

R&D R 29/2002

Rich Ling and Kristin Thrane

**Age and gender as determinants of
broadband acceptance: The case of
interactive media use in Stavanger,
Norway**

R&D Report **R 29/2002**
Title **Age and gender as determinants of broadband acceptance: The case of interactive media use in Stavanger, Norway**

ISBN
ISSN
Project No
Program
Security Gr. **OPEN**
No. of pages
Date **2002.08.01**

Author(s)
Rich Ling and Kristin Thrane

Subject headings
Gender and domestic ICT-use

Abstract
This paper examines user evaluations of a broadband trial held in Stavanger, Norway. The technology was installed in the homes of 750 families in this area and via the broadband connection, users received access to interactive TV services and broadband Internet. Among other techniques, conjoint analysis and qualitative interviews were used to evaluate user attitudes toward the system. While one must be cautious in generalizing the results, the data shows that access to high-speed Internet was the most compassionate dimension associated with the trial. It dominates the other dimensions, particularly those associated with the interactive TV offering in the trial. However, when examining the data by gender, one sees that while men are particularly focused on high-speed Internet. Much of this is driven by interest in MP3 downloading among younger users. Women, however, were more focused on access to enhanced TV services. This finding is examined in the context of user's gendered access to technology in the home.

© Telenor Communication AS 2002.08.01

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher.

Contents

1	Introduction and method	2
2	Results	5
2.1	General result from service package preferences	5
2.2	Gender differences in preferences for Internet and TV-access.....	6
2.3	Age.....	8
3	Conclusion.....	11
4	References	12

1 Introduction and method

The material described in this paper was gathered as a part of the Hybrid Broadband Access (HB@) project carried out by Telenor. During 2000 and 2001 the HB@ project tested how different access solutions may be combined in order to provide a comparable offering of next generation interactive broadband services in cities, townships and rural areas – from the far south to the far north of Norway. HB@ tested different network infrastructure options for interactive broadband services, with emphasis on access network solutions.

Hybrid solutions based on combinations of fixed network upgrades with VDSL (very high speed digital subscriber line), wireless systems like LMDS (local multipoint distribution system), interactive and DTH (direct to home) satellite systems and the DTT (digital terrestrial TV) network were deployed. Home network alternatives have been tested in the project. The target, on the service side, has been to provide the users with offered next generation TV, including access to multiple parallel channels via different TVs, a broad spectrum of television channels, an Electronic Program Guide (EPG) and some Video on Demand services (VoD). In addition, the project provided trial users PC-centric interactive broadband services. This included 10-25 Mbit/s individual downstream access capacity and 100 kbit/s – 6 Mbit/s upstream capacity (Ims et al 2000).

While there were approximately 1000 users in four locations in Norway in the total trial, the major group was approximately 740 VDSL users in the Stavanger area of southern Norway. It is these users that we will focus on in this paper. It is also in this group that we included the conjoint analysis.

In general the area in Stavanger was a relatively up scale section of the city that is, in itself, an upscale market. The trial homes were located in the Forus and Lura sections of the city. Many persons associated with the oil and gas industry live there, and particularly in these sections of the city. These are suburban areas with many single-family homes. The pilot users lived in somewhat larger single-family homes, though their family structure is very close to that of the general Norwegian population. Aside from the Oslo LMDS trial group, these users reported the highest household income; much higher than the average income in Norway. This group of trial users had many TVs, a relatively large number of PCs and a large percentage of them (90%) had access to the Internet before the HB@ trial. In Stavanger 60% of the pilot users had access to only two or three TV-channels (NRK 1, NRK 2 and TV2) before the HB@-trial while 40% had satellite-TV, and thus a broader repertoire of channels from which to choose. Given these characteristics, one must be careful in the generalization of the results reported below.

As an integral part of the trial, Telenor had the ambition of gathering and evaluating user responses to the system. Data collection in this portion of the trial included both qualitative and quantitative research methods. These included telephone interviews with all the trial users. In addition a portion of the users were included in focus groups, in-home interviews, analysis of willingness to pay, traffic logging and Call Center logging. A conjoint analysis of users' preferences for various service packages was included as a part of the quantitative analysis.

