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CYBERFEMINISM REVISITED: IS ICT EITHER FEMININE OR MASCULINE?*

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Abstract

Surprisingly often, ICTs like computers and mobile phones and ICT-based services like sms or the internet are characterised as either feminine or masculine. This occurs among academics as well as in everyday life conversations. How should we as analysts understand and cope with this issue. Is this kind of gendering unproblematic as long as it shifts between the 'masculine' and the 'feminine'? What kind of work is performed through such gendering and with what kind of effects?

This paper will approach this set of problems through a dialogue with so-called cyberfeminism. It represents an approach that argues a quite general change in the gendering of ICT, from masculine to feminine. For example, Sadie Plant claims that as the network features of ICT become dominant, ICT emerges as a deeply feminine technology. In many ways, this appears to be an optimistic view from a feminist standpoint since there is a promise that the gendered digital divide will disappear, perhaps to some extent reversed.

Drawing on the extensive research into these issues performed through the large European SIGIS-study (Strategies of Inclusion: Gender in the Information Society), this paper will discuss some of the problems arising from the cyberfeminist perspective. A major weakness is related to the extensive employment of dualist binaries in the underlying understanding of gender. SIGIS research shows that often, these dualisms are translated into discourses that make claims about gender dualist practices related to ICT. SIGIS research also shows that when ICT practices are analysed in greater detail, the gendering turns out to be paradoxical, diverse and heterogeneous. However, the discourses may inject stereotypical norms and notions about what kind of artefacts and practices that are gender appropriate, thus producing a dualist force that may work to reproduce gender dualisms rather than dissolve them. Thus, while cyberfeminism may seem as a progressive countermove to a traditional assertion that computers are masculine, its discursive effects may not be that progressive in the longer term.

Understanding the gendering of new technologies

Nearly 20 years ago, one of the authors did a study where we asked a large group of engineering students to fill out a questionnaire with questions about the gender of a wide variety of technologies. As it turned out, most of the respondents had no problem in providing an answer, grading the technologies on a scale from 'clearly masculine' to 'clearly feminine'. Interestingly enough, the computer came out as neutral, while chemical laboratory equipment was perceived as feminine. When inquired about their reasons for such gendering, they emphasised the role of the technology with respect to the sexual division of labour, but also qualities like size, degree of cleanliness/dirtiness, and noise levels. A 'feminine' technology would be one that is used by women, small-ish, clean and not noisy, while a noisy, dirty, large technology used by men would be considered 'masculine' (Sørensen and Berg 1987).

An important issue raised by this study, is of course the stability of such evaluations. When Berg and Lie (1995) ask the rhetorical question 'Do artefacts have gender?', their answer is affirmative but in a cautious way. 'Artefacts do have gender and gender politics in the sense that they are designed and used in gendered contexts. But holding that gender is inscribed in technologies does not mean that they are not open to change' (p. 347). Still, Judy Wajcman's (2004) recent overview of feminist research on technology struggles to avoid giving the impression that generally speaking, technology is masculine and thus works to exclude women. In fact, surprisingly often, ICTs like computers and mobile phones and ICT-based services like sms or the internet are characterised as either feminine or masculine. This occurs among academics as well as in everyday life conversations. How should we as analysts understand and cope with this issue. Is this kind of gendering unproblematic as long as it shifts between the 'masculine' and the 'feminine'? What kind of work is performed through such gendering and with what kind of effects?

Let us approach the issue by looking at two examples of artefacts claimed to be feminine. The first is a printer, manufactured by Epson. It was designed by an all-women team who came up with the printer for women shown in figure 1. This beauty-box shaped Epson E-100 printer was designed by an 'All Women, For Women' programme in an effort to make a printer that was 'easy for women to use'. However, Epson does not say anything concrete about what makes this printer feminine. Our best guess that it is the pastel colours, in addition to the stylish handle.

Of course, it would be too cavalier to dismiss the longstanding feminist assertion that artefacts somehow have gender just on the basis of two randomly selected marketing efforts. Nevertheless, the two examples are interesting and important for at least two reasons. First, when feminist scholarship finds that artefacts have gender, they usually observe technologies that are shown to be masculine and tend to exclude women from important social activities, like jobs and positions. Moreover, the designers of these technologies would usually claim that they are gender neutral. When industrial heavyweights like Epson and Siemens design artefacts one usually would claim as gender neutral, explicitly for women, potentially this gives the issue of gender and technology a new twist. We observe a strategy to include women as users of new versions of artefacts that are made in a way that at least intentionally exclude men as users. Second, they clearly and effortlessly invite the use of the female gender as category from which to make sense of technology. However, there are not – yet? – any examples of printer or mobile phones designed explicitly for men. Thus, the printer and the mobile phone designed for women is a different matter from the design of shavers for men and women, respectively. Moreover, in the latter case, at least some efforts have been made to provide a seemingly rational argument for the gendered design differences.

