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1. Introduction: Why Gender and Technology (again)?

It took me a long time to get (what I thought was) a grip on what technology is. During the 80s we went through phases where different definitions of the concept "technology" were heavily debated and in turn rejected (Berg & Rasmussen 1983, Lie et.al. 1988). All the different definitions seemed to lack something. The solution - so far - has been to understand technology as process, a social process involving relations and negotiations where the tangible "thing" or artifact is a non-human actor in line with the human actors. Then when I returned to my main problem; The understanding of the integration of technology and gender - I suddenly discovered that I no longer knew what gender is! Rather frustrating, to put it mildly. And the solution - so far - is of course to understand gender as process...

The interesting point is where technology and gender meet as social constructs. The meeting point, or integrated process(es), has been a focus I have pondered on for some time. Unfortunately, the "new" sociology of technology has not been much concerned about developing an understanding of the gender perspective on technology. But this does not necessarily mean that it is impossible to do so inside this "new" framework. Judy Wajcman (1991) is one of the few who has seriously tried to do so, and I happily agree with her when she (1991) argues:

> "It is impossible to divorce the gender relations which are expressed in, and shape technologies from, the wider social structures that create and maintain them."(p.25)

And I also think Wajcman makes a very important point when she continues:

> "In developing a theory of the gendered character of technology, we are inevitably in danger of either adopting an essentialist position that sees technology as inherently patriarchal, or losing sight of the structure of gender relations through an overemphasis on the historical variability of the categories of 'women' and 'technology'." (p.25)

This is the dilemma today. Gender is not one phenomenon that might or might not be added to a more "general" theory about technology. The

sociology of technology is in need of a better understanding of the **relationship** between gender and the development of technology. In connection with my research on the Norwegian Minitel experiment, I have been reflecting on the meaning of technology in terms of gender. In this chapter I will briefly present some of my thoughts around this[1].

2. A Feminist Sociology of Technology?

When I say feminist instead of gender/women studies of technology, this is because "feminist" includes a perspective of political change. Feminists look at technology in many different ways. But when we (feminists) criticize technology, broadly speaking we do so with a focus on the possibilities for change in gender relations - or the ending of male dominance in and over technology (Cockburn 1983).

In one way, some of us at least have accepted the underlying message that technology changes social relations for better or worse. If we can't find changes for the better, we have had a tendency to assume that it is for worse. We can't deny that we have suffered from a strong feeling of pessimism[2], partly based on a deterministic view of technology. Another reason for this lack of optimism has been the focus on **impact** studies (Berg 1991). Technology has been regarded as a finished product, and what was left for us to study were the harmful social impacts of the new technology on women or gender relations.

One of the main political lessons learned from the social studies of technology is the insight into how human beings shape technology. Feminism can use this understanding of technology to form political strategies for change. This is one of the important aspects of a feminist sociology of technology.

To understand why I raise this question on the relevance of feminism, I have to go back to some of the discussions we had or the way we used to work theoretically some years ago. The central theme was the gendered

[1] The research on the Norwegian Minitel project has been conducted in cooperation with Tove Håpnes. We have shared the ups and downs of field research in phase I and II of the research. What I write in this paper is the result of many discussions with her, but she is not to be blamed for any of it.

[2] For a brilliant review of the literature on gender and technology from a feminist point of view, see Judy Wajcman 1991.

implications of technology. In the early 1980s one central question was; Is technology good or bad for women? The question itself reflects a rather deterministic way of thinking. And of course it was difficult to answer. In the mid-80s a rather advanced answer was "that depends on the kind of technology we study" (Lie et.al. 1988). This answer reflects the influence of the impact studies, but at the same time it includes an incentive to look at diversity.

The new social studies of technology has had as one of its main ambitions, to criticize research that has been based on technological determinism (MacKenzie & Wajcman 1985, Bijker, Hughes & Pinch 1987). The critique of technological determinism does not simply substitute a pessimistic view of technological change with an optimistic. An important insight from this critique is that optimist and pessimist views of technology may both be deterministic (Berg 1991). This is important for feminists to bear in mind. The critique of technological determinism coming from "the social shaping/construction of technology" approaches focuses on the social factors that shape technology, human agency and creativity in relation to technology. These are aspects that have been lacking in many feminist studies of technology, as well as in the so-called general studies. Impact studies are not irrelevant. They have given us much insight into important aspects of technology; but, by focusing on the shaping of technology, our scope can be expanded. It opens up for studies of how gender relations can play a role in the shaping or construction of technologies.

