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Doing technology – or not

The modern human lives with technology. Everyday life is a continuous engagement with artefacts; physically, mentally, emotionally and morally. At least in the relatively wealthy OECD-countries, this situation has become trivial. We expect to live with technologies as matters of fact; we seldom question their place in modern society. And if we do, it is because we expect improvements and new technological options. Thus we do not just take for granted the experience of having modern technology continuously at our fingertips; we have also come to presume that there will be a continuous supply of new artefacts and systems as well as new versions of the established ones offered to us.

Of course, there are controversial technologies. Some are the object of longstanding heated controversies, like nuclear power. Others are questioned occasionally, like television and the car. In fact, there is a number of such technologies that seem to invite moral exchanges about their use. How many hours should children be allowed to watch television, if at all? Should you not use public transport rather than your car to get to work? Under what circumstances should mobile phones be turned off? These debates are important reminders that even if technology's place in modern life is a matter of fact, its use and meaning are not. The practice of technology in everyday life is far more complex and ambiguous.

In this paper, I shall inquire into the complexities of human performance or enactment of technologies, related to what is commonly seen as ownership and use. These activities may be conceptualised as domestication of technology, and the paper is meant as an effort to elaborate this concept and suggest some of its benefits. The argument starts out from the assumption that people construct their own technological practices, but in interaction with other people's practices. To begin with, the focus is on the way individuals and groups of individuals create assemblages or networks of artefacts, meaning and action in their everyday life. However, most technologies involve the construction of social institutions of infrastructure and regulation as well as collective repertoires and repositories of action and meaning. Thus, we need to approach the analysis of 'doing of technology' as a multi-sited, multi-actor process. The

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aim of the paper is to show how the domestication perspective may be helpful in this respect.

This way of framing the issue may be seen to circumvent the set of problems often presented by invoking concepts such as autonomous technology or technological imperative (Winner 1977). They refer to a long-standing anxiety of modern society that technology is out of control, that machines are taking command. Much of the literature that has pursued this perspective seems to take the idea of out-of-control too literally and assume the technological imperative to be too effective. Most inventions never see the light of day. Most innovations never become household goods. These simple facts should caution against simplistic beliefs that technologies have to be used once they have been conceived.

Nevertheless, the issue of technology as an imposed force on everyday life should not be dismissed too quickly. Even if the idea of a technological imperative is misleading, there may be strong social influences that may push us to use certain technologies. This is evident from efforts to analyse what may be conceptualised as non-use of technologies (Sørensen 1994, Wyatt 2003). Clearly, the phenomenon of non-use is a strong indication that people frequently have a choice with regard to what technologies they appropriate, but this choice may not always be exercised at will. In fact, non-use may take a lot of effort as the use of many technologies may be conceived as part of 'normal' behaviour. Of course, non-use may be interpreted as a result of technophobia. Some argue that this is a widespread phenomenon that affects between one fourth and one third of the population worldwide (see Brosnan 1998). However, Wyatt (2003) argues that non-use is a strategic decision, made because the technology does not appear as particularly beneficial or interesting, or because of active resistance. Thus, we have to be aware that ownership or use of a particular technology or a set of technologies may be enforced as well as resisted. To study the enactment of technology, we have to use an approach that is sensitive to the fact that this doing is influenced by choice as well as discipline, by enthusiasm as well as resistance. What should such an approach look like? To clarify the advantages of the domestication approach, it is useful to look into some precedent efforts.

Reductionist approaches

In general, technology has been and still is a marginal issue in the social sciences. This is reflected in the striking absence of technology and technological development as topics in standard textbooks. Most social theorists circumvent technology in the same way as nature, climate, and physical landscape, probably because this allows them to analyse society as a purely social phenomenon, undisturbed by any considerations related to the material dimensions of human existence. Moreover, the exceptional

efforts to analyse how technology interacted with humans were based on varieties of technological determinism or at least technological reductionism. Technology was understood as an autonomous force that had well-defined impacts on people and society, and social change could be explained in terms of technological progress (MacKenzie and Wajcman 1999). To understand the challenges at hand, let us briefly consider two of these efforts; the early sociology of technology and industrial sociology.

