

“We release them little by little”: maturation and gender identity as seen in the use of mobile telephony¹

by

Rich Ling, Ph.D.
Telenor R&D
PB 83
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richard-seyler.ling@telenor.com

Abstract

This paper examines the social meaning behind the adoption of mobile telephones by teens in Norway. Through this adoption process one can see the way in which youth are developing their adult identity as well as their gendered identity. The primary database used in this analysis is from two telephone questionnaires of Norwegian youth aged 13 to 20 carried out in October and December 1998. A total of 2007 interviews are included. The survey instrument covered teens' ownership of mobile telephones, payment forms and the use of mobile telephones to send and receive Short Message System (SMS) text messages. In addition the analysis draws on a survey of 1001 Norwegian parents and ethnographic interviews of 12 families.

1 Introduction

Taking a tip from Garfinkle, a common trick for teaching assistants in freshman sociology classes is to assign their students to break a social norm. One pair of students, from my time as a teaching assistant, went into a grocery store where they walked up to a woman shopper at the bread rack and asked to have the loaf of bread she had just placed in her shopping cart. The woman told them that it was hers. The students replied that that was not true since she had not yet paid for it. Technically, it

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was still the property of the grocery store and thus available for purchase. As the woman’s confusion and the tenor of the conversation rose, she pointed to all the other bread that was unclaimed and talked about her intent to purchase as a proxy for contractual ownership, etc. The students persevered. Eventually, a manager was called, the nature of the sociology assignment was exposed and the situation was resolved.

In addition to giving students the opportunity to play out various youthful impulses, this assignment makes a good sociological point. Namely, it creates an unexpected social situation that exposes some taken for granted social arrangement. In the case reported here the students played with the notion of ownership, payment and personal space.

Turning to the topic of this paper, what does this have to do with mobile telephones? I bring up the norm breaking assignment since the mobile telephone is, in effect, a norm-breaking freshmen sociology student writ large. Their unpredictable and unexpected appearance in a variety of social situations exposes the taken-for-granted nature of society. Their adoption and use in various contexts illuminates aspects of the context into which they are introduced (Silverstone 1993, Silverstone 1994). On the one hand the mobile telephone allows the users to carry out common tasks in new ways. In addition, they highlight various dimensions of the user’s social world for observers, and critics outside the social group.

Mobile telephony is a technology that is currently being adopted by teens in Norway. Like the norm breaking experiment, their adoption sets various aspects of teens’ social context into perspective. Their adoption illuminates teens’ interest in being accessible to peers and the symbolic value of certain artifacts. It also points out the ways in which social maturation and emancipation proceed along various trajectories conditioned by one’s social status, gender, life situation etc.

Not surprisingly, mobile telephones have also become an element in the parents’ notions of upbringing their children. In the words of a mother who was critical to her 15-year-old daughter’s recent ownership of a mobile telephone:

First there is the uncritical use that she has shown with the telephone, it has been completely crazy. Second, it is misused at school, she won’t turn it off when she should and things like that. I am afraid of her use, that she won’t be able to control that. (Lisa-Edith 43)

The appearance of the mobile telephone crystallized the situation. It meant that Lisa-Edith must consider that maturity and judgement of her daughter along a new dimension. Thus, the device forces her hand as a parent. Should she assert her role as a mother and restrict her daughter’s use of the device, or should she trust her daughter? These judgements are not easy to make. In some cases the mobile telephone could prove to be useful as it allows for more nuanced coordination within the family. However, as Lisa-Edith points out, it can also lead to problematic situations since its use has economic implications and it reduces parents’ control over their children.

The qualitative data shows clearly that discussions about teens’ ownership and use of technology are a moment in the social definition of their maturation. In modern industrial society, this transition is not a slow and gradual process with clearly marked transitions. Rather, it is episodic wherein the participation in various events and the consumption of various items mark a child’s progression away from one’s home of orientation into the relatively open period of late adolescence and early adulthood. Events as different as the regular use of make-up, purchasing the first record album, the first party, the first kiss, the first exposure to alcohol, loss of virginity and now,

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the first subscription to a mobile telephone are all points along the way. Many of these activities have, in addition to their manifest function, the latent function of marking the transition.

The new element in this mixture is the development and consumption of information and communication technologies (ICT). While teens have used (misused?) various technologies such as TV, videos and the traditional telephone, the addition of a mobile communication component provides the potential for coordination and interaction within the peer group in a way that was impossible up to now. Meyrowitz (1986) talked about how the TV allows the child to view the entire world. The mobile telephone now allows them to interact without the traditional filtering of parents. Thus, the peer group can and is being organized in new, more dynamic ways (Manceron, 1997).

After a review of the methods used I will examine the social definition of both technology and adolescence. Following this there will be an examination of the data and a discussion of the empirical material.

2 Method

The data examined here comes from three sources. The primary database is from two telephone questionnaire based surveys of Norwegian youth aged 13 to 20. These were carried out with nearly identical instruments in October and December 1998. A total of 2007 interviews are included. In addition to the standard demographic questions the survey instrument covered teens' ownership of mobile telephones, payment forms and the use of mobile telephones to send and receive Short Message System (SMS) text messages.

The second database comes from a survey of 1001 Norwegian parents. To be interviewed the oldest child of the respondent needed to be between 10 and 20 years of age. This was a far more extensive questionnaire covering both traditional and mobile telephony. The questionnaire covered the parent's use of the telephone, their children's ownership of various telephone equipment and their attitudes toward telephony. The questionnaire was administered by telephone in August 1998.

Finally, the qualitative material consist of 12 interviews carried out with families in the Oslo area in the spring and summer of 1997. These interviews covered the parents', and the children's ownership, understanding and attitudes toward ICTs including the radio, the television, the PC, the Internet the and the telephone. In this case, the age of the oldest child in the home ranged from eight to 23. These in-depth interviews were carried out in the homes of the informants.

