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Talking life sciences to both sexes

A WORKSHOP ON RESEARCH COMMUNICATION AND GENDER
9 FEBRUARY 2006

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Talking life sciences to both sexes

A Workshop on Research Communication and Gender
9 February 2006

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Foreword



Following a request from the European Council, the European Commission adopted, in January 2002, 'Life sciences and biotechnology – A strategy for Europe' (COM(2002)27-23 January 2002). The strategy has been developed with the aim of bringing coherence to policy-making, which in Europe is characterised by diverse economic, social and environmental concerns. The strategy sets out a strategic vision and a 30-point action plan for this area up to 2010 to allow Europe to benefit from the positive potential of life sciences and biotechnology, to ensure proper governance and to meet Europe's global responsibilities.

One of the key actions (N°13) focuses on 'Societal scrutiny and dialogue', where the European Commission commits itself to "encourage public debates on biotechnology between scientists, industry and civil society", and recognises that "Developers in the scientific community and in industry have a specific responsibility in actively explaining the background and the benefits of their products."

DG Research is actively contributing to the implementation of this action by insisting that all EU-funded scientific projects include a communication strategy. One key element to successful communication is to know your target audience and to adapt your communication strategy accordingly. In this context, the 'Talking life sciences to both sexes' workshop raised the Commission's awareness on the issue of research communication and gender. The key question was: Do we need to communicate life sciences research differently to men and women? In order to answer (or, at least for the first time, address) this question the Directorate for Biotechnology, Food and Agriculture research in collaboration with the Directorates for Science and Society and for Health organised this one-day gathering on 9 February 2006.

This workshop offered the opportunity for experts from the natural and social sciences, as well as professional communicators, to interact and formulate – with the active contribution of the audience – ideas on how to proceed in this matter. The audience consisted of scientists, representatives from governmental and non-governmental organisations and members of the public with a specific interest in research communication and gender.

This publication aims to summarise the presentations that were given during the workshop, as well as the key points that were raised during the discussions. Since research communication and gender is not a well-documented field, this publication is also meant to become a resource for the public and the scientific community, which has to communicate its research, as well as the experts conducting research in the fields of communication or gender.

A handwritten signature in black ink, appearing to read 'Christian Patermann'.

Christian Patermann

Director for Biotechnology, Agriculture and Food Research
European Commission, DG Research

Programme

Welcome: **Christian Patermann**, Director for Biotechnology, Agriculture and Food Research, European Commission's Research Directorate-General, Brussels, Belgium

Introduction: **Line Matthiessen-Guyader**, Directorate for Biotechnology, Agriculture and Food Research, European Commission's Research Directorate-General, Brussels, Belgium

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'Research, policy and services aiming to improve the health status of a population will have to examine and understand both "sex" and "gender" differences between women and men' by **Peggy Maguire**, Director of the European Institute for Women's Health, Dublin, Ireland

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Closing Remarks by **Jean-Michel Baer**, Director for Science and Society, European Commission's Research Directorate-General, Brussels, Belgium

From unisex to gender-tailored life science communications

An introduction by Line Matthiessen-Guyader



Equality is deeply enshrined in the modern democratic and egalitarian ideal. Almost 60 years ago, the United Nations articulated this aspiration in its Universal Declaration of Human Rights: “All human beings are born free and equal in dignity and rights.”

Europe has been at the forefront of this global struggle for equality and has set the standard in many fields. Article 21 on non-discrimination of the EU’s Charter of Fundamental Rights explains that: “Any discrimination based on any ground, such as sex, race, colour... shall be prohibited.”

For decades, promoting gender equality has been a pillar of European policy at both the national and EU levels. This has involved devising ways of giving men and women equal access to education, health care, politics, the labour force, the legal system etc. Both sexes should also receive equal social and economic opportunities, whether in the work place or at home. But regulation has often outpaced social attitudes and people’s mentalities – and that is why implementation of these principles has sometimes been slow.

Scientific sex appeal

Engendering equality between men and women is as important in the scientific field as it is in other walks of life. A key objective of EU research policy is to create a situation of gender equality in all aspects of R&D: from policy-making right through to laboratory work.

With the strong support of Member States and the European Parliament, the European Commission has been working hard to mainstream gender issues – i.e. insert a gender perspective – into the research agenda, explained Line Matthiessen-Guyader of the Commission’s Research DG. For several years, it has been actively promoting research by, for and on women.

The pursuit of scientific knowledge and using it to serve society requires talent, perspective and insight that can only be ensured by promoting diversity in the science and technological workforce. Therefore, the Commission aims to surpass the 40% female participation ratio in the implementation and management of its research programmes. The gender dimension is also increasingly being integrated into the content of actual research projects so as to ensure that the knowledge generated serves women and men equally. And, if we are to understand social dynamics and eradicate inequality, we need to carry out research on gender and gender relations, as well as their impact on European society.

A healthy dose of gender

Biology is one of those areas where gender differences are quite clear cut – at least at first sight. Yet traditionally research in the field has been gender-blind or biased towards men. Since the life sciences and biotechnology deal with the health and quality of life of people, they are prime candidates for gender sensitisation to ensure that they serve the needs of men and women on an equal footing.

In fact, large EU-funded research projects in these fields are obliged to formulate a gender action plan which diagnoses the current situation of female and male participation in the research project, proposes actions based on this diagnosis and describes how gender differences linked to the research itself will be addressed.

But isolated experiences, although valuable, are not the entire story. For instance, in the area of food quality and safety, the Commission identified, following discussions with the coordinators of large EU-backed research projects, the need to encourage the exchange of experiences and best practice regarding gender action plans.

This prompted the Commission to establish a network on gender in food research which brought together representatives from EU-funded Networks of Excellence and Integrated Projects. In its first meeting, the network identified communication of food research as an important gender-related issue.

The language of gender

Communication is another important string in the EU's science bow. This is born out of a recognition that a certain gap exists between science and society and, in order to bridge it and maximise the social benefits of scientific research, requires effective two-way communications.

In order to engage in well-informed dialogue, citizens need clear and unbiased information. Beyond this, people – both women and men – need well-targeted information to extract the maximum benefit from scientific knowledge and ongoing research.

As in all areas of communication, knowing who your target audience is and what their needs are is an essential component of a successful communications strategy. However, life science communicators have traditionally followed a unisex approach. But is there a case to be made for tailoring the message to fit different genders?

This raises a whole variety of related questions: are there physiological, psychological or social differences between men and women that require different approaches to communication? Do women and men process scientific information differently? If so, how does one best reach the different genders and avoid perpetuating gender prejudices? Should science education take gender differences into account? And much more.

If there is a gender difference and we do not take it into account, we may fail to reach half of society – be it female or male. If there is little difference, but we manufacture one, we may set back the cause of gender equality.

Gender may be regarded by some as a 'soft' issue, but it is one that has very hard and far-reaching consequences. Getting it right is important. In order to put the sexes in their proper life science context, the European Commission organised a workshop in February 2006 in Brussels entitled 'Talking life sciences to both sexes'.

