GENDERED RESEARCH AND INNOVATION:
INTEGRATING SEX AND GENDER ANALYSIS INTO THE RESEARCH PROCESS
Acknowledgements

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About LERU

LERU was founded in 2002 as an association of research-intensive universities sharing the values of high-quality teaching in an environment of internationally competitive research. The League is committed to: education through an awareness of the frontiers of human understanding; the creation of new knowledge through basic research, which is the ultimate source of innovation in society; the promotion of research across a broad front, which creates a unique capacity to recon-figure activities in response to new opportunities and problems. The purpose of the League is to advocate these values, to influence policy in Europe and to develop best practice through mutual exchange of experience.

Executive summary

LERU universities aim to significantly contribute to creating new knowledge and to finding solutions to global challenges, such as climate change, security and public health. LERU universities realise that in order to do so effectively, they need to take into account potential sex and gender differences with respect to the way research is designed, carried out and implemented. Without considering sex and gender analysis in research and innovation (GRI), the scope, impact and utility of research results may not be equally valid for both men and women.

For example, research shows that women tend to present different heart attack symptoms than men. This knowledge was absent until recently, simply because most research had been carried out on men only and the assumption was made that there were no significant differences between the sexes. Producing research results that apply equally to men and women has the potential to improve lives and to save money.

It is widely acknowledged that not all research questions and projects, such as certain fields of theoretical mathematics, have a gender dimension. Yet, recognising the wide-ranging importance of gender analysis, the European Commission designated over 130 subfields where data show that gender analysis can benefit research—these range from computer hardware and architecture to nanotechnology, oceanography, geosciences, organic chemistry, aeronautics, space medicine, biodiversity, ecology, biophysics, among others. It is, thus, crucially important to consider GRI factors systematically throughout the research process before they are ruled out as non-significant. Considering GRI encompasses the entire research cycle: from making decisions about priorities for research spending, through deciding on the research focus, methodology and data collection, to analysing and reporting data, and even to disseminating and applying the results. Asking GRI questions, and integrating them in research where appropriate, will contribute not only to individual researchers’ and to LERU universities’ commitment to excellent research, but also to responsible research and innovation to the benefit of society at large.

This paper outlines research areas with a clear need for GRI and explains the role of Social Sciences and Humanities research in GRI. It gives concrete examples of research projects that include a GRI dimension (found in boxes in the text with further examples in the appendix) and looks at established or emerging practice at LERU universities and in other organisations.

LERU universities aspire to lead by example. Besides providing examples of practice at LERU universities, we formulate recommendations for an action-oriented GRI approach, which LERU and other universities can take. For example, the university leadership should raise awareness of the importance of GRI within the institution; provide tools for researchers to understand and apply GRI methods in their research fields; and bring this important topic to the attention of policy makers.

Next to our recommendations for universities, we suggest that governments should include a GRI dimension in research policies and programmes, help raise awareness and provide information and training on this topic. They should include a GRI dimension in funding calls, where data show sex or gender to be a significant factor. Research funders should also adopt policies to promote GRI.

The European Commission, in its ERA policy framework and in its Horizon 2020 funding programme, emphasises the importance of integrating gender/sex analysis in research and innovation (ERANet) content. The approach taken at the EU level is a model that can serve to inspire national and local approaches; it should be continued and strengthened.

Journals should set standards for the inclusion of information on GRI, developing clear guidelines for authors on how to include sex and gender analysis in research and research reporting.

LERU universities should take a lead in national and international discussions with governments, funding agencies, journals and other actors to emphasise the importance of support for GRI and to ensure that sufficient funds are allocated. A comprehensive, strategic and partnership approach is vital to ensure that the momentum is not lost and that awareness of the importance of GRI as a contributor to responsible research and innovation keeps growing.
List of recommendations

To universities:

1. Advocate widely for gender/sex to be taken into account in research funding, design, implementation and application of research results, where applicable.
2. Create awareness of the importance of GRI throughout the university.
3. Provide tools for researchers to understand and apply GRI methods in their research fields, for instance through training, workshops, seminars and research projects.
4. Emphasise that funding or publication opportunities will be missed if GRI methods are not applied.
5. Consider allocating internal funds to stimulate GRI and/or provide incentives for researchers to work on GRI proposals and projects, in particular in multidisciplinary collaboration.
6. Identify gender experts among the university’s ranks of researchers. Encourage them to act as reviewers on the panels and committees that the EU and national funding agencies use to assess research proposals, and acknowledge their work.
7. Inform the university’s research support services about GRI and make sure they are aware of the requirements in H2020. Training of researchers and of grants offices can be provided by expert internal colleagues, or, if not available, by colleagues from elsewhere.
8. Promote integrating the outcomes of GRI into the teaching curriculum, to better prepare the leaders of tomorrow for dealing with societal challenges.
9. Inform, as necessary, national (and other) governments as well as business leaders and others about the importance of including GRI in the national research and innovation agenda.

To governments:

10. Include a GRI dimension in research policies and programmes.
11. Help raise awareness, provide information and training for researchers and others to consider whether sex and/or gender may be important factors and, if so, adopt methodologies and analyses accordingly.
12. Be aware of the potential need for a GRI approach when funding national granting agencies, universities and projects of national or local importance, and potentially use a gender-budgeting approach to define research/funding priorities.

To funders:

13. Adopt policies to promote GRI.
14. Create incentives for researchers to consider GRI methods.
15. Model national policies after the approach taken by the EC in the H2020 programme.
16. Collect and publicise research that has successfully integrated sex and gender perspectives.
17. At the European level, continue and strengthen the H2020 gender and, specifically, GRI policies.

To peer-reviewed journals:

18. Set standards for the inclusion of information on the gender and/or sex of subjects in humans, animals, cells or cell lines, especially but not exclusively in the Science, Technology, Engineering and Mathematics (STEM) fields.
19. Develop clear guidelines for authors on how to include sex and gender analysis in research and research reporting.
20. Require, especially in areas where there is reason to suspect that male and female animal or human subjects may differ in their response to a situation or intervention, that a study answers questions for each sex separately.

Introduction

1. Europe’s innovative power and vitality depend on its research and innovation. Research and innovation drive economic progress, prosperity and the potential to combat many of the grand societal challenges. LERU universities aim for excellence in research and competitiveness in the global research arena. In order to achieve these goals, we need simultaneously to ensure the right research topics are pursued and to attract the best and brightest minds. On the whole, however, female talent is currently still underutilised, and sex and gender are not systematically considered as potential factors in defining research processes.
2. The present paper focuses specifically on sex and gender.
3. The LERU (2012) paper, Women, research and universities: excellence without gender bias, examined four well-known, data-driven factors that contribute to gender inequality in European universities, and which present challenges to LERU and research-intensive universities around the world. Firstly, academia in Europe is still losing a considerable amount of its female research capacity. Secondly, women progressing in an academic career face unconscious bias against their qualifications as excellent researchers. Thirdly, there are financial considerations such as gender pay gaps, which manifest themselves in academia as they do in other labour sectors. Fourthly, the paper argued that the lack of an appropriate gender dimension in research design, implementation and organisation can result in serious flaws and potentially harmful effects, thus limiting scientific excellence, creativity and benefits to society.

