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# Technology and Feminism: A Strange Couple\*

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## ABSTRACT

The “gender digital divide” constitutes a prolific research program that compares the differences between women and men in access to Information and Communication Technologies (ICT). Nevertheless, those using feminist socio-constructivist perspectives argue for the need to pay attention, not only to “access,” but also to “design,” in addition to considering social relations as something that is coded within technological artifacts. From this perspective, gender constitutes an integral part of technological production. This paper explores the co-constitution of gender and technology, considering a specific action–research experience. It is argued that the re-signification of gendered and technological codes drifts through: a) the opening of gendered and technological codes; b) the production of new cultural imaginaries that question hegemonic representations of gender; and c) the production of new subjectivities through the reorganization of socio-technical practices to develop performative acts that transform patriarchal relations.

## KEY WORDS

Technology, feminism, gender, performativity, subjectivity.

## Tecnología y feminismo: una extraña pareja

## RESUMEN

La “brecha digital de género” constituye un prolífico programa de investigación que compara las diferencias entre mujeres y hombres en el acceso a las Tecnologías de Información y Comunicación. Las perspectivas socio-constructivistas feministas, sin embargo, abogan por la necesidad de prestar atención no sólo al “acceso”, sino también al “diseño”, y consideran las relaciones sociales como elementos codificados en el interior los artefactos tecnológicos. Desde esta perspectiva, el género constituye una parte integral de la producción tecnológica. Este trabajo explora la constitución conjunta de género y tecnología a partir de una experiencia de investigación-acción específica. Se argumenta que la resignificación de los códigos de género y tecnológicos se desplaza a través de: a) la apertura de los códigos de género y tecnológicos; b) la producción de nuevos imaginarios culturales que cuestionan las representaciones hegemónicas de género; y c) la producción de nuevas subjetividades a través de la reorganización de las prácticas socio-técnicas para el desarrollo de actos performativos que transforman las relaciones patriarcales.

## PALABRAS CLAVE

Tecnología, feminismo, género, performatividad, subjetividad.

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## Tecnologia e feminismo: um estranho casal

### RESUMO

A “brecha digital de gênero” constitui um produtivo programa de pesquisa que compara as diferenças entre mulheres e homens no acesso às Tecnologias da Informação e Comunicação. Contudo, as perspectivas socioconstrutivistas feministas defendem a necessidade de prestar atenção não somente ao “acesso”, mas também ao “desenho” e consideram as relações sociais como elementos codificados no interior dos artefatos tecnológicos. Sob essa perspectiva, o gênero constitui uma parte integral da produção tecnológica. Este trabalho explora a constituição conjunta de gênero e tecnologia a partir de uma experiência de pesquisa-ação específica. Argumenta-se que a resignificação dos códigos de gênero e tecnológicos se desloca por meio da: a) abertura dos códigos de gênero e tecnológicos; b) produção de novos imaginários culturais que questionam as representações hegemônicas de gênero; e c) produção de novas subjetividades mediante a reorganização das práticas sociotécnicas para o desenvolvimento de atos performativos que transformam as relações patriarcais.

### PALAVRAS-CHAVE

Tecnologia, feminismo, gênero, performatividade, subjetividade.

## The Digital Gender Gap

**T**o promote gender equality and empower women” is the third goal established in *The Millennium Development Goals* (MDGs) report prepared by the United Nations in 2010, the aim of which was to “eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015” (UN 2010, 20-25).

The section offers data on the percentage of women in top-level occupations compared with the average for the period 2000-2008, indicating that the top jobs are dominated by men globally and that “only one in four senior officials or managers are women” (UN 2010, 24). The percentage of women that have senior and managerial positions is comparatively higher in the regions of the Commonwealth of Independent States (37%), Developed Regions (32%), and Latin America and the Caribbean (32%), while it is lower in the regions of Western Asia (10%), Southern Asia (9%) and Northern Africa (9%), as argued by Hamadoun Touré, Secretary-General of the International Telecommunication Union (ITU) and Co-Vice-Chair of the Broadband Commission for Digital Development.

The Broadband Commission “was created in 2010 by the ITU and UNESCO in response to UN Secretary-General Ban Ki-moon’s call to step up efforts to accelerate progress towards meeting the Millennium Development Goals (MDGs)” (BCWG 2013, 4). In 2013, the Broadband Commission Working Group produced

a report titled *Doubling Digital Opportunities: Enhancing the Inclusion of Women & Girls in the Information Society*, where Helen Clark, chair of the commission, stated that “it shows ways in which we can further advance the sustainable development agenda by promoting the use of new technologies in support of gender equality and women’s empowerment” (BCWG 2013, 2).