An understanding of technology as a process instead of a ready-made "thing", means that the **user** of technology can be an important factor in the shaping of the technology, and not merely the passive receiver of technology. Intentions baked into technology can restrict the flexibility of a given technology, but not determine the use or the meaning of the artifact. Intentions may differ from impacts. Intentions can enable or inhibit actions or the range of possible actions. We might call it enabling structures. The user negotiates these structures in different ways through human agency and creativity. This means that technologies are flexible or open to flexible interpretation.

The inclusion of the user as an agent in the construction of technology is important with regard to gender, because women traditionally are more often users (or consumers) of technology while men are the designers (Berg 1989). A focus on users therefore, at least implies the possibility of making women visible in studies of technological development.

On the basis of some of the new writing on the sociology of technology, I will try to show one of many possible ways out of the predominant pessimism. The case study I will base my reflections around is the Norwegian Minitel project. My focus is on diversity, on **different** ways of using technology, and therefore on the flexibility of technology. What can this teach us about gender and technology?

3 Minitel in Norway - and Gender

Minitel is a French "innovation", but only one of many existing videotext systems. The French Minitel project is famous as the only success-story about teledata in the home, i.e. telematics used by people at home. The Norwegian Telecom (Teledirektoratet) has made an effort to copy the ideas behind the French Minitel project. Minitel is a new technology in Norway. Telecom's pilot project is based on typical technology-push thinking. There is no specific demand for such a technology among Norwegian households (Berg & Håpnes 1991). The Norwegian Telecom made a decision to test this technology by placing Minitel in the homes of actual users to learn more about the technology[3]. Telecom is of course interested in the possibilities of diffusion or rapid growth rates (Berg & Håpnes 1992). Telecom can only make profits when telephone lines are busy.

Essentially the project is a testing out of one IT-system; a small specialized computer with a modem built into it for connection through the ordinary telephone network. You get access to several services connected with the Minitel through this special terminal. In technical terms Minitel is the same as a PC with modem, but the VDU, the key-board, and the integrated modem which make up the Minitel is specially designed for the purpose of the Norwegian Minitel experiment. Our research on Telecom's pilot project is meant as feedback to Telecom. When we focus on the things people do with Minitel, we focus on the flexibility despite of the lack of concern for users. The creative role of users is not only limited to feedback to producers, but can be seen as the whole culture of use.

[3] This "follow-up" study of the users was undertaken by Tove Håpnes and me (1991, 1992). Minitel is tested both in the home and in the work place. Our study is focused on Minitel in the home. We have interviewed the users at two different stages, first a few weeks after they had it installed, and then after 7 -10 months of use.

For a feminist sociology of technology, learning more about gender and technology in the home is of crucial interest[4]. Gender was central when I planned the research project, but when writing the first report we ran into some unexpected problems. When analyzing gender, we seemed not to find any gendered patterns of use, i.e. stable patterns depending on the sex of the user. Users seemed to develop their own approach to the Minitel unaware of traditional sociological categories! This became quite a challenge. Was something wrong with both my theoretical understanding of technology and of gender? To make a long story short, I turned to constructivism for help. The concept of technological flexibility taught me a lot, but what about gender? When working with the interviews I noticed something interesting. There was obviously a gendered pattern of negotiations in connection with Minitel inside each household, but the content of the negotiations varied from one household to another. So in a way it made sense to analyze gender as flexible also. In this chapter I will try, in a pragmatic way, to show how gender can be flexible in connection with technology, although "gendered flexibility" is not a term I am specifically happy with.

In this chapter I will show these two forms of flexibility or diversity by focusing on how users through their negotiations, may be actors in the shaping of Minitel in terms of gender. Technological diffusion can take place through emerging patterns of use and meaning. Different patterns of use become visible when our focus shifts from a traditional producer's point of view with emphasis on utilitarian values, towards a broader user oriented point of view with focus on cultural integration of technology. I will argue that the latter approach may be one way of helping us out of the gender blindness that is characteristic of much of the sociology of technology. The traditional gender blindness is a part of our pessimism, too.