This watershed event brought together specialists – both women and men – from a wide variety of disciplines – including life scientists, biologists, food experts, gender researchers, psychologists and sociologists – with policy-makers to construct a vision for this increasingly important policy area.



In the mediating seat



Part one of the workshop – which set the stage and covered research carried out on the gender aspects of the life sciences – was chaired by **Suzanne Gage Brainard**, executive director of the Centre for Workforce Development and affiliate professor of Women Studies and Technical Communication at the University of Washington (USA).

“We’ve been dealing with gender issues for over 40 years without assessing their efficacy,” she told the workshop. “Today, the focus is shifting away from identifying barriers and who’s to blame to how to create a society that offers men and women an equal opportunity in career choices and advancement.”



Part two dealt with identifying the potential actions that could be pursued in order to address gender differences. **Hans Peter Jensen**, research director at the Danish Institute for Food and Veterinary Research and member of the Commission-appointed advisory group on the Sixth Framework Programme’s ‘Food quality and safety’ thematic priority.

“We need to consider what kind of gender research we need in the future,” he told the participants. “Of course, the issues are much more complex than just a question of man or woman. There are many other differences, including cultural, ethnic, experiences, and language which also have a strong influence.”



Mind-bending truths



For all his reputation as a thinker, Aristotle famously believed that the brain's sole function was as a cooling system for the blood. Although one would expect a philosopher to have an acute awareness of the thought processes going on in his head, the Greek thinker believed that mental activity took place in the heart – a misconception ancient biologists were soon to correct.

Our understanding of the brain has come a long way since then, but we still do not know everything about that most complex of organs – and many popular misconceptions persist. These include the idea that most people only use a tenth of their brain, even though every part of the brain has a known function.

Another is the notion that cognitive functions are separated neatly between the left and right cerebral hemispheres. While some – such as language – tend to be focused on one side of the brain, most are not and the brain is flexible enough to relocate functions away from damaged areas.

SIZE DOESN'T MATTER

Another persistent myth that still finds proponents is the idea that the size of the human brain has a bearing on an individual's intelligence. **“Since the 19th century, it has been clearly shown that brain size does not affect intelligence, but even today some people try to link it to IQ,”** explains **Catherine Vidal**, a neurobiologist at the Institut Pasteur in Paris.

Part of the reason for this is the so-called ‘gender wars’ in which advocates of male superiority claim that men, who on average have larger brains than women, are more intelligent. **“Talking about the brain and sex has never been a neutral matter,”** Vidal notes.

To illustrate her point, she quoted an extract from the *Bulletin de la Société d'Anthropologie* in 1861. **“One wonders whether the smaller size of women's brains is due to the small size of their bodies,”** the French journal begins earnestly enough. **“But let's keep in mind that women are, on average, slightly less intelligent than men. Therefore, one can conclude that the smaller brain of women is explained by their inferiority in both size and intelligence.”**

BEYOND THE FIG LEAF OF SEXUAL DIFFERENCES

At birth, the female and male brains – like the female and male bodies – are different in one significant aspect: the regions of the hypothalamus which control the genitals and reproductive functions. This part of the brain is responsible for regulating the secretion of a cocktail of male and female hormones (testosterone and oestrogen) which is different in men and women. In women, hypothalamic neurons function more cyclically than in men owing to the female menstrual cycle.

Other than these reproductive differences, there are no obvious variations between the male and female brain. Indeed our brains are all different and, as a result, the variability in brain anatomy and function between individuals exceeds the variability between men and women.

Two decades ago, a study found that the corpus callosum, which connects the two hemispheres, is relatively thicker in women than in men. This apparent physical difference has been used to posit a wider range of gender differences. A thicker corpus callosum would enable the two hemispheres of the brain to communicate better and has been used to make the case for ‘female intuition’, the arguable male-female divide in ‘multitasking’ and the seeming edge women have over men when learning languages. Since that time, hundreds of anatomical studies have cast doubt on the original research and found no statistical differences in the size of the corpus callosum between the sexes.

about the human brain

A 1995 study revealed that some women did, in fact, use both hemispheres of the brain when performing language tasks, while all men used only the left. However, there were only 19 male and 19 female subjects taking part in the experiment.

A later meta-analysis of 24 such experiments conducted on 700 subjects between 1995 and 2004 found no statistical difference between men and women, but large variations between individuals. When a large sample of subjects is analysed, the differences between the sexes disappear.

FEATS OF MENTAL DEXTERITY

The human brain is made up of a staggering 100 billion neurones and 1 million billion synapses which act as junctions between different neurons, while there are only 6000 genes expressed in the brain.

Genes control the brain's 'default' architecture at birth. However, the brain is by no means 'hard-wired'. Crucially, more than 90% of the billions of neuronal connections in the brain will form later in life. By the time a person reaches adulthood, each neuron is connected, using different synapses, to about 10000 other neurons.

A number of internal (nutrition, hormones and disease) and external (upbringing, education, experiences, as well as social and cultural influences) environmental factors affect the formation of these connections. This explains, for instance, why studies of the brains of pianists show thickness in the areas controlling finger movement and audition, while taxi drivers exhibit thicker spatial cognition and memory areas.

This adaptability of the brain, its ability to be moulded to different purposes, is known as plasticity – and this could help to explain apparent gender differences. Plasticity shows that the brain is malleable enough to learn and specialise in different tasks and functions – including socially sanctioned gender roles.





One size does not fit all



In our image-conscious world, thin is 'in' and the ideal body shape is getting slimmer every year. Meanwhile, the gap is widening between how people actually look and how posters, television and films tell them they should look.

Despite its growing stigmatisation, fat is actually a valuable and necessary part of our body's make-up and women do not need ultra-thin 'hour-glass'

figures and men do not need sinewy 'six-pack' muscularity to be healthy. In fact, too much dieting – whether eating to get thinner (usually for women) or to get bigger (usually for men) – to try to attain these improbable ideals can actually do harm.

Nevertheless, the amount of fat millions of people in Europe are carrying around is tipping the scales dangerously. Being obese or overweight can affect a person's quality of life by making physical activity difficult and even perilous. It can also lead to a number of health complications, such as heart disease and diabetes, and seriously reduce a person's quality of life.

“Communication is essential in conveying these risks, but there is no consensus on how this should be done,” remarks **Peggy Maguire**, director of the European Institute for Women's Health in Dublin.

A person is considered obese if (s)he has 20% extra body fat for his or her age, height, sex and bone structure. This is often calculated using what is known as the body mass index ($BMI = \text{weight (kg)}/\text{height (m)}^2$). More than a third of EU citizens are overweight ($25 < BMI < 29.9$) and one in ten is obese ($BMI > 30$) and obesity is one of the highest causes of preventable deaths. A quarter of European children are overweight and, every year, an additional 400 000 schoolchildren join their ranks.

Although BMI is only an indicative measure and many other factors – such as the ratio between fat and muscle, and how active a person is – these statistics are cause for major concern. **“Prevention is better than**

intervention,” observes **Maguire**. “Communication is essential in raising awareness of the risks, but there is no consensus on how this should be done.”