The Broadband Commission considers the “digital gender gap” to be a reflection of gender inequalities and believes that women should go online to take advantage of the opportunities that Information and Communication Technologies provide in a modern digital economy. It should also be mentioned that the term “digital divide” can have different meanings, (Gunkel 2001 and 2003), and while the origin of the term remains uncertain and ambiguous, there is enough evidence to suggest that it came from politics and the media (Gunkel 2003), where it was initially used to differentiate between technophiles and technophobics (Moore 1995).

The term later took on several different meanings, including the following:

- A deepening divide between the rich and the poor
- An unequal distribution of Information Technologies (IT) in public schools
- Technical incompatibilities in educational opportunities
- Unequal distribution of employment opportunities
- The divide between those with and those without access to new technologies beginning in the late 1990s (Gunkel 2003)

While the concept most commonly refers to different levels of access to technology today, different gender digital gaps have also been brought to light (BCWG 2013). For example, the difference between “access” to and the “use” of technology is one of the most prominent gaps (Bimber 2000; Castaño 2008). Cecilia Castaño, for example, believes that the “use” of technology should be considered more important in discussions regarding gaps and inequality (Castaño 2008).

Castaño’s theory is based on data from the *Observatory of E-Equality (System of Indicators of Gender and Technology, SIGTIC)* showing that focusing on “use” allows one to clearly identify gender differences when reproducing work on gender division. The findings show that men tend to have an instrumental use of the Internet while women use it for training, communication and care-giving (Castaño, Martín and Vázquez 2008). This knowledge allows one to distinguish between a digital divide that focuses on access to ICT, and a second gap that deals with the use of ICT.

Quality of Internet access constitutes another dimension in addressing the digital divide (Skinner, Biscope and Poland 2003). In their study on how young people use the Internet to obtain health information and resources, Skinner, Biscope and Poland (2003) find that the conditions in which young people access the Internet have an important impact on the ability to get and to use digital health information, suggesting the need to consider an “access quality divide.” Consequently, different tacit dimensions are also sometimes implicated in the notion of “digital divide,” aspects that are often tainted by gender processes.

Nevertheless, it would be dangerous to derive simple causal conclusions from these results. For example, we could assume that (a) accessing well-paid jobs currently held mainly by men will improve gender equality; and (b) the use of new technologies will help women to get a fair share of highly-valued jobs. These statements have been used to argue that the progressive and massive use of ICTs by young people will eventually eradicate the different digital divides, with the exception of the age variable.

Statistical data shows that there is a widespread use of ICT by citizens in industrialized countries, and workers with ICT skills get comparatively better jobs. According to these statistics, the promotion of ICT use can improve equality at both individual and national levels. For example, the survey on *Equipment and Use of Technologies of Information and Communication in Households* conducted by the

Spanish National Institute of Statistics (INE 2009) shows that generational factors constitute the main difference in the use of ICT, while differences between the sexes are smaller (INE 2009). In this context, it could be argued that the knowledge societies produce includes new forms of organization based on information and knowledge, thus opening up new opportunities for social development (Castells 2002). In addition, educational levels can be the crucial factor in upward social mobility.

Extracting conclusions by focusing on one of the dimensions of the digital divide and the confusion derived from the multiple variables involved in conceptualizing it have led to different levels of criticism in the public media (Brady 2000; Crabtree 2001; Thierer 2000). In addition to this one-dimensional approach, these dimensions tend to be a form of oversimplified binary logic (Gunkel 2003), a logic that reproduces a gender binarism that constructs women in terms of “lack” or “difference” when compared to men. This approach indirectly consolidates a hierarchy in which men become the standard with respect to which women must be compared.

There have been recent approaches that try to give a broader and more complex picture. The Gender Equality-Knowledge Society (GE&KS) indicator framework (Huyer 2013) takes a more granular, general approach here aggregating gender-sensitive data on areas such as health and economic and social status in order to assess the barriers and opportunities for women in technology jobs. The GE&KS framework is divided into three sections (WISAT 2013): a) inputs (health, social and economic status; access to technological and economic resources; political and personal agency; cultural capital); b) outcomes within knowledge society (decision-making in corporate and scientific environments; managerial or ITC jobs; participation in science, technology and innovation); and c) supporting policies (knowledge society; gender and gender budgets, science and engineering).

Although not immediately evident, it is quite reasonable to assume, for example, that different access to healthcare may have an important impact on access to top jobs, despite access to technology. Consequently, there will be different concurrent factors that draw on certain conditions of possibility for involvement in ICT. Some of the preliminary results within the GE&KS framework suggest that technological gender equality is related to variables such as economic status, political participation and health and childcare support, thus offering a more complex picture than the merely deterministic relation between access to technology and upward social mobility.