4. How Users Develop Technology through Negotiations

Technological diffusion is traditionally analyzed as an economic process. Thus the dimension which appears interesting is the distinction between the quick adopters and the reluctant or protesting slow adopters. This may be an important aspect of technological diffusion, but is not a sufficient framework for an understanding of diffusion of technology. I mention this because it is the starting point for many diffusion studies and it is important to bear this traditional framework in mind when focusing on the user of technology. A

[4] The Norwegian Research Council (NAVF) has financed the work done specifically on gender and Minitel.

heavy emphasize on the user of technology is in itself a kind of criticism of traditional diffusion theory. My point is that both producers (or designers) and users construct or shape technology.

With reference to the diffusion of domestic technology or consumer technology, some interesting theoretical and empirical attempts to understand the implementation of technology in the home have been made during the last decade.

In an article from 1987, Ruth Schwartz Cowan argues very convincingly for an understanding of diffusion with focus on the consumer of technology. She tries to apply actor-network theory on the diffusion of domestic technology with the user or the consumer as her startingpoint. She illuminates her theoretical points by reanalyzing empirical data about diffusion of cast iron stoves in North American homes. She argues that the "consumption junction" is the location where diffusion actually takes place. This is the point where the actual users enter the picture. One of the points she makes is that network analyses will be different if you choose the user as your starting point instead of the producer.

In our study of Minitel in households we try to start with the user. By being "near-sighted", investigating the actual users and patterns of use, we get a different picture of the technology and implementation process than a more traditional approach with focus on the producers can give us. Cowan also points out that the "consumption junction" is the location where technology can transform social life. She points to the necessity of opening up analyses for "unintended consequences" to be taken seriously as an important characteristic of technological diffusion (p.279). Although Cowan does not go thoroughly into the way technology can transform social life, a focus on transformation points towards the relevance of studying domestic technology in a more cultural oriented perspective. In the introduction to this chapter I argued that a feminist analysis of technology often has changes in gender relations as its main focus. Paying attention to the consumption junction and the possibilities of transformation of social life is important because it also opens up the possibilities to take gender **relations** into consideration, and not only gender representation.

An interesting project based on research about the home, technology, and consumers has been undertaken at the Center for Research into Innovation,

Culture and Technology (CRICT) at Brunel University in England[5]. Their culturally oriented perspective describes the implementation of technology in the home as consisting of four phases; Appropriation, objectification, incorporation and conversion. In the **appropriation** phase the arrival of the new technology in the home is the main concern. It means getting new commodities and symbols and owning them. Getting commodities can mean buying the new technology or as is the case with the Minitel, you can make the decision to say yes to the offer of a free commodity. **Objectification** deals with the way the household or the individual members express their own values, tastes or style through the way they "display" the new technology. In the Minitel project this aspect is covered by asking the users where the Minitel is located in their home and how they reflect around the appearance of it. This underlines the notion that the utilitarian value of an object is only one of many significant aspects. The **incorporation** phase has its focus on the use of the technology. This means to study closer how the technology is integrated in the routines of everyday life. In our interviews the users describe their use of the new artifact by telling about routines and use during the last week. The **conversion** phase connects the household to the outside world again. It concerns the way the household tries to adjust the technology to their own values or view of how society at large is or ought to be. It "carries" the technology into a larger setting again. At the same time the more superior and general values are "translated" into the new technology. In our project we have tried to catch this aspect by asking questions about the respondents' more general views on domestic technology and discussing whether Minitel fits into this picture.

The four phases, as I understand them, are different aspects of the cultural integration process. Integration of technology in the domestic sphere can be seen as a negotiation process. By focusing on negotiations, we can also see gender as negotiated in relation to technology.

A third source of inspiration has been research on technological flexibility. Most technology is developed with certain functions or patterns of use in mind, but technologies can be flexible in the way that new patterns of use or new areas of application can evolve. A fairly common opinion about technology is that it is a producer's ready-made commodity. This means that technology is aimed at **assumed** forms of use. The assumed connection

[5] I base my information about this project on a paper written by Roger Silverstone, Eric Hirsch and David Morley, which Silverstone presented at a workshop in Trondheim in May 1990. It is published in the conference proceedings (Sørensen og Berg 1991). Their work will appear in its final form in a book that will be published in 1992.

between the technological artefact and patterns of use or areas of application is an attempt to **predetermine** the staging or production where the users "negotiate" with the technology. This means that the users' desires or requests for Minitel will be connected to and evaluated in terms of the producers' assumptions about the technology. These engraved visions of use and meaning can be named **users scenarios** (Akrich 1989). The users have to relate to the users scenarios in one way or the other, but they can choose different strategies in relation to them. The different strategies and the development of different patterns of use and areas of application comprise what we have studied as technological flexibility in the Minitel project. It means having a focus on creativity and the unexpected, and this goes for gender as well.

