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Maja van der Velden¹ and Christina Mörtberg^{1,2}

Abstract

Script analysis is often used in research that focuses on gender and technology design. It is applied as a method to describe problematic inscriptions of gender in technology and as a tool for advancing more acceptable inscriptions of gender in technology. These analyses are based on the assumption that we can design technologies that do justice to gender. One critique on script analysis is that it does not engage with the emergent effects of design. The authors explore this critique with the help of two vignettes taken from their design research. In this article they ask: How to design for gender if gender and design are emergent? The authors present two design strategies, degendering design and undesigning design and propose a new approach to doing justice to gender in design. This perspective foregrounds ethics in the design process, in particular the accountability of technology designers.

Keywords

methodologies, methods, genders, ethics, politics, power, governance, other

¹ University of Oslo, Oslo, Norway

² Linnaeus University, Växjö, Sweden

Corresponding Author:

Maja van der Velden, University of Oslo, P. O. Box 1080, Oslo 0316, Norway

Email: majava@ifi.uio.no

Judith Butler describes gender as “the apparatus by which the production and normalization of masculine and feminine takes place along with interstitial forms of hormonal, chromosomal, psychic, and performative that gender assumes” (Butler 2004, 42). Technology is one of the mechanisms through which gender makes, maintains, and questions the masculine and feminine. The design practice, in which a technology comes into being, is therefore understood as a gendered as well as a gendering process. Our desire as design researchers is to intervene in this process. We want to open up the technology design practice in order to work toward technology designs with less normative materializations of gender. This desire to inscribe a more diverse understanding of gender in design is however restrained by our perspective on technology. We understand the outcome of a design process as sociomaterial relations, in which the boundaries between gender, designers, users, and technology design are not yet drawn but come into being in the next version of the design, when the technology is used (Barad 2007; Suchman 2007).

This perspective on gender and technology presents us with a problem: How can we design for a more diverse understanding of gender if we cannot specify gender in our designs? We will address this question in a discussion of theoretical approaches as well as in examples from our design research practices. We will begin by looking at some terms used in script analysis, which may help us to think through the gendering processes in design. We will then present two vignettes, which exemplify the problem of inscribing use and user in design. We discuss two design strategies that address the politics and ethics of design: *degendering design*, an approach developed by Corinna Bath (2009) and *undesigned design*, an approach developed by Martin Brigham and Lucas D. Introna (2007). We will explore how these strategies can be helpful to address our desire to design for gender without essentializing gender, that is, without working with fixed or naturalized notions of woman and man or the masculine and the feminine. In this discussion, we will present Karen Barad’s notion of *intra-action* to refigure the relationship between gender and technology.

Describing Gender

The relationship between gender and design is often explored with terms found in script analysis: script, inscription, and gender script. Madeleine Akrich explains the notion of script as follows:

Designers [thus] define actors within specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of “inscribing” the vision of (or prediction about) the world in the technical content of new object (Akrich 1992, 208).

Script refers to a scenario, a sequence of expected behavior. The term script is also used as an analytical tool to investigate hidden or assumed *gender scripts* (Rommens, van Oost, and Oudshoorn 1999). Leslie Shade uses the concept of gender script to analyze how women have been inscribed as particular users and consumers:

“Ladyphone”—the design mimicked a make-up compact, featuring ‘a biorhythm calculator, a fatness function that calculates a user’s height-to-weight ratio, a calendar for keeping track of your menstrual cycle and a calorie-counting function. Enter an activity (cleaning, dishwashing, cooking, shopping) and the time spent, and the phone works out how many calories have been consumed (Shade 2007, 20).

In *Materialized gender: How shavers configure users’ femininity and masculinity*, Ellen van Oost discusses the concept of gender scripting as a tool to investigate the inscription of gender in technology such as shavers:

Gender script refers to the representations an artefact’s designers have or construct of gender relations and gender identities—representations that they then inscribe into the materiality of that artefact. Like gender itself, which is defined as a multi-level process, gender scripts function on an individual and a symbolic level, reflecting and constructing gender differences in the division of labor (van Oost 2003, 195).

Shavers that are designed especially for men or for women can be read simultaneously as the inscription of gender in design as well as a scripting of gender by design.

The concept of script is generally based on a particular understanding of designer and user. The user is representative of the people who will use the design, while the designer is the creator of technology. When the user does not follow the script of the technology or when the user is different from the one the designers assumed, the technology might fail. Gender script research, which focuses on the inscription of the user and use in a design, found widespread use of the I-methodology: designers projected their

interests and needs on the future users and then scripted those users and their use into the design (Oudshoorn, Rommes, and Stienstra 2004; Rommes 2006).