THE FEMALE FACE OF OBESITY

Research has revealed that women build up fat differently to men and the causes of female obesity tend to differ. In addition, the physical and psychological effects of obesity are different in women.

Women naturally have a higher percentage of body fat than men and new fat tends to accumulate more in their hips, thighs and bottoms. Obese women often have what is colourfully referred to as a 'pear' shape and obese men tend to have more of an 'apple' shape. In addition, the burning off of basal fat is lower in women than in men.

Pregnancy and menopause are significant factors in female obesity owing to changes in hormonal concentrations. This means that older women are more likely to be overweight than their younger peers. Some research has uncovered a direct association between body weight and deaths from all causes in women. When BMI exceeds 30, the relative risk of death related to obesity increases by 50%, according to the American Obesity Association.

There are certain obesity-related conditions which uniquely or mostly affect women. These include the increased risk of infertility, as well as a higher incidence of breast and endometrial cancer. Obese women are 12 times more likely to develop type 2 diabetes than women of healthy weight.

Society tends to view obese women in a rather different light to their male counterparts. Given the super slender popular ideal figure for women, there is more stigma and discrimination targeted against obese women than obese men. Research suggests that obese women have more difficulty finding employment and are paid less than their slimmer peers. In light of all this societal pressure, it is hardly surprising that the relationship between obesity and depression is more pronounced among women than men.

in fight against obesity

'GENDERING' OBESITY COMMUNICATION

Considering the huge health risks associated with obesity, risk education is essential.

One of the issues over which there is no general agreement is whether a 'gendered' or a 'one-size-fits-all' approach is called for when communicating risks related to obesity. The traditional 'disease model' looks at obesity as almost exclusively a biophysiological issue – i.e. it assumes a separation between mind and body – and ignores the psychological aspects of the condition.

Maguire argues that an approach that takes account of the differences between men and women is called for, particularly in terms of perception. **"If we don't consider the gender aspect, this could lead to inequalities in access to health services,"** she notes.

"Bio-psycho-social variables, including physiological sex differences, gender differences in coping strategies, information processing, risk perception and symptom evaluation, provide an explanation of differential perceptions of health status and outcomes. These variables may act in a cumulative or interactive fashion."

Although upbringing, family, peer pressure and social norms affect these gender identities, they are not the whole story. **"Gender identity is not simply passively enforced on individuals by socialisation. Instead,**

individuals actively construct their gender identity and behaviour – what is referred to as 'doing gender'," **Maguire** points out.

However, in order to have an effective gender-sensitive approach to risk communication, more research is needed on how health messages affect the two genders. **"Despite the fact that investigators have assessed the merits of a range of risk communication strategies, our limited understanding of how different aspects of a health risk message affect male and female beliefs and behaviours constrains any recommendations that can be formulated,"** explains **Maguire**.

STARTING YOUNG

In addition to these adult gender issues, **Maguire** would like to see more research into childhood determinants of obesity, so that effective communication strategies targeting children can be developed.

"Given the low success of treatment for adult obesity, increased understanding of the early determinants of childhood obesity may eventually lead to effective solutions to combat further increases," she argued.

For instance, recent research into childhood obesity suggests that children are getting fatter because, for various reasons, they lead more sedentary lifestyles. Studies also show that girls take part in physical activity less than boys. Therefore, effective communication campaigns targeted at children and their parents that encourage lifelong active living would be very helpful.

For girls, these campaigns would focus on addressing the perception that sports are for boys. They would associate sport less with competitiveness and more with healthy living. **"Approaches aimed at promoting healthy diets and physical activity need to be sensitive to gender, socio-economic and cultural differences, and to include a life-span perspective,"** concludes **Maguire**.





The invisible risks of



Some 10% to 20% of European men are obese, compared with 10% and 25% of European women. In the UK, which has one of the biggest obesity rates in Europe, two-thirds of men and a half of women were either overweight or obese. An estimated 14 000 male deaths a year are directly attributable to obesity.

Although obesity rates are equivalent across the gender divide, and men are actually more likely to be overweight than women, there is a general perception, both among men and society, that weight is not a problem men need to worry about. **“Obesity and weight has tended not to be seen as a male issue, but it is very much one,”** observes Alan White, professor of men’s health at Leeds Metropolitan University (UK). **“A lot of men don’t look overweight and may not realise the implications of being overweight.”**

PROBLEM: WHEN FOOD GOES TO WAIST

As men get fatter, they build up weight mainly around the waist and chest, developing the distinct ‘apple’ form described earlier. This concentration of intra-abdominal fat presents overweight and obese men with particular health challenges.

Once a man’s waist size is over 100 cm, there is an increased risk of hypertension, hyperlipidaemia, diabetes, as well as fat-related cancers: prostate, testicular, bowel, liver, kidney, oesophagus, and stomach. Overweight men also run an increased risk of death as a result of obstructive sleep apnoea and can suffer erectile dysfunction and are at greater danger of developing dementia.

One Dutch study found that extremely obese men displayed lower endurance and respiratory capacity during exercise than similarly heavy women. The men also exhibited a condition called ‘carbohydrate intolerance’ – in which the sufferer is unable to utilise carbohydrates as the high-energy fuel source they are meant to be and store the unprocessed, excess carbohydrates as body fat – more frequently than women.

HELLO, BIG BOY

Owing to social conditioning and the gender identity they construct, men tend to perceive their body shape differently to women. A significant proportion of men covets being big, while being thin is seen as ‘unmanly’. Studies suggest that up to two-thirds of normal weight boys feel they are underweight, while an equivalent number of normal weight girls felt they were fat. This means that young women often diet to lose weight, while young men diet to put it on.

‘Six-pack’ muscularity is the kind of figure to which many men aspire. One study found that boys and men associated being lean and muscular with being healthy and fit. Adult men and teenagers explicitly linked having a well-toned, muscular body with feelings of confidence and power in social situations. **“Men want to be bigger and when they are, they report being happier,”** notes White.

And if they can’t be muscular, some men – particular in poorer socio-economic categories – settle for being big. Certain men view – or are encouraged by family to see – their rotund stomachs as a valuable possession. **“A belly is often seen as something to fall back on – or fall forward on to,”** jokes White.

In fact, researchers have found that overweight men think they are healthier, more attractive, and report higher levels of life satisfaction compared to overweight women. Additionally, many cultures see being big – especially for men – as a sign of prosperity.

being an obese man



PUTTING FAT ON THE MALE RADAR

Men and society at large need to become more aware of male obesity. **“Just as men often don’t see themselves as overweight, GPs [general practitioners] and others don’t either, or choose not to raise it with them,”** White points out.

Men are also less likely to seek dietary or medical advice, or go in for health check-ups. **“Men, particularly in areas like the construction industry, don’t tend to go to the doctor’s for preventive check-ups,”** White says.