When we interviewed the users a second time, they were familiar with the new technology and could evaluate its role in the home. The importance of studying patterns of use as technological diffusion is based on the argument that technological diffusion is not the diffusion of a ready-made artefact with predetermined patterns of use. On the contrary, technological diffusion means that artefacts change when different patterns of use emerge, new meanings emerge, and new areas of application can be set up. Diffusion of technology through use is therefore a dimension in the shaping of technology. A focus on technological flexibility may open up our analysis to comprise these kinds of change. Minitel as a technology in the making, and information technology in general, are very flexible technologies and therefore likely to be compatible with several patterns of use. Minitel, like other artifacts, is therefore in process.

5. Negotiating the obtaining of the Minitel - women's appropriation

Our research on Minitel has reached the stage where the interviewing is over and so is the first writing up of some of the empirical findings (Berg & Håpnes 1991, 1992). We have learned a lot more about technology and everyday life than we thought we would and the "gender(ed) thing" has proven far more complicated than expected. What is presented here are primarily **illustrations** of some of the theoretical points made in this chapter.

In a letter sent to every household in Lillehammer, Telecom offered a free Minitel. People had to apply for it, and either got one right away or were put on a waiting list. Here I will give some examples on the variation among women's reasoning around the appropriation phase.

The most common pattern was that one person in the household, either man or woman, is interested and seeks acceptance from the other. The partner's resistance varies, but very few told about conflicts or disagreements. Rakel Østby describes a customary family discussion[6]:

"We did not talk much about it. Even if my husband was more eager than I, we both agreed that this was a good offer. We both thought it would be fun if we were drawn out to get such a terminal. To the extent we discussed it, my husband more or less told me what the letter said. What Minitel was about. (...) We did not have much information to discuss from."

In Rakel's family the husband was more interested in the Minitel than she was, but there was no disagreement or discussion about it. In some households both man and women applied. Kari Breseth told about this:

"First I got the information through my bank. I applied at once, but did not get one. Then I applied once more. (...) I thought; This I feel like wanting. It was just to apply. There was no discussion in the family. I decided it there and then. I did not know that Tor had applied. Had no idea. I heard that later."

Tor and Kari were equally interested, and made the decision without discussing it with each other. Minitel was a free offer and evoked curiosity. It was talked about as "fun" and the introductory letter contained straightforward information about Telecom's pilot project. Signe Svarva describes her reaction to the letter of a free terminal:

"We did not discuss it, I informed him. (laughs) He does not understand much of it. That is the way it is, you step back a bit when you are unfamiliar with computers. He has a job where he does not use a computer so he knows very little about it. Not many people have such jobs any more." (Signe Svarva)

Signe tells about her way of "discussing" Minitel with her partner in a humorous way, but her story is very different from the traditional feminine approach to computers. She does nor mention gender, but attributes lack of

[6] It is difficult to translate interviews that are in the shape of informal conversations. The double meaning of the words and the local touch is lost in the translation. Norwegian might also sound rude in direct English translation. Please have this in mind when reading the quotes.

understanding of computing to lack of experience. Siv Aune tells a somewhat similar story:

"It is exciting to test something new. I also thought it would save me a few trips to town. Apart from that, I did not have any expectations in the beginning. (...) Otherwise it is open eyes and an open mind. I suppose it was a mixture of curiosity and need. I told the kids, what it can be used for, but nothing beyond that. They are interested in computers and things like that."

Her husband joined us in the middle of the interview, but he did not say much. It was obvious that Siv controlled the use of the terminal. He said something about Minitel being expensive, but she overheard that comment. Siv was a very friendly person and talked a lot about technology and her children. Later in the interview she commented to her husband "You around keyboards!" He laughed, obviously embarrassed.