As stated in the report, “in all countries in this review — which represent the leading knowledge-based economies in the world— the knowledge society is failing to include women to an equal extent, and in some cases, their inclusion is negligible” (WISAT 2013, 2). While GE&KS does not offer simple causal relations to guide specific interventions in the gender and technology fields, its approach broadens the context of understanding the relationship between gender and technology, anchoring this process with the socio-economic variables modulated by social institutions.

## Gender, Technology, and Capitalism

The implicit narrative behind the *Millennium Development Goals* drawn up by the United Nations (2010), and the report of the Broadband Commission Working Group (BCWG 2013) suggest that technology constitutes the neutral catalyst that improves gender equality by providing women with better jobs. Nonetheless, this narrative has to be read within the context of the present transformations of capitalism (Suarez-Villa 2009 and 2012). The rigid and alienating Fordist model of capitalism that was characteristic of the mid-20th century has given way to the post-Fordist model of a decentralized and flexible economy. This economy, along with the decline of the welfare state, creates a dystopian future where life becomes insecure and vulnerable in both the public and private arenas. The “Brazilianization” of the workforce (Beck 2000) values the indeterminacy of life defined by flexible capitalist imperatives, where the individual must assume the risks previously held by the state and the economy. In order to avoid being the “localized poverty of the no-longer-needed” (Beck 2000, 102), women need to behave strategically and acquire the necessary skills to obtain the “precarious employment at the top of the skills ladder” (Beck 2000, 9).

Within this narrative, government policies should help women to get involved with technology and obtain the technological skills required to get better jobs and finally achieve equality. Inequality ultimately becomes the result of some form of misfortune that women can revert by themselves with institutional help. In the end, liquid modernity (Bauman 2011) plays with rules at the molecular level that are in fact defined in the molar realm.

The production and commodification of intangibles has been at the core of the capitalist mutations that have predominated in recent centuries (Suarez-Villa 2009 y 2012), deeply interweaving technology, information

and knowledge. While imperial capitalism consolidated centralized networks of communication whereby the metropolis despoiled the colonies of raw materials and returned only manufactured goods, if anything, present-day capitalism works within a globally interconnected network of deregulated monetary flux driven by capital accumulation. The different dimensions and areas of face-to-face interaction are progressively being replaced by technological networks (Van Dijk 1991). The implementation of decentralized, segmented production calls for the development of complex organizational procedures that transform bureaucratic corporations into flexible interconnected networks operating on a global scale (Castells 2010).

Network capitalism is organized by knowledge, consumes knowledge, and produces commodities that incorporate knowledge. The centrality of knowledge in the new forms of capitalism has popularized the term “cognitive capitalism.” Managerial, creative and relational skills are valued in the jobs created in the “knowledge society,” intensifying the penetration of capitalist logic within characteristic human traits (Virno 2003). The intensification and expansion of this logic has engendered technical and legal procedures that have objectified knowledge, culture and affective processes into commodities that effectively circulate in global capital transactions (Roggero 2007). Top qualified jobs erode the distinction between “production” and “leisure,” and one’s whole life becomes focused on immaterial labor that contributes to the production of ourselves (Gorz 2003).

The progressive conquering of areas of human activity by managerial processes, both at the corporate level and at the personal level, transforms life itself into a productive process (Espai en Blanc 2008). Information, knowledge and affection have become the cutting edge of the new economy in areas such as health, education, entertainment and social services; areas in which care and support are central elements. This movement has led to the calculability and commodification of what were once considered to be intangible human traits.

“Advanced” post-Fordist societies have encapsulated emotional relationships in such a way that they can be deployed in monetary transactions, and we can now buy satisfaction, enthusiasm, happiness and effective communication —the same processes by which communities, social networks and sociability are produced and reproduced (Hardt 1999). Affection has become a central element in productive governance

according to the expansive logic of post-Fordist capitalism, thus leading to its commodification, calculability and monetarization (Lasén 2009). Capital accumulation has developed a new expansive folder where oppositions, in terms of consumption and labor, production and reproduction, are collapsed by the ability of affect circulation and management (Clough 2008). Furthermore, Lazzarato (2009) states that these processes operate on the basis of market principles that instantiate, enforce and nourish social inequalities in a way that breaks down the emotional bonds of traditional communities.

Effectively managing these inequalities within a capitalist framework has produced more fear and uncertainty while simultaneously calling for “affective” governance of populations. The development of the industry and governance of affect is ensured by its scarcity. At the same time, reflexive and self-made entrepreneurs invest different cognitive and affective resources—the immaterial resources of the self—in order to become the nuclear productive enterprise of new societies, reframed as a set of businesses.

Some of the effects of power relations in contemporary capitalism are related to the individualization and “autonomization” of selves into adaptable, mutable and flexible subjects capable of affective engagement and detachment, as required by unstable market forces and competitive contexts. One must constantly learn new skills and capacities, retrain, restyle the self, recreate one’s life narrative and form new social relationships (Burkitt 2008).