The quantitative analysis was carried out using SPSS while the qualitative analysis of the latter database was done using computer assisted text analysis in order to facilitate the sorting of the various categories in the data.

3 Technological identity, adolescence and maturation

Before examining the data it is necessary to set the scene by examining two interconnected issues. These include the social definition of technology and the social understanding of adolescence.

3.1 The social definition of the mobile telephone

One of the first issues here is the social definition of the mobile telephone. Along with Sweden and Finland, Norway has the highest per capita consumption of mobile

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telephones in the world. In Norway almost 50% of the citizens own a mobile telephone (Bakke 1996, 83 see also Haddon 1996). This rate is much higher among certain groups. Analysis shows that almost 80% of middle aged men have mobile telephones (Ling, 1998b). To use a biological metaphor, this rate of adoption indicates that the device has filled a niche that was obviously open (Boulding 1978). Boulding’s notion of a niche is interesting in that it assumes both an interaction between species and a context into which the species fits. Boulding applies this concept to technologies. Turning to the topic of this paper, the “species”, that is to say mobile telephones, have entered into a niche, or a social context. Their adoption, growth, interaction with other technologies and factors in the environment can be studied and mapped.

The metaphor has its limitations. None-the-less, it provides a point of departure for the examination of the technology. The implication, of course, is that to explain the adoption of mobile telephones into everyday life, one must also examine the context into which they are integrated. What is the function of the device in the eyes of the user? What symbolic needs are being fulfilled? These are classic questions in the investigation of ICTs in everyday life (Silverstone and Haddon 1996; Silverstone, Hirsch and Morley 1992 see also Bijker Hughes and Pinch 1987; Bijker 1987; Haddon 1992; Haddon and Skinner 1991; Silverstone 1993; Silverstone 1994).

To explore this issue one can think of both the physical and abstract dimensions of the technology. On the one hand the mobile telephone is a physical object that is available for display. It has weight, a color and a design. The mobile telephone can be viewed as a type of jewelry or clothing (Ling 1998 see also, Goffman 1959, Goffman 1971). This physical dimension means that society at large can, and does, assign it meaning. It can be seen as tacky, vulgar, cool or impressive. Thus, the physical aspects of the object in itself are a marker for one’s participation in a set of broader activities. Display of a mobile telephone indicates to the viewer that the owner (or in the case of teens at least the owner’s parents) has the economic wherewithal to pay for the subscription. It can point out that one is in demand and must be accessible and that one is advanced technically. For others the display of the device can be seen as a form of tackiness and false importance.

There is however, another moment in the social definition of mobile telephony. Beyond the simple presence of the object there is also its use. The use of the mobile telephone can be interpreted in both functional and symbolic terms. On the one hand, it can help the user coordinate everyday activities, it can facilitate sending and receiving important and sometimes urgent messages, etc. Thus, the mobile telephone may play a role in the micro-coordination of society (Ling 1998a).

In addition to, or perhaps beside of these uses, it can also be used to literally signal one’s status through its use as a telephone. Traditional research on the use of telephones has often drawn on the dichotomy of function versus social use of the technology (Ling 1994; Rakow 1992). The type of telephone use being described here, however, is on another dimension. The content of the message may be either functional or social, but its identification as being a mobile telephone call wherein the intent is to impress the callee means that the meta-content of the message may likely be status assertion. The casual call from a bus or other previously telephone free environment, the comment that “I am calling from my mobile” and, indeed even the very background sound distinguish the call from traditional telephony (Bakke 1996). In addition with efforts to impress one’s interlocutor use of the device may be calculated to impress viewers of the conversation. Thus, the obvious telephone call in the restaurant or other public place may actually be intended as a visual/audio message

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to others who are in the immediate physical vicinity.² In both cases this is a type of status display.

Obvious high status, like beauty, is in the eye of the beholder and the assertion of status through reference to the communication technology may very well back fire. None-the-less, its intention and its interpretation can be seen as part of the communication process. This points to the notion that with any display, there is interpretation involved. The interpretation of this presentation arises out of the negotiation between the displayer and the viewer. Silverstone et al. note that:

All technologies have the potential to be appropriated into an aesthetic environment (and all environments have, in some sense, an aesthetic). And many are purchased as much for their appearance and their compatibility with the dominant aesthetic rationality of the home as for their functional significance (1992, 23).

Thus, the physical and the abstract dimensions of the mobile telephone are embedded in a social niche. The presence of the telephone changes the context in that it allows for activities that were not available before its introduction. In turn the mobile telephone also becomes a portion of the user's identity. (Silverstone and Haddon 1996, 58 see also Marx 1994; Stone 1994). The interpretation of that identity is a social process. Adolescence is that period wherein these interpretations arrive on the scene. This is the theme of the next section.

3.2 Adolescence in contemporary Norwegian society

The use of technology among adolescents needs to be seen against the backdrop of their social situation. There are several important structural turning points in the lives of contemporary Norwegian children. The first is the move from primary to secondary school that takes place when they are 12 years old. This is important in that it is often concurrent with or immediately before physical maturation and the accompanying interest in (or perhaps confusion over) the opposite sex. In addition, it means that the child moves from the relatively safe confines of a primary school into a new constellation of friends and peers. This is also the nascent beginning of the child's emancipation from the home. Various part-time jobs mean that they have some of their own spending money. Growing identity awareness may also mean that they feel the desire to express their own, or perhaps their peers' sense of fashion and display.