Although the term script seems to refer to a predetermined scenario, it is also used as an analytical tool *during* the design process. In research on Embodied Conversational Agents, Claude Draude (2008) proposes gender scripting as a tool during the design process in order to analyze, for example, the conceptualization of gender in the prototypes. Her gender scripting approach helps to examine assumptions and design choices and makes alternatives visible.

Alison Adams (1998) and Madeleine Akrich (1992) discuss how circumstances can influence how an inscription in technology is performed. Predetermined settings can be ignored or used differently. The prefigured users, the inscribed vision of future users, may in reality not exist and new users and uses may become visible. A script can then be understood as *deinscribed* because of unpredictable or unintended circumstances or, as Oudshoorn, Rommes, and Stienstra (2004) show, because of nonconscious design decisions.

Script analysis is based on a separation of, and interaction between, design and use. This approach excludes the larger network of actors that also influence the design and use situations (Winthereik, Johannsen, and Strand 2008; Elovaara and Mörtberg 2007). Winthereik et al. discuss this limitation of the notion of script in an analysis of a demonstration video presenting a new e-health portal. The authors use Donna Haraway's (1994, 1997) optical phenomenon of *diffraction* to show how the portal is made and at the same time comes into being: "The technology is intricately entangled with the parallel emergence of a new kind of organisation and set of alliances [...] as well as the making of new kinds of health care practices, patients, and citizen users" (Winthereik, Johannsen, and Strand 2008, 121). By invoking Bruno Latour's (2005) notion of *making things public*, the authors suggest that script analysis needs to be combined with a focus on how technology is made public: "how it engages new audiences and outlines certain kinds of agencies" (Winthereik, Johannsen, and Strand 2008, 128).

A focus on how a design is "made public" is close to our perspective on technology design, namely, that the outcome of a design process comes into being in the next version of the design, when the technology is used. This focus on how things are *made public*, in combination with script analysis, proposes one answer to the question of how we can design for gender when the technology design is emergent. In the next section, we will embed this

discussion in our own research practices by presenting and discussing two vignettes.

Designing for Gender and Diversity

As we described above, a script can be deinscribed because of unpredictable or unintended circumstances or because of a misplaced projection of future use and the future user into the script. We would like to illustrate this with two vignettes taken from two of our research projects, in which we focused on *otherness*, the state of being other than the dominant category. The first vignette concerns other ways of knowing and how this diversity relates to a technologically facilitated classification system. The second vignette is about how gender is intertwined with the day-to-day practices, such as dealing with the effects of an inflexible IT system.

Vignette I: Classifying Local Knowledge

The first vignette is taken from a research project called *Local knowledges in global communication*. In this project, we investigated a software program, which forms the basis for a global knowledge-sharing network for community-based organizations in so-called developing countries. The software enables participating organizations to share files in a peer-to-peer network. Each organization in the network functions as an independent media center with access points (publicly accessible computers in local organizations, village information centers or Internet cafés) in local communities. The software program is designed to be able to address the diversity found among the users, such as diversity in gender, language, culture, knowledge, and connectivity. The design is flexible and open: the default settings of the software can be adapted to the particular needs of the users. During fieldtrips to different sites it became clear how the same software package was used in very different locations, such as a fishing village and an urban community center in India and in nongovernmental organization and a Maasai community in Kenya.

One of the characteristics of the software is that it enables the decentralization of editorial services. One of those services is classification. The default settings of the software include a set of categories for classifying the “local knowledge stories” that are shared in the network. Local categories, reflecting local ways of knowing and local needs, can be added to the default classification system, both at the level of the personal computer of the volunteer reporter who writes the article and at the hub level, where a so-

called knowledge worker performs further editorial work. It became clear, however, that this option to localize the classification system was never used by any of the participating organizations or local volunteers in any of the thirteen countries that once formed the network (van der Velden 2008a).

