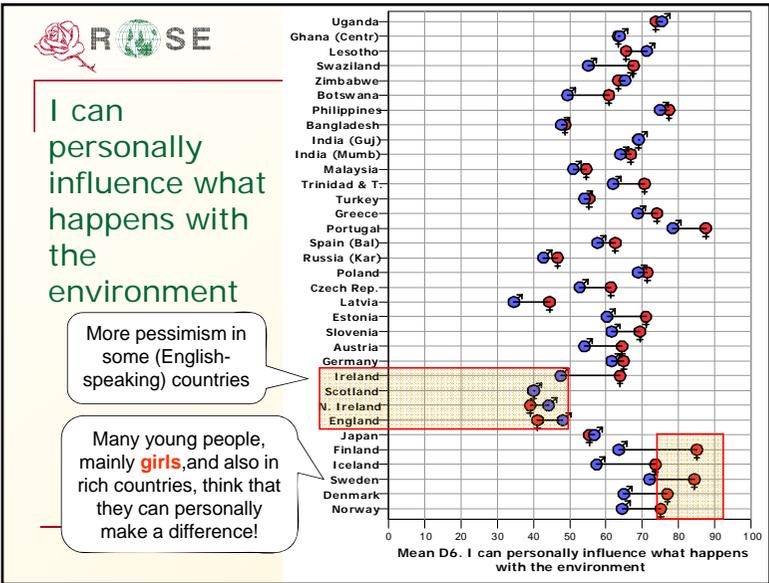
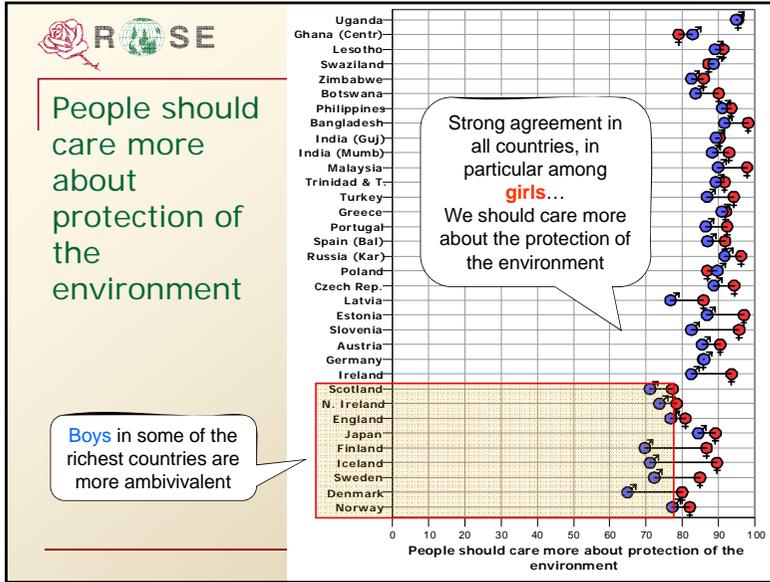