The combination of qualitative and quantitative methods gives complementary insights into important information about user habits and the patterns of their use. Beyond this, however, we also studied why they used it and how it shaped their everyday media life (Ling and Thrane 2001; Ling and Thrane 2002). Whereas quantitative research answers the "how many" questions, qualitative research addresses the issues of why and how. The depth-interviews provide information about users' attitudes towards the adoption of new technology in the domestic sphere and the key drivers – and obstacles – to the diffusion of

new media technology (Kvaale 1997, Fog 1997). In combination, this methodological double approach ensures a high degree of validity and reliability.

We conducted two rounds of telephone interviews in Stavanger; one in the beginning of the trial, and one eight months after start of trial, to explore possible differences in use and attitudes. The second round with telephone interviews included the conjoint analysis. We also carried out two focus groups and two rounds with depth-interviews in with pilot users in their homes. The in-home interviews gave irreplaceable information about the integration of new technology to the domestic sphere. It gave us also the opportunity to see how the informants used their new media access, and give insight to possible future adoption behavior of digital media technologies. In this paper we will explore both quantitative and qualitative data, and make a discussion around the service package preferences (conjoint analysis).

Turning now to the method associated with the conjoint analysis, where market research often separates potential service offerings into their component parts and then asks the individual to respond to these components, conjoint analysis attempts to capture a respondent's interest in a complex package. Thus, instead of asking about one's interest in high speed Internet in one question, the number of TV channels that is appropriate in a second question and the necessity of an Electronic Program Guide (EPG) in a third question, conjoint analysis asks the respondent to evaluate all elements in a single package or scenario. The effect of this is that via the use of statistical analysis, the researcher can then discover the elements in the package that weigh heaviest in the respondent's evaluations.

In a conjoint analysis one combines all the dimensions into a single scenario. By varying the values of the individual dimensions in a set of scenarios and then asking respondents to rank these, one is able to determine which of the dimensions is the most important in the individual's evaluation of the total package. Thus, given the elements outlined above, one might ask informants to rate a package that includes moderate Internet speed, access to many TV channels and no EPG. A second package might include very high Internet speed, few TV channels and access to an EPG. A standard conjoint often includes 10 to 12 scenarios wherein the values of the dimensions result in unique versions.

In the case of [HB@](#), there were five dimensions that were of particular interest. These included:

- 1) The number of TVs that one could connect to the system. The range was one to three channels (assuming that each TV in the home could simultaneously view different channels)
- 2) The number of TV channels available on the system. The range included:
 - a. A small number, i.e. the Norwegian channels plus a small number of other channels but not the more exclusive channels such as Eurosport, MTV, and CNN, etc.
 - b. A moderate alternative, i.e. all the channels mentioned above plus Eurosport, MTV, and CNN, etc.
 - c. A large number, i.e. all the channels in the moderate alternative plus access to the movie channels
- 3) The speed of the Internet connection. The range here varied between:
 - a. A low range, i.e. that of ISDN
 - b. A moderate range, i.e. able to down-load large files quickly

- c. A high range, i.e. able to easily stream material, i.e. view digital video material
- 4) Access to Video on demand. Here one only either has or does not have access to this service.
- 5) Access to and electronic program guide. As with Video on Demand one either has or does not have access to this service.

These five dimensions were formulated into a series of 12 packages that were then presented to and evaluated by the respondents in the final survey in Stavanger. As noted, the material was gathered via telephone interviews. The respondents were told that the interviewer would describe several different possible combinations of services that are possible with the technology used in HB@ and that they would be asked to rate their impression of total packages. Given the total package we asked them to rate it on a scale of 1 to 10 where 10 is best and 1 is worst. The text in the interviews had the following form:

Package 1

- TV connections
- A small selection of channels
- Moderate Internet access speed
- No access to Video on demand
- Use of an EPG

On a scale of 1 to 10 (10 being best) how would you rate this package? _____
This was done for 12 different packages, with differences of this five elements.

The analysis provides one with the relative importance of each dimension for the respondents. This is given in a distribution of weights that sum to 100.

The analysis included 630 of the 739 respondents who participated in the final questionnaire interviews. The data was collected in a database that also included other material such as demographic material such as material evaluating the call center, their satisfaction with the project etc. The results of the analysis are presented below in section 2.