I sat next to Jonathan in his office at the Maasai Rural Training Centre (MRTC) while he used his Worldspace satellite radio to establish an automated Internet connection with the Open Knowledge Network (OKN). Once the connection was established, he downloaded new articles and uploaded the articles he had written himself. Afterwards we looked at the articles he had written the past year. He showed me how he used the OKN software to write an article. He then chose the categories that indicated the article's "type" (news, knowledge, event, etc.), "subject" (agriculture, health, etc.), and "intended audience" (housewives, farmers, fishermen, etc.). We looked at all the possible categories. Jonathan showed me that there were no categories for the audience for which he usually writes his stories, Maasai communities and, more generally, pastoralist communities. I showed Jonathan the option to create local categories. This option was however located outside the screen he normally uses to write, classify, and upload his stories. Jonathan responded that he did not see it as his task or responsibility to use that option to localize the classification system (based on van der Velden 2009, 119).

Vignette 2: Day Care Invoices

The second vignette is taken from the research project *From government to e-government: gender, skills, learning and technology*. The project took place in southeast Sweden from 2005 to 2007. The aim was to study how e-government comes into being in day-to-day activities (Elovaara, Igira, and Mörtberg 2006; Mörtberg and Elovaara 2010). Civil servants from four municipalities participated in the project. The vignette presents a story about an inflexible IT system, which a civil servant called Anna related to one of the authors and her colleague¹ in an informal interview. Anna had worked in the municipality accounts department since 1987 and she was at the time responsible for the invoice process and related tasks. She told us about a phone call from an upset citizen, the start of a story of about 1,500 invoices sent to citizens with children in the municipal day care system. In this vignette we present a summarized version of her story, while showing the relationship between the thoughtfulness Anna expresses in her work and the current e-government discourse in which the municipality's aim is to offer citizens good services.

Information about a new service, a direct debit system, was added to the day care invoices this month. The municipality offered this service to all citizens. It is this service that is part of Anna's responsibilities. Usually the main switchboard number is printed on the invoice, but Anna preferred to give the direct telephone number in case citizens had questions about the new service. When Anna received the first phone call, she was not aware that something was wrong with the invoices. Usually an invoice is one-page long, but this time it was printed on two pages because of the extra information about the direct debit system. The notice about an extra fee of 160 Swedish crowns is always included in the day care invoice and will only be charged in case the invoice is not paid in time. However, it was the change from a one-page to a two-page invoice that made citizens suddenly aware of the possibility of having to pay an extra fee. The result was that anxious citizens called Anna to inquire about the extra fee. For Anna this meant a huge amount of phone calls, in which she had to calm down the upset and worried citizens. Anna wanted to know the source of the problem. She found out that a colleague had made some changes to the text of the invoice. The text did not fit on one page any longer and was therefore printed on two pages.

Emergent Effects

We have chosen these two vignettes because they point us, in subtle but pertinent ways, to the need of a more complex understanding of the relations between design, user, and use, than the notions of *script*, *inscription*, and *making public* may imply.

The option to localize a default classification, as we saw in Vignette 1, was not used. This option was located in another window than the one used to write, edit, and classify content. The consequences of this particular design can be analyzed with the notion of *making public*. For example, we can focus on the fact that diversity, which was one of the key issues in the network, was restricted by design. The design resulted in a particular kind of *making public* of the software. Jonathan did not find a way to work around this problem and used the existing categories to classify his stories about his Maasai community. What becomes invisible in this analysis is the emerging effect of this outcome. In Jonathan's iteration or "version" of the design, the category "Maasai," reflecting the life and knowledge of his community, was not possible and therefore not available in further iterations of the design. A new volunteer reporter is now based at the Maasai Rural Training Centre, working on what used to be Jonathan's computer and working with what used to be Jonathan's local classification. As the

new volunteer was not confronted with a category called “Maasai,” she did not have to make the decision to use this category or not. The “nonexisting” category “Maasai” has now become even more “invisible” as this reporter’s “local knowledge stories” no longer reflect the interests and knowledge of the surrounding Maasai community.

Vignette 2 makes clear that it is impossible to predict the effects emerging from the practices in which an IT system is used, that is, after the design is *made public*. Akrich writes that designers assume the world “will evolve in particular ways” (Akrich 1992, 208), thereby making decisions, inscribing their visions in the artifact, system, or service. This has consequences when the design is used, such as we saw in the vignette, where an invoice becomes two pages instead of one, because the text had become longer than what was inscribed in the assumptions. The length of the invoice text was set in the design, but there was no mentioning of possible consequences if a civil servant made the text too long for one page. Furthermore, the printing of the invoices was outsourced to an external company. This meant that Anna and her colleagues could not make test prints, to check the consequences of changes in the invoice text. Although it was impossible to predict how the practices of the civil servants would evolve when the IT system was developed, the designers’ visions and assumptions mattered in today’s practice. The decisions the designers took at the time of the design had consequences for Anna’s day-to-day doings and activities. Anna took responsibility for the unexpected consequence. She used her embodied knowledge, offered good service, and figured out why it went wrong.