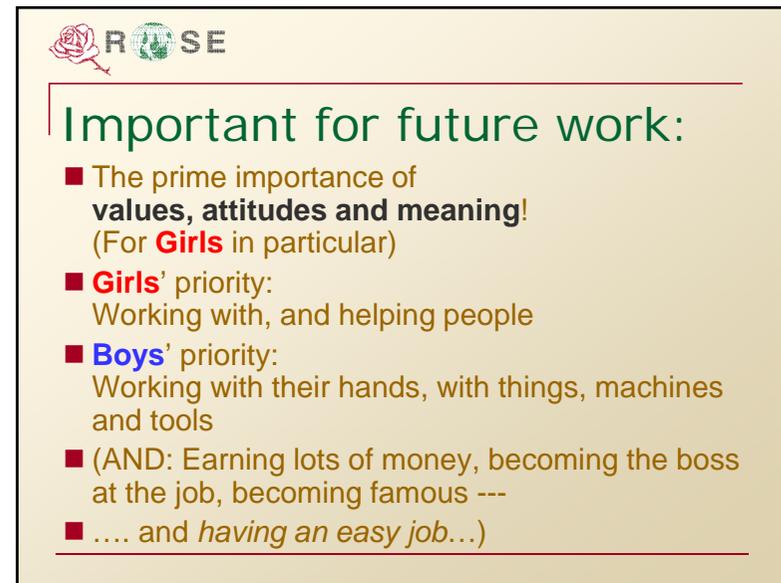
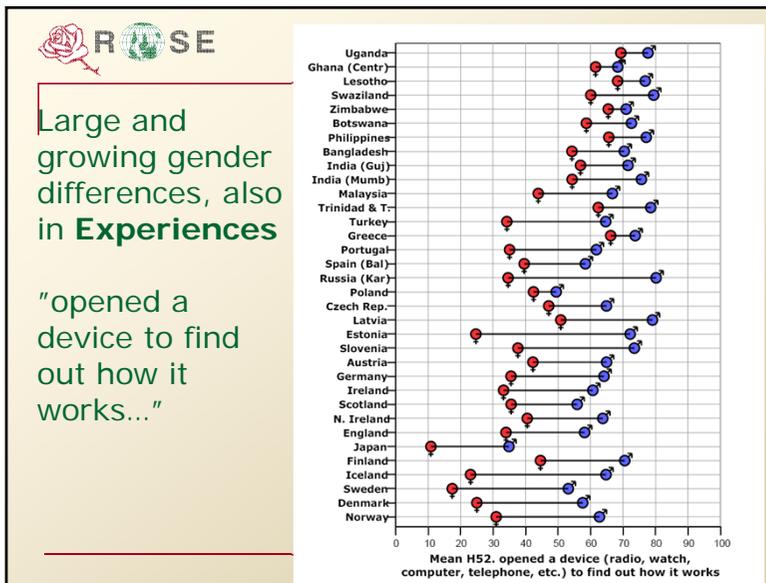
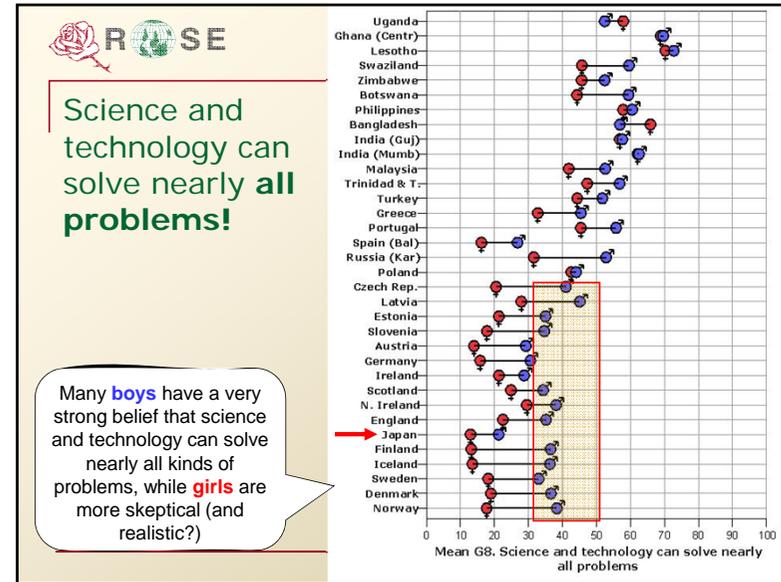
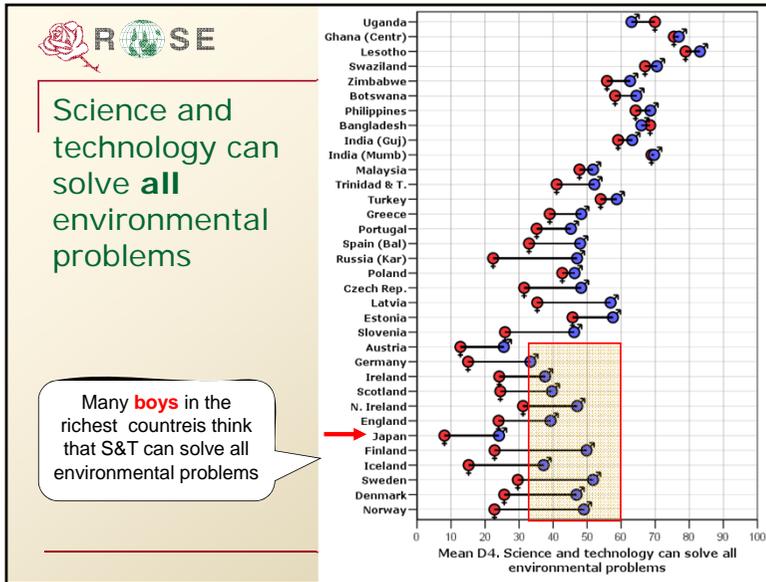