This echoes the findings of the Men’s Health Forum in the UK. In a survey of more than 1000 men it found that more than half said they would not go to a doctor for advice, while 87% were against joining slimming clubs. It also revealed that men were more likely to be motivated to lose weight to help them become more successful with the opposite sex (43%) than for health reasons (39%).

The men canvassed demonstrated a lack of understanding about the health consequences of being overweight. Only two-thirds knew that being overweight was linked to diabetes, while a third were aware of the link to erection problems.

Like Maguire, **White** also recommends a gender-sensitive approach to communicating the health risks associated with obesity. **“We need to adapt communication and policy to better reach men,”** White suggests. This would involve adopting male-oriented approaches to communicating the risks that men run by being overweight or obese.

DRIVING HOME THE ISSUES

White outlined a number of approaches that could reach men more effectively. These included on-line support systems, workplace-based initiatives, ‘information’ rather than ‘counselling’ programmes men can follow on their own and in private, and linking in to men’s competitive spirit.

He pointed to one successful example that tapped into the fascination many men have with cars in a humorous way. The Men’s Health Forum produced a health guide in the style of a car manual to help change male attitudes to their weight. Known as the ‘HGV Man’ manual, it was produced in conjunction with car manual publishers Haynes and describes itself as an “owners workshop manual”.

In a parody of the ideal proportions of Leonardo Da Vinci’s Vitruvian Man, the guide has an illustration on the cover of an overweight man – and a slimmer man on top – with his arms and legs outstretched standing at the centre of a circle and a square.



Back to school for girls'



Europe is the world's biggest 'brain factory', generating more science and technology graduates than its major rival – although relatively fewer make it into the R&D workforce. Nevertheless, this number has begun to taper off in recent years and fewer young people are pursuing science-related studies and careers.

This declining interest in science comes at a time when

Europe needs legions of new researchers as it pursues its ambitious drive – known as the Lisbon Strategy – to construct the most competitive knowledge-based economy in the world. According to European Commission estimates, Lisbon is likely to create some 700000 new research-related jobs across Europe in the coming few years.

A complex array of factors have caused this dip in scientific interest among young people, including the growing complexity of science, technology fatigue owing to the accelerating pace of technological progress which means few people can hope to become expert in a given field, and an evolving sense that science can deliver bad things as well as good.

The communication gap between the scientific community and society at large has not helped matters either. Some place a large part of the burden of blame on science curricula which fail to look beyond the school gate to relate to the experiences and interests of students.

THE GENDER DEFICIENCY

Women make up around half of humanity. In science, however, they represent a progressively smaller proportion of the population the higher one climbs up the education and then career ladder.

Although European women now constitute more than half of the university population, most female students tend to opt for humanities and 'soft' sciences. Certain disciplines – such as mathematics, physics and engineering – tend to be dominated by men, while a small number of scientific disciplines, including the life sciences, have an even gender balance.

"You'll find a lot of women in certain scientific areas, such as biology, medicine and the veterinary sciences," says **Helene Sørensen**, a lecturer in curriculum research at the Danish University of Education (DK).

"The number of girls [in Europe] choosing to study some science subjects at secondary school level, particularly physics, computer science and engineering, is still low," found a Commission-appointed High Level Expert Group on Increasing Human Resources for Science and Technology.

"The choice of school subjects often results in a gendered pattern, where some subjects become boys' subjects, while others are dominated by girls," said the final report by the independent group led by former Portuguese Science and Technology Minister **José Mariano Gago**.

It recommends the adoption of **"measures to engage girls and young women in science, namely by taking account of gender differences in science teaching, improving the image of science, engineering and technology, and adapting careers materials and services to attract girls and young women into scientific professions."**

science education

WHAT GIRLS WANT TO LEARN

The Programme for International Student Assessment (PISA) – a survey of students from 41 countries carried out by the Organisation of Economic Co-operation and Development – found that the gender gap in science was smaller than in mathematics and reading, according to **Sørensen**. In contrast, the results for Finland, Iceland and Tunisia actually showed girls outperforming boys in science.

Nevertheless, a gender gap in favour of boys does exist in science and it is a significant one in many countries, such as Canada, Denmark, Greece, Korea, Luxembourg and Mexico.

One reason for this gender gap is that boys like science more than girls. The Relevance of Science Education (ROSE) – a comparative research project of 15-year-olds across the world which aims to shed light on the factors of importance to the learning of science – revealed that in all countries surveyed boys like science more than girls.

“Life experience has a strong influence on scientific performance,” notes **Sørensen**. And girls often grow up being subtly discouraged from taking an interest in science by society and family. This can be seen in common attitudes that science is a ‘boy thing’ to gender-biased toy advertising, where chemistry kits and other home science toys are usually pitched at boys, while dolls and house-keeping toys are targeted exclusively at girls.

Girls and boys also show a striking difference in what kind of science-related questions they would be interested in having answered in the classroom. Research carried out by **Sørensen** in Denmark showed that the top 20 questions Danish schoolgirls posed focused on biology, psychology and the social dimension. ‘Why do we dream while we are sleeping?’ was number one. Other questions included: What do we know about HIV/AIDS? How can we exercise to keep our bodies fit and strong? And does life exist on other planets?

GIRL-FRIENDLY SCIENCE CLASSES

These measurable gender differences demand a more female-friendly approach to science education in our schools. Such a methodology would acknowledge that the aim of science schooling is the same for everyone, but boys and girls have different starting points.

Science educators should realise that girls and boys have their own specific interests outside the classroom and these can be tapped to enhance their interest in science. In addition, girls and boys work differently in groups. Girls usually prefer to co-operate and negotiate their roles in order to give everyone a chance to take part. When there is disagreement, girls will discuss working conditions.

In contrast, boys are more hierarchical in their group work and compete more for dominance of the group. They also prefer pursuing individual goals and will often deviate from the group if it takes a track they do not wish to follow.

In short, science curricula need to engage girls more actively, empower them and provide them with affirmative feedback. Science educators need to understand and better tune into the specific worldview of girls so as to inspire them to pursue scientific studies and careers.





At the gender-computer



Everyone interacts differently with technology, and women are not any less competent with computers than men. However, numerous studies indicate that there is generally a gender gap, with men showing a greater aptitude for computer technologies, despite the best efforts of policy-makers and educators.

“It seems that, after a decade of efforts, the gender gap is still not closing,” notes **David**

Passig, head of the graduate programme in information and communication technologies at Israel’s Bar-Ilan University. **“We cannot allow this gap to remain for another decade.”**

Passig has been conducting research into this area in recent years to determine what the causes of this gap are and how to narrow it. **“This does not imply that girls or women are inferior,”** he stresses. **“It’s just that software developers have tended to be men.”**

His work suggests that there is no innate reason for such a chasm to have formed, but that computer technologies have traditionally been designed by men and, intentionally or not, for men.

KINDERGARTEN RIFT

The gender gap in technological ability begins as early as kindergarten, with boys having a measurable advantage over girls. Studies have shown that there are many gender differences in terms of the time spent on performing a task, the intrinsic satisfaction derived from it, depth of interest and usage preferences when it comes to multimedia-based learning programs. Some have endeavoured to attribute this difference to social, environmental or even genetic factors.