Butler (2004) argues that gender is also an effect of the reproduction and questioning of norms and values. While the gender division of labor in the municipality as well as in Swedish society is invisible in Anna’s story, they are intertwined with her day-to-day activities. The public sector is the dominant labor market for women in Sweden. Administrative officers, like Anna, are predominately women and they are generally low paid. In addition, caring and care taking are associated with women as these tasks are often part of work primarily performed by women. To take responsibility and to offer good service, as Anna did, are expressions of good and caring governance. Anna’s story reflects the performativity of gender as gendered values and norms in the form of caring and care taking found in the municipality and in Swedish society. These norms and values were reproduced in the way in which Anna took responsibility and offered good services (Butler 1993, 2004).

Similarly to the discussion about Jonathan’s classification work above, using concepts such as *inscription* and *making things public* do not seem

to fully explain the effects of the civil servants' use of the system. The gendered norms and values that come into being in Anna's story remain invisible. These norms and values are not pre-given or fixed but reworked: they are cited, reproduced, or questioned in ongoing performances (Butler 2004).

In this section, we looked more closely at the relations between design and use. These relations effect new possibilities, as we saw in Anna's case, in which gender intersected in the relationship between an IT system design and a daily practice. They also closed off possibilities, as we saw in Jonathan's case, where the nonexistence of a category in one iteration of a design continued in the next. We see these consequences as emergent, as the *effects of making things public*. Our vignettes exemplify that an investigation of the relations between design and use should include the effects of use, as gender and diversity emerge in and through these effects. The vignettes thus help us to formulate our research question more precisely: *How can we design for gender when design and gender, and their relations, are emergent?*

Strategies for Design

In this section we will discuss two design strategies, which we consider of particular interest for dealing with our research question. *Degendering the design*, a concept developed by Bath (2009), is a strategy that deals explicitly with gender, by focusing on the figuration of gender in technology design. The second strategy, *undesigning the design*, presents us with the perspective that ethics should guide our understanding of the relationship between design and user. We will present each strategy and then continue by reading one strategy through the other. Such diffractive reading (Haraway 1997) remains attentive to differences but produces differences that matter by constructively engaging the two strategies (Barad 2007).

Degendering the Design

In *Searching for methodology: Feminist technology design in computer science*, Corinna Bath (2009) analyses design approaches or methodologies in order to develop a strategic design approach called the *degendering of technology*. Bath's aim is threefold: (1) she wants to "counteract problematic inscriptions of gender into technology": inscriptions that reproduce and further stabilize "the existing structural-symbolic gender order" (Bath 2009, 1); (2) to replace gender stereotypes with gender as socially constructed; and (3) to understand gender as an unstable,

Table 1. Degendering the Design

Design Mechanisms	Degendering Design Methods
1. I-methodology	<ul style="list-style-type: none"> ● User-centered design ● Requirements analysis of intended users
2. Design for women	<ul style="list-style-type: none"> ● Inclusion of female users ● Inscribing gender equity ● Participatory Design approaches such as “design for skill” and “design for technical empowerment”
3. Human-like machines perpetuating gender norms	<ul style="list-style-type: none"> ● “Underdetermined design” ● “Design for experience” ● “Reflective design”
4. Algorithms, formal objects, and conceptual approaches in computer science	<ul style="list-style-type: none"> ● Questioning assumptions, ontologies, and epistemologies ● Dissolution of dichotomies ● “Narrative transformation” ● “Mind scripting” ● “Value-sensitive design” ● “Critical technical practice” ● Laboratory studies

negotiated, and performed category in design practices. Bath moves the focus from women to technology in order to make the design of technology visible as a gendered process.

Bath envisions three possible outcomes of a *degendering the design* approach: a gender difference approach, a gender equity approach, and a deconstruction approach. Bath argues for a situated methodology: the choice of one of these three approaches needs to be “based on a close analysis of the technological artefacts in question” (Bath 2009, 3). Bath thus analyses four gendering processes or *mechanisms* in technology design and discusses a set of design methods that can support the degendering of the design. We have summarized these mechanisms and the connected methods in Table 1.