Signe and Siv both display an interest in Minitel as a new and possibly exciting technology, and in different ways they asserted their control of it. Inga Hansen has a different story to tell:

"It is of no interest to me. I always think that I do not understand. I leave it to Egil. It is his domain. If I were interested or wanted to learn, he would be very pleased. He enjoys teaching me things (...) He felt like trying it, interested. He can do what he wants to if he enjoys it. It costs next to nothing. If it had been expensive we would have discussed it."

Later in the interview Inga said that she would have liked to be a bit more interested in computers. She talked about her partner as a "local Gyro Gearloose", and in their relationship one way of expressing her love for him would be to show more interest in computers. By appreciating computing, she would also tell him that she cared for him. But she said she found computing equally difficult and boring, and therefore left it to him alone.

The women's attitude and experience vary from household to household. Of course, a small sample of 25 households does not say anything about the "normality" of the appropriation phase, but my point is to show that women have, not one but several approaches. Men are also different. Both men and women span from "traditional" techno-fear to down-right enthusiasm. This means that technology may have very different meanings when it comes to gender identity. I did not expect Minitel to turn out like this. My data here illustrates how both technology and gender are flexible categories depending on the users' interaction with the artifact. To me, now, it seems a rather

trivial point, but still I find it important to show this kind of variation as a reminder of how both technology and gender are processes, and not stable categories. It is this kind of "near-sighted" detailed studies that can put us on the trail of change - both in the meaning of technology and gender, and in the interaction or relationship between the two.

6. The Electronic Telephone Book and Design of the Minitel VDU - Female Creativity and Traditional Roles

As I have said before, I am on the lookout for a way to present a relational approach to gender and the Minitel as a new technology for everyday life. I will use two examples to illustrate this; The negotiation in the households around the location and style of the VDU, and the negotiations of the electronic telephone book. These are only two small examples from our study, and at this stage, I do not pretend to say anything about the Minitel as such from these illustrations. My intention here is to use data about the electronic telephone book and the location and style of the VDU to illustrate how negotiation and creativity can be central elements in gendered shaping of technology.

Design and location: a dainty little thing - or?

When focusing on cultural integration of new technology in everyday life, other aspects than the purely utilitarian or practical are in focus. We wanted to know whether this had any relevance for the users of Minitel by discussing it with them. The terminal is a small grey "box" with a black and white VDU and a key board you can turn up. We questioned them about the appearance of the Minitel, what kind of aesthetics it expresses, and what it signals to the users and their environment. We asked them where the terminal was located in their home and why, and their opinions on the design and style of it. We were surprised how easy it was to discuss this topic in the interviews. These questions opened up for valuable and ambiguous information.

Most people had thought about the **location** of Minitel as a weighing between function and style. Function because it can't be placed just anywhere: You need a telephone plug for connection to the telephone network. The first time we interviewed them, the Minitel was placed in the sitting-room, the kitchen, the hall, the computer corner under the stairs, or the study. It is interesting to note that the second time we were told about

additional places like in the woodshed, under the sofa or in the storeroom. Those who told about these locations were the people who had stopped using the Minitel. It varied a lot how visible it was.

When it comes to **style** both location and appearance is discussed. Kari Breseth carried on a conversation with herself about this:

> "It is located in the kitchen. Actually it isn't all that lovely. But it has to be close to the telephone. It is not the kind of thing you want to show off or brag about. Telex, telefax, telephone - those are fascinating tools and can stand to be displayed. It is straight enough for the kitchen. It doesn't blend with the suite of furniture in the living room. Definitely not on the desk. We have gone for pinewood and bluish colors[7]. To fit in, the VDU should have come in that material or color. Perhaps it could have been placed in a roll-top (nedfallsbord). But it is small and neat, that's fine.
>
> It's the same way with the telephone, too. It doesn't fit in. I like some of the more special models, one with peasant style of painting or rustic art (rosemalt), I think. That was fun. One is a bit vain, you know. It is important with interior or scheme of furnishing. That's the way it is with our new system, too. (They had recently bought an advanced piece of music equipment that could be played in different rooms at the same time and be operated by remote control. It was of the brand Bang Olufsen, which is expensive and regarded as advanced in Norwegian culture. It has a certain "high-tech" design.) Design Bang Olufsen doesn't blend easily with the scheme of furnishing here. I wanted the equipment kept out of sight. Tor (her husband) wanted to display it on the wall, but then I said no! (Still, the Bang Olufsen equipment is centrally displayed in the living room.) We have everything in from the same brand now."