The first explicit attempt to develop a sociology of technology came from American sociologist William F. Ogburn and his collaborators. They did thorough, empirical efforts of analyzing and assessing technology and technological development (Allen et al. 1957, Gilfillan 1970, see also Westrum 1991). While Ogburn's prediction that a personal airplane would replace the car with hindsight appears ridiculous, this is not sufficient reason to neglect the approach. His sociology of technology consisted of two parts. First, his theory of inventions, which was integrated into a larger theory of social evolution. This theory was based on four key concepts: *inventions*, *cultural accumulation*, *diffusion* of inventions, and *adaption* of one part of the culture to another. The rate of inventions, according to Ogburn, grew exponentially with cultural accumulation, implying an acceleration of human progress (Ogburn 1964 [1950]:17-32).

The second part of Ogburn's sociology of technology was concerned with social effects. Similar to multivariate statistical analysis, social effects of technology were to be identified through an analysis of variations: "Since cause and effect are always variables, then, an effect cannot be explained by something that has not varied" (Allen et al. 1957:13). The crucial point was the perception of technology as a more or less continuously changing feature of modern society because of the exponential growth of inventions. This was contrasted to humans who were perceived as constants: 'We say that the automobile creates motels, though actually it is the human beings who do the creating, because the variable is the automobile and not the human beings' (ibid., p. 15). Consequently, we may describe this methodological approach as *techno-variate*. The concept emphasizes the fact that the main characteristic of the methodology is to compare social systems or social events through their classification based on the stages in the development of a given technology. To Ogburn, technology was the only independent variable in his analysis of social change.

Nevertheless, the effects of technology are perceived as products of human action and not as a necessary outcome of new technology:

By granting that we may choose to use a radio receiving set in several different ways, if enough people use a radio to listen to music, then it may be said that a radio has a social effect upon our musical enjoyment. If enough choose to listen to reports of the news, then broadcasting has a social effect upon our civic education. (op. cit., p. 18)

In most of the work of the Ogburn group, social effects were deducted from technology in a rather the sweeping manner. Put a little crudely, what they did was to make an inventory of new phenomena that could be linked to a specific technology in a given period (like radio, television, the automobile and so on). Linking meant observing that the technology played a role in the phenomenon, like increased physical mobility or different strategies of keeping informed about what happened in society. Since they, as we noted above, tended to perceive technology as the main source of social change, such new phenomena were attributed to technology.

To the very limited extent that standard sociology touches upon issues of technology and technological change, a similar analytical move may be found in the analysis of technology as an external force of variation. Take for instance Talcot Parson's grandiose effort of social theory, *The Social System* (Parson 1951). While most of his efforts are concerned with social reproduction, his analysis of social change brings him to science and technology as the main force of social transformations: "Obviously, one fundamental feature of the institutionalization of science and its application is the introduction of a continual stream of change into the social system" (p. 505). Parsons was more abstract in his analysis of technological change, but no less impressed by the scope of impacts than the Ogburn group.

Industrial sociology came to develop a quite different approach to the analysis of how technology could impact human action. Here, one was interested in the interaction of humans and machines related to processes of mechanisation and automation. A machine may be seen as an arrangement that requires certain tasks to be performed. In this way, it may be argued to produce instrumental constraints, for example along the following four dimensions (Kern and Schumann 1970, see also Bright 1958):

- The technical content of the task or its instrumental structure.
- The temporal structure of the task
- The spatial structure of the task
- The technical consequences of not executing the task or the technical sanctions.

This allows for a much more detailed analysis of the interaction of humans and machines than Ogburn's techno-variate method, with greater emphasis on characteristics of the machinery under scrutiny. From this perspective, 'effects' are observed in terms of division of labour, skills, bodily and mental strain, and possibilities of social interaction. However, the analysis presupposes that technology has definite instrumental constraints, unmediated by human interpretation. Industrial sociology serves as a reminder of the need to analyse the interaction of humans and technology in detail, but its methods failed, particularly through its

inability to account for diverse socio-economic outcomes of identical technologies.

The intention of these two approaches, the sociology of technology of the Ogburn group and industrial sociology, was to provide empirical insights into the role of technology in society and at work, respectively. Both approaches emphasise the need for detailed analysis and the importance of studying technology in a concrete way, which is important to a domestication perspective. They had outlined an important challenge, even if the problems inherent in their reductionist strategies of inquiry pointed to the need to find other ways to conceptualise the interaction of technology, culture and human action

Consuming technologies – or domesticating them?