Passig and colleagues set out to discover whether the user-technology interface was not the major cause for this gap. They sought to suggest a taxonomy of user interface elements that best suits one or the other gender, under four clusters or categories: presentation (i.e. familiarity, transparency and visual consistency), conversation (i.e. clear dialogue, feedback and flexibility), navigation (i.e. visibility, marked exits and direct manipulation), and control (icon design and user controls).

Their study uncovered striking differences in the preferences of boys and girls. Boys liked more navigational support and control elements. They liked the interface to show them how to continue, to include sharp transition between different phases, and to present them with a variety of choices. They also preferred to work alone and were most stimulated by the colours blue and green.

In contrast, girls preferred a more presentational design with various conversational elements. They were influenced by the overall appearance of the interface and liked it to be colourful with a lot of animation and feedback possibilities. They were most stimulated by the colours red and yellow. **“By addressing specific genders, we can close a great deal of the technology gap that seems to hold back girls from extensively using computers,”** **Passig** recommends.

interface

THE SPACE DIVIDING BOYS AND GIRLS

Numerous studies suggest that the perception of space and time differs according to gender. Girls and boys perform differently at mental rotation, space rotation and space orientation tasks when using various modes of expression, such as maps and graphs. **“There are clear differences in perception modalities between age groups and genders amongst children,”** Passig explains.

For spatial perception, **Passig** and his team aimed to determine which aspects of various modes of expression – text, sign language, two-dimensional multimedia and three-dimensional multimedia – suited boys and which suited girls. The study found that virtual reality rotation technology was beneficial for both sexes and helped them enhance their induction skills and their ability to think flexibly.

As people grow older, their perception of time shifts considerably. New-born infants live exclusively in the present. Children between five and seven have an awareness of the past, present and future. By the age of 11, people usually have a full grasp of time.

In traditional two-dimensional representations used to teach time to children, gender differences have been observed. **Passig’s** team tried to determine whether boys and girls would grasp and express temporal order better or worse depending on the mode of representation: pictorial, textual, spoken, and three-dimensional immersive virtual reality.

The study found that boys and girls – both of kindergarten and school age – taught to order events sequentially performed best using immersive virtual reality. Pictorial representations also worked well for children at kindergarten, while aural representations worked better for school-age kids.





Gauging the gender



Public opinion surveys – such as the EU-wide Eurobarometer and the Canadian and US national surveys – are indispensable policy-support tools. They allow policy-makers to measure public attitudes towards certain important policy questions and issues, determine the reasons for popular support or opposition, and identify gaps requiring awareness-raising and communication activities.

For instance, two Eurobarometer surveys on science and technology revealed some interesting facts about European public opinion⁽¹⁾. The surveys showed a **“very positive and optimistic perception of what science and technology can actually do for humanity”**. One key finding was that nearly three-quarters of Europeans believe that governments should boost their research spending and about half think that basic research is essential.

Europeans have a great respect for scientists, the surveys reveal, but they feel scientists fail to communicate effectively – an important finding in the context of this workshop. Although EU citizens generally support the freedom for scientists to follow lines of research objectively, they also believe that these efforts should be governed by a strict ethical framework.

The surveys indicated that a majority of citizens think that biotechnology, genetic engineering and high-tech agriculture will have a positive effect on our way of life. However, views are subtle and complex, with wide national variations. The level of support for or hostility towards genetics depended on applications, with medical applications that would clearly save lives receiving the highest backing. The overwhelming majority of respondents drew the line at human cloning which they rejected outright.

In the case of genetically modified (GM) food, more than half (54%) thought it was dangerous. Although this figure is lower than the clear majority who thought so in a 2002 survey, it still presents a challenge for the biotech sector.

GENDER AND EMERGING TECHNOLOGIES

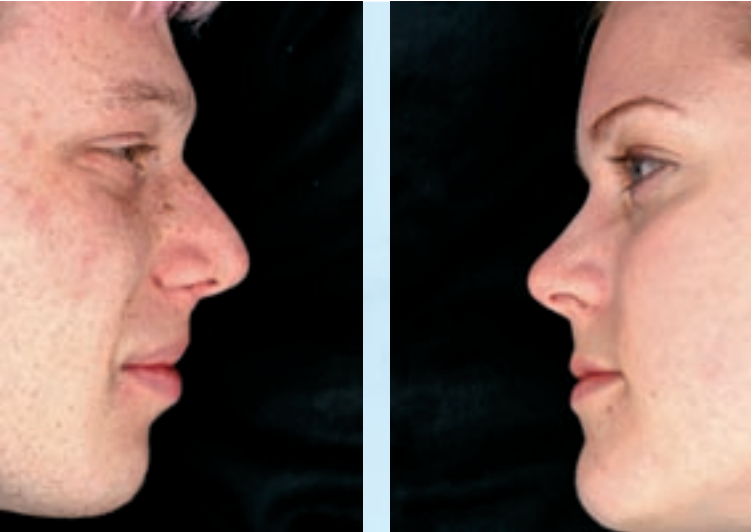
Men and women perceive certain technologies differently, and such gaps in perception should inform policy and the communication strategies of policy-makers. But does such a gender gap exist in new and emerging technologies?

Edna Einsiedel, a professor of communication studies at the University of Calgary in Canada, presented the findings of an international comparative study carried out in North America. **“This builds on earlier transatlantic comparisons of men’s and women’s views on biotechnology applications,”** she explained.

When it came to the opinions of American and Canadian men and women regarding the future benefits, over the next two decades, of emerging technologies, the gender difference was fairly small. For instance, 80% of men and 78% of women believed that stem cell research would benefit our lives in the next 20 years. The only exceptions were GM food and nanotechnology, where the ‘optimism gap’ between men and women was 12% and 14% respectively.

At the other end of the scale, however, significant differences were observed, with women significantly more pessimistic about the future impact of emerging technologies. For instance, 57% of women believed that GM food would make life worse over the next two decades compared with 42% of men.

opinion gap



MALE AND FEMALE PROFILES

From the findings of this comparative international study, general gender profiles can be constructed. Men and women tend to differ in their assessments of new technologies, with men usually more receptive and optimistic.

Men are more likely than women to focus on risks and benefits. Women tend to raise social and moral questions more frequently than men. Men trust institutions more than women. That means that they tend to be satisfied with current regulatory conditions, while women are more likely to opt for stricter controls.

Both sexes employ a combination of utilitarian considerations and reliance on institutional confidence for technological assessments. While gender differences can be significant, these individual differences appear to be less important than other factors that play a role in technological judgements.

NON-SEX FACTORS

Age, religious belief and nationality had more of an impact on opinions relating to the benefits, risks and moral acceptability of a number of emerging technologies, particularly GM foods. **“We found a fairly similar pattern of determining factors across various technologies. Other dimensions have a stronger impact than gender,”** points out **Einsiedel**.