Kari is very concerned with style, appearance, furniture and "matching" technology. Tor Breseth, Kari's husband, does not have as much to tell as his wife about the VDU's location and style. He talks about style and practical aspects at the same time when asked about the design of the Minitel:

> "Now, the VDU isn't exactly lovely. It is more like a box. Doesn't look very exiting. Perhaps it should be equipped with a color screen. We have placed it in the kitchen because of the cats, but it isn't an ornament either.

[7] The word here is "syreluta". The Norwegians will recognize the style, but I find it impossible to explain in English.

It is just as well that it is not so visible. But I think it is more important that the services and databases are practical and user-friendly, than how it looks. Like I said before, the functions of an ordinary telephone should be built into the machine."

Tor and Kari are both concerned with the appearance of the Minitel, its location and display of style. The difference is that Kari is very conscious about its appearance in the same aesthetics sense that she cares about her furniture. She wants it to be tasteful, to blend in with the style she sees her home as a representation of. She wants objects, not only the Minitel, to show up to one's advantage, but the spouses do not always agree on this, or rather **how it should be done**. For Tor it is more important that the technical content is displayed. In this respect Kari and Tor are typical for our respondents.

Appearance means something for the people who have Minitel in their homes. This goes for **both** men and women. It is not the case that appearance is something that only women care about, like the stereotype says. The point is that appearance implies different **meanings** for men and women. When this is said, I will underline that the content of these gender differences are unstable categories. But the tendency is that they do not agree over appearance in the households, and they negotiate the disagreement in connection with the Minitel.

The introduction of Minitel in the house represents a new opportunity to negotiate style. In this negotiation men talk about function and women about taste. But how they stress it, the **content** they give "taste" and "function", varies from household to household. The main feature is that women are concerned with the aesthetic aspects and want the technology to blend into the totality of style in the home, while men are more concerned about the signalling of technical content. They talk more about function, and they want the Minitel to **appear** functional.

This is in a curious way, contradictory to the findings that say women are mainly concerned with the usefulness of a technology. Technology and gender are more ambiguous than that. men wanting technology to display technical content is more in line with "technology as masculine jewellery".

The Electronic telephone book

One of the services in the Norwegian Minitel, similar to the French Minitel, is the electronic telephone book called the "El-catalogue". You can connect up your Minitel to the telephone book and write the name of the person whose number you want. This is an alternative to using the paper telephone book or calling 0180 which is the ordinary way of finding a telephone number in Norway. But there are alternative ways of using the El-catalogue. Instead of writing the name and finding the correct number to call, you can write any number and find the subscriber(s) to the number. By doing this you can get information about the subscribers, their names, their addresses and how many people who subscribe to the same number. You can also write any address and find out who lives there and has a telephone subscription.

The first time we became aware of this possibility of use was during the first interview with Heidi and Stig. Heidi was 16 and her younger brother 13. They shared a computer at home and now they were keen to use the new Minitel technology. They had been fighting a lot over the computer, and they started arguing about the computer when we asked them about their familiarity with information technology in general. Stig started by saying that he uses the computer for almost any kind of games, and he often plays these games with his friends.

> Heidi: "You and your childish games - stupid games. There is no point in games, nothing!" (But you told us before that you used to play games as well?) "Well, that was a skate board game. Driving through ramparts and things - the point was to get as high a score as possible. But I don't do it any more. I hardly ever use the computer any more."

AJB: "You told us you use the Minitel though?"

> Heidi: "Yes, I use it mostly for fun. Like when someone is selling something through the newspaper. I notice the telephone number and can find out who it is. (She laughs) So what I use is the telephone book. I have looked at other data bases also. And the electronic notice board. Some crazy things there! (...) Minitel is more useful, not as childish as a computer."

Here Heidi mentions the electronic telephone book and a new way of using it. We shall return to the El-catalogue, but first look more closely at what

she is saying about gender and computers in general. She continues to talk about the "stupid computer:"

> Heidi: "I will not choose any subject that has to do with computers in high-school. Science is boring, I like maths though. Yes, I really love maths. It is OK. (pause) Boys they play with computers, but girls really use it for some purpose."