4. GRI is about the “processes that integrate sex and gender analysis into all phases of basic and applied research to assure excellence in research” (EC, 2013a). These phases include setting research priorities, making funding decisions, establishing project objectives, developing methodologies, gathering and analysing data, evaluating results and developing and transferring ideas to market and drafting policies. When applying sex and gender methods and analyses, researchers ask themselves whether the outcomes of their studies may differ when a distinction is made between male and female subjects, either in terms of gender or in terms of sex, in any phase of the research. A similar case can be made for paying specific attention in research and innovation to race and ethnicity, age, sexual orientation and a number of other factors that define a person as part or not part of a ‘group’.

5. A pivotal initiative in bringing out the importance of GRI has been the Stanford University project ‘Gendered Innovations’ led by Prof. Londa Schiebinger and supported by the European Commission and the US National Science Foundation (EC, 2013a). Researchers involved in the project have contributed significantly to the GenSET Consensus Report (GenSET, 2010) as well as to the 2011 United Nations resolutions related to gender, science and technology (UN, 2011). According to Schiebinger, “gendered innovations is about stimulating gender-responsible science and technology, thereby enhancing the quality of life for both women and men worldwide”. Next to “fixing the number of women” participating in research and “fixing the institutions” to effect structural change for gender equality in research careers, Schiebinger argues that it is equally important to “fix the knowledge”, integrating sex and gender analysis into research content and process. Adopting a “gendered innovations” (i.e. GRI) perspective can benefit excellence in research, policy and practice in many fields, from health and medicine, to engineering, the social sciences, and more. It has the proven potential to save lives and money (Roth et al., 2014).

6. This paper is primarily aimed at LERU and other universities, to explain how GRI goes hand-in-hand with their pursuit of excellence in research. It gives examples of the importance of sex and gender ana-
GRI in specific research areas

8. In this section we describe how a GRI approach is relevant in two fields of research (health and medicine, and transport), where a focus on sex and gender may have important consequences for the validity and applicability of the study results. We describe the potentially negative effects of failing to take sex and gender into account, as well as the positive effects of including them. More examples from these and other fields may be found in the Gendered Innovations report (EC, 2012a) and on the Gendered Innovations website. A selection of examples from LERU universities (and a few from the Gendered Innovations project), illustrating the scope of GRI approaches in different research areas, appear in separate boxes in the body of the paper; additional ones are collected in an appendix at the end of the paper.

9. Some of the most striking examples of the effects of the failure to take sex and gender into account can be found in health and medicine. Biological sex differences and behavioural gender differences - and the interaction between the two - can produce very different health outcomes for men and women. Sex differences can be pertinent to both humans and lab animals and can have consequences even at the level of cells and cell lines (cf. example 1 on fruitflies). Gender differences are related to socio-cultural factors, and can include behaviours (e.g. help-seeking behaviours), lifestyle factors (e.g. drinking, smoking and nutritional habits) and socio-economic factors (e.g. poverty and access to health care).

Health and Medicine

10. Interaction often occurs between sex- and gender-related factors and it can be hard to distinguish between the two. For example, gender differences with respect to nutrition or exercise can influence hormonal and physiological processes that in turn can influence the likelihood of disease. Sex differences can influence health care and help-seeking behaviours. It can, for example, be easier for women to seek medical help in other areas after they have experienced receiving care in pregnancy, or women’s willingness to engage in preventive behaviours such as stopping smoking can be greater than men’s if women are motivated during pregnancy.

11. In the last decades, research has shown differences between men and women in health and health outcomes. Many diseases have been identified that affect women more heavily than men, such as cancer, rheumatoid arthritis and osteoporosis. It is increasingly recognised that women and men may manifest and experience diseases differently, respond differently to treatment, metabolise drugs differently and respond differently to devices (cf. the case study on heart disease on p.8). Some male/female differences can occur as early as during pregnancy and birth. Female infants, for instance, are more likely than males to contract HIV perinatally, regardless of weight and mother’s viral load, while male infants are more likely to be infected through breastfeeding. The differences between the sexes can be found at a very fundamental level, namely even in cells, cell lines and cell regulatory practices (Mittelstrass, 2013).

12. Remarkably little effort, however, has been made into rigorously investigating and reporting the underlying sex and gender differences. For too long, medical research has not systematically focused on differences in disease prevalence, progression, clinical outcomes and responses to treatment between women and men. Too often it has been, and still may be, assumed that men can be used as the norm group for the entire population. As a result, women (and people who do not fit in the binary male-female scheme) continue to be underrepresented in clinical trials and are frequently subject to medical and health care practices based on data from a predominantly male population (Wizeman, 2012). Treatment guidelines are predominantly based on data on men (Wizeman, 2012). It is crucial that GRI-informed findings are translated into initiatives to bring sex differences in health to the public’s attention, as is illustrated by example 2 on heart and cardiovascular disease.

Example 1: Gender-specific aggressive behaviour in fruitflies (KU Leuven)

Aggression is a social behaviour present throughout the animal kingdom. It is important in the acquisition of food, mates and territory, defence against predators and for establishing social hierarchy. Aggression is genetically complex and it requires the integration of different types of sensory and physiological information to yield a context-appropriate response. Sex-specific differences in aggression in the fruitfly Drosophila melanogaster have been described and depend at least in part on gender-specific differences in neural circuitry. The analysis of the genetic networks that regulate intermale aggression will facilitate the identification of the role of these networks in interfemale aggression and of genes that contribute to gender-specific aggression.


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Example 2: Research on heart failure and cardiovascular disease in women and national support initiatives (Utrecht University)

The University Medical Center Utrecht (UMCU) contributes to large research consortia focused on sex differences in cardiovascular disease. The Queen of Hearts consortium (www.queen-of-hearts.eu), focuses on sex-specific biomarkers for heart failure, and the CREW consortium (Cardiovascular Healthy Ageing for Women) focuses on risk prediction of cardiovascular disease in women. Both are funded by the Dutch Heart Foundation and the main coordinators are appointed in the UMCU. Special topics, such as “Sex matters to the heart,” have appeared in Althoerocrin, and other journals. Also, academic expertise and support are provided to Women Inc (www.womeninc.nl), a national initiative which brings sex differences in health to the public’s attention.


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Case study: heart disease in women

Heart diseases, such as coronary artery disease, myocardial infarction and heart failure, often have different pathophysiological and different manifestations in men and women. The differences depend on the differential effects of sex hormones and sex chromosomes as well as on gender differences in patients’ life-style and health-seeking behaviours and differences in the management of the disease for female and male patients on the doctors’ side.

Myocardial infarction (MI) has long been believed to be primarily a disease of men, to a large degree because research was primarily carried out in men. It has a slightly lower prevalence in women than men, but because women on average live longer than men, the numbers of men and women suffering from MI are roughly the same (Anand et al., 2008). A large number of recent studies found that men and women present with different symptoms, which can influence diagnosis and treatment. Men are more likely to exhibit symptoms of chest pain, while women more frequently exhibit nausea, general weakness, sweating and a larger variety of symptoms (Regitz-Zagrosek, 2012). Men and their doctors are more likely to attribute chest pain to heart disease than women and their doctors to attribute their symptoms to heart disease. As a result, the so-called door-to-needle time in women who are admitted and subsequently diagnosed, is significantly longer than that of men (Dey et al., 2009).