In the early 1990s, a small group related to the newly established ‘Centre for technology and society’ in Trondheim, Norway² initiated a few projects to explore aspects of technology and everyday life. We knew we had to search for non-determinist and non-reductionist approaches, but where? Our research interest was embedded in a long-standing, local interest to study technology from the perspective of users or workers and the call from economic historians like Nathan Rosenberg (1982) to get inside the black box of technology. Ruth Schwartz Cowan (1987) also provided an important stimulus to investigate ‘the consumption junction’ in relation to the development of technology.

Eventually, we came to engage particularly with two sources of inspiration. One was actor-network theory (ANT) and the effort to develop a semiotic approach to the study of technology (Akrich 1992; Latour 1988, 1992). From this endeavour came above all some new concepts that helped the analysis of technological artefacts as embodiments of designers’ ideas about the ways users were supposed to apply their designs. Design was seen to imply to “define actors with specific tastes, competences, motives, aspirations, political prejudices and the rest”, and it is based on the assumption “that morality, technology, science, and economy will evolve in particular ways”. The designer has to inscribe this vision of the world in the technical content of the new object (Akrich 1992: 208). This inscription Akrich calls a *script*: “Thus, like a film script, technical objects define a framework of action together with the actors and the space in which they are supposed to act” (ibid.). These ideas resonated well with designer guru Donald A. Norman’s suggestion that artefacts could be considered as *affordances* related to human action, a mixture of suggestions and

² The group included Håkon With Andersen, Margrethe Aune, Anne-Jorunn Berg, Marit Hubak, Tove Håpnes, Gunnar Lamvik, Jon Sørgaard, Per Østby and myself.

facilitations with regard to how designs should or should not be used (Norman 1988; see also Pfaffenberger 1992).

Another important idea in ANT was that the script could be contested by users who consciously would override inscriptions. Latour (1993) suggested that the actual use of an artefact could be understood as a dynamic conflict between designers' programmes of action, inscribed in artefacts, and users' anti-programmes that countered or circumvented these inscriptions. The outcome could not be predicted; it had to be observed through empirical investigations.

The second source of inspiration came from media studies and the proposal to study information and communication technologies (ICTs) in everyday life through the concepts of the moral economy and of domestication (Silverstone et al. 1989, Silverstone 1991, Silverstone et al. 1992). Silverstone and his colleagues thereby proposed a suggestive and very promising theoretical scheme to study the use of technology, proposing to do this by analysing four dimensions or stages in a household's dynamic uptake of a technology: (1) appropriation, (2) objectification, (3) incorporation, and (4) conversion. This scheme integrated action and meaning. Silverstone et al.'s main focus was on the household, where the concept of the moral economy was invoked to emphasise that the economic circulation of ICT commodities was paralleled by a transactional system of meaning:

To understand the household as a moral economy, therefore, is to understand the household as part of a transactional system, dynamically involved in the public world of the production and exchange of commodities and meanings. (...) At stake is the capacity of the household or the family to create and sustain its autonomy and identity (and for individual members of the family to do the same) as an economic, social, and cultural unit. (Silverstone et al. 1992:19)

This concept of domestication was attractive in two main regards. First, it presupposed that users played an active and decisive role in the construction of patterns of use and meanings in relation to technologies. Second, it suggested that a main emphasis should be put on the production of meaning and identity from artefacts. This meant a fundamental break with technological determinism, as well as a move away from a long-term tendency to interpret technologies in mainly instrumental terms, as purposive tools.

The growing scholarly interest to study ICTs provided a common ground of investigation for media studies and technology studies.³ Still, these two fields of inquiry do have their different analytical focusing devices and research questions. Thus, arguably, there is a media studies

³ This has been fruitfully explored in the EMTEL I and II network projects, from which this paper draws inspiration.

version of domestication as well as one emerging from technology studies. These two versions are in my opinion compatible, but there are important dissimilarities due to the fact that the two versions have been employed for different purposes. Thus, to some extent, the resulting conceptual and theoretical work has pursued different problems and made use of different intellectual resources. Here, I will try to clarify some such issues by looking into some characteristics of the technology studies version.