In this context of affective precariousness, information and communication technologies have become one of the protagonistic parasites of affective labor—the noise that populates our present human life. The neutrality that our common sense attributes to technological devices obliterates the pervasive power-effects shaping our social order and subjectivities. While in other areas of technological development it has become clear that technical design implicitly encapsulates a political project, ICTs generally remain unquestioned in terms of political implications.

Social policies, for example, have involved spending a great amount of resources in dealing with what has been called a “digital divide” between different social groups in terms of gender, age, or ethnic background, thus resulting in a focus on providing technological access to disadvantaged groups. However, this focus on universal

access, as well as the welfare that such access should provide, can serve as a smokescreen that hides the same inequalities its proponents seek to erase. The use of ICT should not be considered a personal skill, but rather understood in terms of cultural patterns that may help to reproduce or transform the network of technologies, subjects, affects and politics that constitute our present socio-technical world.

At the beginning of the second millennium, women are to become the precarious immaterial labor of the knowledge society. At the same time that occupations traditionally associated with women have become highly devalued, women are being urged to accept the promise offered by ICTs in order to overcome inequalities and become “digital citizens.” As Rasmussen and Brown (2002, 187) have suggested, citizenship is the “struggle to define the terrain of the political,” ruling through techniques of inclusion, empowerment and recognition.

ICT forms part of the new “regimes of truth” since it constitutes the tool by means of which someone can be considered a “citizen,” similar to “being able to read.” In our present “regime of truth,” a citizen is a reflexive individual with the ability for self-governance, and one who is responsible, autonomous, motivated, willing and capable of carving out her life-course on the basis of her own ideas, circumstances and ambitions (Rose 1999). In this context, inclusion is another means of enhancing international competitiveness (Larner and Craig 2005). Women are encouraged to get involved with technologies and practices traditionally associated with masculine values, technologies that are increasingly becoming an “obligatory passage point” (Callon 1986). ICT constitutes the mandatory transport in post-Fordist landscapes if one wants to be recognized as a legitimate actor. Technology becomes central to most parts of our daily lives, inherent to the things we normally do in different stages of our socialization, and fundamental to the transition to employment. Without a critical stance, ITC could be read as a neutral tool that offers women the opportunity to become a central agent of social change.

Considering the wider economic and social contexts, the involvement of citizens in technology and the digital definition of citizenship strings together gender and technology in a perverse association. Technology is now crucial in present forms of governance, and the digital definition of a citizen makes social inclusion dependent on the enhancement of international competitiveness (Larner and Craig 2005).



## Technology from a Feminist Perspective

In our previous narrative, there was a difference in the use of technology between men and women, and our society is increasingly moving towards a “digital society.” Getting women involved in technology is one way forward, if we take for granted certain approaches to “gender,” “technology” and the inevitability of our society as it is now.

According to Judy Wajcman (2007), there have been different interpretations of the relationship between gender and technology and the manner in which we understand said relationship depends on our understanding of gender. To consider women and men as two clearly defined categories is the common understanding, which first led to concerns during the 1970s and 1980s regarding the unequal access to technology for women as well as their limited access to social and employment opportunities (Cockburn 1983; Grint and Gill 1995; Wajcman 1991). We could consider this approach to be “reductionist” (Royal 2008) since it does not take into account other considerations with regard to the relation of women to technology.

Access to technology is just one of the multiple dimensions we can tackle, and just as important as access to technology is how it is used and the purpose it serves. We have seen how gender positions define how technology is used. It is possible to argue that some technologies can have negative effects on women’s lives, and technologies such as weapons, beauty treatments, and the mass media are sometimes used against the interests of women. From a feminist perspective, it would be outrageous to get women involved in worsening women’s living conditions, even when it might imply an improvement in their working conditions. Furthermore, the focus on access to technology fails to question the production of technology politically, and assumes that technology itself is intrinsically neutral and objective. In conclusion, interventions primarily oriented to promoting access to technology may fail to address other important dimensions (Henwood 2000).

However, if we direct our attention to the inequalities produced by patriarchal society in the field of ICT instead of considering the differences between men and women, the picture is quite different. The subject positions of “women” and “men” are the consequences of a certain societal structure, a structure that must be transformed if we really want to address gender inequality. At the same time, social structures are an abstraction of concrete relational processes.