Arguably, to understand the gendering of technologies have become more complicated. This is also due to the efforts of so-called cyberfeminism to counter feminism's traditionally pessimistic outlook on technology by claiming that new information and communication technologies have feminine qualities that will give women advantages as users and designers of these technologies. In the rest of this paper, we will discuss the cyberfeminist ideas and see how they converse with some of the findings from a large European project analysing gender aspects of ICT and inclusion efforts to attract women to the technologies of the Information Society. The project called Strategies of inclusion: Gender in the Information Society (SIGIS) is probably one of the largest studies of gender and ICT ever done. In total, 48 case studies of inclusion initiatives were done in five European countries: Ireland, Italy, the Netherlands, Norway, and United Kingdom.³

Cyberfeminism and the gendering of ICT

Early feminist work on computers and work described the computer as a potential risk for women's quality of working life as well as

³ More information about the SIGIS project as well as papers describing each of the 48 case studies may be downloaded from www.sigis-ist.org.

employment (Lie and Rasmussen 1983, Cockburn 1985, Probert and Wilson 1993, Webster 1995). The new technology seemed to offer new ways of including men and excluding women with regard to attractive jobs by demanding new, presumed abstract skills or as means of redefining the qualifications needed in typical women's jobs, like secretarial work or nursing. Computers came to be seen as a masculine design, and the male hacker emerged as the ideal user.

As mentioned above, cyberfeminism has been developed to provide a different and more optimistic understanding of the potentials for women of information and communication technologies (ICT). The result is not a new theory of gender and ICT as much as it is a political position from which to claim a place for women with respect to these new technologies, above all related to the internet:

CyberFeminism is a philosophy that acknowledges, firstly, that there are differences in power between women and men specifically in the digital discourse; and secondly, that CyberFeminists want to change that situation (Hawthorne and Klein 1999:2).

From this perspective, cyberfeminism represents a kind of feminist politics to support and encourage women's exploration and domestication of computers. It is a strategy to use computers as political tools for feminists, while at the same time celebrating women's achievements with regard to ICT (Wilding 1998, Everett 2004). A main point is the celebration of the potential of networked computers to provide new opportunities for communication, above all through the internet. Communication, perceived as particular feminine skill, is argued to be a gateway for women into computing, but also a feminine alternative to skills and interests seen as masculine, like control and information.

The most radical version of cyberfeminism has been presented by Sadie Plant (1997). She argues that the advance of digital technologies and the making of the internet, cyberspace and virtual realities have created a technical arena that is an ideal feminine medium. Indeed, Plant claims that current developments work to the long-time benefit of women:

The father's authority is undermined as the sperm count goes into decline and oestrogen saturates the water supply. Queer culture converges with post-human sexualities which have no regard for the moral code. Working patterns move from full-time, life-long, specialized careers to part-time, temporary, and multi-functional formats, and the context shifts into one in which women have long had an expertise. It is suddenly noticed that girls' achievement in school and higher education are far in excess of those of their male counterparts, and a new transferable intelligence begins to be valued above either the strength of single-mindedness which once gave the masculine its power and are now being downgraded and rendered obsolete. (...) Global telecommunications and the migration of capital from the West are undermining both the pale male world and the patriarchal structures of the south and east, bringing unprecedented economic power to women

workers and multiplying the possibilities of communication, learning and access to information (Plant 2000:334).

In her analysis of digital media, Plant uses highly gendered metaphors. Internet is described through reference to the matrix, the Latin word for womb. In doing so, she draws extensively on French feminist philosopher Luce Irigaray and her ideas of irreducible sexual differences. Plant claims that, ironically, it is the ultimate dream of total control through the internet that finally will lead to the collapse of the patriarchal economy, precisely because patriarchy will find itself unable to control the net:

But cyberspace is out of man's control: virtual reality destroys his identity, digitalization is mapping his soul and, at the peak of his triumph, the culmination of his machinic erections, man confronts the system he built for his own protection and finds it is female and dangerous (Plant 2000:335).

Plant's radical version of cyberfeminism may be criticised as an expression of technological determinism as well as gender essentialism (see, e.g., Wacjman 2004, ch. 3). But probably, it is important as an expression of a strategy where digital technologies are to be domesticated by women through labelling them feminine or at least through making these technologies 'gender authentic' to women.

This is recognised in research where the communication aspects of ICT is highlighted as an important, perhaps the most important quality of digital technologies that helps to facilitate the inclusion of girls and women as users of these technologies (Håpnes and Rasmussen 2003), even encouraging them to become computer enthusiasts (Nordli 2003). The option that computers may be used for email, chatting, and writing appears at least to imply a change in their symbolic coding; the technology is no longer obviously masculine.

But it is not just Plant who wants to take the argument further. Both with regard to computer games (Cassell and Jenkins 1998) and pedagogical experiments (Brunner and Bennett 2002), the idea to make feminine designs is claimed to be important. Underlying this way of thinking is an explicit dichotomous understanding of gender:

In our research about the educational uses of technology ... we have come to recognise two very-distinct attitudes toward technology One seems recognizable "feminine" because it supports and reflects the values associated most strongly with women. It contrasts with a more traditionally "masculine" perspective about technology ... which supports values more commonly associated with men (Brunner and Bennett 2002:71).

This perspective gives rise to a clear-cut definition of a feminine and a masculine relationship towards technology:

This feminine perspective regards technology almost as a fellow creature, needing care and feeding to stay in balance with the environment, both social and physical that surrounds it. A feminine

perspective wants technology to be small and versatile, to permit conversation and connection, the sharing of ideas and feeling and experiences. (...) The masculine perspective asks that technology grant the user transcendence over time, space and the limitations of the physical body. It sees technology as affording power, command, and control (op. cit., p. 71-72).