She is very concerned about the way boys use the computer. She flatly refuses to be associated with this kind of use of the computer. She goes on to tell about the boys:

> Heidi: "You should have seen when we had a party for our classmates here. Boys partying! They occupied the computer all the time. Some of them even decided to walk over to our neighbors to borrow their machine. That's pretty asocial. Huff! Of course it is not all of them, some are a bit special. But they are many!"

Heidi wants Minitel to be her technology. She does this by defining Minitel as a machine that is more suitable for girls (ie herself) than for boys (ie her brother). Furthermore she ridicules the way boys in general use computers. In terms of gender, she says that girls are clever and think about useful matters. Minitel is useful, therefore Minitel is suitable for her as a girl. She defines the computer which Stig has in his room, as a childish toy -- a rather astonishing contrast to the high-tech, male image conventionally associated with computers.

When we re-interviewed Heidi seven months later she told us that she had continued using the el-catalogue to find information:

> Heidi: "I look up to find out who is hiding behind a telephone number I've seen in the paper. I have also used the El-catalogue to find out where my classmates live. I have started in a new class with new people, and then I can find their addresses with the Minitel. It is kind of fun. Some times I do this with other people also - find their addresses".

Heidi's mother, Sissel, had no intentions of using the Minitel the first time we interviewed the Godås family. When we came back for the second interview she told us rather proudly that she had started using it. She started out by helping the children with their homework and:

"In addition I have checked out telephone numbers. Simply out of curiosity! (Jens, her husband, and Sissel both laugh) It goes like this; When I see a telephone number in the paper, some ad for selling a house for example, then I can look it up and find out who is selling."

When Jens and Sissel laugh at Sissel's curiosity, they both signal that they know that some forms of curiosity - "nosiness" - are not really socially acceptable. She knows it is "wrong", but she does not care. She has shown her neighbors how to use the El-catalogue for this purpose also. Sissel has found a new way to keep herself (and her friends and family) informed about local goings on. Jens does not criticize her or tease her about her curiosity. Obviously they do not make a strict distinction between talking about social events, trying to find exact information and looking it up in the El-catalogue. She signals that she knows it is not socially quite acceptable to be curious about people in her immediate neighborhood, but as long as she admits she is curious she finds it acceptable to use the Minitel to satisfy her curiosity.

We find the same "negotiation" about curiosity and the El-catalogue in other families too. With one exception, we find that it is women who talk about this kind of use of the Minitel in a positive manner. This is not surprising, women are the ones who traditionally have the role of "informationworkers" in the family and local community. But being curious about local matters is a dubious moral quality. It is fairly close to the feminine stereotype of a gossip. When interviewing the Hagnes family, the wife mentioned the El-catalogue. Her husband, Hans, felt very uncomfortable with her telling us about it:

Kjersti: "What I find interesting or amusing is to use the electronic telephone book. By using it you can find addresses. You can allow yourself to be a bit curious then."

Hans: "If you are that type of personality, curious, yes. But the El-catalogue has very limited possibilities of use if you are not the curious kind."

Hans says this in a very moralistic voice. To be curious is obviously nothing to be proud of in this connection. He defines curiosity in very negative terms. Kjersti does not want to follow up this line and changes the direction of the conversation. A bit later she says aloud to herself:

"But the El-catalogue is good if you need to find some addresses, for letters or Christmas-cards."

If you can say you use it for "practical" reasons, like finding addresses, it is obviously more acceptable. The use of the El-catalogue to gather more informal information is something that has to be negotiated inside the household and possibly outside also. In this way Minitel changes from being a practical tool for socially acceptable "rational" information gathering, to becoming an object for moral debates and negotiations of acceptable behavior. This "acceptable behavior" has gendered implications in the case of Minitel's electronic telephone book. When women as the main "care takers" of social relations in the community, do so and label it curiosity with a double meaning, it is also an aspect of the traditional meaning of gender that is at stake. Studies of the history of the telephone have shown a similar point. Women's "gossip" on the telephone has been condemned and not regarded as a creative way of using a new technology (Martin 1991, wajcman 1991). Technology as a tool for "getting a job done" is accepted. Using technology in the way they describe it here, for the sake of mere curiosity, is not immediately acceptable. Looking up names in the electronic telephone book remains a case of doubt.