The homogenization of the category “women” undermines the diverse and fragmented nature of women’s needs and experiences. As noted by Judy Wajcman (2004), our technological artifacts are the result of certain configurations of gender relations. Technology is “society made durable” (Latour 1991), and the technology we develop solidifies the relations of power in our patriarchal society. We cannot forget that the current focus of ICT is closely linked to the promise of productivity and progress associated with a certain mode of social production. We are confronted with a context (Camacho 2005): a) that establishes a technological determinism where access to technology is equivalent to development; b) where social transformation is achieved by becoming technologically active; c) in which ICT can increase or decrease the various social gaps; d) that does not develop a critical genealogy of how we arrive at the digital divide; e) that considers the elimination of the “digital divide” a universal goal independent of social context; f) the development of which is suspiciously linked to business interests and the strengthening of intellectual property; and g) which implies a mode of action and intervention that is extremely individualistic.

The new post-industrial landscape, illustrated by authors such as Castells (2002), Giddens (1999) and Beck (2004), with a strong influence on current socio-economic policies, offers a digital future in which relations (and discrimination) between and within traditional social categories (such as gender) are transformed to give way to a new form of division based on educational levels and the risks individuals take in building their own personal and reflexive identity (Wajcman 2004). We run the risk of letting a restrictive analysis of the digital divide contribute to hiding traditional social inequalities, which is not a way of correcting gender inequalities, but a reflection of such inequalities instead. In any case, a careful analysis of the political agenda behind ICT does not seem to match the goals of current feminist activism. As stated by Saskia Sassen (2002), while digital technologies can in fact provide new social dynamics, they can also reproduce dominant social conditions. Therefore, we need to enhance the transformative nature of these technologies instead of being thrown into individualized interventions based on the development of training programs that offer a fragmented and decontextualized knowledge of technological tools. It is necessary to undertake a thorough analysis of the relationship between gender and technology that provides space for techno-feminism perspectives capable of transforming

the ways in which new technologies contribute to maintaining and transforming patriarchal domination relations (Wajcman 2004; Núñez and García 2009).

What principles could a feminist approach to gender and technology be based on? María Lohan (2000) suggests that feminist perspectives, in dialogue with the field of Social Studies of Science, should develop a constructivist view of technology that locates it in a heterogeneous network of socio-technical assemblages as they are *constituted from* and *contribute to form* the social world. The analysis should take into consideration the ways in which knowledge and technological culture are themselves gendered, assuming that technological artifacts are open to analysis in relation to their use, design and technological content, as well as the processes by which differences and gender asymmetries form part of the “process of technology” (Wajcman 2000).

Feminist studies of technology that take a socio-constructivist stand assume that technology incorporates social relations such as gender relations, by ordering the contexts of creation and use so that gender is an integral part of shaping the technology. In other words, the process of co-constructing technologies and gender should be highlighted in order to include the social dimension of technological use (Lohan 2000). However, while this field of study considers the socially constructed character of technology, it nonetheless tends to understand gender identity as a fixed and stable entity.

Gender identities of designers and users are treated as stable characteristics that precede the creation of a malleable technology. This fixation of gender is inconsistent with the objective of understanding the co-production of gender and technology (Landström 2007). Indeed, Wendy Faulkner and Merete Lie (2007) highlight the tension between incorporating gender stereotypes and challenging them. On the one hand, they claim that there is evidence that gender binarism validates the interests and practices perceived by women, e.g., arguing for the presence and persistence of the digital divide in the design of technologies. On the other hand, the essentialist perspective tends to prefigure the relationship or motivations that women and men would have with technology, reproducing gender prejudices and stereotypes. This involves questioning the irreflexive use of gender binaries, such as “men/women,” “masculine/feminine” etc., categories that were once dominant in the field of gender and technology.

Instead, the present analysis focuses on how gender categories and relationships are constituted in technological processes (Landström 2007), developing a techno-feminist perspective that pays attention to the political identities created and recreated in the field of technology, and how they reproduce and transform our patriarchal society (Wajcman 2007). This approach is nourished by perspectives that understand gender as the product of a dynamic relational process, emerging from collective understandings and practices—a gender constituted in interaction (Butler 1993).

Different degrees of determination at various times and in various relationships are accomplished in the technological field through socio-technical configurations that arrange objects, relations and discourses in a particular discursive-material ordering. It is precisely this particular ordering that constitutes a performative gendered “reality” where technical and social elements are contingently updated (Wajcman 2007).

The notion of “assemblages” is helpful for understanding the co-construction of gender and technology. Catharina Landström (2007) uses it as a functional conglomeration of elements that are not unified, stable or self-identical, so the resulting assemblage cannot be characterized by the simple addition of such elements. Assemblages are the result of a certain configuration of elements. According to the author, this idea incorporates a different notion of cause and effect from that used in techno-constructivist feminist theory in the sense that it does not postulate a point of origin located before or outside of the particular assemblage. Identities emerge as an effect of the articulation, and assemblages reconfigure subjectivity as constituted in the complex relationship with technology.

