There is a *mass* of women missing from ICT. Let's bring it in!

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ABSTRACT
This paper is a reflection on some of the ways we represent the relation between women and ICTs. I claim that since such ways serve as frames for representing reality in certain ways, their content consequently matters for orienting the directions for social change. Thus specific contents will orient change in specific directions. In particular, I am interested in one argument that insists that once a *critical mass* of women is present in ICT domains, these would become *gender-authentic* and so their *masculine image* would cease to exist. I want to see how such argument represents women, ICTs and their relation, and how it delegitimizes other alternative representations that it as such opposes.

Keywords
Critical mass, gender authenticity, masculine image, SIGIS.

INTRODUCTION
The question of women and technology is 'sexy'. Zoë Sofia (1999) understands this sexiness as the result of the often-uneasy intersection between attempts to critically reconsider technology and to voluntarily insist that technology is a place for women too. She further suggests that the sexiness of a topic has something to do with transgression, bodies or pleasure, and rejection of past loyalties (65). Here I explore the kind of transgressions, pleasure and betrayals prompted by some particular views on women and technology.

Technology never ceases to be the last hip thing, being, and mode of existence. Technology seems to evolve at a rate never known by organic species, and thus turning into probably the most organic of all species with the fastest rates of birth, death and adaptation. Technology is everywhere, but most of it in powerful and rich hands that are seldom women's. There are issues of power and knowledge that technology embodies at its best. Surveillance of bodies, monopoly on the quality and amount of information, postcolonization of cheap labour force, or what in short has been called 'the informatics of domination' (Haraway 1991).

The technological world we live in doesn't carry on by the principle 'take it or leave it'. Our immersion in technology is so cunningly sophisticated that it can be apparently dealt with only in quantitative terms: the extent to which one is a result of technological mediation or enhancement doesn't allow one to simply step out of and naively reflect on our technological lives. Hence one can have or be 'more or less' technological but never 'either, or'.

This quantitative 'more or less' has however also a qualitative substratum. The fact that some actively benefit more than others due to access to technology adds an ethical dimension to our technological relations. Benefit and access are the two key words reiterated as the problem and resolution to women's absence from technology. The access to technology that women have been denied and which needs to be facilitated is argued on the basis of the social benefits that technology sustains. This strangely appears to be a quasi-deterministic view on technology. Although aware of the impossibility of technology to merely determine our lives, we are nevertheless encouraging women to sign up in greater numbers for technological futures. There seems to be at least one immediate dimension of technology that determines our conduct: it has a potential for what we understand to be the betterment of our lives.

This paper explores the causal relation between some views on technology and gender, and the design for social change. In other words, I interrogate how specific understandings of technology and gender lead to specific visions of the future; and the other way around, how specific directions for social change shape our understanding of how the social relations that need to be changed are constituted. To illustrate this reciprocal process in connection to the issue of women's absence from technology, I choose to focus on one set of claims that problematize women's absence from ICTs. These claims sustain the idea that the image problem ICTs have due to the identification of computers with masculinity, can be overcome by increasing the number of women in the field (Sørensen 2004). This further means that the image redefinition of ICTs would be an immediate consequence of the presence of more women in computing and not the other way around. "[S]ome sort of critical mass needs to be reached – and be seen to have been reached – in a previously male-dominated technological field before entry becomes a 'gender authentic' rather than gender inauthentic option for girls and women" (Faulkner 2004: 27). The image problem, according to this line of argumentation is a matter of numbers and not necessarily

one that resonates with the symbolic association of ICTs with masculinity.

This argument is subsumed, according to the mentioned authors, to a wider theory about gender and technology – 'the co-construction' and/or the 'co-production' of gender and technology. This paradigm insists that the meaning of both gender and technology are constructed thus flexible and, consequently, rejects any claim about inherent properties of either gender or technology. In more detail, according to such an approach, there is nothing natural about women's lack of technical skills; there is nothing inherently masculine about technology and so on. It appears then that the gender-technology co-construction model is affirmed against any other claims that would argue for gender specificities in relation to technology, on the assumption that such gender specificities could reinforce binary gender stereotypes.

What I plan for myself to do in this paper is to crack open and disturb the tranquility, in John Caputo's definition of deconstruction (1997: 32), of this argument that links the idea of critical mass with the field of ICT becoming gender authentic for women. What interests me is to show how the possibility of such argument is sustained by its very impossibilities (ibid.), by the very ideas it denies. In the field of feminist policy studies, the concept of 'critical frame analysis' (Verloo and Lombardo 2007) is used as a deconstructive method to identify 'which voices (perspectives and experiences) are more regularly included or excluded from the possibility of framing policy problems and solutions in official texts' (idem: 34). My most important question then is: What are the perspectives set aside as incompatible with the inclusion of women into ICT illustrated in the above discussed arguments to gender and technology? In a deconstructive vein, I aim to show that the very opposition equality vs. difference, or constructed vs. essential is a construction in itself, and, as Joan Scott (1990) argues, its content is dependent on the purpose it serves and the context it functions in.