An extra complicating factor is that MI is traditionally often diagnosed by angiogramme, showing obstructed arteries. Recent studies have found that women with an MI, even when they exhibit chest pain, more often than men do not have closed-off arteries and do not show abnormalities on the scan. In women, ischaemic heart disease rather than obstructive disease may better describe the underlying issue (Shaw et al., 2009). As a result, many women with MI have been and still are being underdiagnosed, misdiagnosed and under- or mistreated. Research in the last decade has shown that women suffer from MI on average 10 years later than men, are more likely than men to report emotional rather than physical stress as the trigger and more often than men have had MI without chest pain (Komed et al., 2010; Regitz-Zagrosek, 2012). Women are less likely to receive thrombolytic therapy, aspirin and beta-blockers when suffering from an acute MI. Even today, mortality after MI is higher for women than for men, especially in younger age (Rosengren et al., 2001; Vaccarino et al., 2002; Vaccarino et al., 1999). The recent significant decrease in mortality due to better recognition and treat- ment has occurred primarily in men, not women (Lundblad et al., 2008; Vaccarino, 2009).

Example 3: Female and pregnant crash test dummies lead to better vehicle safety standards (Gendered Innovations Project)

Although crash test dummies were developed as early as 1949, female crash test dummies only appeared in the late 1980s and preg- nant test dummies did not become a research priority until the 1990s. Conventional seatbelts do not fit pregnant women properly, and motor vehicle crashes are the leading cause of fetal death related to maternal trauma. Today, state-of-the-art virtual pregnant crash test dummies, including a 36-week fetus (developed by Volvo, for example), allow researchers to model the effects of high-speed impact on the womb, placenta, and fetus.

Analyzing sex has led to the development of pregnant crash dummies and computer simulations. Ultimately, it has given rise to more inclusive standards for crash test dummies and greater vehicle safety overall.

Importantly, it should be remembered that from the start, devices should be engineered for safety in broad populations. Taking both women and men as the norm may expand the quality and creativity of scientific and technological innovation.

Example 4: Gendered effects in the labour market (University of Zurich)

In many countries, highly skilled women also have a higher risk of involuntary part-time employment – generally explained by the gendered nature of family and care responsibilities in European societies – increases the probability of women being labour market outsiders. The study reveals that highly skilled women have a higher risk of involuntarily part-time employment than the general population in all but three of the 13 analysed countries. Moreover, in many countries, highly skilled women also have a higher risk of temporary employment (ranging between 14% and 31%).

The role of Social Sciences and Humanities (SSH) in GRI

14. Women are less likely than men to own cars, and are more likely to use public transport, walk, ride bikes, and take children to childcare and school in cities and metropolitan areas. They travel shorter distances than men and make more frequent trips. They have different safety concerns and restrict their time of travel because of perceived risks. Women are overrepresented in groups that have specific transport needs that are often not fully met, such as older people, people with disabilities and people with caring and parenting responsibilities. This relative disadvantage has affected women’s job opportunities, economic independence and wellbeing (cf. GenderSTE project http://www.genderste.eu/transports.html). Yet, women are underrepresented in decision-making processes regarding infrastructure planning, and a lack of gender analysis has resulted in underreporting of the gender dimension of transport (Sánchez de Madraiga, 2013).

15. Three times more pedestrians than motorists get injured due to slippery/wet roads in winter, with the cost of medical care and lost of work days rising to four times as high as the cost of keeping the roads free from ice and snow. Gender-sensitive transport research can lead to innovative urban transport and planning policies, as demonstrated by a gender-equal snow clearing project in Sweden (Regitz-Zagrosek, 2012). By reversing snow clearing priorities (i.e. starting with pavements and bicycle paths, then roads passing schools, child-care facilities and employers with female-dominated workforces), more people got to work and school faster and were less likely to have accidents. Karlsko- ga was the first city to implement this policy, and more cities in Sweden are now adopting it.

25. Analysing sex has led to the development of preg- nant crash test dummies and computer simulations (see example 3), which has not only saved the lives of pregnant women and their unborn babies, but has resulted in greater vehicle safety overall.
as their key role in food production, preparation, consumption, and in educating children about these foods and culture (especially looking at the historical evolution of these issues). Only through a better understanding of women’s needs, cultural position, local traditions, and educational pathways can useful policies be implemented to meet medium and long term goals.

In the societal change ‘Climate action, environment, resource efficiency and raw materials’ it is important to study how, for example, climate risks and impacts are perceived by different segments of society and across regions and cultures. Example 5 makes the point that factors intersecting with gender—including income, age, travel patterns, geographic location, and environmental attitudes—need to be taken into consideration to contribute to a better understanding of climate impacts and responses to mitigation measures.

Integrating a gender perspective in different phases of the research process

10. As we have seen from the examples above, engaging in GRI includes addressing potential sex and gender differences in each stage of the research cycle: from making decisions about priorities for research spending; through deciding on the research focus, methodology and data collection; to analysing and reporting on data; and even disseminating and applying the results.

11. The potential for gender inequality exists right from the outset of the research cycle. Funds are, by definition, limited and spending in one area will inevitably de-prioritise other areas. Funding priorities depend on many different societal and academic processes and influences: public opinion, unconscious or conscious assumptions, the political need to invest in certain social or medical problems, the influence of powerful vested interests (e.g. industry, pharmaceutical companies and the military), the status of different academic fields, among others. If, for instance, funding is aimed at investigating the potential health effects of particular types of employment and most of the employees in that sector are women, the health effects of men’s employment may be relatively under-researched, thus disadvantaging men.

12. In framing the research question, lack of attention to the potential effects of sex or gender differences may limit the scope of the study. If research questions are framed in a way that wrongly assumes no sex differences, or that the research is ‘gender-neutral’, opportunities for innovation may be missed, outcomes may disadvantage one sex over the other, or mistakes that limit the validity of the conclusions made, as, for example, in the case study of heart disease. Example 6 on sex-specific effects of maternal smoking and example 7 on sex differences in bird song also illustrate this. Similarly, if stereotypical beliefs exist about gender roles, innovations may be ‘gender-specific’ in ways that do not benefit all users. Researchers should be aware of potential gender and sex differences in their specific field, should consult widely, and encourage participation/inclusion of different perspectives in research design. They should determine whether any differential effects will arise in the development phase of their research question.

13. Lastly, in the reporting phase of the study, the differences in outcomes based on sex and the potential interaction between them should be described. Sex-disaggregated data should be published. If there are no such data or no differential outcomes, this also needs to be clearly mentioned. Often, no mention is made of potential sex or gender differences, thus making it unclear whether they do not exist, or have simply not been studied.

Related issues: gender balance of teams and non-evidence-based assumptions

21. In the analysis phase of a study, sex should be taken into account, where applicable. Sex is an important variable in most biomedical research, fundamental and applied, animal and human, and in product and systems design. Example 8 on machine translation systems shows how a GRI approach is important in computer science (and, importantly, that product design needs to incorporate a gender awareness from the very beginning). Including both sexes in the study and explicitly analysing sex-disaggregated outcomes is a key element. Gender analysis should be used when cultural attitudes, needs and behaviours are important factors that may determine the study outcomes. Sex and gender can sometimes interact, most notably in biomedical research, which can demand complex analyses. Other factors may interact with sex or with gender, or both, such as socio-economic status, age or environment, and may diminish or amplify sex and/or gender differences. Researchers need to consider and measure relevant factors and use them appropriately in the analysis.

22. No studies have yet been undertaken to determine whether there is a relationship between the gender balance of a research team and that team’s engagement in gender-sensitive (GRI) research. However, anecdotal evidence suggests that more female than male researchers are gender experts, and gender training and expertise are mostly provided by female researchers, in research general and in the STEM (Science, Technology, Engineering, Math) fields in particular. There does appear to be evidence that a gender focus in STEM fields attracts young female students and scientists, just as crossdisciplinary and multidisciplinary approaches in education and research appear to do so, although more evidence is needed. Whether a relationship between GRI and gender balance in teams exists is an area which requires further study.