The resulting relationship is the crucial mechanism by which agents are generated and technological assemblages act as material-semiotic spaces where the redefinition of both technological artifacts and gender identities occur. It is the relationships and actions of these everyday acts that give way to subversive repetitions that transform gender fixations (Butler 1998). At the same time, Lawrence Lessig (1999), when referring specifically to information and communication technologies, considers that technology should not be understood as a finished product but rather as a process of production of meaning in which both hardware and software contribute to its regulation. He argues that technological code has a regulatory role in the relational space.



Technological code, like law, works abstractly, moving from the particular to the general in an effort to define the boundaries of normality. The premise of law is founded on the regulation of social functions, abstracted from particular instances or everyday events (Lessig 2004). Overall, the code is based on its own repetition and reiteration, appearing as an undifferentiated repetition even when applied in diverse situations, contexts and events (Thomas 2005). Like law, code is normative and political, embedded in a techno-cultural space where politics, technology and culture interact (Penley and Andrew 1991).

Other authors, such as Inke Arns (2005), have suggested the concept of “performativity of code” to refer to the code as an act. The code is not understood as a representation or description of something that lies beyond, but only as something that becomes an action when it is used. The code is established and becomes operational by hiding its process of production, by appearing as a finished product. According to Thomas (2005), this is precisely the difference between code and performance. While the code seeks its infinite repetition without difference, the performative act is the production of an unrepeatable event, a singularity, a repetition with difference.

Thus, returning to the idea of the co-construction of technologies and gender, it is possible to establish a certain parallelism between code and performance. While code seeks to establish itself as the law, as a space defining the limits of normality/abnormality, the performative reiterates, reaffirms and transforms the code in every act and assembly, creating new forms of meaning in the use of both gender identities and technological tools. These assemblages are an open field of power relations and, because of their unfinished character, they allow for politicization and re-signification. Locating the technological and gender codes on the same plane initiates a process of articulation wherein concrete assemblies facilitate new arrangements of techno-gender that produce new meanings, identities and subjectivities against the current relations of patriarchal domination.

The framework outlined above suggests a certain techno-feminist approach that transmutes the passive subject of technological-gender-gap narratives with a feminist agent, a cyborg (Haraway 1991) that not only navigates within the current techno-culture but transforms it as well. This transformation is based on recognition of the positions and relationships that configure our technological network, positions that also define gender binarism. Our cultural practices are responsible for

the construction of gender categories and the unequal distribution of attributes, practices and resources among them. Taking into consideration the fact that we are configured by different network interrelations makes us aware of the interconnection between different cultural spaces as a form of political action. These premises were incorporated into the action-research project *Generattech*.

## Techno-Feminist Assemblages

The need to produce new articulations that constitute us as transformative agents of gender relations within a technological culture inspired the action-research project *Generattech*. Thematically anchored in the field of gender studies and technology, it seeks to challenge the dominant gender imaginary of current patriarchal societies by establishing alliances and commonalities with agents concerned with the transformation of socio-technical borders in order to create a platform for joint action. One of the articulatory elements of this assembly has been in the area of audiovisual production, an area that embodies multiple desires and has strong technological development affecting our everyday culture and representations (Rommès, van Oost and Oudshoorn 1999).

*Generattech* began in 2007 with a meeting of Spanish feminist associations in order to work in the area of technology. The project defined three interrelated goals: a) the production of new audiovisual gender imaginaries; b) feminist involvement with technology; and c) the subversion of patriarchal practices. The face-to-face meetings became consolidated into a network involving face-to-face, virtual meetings, a virtual social network that promotes engagement with technology from a feminist perspective. Virtual social networks structure an online realm, which creates communicative symbolic codes (Papacharissi 2009).

Communication processes are, at the same time, the product of social interaction and the producer of the techno-social space. *Generattech* was instituted as a social virtual platform that defined a virtual territory configured around the transformation of techno-gender boundaries. The group (instead of the “individual”) was the organizational unit of the platform and it defined public and private (i.e. accessible to group members only) content that was visible to a defined set of individuals or groups. The development of the network interconnected three subversive cultural recodifications: technological, audiovisual, and subjective.

## Technological Code

Free software (Stallman 2010) constitutes a metaphor and a regulatory space for the construction of tools that subvert established forms of code restrictions. Free software gives users the freedom to *share, study, modify* and *distribute* the code and, therefore, constitutes a techno-social ordering in which semiotic (i.e., the appeal to “freedom”) and material (i.e., the possibility of code modification) elements conform to a particular configuration. Because gender is also a semiotic-material ordering, a parallelism between gender and software can be established in the sense that both are normatively and institutionally regulated. This unisonance establishes a common ground for transforming the techno-gender assemblage.