DESCRIPTION OF THE PROJECT

The broad context of my topic of investigation is the European transnational project SIGIS – Strategies of Inclusion: Gender and the Information Society[1]. As the name indicates, this is a project that problematizes women's absence from ICT fields by evaluating various strategies of inclusion that have been already implemented in various European countries. In more detail,

[The] project conducted during 2000-3 […] analysed 30 such initiatives and related processes of inclusion. The aim was to study the strategic features of inclusion, partly to learn from relative successes, and partly to provide a knowledge base to support and encourage development of new inclusion efforts. This knowledge goes towards safeguarding the development of an information society for all, and to improve the chances of commercial success of commercial ICT projects.
The case studies cover education, training, and support networks for professional women in ICT sectors; training and empowerment of the social excluded; design of new products, including mobile phones, web publications and games for female audiences; and experiences of ICTs and the meanings that they have for men and women in everyday contexts. The analysis of these cases will help policy makers, businesses, NGOs at local and national levels, and individuals deal with the challenges of new and not so new technologies. They illustrate the diverse ways that women and men think about and use new technologies, and the continuing imbalance in the employment of women in this most dynamic sector. (http://www.rcss.ed.ac.uk/sigis/)

The project thus critically presents a number of case studies from 5 countries (Ireland, Italy, the Netherlands, Norway and UK) and assesses their potential as future social policies that can facilitate women's presence and participation in the Information and Communication Society. In one of the final reports titled "Gender and Inclusion Policies for the Information Society", Knut H. Sørensen (2004) evaluates the strategies employed in all of the case studies. Some strategies are eventually pointed out as being more efficient than others in reaching the proposed goal. According to Sørensen, the project delineates four major categories of inclusion strategies by the name of: (1) Women-centered spaces; (2) Symbolic redefinition; (3) Relative numbers of women; (4) Resources for learning. Among these, this final project report concludes, symbolic redefinition is the least likely strategy to bring about visible results in terms of increasing the participation of women in ICTs.

According to Sørensen, "the image [problem] model" is one of the models that were used in some of the case studies in order to explain women's exclusion from ICTs. Those making use of this model, "see exclusion as produced through the symbolic link between masculinity and ICT, which makes the design and use of ICT gender-inauthentic to women." (31) Thus one of the preliminary hypotheses of the "image model" is that dismantling the symbolic link between masculinity and ICT could respond to a process of exclusion that gets perpetuated through an image model. In this view, once the symbolic redefinition is completed, the strategy would have reached the goal of including more women as users and designers of ICT products. But this proved simply not to be the case. Sørensen (ibid.) points to the case *Squares and Circles* (Lagesen 2003) where, he and Vivian Lagesen conclude, the attempts to redefine the symbolic could not be ascertain to be one of the causes for the raising number of women students.

The *Squares and Circles* case study described by Vivian Lagesen (2003, 2007) refers to the "Women and Computer Science" initiative started at the Norwegian University of Science and Technology (NTNU), Trondheim, in autumn

[1] However, I refer throughout my paper also to academic articles which came out from the SIGIS project and which keep in line with the theoretical commitments of the project.

1996. The initiative was a response to the number of women in ICT higher education dropping from 20% to 6% in the period from mid 1980s to mid 1990s. The campaign employed three inclusion instruments: a quota for women; an advertising campaign that aimed at putting an end to the masculine image of ICT; and various measures that targeted more or less the educational aspect of computer science (Lagesen 2007: 73). In the spring of 1997 the number of female applicants doubled, so the campaign was considered to have reached its goals.

I will further look only on some parts of the advertising campaigns, as presented by Lagesen (2003), since they supposedly are the only instruments that targeted the symbolic of the field. The first advertising material is a screen commercial called "Tom and Linda". It starts with a picture of Tom: "When Tom started the computer science program he used one hour to get himself into the database of Pentagon. Today it takes him only ten minutes. Well done, Tom!". The image of Linda follows: "Linda knew nothing about computers. Today she talks to people, analyses problems and solves them. Besides, she can get into the database of the pentagon – if she wants to". The commercial ends with the following message: "The computer science program is more about human beings, than about machines. NTNU wants more women to computer science."