The next transition is the move from middle into high school at age 15. Again, there is a reconfiguration of the peer group and a continued movement away from the sphere of their parents. The final and perhaps the most profound point of inflection comes when the child is 18. They are finished with obligatory schooling and move either to the working world or about 25% continue to study at a university or college.

As in many industrialized societies, there is an unclear transition from adolescence to adulthood in Norway. It is only as the individual completes their obligatory education that one can really talk of emancipation in any total sense of the word. But emancipation and adulthood are two overlapping concepts. The individual may have their own economy and may establish their own home, albeit a very elemental efficiency apartment or a cooperative arrangement with friends. None-the-less the individual, who is no longer a child, can not be considered a mature adult. In almost all

² See Håberg (1997) for an analysis of the urban legends surrounding the use of the mobile telephone.

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cases they have neither started a career oriented work life in earnest nor have they established a family of procreation.

Thus, much of adolescence is concerned with the child's movement from the home of their parents to their eventual role as independent adults and, in most cases, into their role as parents and wage earners. Adolescence is the period in which one is allowed, and even encouraged to test out various identities. In industrial society adolescence has, in many ways, replaced the specific passage rites of traditional societies. Rather, one's status makes a series of transitions from one to another overlapping set of roles, i.e. the movement from school into part-time work while still in school to working and then perhaps back into more advanced schooling (Gennep 1960).

In contemporary industrial societies children only rarely follow in the career footsteps of their parents. Moreover, technical developments give children much different life experience from that of their parents. While industrialization results in rapid shifts in the material culture, the non-material culture is less fluid (Ogburn 1950). According to Ogburn this is the basis for a cultural lag wherein the values of a society are not always synchronized with the material situation. A condition in modern society is that neither the culture, nor one's socialization can be assumed to be received. Because of this children can not rely on intergenerational knowledge. Also the need to educate and socialize children into the specialized skilled labor force has resulted in an expanded system of formal education. Within the educational system the age sorting of children has meant that the peer group has become a strong reference group for children.

Thus, the relative isolation of children from the working world as a result of industrialization (Aires 1972, Rubin 1984, 6) along with enforced interaction has crystallized in a robust youth culture (Hogan 1985, 2). Adolescence is, in many respects, an alternative and competing focus to the family (Prost 1991). During the early and mid-teen years the peer group often takes on a more active and vital dimension in the life of the adolescent. There may even be an element of generational conflict in that while parents may not consider their work completed, the teen is active in their development of an identity separate from the family.

Within this context the peer group is central. The adolescent peer group has several distinguishing characteristics. These include independence from adult supervision that provides space for the development of contrasting values, a fluid status structure and usually segregation by gender. The mutual need for affirmation and status are easily attained here (Rubin 1985, 109-111). The adolescent peer group provides the teen with an opportunity to develop an independent identity, practice in role taking and impression management skills and socialization in the informal, but very important, areas outside the formal system. These include areas such as the practice of sexual behavior and its boundaries and strategies of informal behavior within formal systems. (Gekas 1981 see also Danesi 1994, Rainwater 1970, 275-315). This knowledge is used when tackling everyday situations and preparing them for the issues that they will meet as adults (Meyrowitz 1986). As opposed to traditional societies the adolescent and the peer group are active in shaping their own socialization (Glazer and Strauss 1971, 57-88).

Coming down to the level of specific new technologies such as the mobile telephone, while this technology facilitates the coordination of everyday family life, it also adds a new dimension to the adolescent's coordination of their reference groups. There is a small literature on adolescents and PSTN based telephony, (Aronsen 1977; Castelain-Meunier 1997; Claisse and Rowe 1987; Heinzman, et. al. 1997; Katz and Asp-

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den 1998; Kellner 1977; Lohen 1997; Pratto and Rodman 1993). However, there is only the beginnings of a literature on adolescents and mobile telephony (Ling 1998a; Manceron 1997).

Bringing together these two streams of thought, in addition to their functional properties, mobile telephones are also available for incorporation in the symbolic universe of adolescents. The functional aspects of the technology fit well into adolescents desire to be continually available to be emancipated from their parents' home and to coordinate of their everyday activities. They are also available to serve in a variety of symbolic roles in a period when one is establishing an individual identity. Finally, the introduction of pre-paid subscriptions that reduce the threat of major economic consequences have also facilitated the adoption process.

This is not to say that the devices are only positive and have been met with open arms by both children and parents. Nor is it to say that they only lead to dysfunctional behavior on the part of adolescents. Rather, the point here is that one can understand their adoption and use better by looking at both the technology itself and the context into which it is being adopted. Further, its very adoption by teens illuminates various aspects of the emancipation and gender identification process for contemporary adolescents.

4 Results

The analysis of the data will be divided into three general areas. The first will be the analysis of mobile telephone ownership. The next portion of the analysis will examine the use of pre-paid subscriptions, one of the true motors behind the recent development of this market. Finally, the paper will examine the use of text messaging via the so-called Short Message System (SMS).

	Age Group			N
	13-14	15-18	19-20	
Nov 97	3.14	14.54	38.56	1000
Oct 98	8.06	31.56	64.31	1010
Dec 98	8.50	34.39	60.56	1004

Table 1 Reported ownership of mobile telephones by Norwegian youth

4.1 Mobile telephony ownership among Norwegian youth

4.1.1 Ownership and borrowing

The data shows a steady growth in the use of mobile telephony among Norwegian youth. As of December 1998 more than one third of Norwegian teens reported that they had the exclusive use of a mobile telephone.³ When looking at ownership by

³ It needs to be noted that there has been a slight, but perhaps meaningful change in the exact formulation of the question between the November '97 survey and the October '98 survey. In the former questionnaire the respondent was asked if they "owned" a mobile telephone. The problem is that this plays on a legal issue in that those younger than 18 years of age are not allowed to enter into contractual agreements in Norway. Thus, it is not legally possible for a teen to own a mobile telephone and be a signatory to a subscription contract using a traditional billing system. In the two '98 analyses the wording was changed to adjust for this situation. Respondents were asked if they "Generally dispose of/own a mobile telephone alone (*Disponer/eier en mobiltelefon stort sett alene*). In addition, it is now possible for a teen to own a mobile telephone and use a pre-paid subscription since there is not contractual agreement involved. Pre-paid subscriptions were only begin-

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age one can see a dramatic growth for the middle age group (15-18 year olds). This group has gone from about 14% to over 34% penetration.