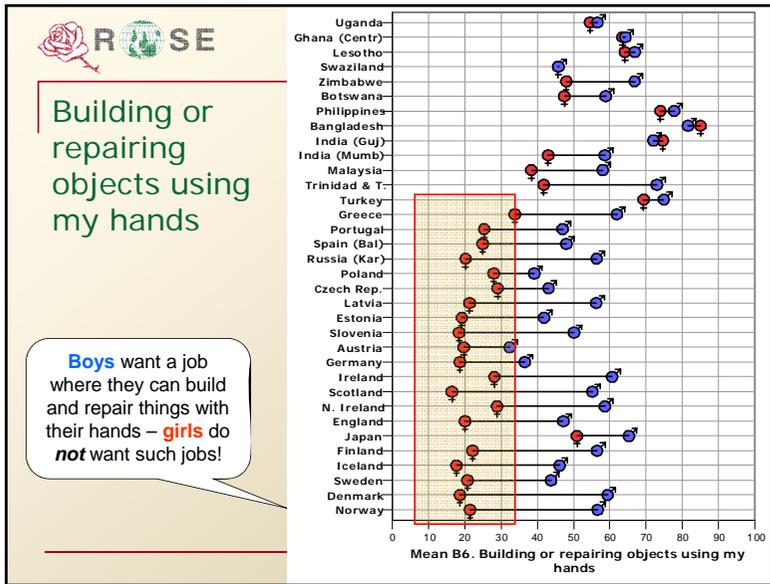
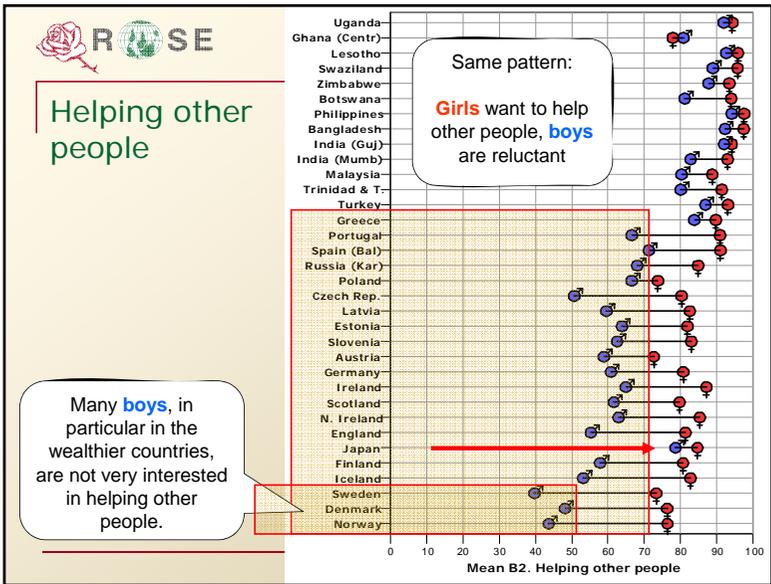
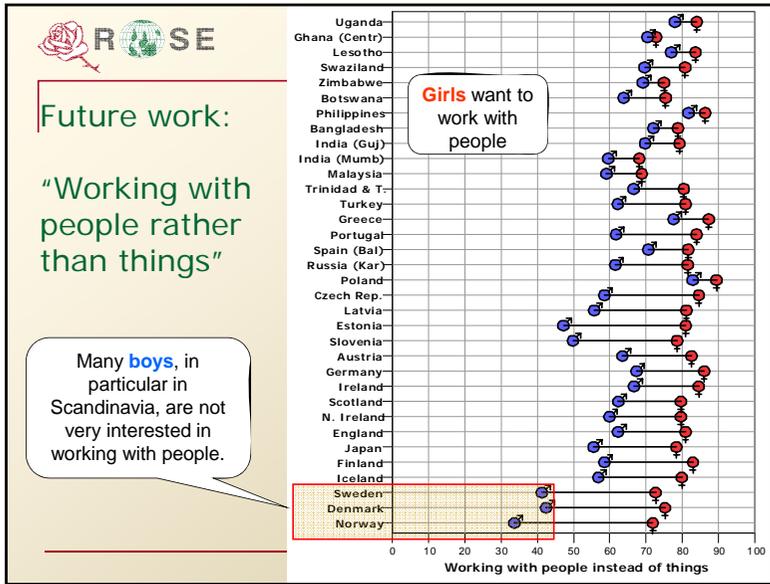
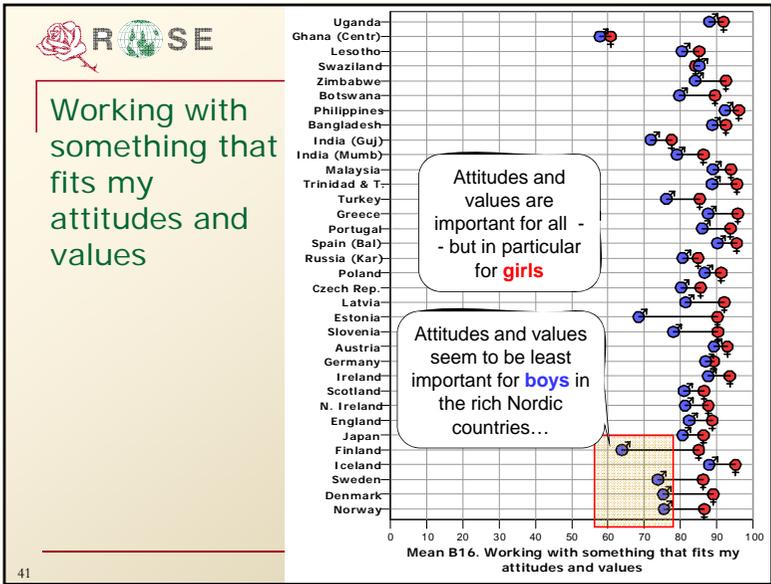
ROSE