A technology studies approach to domestication

The technology studies approach to domestication developed from an emphasis on the analysis of specific artefacts; initially primarily of the computer and related commodities (Aune 1992, 1996; Berg 1996, Håpnes 1996). In addition, there was an expressed concern to study domestication as a negotiated space of designers' views and users' needs and interests. Thus, in this version, domestication was less about household consumption and more related to the construction of a wider everyday life (Lie and Sørensen 1996, Sørensen et al. 2000). As a starting point, domestication was used as a metaphor for the transformation of an object from something unknown, something 'wild' and unstable, to become known, more stable, 'tamed' (Lie and Sørensen 1996, see also Silverstone et al. 1989: 24-25). This analysis is not just concerned with the enactment of technology. In the domestication process people and their socio-technical relations may change as well. Thus, domestication has wider implications than a socialisation of technology; it is a co-production of social and technical characteristics.

Thus, rather than to situate domestication within the moral economy of the household, the concept could be seen to have a wider potential. First, from a technology studies point of view, domestication invites to focus on three main, generic sets of features (Sørensen et al. 2000):

- The construction of a set of practices related to an artefact. This could mean routines in using the artefact, but also the establishment and development of institutions to support and regulate this use.
- The construction of meaning of the artefact, including the role the artefact eventually could play in relation to the production of identities of the actors involved.
- Cognitive processes related to learning of practice as well as meaning.

Pursuing the generic potential, domestication becomes a multi-sited process that transcends the household space and where the sites interact. Østby (1994) shows how the historical integration of the car in Norway may be understood as a process in which the set-up of national institutions and collective discourses are involved, together with the production of individual practices. Similarly, Brosveet and Sørensen (2001) suggest how the uptake of multimedia technologies and the way these technologies are

made available for, e.g., households, involve an extensive production of a wide variety of institutions and standards at a national level. Levold (2001) and Lagesen (2004) have taken the perspective in yet another direction. Here, the domestication concept is employed to analyse computer scientists and computer science students, to sensitise readers to the ambivalent and ambiguous acts of development and positioning that take place when the students and the computer scientists become or evolve as computer professionals.

Such observations may be taken further by drawing on ANT as a theoretical resource. First, the 'taming' of an artefact may be understood as a process where a script or a programme is translated or re-scripted through the way users read, interpret and act. Second, domestication may be seen as the process through which an artefact becomes associated with practices, meanings, people, and other artefacts in the construction of intersecting large and small networks (Sørensen 1994). Only rarely do we domesticate things in isolation. Using a slightly different vocabulary, domestication of artefacts may be understood as the complex movement of objects into and within existing socio-technical arrangements. In contrast to the standard assumptions of diffusion theory (Rogers 1995), such objects are not immutable; they are – at least in principle – mutable and may change through their movement.

de Laet and Mol (2000) describes this phenomenon as the fluidity of technology. Their example, a kind of water pump, may be particularly open to reconfiguration, due to the lack of sharp and solid boundaries, potential for collective and shifting 'authorship' with regard to the technology, and the absence of precise criteria for what may be considered successful functioning. However, following Law's (2004) suggestions, we should not just be aware that objects may be mutable; they may be elusive and/or multi-vocal. This is not so much a quality of the object as it is a situational issue related to the kind of network within which the object moves or becomes stabilised.

On the other hand, the domestication perspective may add concrete sensibilities to the rather abstract ANT vocabulary. First, it represents a reminder of the temporal aspect of change processes which may be understood as social learning, the important observation that the use of technologies might be transformed over time and that the trajectory of these modifications is important (Sørensen 1996). Domestication may end in the sense that the artefact is forgotten or thrown out, but the process is irreversible.

Second, the domestication perspective adds subjectivity to ANT through its focus on practice, meaning and learning. Domestication does not only imply to move objects in network, it is also a series of joint enactments between human and non-human elements of the network and in the intersections of network.

Andrew Feenberg (1999) has criticised the use the domestic metaphor in the domestication perspective:

The metaphor connotes the narrow confines of the home however it is reformulated, and thus privileges adaptation and habituation in a way that short circuits the appeal to agency. (Ibid., p. 108)

Given the emphasis on social differences, like gender or social class, in many domestication studies (see Haddon 2004, Lie and Sørensen 1996), this critique seems misplaced. Social conflict, discipline and power are inherent in most domestic practices, within households, organisations or nations. Arguably, agency starts out from the familiar, even if the aim is to transcend well-known territories. When domestication of artefacts may appear to involve adaptation and habituation, it is through hindsight – the knowledge of what actually happens.