	Age							
	13	14	15	16	17	18	19	20
Dispose of/own alone	6.43	10.12	25.69	30.16	34.78	41.11	55.69	69.48
Can loan regularly	5.62	9.31	12.25	14.29	15.02	12.25	5.10	1.20
Can loan occasionally	27.71	34.01	23.32	24.21	20.95	18.58	14.90	9.64
No access	60.24	46.56	38.74	31.35	29.25	28.06	24.31	19.68

Table 2 Percent of teens in Norway with various levels of access to mobile telephones, October and December 1998 (n= 2014)

It is also interesting to see that there was a slight reduction in the percent of 19 – 20 year olds who reported ownership of a mobile telephone. This, along with the fact that this age group reported the lowest percent growth of ownership between November 1997 and October 1998 may indicate that this group is reaching the saturation point.

Table 2 gives a more nuanced examination of the data in that it shows the rate at which mobile telephone ownership increases with age. This goes from less than 10% to almost 70%. Most tellingly, however, is the percentage of teens who can regularly loan a mobile phone. Here the rate goes from 5,6% for the youngest group to almost three times that for 17 year olds. The rate drops to slightly more than 1% for 20 year olds. This describes a transition from first, the socialization into the culture of mobile telephony – subsidized with the use of one’s parents’ mobile telephone – to the child’s transition away from access to their parent’s resources. This progression is seen in the following comment from a series of interviews with the parents of teens. A father describes his 19-year-old son’s entry into the world of mobile telephone owners.

Before [he had his own telephone] he borrowed a mobile telephone from us at certain times. Suddenly we discovered that our telephone was gone you know. Then I thought that now he can get his own (Ragnar 47).

Here one can see the transition from the occasional borrowing of the parent’s device to the point when that became troublesome. At this point the child was encouraged (pushed) into purchasing his own telephone.

	Age of child													
	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Owner/shopping	1	2			3	15	9	25	10	21	21	21	25	26
Owner/not shopping	3	3		2	7	11	20	22	34	32	36	33	30	21
Non-owner/shopping	1	2	4	10	7	11	13	8	6	13	9	9		11
Non-owner/not shopping	94	94	96	88	84	63	59	45	50	34	33	36	45	43

Table 3 Percent of adolescents who own, are shopping for or reject a mobile telephone by age, Norway 1998

ning to be available at the time of the 1997 survey but had gained wide acceptance by the time of the 1998 surveys. Thus, the latter formulation is perhaps a bit more encompassing than the former and may account for a portion of the growth reported here. For stylistic purposes the term “ownership” is used here.

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One can also see the mid-teen transition using the data set from the questionnaire sent to parents. In this analysis we have divided up the teens by their ownership status. In addition, they have been divided by their interest in buying a new mobile telephone.⁴ The data shown in Table 3 indicates that there is a marked drop in the percent of mobile telephone “rejecters” – i.e. those who did not own a mobile telephone and who were not shopping for one – between the ages of 14 and 18. Thus, the data from the three studies agrees. Both of them indicate that the mid-teen years are an important turning point in one’s adoption and use of mobile telephone technology.

The data for adolescents’ access by gender is shown in Table 4. At the general level, significantly more boys reported owning a mobile telephone while girls reported loaning them.⁵ When one examines gender by age one sees that the progression from non-owner to owner is quite similar for the two genders through the first teen-aged years. It is only after one becomes a 19-year-old, that is after one leaves the obligatory school period, that the difference between genders approaches statistical significance. If, on the other hand, one looks only at the gender difference between those who own and those who loan a mobile telephone one sees that it is in the mid-teen years that the difference is significant.⁶

Age	Own		Loan ⁷		No access		df	f	n
	Boys	Girls	Boys	Girls	Boys	Girls			
13	6.04	6.74	31.32	34.83	62.64	58.43	1,246	0.507	0.477
14	11.05	8.93	39.53	45.24	49.42	45.83	1,245	0.019	0.891
15	31.65	19.35	31.01	40.65	37.34	40.00	1,251	2.233	0.136
16	32.43	28.00	33.11	44.00	34.46	28.00	1,250	0.153	0.696
17	40.58	29.13	28.26	42.52	31.16	28.35	1,251	0.525	0.470
18	42.74	38.53	27.35	35.78	29.91	25.69	1,252	0.229	0.632
19	65.71	46.38	20.00	20.29	14.29	33.33	1,253	9.031	0.003
20	76.19	58.33	11.90	12.50	11.90	29.17	1,248	17.123	0.000

Table 4 Percent of teens in Norway with various levels of access to mobile telephones by gender (n= 2004)

This data illuminates several trends. The first is that while the two genders start their teen years at about the same ownership levels, a vanguard, but not a significant number of boys move from non-owners to owners in their mid teen years. There is a parallel drop in the rate of non-ownership for both genders from the youngest groups through those in their mid-teens. The data shows a split, however, for the oldest teens. For the girls, the rate of non-ownership remains stable at around 30% from age 16 through age 20. By contrast, for boys it falls from about 30% at age 18 to near 10% for the 20-year-olds.