The development and implementation of social practices that challenge the meanings associated with cultural and technological production have the effect of constituting a form of reality that undermines the normative function of the code (Thomas 2005) and creates a new socio-technical agent, the “free software,” that opens up new possibilities of cultural conformation. The *Generatex* virtual platform was socio-technically designed based on the premise of free software. Development of the program borrowed from previous software developments, creating new code and releasing it to the broader free-software community, and viewing the group (instead of the individual) as the main actor. Sharing and collectivity were considered to counter the logic of capitalism. Given that the positions within the network are co-produced, the transformation of the techno-social code has important ramifications for a techno-feminist political agenda.

On the other hand, intellectual property laws constitute the norms which favor large corporations against actors with fewer economic resources. Within the network, the use of legal and economic relationships sustains a particular ethical and political arrangement that affects its constituent elements. The subversion of cultural and technological standards needs to question the ownership of collective productions and promote the local production of assemblages. Restrictive intellectual property laws define a static socio-political network in terms of access to and reconfiguration of technical and cultural artifacts.

In the *Generatex* project, different “copy left” licenses are available for participants to use for their text, visual, audio and audiovisual productions, in order to promote free access to these contents. The construction of citizen-based communications and networks re-encodes closed,

unilateral and anti-dialogical technological assemblages. The regulatory mutation created by open-source licenses allows for the circulation of technologically-mediated content (Scolari 2009) and, like gender performances, it has a subversive effect since it destabilizes the legal-economic norm that defines and legitimates certain subject positions in the production and distribution of knowledge and cultural productions. The techno-feminist assemblage is built upon the possibility of active technological appropriation by participants. These networks are models of effective action against both consumerism and technological passivity, and seek the re-appropriation of the hegemonic mechanisms of cultural production in order to create a new technological grammar.

## Audiovisual Code

Progressive simplification in the digitalization and dissemination of audiovisual codes transforms the personal computer into a center for local audiovisual productions that can be easily spread throughout the global network (Furstenau and Mackenzie 2009), culminating in the domestic production of amateur imagery. While this should increase citizen participation in the transformation of audiovisual codes, it is highly constrained by commodification, audiovisual regulation and self-identity (Furstenau and Mackenzie 2009). Furthermore, the audiovisual code has traditionally been allied with patriarchy.

Craig Watkins and Rana Emerson (2000) argue that images of women in the media are often associated with the domestic sphere, while the workplace and other public settings are more often characterized as being masculine. In addition, television advertisements target women for home appliances and beauty products, thus reinforcing their traditional social roles. These authors also pay attention to the ways in which different axes of oppression, such as race/ethnicity, sexual identity, social class and age, intersect in the mainstream media where hegemonic images and values are widely reproduced while issues such as employment discrimination, gender violence and discrimination in care-giving tasks are generally either marginalized or ignored (Watkins and Emerson 2000).

The image of the female body is portrayed in terms of the masculine gaze (Blair and Takayoshi 1999), and women with non-normative bodies or sexualities are hidden (Nead 1992; Juhasz 1999). Donna Haraway (1991) reminds us that we must recognize our position in the production

and maintenance of domination logic, and it is clear that the female body is constituted and criss-crossed by deep socio-technical codes. The means of communication constitute an arena of socio-technical intervention with a significant impact on the beliefs and practices that constitute the current female cyborg.

Popular culture is driven by an economic agenda that encourages a hyper-real female-body standard of beauty defined by consumer brands. Audiovisual technologies tattoo female subjectivity with regulatory codes that define how the body should look and behave—a body adapted to the needs of post-Fordist consumption and coded by highly sexualized audiovisual technologies (McNair 1996 y 2002; Paul 2005). The media tend to produce a segmentation of displayed bodies in terms of their social desirability based on sociological categories of gender, social class, age, disability and ethnic background (Gill 2009). Audiovisual codes have a profound impact on the reproduction and transformation of the hegemonic social imaginary, with population management processes becoming a central political field. The audiovisual industry has established itself as the legitimate center of management for this type of code, an area that is a significant technological development affecting cultural production (Rommès, van Oost and Oudshoorn 1999).

Audiovisual production is permeated with a normative field united by economic gravitational forces. While there is an increase in the production of localized audiovisual codes, large media corporations continue to thwart local appropriation, modification, and dissemination of localized productions. The re-appropriation of visual codes is clearly an essential part of the production of new subjectivities, and we should claim the right to local audiovisual production in the face of mass production and distribution of hegemonic codes. In this context, members of *Generatech* have explored how audiovisual materials can produce images of gender relations that diverge from the dominant cultural patterns.

Appropriation of the technologies of cultural production both questions and transforms hegemonic models. Activities focused on the re-appropriation of information and communication technologies constitute fundamental elements of agency and potential transgression (Lago 2008). Freedom in the production and dissemination of audiovisual content transforms the production of culture and subjectivity. In the current context, where media corporations carefully design, distribute and exhibit hegemonic cultural models of audiovisual culture, the creation

of new cultural imaginaries constitutes a key element for challenging normative patriarchal relationships. Video production, embedded in a field of possibilities and limitations, constitutes a privileged symbolic space that can contribute to displacement of the boundaries of normality and exclusion.