Such approaches may be criticised, not just for the dichotomous understanding of gender, but also with respect to the gender essentialism that underpins the argument. However, we believe that it may prove more fruitful to read Brunner and Bennett's effort as a conscious, cyberfeminist strategy to get girls/women included into ICT by providing a gendered or, rather, feminised space where girls/women may domesticate ICT without feeling that they enter into a non-feminine or even masculine domain. In this reading, the main thrust of cyberfeminism is to get women to occupy ICT so that ICT get a feminine stamp and may be used to empower rather than marginalise women.

This raises interesting empirical questions about the ways in which women may occupy ICT spaces and the effectiveness of strategies that explicitly feminise ICT in order to get women included as users and designers. Such questions were important to the SIGIS project, and we will now turn to some of the case studies that may be used to discuss these issues in a more empirically grounded way. One set of inclusion strategies studied in SIGIS aimed to create so-called women-centred spaces, to provide situation where it was made explicit that it was a concern for women that would dominate teaching, explorations, networks, or designs. If not identical with the cyberfeminist inclusion strategy presented above, it is close enough to make it fruitful as basis to investigate the fruitfulness such explicit gendering through feminisation.

Feminisation of ICT through the creation of women-centred spaces

Inclusion strategies that aim to create what we have called women-centred spaces are above all concerned to provide opportunities for women to encounter and explore ICT together with other women. The SIGIS case studies cover four main domains that we will briefly analyse:

- Women-only training
- Women's web magazines
- Networks for women
- Products aimed particularly at women.

Women only training

The main idea underlying women only training is that women find it easier to learn in the absence of men who otherwise might dominate the learning environment. In relation to ICT, to educate women without any men present has been perceived as a way of countering or subverting the perceived symbolic link between ICT and masculinity.

In the Vrouwen Vak Scholen case (VVS), van Slooten (2003) analyses Dutch vocational training centres that offer ICT courses. These schools aim to:

- help women to get a paid job,
- strengthen the position of women on the labour market,
- provide employers with qualified employees.

The target group are women who want to get back to work after they have been out of the labour market for a longer period, usually because they have taken care of their children. This means that the training of these women is outdated. Also, many students are divorced or single parents. VVS has a strategy to get these women back into the labour market that employs a mixed bag of instruments. They give thorough information about the labour market, their training is short, they offer much student counselling and women only training. The result is ICT courses given in a women-only environment where there is room for dealing with personal as well as training problems (van Slooten et al 2003).

The VVS formula for offering ICT training may be summarised in the following way:

- Take a broad base as the starting point for the education. This implies a flexible approach to the learning needs of students.
- The personal situation of the students is given attention
- Pragmatic adoption to the needs of the labour market.

Also the Edinburgh Women's Training Centre (EWTC) case study (Faulkner and Kleif) 2003) analyses an effort to provide women with vocational training. The original objectives of EWTC were to support and train disadvantaged women who wanted to (re)enter the labour market in computer technology. The trainees are selected on the basis that they are unemployed women who have low, unrecognised or no relevant qualifications, and who are disadvantaged in one or more of the following ways: lone parents, returners, over 40 years old, disabled, from ethnic minorities, and/or from neighbourhoods with high unemployment. Also, they should have sufficient aptitude and motivation to get something from the course. The course plus any travel and childcare costs are paid for. It takes a full year, allowing time for trainees to achieve meaningful levels of competence. Building confidence and self-esteem are crucial objectives, to which the strategy of women only training seems well adapted. One of the EWTC trainers expresses this in the following way:

The theory is basically that we work with women, with women as role models as trainers. And that we therefore build up the skills and the confidence of women who've had a bad learning experience or no learning experiences in a non-competitive environment. And they are then enabled to make choices about where they go and what do they do and gain the skills to take them there (Faulkner and Kleif 2003: 218).

Both the *VVS* and *EWTC* are considered successful initiatives to get women included in the Information society by providing important computer-related skills. However, it is important to note that the women-only training does not work simply because it is for women only. The positive outcome is a result of a heterogeneous strategy where different measures are combined. The problem of exclusion is understood as related to several aspects of the situation of the participating women; as lacking skills, as mothers, as lacking money, as lacking in confidence, etc. The inclusion thus works by focussing on these aspects in two main ways. First, the training is organised so that it provides skills by flexible teaching methods, but also allows the women to reflect and discuss their situation outside of the training arena. Second, the two institutions make sustained efforts to help women cope with the practical problems of studying by offering support for child-care and by adjusting the timetable to suit school terms and daytime hours of children.

A virtual room of one's own? Women's magazines on the web

Women's magazines may in general be considered a space where femininity is designed and redesigned while addressing issues considered being of concern either to all women or to particular sub-groups of women. The consumption of such magazines belongs mainly to leisure, but their content display an interesting mix of entertainment and utility. To people that consider to design products particularly for women, women's magazines on paper represent a well-established and successful example of such an effort.