2 Results

It is important to note that in some cases the empirical data collected through the user investigation is data that is based on the trial users experience with services and products for a limited of time. To bring new ICT in to the home and private sphere include several social processes where the ICT brought to home will find its place or be discarded. This so-called domestication process, which goes from manufacturing of a product, via the acquisition process to the transition and fully developed adoption process. In this project the trial users acquired this new technology and these services through an offer of free access from the HB@ project. So, in this case there have not been long discussions in the family, like economical question in relationship to the newly-acquired technology. When the technology enters the home a phase wherein the products are redefined to coincide with the households life will occur. This adoption process will last for a period of time. In some of the HB@ pilots and some of the services, the time span has been too short for these new technologies and services to be fully domesticated (Mante-Meyer 2001). It is important to bear this in mind when reading this chapter on with our experience from the HB@ trial.

2.1 General result from service package preferences

In section 1 we discussed the use of so-called conjoint analysis. The results of the analysis show that, in general it is the speed of the Internet a package offering that is the dominant elements. If all elements sum to 100, access to high speed Internet can be seen as having a weight of almost 50. Interestingly, access to an EPG is the second most important element for the users. This variable claims about half of the remaining importance with a weight of 23. The final three elements, in order of diminishing importance are the number of channels which one has access to (13), access to VoD (11) and access to several parallel streams of TV content (4).

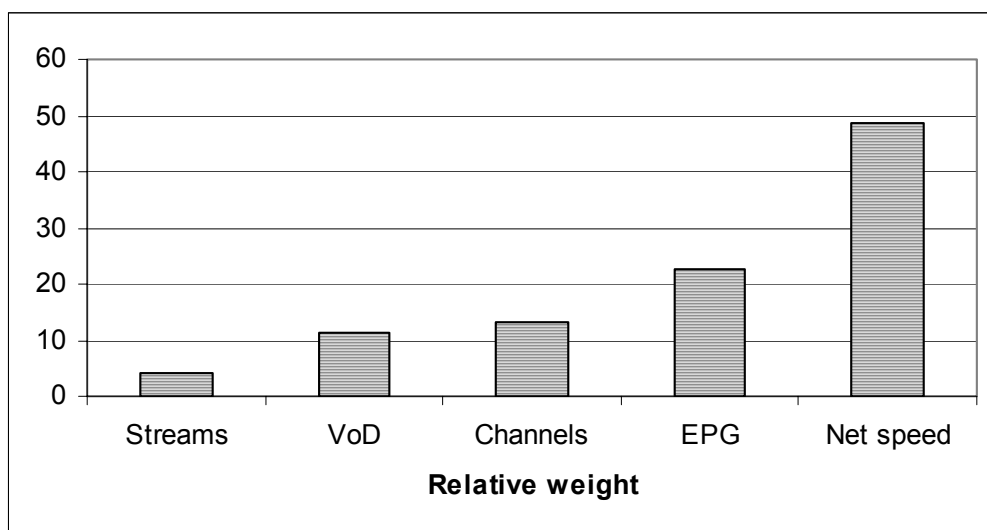


Figure 1 Relative interest in various dimensions of an eventual broadband offering (the weightings sum to 100)

This finding indicates that, to a very large degree, it was the speed of the Internet connection that determined the user's general evaluation of the system. This is also very

clear in the in-home interviews. Both the speed, but also the “always-online” solution was highly valued. Almost all households interviewed mentioned the cost using the Internet. All the households who had Internet before the trial started, had an analog solution or, as the most common, ISDN. They were accustomed to paying for the amount of time spent on-line. In the HB@ project the trial users had free access for several time, but through a willingness to pay experiment we saw clearly that there were willingness to pay for an high speed Internet, and that the popularity was not only a result of a free access.

The other TV based elements in the packages were less important in the general evaluations. However, the qualitative analysis shows that access to many TV-channels was more preferred by teens and children than their parents. Many stressed also that they rate highly many TV-channels, but that they were not sure about their willingness to pay for this in a commercial situation. Here it is important to have in mind that only 40 % had a cable- or satellite-dish-TV-solution previous to the trial. Thus, many had made up their minds to not get cable/satellite dish (read: to have access to multiple TV-channels) before the trial. When looking that the same material divided by those who have only one TV vs. those with several TVs as well as an analysis of those who have a satellite dish vs. those without, there are only marginal differences in the weighting. The qualitative material, however points out some nuances in this situation. As one father said:

Ja. Og så mine unger, de, største nytten av hele systemet for meg, det er at ungene kan ha tre fjernkontroller som alle kan velge sin egen kanal, så vi kan ha fire personer som ser ulike kanaler samtidig. Det er absolutt største nytten som vi...