The environment and sustainable development?

- Important for all, but mainly for **girls**
- **Boys** think problems are exaggerated and trust experts to sort out the problems
- **Girls** believe that each individual makes a difference
- **Girls** are willing to 'pay the price', **Boys** are reluctant







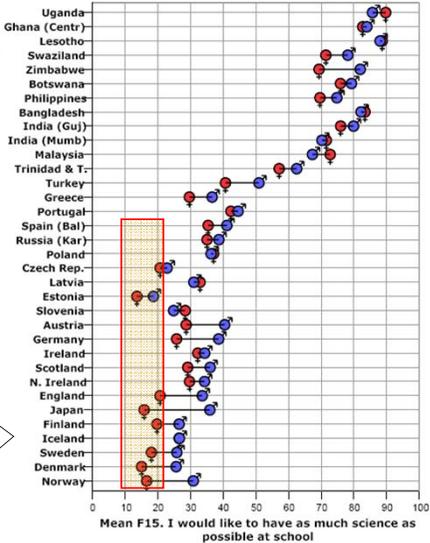


What about future educational choices, careers and studies in S&T?



I would like to have as much science as possible at school

In wealthy countries, young people are not enthusiastic about school science -- in particular not the **girls**



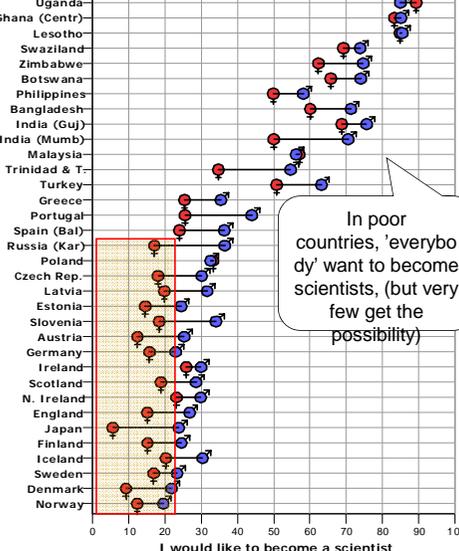
Mean F15. I would like to have as much science as possible at school