However, when SIGIS decided to dedicate several case studies to analyse web versions of women's magazines, we were mainly interested in the way in which these Internet-versions might work as inclusion mechanisms for women, to motivate them to use the Internet and acquire the competence needed to do so. Thus, we were also interested to see if the web-based women's magazines would encourage women to self-learning of ICT skills.

As an inclusion strategy, web-based women's magazines have a precarious relationship to a quite traditional construction of femininity and womanhood. On the one hand, they emerge from a well-established and entrenched dualist construction of gender. The magazines are intended for women, not for men. The content mainly reinforces traditional femininity. However, some of these publications address a subsection of women, called

Modern woman. The modern woman is employed, career-conscious, and struggles to balance a wide variety of demands, including a complicated life work balance. Also, the modern woman is interested in new products. ICT definitely belongs here.

Thus, it is no accident that the magazines studied by SIGIS – *Donna Moderna* (Fortunati 2003), *Femme* (Hestflått 2003), *Libelle* (van Slooten 2003) and *eVenos* (MacKeogh 2003a) – have the ‘modern woman’ as their target audience. This is evident from the way the editors motivate the content of the magazines, but also from the design strategies underlying the web pages and the implicit assumption that women readers have the skills needed to find and read the magazines. Basic ICT competence is taken for granted, but on the other hand, the web pages are generally designed to be easy to use.

Some of the magazines offer opportunities for readers to develop their skills further. For example, *Libelle* has a forum where one may ask questions about computer-related problems. This opportunity is utilised by quite many women. Also, the magazine offers information about computers and computer jargon. A different strategy was pursued by the *Donna Moderna* magazine, which utilised the printed version to offer information about computers and the Internet to increase the level of computer literacy among its readers.

However, in relation to skills, the main importance of the web-based women’s magazines has been to offer motivation and opportunity for its readers to become more familiar with the use of the Internet as a source of information and learning as well as a chance to interact with other readers. All four magazines offer options for interactivity through various types of forums where readers in a way create their own content and in a continuous way. In fact, it seems as if these forums provide motivation to log on to the magazines’ websites more frequently than changes in the editorially provided content. Consequently, they play an important role to motivate self-learning among the users of these websites.

As expected, the majority of the users of these websites are women. However, they are not women-only spaces. Some men do also read these magazines and participate in the forums, even if they are intended as women-centred. Probably, this is due to the possibilities of flirting and dating through some of these forums.

In the *Femme* case study (Hestflått 2003), a comparison is made between this online magazine for women and the websites of two PC magazines with an audience mainly of men. Of these three magazines, only *Femme* offered interactive services. Arguably, this meant that *Femme* socialises its readers to become skilled users of the Internet, in particular by enhancing the kind of competence needed to communicate through computers by text and signs. On the other hand, the PC magazines socialise

their readers to become skilled users of different ICT gadgets by providing technical information that may be downloaded from their websites. In both cases, opportunities of self-learning are offered, but with rather different emphasis and corresponding to rather traditional gender stereotypes.

A safe haven? Networks for women in ICT sector

While the web-based magazines for women are commercial enterprises, there are web-pages intended for a women audience emerging from voluntary initiatives. The SIGIS project did several case studies of such web pages. The *Lupus* case (Fortunati and de Luca 2003) analysed a web site – www.Lupus.it – where health information and the possibility to interact with a focus on a particular women's illness are the main appeals. The web site gives information about a rare disease called 'lupus eritematosus', which mainly affects women and especially young girls. Even doctors know little about this ailment, so internet has become a precious place for obtaining knowledge. Since lupus is so uncommon, the site has also become a place of formation and development of a virtual community, prevalently of women, and with complex forms of sociality. The survey done as a part of the analysis of *Lupus* (Fortunati 2004) shows that the women's use of this web site had meant a kind of self-inclusion that had raised their level of competence in the use of computers and internet considerably.

Several other case studies focussed on organisations intended to provide opportunities for women to network with other women working in the ICT sector, also utilising the Internet for communication. These organisations have been established at least partly to fight what is perceived as gender discrimination in the ICT industry. Thus, when looking at these initiatives, we study inclusion strategies with an outspoken gender politics.

Untold (Pitt 2003) is a recently formed organisation in the UK, which emerged as a reaction to the under-representation and invisibility of women in the field of digital design. It started as an exhibition of women digital designers at the Institute of Contemporary Arts in London in the summer of 2002 and has evolved into a community and a forum for discussion on a variety of issues relating to gender and technology. *Untold* responds to the discrimination of women by offering women digital designers a platform to display their work and share experiences of working in the field.

For these purposes, *Untold* has a web-site that presents information about women designers and their work. This homepage is meant as place where visitors may familiarise themselves to these women's efforts and capabilities. In addition, *Untold* hosts meetings where guest speakers talk about key ideas around gender and digital design. Also, the organisation has hosted social networking events to help women managing their careers

more successfully. Thus, the SIGIS case study of Untold identifies the need for inclusion initiatives that provide space for increased visibility as well as opportunity to share and reflect upon problematic experiences in order to empower individual women working to succeed in the ICT industry.

The *WITI* case study (MacKeogh 2003b) presents a similar need. It analyses the establishment of an Irish branch of Women in Technology International (WITI). This organisation exists also in North-America, Australia and UK. It operates as a professional self-help group, trying to support women to fight gender discrimination in the ICT sector. Such discrimination was felt by many members to be stronger in this industry than elsewhere, and in general, they felt working condition as unfriendly to women.