The second advertisement, made one year after the previous, consisted in a pamphlet and a postcard, which were sent to upper secondary schools. They both had in common a stylized image picturing one man standing beside a square and one woman standing beside a circle. The message wrote: "Women make circles and men make squares. The universities want more computer science students that make circles." Also, inside the brochure, the human aspects of computing, as opposed to the abstract technical ones, were emphasized as making up a significant part of computer science, which should determine women to become more interested in computer science.

As both Lagesen and Sørensen evaluate, it appears that the means (i.e. advertisements) employed for changing the symbolic of computer science, did not really influence women's choice to enroll as computer science students. It seems that women made this choice due not to the influence of advertisements that emphasized the field in need for more feminine abilities and competences such as communicative and interpersonal skills, but they simply responded to the general message that women are welcomed. These findings were drawn from a set of interviews that Vivian Lagesen made with 10 female students who applied as a result of the campaign and who were at the time of the interview in their fourth or fifth year (2007). Lagesen concluded that the symbolic redefinition strategy in the *Squares and Circles* could not be linked to the increasing number of women students, and thus the strategy was dismissed as an adequate tool for solving the image problem of the field. More importantly, this strategy, the authors insist, makes use of gender stereotypes that maintain an unfortunate gender dualism, which might have put off or perhaps fortunately not reached the women who enrolled in the program. I will discuss later in the paper the danger that gender essentialism poses for redefining the image of the field.

An alternative to such symbolic operations is reaching a 'critical mass' of women in male-dominated fields in order to reshape the image problem of ICTs (Sørensen: 33). As soon as a critical number of women are present in a certain domain, that domain will be perceived as favorable to women. In the *Squares and Circles* case, the inclusion instrument that directly led to an increase in the number of women was the quota i.e. the number of places reserved to women students for instance at the computer science department. The quota was also supported by other already mentioned measures that made women enroll as computer science students.

The 'critical mass' or 'relative numbers' do not point up mere procedures of counting and adding, Knut Sørensen argues (34). It is not a simplistic liberal principle that seeks to describe the exclusion of women in terms of numbers (Lagesen 2007: 88). However, as Lagesen continues, "the point is that a numerically weak position of women frequently seems to produce a symbolic image of the discipline as 'masculine', which in turn may reinforce the minority position of women. Thus, increasing the numbers will facilitate changes in the gendered symbolic image of objects or fields, at least by obscuring the gender-related images. In turn, this seems to produce more space and freedom for the minority group, in this case women". She calls the number of women needed to change the image of ICTs, a "degendering mass" (ibid.).

The concept of 'critical mass' also explains, Sørensen argues, the ways a minority i.e. the women already present in a male-dominated ICT field connects to the idea of gender authenticity. The presence of a woman role model who took on a role traditionally perceived as masculine may change the perception of the small relative numbers as a reason for ICT being gender inauthentic. That is to say that even though the number of women in ICT is small, it is enough that few successful women exist and become *visible* for the image of the field to change. This strategy, of bringing successful women to promote the importance of having a career in ICT to prospective students was used in NTNU campaign and also in few other SIGIS case studies. As Sørensen puts it, "this strategy tries to simulate women as a non-minority and thus their choice of career as being gender authentic" (2004: 34). Another way to simulate women as non-minority is the construction of women-only spaces, where "the relative number of men and women is changed radically and thus creates the impression as women as 'natural' users and students of ICT' (ibid.). This strategy was implemented in the 'Women and Computing Initiative' at NTNU in the form of a women-only computer lab, *Cybele*.

There is also another reason for arguing that symbolic change is not the strategy that could fix the image problem of ICT. In several other case studies covered by the SIGIS

project, women asserted that they cared less about the association between ICT and masculinity and more about work conditions and the ways in which they could cope with realities of the glass-ceiling phenomenon, inflexible hours of work, self-assertiveness and competitiveness as important attitudes required in various ICT workplaces. Women were more concerned with the ways of dealing with this 'hardship culture', than about ICT jobs being said to be masculine. As such, Sørensen's report operates a distinction between 'masculine hegemony' and other more 'pragmatic' issues as aspects of the image problem of ICT (idem: 36).