To clarify this point, it is important to investigate domestication processes that extend in time and space. In the following sections of the paper, I will discuss two examples of such domestication processes which are presented by drawing on some of the technology studies vocabulary introduced above. The first is a brief outline of the Norwegian appropriation of the car, to demonstrate the multi-sitedness, multi-vocality and emergent character of a long-term enactment of technology. The second is a study of gender and mobile telephony that looks into the tension between diversity and standardisation of use. Both examples are also intended to highlight an additional aspect of domestication, namely the co-production of norms and enactment of technologies.

The successful construction of the Norwegian car

There are a few attempts to manufacture cars in Norway. They have all failed, including the latest effort, the electrical car Th!nk. Still, from a domestication point of view, the headline makes sense. ‘The Norwegian car’ is an allegory that suggests a specificity of cars in Norway that distinguishes them from Swedish or German ones, even when the cars technologically speaking are identical (Sørensen 1991).

To make the argument and to indicate the fruitfulness of studying domestication at a national level, we begin by considering the early historical process through which cars became introduced to and embedded in Norwegian society. In the first stage, in the late 19th and early 20th century, the car in the role of a ‘rail-free vehicle’ was a contested object. Many municipalities met the car with strong regulations; some even prohibited driving. The car was seen as a scary enemy of the perceived natural order, where transport was conducted by foot, horses, or – at best – railways. In addition, cars were believed to have a destructive impact on roads (Østby 1995: 90f). On the other hand, the car was invoked to signify progress by other actors. A main supporter, Hans Hagerup Krag, general

manager of the Norwegian Highway Directorate from 1874 to 1903, suggested – as early as 1899 – increased public grants to improve roads to prepare for the use of cars:

(I)t would be of great harm, if the nation – due to a lack of resources to improve roads – still for some time should have to do without the great advantages of such means of communication (Skougaard 1914, p. LI).

Two years later, Krag drove a car through the Norwegian mountains from Otta to Åndalsnes, a strenuous journey, to make his contemporaries aware of the car and its – in his opinion – great possibilities. Krag also sent his subordinates to other countries to study highways but also cars and driving (Kristiansen 1975).

There are probably many similarities between the Norwegian domestication of the car and what happened in other countries with respect to the building of infrastructure and the regulation of car ownership, driving, and the construction of roads. However, important specific qualities have been identified by Per Østby (1995). He shows how Norwegian efforts were shaped by a lack of a national car industry, a long-standing concern for the balance of trade with other countries, and high costs of road-building in a mountainous and sparsely populated country. This resulted in high duties and strict import controls. Between 1934 and 1962, people needed permission from a public authority to buy a car.

After 1945, new institutions were designed to provide input to the political planning and regulation of cars, traffic, and roads. Many engineers were trained in highway planning and management in the US. They returned to fill posts in public management, in education, and in a new national research institute for transport economics that was established in 1958. These institutions and the highway engineers came to manage national level domestication of the car in Norway, in the absence of a powerful car industry. In particular, city and highway planning shaped the use of cars, while extensive car ownership and driving was a basic premise for the planning. It is not possible to understand the domestication of the car on the national arena or by individuals without analysing the interaction between car traffic and the construction of roads and highways. The practice of driving has been and still is scripted by engineers and politicians, even if the various scripts have been consistently resisted (Sørensen and Sørgaard 1994, Østby 1995). What we see is really a complex interaction of a wide variety of objects, resulting in a strong and powerful but also fluid and malleable network, due to conflicting efforts of domestication.