For both GM foods and stem cells, individual attributes – such as age, education and gender – were less likely to affect approval than the actual attributes of the technology – benefits and risks – and levels of institutional confidence. For pharmacogenomics and nanotechnology, individual determinants, but not necessarily gender, were the most significant factors.

These findings have important policy implications. **“There is no specific answer to the question whether life science communication should be gender-targeted. The only answer I can give is that it depends on the specific situation,”** **Einsiedel** maintains. **“In education programmes related to the life sciences, I’m not sure it would be productive to target them differentially,”** she argues.



Social marketing,



Driven by fierce corporate competition, marketing has come a long way in recent decades. From the early days of 'finger in the wind' guesswork, it has evolved into a mix between science and art which carefully and thoroughly studies the attitudes, opinions and behaviour of its various target audiences.

Although government and the social sector are not driven by a profit goal, their messages are

increasingly having to compete with the tidal wave of communications which submerge the average citizen every day: television, newspapers, magazines, the Internet, radio, books, and more.

For that reason, the public and social sectors have been borrowing the techniques – if not the goals – of the private sector. Recent years have seen the idea of social marketing move from being a frowned-upon concept to become generally accepted in the non-profit sector.

“The private sector has been using sophisticated demographic tools for decades. This is now being used more and more in the public sector,” says **Richard Forshaw**, a media marketing manager for the UK's National Health Service (NHS). He works for a company that describes itself as a marketing agency providing private sector know-how to the public sector.

THE MARS AND VENUS FACTORS

For various societal reasons, men and women can often have specific gender identities and these should be recognised when designing communication campaigns, argues **Forshaw**. **“Social marketing needs to take gender differences into account when planning marketing campaigns,”** he says.

This is what the NHS has been doing in recent years. **“Health communications is moving away from a one-size-fits-all approach. We need to look locally at the audiences we wish to target.”** To underline the importance of understanding the local target audience, **Forshaw** presented an NHS campaign his company designed.

The local authority of Brent in London wanted to reduce the teenage pregnancy rate. A survey uncovered that underprivileged young people, often the children of immigrants, were the most at risk of teenage pregnancy. Further research revealed their attitudes and behaviour, and where this group of teenagers tended to acquire their information.

gender and beyond

TAILOR-MADE CAMPAIGNS

Once the features of the target audience had been ascertained, a campaign could be designed. **“We decided that the best way of reaching our target was to use direct marketing by teenagers for teenagers,”** Forshaw explains. Local teenagers were not only recruited as ‘safe runners’ but helped design the communication campaign which revolved around a lifestyle-like free magazine called *Safe*, with a version targeted at boys and another at girls, featuring interviews with celebrities.

“It was designed to look like a lifestyle magazine because young people thought they couldn’t take it home if it was openly a sexual health magazine,” Forshaw discloses. **“In addition, the magazine needed to look and feel like something they would buy – except it was free.”**

The NHS produces a whole line of magazines targeted at different groups for different purposes. *Your life!* is a general health magazine targeted at young women and *Fit* is the same kind of publication but targeted at young men. *Prime* – also with men’s and women’s versions – is a general health magazine targeted at middle-aged people.

An independent evaluation found that these publications **“will stimulate changes in behaviour”**. **“The degree of practical, ‘realistic’, advice contained within these publications has been consistently praised... The publications successfully provide both a goal and the means to achieve that goal,”** the evaluators also found.

MORE TO MARKETING THAN SEX

Gender is just one factor amongst many affecting an effective communications campaign. Socio-economic group, education, cultural background and profession can have equally profound impacts on people’s attitudes, behaviour and needs.

“To become truly effective in designing social marketing campaigns one often needs to look beyond this simple ‘Mars’ and ‘Venus’ division. Our experience in tackling a range of health issues shows that, very often, it is more important to understand the lifestyles and consumer habits of a target audience than simply working out whether they are male or female.”





Putting gender on the



Research has confirmed the important role diet plays in maintaining human health. Food components have been shown to help prevent a range of diseases and to prolong active life, and the search continues to unravel the various effects of different nutrients. However, a lot of the information uncovered by this work is hard to access, despite the best efforts of the European Commission and other stakeholders.

For instance, food composition information can help consumers determine the nutritional value of the food they consume and make informed dietary decisions. These values are either based on chemical analyses or are derived from the nutrient composition of ingredients.

However, these databases are not easily accessible, are fragmented across Europe and are not always easy to understand. **“Europe needs a unified, reliable and accessible food composition information resource,”** says **Brigid McKeivith**, a senior nutrition scientist at the British Nutrition Foundation.

INFORMATION FOR ALL

McKeivith works on just such an endeavour, the Commission-funded European Food Information Resource Network (EuroFIR), which brings together 40 universities, research institutes and SMEs from 21 countries. This project will help to create a comprehensive and authoritative European databank containing information on nutrient ingredients and newly emerging bioactive compounds with putative health benefits.

EuroFIR will be the first port of call for pan-European information about the composition of food. It will help scientists collaborate in validating the relationships between dietary habits and chronic disease, and to exploit the findings to reduce the medical and social costs of ill health.

It will also help the wider community to gain access to nutritional research results and understand their implications for public health nutrition. The database will be accessible to a wide range of stakeholders – policy-makers, the food industry, health professionals and concerned consumers.

The EU-funded project has five strategic objectives. The first is to strengthen scientific and technological excellence in food databank systems and tools. The second is to identify and provide missing data for nutrients and biologically active compounds for all food groups. The third is to spread excellence through training and sharing of methods and facilities. The fourth is to communicate with all user and stakeholder groups. The last is to disseminate and exploit new scientific and technological knowledge.

food communications menu

A RECIPE FOR SUCCESS

EuroFIR aims to raise awareness among European citizens of food nutrition issues. This requires a gender-sensitive communications approach. **“Women and men have different susceptibility to diet-related diseases and they often have different acute and chronic responses to nutrients,”** explains **McKevith**.

One example is folic acid. For pregnant women, folate is important during the first twelve weeks of pregnancy. Extra folate at this time reduces the risk of having a baby with a neural tube defect, such as spina bifida.

“Women and men often have different motivations with regard to their own, and their families’, nutrition. They also process nutrition information differently,” she continues. Numerous studies have revealed that women tend to make the nutritional decisions for their families. They are also more knowledgeable about food nutrition and it is more likely to guide their purchasing choices. Thus, it is perhaps not surprising that women are more likely to show an interest in food labelling than men, and numerous studies have confirmed this behavioural difference.

Women are also more likely to follow dietary advice from specialists, notes **McKevith**. One reason for this is because more men cannot cook or do not feel confident enough in the kitchen to cook from basic ingredients.

For these reasons, EuroFIR sees a clear need for tailoring their messages along gender lines. **“For example, a focus on nutrition labelling may not be of interest to male readers. Women may be more interested in the health aspects of traditional foods. For men, taste and pleasure may be more appealing,”** **McKevith** says by way of illustration.