But probably the most repudiated weakness of the symbolic redefinition as an inclusion strategy is the employment of gender stereotypes. The advertisements in the *Squares and Circles* case study put emphasis on feminine features such as, for instance, the ability for interpersonal communication, in making the point that these features have been absent from the field concomitantly with the absence of women. Vivian Lagesen's (2003, 2007) analysis of the above mentioned Norwegian campaign is critical of one of the explicit goals of the advertising campaign, namely including such supposedly feminine characteristics as a mechanism of changing the image of the field. Lagesen draws attention to the strategy's tendency to naturalize feminine gender and to assign specific attributes to women only because they are women (2003: 3). She is discontent with the lack of any assumption that women need to be changed. Quite the opposite, she holds that "the essential and quite traditional qualities ascribed to women are used as arguments to get more women into computer science […] They are thus invited to take part in the computer science profession, not because they really are interested in computer science, but rather because of some female essence" (idem). In this sense, the fact that gender and technology are co-constructed is not something that the message of the advertisements seems to convey. In Lagesen's views, while the campaign questions the masculinity of computer science, it is not so evident that women are in need for change, too. In her own words, regarding one of the advertising images, "the circle and square-images can be seen effectively dichotomising and freezing gender in quite strict terms. In other words we can say that gender seems to remain a constant here, at least when it comes to women, while ICT and the culture of computer science are featured as objects of reshaping. Female characteristics are ok, ICT is not - and boys are a lost case!" (2003: 18).

To go over the main points, interpreting the SIGIS case studies results, Knut Sørensen's final report concedes that the alleged image problem of ICT is hardly altered through a symbolic redefinition of the field. The image problem may be more connected to the relative numbers of women than to a symbolic correlation between ICT and masculinity. If a critical mass of women is reached within those areas previously or traditionally dominated by men, the areas in question will be perceived as gender authentic to women. There are two major criticisms directed against the symbolic redefinition as an inclusion mechanism. Firstly, it cannot be easily decided whether there is a causal relations between symbolic operations and the more women entering the field. Secondly, symbolic redefinition, with the aim of changing the image of the field as related to and defined by various masculine characteristics, makes use of static representations of gender. Often the strategies that employ symbolic reinterpretation instruments do so in the attempt to balance the masculine aspects of ICT with feminine ones that had been said to be inappropriate for carrying out computer activities. However this move puts emphasis on stereotypical images of femininity that as a result might yet again congeal ICT as masculine and gender inauthentic for women. In contrast, achieving a critical mass would switch technology from a particular masculinity to something cross-gender or trans-gender (Sørensen 2004: 37). A simple handling of stereotypical gender images would do nothing but provide men and women with a limited spectrum of possibilities whereas getting beyond gender binaries would result in a more individual freedom and diversified experiences (ibid).

What interests me in the following section is what of the social world is represented in the concepts of 'image problem', 'critical mass', 'gender authenticity' and 'symbolic redefinition' and how. What does the use of such concepts create as an unjust vs. desirable social reality with regard to women and ICTs?

ANALYSIS

It seems then that one of the explanatory frameworks for why women are absent from ICTs invokes a certain image that ICTs have due to their association with masculinity. This image is reckoned in turn to be an effect of the (visibility of) physical absence of women from ICTs domains. It follows that to alter the effect is to alter the cause is to aim at increasing the number of women in the field. Once this critical number of women is reached, the association between masculinity and ICTs looses its empirical ground.

This is how we should logically expect the presence of a *critical mass* of women to turn ICTs into *gender-authentic* domains for women and as such to short-circuit the masculine image problem. The empirical ground for this argument needs to rest then on the physical bodies of women. If the masculine image of ICTs is dissipated once a certain number of female bodies become visible, it must be that the masculine image is determined by the predominance of male bodies. Vivian Lagesen makes this connection quite explicit, arguing that a *degendering mass*, that is women being present in a specific percentage, would correct the reality which "may seem *prosaic, but true*; when men dominate a field numerically, the field is coded as 'masculine'; when women dominate, the coding becomes 'feminine'" (2007: 88; my emphasis).

This *prosaic* character of reality could at this moment point to two distinct things. Prosaic can mean *merely descriptive*, an ordinary account of things as they are in our absence or as they are for us. There is nothing interesting about the

fact that the fluffy animal that purrs is called *cat*; however it doesn't cease to be a pragmatic truth – it facilitates communication. In Vivian Lagesen's sentence *prosaic* stands against diversity in expectations and experiences. *We* might think and hope that the relation between women, men and technology is more complex, but the *truth* is that at least the common perception of this relation is trouble-free. The number of men in a field determines the 'masculine' label of that field. My question is who this *we* who is being interpellated to witness the truthfulness of prosaic things is. This takes me to a second dimension of the term *prosaic*.