In this case study, WITI members have been asked about their assessment of women's situation in the ICT industry and what kind of contribution they wanted from the organisation to support improvements. While many saw it as important to lobby for improvements in the working environment, the women mainly called upon themselves to solve the problems. A preferred strategy was to appropriate skills traditionally perceived as 'masculine', like competitiveness, aggressiveness and skills at politicking, to cope more successfully with the demanding work environment. Even if they saw their problems as structural rather than individual, WITI members seemed to go for individual strategies, maybe because this approach appeared as more realistic.

Untold as well as *WITI* exemplify how networking of women may provide support and even empowerment to sustain individual efforts to succeed in the ICT industry. However, the two case studies also show the temptation to go for gender mainstreaming. WITI members want to be able to compete with men colleagues on what we normally would consider as masculine terms. *Untold* provides space for the display of women's design, and its ideology emphasise the need to provide for feminine approaches to design. However, success depends on being able to communicate also with men and thus on the creation of spaces that may be consider as gender neutral. Thus, the women-centred space needs to intersect with a space that works as cross-gender.

Designing for women only

For at least two decades, the computer industry and the ICT sector have been criticised for making products and systems that are 'made by men for men'. In the last few years, the prime example of this has been computer games. To play such games has been considered as something only boys and young men would do because the games had been designed to cater for masculine interests only. This has lead to a demand for computer games also for girls and women. Similar strong requirements

have not been made for other ICT products, although some such ideas have been forwarded.

Anyone who has entered a toy store or viewing commercials for toys will know that in their packing, such products are gendered more visibly than any other products besides underwear and cosmetics. From this perspective, the demand for computer games for girls seems obvious. Stewart (2003) shows that there is in fact a quite broad interest in designing computer games for a female audience. The company analysed in this SIGIS case study has produced a series of 'girls' games', entertainment CD ROMs for early teenage girls. Their design strategy seems to follow a well-established tradition within the toys industry, namely to work from a rather dualist set of gender stereotypes. Boys and girls are perceived as different types of users of games and play. They are assumed to have different interests and play styles and different patterns of consumption of computer and video game entertainment. Boys are seen as being into a high-speed interaction style and a common 'dark' and 'digital' aesthetic. Girls are believed to prefer more cooperative play, not only competition. They supposedly like environments to explore at their own pace, not to be pressured by goals, rules and a ticking clock.

Design also works from the idea that boys and girls have different preferences in terms of themes and content. To construct games exclusively for girls, the company drew upon themes like the secret diary, the pop-star emulation game and the game of being in love. They also used a particular aesthetic with very pink, cartoon-like and irregular shapes, taken from widely read girls' magazines. In this manner, Stewart (2003) demonstrates the possibility of transferring design strategies from the toys industry to computer games. The company considers this strategy as reasonably successful in economic terms; they have found a profitable market.

This design strategy works from a clear-cut dualist understanding of gender, drawing upon a traditional stereotype of 'girl' as the main source of ideas and criteria. Other companies studied through SIGIS have proved to be reluctant to accept this point of departure. A very interesting example is the case study of Philips' effort to make an electronic game for girls aged 7-12, called KidCom (Rommers et al. 2003). It gives important lessons about the complications that may be experienced.

To construct KidCom, Philips pursued two main strategies. First, they put a lot of effort into developing a methodology that could provide reliable information about what girls in the chosen age group could be interested in. Second, they tried to reach girls by aiming at a common denominator of 'girliness'. An important goal of the design process was to define in what ways girls 'are' different from boys. Gender differences between boys and girls were constructed from designers' own views and experiences, literature, expert advice and the feedback designers got from

the children with whom they tested the concepts. This contributed to making KidCom into a communication device, rather than a game.

Rommes et al. (2003) show that the design team behind KidCom succeeded in making a toy that was popular among its intended audience. However, Philips decided in the end not to put the product on the market, partly for technical reasons but also because it became too expensive. Moreover, the company went through a cutback operation at that time.

It is interesting to note that the design team behind KidCom discovered that girls did not want the pink look that the designers suggested. They rather preferred darker colours and less childish shapes. However, the design team stayed with pink and 'round shapes', saying that they wanted to satisfy the parents. Thus, assumptions of what parents would prefer made the gendering of KidCom more traditional than it otherwise might have been. Anyway, in the final instance, both the KidCom case study and the Boys and girls are into play-case study exemplify how female gender stereotypes are made use of in efforts to design ICT particularly for girls. Consequently, there is no outspoken effort to challenge these stereotypes; rather, they are reinforced.

A crucial issue here is in the choice to work from differences between girls and boys. Alternatively, one could have pursued the option that there might be a lot of overlap between tastes and interests, to provide designs that could be considered cross-gender. Kerr (2004) shows how young women, when introduced to computer games, find these games quite entertaining, even if they are critical of some 'boyish' aspects. In their study of Norwegian computer game designers, Gansmo et al. (2003) found that the designers were quite concerned with girls and women as a potential market, but also that they expressed the view that women are much more into the playing of computer games than usually assumed. Thus, men and women may not be that different.