The Norwegian car was initially a luxury, mainly for the few and wealthy, but gradually it came to be the most important means of transport and thus of great economic significance. Culturally, the continuing increase in car ownership meant that it became a household good, which during the 1960s and 1970s came to be more or less taken for

granted. Still, the meaning of the car never stabilised entirely. While some controversies were closed – like the issue of luxury versus utility and triviality – new ones emerged. Thus, the domestication of the car in Norway has taken place in a continuous engagement with moral aspects of ownership and driving. Using Bakhtin's concept of polyphony in a metaphorical way (Bakhtin 1986, see Lagesen 2004), we may identify an abundance of contradictory authoritative voices and expectations regarding car ownership and use, such as, for example:

- 'Cars are an unnecessary luxury'
- 'Cars are needed to provide important social activities, like transport of goods and people, and to perform services, like doctoring'
- 'Cars are an economic problem'
- 'Cars are needed to support economic growth and development'
- 'Cars are dangerous'
- 'Cars are a part of a modern welfare society and a sign of progress'
- 'Cars need to be taxed severely to pay for costs of infrastructure and accidents'
- 'Cars are a threat to the environment'
- 'To drive a car is a human right'
- 'You should rather use public transport' (see Sørensen and Sørgaard 1994, Østby 1995, Aune 1998)

Clearly, this allows one to find arguments that support both use and non-use of cars. A wide diversity of ways to domesticate or not emerges. However, it would be misleading to see this as an exercise of free choice. Only a small minority of Norwegians do not have access to a car, and most people in this category are either young or old. In the infrastructure offered to Norwegians with regard to where they live, where they work, and where they find shopping and service institutions, car ownership has been inscribed as a clear expectation. In particular, Aune (1998) argues that when people have children, this represents a practical demand to acquire a car, because it is commonly perceived that children need to be driven to kindergarten, sport events, social activities, etc. This makes car ownership a social standard, a normal way of life.

Still, car driving in Norway is a matter of concern. It is recognised as a normal thing to do, but also as something that one should do less of. In this respect, domestication of the car involves the management of moral ambivalence and ambiguity. As a society, Norway has domesticated the car to the extent that car ownership has become normal. Strong disciplining mechanisms set standards for ownership as well as driving, like traffic rules, police surveillance, road bumps ('sleeping policemen'), mandatory technical controls, and parking rules. While car practices remain diverse, subject to

individuals' needs, values, and creativity, the car has become what we could call a quasi-stable object. It is stabilised in a complex and extensive network, but it also remains mutable. Therefore, the car has to be domesticated over and over again, even if there is an abundance of voices to guide the enactment. In a deep sense, to drive a car is a messy business (Law 2004).

Mobile phone morality⁴

The mobile phone offers an interesting opportunity to analyse domestication processes because this artefact very rapidly has become a widely used communication device, involving considerable cultural changes. In particular, I want to look into the construction of technology-related norms that may shape meaning as well as use of the artefact.

On one level, Norway's domestication of the mobile looks very much like a 'critical mass' story, given the very rapid growth of ownership of mobile phones and the dramatic increase in traffic. In 2003, 86 % of Norwegians between 9 and 79 years of age owned a mobile phone.⁵

The people interviewed in our study acquired their first mobile at different times and for different reasons. Most of the early adopters got their mobiles through work.

I got my first mobile in 1995. I needed it at work, and my employer paid for it. At that time, I drove my car every day from Sandefjord to Oslo. Then I could do a lot of work in the car. There were a great number of people I needed to call, and I could spend the time doing this while I was in the car anyway. (Anders)

The late adopters got their mobile one to three years before the interview took place. Several had resisted the mobile, and some had even decided that they never wanted a mobile. Resistance was primarily explained in two ways. The first claim was that they really did not need one. The other claim was that they did not want to be accessible at all times.

I resist it. I feel that I want to protect myself and not be so accessible. This is something I believe is related to my situation at work; all the time somebody wants something from me. Also, socially and family-wise I am at a stage where everyone sells and buys homes in need of refurbishing and wants some assistance. (Reidun)

Nevertheless, some of the resistant users had become quite active. Thus, to be a late adopter does not mean that one has to remain moderate or cautious, only that adoption may be a slow process. Reidun told us that

⁴ This section is based on Nordli and Sørensen (2004). They present a case study based on interviews with 21 Norwegian men and women in two age groups, between 25 and 45 and between 50 and 60 years of age. The informants include both early and late adopters.

⁵ <http://www.ssb.no/aarbok/tab/t-070230-271.html>

she felt her attitude towards her mobile was changing, but only very slowly.

A striking finding was a gendered pattern of acquisition of the mobile phone. While the men informants either got the mobile through their employer or bought one themselves, all the women received their first mobile as a present. It was given to them by their husbands, boyfriends, sisters, brothers, fathers or other family members. Often, they got a used mobile, available because the giver had acquired a new one. Arguably, we observe a phenomenon that may be called a “wife mobile” similar to the “wife car”.