It is *the prosaic* as in mundane, commonplace beliefs and practices that make the objects of various feminist and other critical analyses. Prosaic in this sense is everything that is taken at face value because it is presumed to exist with necessity. Women are assumed to be inferior to men due to their physical constitution, which causes a specific psychical structure and consequently a certain behavioural and intellectual outlook. Sometimes *inferior* is substituted by *different* on the way to justifying unequal distribution of civil and political rights. A while ago restless wombs were quite a prosaic explanation for denying women the right to education. Prosaic is what does not need a justification, often because it is secured as natural thus redundant regarding its verification. Hence a feminist intervention in the prosaic is quite often an epistemological operation of showing that what we take to be natural and necessary relations between men and women needs either further justification or is simply a result of an irremediably faulty argumentation.

It is indeed quite prosaic for many people that technology is a man's (masculine) thing given that so many men are involved with technologies both as producers and users. But Vivian Lagesen wants to compel us into accepting that this prosaic reality is nevertheless true at the level of commonsense judgments. An attempt that appears to be redundant since truthfulness at this level is, as I have already mentioned, a defining characteristic of the prosaic. It is at and into this level of commonsense beliefs that feminist and other kinds of critical interventions take place in order to defamiliarize the prosaic. Lagesen insistence is, however, other than redundant. Lagesen's *prosaic* is not the commonsense *prosaic* but the feminist *prosaic*, which is the prosaic that has been revealed as fiction: for at least one category of feminists, to claim that there is a causal connection between what men do and masculinity has always been groundless; and it has for some time become quite prosaic[2]. When Lagesen says that the association between what most men do and masculinity is prosaic, but true, she interpellates those who understand that the association between what men do and masculinity is a fiction, but who despite that might want to consider the benefits of suspending the fictional character of such association. What she implicitly argues is that acting as if this fictional truth was not prosaic, that is, acting as if the prosaic had the status of truth, is necessary for thinking how to change the prosaic i.e. the necessary association between masculinity and what a majority of men do. The truth of such association is fictional for feminists but self-evident for the rest of the world, and it is the latter that apparently has to serve as the starting argumentative point for changing in this context the relation between women and ICT fields.

But why would we need to accept the prosaic as true at the level of commonsense? One reason is that the change that the *critical mass* effects as *gender authenticity* is at the level of perception, at the level of superficial association of masculinity with men with technology. Knut Sørensen tells us that "areas, activities and artifacts mainly populated by men *tend to be seen* as masculine" (2004: 41; my emphasis). Thus masculinity is seen, perceived, is something assumed to be connected to the visible male body. To claim that once a critical mass of women is present in the field the gender symbolism of the field would change requires to accept as unproblematic the fact that the masculine symbolism of ICT was constituted in the first place due to the presence of a critical mass of men. Both the premise and the conclusion present us with changes that take place at the superficial level of perception of the field. The implicit claim here is that there is nothing inherently or deeply masculine (thus gendered) about technology. There is no essential masculine way of engaging with technology; hence one cannot argue for an essential feminine way of engaging with technology. The masculine association with technology is at the level of perceiving many male bodies, thus the solution should act at the same level of the visible. But is it what you get always what you see?

In another note, a different outcome of taking at face value that the masculinity of the field is generated by the predominance of men entails accepting that masculinity is only what men do. This leaves on the margins the possibility of masculinity being a potentiality of the female body. But if female bodies can embody forms of masculinity[3] the very possibility of turning ICTs into *gender-authentic* fields for women becomes problematic in the sense that it concomitantly raises difficulties for the very idea or *critical mass*.

Talking about exclusion and inclusion we most often refer to women who are not present in ICT fields most probably

[2] Monique Wittig (1981), Judith Butler (1990), Anne Fausto-Sterling (2000), just to name a few, argue that there is nothing natural about sex, which ultimately becomes meaningfully divided into male and female due to prevalent heterosexual gender norms of femininity of masculinity. This means that no claims about the naturalness of the sexed body can be further supported, other than being explained through the pervasiveness of specific gender norms that make bodies intelligible as male and female.

[3] Which indeed carries out different signification than male bodies embodying similar forms of masculinity, as Moira Gatens argues (1996: 9).

because of their reluctance to getting and/or staying not necessarily into a male-dominated field, but in a field which indeed is said to be inappropriate for women. This reluctance is built at various ages, starting from a young age when girls are being told that technology is not for girls, and continuing at a later age when women with a technical education cannot face the 'chilly culture' (Faulkner 2004: 28) of technological jobs. So if indeed there is a *critical mass* that is not part of ICT, the only feature of this mass of women is, tautologically, that it is not present in ICT due to the chilly image of ICT. Besides that, the mass is quite heterogeneous with regard to its responses to the chilliness of ICT. Not all women consider technology to be gender-inauthentic for similar reasons. To argue than that a critical mass of women could turn ICT into a gender-authentic field for women requires a monolithic understanding of why women consider technology to be gender-inauthentic in the first place. Ironically, it is precisely such monolithic understanding of the category of *women* that Sorensen, Lagesen and Faulkner repudiate in their rejection of a stereotypical feminine redesign of technology, but which however is premised in the *critical mass* argument.