The Norwegian game designers emphasise the need to find a good story from which a computer game may be constructed. A main issue is quality. The ambition of the game designers was to make better games. They believed that higher quality also was the key to enrol more women game players. Thus, they were not concerned with designing games particularly for women. Rather, they were sceptical to this aim, partly because they previously had experienced failures in this pursuit, partly because they believed in alternative strategies (Gansmo et al. 2003).

These alternatives, in addition to the emphasis on quality, were based on the idea that a variety of tastes and interests could be catered within the same game. For example, one could add more women role characters in the game, or offer a greater variety of activities that included 'feminine' as well as 'masculine' options. Thus, the goal was to design cross-gender games, rather than games specifically for girls or women.

It seems reasonable to assume that cross-gender strategies generally are more attractive than going for design either for men or women. At least from the perspective of finding the largest market possible, this choice seems to be logical. Moreover, it may not be that easy to design ICT products either for women or men. If one works from dualist gender stereotypes, one may find a lot of criteria that allows the design to pursue the stereotypes. However, in the end, the stereotypes may not be all that attractive.

The challenge is well illustrated by the *TILAB* case study (Fortunati and Manganeli 2003). It analyses efforts to include a concern for women among designers at Telecom Italia Lab. They are working to design the mobile phone to emerge from the transition from GSM to the new UMTS system. The task to translate 'femininity' into a new generation of mobile phones proves not to be easy. Telecom Italia are challenged to think about gender because the spending power of women in the area of mobile phones has increased considerably. This results in the introduction of more women as participators in the design teams working at the lab. However, the main strategy appropriated by relevant actors is to focus on how to get women to appropriate new mobile phones more quickly.

Designing for women only does not seem to be the preferable strategy to change the conditions of design of ICT. Ideally, designs should be for everybody. However, as shown by the case studies referred above, gender sensitivity may be important under any circumstance. 'For everybody' means to be concerned with tastes and needs of heterogeneous groups of men and women. To design for women may in fact mean to design for some women. 'Women' is not a relevant category of design in all circumstances; neither is 'men'.

Does feminisation work?

The referred SIGIS case studies show that to create women-centred spaces may be effective to achieve inclusion. For example, to be allowed women-only training in ICT seems to be very important to some groups of women. Empowerment and support through women-only networks may obviously be quite productive in the fighting of a culture of work that generally put women at a disadvantage.

Having said that, SIGIS findings make us question the fruitfulness of the cyberfeminist idea of claiming ICT, or particular ICT domains, as feminine. The main problem is in using categories like 'feminine' or 'women' as singular categories. When we look closely at the case studies of women-only training initiatives, we see that they are not simply women-only. The target groups for the initiatives are some groups of women, but by no means all. The networks were not for all women, but rather for the small number who try to make a career in the ICT industry. Even the web-

based women's magazines were not really intended for all women. Their main readers were thought to belong to the category of the 'modern woman'.

Thus, we may learn that the construction of women-centred spaces in many situations represents an inclusion strategy with a more particular focus. Seemingly, the spaces are made for 'women', but when we analyse them, we see that they really are made for sub-categories. This is important, because it marks a break with the dualist dichotomy of women versus men, feminine versus masculine. The construction of women-centred spaces is mainly about the provision of a context where groups of women find other women like themselves, with which they may exchange experience and learn, not because they belong to the large category of 'women', but because they belong to a more specific and identifiable group. It may be a good idea to gender ICT consciously, but gendering should then be done with reference to a spectrum of femininities and masculinities.

A different set of problems emerges from the strong tendency observed in the case studies where the efforts of gender-specific design frequently tend to use gender stereotypes as ordering devices. The use of similar stereotypes may also be seen in cyberfeminist texts, which raises the question if stereotypes are acceptable as long as they are used for a good purpose. The evidence from the SIGIS case studies is a bit mixed, but it remains clear that design based on gender stereotypes is not always serving a good purpose nor helpful to achieve inclusion. Some further insight into this problem may be gained from a study of a Norwegian campaign to recruit more women into computer science.

Stereotype problems and the limits of symbolic redefinition

One of the most popular ways of explaining why many women have a reluctant relationship to ICT, and why so few choose to study computer science and engineering, is by referring to the so-called image problem of the field. This image problem has many facets. In the research literature of the 1980s, women's absence from computer science was seen at least partly as caused by the close symbolic link between this discipline on the one hand, and military interests and mathematical influence on the other. During the 1990s, the image problem was more and more often described as emerging from the symbolic identity between computers and masculinity, reinforced by the frequent reference to the hacker figure, which came to represent a practice with computers that seemingly appalled women. In addition, the ICT industry is often depicted as a stronghold of work practices and a skewed work life balance that is difficult to combine with family life and the raising of children.

The observation of such image problems frequently leads to the idea that it might prove to be a very efficient inclusion strategy to change the

image of ICT and computer science. One aspect of this could be to try to contribute to a symbolic redefinition of the technology, for example to undo or at least destabilise the frequently invoked symbolic identity between computers and masculinity. From this point of view, when such a redefinition is achieved, one will also have succeeded in including more women as users or students of the technology. This way of reasoning seems also to be in concert with cyberfeminist points of view.