23. It is important that sex and gender differences are researched and reported thoroughly for two main

Example 5: Change in nurses’ attitudes and practice to menopausal care in the UK; 2001

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Example 6: Effects of pregnant women’s smoking on baby boys and girls (University of Edinburgh)

The liver secretes numerous proteins into the blood stream. It is the main site in the body where chemicals are processed and detoxified. Maternal smoking while the baby is in the womb is known to associate with low birth weight and increased cardiovascular disease risk in children. Importantly, the effects of maternal smoking have been shown to be different in boys and girls.

Specifically, exposure in the womb to cigarette chemicals induces sex-specific disruption of n-carbon metabolism and DNA methylation in the human fetal liver. Research using human fetal livers from the second trimester has shown that one mechanism may be through effects on methyl donor availability, n-carbon metabolism and DNA methylation at key target genes. These effects are sex-specific and maternal smoking actually reduces the sex differences at a number of parameters which show sexual dimorphism.

Communications 5, 3379.

This integrated data set has already yielded surprising novel insights regarding the evolution of sex differences in vocal behaviour: traditionally been exclusively studied in male songbirds. Yet, factors in the environment during early development (such as family cognitive neurosciences. Given the often pronounced sex differences in song production, vocal learning and its neural substrate has

Songbirds are the closest animal analogue to human speech acquisition and the foremost animal model for vocal learning in the

16. European research policy has placed increasing emphasis on gender equality and integrating gender into research in recent years, in particular as one of the priorities for action in the development of the European Research Area (ERA), a concept which was first introduced by the European Commission in 2000. ERA is strongly convinced of the value of the ERA and its aim to create “a unified research area open to the world based on the Internal Market, in which researchers, scientific knowledge and technology circulate freely and through which the Union and its Member States strengthen their scientific and technological bases, their competitiveness and their capacity to collectively address grand challenges”, as defined by the European Commission (IEC, 2012), and of the value of its inclusion in the Treaty on the Functioning of the European Union (TFEU, Title XIX, Article 179).

Since 2012, when the European Commission published a Communication on ERA, the ERA concept has become a more visible policy instrument for the EC with more tangible and concrete actions, centred on five ERA priorities. These include, next to gender equality and mainstreaming in research, an open labour market for researchers, optimal circulation of knowledge, effective national research systems and transnational cooperation. A sixth dimension, internationalisation with a global outlook, has since been added.

At the same time the ERA Communication was published in 2012, LERU signed a Memorandum of Understanding (MoU) with the EC in the spirit of the proposed partnership approach to achieve real progress on a number of priorities. LERU’s MoU identified twelve concrete topics for action within the ERA network, one of which included gender equality. LERU has since reported on the actions undertaken (LERU, 2014b) and has published a briefing paper (LERU 2014c) on the ERA and other priorities for the European Commission and Parliament that were installed following the elections in May 2014. For LERU a smooth functioning ERA is important, and progress on gender-equality issues is an essential element.

In a report commissioned by the EC, an ERA expert group called for integrating the gender dimension into research and innovation and into higher education curricula “in order to ensure research quality, long-term sustainability of research and innovation findings, and social robustness of research, as well as in avoiding economic losses” (EC, 2013c, p.48). Yet, progress is slow and difficult to measure. The 2014 ERA Progress Report, for example, notes that the lack of gender analysis in research programmes remains a challenge (EC, 2014a, p.6). An ERA survey reveals that ten EU member states reported having provisions to include gender analysis in research programmes (EC, 2015b, p.33) and only a few countries fund it. Comparatively more research performing organisations (RPOs) include a gender dimension in research content, although figures vary significantly, from >70% of RPOs in Austria and Estonia to (almost) none in other countries, such as Malta, Hungary and Greece.

The European Commission has introduced significant changes in Horizon 2020, its major research funding programme for 2014-2020. It has developed three objectives on gender equality:

- Fostering gender balance in Horizon 2020 research teams, in order to address the gaps in participation of women in the Workprogramme Horizon 2020’s projects;
- Ensuring gender balance in decision-making, in order to reach the Commission’s target of 40% of the under-represented sex in panels and groups (50% for advisory groups);
- Integrating gender analysis into research and innovation content, to improve the scientific quality and societal relevance of the produced knowledge, technology and innovation.

Example 7: Developmental and evolutionary origins of sex differences in avian vocal behaviour (Universiteit Leiden)

Example 8: Fixing he/she pronoun errors in machine translation (Gendered Innovations Project)

The Gendered Innovations project worked with natural language processing experts from Stanford and from Google to fix the problem (which has not yet been fixed even that the initial platform unconsciously excluded gender issues). Constantly retrofitting for women is not the best road forward. To avoid such problems in the future, it is crucial that computer scientists (and others) design with an awareness of gender from the very beginning. A deeper fix will be to integrate gender studies into the engineering curriculum so that engineers don’t make such errors in the future.

To read the full case study and for research references, go to: http://genderedinnovations.stanford.edu/case-studies/ship.html

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Machine translation (MT) becomes increasingly important in a global world. Machine translation systems massively overscore masculine pronouns (‘he’, ‘him’), even where the text specifically refers to a woman (Minkov et al., 2007). The result is an unacceptable infidelity of the translation and perpetuation of gender bias. When translation programmes default to ‘he’, the occurrence of the masculine pronoun on the web increases (which will reverse the positive trend of equality in language). To fix this, it is crucial to develop algorithms that explicitly determine the gender of each person mentioned in the large text corpora that are used for training machine translation systems like Google Translate or Systran and use this computed gender to inform the translation, thus avoiding the masculine default and increasing the quality of translation overall.

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Example 7: Developmental and evolutionary origins of sex differences in avian vocal behaviour (Universiteit Leiden)

Example 8: Fixing he/she pronoun errors in machine translation (Gendered Innovations Project)

Machine translation (MT) becomes increasingly important in a global world. Machine translation systems massively overscore masculine pronouns (‘he’, ‘him’), even where the text specifically refers to a woman (Minkov et al., 2007). The result is an unacceptable infidelity of the translation and perpetuation of gender bias. When translation programmes default to ‘he’, the occurrence of the masculine pronoun on the web increases (which will reverse the positive trend of equality in language). To fix this, it is crucial to develop algorithms that explicitly determine the gender of each person mentioned in the large text corpora that are used for training machine translation systems like Google Translate or Systran and use this computed gender to inform the translation, thus avoiding the masculine default and increasing the quality of translation overall.

The Gendered Innovations project worked with natural language processing experts from Stanford and from Google to fix the problem (which has not yet been fixed even that the initial platform unconsciously excluded gender issues). Constantly retrofitting for women is not the best road forward. To avoid such problems in the future, it is crucial that computer scientists (and others) design with an awareness of gender from the very beginning. A deeper fix will be to integrate gender studies into the engineering curriculum so that engineers don’t make such errors in the future.