The first mechanism is the so-called I-methodology, in which designers build forth on their own suppositions, knowledge, and experiences rather than to explore alternatives and different understandings. Consequently, the designers perceive their own assumptions, norms, and values as suitable for everyone and everywhere. Gender is a non-issue in the I-methodology.

The second mechanism consists of a set of strategies in which the objective is to design for women, a kind of user-centered design. Bath argues that

one risks reproducing gender stereotypes when women (or men) are understood as a uniform group with similar demands, knowledge, and experiences. An user-centered approach with roots in gender differences is not sufficient, if the aim is to contest gendered design processes. Consequently, Bath recommends a degendering strategy for designers who “strive to inscribe gender equality into technology” (Bath 2009, 4). It is however important to be aware of which users to include, Bath argues, to avoid falling back to gender stereotypes and essentialism. This degendering strategy could also be included in the I-methodology.

Participatory Design (PD), and particularly the Scandinavian tradition of PD, is a method Bath points out as a kind of degendering approach. In PD, the ultimate user of a technology plays an important role in the design process. In the Scandinavian tradition, the focus is on democratization, the co-construction of knowledge and skills, involving multiple voices, and asymmetrical power relations (Gregory 2003; Bjerknæs and Bratteteig 1995; Sefyrin and Mørtberg 2010). This focus can be used to challenge gendered patterns and gender symbolism. Even though PD researchers are aware of asymmetrical power relations and try to address them by involving various practitioners, methods, and techniques, Bath demonstrates PD’s shortcomings. She sheds light on how PD seems to take for granted the possibilities to translate and inscribe “emancipatory ideas . . . into the technology (Bath 2009, 6). An additional critique is feminist PD researchers’ tendencies to re-essentialize gender when they explore practices and make work and competences visible that are mainly done by women. Bath concludes that also participatory design approaches are in need of additional reflections aiming at degendering strategies.

Bath also finds limitations in strategies that emphasize the human dimension in technology design, the third mechanism. Hence machines that are human like are likely to normalize, reproduce or to stabilize gender dichotomies or gendering symbolism. Approaches that build on self-reflection, argues Bath, are promising in counteracting gendered design processes in human-like machines. A combination of reflective design, in which critical reflection on values and metaphors of both designers and users form a crucial part of the design process (Sengers et al. 2005); design for experience, feminist theories and deconstructionism is what Bath suggests to degender gendered designs of human-like machines.

The fourth mechanism addresses the gendering processes in the design of algorithms, formal objects, and conceptual approaches in computer science. Bath suggests here as a part of a degendering strategy a variety of methods and approaches for “re-contextualizing formal objects and replace

questionable ontological and epistemological in basic research in computer science” (Bath 2009, 5).

Undesigning the Design

The second strategy that may help us deal with our design challenge does not provide us with a set of methods we can apply during the design process but is an perspective that focuses us, during the design process, on the unknowable uses and users of the technology we are designing. In *Invoking politics and ethics in the design of information technology: undesigning the design*, Brigham and Introna argue that the instrumentalist view on technology—technology as tools for human activities—prevents a thorough understanding of the political and ethical practices in which technologies and their design are embedded. The authors describe the “ontological divisions” between technology and humans as the main obstacle to understanding the role of politics in design and in making ethics visible: “Maintaining such divisions leads to circumscribed politics of design and use that is concerned with questions of more or less user involvement, system flexibility and the type and range of skills that IT enables” (Brigham and Introna 2007, 4). A focus on how the boundaries between technology and humans are made, they argue, show us how both are “mutually constitutive moments,” they do not pre-exist their relationship but *become* in their relationship (Brigham and Introna 2007, 6). Building forth on the work of Bruno Latour and Brigham and Introna thus invoke a politics of technology based on a *parliament of things*. Gender, in this perspective, is mutually constituted with technology in the design process as well as constituted in relations when technology is *made public* (see also Winthereik, Johannsen, and Strand 2008).

Brigham and Introna argue that ethics becomes invisible in sociotechnical approaches such as Latour’s actor-network theory. They call upon the ethical philosophy of French philosopher Emmanuel Levinas to discuss the relationship and tensions between ethics, politics, and justice. Levinas’ main concern is our responsibility for the Other, the other person or persons, and the relationship between the Self and the unique, unknowable Other. When I meet the Other, Levinas argues, I already acknowledge the difference between the Other and myself before there is language to make a representation of the Other. In the meeting with the Other, I become Self (Levinas 1989). Brigham and Introna explain the primacy of ethics² in philosophy with the distinction Levinas makes between “need” and “desire” and “said” and “saying.” “Need” and “desire” can be

understood as two understandings of love. “Need” is about love of the Self and “desire” is about love for the Other. Need is about a lack that one wants to fill for oneself. Desire is not an insatiable need but an a-satiable desire, a desire that cannot be fulfilled because the “desire” can never meet the “desired,” the “need” of the Other.