⁴ This was determined by asking the parent if the adolescent had gathered information on the potential purchase of a new telephone during the three months previous to the interview.

⁵ $f(1,2010) = 17.168$, sig. = 0.000.

⁶ In this case the f statistic for 15 year olds who loan mobile telephones was $(1,153) = 3.945$, sig. = 0.049. It was $(1,172) = 4.56$, sig. = 0.034 for 16 year olds and $(1,177) = 4.285$, sig. = 0.040 for 17 year olds.

⁷ Can loan either occasionally or regularly.

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The second trend has to do with borrowing mobile telephones. The boys borrow mobile telephones up until the 18-year-old group at a stable rate of about 30%. From this point there is a dramatic drop in the percent of boys who borrow. The borrowing pattern of girls is quite different. Starting at about the same level as boys, the rate increases to almost 45% for 16 year olds. From there it drops again about the same level as that of the boys in the sample for the final two years of the distribution.

Thus, the girls are the borrowers of the technology and, when their access to a readily borrowed mobile telephone is reduced – that is when they move away from home – they are not motivated to the same degree as boys to establish their own subscription.

4.1.2 Parental opinion

In the analysis of parents, respondents were asked if they felt that teens’ use of mobile telephony was a negative development (*Ungdoms bruk av mobiletelefoni er en uting*). Analysis of this data by age of the child shows that parents of young sons are more critical towards mobile telephony but that they become relatively positive towards the technology as their sons age.⁸ On a five-point scale where one was complete agreement and five complete disagreement, parents of the youngest boys scored a mean of 1,75 while those of the older boys scored well over two. The parents of daughters, however, show a stable, if somewhat negative attitude towards mobile telephones across the age groups.⁹

It is also interesting to note that mothers changed their attitude more than fathers. While the attitude of fathers was less skeptical towards the technology among the young and middle-aged teens, they became somewhat more skeptical as their oldest child moved into the late teen period. The opposite was true for the mothers in our sample. They were relatively more skeptical during the younger period and less so as the age of their oldest child increased.¹⁰

	Age								
	13	14	15	16	17	18	19	20	Total
NetCom	41.38	30.56	35.71	31.51	27.14	22.50	32.95	15.48	28.10
Telenor	58.62	69.44	64.29	68.49	72.86	77.50	67.05	84.52	71.90

Table 5 Percent of mobile telephone subscribers by provider and age ($n = 518$)

When examining attitudes toward using the mobile telephone in a concrete situation, there was also an age effect. Specifically, as the age of the child increases, parents were more and more in agreement with the statement that “A positive thing with children’s use of mobile telephones is that one can always reach them.”¹¹ The data shows no gender-based difference in this case.

⁸ $F(2,893) = 8.592$, sig. < 0.001

⁹ The f statistic for homes wherein a sons was the oldest child was $(13,444) = 2.296$, sig. = 0.006 where the f statistic homes wherein the daughter was the oldest child was $(13,422) = 1.114$, sig = 0.343.

¹⁰ The f statistic for mothers was $(13,555) = 2.106$, sig. = 0.012 while the similar statistic for fathers was $(13,313) = 1.134$, sig. = 0.329.

¹¹ $F(2,899) = 26.820$, sig. < 0.001

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4.1.3 Service provision

The next portion of the analysis takes up the issue of service provision. Using the data from the analysis of teens, one sees that Telenor is the dominant mobile service provider to Norwegian youth. The data shown in Table 5 shows that slightly more than 70% of the respondents were customers of Telenor.

	Area population (upper limit)				
	<200	2 000	20 000	100 000	>100 000
NetCom	24.03	22.86	26.35	48.10	26.47
Telenor	75.97	77.14	73.65	51.90	73.53

Table 6 Percent distribution of adolescent mobile customers by the size of the town or city in which they live, Norway 1998 ($n = 519$)

The data also shows that as one ages there is a general movement from NetCom to Telenor. Among the youngest age group there is about a 60/40 division between the two service providers. This increases to roughly a 20/80 distribution for the oldest groups.¹² In the population as a whole, NetCom provides services to about 30% of the mobile customers in Norway while Telenor provides services to the remaining 70%.

The data also points out what appears to be a difference in marketing strategy for the two providers. One can see in this data that in general NetCom has its greatest impact in second tier cities, i.e. those with a population of between 20 000 and 100 000. In these cities there is nearly a 50/50 split between the two providers. In all other situations NetCom has about a 25% market penetration.¹³

4.2 Payment for mobile telephony

4.2.1 Who pays

An important element in the emancipation process is one's understanding of and participation in the economic sphere. Since mobile telephony is a system requiring money for both the initial purchase of the equipment and for continued use, it provides insight into teens' participation in the economic world.

Looking first at gender related differences, (see Table 7) one finds that boys were significantly more likely than girls to pay for their ownership and use of a mobile telephone. A portion of this can be explained by noting that boys in their late teens are significantly more likely than girls to have a job.¹⁴ It also points to the fact that those girls who do work, do not prioritize using their money on mobile telephony.

	Boys	Girls	d.f.	F	Sig.
Pay all	51.82	39.85			
Pay some	4.55	3.38	1,593	9.689	0.002
Don't pay	43.64	56.77			

¹² The f statistic for this distribution approaches significance as $(7,509) = 1.917$, sig. = 0.065.

¹³ The f statistic for this population is $(4, 513) = 4.657$, sig. = 0.001.

¹⁴ An analysis of our data shows an f statistic of $(1,710) = 9.185$, sig. = 0.003 when comparing those working as opposed to those studying. Among the 18 and 19 year olds in our data the boys were significantly more likely to be working. This difference vanished, however, among the 20 year-olds.