To read the full case study and for research references, go to: http://genderedinnovations.stanford.edu/case-studies/ship.html

Example 7: Developmental and evolutionary origins of sex differences in avian vocal behaviour (Universiteit Leiden)

Example 8: Fixing he/she pronoun errors in machine translation (Gendered Innovations Project)
The role of research universities – innovative practice and recommendations

32. University researchers and leaders can be instrumental in implementing GRI approaches and raising awareness of its importance within their institutions and beyond. In the Hetfi Statement that was signed by LERU and like-minded university networks around the world 10, their role is phrased as follows: “Research universities are distinguished by the quality, breadth and depth of their commitment to research. Nations increasingly rely upon research universities to drive national development and wellbeing. Graduates leave universities to work in government, business and the non-profit sector, taking with them the knowledge, skills, and understanding that make it possible for these sectors to work effectively, to respond to changing circumstances and to innovate. In their work and their social interactions, graduates draw on their university experience and the values that experience has developed to create a richer, more resilient and often more diverse and humane society. Research universities are centres for the development of new ideas and discoveries. They expand our understanding by testing and challenging existing knowledge. They are also centres of creativity that develop new technologies and new ways of doing things. […] University research-driven innovation, helps respond to major national and global problems, and provides the narratives that make it possible to understand a rapidly changing and increasingly volatile world.”

33. LERU universities want, first and foremost, to take a lead by ensuring that the research performed within the institution incorporates sex and gender analysis at all stages when relevant. We agree with the GenSET (2010) recommendation that leaders need to fully “buy into” the importance of GRI and that the most effective way of doing this is to show how incorporating sex and gender analysis promotes research excellence.

34. Below are a few examples to illustrate how LERU universities are taking action to promote a GRI approach to research:

- The University of Barcelona dedicates a section to GRI in its Horizon 2020 funding opportunities booklet11. It also includes topics such as gender violence in compulsory courses (e.g. on family and community medicine) at the Faculty of Medicine.
- At the University of Freiburg GRI has been attracting increasing attention, with awareness raising actions steered by the Rectorate. A workshop for researchers and students of all disciplines is scheduled for 2015 in order to further raise awareness and stimulate new interdisciplinary research projects.
- At the University of Heidelberg, anyone preparing an application for a collaborative research project gets advice from the Equal Opportunities Office on gender in research, on gender-balanced research groups and on funding possibilities for gender-related activities. Funded projects are coached by the Equal Opportunities Office concerning gender activities.
- Leiden University has incorporated in its comprehensive diversity policy the training of its researchers in writing gendered research proposals and carrying out gendered research. Leiden has also organised internal and external symposia on the topic and has started conversations with its Ministry for Education and Science about the importance of GRI.
- At Imperial College London, Prof. Julia Buckingham, then Pro Rector (Education), addressed GRI in her 2010 Athena SWAN lecture, in relation to her own research. Recognising the importance of gender equality for excellent research, Imperial appointed Prof. Dorothy Griffiths as Provost’s Essay for Gender Equality in March 2014. Under her leadership, the Academic Gender Strategy Committee has discussed GRI. The Medical Faculty is particularly aware and concerned, and gender-sensitive research issues are increasingly recognised and addressed in UK clinical trials.
- The University of Milan has organised several workshops and optional courses on GRI at the Faculty of Medicine. The goal is to make such courses mandatory4. The University has also had a programme to provide information on the gender dimension in research in H2020. In addition, Milan has organised a programme for graduate students on how the publication process works with specific attention devoted to sex and gender aspects in research.
- At the University of Barcelona, an analysis has been conducted of teaching staff’s needs and beliefs concerning introducing the gender dimension in teaching practices. In addition, the study seeks to identify the most significant elements that should be included to introduce the gender perspective into teaching practices. Five faculties (Psychology, Education, Economics and Business, Philosophy and Nursing) have thus far been involved in this project.

35. To be sure, there are many other initiatives at LERU and other universities in Europe and elsewhere that demonstrate good policy and practice on GRI. We put forward the following recommendations to LERU and other universities who wish to pursue a GRI agenda:

a) Advocate widely for gender to be taken into account in research funding, design, implementation and application of research results, where applicable.
b) Create awareness of the importance of GRI throughout the university.
c) Provide tools for researchers to understand and apply GRI methods in their research fields, for instance through training, workshops, seminars or showcasing good examples.
d) Emphasise that funding or publication opportunities will be missed if GRI methods are not applied.
e) Consider allocating internal funds to stimulate GRI and/or provide incentives for researchers to work on GRI proposals and projects, in particular in multidisciplinary collaboration.
f) Identify gender experts among the university’s

Example 9: Eating disorders in young men are underdiagnosed and undertreated (Universities of Oxford and Glasgow)

Young men with eating disorders are not getting the help they need because of the perception that eating disorders are a “woman’s illness”. Researchers interviewed 39 young people aged 16 to 25, including ten men, about their experiences of diagnosis, treatment and support for eating disorders. The study suggests that men are underdiagnosed and undertreated for anorexia and other eating disorders, despite making up about a quarter of cases. Frontline health workers have a key role in identifying eating disorders in young men.

ranks of researchers. Encourage them to act as reviewers on the panels and committees and tell EU and national funding agencies to use assessment criteria to assess research proposals, and acknowledge their work.

g) Inform the university’s research support services about GRI and make sure they are aware of the requirements in Horizon 2020 (cf. paragraph 30). Training of researchers and of grants officers can be provided by expert internal colleagues, or, if not available, by colleagues from elsewhere.

h) Promote integrating the outcomes of GRI into the teaching curriculum, to better prepare the leaders of tomorrow for dealing with societal challenges.

i) Inform, as necessary, national (and other) government as well as business leaders and others about the importance of including GRI in the national research and innovation agenda.

38. Governments and funding agencies can ask for proposals that demonstrate that gender and/or sex differences will be taken into account, if applicable, in areas that have been determined as priority fields, as is the case with Horizon 2020. By requiring that researchers themselves consider questions as to who benefits from the research and who does not, important GRI dimensions will be encouraged.

39. A few examples of good practice are:

- In 2012, the US Federal Drug Administration Safety and Innovation Act included a requirement that the FDA study the availability of data on sex, race, age and ethnicity in clinical trials for new drugs and devices (FDA, 2012).

- In 2013, the Italian national parliament adopted legislation regulating the introduction of gender medicine into teaching, research and healthcare as part of the national health policy.

- In 2014, the Spanish Science, Technology and Innovation Act was passed requiring a gender perspective to be included in all aspects of the research process. As a result, both the Spanish Strategy on Science, Technology and Innovation 2013-2020, which contains the general framework, and the State Plan for Scientific and Technical Research and Innovation, which develops the aims and principles of the strategy for 2013-2018, have included integrating a gender perspective into public RDI policies as one of the main principles.

- The city of Vienna has, for two decades, engaged in gender-sensitive city planning which has resulted in neighbourhoods, transport, roads and streets being planned and designed according to the needs of both men and women (Sanchez de Madariaga and Roberts, 2013).

40. Our recommendations to governments are as follows:

a) Include a gender dimension in research policies and programmes.

b) Help raise awareness, provide information and training for researchers and others to consider whether sex and/or gender may be important factors and, if so, adopt methodologies and analyses accordingly.

c) Be aware of the potential need for a GRI approach when funding national granting agencies, universities and projects of national or local importance, and potentially use a gender-budgeting approach to define research/funding priorities.

Funding agencies

41. Funding agencies decide on the research areas to be funded and thus promoted, and could play an important role in integrating sex and gender analysis into funded research. Researchers’ behaviour and awareness are more likely to change when research money is at stake.

42. The European Commission Directorate-General for Research and Innovation has emphasised the need for sex and gender analysis in its funded projects for years. These policies have been reinforced and strengthened in the current funding framework Horizon 2020 (cf. paragraph 30). In the proposal template applicants are asked to describe, when relevant, ‘how sex and gender analysis is taken into account in the project’s content’. We approve of this approach and recommend that it be strengthened and good practices shared.