Closely related to “need” and “desire” are the notions of “said” and “saying.” The “saying,” which Levinas describes as meaningful utterances in a dialogue between the Self and the Other, cannot be reduced to what is “said,” that what is understood in this dialogue: “The said is concerned with calculability, programmability and formalisability. ‘Saying’ refers to the Other, who is neglected in the violence of the ‘said’—because all ordering, including language, is violent” (Brigham and Introna 2007, 6). “Unsayings the said” is the ethical position of making the “saying” and the Other visible. In analogy, the authors propose an *undesigning the design*, a revealing of who and what is made invisible or silenced in the design. The relevance of Levinas’ ethical philosophy for IT design, the authors argue, is that it focuses the designers on the Other: “Singular claims by silenced Others would destabilise and cast doubt upon assumed interpretations and expose the violence inherent in the design and deployment of technological infrastructures” (Brigham and Introna 2007, 7).

To Degender or to Undesign?

The two design strategies we presented above differ in several ways. Etymologically, to “de-do” something means to remove something³ while to “un-do” something is to reverse back to the previous state. To *degender the design* is to “counteract problematic inscriptions of gender in technology” (Bath 2009, 1). We understand degendering as a dismantling of the inscriptions and meanings of gender in design in order to find ways for possible intervention. Degendering design addresses our *need* to counteract inscriptions of gender we deem problematic.

Undesigning the design is based on the premise that every design is based on violence and will be challenged by silenced Others (Brigham and Introna 2007, 7). This means that every inscription of gender, even the inscriptions resulting from the degendering methods proposed by Bath, will be undone, returning to a “previous state” of gender, in order to be “done” and “undone” again. Undesigning the design is thus a perpetual state of challenging inscriptions of gender in design. Each inscription of gender in design is, or will be considered at one point, problematic.

The two design strategies also have an important method in common. Both strategies stress the *need* to analyze the inscriptions of gender in a design. The concept of script is thus central, in both strategies, to understanding how gender is inscribed and deinscribed in a design. The analysis of gender scripts will form an important part of our strategy to address our design dilemma. Can the degendering and undesigning strategies also help us in other ways? Can we undesign the design and make the Other not only visible but also the “desired” of our new design. Can we use Bath’s degendering methods? Some of the methods Bath proposes in a *degendering the design* strategy may be able to prevent some of the “violence” we described in our vignettes from reoccurring. For example, Bath discusses the need to do a “thorough requirements analysis of the intended users” and “particularly involving diverse, e.g. female users in the design process” (Bath 2009, 3), as well as “design for skill” and “design for technical empowerment,” such as found in the Scandinavian tradition of Participatory Design (Bath 2009, 4). We alluded to how difficult it is to include intended and possible future users in design in Vignette 1, the case of classifying local knowledge. Representatives from local organizations from several countries in Africa and Asia were invited to workshops and discussions to develop the default classification together with the designers based in the United Kingdom and India. The people who were going to work with the software, both as editors at the national hub level or as local volunteer reporters at local community access points, were not invited or were not yet involved with the OKN. The designers dealt with the issue of future users by providing the option to add new categories. As we saw in the case of Jonathan, the volunteer reporter, this option was not used, because it was not within the same window in which editorial work was done and he therefore did not consider it part of his editorial work. Small changes, such as locating an option in a different window in a software program, may have important unforeseen effects.

A similar situation becomes visible in Vignette 2. It makes clear how a participatory design approach such as “design for skill” may not result in the expected outcome. “Design for skill” is a participatory design approach aiming at making practitioners’ qualifications, knowledge, and experience visible in order to avoid designing systems that reduce the practitioners’ agency. In the second vignette, the design limited the civil servants’ day-to-day activities. The service was designed with a presumption that only short texts would be included. New meanings were created when a longer text was included. Anna, the civil servant, used her embodied and situated knowledge to offer good service to the worried citizens. Anna’s

norms and values were rooted in accountability and her thoughtfulness came into existence in her doings and actions. Her skills became evident in spite of the design. The breakdown, as a result of the two-page invoice, made Anna's knowledge and experience visible by offering good and caring services to the citizens who called her number. On another layer, not visible in the vignette, other governing principles such as the gendered division of labor were also present in Anna's performances.