I would like to become a scientist

In wealthy countries, very few want to become scientists -- in particular not the **girls**

In poor countries, 'everybody' want to become scientists, (but very few get the possibility)



I would like to become a scientist

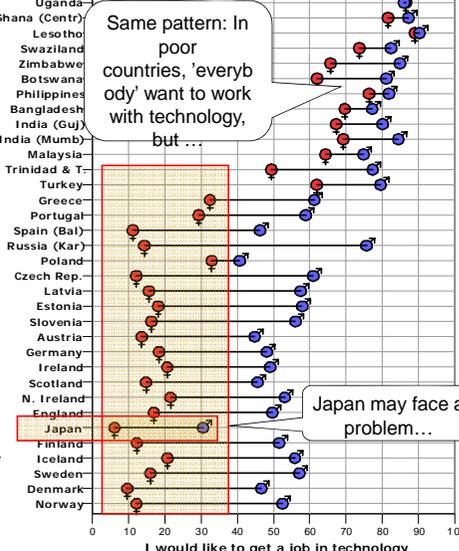


I would like to get a job in technology

In wealthy countries, nearly no **girls** want to work with technology, and even **boys** are ambivalent

Same pattern: In poor countries, 'everybody' want to work with technology, but ...

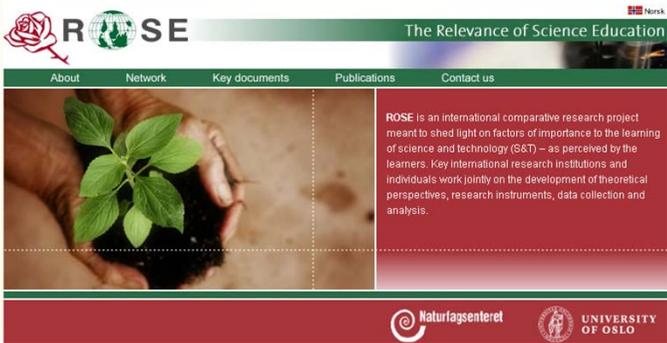
Japan may face a problem...



I would like to get a job in technology



ROSE-articles, PhDs etc:
www.roseproject.no
 Other articles Svein's home page
<http://folk.uio.no/sveinsj/>




What's next?

IRIS:

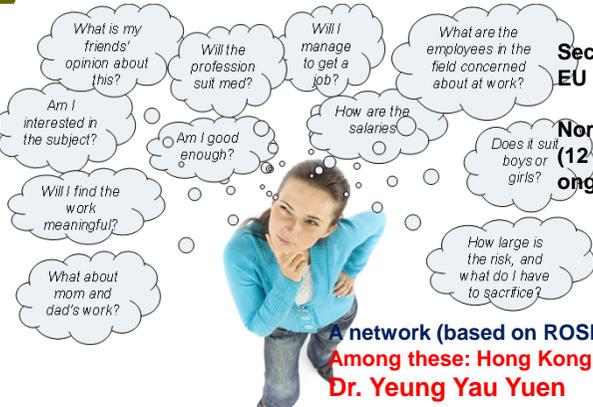
**an emerging EU-funded
 research initiative to address
 interest, recruitment and
 choice
 of STEM-subjects**



IRIS

Interests & Recruitment in Science

Factors influencing recruitment, retention and gender equity in SMT higher education



What is my friends' opinion about this?

Will the profession suit me?

Will I manage to get a job?

What are the employees in the field concerned about at work?

How are the salaries?

Does it suit boys or girls?

How large is the risk, and what do I have to sacrifice?

Am I interested in the subject?

Am I good enough?

Will I find the work meaningful?

What about mom and dad's work?

Secured basic EU research funding

Norwegian 'pilot' (12 000 students) ongoing:

A network (based on ROSE) also take part.
Among these: Hong Kong and Guangzhou
Dr. Yeung Yau Yuen