43. The US National Institutes of Health, the Canadian Institutes of Health Research, the World Health Organisation, the Norwegian Research Council and the Irish Research Council have all adopted policies to actively promote gender-sensitive research and innovation. The latter, for example, states: “Excellent research fully considers the potential biological sex and social gender elements of the research content to maximise the impact and societal benefit of research. Not including the sex/gender dimension into the methodology, content and impact assessment of research can lead to poor research and missed opportunities. In order that any assumptions made or issues addressed are based on the best available evidence and information, the sex-gender dimension has to be fully considered”. The Swedish Research Council recently published the fourth review of its evaluation process from a gender equality perspective. This review promotes quality in research, identifies tools to achieve gender equality, and shares good examples.

44. Our recommendations to funders are:

a) Adopt policies to promote GRI.

b) Create incentives for researchers to consider GRI methods.

c) Model national policies after the approach taken by the EC in the Horizon2020 programme.

d) Collect and publicise research that has successfully integrated sex and/or gender perspectives.

e) At the European level, continue and strengthen the Horizon gender and, specifically, GRI policies.

Journals

45. Peer-reviewed journals can play an important role in promoting GRI by demanding that authors explain why only men/males or women/females were studied if that is the case and that authors explicitly state when no sex or gender differences were observed. A number of journals, notably in the life sciences, are now requiring sex- or gender-specific reporting of research. For example:

- The Lancet asks prospective authors to routinely include women into clinical trials and to analyse research data by sex and gender.

- PLOS Biology, Nature and Science ask that authors of animal research provide information on the sex of the animals studied.

- PLOS Medicine asks that authors make explicit their methods of categorising human subjects by sex and gender.

- The Journal of the International AIDS Society strongly encourages authors to include dis-aggregated sex and to provide a comprehensive analysis of potential gender differences.

46. Our recommendations to peer-reviewed journals are:

a) Set standards for the inclusion of information on the gender and/or sex of subjects in humans, animals, cells or cell lines, but especially, but not exclusively, in the STEM fields.

b) Develop clear guidelines for authors on how to include sex and gender analysis in research and research reporting.

c) Require, especially in areas where there is reason to suspect that male and female animal or human subjects may differ in their response to a situation or intervention, that a study answers questions for each sex separately.
Conclusions

47. Addressing GRI, i.e. sex and gender analysis in research and innovation content and process, is an important issue. Next to “fixing the numbers” and “fixing the institutions”, GRI represents a third gender-equality dimension, which can be described as “fixing the knowledge”. GRI should be seen as a separate but related issue, which needs to be given due attention if we are going to achieve gender equality and mainstreaming. From our discussions with a wide range of people within LERU universities and beyond, it is apparent that the GRI approach is not as widely understood or practiced as it should be.

48. More awareness-raising and training are necessary across the board to make research more sensitive to gender and sex differences. While GRI is rapidly becoming better known in certain fields, especially health and biomedical research, in other research areas it is still unknown. Our argument is not that all research questions and projects must necessarily have a gender perspective; it is merely that such questions should be posed at the outset and systematically throughout the research process to assess whether important sex of gender differences need to be addressed.

49. It is important that GRI be linked to and integrated with other gender equality initiatives at all levels: through inclusion in government policies and strategies, funders’ granting programmes, universities’ research activities and researchers’ projects. We have therefore formulated a set of recommendations in this paper for various stakeholders to act upon. We have listed them at the beginning of this paper in the hope that they will be acted upon by those responsible.

50. LERU universities, individually and as a network, must take the lead in discussions with governments, funding agencies, journals and other actors to highlight the importance of GRI and to ensure that sufficient funds are being allocated to it. A comprehensive, strategic and partnership approach is vital to ensure that the current momentum is not lost and that awareness of the importance of GRI continues to grow. LERU universities can play a pivotal role in making research results equally applicable to men and women, which will save money and lives, and will contribute to LERU universities’ commitment to responsible research and innovation to the benefit of society at large.

References


Gendered research and innovation: Integrating sex and gender analysis into the research process

Endnotes

1. The terms ‘male’ and ‘female’ and ‘man’ and ‘woman’ are used throughout this paper. However, we recognize that not everyone identifies with the binary notions of ‘male’ and ‘female’, and that it is equally important to address non-binary definitions of sex and gender in research.


4. The relationship between gender diversity in teams and research performance is studied, for example in a Horizon 2020-funded project “Gender Diversity, Research and Innovation through Gender Diversity (GDRi)”. It aims to produce new insights into how gender diversity in teams affects research performance. Using innovative methods for analysing the diversity-performance relationship, the project will develop the first place a reliable gender-diversity measure, the Gender-Diversity-Index (GDI), which is sensitive to power, status and information sharing differences within research teams and across public and private organisations.


7. The ERA survey was completed by a limited number of organisations. The EC notes the EDI (performance) and EID (funders) responses cover respectively about 155,000 researchers (about 20% of total EU researchers) and about 30% of total GEBARD.

8. There are two ways of accessing topics with an explicit gender dimension in the H2020 participants portal: 1/ by clicking on a “quick finder” link, or to a recent high-profile study. Research conducted at the University of Edinburgh has demonstrated the value of highly


10. These are the American Association of Universities (AAU), the Russell Group in the UK, the Australian Group of Eight (Go8), the Chinese network C9, the ARACU (Association of South East Asian Research Universities), the EU5 in Japan, the City Canada and the City Germany.


12. Work performed in the context of the EDI-funded FP7 project STAGES - www.stages.unimi.it

13. Tromsø and Stanford are examples of universities where a strategic approach to GRI has been taken.

14. Gender budgeting as a general approach for gender equality and for improved government accountability is advocated for example by the UN, see http://www.genderfinance.org.

15. There are the American Association of Universities (AAU), the Russell Group in the UK, the Australian Group of Eight (Go8), the Chinese network C9, the ARACU (Association of South East Asian Research Universities), the EU5 in Japan, the City Canada and the City Germany.


17. There are two ways of accessing topics with an explicit gender dimension in the H2020 participants portal: 1/ by clicking on a “quick finder” link, or 2/ through a keyword search at the following link: http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/search.search_topics.html

18. Through a keyword search at the following link: http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/search.search_topics.html

19. Endnotes

20. The Act involves the inclusion of a gender perspective in the content of scientific, technical and innovation research in order to enrich the creative power of research.

21. See https://vimeo.com/77692813 for a video about the initiative. More information is also available at the Swedish Standards Institute website:


23. Contact at the University of Barcelona: Marta Soler Gallart, Head of the Centre of Research in Theories and Practices that Overcome Inequalities, creab@ub.edu, http://creab.info

Appendix: Examples of gendered research and innovation at LERU universities

Empowering young people in preventing gender-based violence through peer education (University of Deusto)

The aim of this research is to contribute to preventing and combating gender-based violence among adolescents. In addition to producing new insights into young people’s attitudes towards gender-based violence and the links between gender stereotypes and gender-based violence, the research provides educators with information and tools for working with young people in the prevention of gender-based violence, to promote the role of schools and other formal and non-formal education centres, and to contribute to policy development on the prevention of gender-based violence in educational contexts on a national and EU level.