An interesting example of an effort that utilises cyberfeminist rhetoric in an effort to perform symbolic redefinition, is the so-called Women and Computing Initiative (WCI) at the Norwegian University of Science and Technology (NTNU) in Trondheim (see Lagesen 2005). This initiative was started in 1996 to address the problem of a very low and declining rate of women students of computer science and engineering. Through the concerted application of a wide variety of inclusion instruments, the initiative succeeded in raising the share of women students from 6 to 38 per cent from 1997 to 1998.

One of the most visible instruments was a series of advertising campaigns, targeted at young women in upper secondary school. These campaigns – in the studied six-year period there were three versions – represented very conscious efforts to redefine the gendered symbolic content of computer science. First, the campaigns argued that computer science mainly was concerned with communication and people-issues, while technical aspects could be considered relatively unimportant. Second, working from dichotomous gender stereotypes, the campaigns maintained that women were in fact more suited to study computer science than men. This argument referred to the importance of communication and people-issues, central qualities in the traditional stereotype of women, but also to women's presumed pragmatic attitude towards technology, which made them more interested in the utility of new designs rather than being enthusiastic about newness, like the stereotypical image of men computer scientists.

Figure 4, which is the front page of the brochure made as the second of these campaigns, gives a visual impression of the message. The caption reads: 'Women make circles and men make squares. The universities want more computer science students that make circles'. The brochure contains claims that it has been made by young women from four Norwegian universities who have studied computer science. The text is shaped as a 'voice' from these women, which addresses young women readers directly, arguing why they should choose computer science. In between there are portraits of young women who study or have studied computer science and their direct statements about it.

This effort of symbolic redefinition may be evaluated in two ways. First, it may be criticised on a theoretical basis for its rather frivolous engagement with traditional gender stereotypes. Even if these stereotypes are used in the campaigns in quite untraditional ways to turn conventional value hierarchies on their heads, stereotypes may have quite problematic effects. Above all, they tend to limit the space of what may be considered as 'gender authentic' actions. Thus, the campaign could be read as an argument that a 'real woman' could not be interested in computer hardware or programming. Also, the advertising promoted gender dualisms that seriously limit the performance of gender for women as well as for men.

Second, the efforts of redefinition may be considered on the basis of how the advertisements were interpreted by the students. The results from an interview study (Lagesen 2005) showed that most of the women students had seen the advertisements. However, they claimed to have interpreted them mainly as an expression that NTNU really was interested to recruit more women to computer science. The actual content was generally claimed to be overlooked, maybe because it was seen as marketing and not as a 'real' message.

Whether the advertising campaign actually did harm through the way they invoked traditional gender stereotypes is unclear. However, there is no evidence to suggest that the advertising influenced the symbolic interpretation of computer science. If there was a positive effect, this was from the promotion of a much simpler message, namely that women students were very welcome.

The SIGIS studies of design of computer games and other toys (Gansmo et al. 2003, Rommes et al. 2003, Stewart 2003) suggest a different take on the issue. This industry definitely has a gender-related image problem, and there is no doubt that computer games by and large have been seen as a pastime for boys and young men. The dominant cultural interpretation has been that computer games symbolises masculinity. This is admitted by the designers that were interviewed. To some extent, they try to address the image problem by changing or rather diversifying the use of colours and shapes in the way products are designed and packaged. However, their main strategy to deal with the problem is through diversifying their products to cater for a more heterogeneous set of tastes.

Some companies try to design toys and games for particularly for girls, to supplement the products they already have and which are perceived to be mainly for boys. In the study of Norwegian game designers (Gansmo et al. 2003), we learnt that they opted for designs that they hoped would be more cross-gender and thus more inclusive, without targeting men or women explicitly. They also used the concept of quality as a signifier for this effort. To make computer games cross-gender was to them an issue of increasing quality, of changing the design practice, rather than trying to

change the symbolic meaning of computer games. This is still a gendering strategy, but it is rather different from the one we have labelled cyberfeminist.

Women rather than femininity

In the introduction, we presented a mobile phone designed for women. Given the fact that mobile phone ownership shows a small gender gap (Sørensen and Nordli 2005), this design move has to be understood as a strategy to compete for women customers, rather than to recruit new groups of women to become owners of mobile phones. Moreover, the gender gap that once existed has been closed without much effort of providing particular exclusion programmes.

When we look more closely at the domestication of mobile phones in terms of gender, we find that mobiles are integrated into a wide range activity for men as well as women (Sørensen and Nordli 2005). In this manner, we might say that mobiles are gendered through the ways in which it is associated with individual gender and thus has become one more material element in a large amount of individual gender networks (Lagesen 2005: 36ff). But the mobile phone as such is neither 'feminine' nor 'masculine'. Since it may be associated to a variety of femininities and masculinities, it has become a trans-gender artefact. From our point of view, to make ICT trans-gender, seems a fruitful aim of feminist politics. Creating feminine spaces should only be considered – at best – a step on the way.