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Table 7 Percent of tee- aged boys and girls who pay for their use of mobile telephones, Norway 1998 (n = 594)

The data also shows that age is a significant indicator of teens' payment status. Table 8 shows that the percent of those who pay all of the mobile telephone related expenses goes from less than 20% among the 13 year olds to almost 90% among the 20 year olds. By contrast the percent of those who do not pay anything goes from slightly more than 80% to just over 10%.

The data in Table 7 and Table 8 also show that payment for mobile telephony is an all or nothing proposition. At its maximum only 8,5% of the teen-aged respondents reported paying a portion of the bill. This type of solution seems to be a temporary approach that is reported by those who are between 14 and 17 years of age. The negotiation over who pays is one of the elements in the emancipation of teens. Insight into the negotiation process can be seen in the following dialogue between a mother and her 16-year-old son. While the son does not have his own mobile telephone, many of his friends do. Thus, his participation in a peer culture has impact on the family's telephone bill.

Grete 45: We have had some pretty big discussions about our last telephone bill. It grows and it grows and it grows. And we have tried to tell you . . . but, like it is, his friends, generally they have mobile telephones each of his friends. When he calls a friend it is a call to a mobile telephone and if he doesn't call a mobile telephone how is he going to get in touch. . . . So we see our bill it is incredible after awhile.

Interviewer: Have you made an agreement [on how to divide up the bill]?

Grete: Everything over 1500 Kr. (\$200) he has to cover himself. He doesn't agree but we have said that we will not cover anything over 1500. But it is specified as I said, I see what it costs for calls to pagers. It is on the bill, we had 400 Kr (\$53) last time and there were calls to mobile telephones for over 1000 Kr. . . .

Interviewer: You think it is a little unfair?

Fredrik (16): No, not really.

Interviewer: You understand it a little?

Fredrik: Yeah, I understand it.

Grete: It is a bitter pill isn't it?

Fredrik: Yeah.

One can see in the sequence both the negotiation over payment for the telephone, but also negotiation over the maturity of the son. The demand that he take responsibility for the consequences of his telephone use is also a discussion about his economic freedom of action. One can see that he accepts this responsibility, albeit reluctantly. The final exchange between them points out the mother's empathy for her son's situation. Thus the interaction illuminates several of the dimensions surrounding the maturation process, i.e. responsibility vs. freedom of action, the nurturing of parents vs. the pressure for independence.

The data from the study of parents corroborates the notion that payment is an issue in homes with children in their mid-teens. In that database it was found that there was a significant increase in agreement with the statement "We often argue over the telephone bill in our home" for those homes in which the oldest child was in their mid-

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teens.¹⁵ As the oldest child moved on to their late teens the agreement with the statement receded.

	Age								d.f.	f	Sig.
	13	14	15	16	17	18	19	20			
Pay all	17.07	18.37	32.86	27.91	37.97	50.00	66.30	89.89			
Pay some	2.44	4.08	8.57	5.81	5.06	2.27	2.17		7,588	22.614	>0.000
Don't pay	80.49	77.55	58.57	66.28	56.96	47.73	31.52	10.11			

Table 8 Percent of teens who pay for their use of mobile telephones by age, Norway 1998 (n = 595)

4.2.2 Pre-paid vs. traditional¹⁶ subscription

Another payment issue is the comparison of traditional and pre-paid subscriptions for mobile telephony. Since its introduction, pre-paid subscriptions have become popular among Norwegian youth. In the past year, pre-paid subscriptions have seen a dramatic growth. At the end of 1998 almost 40% of the subscriptions among youth were pre-paid. The data also shows that there was even a significant shift in this direction in the period between the two closely spaced measurements in October and December.

While the price paid per minute is higher than with traditional subscriptions, they provide an absolute control over the total use of the telephone. Traditional subscriptions allow the open ended use of the telephone and thus one can wade out into water that quickly becomes too deep as seen in the following citation of a 19 year old girl.

I was in school, and it was hard work, in England for two weeks and I was so lonely, no, it wasn't lonely, but sort of like boring. I had Papa's mobile telephone and so I sort of like called. . . . I called around a little and it was so nice to talk with people but it was so disgustingly expensive. . . . As a matter of fact it was 5000 [kr.] (\$660) for two weeks (Lisa 19).

	October	December	d.f.	Person X ²	Sig.
Normal	69.40	61.75			
Pre-paid	30.60	38.25	1, 1146	7.43	0.006

Table 9 Percent of Norwegian youth using prepaid and traditional subscriptions in October and December 1998

The use of the pre-paid subscriptions, like the borrowing of mobile telephones, seems to be a phenomenon associated with the mid-teen years. The data in Table 10 shows that there was roughly a 70%/30% split between traditional and pre-paid subscriptions. The split drops to 50%/50% for 16 year olds and then rises again to approximately a 70%/30% split among the oldest respondents.

	13	14	15	16	17	18	19	20	Pearson X ²	Df	sig.
Traditional	46	67	65	89	103	118	136	132			
Pre-paid	19	37	67	64	59	53	44	51	32,818	7	>0.001

¹⁵ $f(13,896) = 3.371$, sig. < 0.001

¹⁶ The term "traditional" subscriptions refers here to invoicing after services have been rendered.

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Table 10 Number of Norwegian youth using prepaid and traditional subscriptions by age, October - December 1998 (n=1150)

One aspect of a teen’s decision to use one or the other type of subscription is their ability to pay for the more open-ended traditional subscription. The data indicates that significantly more of those who pay all expenses associated with their mobile telephone use pre-paid subscriptions (see Table 11). There is a particularly marked transition between the situation in which others pay all expenses and that wherein the respondent had to pay a portion of the expenses themselves.