There is a communication logic, which fuels the motive to give away mobiles. To those who own one, their experience suggests that it is very practical that the people they relate to also have access to a mobile. As a communication device, mobile phones seem to carry the seed of their own diffusion – an object-generating object. As an increasing part of the population owns one, access becomes increasingly tempting, even a pressing concern. One of the women, Reidun, said she felt pressured. She vividly claimed that she did not want a mobile, but her children and her parents had ‘forced’ her to have one, so they could reach her when she spent time alone at their cabin in the mountains. Domestication may thus be disciplined in a quite upfront manner.

The conjecture that there is considerable variation between our informants in terms of their domestication was definitely confirmed. Some of them spend a lot of time, energy and money on communication through their mobiles. They tend to leave their mobiles on at all times, and they send a lot of messages. Some of them also talk a lot with people through their mobiles, but that tends to be related to work. Anne typically admits that:

I have made myself a bit dependent, really. You get accustomed to be accessible when you want to. Sometimes, it is very convenient to be accessible. You decide yourself. You can ignore people; you can turn it off or choose not to respond. (...) I mainly use the mobile to send messages. Usually about nothing, such small everyday life things. In a way, this is a toy that you buy for yourself. I really don't phone very much.

Anniken got her first mobile through her employer to make her more accessible. Presently, she is a housewife and she mainly refers to her social life and her interest in chatting, when she explains why she needs a mobile:

Everyone else had one. I missed out on so much when I didn't have a mobile. There were a lot of at-the-moment appointments. Then it was impossible to get hold of me. I had a telephone at home, but it wasn't used in that way.

Among our other informants, we find a pattern where the rationale behind the use of the mobile resembles the one we observe among the heavy users. After a while, they become much more eager users than they had planned to be. This was particularly true for some of the initially

resistant. Suddenly they found themselves bringing the mobile with them wherever they go. Another change is that they more rarely turn off the mobile. Instead, they apply the silent mode. Their reason for leaving the phone on even at times when they are not able to or do not want to answer it, is to remain in control of who has called and to see when a message has come in.

The restlessness and the urge to have the phone turned on seems due to a feeling of belonging or being part of a group. When they received a text-message, they knew someone was thinking of them. To some degree, there was also the fear of being left out. Many of the informants had noticed that there had been a change in the way people made plans. While in the past, they used to make plans in advance, some of the planning was now left to the last minute.

It is also important in love affairs. Marit told us how essential the mobile had been in her last relationship. Within the first couple of weeks, she sent 258 messages to him, and he answered all of them. As the love affair cooled off, the messages became increasingly rare. Anniken told a similar story, but on a more positive note. She and her present partner had exchanged 600 messages the first two days after they had met. She had written them all down on paper, which she kept like a treasure. Every now and then she would read them to be reminded of their first days of getting to know each other.

It was common to talk about 'mobile common sense' or 'proper behaviour'. Here, we observe the emergence of a morality as a part of the domestication of the mobile. The main concern expressed by the informants is to avoid disturbing other people. The most active users say moral sense is about not having telephone conversations at weddings, funerals or very nice restaurants. To some degree, they concur that talking on the phone when you are with just one other person should be avoided. However, conversing on the phone during public transport, in cafes and other places where talking is permitted, they find okay. The more moderate users said they would try to keep their voices down and make the conversation short if other people were around. As a rule they thought people should avoid talking on the phone in public places when other people were close.

Many informants also said they should be better at turning off the mobile or even leaving the mobile at home. However, all of them acted in the opposite way. They left the mobile at home or turned it off more and more rarely. In a way, one could perhaps say that they became habituated to having the mobile in an 'accessible mode'. For example, they would say that other people were so used to being able to reach them at all times that they got worried if they did not answer. Also, they admitted to feeling restless when they did not know whether someone had sent them a message or tried to call them.

That people talk at length about moral aspects of mobile telephony is no evidence that there is a well-defined morality related to mobiles. On the contrary, suggested moral rules vary a lot and many admit to breaking the rules they themselves suggest. Thus, clearly, the situation regarding norms for the domestication of mobiles is more ambiguous than in the case of the car. However, many people feel that technologies like mobile phones should somehow be regulated in a normative way because the use of them raises important moral issues about appropriate behaviours and consideration of other people.