Ungendering Gender in Design

The scripting of gender equity or gender differences in a design does not necessarily create the results we need. As we discussed above, the concept of *making things public* captures what happens when an artifact is translated in a new situation: it will get new meaning, new uses, and sometimes even new users. Our vignettes pointed, however, to the *effects* of making things public, the emergence of new possibilities and new constraints. The degendering the design strategy, we argue, may not cover such emergence. We thus propose to refigure the degendering the design strategy within a Levinasian approach to design, the *undesigned the design* approach. We may understand this new strategy as *ungendering design*.⁴ This strategy is based on the idea that every inscription of gender is or will be problematic at one time, because we can never foresee the effects when an artifact gets new meaning or when it is altered or ignored.

We therefore propose a focus on the gendering process in each of the iterations of the design, instead of focusing on creating unproblematic inscriptions of gender in design. Borrowing the language and insight of physicist Karen Barad (1996, 2003, 2007), we understand each iteration or "version" of a design as the enactment of a *cut*, in which design and gender emerge. Crucial for our argument is the understanding that this becoming of design and gender is dependent on what is included in the *intra-actions* in the design process and what is excluded. This notion of *intra-action* is different from interaction. Interaction assumes two separable objects, while *intra-action* denotes two ontologically inseparable objects. The design process is the enactment of agential cuts in which gender and design get determinate meanings (Barad, 2003).

Barad explains the notion of *intra-action* in a discussion of causality:

Intra-actions always entail particular exclusions, and exclusions foreclose the possibility of determinism, providing the condition of an open future. But neither are anything and everything possible any given moment. Indeed, *intra-actions* iteratively reconfigure what is possible at a given moment and

what is impossible—possibilities do not sit still. One way to mark this might be to say that intra-actions are constraining but not determining. But this way of putting it does not do justice to the nature of “constraints” or the dynamics of possibility. Possibilities are not narrowed in their realization; new possibilities open up as others that might have been possible are now excluded: possibilities are reconfigured and reconfiguring. There is vitality to intra-activity, a liveliness, not in the sense of a new form vitalism, but rather in terms of a new sense of aliveness (Barad 2007, 234-35).

The notion of intra-action brings our accountability as designers in each iteration of an artifact in the design process to the foreground. In Vignette 1, it became clear that possibilities that came into being in one iteration were not included in another. An agential cut was created when the OKN software was delivered to the various hubs. Flexibility, openness, and diversity in terms of gender, language, culture, knowledge, and connectivity emerged out of this iteration. This diversity was not included in the iteration described in Vignette 1. Jonathan, the volunteer reporter, drew the boundaries differently than the designers, when he did not use the option to add new categories.

In Vignette 2, several agential cuts are visible. The first telephone call was such a cut, in addition to the two-page day care invoice, the inflexible IT system, and the civil servant who made the changes to the text of the invoice. Anna’s work was reconfigured due to what emerged out of the first iteration (when the invoices were produced). She had to deal with worried parents and caretakers and had to convince them that the invoices were in order. All telephone calls mattered in Anna’s day-to-day activities. With no telephone calls, the ongoing intra-actions would have continued without breaks.

Following Barad (1999), we do not limit our understanding of the intra-actions in Vignette 2 to tangible apparatuses,⁵ such as people and technologies. When Anna performs her tasks, a wide range of material-discursive apparatuses matters, such as thoughtfulness, experience, skill, good service, and the gendered division of labor in the municipality as well as in Swedish society. To not include these apparatuses in the design process entails a risk to fall back to, and to reinforce, existing gendered values and norms.

Our focus on the gendering process in design is not only based on the need to prevent “problematic inscriptions of gender.” It also based on our desire to design for the Other, which we will never be able to know fully.⁶ This means that each iteration and every step in the design process presents us with an ethical dilemma. In our desire to do justice to these “Other

genders,” we have to make choices. Our justice will always incomplete, our desire a-satiated, but it is this desire to do justice to the Other, which will guide us in our work as technology designers and design researchers (van der Velden 2008b).

Concluding Remark

Our desire is to design information systems that do justice to gender. We looked for strategies that enable us to engage with gender in design in non-problematic ways: design strategies that “avoid a reproduction and further stabilization of the existing structural-symbolic gender order” (Bath 2009, 1). We found that the degendering strategy proposed by Bath addresses our *need* to design for gender, but we argued that this strategy may not fully address our *desire* to do justice to the future user, the Other.