I will return now to the argument that links the change in the perception of the field to the change in numbers. If a change in numbers equals a change in the symbolic, this means that there is nothing *inherently* masculine about a field, but that the masculinity of the field is a result of a historical *association* of men with ICTs. More importantly then, this historical association had no impact on the content of the field, on the meanings, methods, concepts being used. In fact, Sørensen does show that there is nothing essentially different in the ways men and the women engage in various scientific practices, in terms of objective methods but also subjective values attached (1992). Irrespective of whether his findings prove or not the claim that there is nothing inherently masculine about a male-dominated field, this claim is nevertheless consistent with the idea that the masculinity of ICT is derived from the merely perceiving the existence of many male bodies. Which ultimately means not only that gender means sex, or that what is gender authentic for men is only what usually men do, but also consequently, when thinking about change, what is gender authentic for women must be what is not usual anymore only for men to do. And this is assumption that turns 'critical mass' into the most feasible instrument for achieving symbolic redefinition. Once a lot of female bodies are present in ICT, the field would cease to be gender authentic only for men, and its symbolic would change.

So far my line of argumentation led to two conclusions. To accept that when men dominate a field that field is coded masculine is to further accept that (1) masculinity is something that a male body *is*, and *does* with necessity, and also that (2) there is nothing inherently masculine about the interaction between men and technology other than the fact that there are men (male bodies) engaging with technology. At the same time the content of masculinity is *unspecific* for whatever men do is prosaically considered masculine.

Masculinity is then only the result of perceiving male bodies, thus an inferred necessary but unspecific quality of the male body, and not some sort of specific psychic identification that a body can take on. To sum up, there are two consequences of accepting *the prosaic, but true*: (1) That there is nothing specifically in the male body that makes it masculine; (2) That further on there is nothing masculine about the relation between men and technology, and to this extent about technology itself.

There is an important consequence of masculinity being merely an essential but unspecific property of a male body. It shows that what the critical mass argument takes as its premise, the contingent association between masculinity and a male-dominated field like ICT, allows for an immediate substitution of masculinity with male. For what then is the *masculine* field of ICT if not a *male* field? Masculinity then is in fact just another word for the same referent (or what the referent is doing). And since to claim that there is some specificity in which male bodies engage with things is to make determinist claims[4], it follows that masculinity has for the *critical mass* argument no analytic significance. This is coherent with Vivian Lagesen's rejection of so-called stereotypical uses of feminine characteristics in the *Squares and Circles* advertisements. No use of feminine characteristics could reshape the symbolic of ICT since this symbolic was not shaped by masculine characteristics to begin with. Although Lagesen argues against femininity on the basis of its potential to reinforce gender stereotypes, what I claim at this point is that logically the rejection of femininity is, in the economy of the *critical mass* argument, supported by the absence of any relevance of masculinity with respect to technology. Masculinity has no significance whatsoever in this argument, rather than being another word for an empirical, irrelevant, stand alone male body.

This last conclusion is supported by Knut Sørensen's argument that, in contrast to a symbolic redefinition of ICT by using gender stereotypes, achieving a critical mass would switch technology from a particular masculinity to something cross-gender or trans-gender (2004: 37). A simple handling of stereotypical gender images, he goes on, would do nothing but provide men and women with a limited spectrum of possibilities whereas getting beyond gender binaries would result in a more individual freedom and diversified experiences (ibid). This line of thought draws equivalence between the gender authentic technology to be found in the *critical mass* argument and a cross-gender or trans-gender technology. Gender authenticity then means either the mixture of gender symbolisms to the point of purging them of stereotypical

[4] This is my own assumption about the consequences of the *critical mass* argument, since nowhere its supporters argue for the idea of embodiment, of how specific bodies carry on specific activities and so on.

connotations or the operation of going beyond a sharp division between genders and their sex shares. But how can this cross or trans-gender technology state be reached if we consider the presence of feminine aspects of ICT as stereotypical? This is however possible if again, what Knut Sørensen means by gender is again sex, so that the presence of certain shares of differently sexed bodies in the fields of ICT is enough a condition for the field to become gender diversified[5].