	Pay all self	Pay some self	Others pay	d.f.	f	Sig.
Traditional	47.60	54.17	77.56	2,545	27.697	>0.001
Pre-paid	52.40	45.83	22.44			

Table 11 Percent of Norwegian youth using prepaid and traditional subscriptions by job/school status, October - December 1998 (n=547)

Finally, we found that those who have a job have a better possibility to pay. The data shows that more than 72% of those who are working – that is those who have an income – have traditional subscriptions.¹⁷ By contrast, those who are studying are over represented among the subscribers to pre-paid systems.

4.3 SMS

The final area covered in this analysis is the use of SMS messaging among adolescents. SMS is a service that allows one to send text messages of up to 160 characters in length. Until the fall of 1998 this service was offered free of charge to GSM mobile telephone users in Norway. While the service has been available for several years its main focus was in relation to broadcast of financial data, weather forecasts, etc. During the fall of 1998, however, the service experienced a rapid growth in popularity. As shown in Table 12 there was a 450% increase in traffic between January and September 1998. The traffic doubled again between September and October of 1998. Telenor was forced to close the service as the volume of traffic was threatening to squeeze out the use of traditional voice telephony. The service was reestablished in the Telenor net as a service for which one pays a small sum per message. In spite of the new tariffs, the traffic is again rising and has almost reached the levels seen in the fall of 1998.

	1996	1997		1998			1999	
	Jan	Jan	Jan	Sept	Oct	Nov	Dec	Jan
Netcom		1	65	110	180	210	250	290
Telenor	20	60	110	510	1330	525	785	1000

Table 12 Number of SMS messages per day, 1996 – 1999 (x 1000) Source: (Aftenposten, 31.1.98)

In Table 13 one sees the distribution of daily SMS traffic reported by the respondents. The data indicates that almost half of those (47.2%) who either owned or had access to a mobile telephone send an SMS message on a daily basis. Those who report owning a mobile telephone also report a significantly higher rate of SMS use.¹⁸ The median number of messages per day was three for those who owned the mobile

¹⁷ Pearson X^2 (1,1104) = 4.741, sig. = 0.029.

¹⁸ f (2,278) = 6.338, sig. = 0.002.

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telephone and two for those who could loan a telephone on either a regular or irregular basis. There were no statistically significant age or gender based differences in the data.

	Number of messages														
	1	2	3	4	5	6	7	8	10	15	17	20	25	30	50
Number of respondents	44	85	28	15	25	9	8	6	24	17	1	7	8	4	1

Table 13 The number of SMS messages sent daily by Norwegian youth, October-December 1998, (n = 281)

The traffic data indicates a popularity among youth. The growth curves remind one of fad behavior that may rapidly fall off. Anecdotal reports indicate that SMS messages are used for a variety of purposes among youth. In addition to function use, i.e. agreeing on when and where to meet, the reports indicate that it is also used as a type of reverse marking and clowning. The phenomena has arrived on the scene too late for a qualitative analysis, thus one can only speculate as to its social meaning. If indeed it is a fad like behavior, then, like the tamaguchi, yo-yos, platform shoes and hula hoops it can be used to indicate group association so long as the fad lasts.

5 Discussion and conclusion

After this excursion through the data we now need to look at the larger picture again. At its most general level, this paper is about how the adoption of new technologies illuminates various aspects of the culture. In the material presented here one finds two points in particular. The first is the way in which the mobile telephone both indicates and facilitates (some would say co-conspires) with an adolescent's coming of age. The other issue of note is how the technology seems to have become gendered.

5.1 Coming of age

At several points in the analysis one can see that the mid-teen years have a significance vis-à-vis mobile telephony. Areas in which one sees age based differences include ownership vs. loaning of a mobile telephone (see Table 2), the shifts in the number of mobile telephone rejecters (see Table 3), shifts in parental attitudes (see Section 4.1.2), changes in payment arrangements (see Table 8), the growth and then waning of pre-paid subscriptions (see Table 9) and the identity marking as seen in the use of SMS messages (see Table 13). This data along with material from the qualitative analysis point to the mid-teen years as particularly telling.

During the mid-teen years, the period immediately before their legal emancipation, the ambiguity of one's situation is greatest. Both in the eyes of the teen and in the eyes of their parents there is a confusion in how they are to function in society and the extent of their independence. On the one hand they have extensive contact with peer groups outside the home. The desire for availability, and the need for acceptance within the peer group are at their apex. By way of contrast, parents may see their work as unfinished. They may feel that the child still has an immature understanding of social interaction and economic responsibility. This is the nub. There is disagreement and ambiguity as to the nature of the situation. The child wants freedom, but still wants the security provided by the home. It is not a uniform process. In one case the child may show maturity and judgement beyond their years while parents revert to a childlike stubbornness over an inconsequential point. When the next issue arises the partners take the opposite role. The parents want their child to be popular and social but can still see the small child. Thus, there are points of

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agreement in the general lines of the development, but there are also many points of divergence and chafing.

The parents are left to balance their desire for control over their children against the realization that the child is moving into a new phase of life. On the one hand there is pressure to realize that the child needs to be available and to be social. This is balanced up against the fear that they are moving into deep waters too quickly. Thus, the parents are left to judge the situation. Informants reported continued guidance and concern for their children and at the same time, they accepted the growing maturity of their children. In the words of one mother “We release them little by little.” We have seen that the mobile telephone adds a new dimension to this situation. It facilitates communication and the ability to coordinate among peers at a point in one’s life where social accessibility is paramount. In addition it has very strong symbolic meaning. It is, in effect, the assertion of emancipation as the device allows for social coordination unfiltered by one’s parents. The possession of a mobile telephone also is the assertion of economic emancipation – even in the face of parental subsidizing of other portions of the teen’s life. One can see the sensitivity of this issue in the following citation where a father suggests the need to help his daughter pay for her new mobile telephone subscription.