Bath describes how technologies have gender politics and how we can intervene in these politics with a set of methods to counteract problematic inscriptions of gender. Brigham and Introna also affirm the politics of technology but question the primacy of politics over ethics. Levinas, they discuss, makes a distinction between need and desire. A desire is something that cannot be satisfied. Likewise, our desire to design for gender will never be fulfilled, because we can never do justice to the Others.

Applying the degendering design strategy to address our desire to design for gender may result in less problematic inscriptions of gender, but at the same time risks making the violence inherent in design invisible. We propose to refigure Bath’s degendering strategy using the undesigning design strategy proposed by Brigham and Introna. We argue that ungendering, in analogy with Levinas’ notion of “unsaying,” refers to making space for a gender not yet “said,” the unknowable gender of the unknowable Other.

How can we design for gender if we cannot fully know the Other? This question confronts us with a demand we cannot fulfill. We are caught between the need to design for gender, based on our understanding of problematic inscriptions of gender, and the desire to design for gender, our ethically responsibility towards the Other. We become ethical subjects (Critchley 2007) when we address this demand as technology designers, as each iteration in the design process is an intra-active cut, in which design and gender comes into being. What emerges out of this process is dependent on what is included and excluded in the ongoing practices. This makes designers ethically responsible for these intra-active cuts, as each cut affects our responsibility toward the Other. This is not a “cause and effect” kind of responsibility but a responsibility for the material entanglements we help

enact, as each cut reconfigures what is, at a given moment, possible and impossible (Barad 2007).

How to judge then? How to make responsible cuts? Levinas argues that it is the wisdom of love that will guide us, as “justice comes from love” (Levinas 1981, 89; van der Velden 2008a). Barad (2007) speaks in this context about mattering: it is about who and what matters or has been excluded from mattering in these material entanglements. Design becomes an ongoing negotiation between our need to do justice in design and the awareness that we are not able to know the effects of our design decisions. Practically, this means for our design and research practices that we need to look careful at the iterations (visions, scenarios, specifications, abstractions, categories, prototypes, etc.) in the design process. Each iteration is an intra-action in which decisions are made about who and what matters and what may emerge out of the next intra-action. Once we have this understanding of the design process, we become accountable not only for the things we help make but also for how things are used.

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Notes

1. This research was implemented by Pirjo Elovaara and Christina Mörberg.
2. Levinas argues that we cannot reduce ethics to politics, but this does not mean that we can separate ethics from politics. Critchley (2007, 120) mentions in his discussion of the philosophy of Levinas: “If ethics without politics is empty, then politics without ethics is blind.”
3. Draude (2008) points out that several online dictionaries define degendering as making something gender neutral by taking away references to gender or sex. Bath (2009, 1) mentions that degendering implies that there cannot be a gender-free zone. Although these conflicting meanings may confuse the debate on design and gender, we follow here Bath’s understanding of degendering.
4. We only use the notion of *ungendering* for the sake of furthering our argument. For reasons mentioned above (see note 3), we do not want to contribute to further confusion in the debate on design and gender.

5. The concept of apparatus is the product of Barad's diffractive reading of Nils Bohr and Michel Foucault (Barad 2007). An apparatus is a material-discursive practice that produces differences that matter.
6. Donna Haraway (1988) uses the notion of *partial connection* for this position of wanting to know the other, without claiming to be the other. Similar to Levinas, Haraway describes how one becomes "self" in the relation with the other.

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Bios

Maja van der Velden, PhD, works as a researcher at the Department of Informatics, University of Oslo, Norway. Her research interests are the regulatory ecology of autonomy and privacy online, gender and culture in the design of information systems, and the materiality of knowledge. Her research is at the intersection of information systems design, ethics, ecology, and feminist technoscience.

Christina Mørtberg, PhD, is associate professor at the School of Computer Science, Physics and Mathematics, Department of Informatics, Linneaus University, Sweden and Department of Informatics, University of Oslo, Norway. Her research focus is on design and design processes as knowledge processes, intra-actions between people and technology, and how gender is intertwined in intra-actions. Recent publications are *Attaching People and Technology: between e and government* (with Pirjo Elovaara, 2010) and *Designing for Sustainable Ways of Living with Technologies* (with Dagny Stuedahl and Pirjo Elovaara, 2010). Her research is at the intersection between participatory design, interaction design, and feminist technoscience.