This seems to indicate that in some cases the access to multiple channels was seen as a practical solution to the common discussions (arguments) over which channel one should view (Ling and Thrane 2001). These types of findings are those which often come out when a group is interviewed as opposed to the more individualized conjoint analysis.

2.2 Gender differences in preferences for Internet and TV-access

In the package preferences there were, however some gender differences in the ranging of the data. In general the men were more focused on high speed Internet while the women put relatively more emphasis on the number of television channels and television streams available.

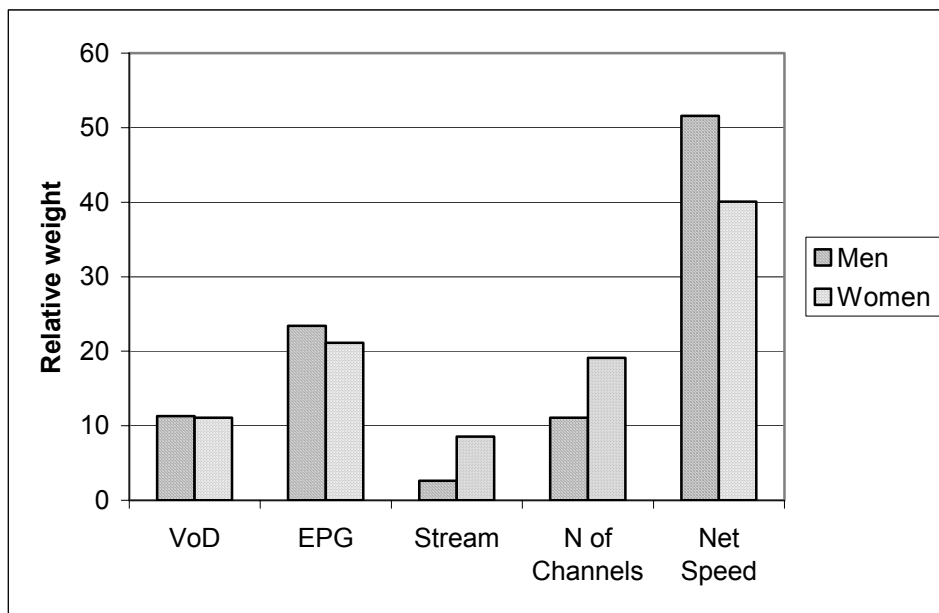


Figure 2. Relative interest in various dimensions of an eventual broadband offering by gender (the weightings sum to 100)

This could point to the fact that often men dominate the central television device that often has a broad range of television channels. Children, but also women, often use secondary TVs that, in the case of satellite homes, do not have the same access to a broad range of channels. Thus, the fact that women are interested in many channels and streams seems to hang together with their typical access to the TV, but it also can be related to their wish of no arguing in the family of what to watch on TV, especially homes with teens. Another explanation might be the Norwegian trend towards a second living room or den for children to use. There is also the associated desire for having a “full-potential” TV offering on this secondary TV. Earlier studies show that when children grow older the parents feel a need for a second TV, to fulfill all family members’ program preferences (Thrane and Ling 2000).

This said, the access to high speed Internet is still an important issue for women and even more important for men. Women’s ranking of the multiple TV-streams and multiple TV-channels can also be explained by that women do not always use the computer and Internet at home as much as men and maybe especially teenager and young adults. Citations such as “I use it on work that’s enough for me” (Mother 45, two children) were common. This could be explain some of the gender differences in why women choose multiple TV-streams and TV-channels instead of Net Speed, in the conjoint analyses.

One of the conclusions in the HB@-project is the desire for services focused not only on the early adapters and frequently users, but also services connected to for example “women with children’s” daily life. That is, service offerings that go beyond downloading of films and music. From the in-home interviews we have a strong impression that women’s use of Internet at home is connected to banking, information gathering (example holidays etc) and teleworking/ remote-education. In addition the analysis shows that they try to limit time spent on the home computer.