We shall unpack the argument by referring to some important observations made by Helen Gansmo (2004) with regard to the so-called 'girls and computing' problem and the way this has been dealt with in Norwegian education policy. The 'girls and computing' problem seems to continue in Norway, despite two decades of active policy intervention to solve it. However, and that is important from the perspective of this paper, the problem has been transformed, not least because the meaning of 'computing' has changed in accordance with rapid technological developments. Originally, 'computing' symbolised activities such as programming and processing of numbers and words. The transformation of the computer into a technology of multimedia and communication have given computers a wider and more heterogeneous meaning, summarised through the acronym ICT. Accordingly, 'computing' has come to signify a much greater variety of activities than earlier. This includes activities traditionally perceived as 'feminine'. Thus, one should believe that ICT – at least for younger people – has acquired a trans-gender quality through an erosion of the previous dominant symbolic link to masculinity.

Gansmo's interviews with pupils in secondary school confirm this. Compared to the descriptions in earlier surveys (e.g. Håpnes and Rasmussen 1999) the gendering of computing has changed and has become more complex. This is related to a profound alteration of the understanding of computer technology and what it means to do computing. The basis for this change is surely enough that computers have become a completely ordinary tool which most people have access to, quite like the telephone and television. In this way, computer technology has been trivialised. There is nothing mysterious with how to make use of it, nor is there much reason for the lay person to be much interested in how computers work, unless you need that to pursue particular interests or tasks.

As a consequence, the comprehension of what it means to 'do computing' has changed. On the whole, none of the pupils interviewed said that they were 'into computing'. True, computers were frequently being used, but that was described as being involved in different kinds of activities, such as computer games, chatting, downloading music, gathering information or schoolwork. In this way, the concept of computing has been transcended. The focus on technology that has dominated, with the computer as the main signifier of the actions, seems to be losing ground in relation to a focus on particular activities. The teenagers told that they played, chatted, sent e-mail, etc. Thus, when prompted about their use of computers, they made very concrete response about particular forms of applications:

Computing is boring. (...) In school we were taught were all the keys are. Then I went home, went online and spoke to other people there. The only thing I need computers and the Internet for, is to send e-mail and stuff like that. I do that a lot. Have sent really many lately. My father told me in so many words, that the bill got so big that I had to take it easy. So, now I only send about two every day. I e-mail those I got to know through the Internet and stuff. I went online and into one of those chatting programs. There you can talk to them and then you get to know them. And then I e-mailed Australia and stuff (Gansmo 2004:200).

Here, there was no difference between boys' and girls' evaluations. Nor did the teenagers see any general gender differences when it came to interest, time spent or skills. Gansmo's informants indicated to her that it is no longer obvious that boys are more interested in the use of computer technology than the girls, even if there may be a difference in aggregated terms. Moreover, the teenagers understood interest as a product of an individual choice. In principle, there is nothing that should prevent girls from being expected to be heavy computer users and to have an enthusiastic relationship to the whole spectre of applications.

When that has been said, we have to keep in mind at the same time that still, far more boys and men are actually computer enthusiasts. Norway's biggest computer party, 'The Gathering' held in the Viking Ship

at Hamar, has 4-5000 participants, and the number of women is about 10-15 percent (Nordli 2004). Here, according to interviewed participants, activities considered relatively 'feminine', such as chatting and web-design, are valued as less demanding and prestigious than activities considered more 'masculine', such as computer games and programming.

Thus, problematic characteristics of the way ICT is gendered have not disappeared. Rather, the gendering has become more complex and heterogeneous and less consistently troublesome. Gansmo's (2004) interviews with pupils in Norwegian secondary school show that these teenagers are careful to avoid the use of dichotomies and stereotypes. A number of them are expressing a fundamental scepticism towards such ways of understanding gender. Still, stereotypes and dichotomies slip into their discourses, and the 'girls and computing' problem is not completely resolved. But if efforts were made to provide 'feminine' ICT spaces for these girls, they would probably resist it on the grounds that underlying definition of femininity would be too narrow to cater their needs. Probably, ICT is sufficiently trans-gender to allow many girls to use computers for a wide variety of purposes, without experiencing their activities as troublesome to their performance of female genders. They are young women, but they feel they do not belong to a singular feminine stereotype.

Heterogeneous gendering!

We introduced this paper by noting that the critical point about artefacts having gender, previously introduced by feminists, now have been appropriated and made trivial by large international companies as part of their marketing strategies towards women. While the irony of this move should not be overlooked, the observation was mainly intended to introduce greater caution to the analysis of gendering of technology. What we observe in the two examples is the use of a highly stereotyped notion of femininity.

As a political project, cyberfeminism has tried to pave the way for more women as users and designers of ICT by claiming ICT – in particular the internet – as a feminine space. In doing so, they also utilise highly stereotyped notion of femininity – and of masculinity as well. A good cause may serve as a reason, but in this paper we have tried to show through empirical analysis that the cyberfeminist strategy is a mistake. While the construction of what we have called women-centred spaces offer considerable advantages, in practice such constructions are not made to cater for all women. They usually address particular groups of women that have particular needs and characteristics.

In fact, as we have tried to show, stereotypical feminine spaces are not perceived as attractive by women. Rather, they seem to be attracted by observing that ICT is trans-gender, that women as well as men engage in ICT practices, and that these practices are integrated in a variety of femininities and masculinities. ICT still becomes gendered, but in a diverse and heterogeneous manner. It is not a manner of ICT being either 'feminine' or 'masculine', but in a sense both and none of them. As long as everyday practices tend to be gendered, so will artefacts. But not in a dichotomous fashion.

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