The 24-month project YOUTH4YOU was funded by the Daphne III programme of the European Commission, coordinated by the Mediterranean Institute of Gender Studies (Cyprus), with the University of Barcelona and others as partners. See for example the teachers’ manual produced: http://www.medingenderstudies.org/wpsicontentuploads/V4Y-Manual_digital_r12.pdf

Contact at the University of Barcelona: Marta Soler Gallart, Head of the Centre of Research in Theories and Practices that Overcome Inequalities, creab@ub.edu, http://creab.info

Estrogen protect male mice from obesity complications (University of Edinburgh)

In comparison to men, women may be protected from the metabolic consequences of obesity, at least until the menopause. There is growing evidence that estrogen has an important effect on body fat and metabolism in males. Research using a mouse model of diet-induced obesity (DIO) has shown that male and female mice responded differently to stress hormones. Specifically, DIO-induced sex-specific changes in glucose-insulin homeostasis were ameliorated in males treated with estrogen, highlighting the importance of sex steroids in metabolism.

The research also provided evidence that the sexually dimorphic expression and activity of glucocorticoid metabolising enzymes may play a role in the differential metabolic responses to obesity in males and females.


The diagnosis of myocardial infarction in women (University of Edinburgh)

Women presenting with suspected acute coronary syndrome can get a better diagnosis (and hence treatment) thanks to a recent high-profile study. Research conducted at the University of Edinburgh has demonstrated the value of highly

Sensitive troponin I in increasing the diagnosis of myocardial infarction in women. Highly sensitive troponin I increased the number of appropriate diagnoses by 100% in women, compared with only 20% in men, suggesting that novel test could be beneficial to women.

Publication: Shah AS et al. 2015. High sensitivity cardiac troponin and the under-diagnosis of myocardial infarction in women: prospective cohort study. BMJ. 350:g7873. doi: 10.1136/bmj.g7873

22

23
Empowering vulnerable people through rights education (University of Geneva)

The Law Clinic organises gender-sensitive courses on the rights of vulnerable people. The programme uses a “Know Your Rights” approach, which is aimed at empowering vulnerable people through rights education. Every year a group of 15 Master’s students conduct extensive legal research on specific questions for a specific vulnerable group living in Geneva. Specialists on gender issues are invited to raise awareness among the students.

During the first year, the Law Clinic worked on the rights of Roma People living in precarious conditions in Geneva. During the second and the third year, the Law Clinic focused on the rights of illegal immigrant women in Geneva. This topic addresses specific questions concerning illegal migrant women, for instance working conditions in specific areas where women are mainly employed, such as domestic work or sex work. In all of the clinical work (research papers, brochures, etc.), gender-inclusive language is used and gender stereotypes are analysed critically.

A multidisciplinary doctoral programme based on Gender Studies (University of Helsinki)

The doctoral programme ‘Gender, Culture and Society’ (Sosiaali-, kulttuuri- ja yhteiskunta, SKY) is a multidisciplinary programme based on Gender Studies at the Department of Philosophy, History, Culture and Art Studies at the University of Helsinki. The programme on the central Helsinki campus welcomes applications from students interested in gender, sexuality and feminist scholarship.


Thinking public spaces through the spatiality of women (KU Leuven and VUB)

In the conservative Arab culture of the city of Nablus, Palestine, public and private spaces are strictly separated, with different rules and habits. As a result, men and women do not use the different spaces in the same manner. For example, women employ indoor rather than outdoor spaces for social and recreational activities. By introducing semi-public spaces, e.g. the school play yard, as an intermediate for public and private spaces, cultural barriers can be overcome and urban planning problems can find new solutions. These ‘semi-public spaces’ are of vital importance. They respect the cultural values and help the society in organising the activities in a familiar space where everyone has the right to use.


Understanding and changing gender assumptions in physics (Lund University)

To find a gender perspective in physics is an important and challenging task. Despite the fact that the objects of physics seem non-gendered (elementary particles do not have a sex after all), physicists use metaphors and pictures to explain and illustrate their concepts. It is clear that these can introduce bias. Recently a commonly used textbook of physics (Benson’s “University Physics”) was analysed in Lund, after it was reported as sexist by one student. A picture illustrating the effect of parallel mirrors and an infinite number of images showed a scantily dressed actress. A further analysis of the pictures in this textbook found that the pictures of men and women were very different, both in content and in numbers. It is clear that visual representation can be very powerful – and very biased.

The physics textbook analysis was performed in the context of the university-wide “Gender Certification” project at Lund. In an assessment of the project after five years, it was found that the physics department not only had been able to attract more women students and hire a woman professor, it had also worked systematically with methods very similar to the ones outlined in the Stanford “Gendered Innovations” project. Through several workshops, for example, physicists analysed gender assumptions in their teaching and research. As a result, academic staff rethought their teaching, including concepts and language, and changed their research questions and priorities.

Contact: Thomas Bege, Department of Physics, Lund University

Women suffer more from mental illness (University of Oxford)

Mental health professionals, psychologists, and psychiatrists give surprisingly little attention to the question of gender differences. Research looking at international epidemiological data shows that in any given year total rates of psychological disorder are 20-40% higher in women than men. As to why women suffer from mental illness disproportionately, there are some indications that biological and genetic influences may be involved. But, for now at least, the bulk of the evidence points toward the contribution of life events and social roles. Indeed the conditions to which women seem especially vulnerable (such as anxiety and depression) are those for which genetic factors are known to be much less significant than environmental influences. Conditions with relatively high heritability – such as schizophrenia and bipolar disorder – tend to occur equally in men and women. More research into the causes of mental illness and specifically the role that gender may play in mental illness are needed.


Gender-sensitive sports education (Université Paris-Sud)

It is essential that the findings of gendered research are taken up in the educational curricula at universities and beyond. In order to raise awareness and to educate future sport professionals about gender, diversity and equality issues in sport, a 37-hour teaching module entitled “Activité physique et sports et équité des sexes” for all second-year students of STAPS (Sciences and Techniques of Physical and Sports Activities) at the University Paris-Sud has been developed, which is informed by gendered sports research carried out at the university and elsewhere. For third-year students, 30 hours of tutorial classes are dedicated to gender and diversity in sports education, taking into consideration socio-historical, psychological and pedagogical approaches. Another teaching module entitled “industry knowledge” includes ten hours of education about gender equality to deconstruct gender stereotypes. Developed with the ESPE (Ecole Supérieure du Professeur et de l’Éducation), it is open to all Paris-Sud training courses (mathematics, physics, chemistry, biology, sports).

The family structure and childcare: constrained arbitrations and socialisation effects (University of Strasbourg)

Childcare is a crucial issue for gender analysis. This research analyses two dimensions of family structure: the logic governing the choice of childcare, shaped both by objective constraints (socio-professional conditions and local context); and the subjective representations of parents, shaped by the distribution of the care between father, mother and other guardians form a context of secondary socialisation, capable of transforming the practices and representations of both spouses. The 18-month survey is based on a hundred detailed interviews conducted with fifty couples, selected to represent a diversity of socio-professional and residential situations in which both spouses are met separately. It aims to highlight the changes of relations between sexes during the learning process of parental roles and to clarify the specific role of different types of childcare in this process.