To repeat, if what is masculine about ICT is the predominance of individual male bodies, it follows that there is nothing inherently masculine about men, about the relationship between men and technology, and lastly about technology. This allows both Sørensen and Lagesen to argue against the inadvertence of using gender stereotypes with the aim of reconfiguring the gender symbolism of computer science in the *Squares and Circles* study. Since there is nothing masculine about technology, how can one argue, for instance, for the relevance of feminine re-design of technology? If technology was never in a square shape, how can anyone argue for its circles? Good point.

Let me return again to the presence many male bodies out there in the field of ICT. If there is a potential critical mass of women left on the margins of ICT, and if what is masculine about ICT is the predominance of male bodies, there must be a specific reason for why there is a critical mass of men (male bodies) *in* and a potential critical mass of women (female bodies) *out*. If women's exclusion is to be explained in other terms than the masculine specificity of technology, the explanation has to reside in the sexual specificity of bodies[6]. Given that the two critical masses are at least at the level of perception sexually different, it must be that there is something in the way the bodies of women are lived that determines their exclusion. What I mean to point is that the rejection of any masculine specificity of (men's relation with) technology rests paradoxically on an acceptance of a bodily sexual specificity. If the idea of gender authenticity is defined as caused by numbers, this is made possible only in the concomitant *negation and affirmation* of sexually specific bodies. The negation derives, I repeat, from the fact that for the critical mass argument masculinity and the male body remain empty signifiers. But if then bodies mean nothing specific, how else can we explain the absence of such a critical mass of women if not through a sexual specificity, which causes and probably reproduces the missing masses? The exclusion of women is the exclusion of female bodies that needed/need to be specific in order to be excluded. Whether this bodily specificity is a constructed misfortune that needs to be rejected, or perhaps the opposite, a form of embodiment that has to be worked through its own contradictions, is not the area of my discussion here. What I wanted to point is the impossibility of denying the masculine specificity of technology without affirming the sexual specificity of (at least a large number of) women in relation to technology.

And isn't this what Vivian Lagesen implies when she holds that when the traditional characteristics assigned to women are used as arguments to get more women into computer science, "[t]hey (i.e. women) are thus invited to take part in the computer science profession, not because they *really* are interested in computer science, but rather because of some female essence" (2003: 3-4; my emphasis). Lagesen's claim that the use of stereotypes sends the message that women are not *really* interested in the field, implies that she thinks there is a *real* technology that has no characteristics other than technical rationality, abstractness and so on. And still, if this was not the case and if there is nothing stereotypically gendered about technology, on what basis are women excluded from technology? Can we still maintain, as Lagesen does, that "gender seems to remain a constant here, at least when it comes to women, while ICT and the culture of computer science are featured as objects of reshaping. Female characteristics are ok, ICT is not - and boys are a lost case!" (Lagesen 2004: 18)? But how can women's gender remain a constant when it was women's gender that was constantly excluded from technology? If women's gender remains a constant it is perhaps only as a constant object of analysis, and not as a *constant* that was part of what we understand technology to be. Perhaps it is this very *constant* which is needed for reshaping the *real* technology.

That increasing the number of women would change the symbolic is still a very liberal idea with a radical twist or maybe only a slight flavour[7], despite both Lagesen and Sørensen's rejection of this. To prove that their argument is not the same as the liberal principle of adding numbers, they are offering another instantiation of how the idea of *critical mass* operates. The example of the role model that could change the perception of women-as-minority is meant to show that a critical mass argument does not merely insist on the importance of numbers, but primarily on the exemplary power of one or few successful women in

[5] For instance, Knut Sørensen defines women-only spaces as an "effort to create circumstances where the issue of relative numbers is transcended by making women into a majority not to say the only *gender* present" (2004: 35; my emphasis). From here I deduce that either Sørensen actually means *sex* by *gender*, which means that gender doesn't have any analytic significance for him, or that he supposes that women are *a* gender, which goes against his claims that gender should be de-essentialized.

[6] By sexual specificity of the body I mean a particular way in which the sexed body is experienced and experiences the world around it. More than a blank slate on which gender as social expectation writes itself onto, the specific sexual body is not an inert body but a lived body that has however a biological dimension. (see for instance Grosz 1994, ch. 8).

[7] Vivian Lagesen maintains that the idea of critical mass is, at least in the context of her research, more like a 'metaphor' for the impact of a relative mass of women (2007: 70).

the field whose presence can alter the gender-inauthentic image of ICT. But if the mere presence of one or several successful women can alter the image of the field, it means that the concept of *gender authenticity* refers to something that might compel women to do certain things once the one woman who already does those things becomes *visible*. Knut Sorensen associates the 'role model' strategy with an "'*impression* management' effort" (2004: 36; my emphasis). He also describes another way to simulate women as non-minority in the construction of women-only spaces, where "the relative number of men and women is changed radically and thus *creates the impression of women as 'natural' users* and students of ICT" (Sørensen 2004:34; my emphasis). Yet again the gendered image of the field is a matter of *impression*, of what it only seems to be, and not of what it is. What I claim is not that gender *is* something irrevocable, but that gender is not merely an impression, and illusion, a matter of perception. To claim this is not to claim that gender is naturally a property of the body. But whether gender is performed or not, it is still a mode of identification which the bodies take on, and not a mere *impression* of bodies.