Talking



One of the biggest talking points at the workshop was the consequences of tapping into gender differences when communicating life sciences. Some members of the audience feared that gender-targeted communications could end up entrenching certain gender stereotypes.

“It’s not enough to have good communicators. We need people who will challenge social stereotypes,” said one member of the audience.

Members of the panel acknowledged the risk, but pointed out that this should not make us shy away from addressing – when they arise – the very real issues faced by the two sexes.

“We are aping the culture we’re in, so sometimes we may be guilty of perpetuating gender stereotypes,” admitted **Richard Forshaw**, a social marketing consultant. **“Of course, we try to change attitudes as much as possible, but within a framework people can understand. But all we can do is hope to chip away at the sides of existing prejudices. It might be a challenge for the public health world to borrow from the media, which so often gets it wrong. But when it comes to certain health messages that are not getting through to vulnerable groups, doing nothing could be worse than playing up to some stereotypes.”**

“Let’s not get carried away,” cautioned **David Passig** of Israel’s Bar-Ilan University. **“We’ve done a lot in the last two to three decades to bridge the gender gap.”**

Regarding obesity, there was concern that the increasing public health alarm and the media’s obsession with thinness could lead to the further stigmatisation of overweight people. **“If it were only an issue of body shape – i.e. are you a little rounder than normal – then it is not a problem. But there are serious health consequences of being significantly overweight and not getting enough exercise – and this needs to be communicated,”** said **Alan White** of Leeds Metropolitan University (UK).

As noted earlier, **Peggy Maguire** of the European Institute for Women’s Health said: **“I appreciate that there is a lot of hysteria in the media, but we cannot ignore the health implications of obesity. There is a risk that our children might die younger than we do... Gender mainstreaming should not be an excuse for ignoring the differences between men and women.”**

EDUCATIONAL EXPERIENCES

This may even have implications on how to educate the young. The question of whether or not to divide science classes along gender lines or to put boys and girls in separate classrooms altogether is the subject of heated debate.

Placing boys and girls in different classrooms **“does not necessarily enhance the scientific performance of girls,”** noted **Helene Sørensen**. However, putting them in different groups can have positive effects. **“In Denmark, when girls and boys were put into different groups, girls took more responsibility for their scientific work and this boosted their scientific performance.”**

Research in the United States complements this finding. A longitudinal study at Wellesley College found that women in all-women colleges majored in science and mathematics fields in larger proportions than in co-educational institutions. It also found that proportionately more of these women pursued scientific careers.

shop

BRINGING COMMUNICATION TO LIFE

The most effective approaches to communicating life sciences were also topics for keen discussion. **“It is important to consider how research should be managed and communicated,”** noted one participant. **“The research process and research communications will increasingly depend on team work,”** speculated another.

“We need food scientists, marketers, sociologists and other stakeholders to come together and formulate a communications strategy,” volunteered another member of the audience.

Communications should be timely and well thought out. **“We need to think closely about why we are communicating. It’s useful to identify what our front-end objectives are,”** said **Edna Einsiedel** of the University of Calgary (CA).

“There’s sometimes too much of a rush to disseminate. If scientists can’t agree among themselves, how can we transmit a message clearly?” asked **White**.

Nevertheless, this represents progress, since it was not so long ago when scientists were reluctant about communicating. **“A few years ago, there was a lot of resistance in the scientific community towards the obligation to communication,”** recalled **Johannes Klumpers** of the Women and Science Unit at the Research DG.

“In future research programmes, we need to investigate how media use gender and how they communicate health issues,” suggested a member of the audience.

Ensuring research communication is gender-sensitive requires more female subjects to be involved in the research itself, pointed out one participant. **“In ethical reviews of clinical trials of new pharmaceutical products, projects are not always asked if there is an equitable inclusion of men and women test subjects.”**

A QUESTION OF TRUST

Communication is not much good if the source of the message is distrusted was one point made by several participants. **“Trust is key to a good communication strategy because if the messenger is not trusted, then people will not trust the message,”** said one participant who pointed out that the biotechnology-related Eurobarometer surveys consistently showed that Europeans trust independent NGOs the most to tell them the truth about new technologies. Medical professionals and scientists also scored well but industry and politicians score badly.

“NGOs are most trusted because they are seen to be rooted in society and close to it. They are even viewed as being members of society,” interpreted another member of the audience.

“Science communication is a two-way process. The more scientists listen to society, the more society will listen to scientists,” remarked another participant.





Concluding remarks

The issues discussed during the ‘Talking life sciences to both sexes’ workshop are very good examples of what is meant by the ‘gender dimension of research’. Scientific discussions frequently overlook gender aspects. This is sometimes because perspectives are modelled around the male ‘norm’. At other times, it may be informed by ignorance and a lack of knowledge.

Gender aspects clearly go beyond simply counting the number women and men in a particular research field, and scientific discussions, such as the ones which took place during the workshop, contribute to increasing scientific understanding. Both men and women will benefit when sex and gender differences are properly taken into account, as clearly demonstrated by the examples given in the women’s and men’s health presentations.

The question of whether we need to communicate differently to men and women has been answered in different ways. One answer was: “not necessarily”. The functions of the human brain functions have such great variability that individual differences are larger than differences between women and men. Another answer is “yes”. Taking into account the different life situations of women and men when, for example, communicating public health issues or prevention, certainly appears to be the way forward to improving the message.

To have these aspects included in the gender (and communication) plans of large research projects definitely holds promise of enabling life scientists to reach out to the public – both men and women – more effectively. It will also ensure that research will be specifically targeted at the sometimes divergent needs of each gender, whenever this differentiation is necessary and useful.

Speakers' biographies

Suzanne Gage Brainard

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Suzanne G. Brainard, PhD is Executive Director of the Center for Workforce Development at the University of Washington. She is an Affiliate Professor in Technical Communication in the College of Engineering and in the Department of Women Studies in the College of Arts and Sciences. She is co-founder of the Women in Engineering Programs and Advocates Network, past-chair of the Committee on Equal Opportunity in Science and Engineering, and served on the National Academy of Engineering Committee on Diversifying the Engineering Workforce and the AAAS National Mentoring Committee. She is a recipient of the 2001 Maria Mitchell Women in Science Award.

Her research includes programme evaluation, mentoring, diversity and climate studies in engineering and science. More specifically, she has focused on longitudinal studies examining retention and advancement in engineering and science and the workforce, institutional climate studies at the University of Washington, and national climate surveys in engineering and science. She also evaluates intervention programmes on increasing the participation, retention and advancement of women and minorities in these subjects. Dr Brainard is currently co-directing the 'Global Alliance in Science and Engineering to Diversify the Workforce' international initiative.

Edna Einsiedel

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Edna Einsiedel is University Professor and Professor of Communication Studies at Canada's University of Calgary. Her research has focused on the social issues around biotechnology and genomics, examining social representations among various publics and stakeholders, and public participation mechanisms for technology assessment. She has produced policy papers for various Canadian federal ministries on publics and biotechnology applications, for the FAO, and is a member of the Canadian Commission for UNESCO committee on bioethics. Edna serves as a co-leader of an international collaborative project on Translating Genomics and Public Health, funded primarily by Genome Canada, running from 2006 to 2009. She also sits on the board of governors for the Canadian Academies of Science and is currently the editor of the journal *Public Understanding of Science*.