Viggo (45 father): But I have to say that if, like with the new mobile telephone subscription, if it is so expensive then I have to say that I could imagine that I will come with a contribution, that is obvious.

Erika (15 daughter): With the new mobile?

Viggo: Yea, if . . .

Erika: You are not going to pay for that regardless.

Viggo: Yea I hear what you are saying

Erika: Relax!

The exchange underscores the unsettled and contrasting issues surrounding adolescence. The daughter’s use of a mobile telephone makes her continually available without the filtering of parents. This is weighted up in her parents’ minds, against concerns about her “uncritical use.” The mobile telephone provides her with the opportunity to assert economic independence. However, her inexperience with economic issues prompts her father to volunteer support if needed. As seen in the citation, this is interpreted as an unnecessary interference in her personal life.

5.2 Technology and gender identity

Turning to the second general theme, the data presented here suggest the role of the mobile telephone is different for the two genders. Data on ownership status among the oldest teens (see Table 4) and payment for use (see Table 7) indicates gender differences. As we saw in the section on access to mobile telephony, the girls borrow mobile telephones. When their access to a readily borrowed mobile telephone is reduced – that is when they move away from home – they are not motivated to the same degree as boys to establish their own subscription. The data also shows that boys adopt economic responsibility for mobile telephones to a greater degree than do girls.

Just as one’s first car, various articles of clothing or participation in certain activities are used by adolescents to mark gender boundaries, it seems that the ownership, but

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not necessarily the use of mobile telephones is a gendered cultural item in Norway.¹⁹ For boys it seems to function as a visual sign of independence and economic wherewithal. The fact that the boys are willing to use their money for mobile telephones indicates that possession of the technology in itself is of greater importance than it is to girls. It may be a way to indicating one’s maturity and one’s participation in the adult world. When talking to older teen males it is, for example, not unusual to hear the purchase of a mobile telephone rationalized as a type of device allowing for increased preparedness in the case of, for example automobile accidents (Ling 1998).

While girls are not skeptical to mobile telephones, they seem to place their ownership, and their use into a slightly different context than do boys. The device is useful and convenient. One 13-year-old female interviewee who generally thought it “tacky” to carry one none-the-less borrowed her parents’ mobile telephone when riding horses in the forest and called her girl-friend from the family cottage via mobile telephone. Thus, while there is an acceptance of the technology, the data indicates less pressure to own a device.

One can wonder about the basis of this dichotomy. A portion of the difference may be explained through simple structural analysis. Since boys generally enter the working world before and in greater numbers than girls, they have the economic means with which to buy mobile telephones. This approach focuses on the necessary but not the sufficient conditions for the purchase of a mobile telephone.

A more psychologically based explanation suggests that the symbolic value of the device is more important for men than women. This may be based on early life experiences like bonding with mothers for girls vs. a focus on individuality for boys (Rubin 1984). It might be possible to extend this by saying that boys pursue concrete artifacts such as the mobile telephone to replace the perceived loss of affection or contact. Thus, the security and concreteness of the physical device is of primary importance. Another reading on the interaction between gender and psychology suggests that since men are unable to create life as in the case of women, they feel it necessary to control it, a type of “womb envy.” (Wajcman 1991, 139).

A transition to more socially based explanations is found in Turkle who, in her analysis of computer hackers, focuses on the issue of power and control in a context that is perhaps less complex and unpredictable than general social life (Turkle 1984; Wajcman 1991, 139). In the case of the PC, the technology allows a mastery over portions of the life that is otherwise complex and unwieldy. Technology is not, however, viewed as a refuge, but rather as a canvas upon which one can paint themselves in heroic terms. Understanding the complexities of the computer program allows one to display their intelligence. In a similar way, uncovering the devilish problems of one’s carburetor allows one to see themselves as a warrior fighting against chaos. The mobile telephone fits into this context. Its ownership, but not necessarily its use for social interaction, provides a secure foothold. It increases ones’ potential for independent action and, when confronted with the unexpected such as coming upon a car accident along the road, the mobile telephone allows one to aid in setting things aright. There is also the symbolic value of being involved with the newest technologies as being a sign of one’s modernity.

Thus, a socialization approach suggests that social institutions teach boys how to manipulate technology. It is the male culture that has received the responsibility for

¹⁹ Katz and Aspden do not report gender based differences in the consumption of mobile communication in the US (1998).

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the design, construction and marketing of technology. Technology is, in essence, culture. It is the crystallization of social relations, knowledge and beliefs (Wajcman 1991, 149). Technology, including mobile telephones fit into a male turn of the mind. When it is adopted by women Rakow and Navarrow suggest that it functions to enforce existing roles (1993 see also Berg 1998, Livingstone 1992, Lohen 1998, Moyal 1989, Rakow 1988, Vestby 1998).

In conclusion, the introduction of mobile telephones into existing social situations illuminates various aspects of the context. The mobile telephone is being adopted by teens with great speed. Through this adoption process one can see the way in which youth are developing an adult, as well as, a gendered identity.

While this is the situation today, it is far from static. One can see that the traditional telephone, while originally seen as a technology to be used by men, has become more feminine. As the mystique was removed from the technology, and as it became less and less expensive to use, women have incorporated it into their role as the hub of various social networks (Fischer 1992; Martin 1991). Data on time of use for mobile telephone indicates that while there is no significant gender based difference among adults, there is, a gender based difference among teens (Ling 1998a; Ling 1998b). Thus, we are likely seeing the beginning of the incorporation of the technology into women's everyday life. The data here suggests that as these teenaged girls mature they may likely incorporate the technology into their roles as important hubs in various social networks.

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