What I wanted to show throughout my analysis is that in the economy of the *critical mass* argument masculinity or gender means nothing else than sex, and sex has no relevance for what men and women do. The argument functions on accepting the commonsense linguistic equivalence of men with the masculinity of the field, since what it aims to argue is that the masculinity will vanish with the visibility of more women's bodies. Whereas it is perhaps accurate that all naming of the world is prosaic but true, the mere acceptance of the equivalence between men and masculinity leaves us in the impossibility to understand the functioning of gender as, for instance, (hierarchical) structures, identities, and symbols (Harding 1986). What the *critical mass* argument denies is the very possibility of masculinity to have a specific content, at least on the descriptive level of how things are, if not at the normative of how things should be. This further on has an impact on how we conceive the relation between gender and ICT. If gender means nominally nothing else than sex, and since to claim that there might be a causal relation between sex and engaging with technology means to fall in the trap of determinism, it follows that there can't be anything sexed thus gender specific about ICT. However, this understanding of technology leaves unexplained the very exclusion of women from ICT. How is it possible that a gender-neutral ICT is dominated by men and has excluded women? And how can we argue for diversity (as cross-gender or trans-gender) in the absence of gender, when it was in the name of gender that diversity was excluded for such a long time? (Keller 1987: 42).

CONCLUSION

At this point you might very well wonder what the whole point of this paper is. Does she at least accept that there is a critical mass of women missing from ICTs? This at least should be quite obvious to her and not relative to the context in which this claim was made. One of the anonymous reviewers of my extended abstract suggested that I could use quotation marks in/outside (this wasn't clear to me) the title to note my distancing from it. After having done some thinking I understood that I don't mean to distance myself from the title. Quite the opposite, I wanted to closely engage with its meaning so I literally transcribed what I thought was the political significance of the *critical mass* argument. It sounds like this: "There is a *mass* of women missing from ICT. Let's bring it in!" It surely has an ambiguous tone; my reviewer was at first confused. Whereas the first sentence in the title can be found in the literature that I have just engaged with, the second is what to me *seems* like the political tone of the solution that argues for securing a critical mass of women. What this taken-out-of-context title makes visible is that (at least some) women could be a mass, which could be handled like an object with enough strength and intentionality. This confuses not only both our experiences and theories that women are not a mass and their situation cannot simply be shifted from right to left; it also opens up the issue of representation. Who is talking here, whom are we here to represent, why and how?

Vivian Lagesen (2003:8) does mention that the concern to increase the number of female students at NTNU was based on two arguments. The first, the 'equal opportunity argument' emphasizes that women have been deprived of the opportunity to influence such an important social resource like technology. The second, the so-called 'resource argument', refers to the fact that society loses a lot from not using women's creativity and also labour power in the ICT industry. Lagesen however does not take time to question the legitimacy of these arguments, why they are to be used as arguments in the first place, why technology is such an important resource for global markets, who benefits from computer-based technologies, at whose expense etc. It appears as if women's well-being is enhanced by their participation in technology, and society's well-being is enhanced by women's participation in technology. What we need perhaps to ask at this point is whether women's well-being is an end in itself or a means for society's well-being, or both. "If we value women's freedom because it is useful in solving certain social problems, we may not value freedom when it interferes with social utility or when more expedient ways of reaching the same social results can be shown" (Zerilli 2005: 9). Who really wants women to be part of ICTs and how does this influence the ways we represent women and technology? Can we imagine for a second a society that would still encourage women to become technical even if there were no benefits to be gained by the society at large?

But despite what might look like the obvious, my purpose was not to moralize. What I meant to show is how our theories fit our aims, how the way we interpret the world is coherent with the way we want to change it and vice versa. When our purpose is the presence of more women into ICT then gender needs not have a specific content for us, neither descriptive (how women are) and especially not normative (how women should be). (The constitution of) gender

and/or sexed bodies really need to be devoid of any analytical potential. Thus the masculinity of ICT is a historical contingency of the predominance of men (read again unspecific male bodies) in the field, and as such increasing the number of women, which is our goal to begin with, can rectify this contingency.

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