Richard Forshaw

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Richard Forshaw spent five years working in marketing and public relations for the UK National Health Service, having worked for seven years as a journalist and writer. While with the NHS, he ran a number of successful social marketing campaigns which helped meet corporate objectives and delivered a significant return on investment. At Dr Foster, he is responsible for overseeing the implementation of all social marketing campaigns commissioned by the public and voluntary sector. He lives in Brighton (UK) with his partner and three-year-old daughter.

Hans Peter Jensen

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Hans Peter Jensen received his MSc in chemistry from the University of Copenhagen and his doctorate degree from Chalmers University of Technology in Gothenburg, Sweden. He holds honorary doctorates from Shenandoah University in Winchester, USA, Helsinki University of Technology, Finland, and State University of New York, USA.

His scientific interest lies in the use of phase modulation spectroscopy (polarised light) in molecular and electronic structures of inorganic complex compounds.

As rector at the Technical University of Denmark, he was very involved in science and education policies. He was Chairman of the UNESCO International Committee on Engineering Education and on the Higher Education and Research Committee under the Council of Europe. He was also a member of the Danish National Science Research Council, and the Collaborative Research Grants Programme Panel under NATO Scientific Affairs Division.

He is now Deputy Director at the Danish Institute for Food and Veterinary Research and the Danish member of both the Board of Governors for the EU’s Joint Research Centre and the European Food Safety Authority’s Advisory Forum. He is also on an EU scientific panel for food quality and safety and the Academic Advisory Panel for the Asian Institute of Technology in Bangkok, Thailand.

Peggy Maguire

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Peggy is a political scientist and graduate from Trinity College Dublin. She is Director General of the European Institute of Women’s Health (EIWH) and recently has been working at European and international level to create awareness of the need for gender mainstreaming in health policy at all levels:

- 1996 – edited the ‘Women in Europe – Towards Healthy Ageing’ report
- 1998 – worked with the UN/WHO expert group on the document ‘Women and Health Mainstreaming the Gender Perspective into the Health Sector’
- 2000, the EIWH produced a document aimed at the EU – ‘Promoting Gender Equity In EU Public Health’.

During this time, together with experts from the EIWH, Peggy worked with the European Commission’s Research DG’s Women in Science Unit to prepare the text on gender for the Sixth Framework Programme’s guide for applicants and evaluators.

Since 2000, Peggy has lobbied European Parliament members on the need for a gender dimension to be included in the EU Public Health Programme. With support from several MEPs, the EIWH amendments on gender were included in the Trakatellis Report, and voted through the Parliament.

Peggy has also been a member of the EC’s EAG on ageing and disability, and of the WHO expert group on gender mainstreaming.

Brigid McKeivith

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Brigid McKeivith obtained a degree (Bachelor of Consumer and Applied Sciences) in human nutrition and a postgraduate diploma in dietetics from the University of Otago, Dunedin, New Zealand. She is a registered dietician both in New Zealand and in the UK, and a Registered Public Health Nutritionist. She has had experience in communicating to groups of health professionals, students and members of the public, as well as one-to-one consultations.

Prior to joining the British Nutrition Foundation, Brigid was the Company Dietician at Yakult UK and was involved in a number of different activities including employee training, conference organisation and a key member in organising 'Gut Week'.

Since 2002, Brigid has worked as a nutrition scientist for the British Nutrition Foundation where her work focuses primarily on EU food law, in particular health claims for food and nutrition labelling. Another aspect of her job is responding to general enquiries from the media and she appears regularly on TV and radio. Within the EuroFIR project, Brigid is leading on gender activities and is also working on project communications and information dissemination.

David Passig

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Dr David Passig is a futurist, lecturer and consultant who specialises in technological, social and educational futures. David holds a PhD in Future Studies from the University of Minnesota, Minneapolis, USA. He is a faculty member at the Bar-Ilan University, Israel, where he teaches systems theories, future methodologies, technological, social and educational futures at the Graduate School of Education. He is head of the Graduate Program of Communication Technologies as well as of the Virtual Reality Lab. David has been a consultant for many years for numerous institutes and companies, including industrial, financial, defence and high-tech entities in Israel, Western Europe and North America. He lectures in colleges, universities, professional associations, government and financial entities.

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Helene Sørensen is an associate professor at the Danish University of Education in Copenhagen, where she is Head of the Research Group for Mathematics and Science Education, as well as Director of the Research Group for Science Education at the Department of Curriculum Studies. Her PhD from the Royal Danish School of Educational Studies was followed by a research fellowship from the Danish Research Council for the Humanities and assistant and associate professor positions at the Royal Danish School of Educational Studies.

She has held various memberships of academic committees, such as the JRST's award committee, the executive committee for the European Science Research Association and the planning committee for the ESERA 2007 conference. For the past 15 years she has also been part of the presidium for Experimentarium in Copenhagen.

Her research projects include: 'Out of school learning together with Experimentarium and Gentofte Kommune'; 'Out of school learning together with Experimentarium'; 'Rose – the relevance of Science Education'; 'PISA, the international science study'; 'Out of school learning and the Danish Science Centre'; The Relationship between Changes in Teachers' Self-efficacy Beliefs and the Science Teaching Environment of Danish First-Year Elementary Teachers.

Catherine Vidal

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Catherine Vidal is a French neurobiologist and research director at the Institut Pasteur in Paris. She holds a PhD and a Doctorat d'État in neurophysiology (University of Paris 6). Her main research work has been concerned with the physiology of pain, the role of the cerebral cortex in memory, and the infection of the brain with the AIDS virus. Her current research relates to the neuropathology of prion diseases.

Besides basic research, she is also involved in communicating the science of brain research to the media. She is the author of a large number of publications including books such as *Cerveau, sexe et pouvoir* (2005, pub. Belin) and *Féminin-Masculin: mythes et idéologie* (2006, pub. Belin).

Alan White

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Alan White is Professor of Men's Health at Leeds Metropolitan University and is Chair of the Board of Trustees of the Men's Health Forum (England). He is on the executive of the European Men's Health Forum and the International Men's Health Society, and was a founder member of the Kings Fund Gender and Health Partnership.

His research focuses mainly on men's health beliefs and behaviour, and he is currently exploring alternative ways of providing services to men and boys that more closely target their needs, through the evaluation of the £1m 'Health of Men' initiative in Bradford. He has undertaken numerous research projects into men's health issues, including the 'Scoping Study on Men's Health' for the Department of Health, and studies into men's experiences of chest pain, radiotherapy following prostate cancer, and Type II diabetes. Recently, he completed a report on the state of men's health across 17 European countries, which was launched at the European Parliament in July 2003. Alan is currently undertaking an analysis of mortality data among young men for 44 countries.

European Commission

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