The Minitel is flexible enough for users to find applications outside the "rational" area of use. Women use Minitel, in the example given here, to maintain one of "their" areas of everyday life. That is information gathering about local social activities. In this way, the sexual division of labour is preserved, BUT it is also made visible. It is on the agenda again for renegotiation in connection with Minitel. It is interesting here to see that creativity is negotiated in gendered terms in everyday life. In the case of Minitel this kind of gendered creativity is one of the interesting details to go into if we want to learn more about gender and technology in general.

7. Gender, Technological Flexibility and Political Pessimism

Understanding gender and technology as interwoven processes is difficult, but fruitful. Gender relations exist, but take on different forms. The meaning of gender is negotiated in connection with Minitel, but it varies and is not stable sex categories in interaction with Minitel.

In the introduction to this chapter I wrote that I feel uncertain about what gender is - except that it is something negotiated in social relations. Gender is not something "ready-made" that can be added to a "general" sociology of

technology. Research and discussions around gender and science have shown how gender and science are mutually dependent processes, but these studies have also pointed to difficulties, both epistomological and political, with such an approach (Harding 1986, 1991). We can learn certain things from the feminist studies of science, especially on methodology, but it is not advisable to uncritically copy this in technology studies.

Earlier in this chapter I have described three different sources of theoretical inspiration in my research on patterns of use as elements in the shaping of technology. Appearance and style are aspects of technology that are infrequently mentioned in traditional diffusion theory. In the example with the electronic telephone book we can see that this traditional theory is reflected in the way practical and rational information gathering is regarded as a socially acceptable use of Minitel.

The shift from a producer's point of view to a user oriented approach, widens our possibilities to see technology as an actor in social processes and an element in social relations. Here Minitel is negotiated simultaneously with gender. When the meaning of gender is negotiated, Minitel can play a role in the negotiation process. Style and socially acceptable use are both examples of what can be discussed. Style and socially acceptable use are **cultural** dimensions which are lacking in traditional diffusion theory.

Minitel is a new and unfinished technology. Patterns of use are emerging and are not set. I have described Minitel as a flexible technology, meaning that different, new or unintended patterns of use can emerge. The use of the electronic telephone book as described here, is such a pattern - and it is a gendered pattern under negotiation.

At this stage Minitel is a flexible technology that is open to different forms of use and meaning. Women in my study, have found ways of asserting control and using the Minitel in connection with their own work such as information gathering about social events in the neighborhood and decorating the home. When speaking of social information gathering, they say it is their curiosity that starts this kind of use. Curiosity can be related to creativity. Interior decorating is also a creative activity. Creativity is a highly valued quality in people, especially in connection with information technology. Women's information gathering and women's concern with appearances of appliances tend to be labelled with negative words -- "gossiping", "vanity" -- especially when spoken about by men.

Both the producer and user are actors that shape Minitel through their negotiation of the technical solution. Here, both technology and gender are in action. By shifting our focus from the traditional producer orientation to the user, different patterns of use become visible, as does gender[8].

The diffusion of technology can be a gendered process. I do not argue that women are creative in relation to technology. My point is to show that women can be creative. As long as we continue using theories that make us blind to such aspects, we will go on not finding creativity. When using static theories there is also a possibility that we will support gender blindness instead of stimulate possibilities for change. A user oriented approach with focus on cultural integration of artifacts in everyday life, can be a way of helping us out of the gender blindness that is characteristic of much of the sociology of technology. Shifting our focus to untraditional aspects of technology, to the relational perspective, can be a way out of pessimism.

Gender and technology can be negotiated simultaneously. Gender is not ready made - just like technology. Gender is not something we can "add" to technology, just as technology is not something we can "add" to society. Understanding gender and technology is a challenge both to the sociology of technology and women studies in general. I agree with Judy Wajcman (1991) when she in the preface to her book says:

> "The argument that women's relationship to technology is a contradictory one, combined with the realization that technology is itself a social construct, opens up fresh possibilities for feminist scholarship and action." (px)

Feminists in the social sciences are interested in learning more about process, relation and negotiation. What I loosely term "constructivists" are interested in learning more about process, relation and negotiation. The conclusion is obvious; We need more studies of gender and technology to learn more about how these processes, relations and negotiations are knit together.

[8] This does not mean that what traditionally is labelled "innovation processes" are gender neutral. Gender as relational implies also that gender relations are at work among male developers in the construction of artifacts (Berg 1991).

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