## Subjective Code

Subjectivity constitutes another surface for normative coding, and democratization of the technological and audiovisual code should go along with liberation of the subjective code. The queer movement is an example of the re-coding of everyday corporeal technologies. Since sexuality is constitutive of subjectivity and legitimizes gender difference, queer movements question sex/gender performances that produce bodies in terms of gender binaries. Applying tactics that could be described as “guerrilla communication” (Blissett and Brünzels 2000), they use public performances of the body as a semiotic battlefield that politically destabilizes normative sexual representations (Califa 1994, Chancer 1998, Rubin 1984). The development of sexual practices that break with gender binaries (Preciado 2001) constitutes an assemblage that transforms constitutive gender categories.

Queer perspectives consider the body and subjectivity to be techno-social productions in which multiple semiotic-material technology and production assemblies seek to facilitate the production of new forms of desire and corporeality. The parody-like performative and ritualized sexual practices evidenced by constitutive body-prosthetic technologies lead to a dessentialisation of sexual identity, showing the artificiality and multiplicity of sexual practices that can hardly be categorized within the sex-gender binaries. It is thus necessary for the proliferation of subversive practices to diffract the dominant patriarchal rules. However, after more than a decade of development of subversive performative practices, the incorporation of performative code into commercial audiovisual production and privatization of the code still tend to relegate said practices to commercial subcultures or minority groups.

## Concluding Remarks

The promise of achieving gender equality by closing the gender digital gap, blustered by academic and political narratives, comes at a price: greater technological, cultural and subjective involvement with post-Fordist forms of production. Those who are able to move on

and adapt to the challenges of training and flexibility required by the new economy will become full citizens of knowledge societies in a world where education will blur gender and social class differences.

It comes as no surprise that feminist thought is suspicious of the promises of gender equality for those who most enthusiastically embrace the unequal principles implicit in the capitalist organization of the new economy. Hidden beneath the promise of similar wages for women and men, the same old patriarchal relations are maintained with respect to the production and exploitation of life. Therefore, while it is undeniable that ICT provides a framework that is radically transforming our everyday lives, it is also necessary, from a feminist perspective, to deepen the analysis of present sociotechnical transformations.

Technology is inherently political, and a feminist agenda must tackle such a strategic field. This article outlines a set of related political alliances in order to transform our patriarchal society from a socio-technical perspective, by creating spaces that transform our techno-cultural field (Montenegro and Pujol 2010). The proposal is based on the premise that “gender” and “technology” are co-constituted within a heterogeneous assemblage which, in turn, transforms the elements of the assembly itself. This perspective broadens the boundaries of the definition of the term “digital divide,” considering both “gender” and “technology” to be socio-technical entities within an assemblage. These entities are involved in its production and are transformed by the transformations of the network (Landström 2007). Consider the assemblage as a material-semiotic network, united by the gravitational force of the code, that offers a single logic with which to analyze the different types of normative solidifications and locate, on the same plane, seemingly unrelated conceptual tools such as the notions of “programming,” “embodiment” and “performativity” (Thomas 2005). This approach highlights articulations between different political forces in the development of a techno-feminist agenda. While it is important to consider the regulatory effect of the code, it is also important to highlight its performative variability.

The political activity involved in the recognition of, reflection on, and action regarding the techno-gendered codes requires a technical configuration based on openness and articulation. Mainstream cultural and technical code appears like a “black box” that positions the citizen as a passive consumer and makes gender practices seem natural in the context of a consumer society that pushes towards the construction of hyper-real bodies.

To rewrite the code, we must become agents of our current techno-cultural context, to challenge the field of controlled technological knowledge of proprietary technologies and knowledge and to advance in the appropriation of tools for knowledge and cultural production. The creation of collaborative networks for producing and distributing content is a mechanism used by the free software and free culture communities in order to expand our appropriation of technology. This enables us to create spaces of dissent in order to question and subvert the dominant imaginaries of gender and sexuality.

In our current context, audiovisual productions constitute the dominant form of producing and disseminating images that interpellate gender construction. It is of primary importance that we become agents in the production of such cultural codes. *Generattech* is another modest contribution in the transformation of gender relations through technological agency by means of audiovisual productions. Culture, technology and politics are all intimately connected. In order to transform our cultural hegemony, we have to recode the normative patterns that sustain our everyday practices. Thus, the politicization of techno-social spaces may eventually lead to transformation of the cultural field in which the relationships of co-production between gender and technology are located (Montenegro and Pujol 2010). ♦♦

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