These concerns are shared by men and women, and there was no clear-cut distinction between the moral narratives offered by men and women informants in the study. This emphasises our previous suggestion that mobile phones are not constructed as belonging to one gender. They are not gender-neutral, but they seem to facilitate a complex set of symbolisms and practices related to – but not determined by – gender.

The domestication of the mobile phone is a moral undertaking in a double sense. We have observed that moral concerns are invoked in the account of the domestication process, but also that the construction of such norms is done as a collective aspect of the domestication. People discover a need for norms and struggle to negotiate what they should be (see also Ling and Yttri 2002). In this way, they retain agency, while the mobile phone remain fluid. The construction of norms is of course an effort to achieve stabilisation, but it is not effective in this case.

However, the most striking aspect of the domestication of mobiles is the emergence of a more intensive communication practice. Ling and Yttri (2002) propose that mobile phones facilitate ‘hyper-coordination’ in terms of the instrumental possibility of exchanging information about time and space coordinates. Both men and women use the mobile phone to exchange information and emotional messages, to allow for tighter socio-spatial navigation. However, in most cases, coordination is not that hyper. It is just improved, compared to previous communication technologies. What is new is the emerging feeling that one should be accessible everywhere and at all times. This moral norm seems to strongly influence the domestication of the mobile to achieve accessibility, but as our study shows, the space for diversity is considerable.

Representing complexity

The idea that technology has social impacts is widespread. In popular accounts, the car reshaped modern society in a fundamental way and the mobile phone is causing deep changes in late modern living. The technovariate method of Ogburn and collaborators probably resonates much better with popular thinking about technology than domestication does. The suggestion of industrial sociology that machines direct human action

seems close to everyday experience. Is there any reader who has not at least once cursed her car or his computer for its spitefulness and uncomfortable interventions?

The challenge of thinking in terms of 'impacts' is at its most evident when new technologies are about to be introduced. If we look at the arguments provided for heavy investments in broadband technology or so-called 3G mobile telephony, they are surprisingly slim. They focus on speed and capacity, as if these features do have an immediate social meaning. It is assumed that increased speed and capacity will be translated into something useful, but it is unclear what the utility will be. Broadband and 3G clearly need to be domesticated; it is only after an eventual domestication that 'impacts' may be identified. Impact is hindsight, something we may believe in after the underlying performances have been rendered invisible or uninteresting.

This is no denial that technologies are forceful ingredients of modern society; it only denies that the forcefulness is inherent in technology itself. Actor-network theory has argued that this force emerges from the way technology and culture become enmeshed through delegation and re-delegation of action between human and non-human actants (Latour 1988, 1992). We experience the force of technology through learning and discipline made invisible.

Thus, the main advantage of the domestication perspective is that it is a conceptual device that sensitises the analyst to the complexity of integrating artefacts into dynamic socio-technical settings, like the household, the workplace, or society. It is a reminder to be concerned with the practical, symbolic and cognitive aspects of the work needed to do this integration, at multiple sites. The brief efforts to analyse the domestication of cars and mobile phones was meant to demonstrate this point and to show the great number of diverse efforts needed to achieve a productive integration.

In particular, I have emphasised the morality of domestication to show the importance of considering the normative aspects of technologies. On the one hand, domestication is disciplined through expectations and norms. A person may feel that she has to bring a car or a mobile phone into her life, even if she does not want to. On the other, over time, a collective domestication produces new norms and expectations that influences the way the artefact is used, the meaning it signifies, and the possibilities of learning new ways of doing and thinking about it. In this respect, technologies are deeply moral enterprises.

This observation is related to but also distinctly different from the perspective of a moral economy. As developed by E. P. Thompson (1971), the concept of a moral economy is meant to emphasise the importance of non-economic features to explain action and agency. He was concerned

with social norms and obligations as given, as preconditions of proper behaviour. The domestication argument, as presented here, is that norms may be understood as contested, fluid, emergent properties of developing technologies. At some point, norms may influence domestication, but the moral aspect of technology seems to remain dynamic. Maybe this is typical of norms in late modern societies, which suggests that the concept of a moral economy is too strict and stable.

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