Corresponding author: Anaïs Collet, Sylvie Monchatre, UMR 7363 - SAGE Laboratory – University of Strasbourg
Gender equality and economic growth in the cliometric long run (University of Strasbourg)

Despite the recent recognition of gender equality and female empowerment as a key goal for economic development, gender differences persist and continue to be a major challenge for both developed and developing countries. Inequalities between men and women seem to be rooted in the cultural, social and political systems of many countries. This research project is stimulated by the conviction that the understanding and the explaining of comparative economic development requires a global view of the entire process of development. It addresses the relation between economic growth and gender equality over the whole period of human history. To do so, insights from sociologists, demographers, historians and anthropologists are needed, even if the approach remains that of economists specialised in cliometrics. A cliometric projection of the social sciences in the past is produced, structured by economic theory and mathematical modeling using statistical and econometric methods. The ambition of the project is twofold: building a bridge between theoretical growth models and economic history; and encouraging economists to examine more systematically these theories grounded upon history while nevertheless aiming at finding general laws. This middle road between pure empiricism and abstract theory aims at opening the door to better economic theory, enabling the scientific community and the society in general to interpret current economic issues in the light of the past and to understand more deeply the historical working of socio-economic processes.


Girls and boys are not looked at in the same way (Universities of Strasbourg, Lorraine and Ca’ Foscari)

Body, gender and age are at the centre of current concerns over the transition from childhood to adolescence. Discussions, for example, about the hypersexualisation of girls or risky behaviour, have given expression to a form of moral panic which, in focusing on the developing body, has called into question the place of the child in contemporary society and the process of doing gender in life transition. The CorAge programme focuses on studying both the way children think of and experience these changes in everyday life, and how the adults around them perceive them and give support during this stage in life. This anthropological and comparative research has deconstructed risk rhetoric that propagates concerns bearing little relation to the child’s experience of growing up. The way puberty is constructed in educational and medical discourse, popularised, simplified and given media coverage has reinforced such issues as, for example, the early development of young girls, and sexist representations of the “loïto” type. The wide range of children’s and adults’ experience questions the idea of the child’s development which places growth in a continuum of universal, objective phases. Rather, growing up means coming to terms with a multitude of norms, models and recommendations. Girls and boys are not looked at in the same way; other than in the children’s press, the male process of growing up is given little visibility: the experience of boys should be given more consideration. On the other hand, in epidemiology, clinical discourse, media and educational programs, girls’ puberty and sexuality are over-emphasised, even if these representations don’t match children’s actual experiences.


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Sex-based differences in the neuroendocrine regulation of human, social–emotional behaviour (Utrecht University)

Steroids and peptides mediate a diverse array of animal social behaviours. Human research is restricted by technical-ethical limitations, and models of the neuroendocrine regulation of social–emotional behaviour are therefore mainly limited to non-human species, often under the assumption that human social–emotional behaviour is emancipated from hormonal control. Development of acute hormone administration procedures in human research, together with the advent of novel non-invasive neuroimaging techniques, have opened up opportunities to systematically study the neuroendocrinology of human social–emotional behaviour. Researchers at Utrecht University reviewed all placebo-controlled single hormone administration studies addressing human social–emotional behaviour, involving the steroids testosterone and estradiol, and the peptides oxytocin and vasopressin. These studies demonstrate substantial hormonal control over human social–emotional behaviour and give insights into the underlying neural mechanisms. They have also proposed a theoretical model that synthesises detailed knowledge of the neuroendocrinology of social–emotional behaviour in animals with the recently gained data from humans described in the review.

Importantly, this review study systematically addresses sex-based differences. For example, it points out that research on social recognition is limited because most data on a single hormone is obtained from a single sex. Oxytocin data is collected mostly from males, whereas testosterone data is collected mostly from women. The choice to limit the subject group to males is mostly to avoid interactions with cyclic hormonal fluctuations in female participants. A recent imaging study (discussed in the review study), which investigated the effect of the hormone oxytocin on face processing specifically in females, found different activation patterns compared to data obtained from male subjects. Interestingly, females showed more reactivity in the amygdala in response to fearful faces after oxytocin as compared to placebo. Also, in females activation was enhanced by oxytocin in the inferior frontal gyrus (IFG) and the superior temporal gyrus (STG), both of which are involved in the evaluation and interpretation of complex stimuli such as emotional expressions, mind-reading, and imitation. This finding indicates that the current knowledge on the effects of oxytocin on the brain is biased by not taking into account the striking sexual dimorphism of the brain (i.e. the physical differences between male and female individuals that arise as a consequence of sexual maturation). The next challenge is to elucidate the effects of oxytocin on face processing in both sexes, and investigate the mechanism by which oxytocin affects the different neural regions involved in social processing.

In sum, it is crucial that sex-based differences are systematically investigated and reported in the development of models of the neuroendocrine regulation of human, social–emotional behaviour.


Corresponding author: P.A. (Peter) Bos, Utrecht University
Flirting in the field: the effect of sex and gender factors on research data collection (University of Zurich)

There is a now a sophisticated body of literature discussing how situated identities such as gender, race and age as well as interlocked power relations shape what is said and done – or not said and not done – in research encounters, i.e. in situations where researchers and human subjects interact (in interviews, observations, test taking, etc.). This work gives evidence about the complex engagements and disengagements with sexuality in fieldwork and how this affects research data collection. The analysis of episodes of flirting in research encounters provides evidence not only of the contingency of data collection, but of the fluidity of subject positions. Furthermore, sexuality enacted in fieldwork can be experienced as both threatening and pleasant; it can facilitate data collection or impede it; it can balance power relations or enforce or reverse the asymmetry; and more likely than not, this will all take place within the very same encounter. As these relations are part of the data itself, they need to be taken into account in analysis. Based on feminist methodology, the paper gives evidence that doing so clearly enriches data analysis and hence research outcomes.

Publication: Heidi Kaspar and Sara Landolt. 2014. Flirting in the field: shifting positionalities and power relations in innocuous sexualisations of research encounters. Gender, Place & Culture: A Journal of Feminist Geography. DOI: 10.1080/0966369X.2014.997704

Why are male care workers and female electricians still rare? (University of Zurich)

Compared to other countries, gender segregation of educational and vocational pathways in Switzerland is high and persistent. Young adults who persevere in gender-atypical pathways have higher than average scholastic abilities and more beneficial family backgrounds. This indicates that – for both women and men – successfully establishing a gender-atypical employment field for oneself is still more difficult than a gender-typical one. Anticipating these difficulties, young adults who are deterred from entering gender-atypical educational pathways and the respective employment fields lose a considerable number of potentially talented young people. Gender-sensitive analyses of occupational pathways identify these deterrents and develop measures to ensure more equal access to all occupations irrespective of gender.


Gendered research and innovation: integrating sex and gender analysis into the research process (University of Zurich)

Mainstreaming gender has become a core concern in larger research projects. Within the Swiss National Center of Competence in Research North-South (NCCR N-S), Research Partnerships for Mitigating Syndromes of Global Change), for example, a dual strategy for gender mainstreaming was pursued - on the organisational level and in project design. Measures include policy statements and guidelines for the advancement of women in the team and the analysis and consolidation of concepts and methodologies for gender-sensitive research related to sustainable development. By elaborating a rationale and ways to enhance research projects focusing on or considering gender/sex as an important category and by individual coaching of young researchers, gender-relevant knowledge has become enhanced and applied in many research projects.


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Gendered memories (University of Zurich)

Over the last three decades, the role played by phenomena linked to the (re-)making of collective memories in situations of societal and political change has gained attention in humanities and social sciences research, and only in recent years has this subject been researched with respect to colonial and postcolonial settings. Importantly, up until now gender has largely been neglected on the conceptual level. The research indicates that the making of collective memory is often linked to highly gendered and sexualised models of national, religious, or ethnic identity. At the same time, situations of societal and political change open up spaces for questioning and (re-)negotiating existing gender norms and gender relations.


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