Every user segment should find something according to their taste and needs. There is accordingly an inherent danger of over focusing on segments already having a so-called advanced use pattern and neglecting developing broadband based services for other groups. Referring to the results in the pilot, there is in fact a difference between the members of the household concerning the use of internet/broadband/interactive services. This is normally

interpreted as non-users being anxious about the technology. This is often associated with women, and the fact that women, as we see in our data, often prefer multiple TV-channels in advance of Internet.

We think this is a misleading conclusion, that women often are associated with technophobia. This is particularly true for the middle aged women included in this analysis.¹ It is true that especially the mothers of the households were often more modest Internet users. Nor did they surf on TV or use the TV portal as often as the rest of the family. In most cases was not technophobia, but out of a lack of interest in gadgets and technology per se in combination with a very prudent attitude of how to they are spending their scarce free time. Consequently, they adopt a highly eclectic use pattern and seen from this perspective, the usage patterns prevailing in this group should be carefully monitored because their use pattern is indicative of a highly eclectic and focused 'practical wisdom' concerning future services. This group may therefore be the ones who point towards future services with mass appeal.

2.3 Age

In the Stavanger trial, there were not surprisingly, a predominance of homes with children and teenagers. This allows for particularly good insight, especially in the focus groups and in-home interviews, with regards to age and generation differences.

Both parents and children themselves stressed the advantage of always-on. In effect this relieved them of the worry concerning the cost of time spent on the Internet. High speed access simplified the children's use of the Net since downloading was a very popular and, for many of the informants a new, activity. This was particularly true with "teenaged" homes. "I never turn off the computer, why should I" as one teenage girl said referring to the PC she had in her own room. When asked why, she said that she used it to download music while doing other tasks. The immediate access to e-mail was also mentioned as a good feature of always-on. This meant that one did not need to boot up the PC and log in every time they wanted to read e-mail. In addition to this, parents liked the ability to contain costs while children liked the freer access to the Internet. Another unexpected result was that children saturated their desire for use. A father said:

Because they get a little tired of [it]. For example, if you think ____, then there was a lot of searching to start with, but it has limited itself because they do other things, they play soccer . . . The parents who have to pay the bills save a little energy when they try to limit this, I think that it limits itself after awhile.

This citation stresses the same seen in other studies of Norwegian teenage families that cost is how parents control teenagers' use of Internet. In the HB@-trial we saw a tendency that parent were more open to letting their children have unlimited access to Internet. When the cost of Internet use is not an issue any more, it seems that parents let the children more or less control their own use and time spent on the Internet.

A 15 years old boy in a focus group in Stavanger said this about his use of Internet:

I use Internet but I'm also out and do others things, most teens have hundreds of things to do, football, training, Judo, music and homework. Maybe you use Internet one hour a day it's not fun when you sit to long. I do not think teens watch or use TV and Internet too much. It is limited what you can do. What I do is downloading music and film and other things, but I do not sit in front of TV all day.

¹ Other data shows that elderly users are often outside the Internet revolution and thus the discussions of technophobia might better apply to that age group, both males and females (Mante-Meier et al 2001)

Many things suggest that this teen's behaviour is similar to many young boys (and girls) of his age – they are frequently high users of Internet without spending all spare time in front of Internet. Their frequent high use, associated with their sometimes uncritical downloading of music and other multi media material might change with another type of billing. The citation above also describes the scarcity of time, and how broadband services are not only competing with other media technologies, but also in general with other activities. Time and attention are scarce resources.

More extended use of Internet underscores the need for parallel Internet access. More than one third of the households in the Stavanger trial had 2 or more PCs. We find that it is often teen home that two PC's at home, and that many of them had made home networks. Parallel Internet access in the home and the possibility of making a home network is important for many users to ensure efficient coordination among the time use of the family members. This makes it easier for all to use the computer and Internet. Some interviewees even said that the family members stood in line for their turn on the PC. This further underscores the fact that unlike the TV, the PC often corresponds to a highly individualistic mode of media consumption. The quantitative analysis from the telephone interviews shows more than half of the respondents think that there should be access to more than one Internet access point in their homes.

The following table sums up the impression of the PC-centric activities from the interviews. The table is a rudimentary way of summing up the dominant use patterns. Though not having statistically valid status, we nevertheless feel it provides a neat summary. The term light refers to use on an irregular basis. Popular refers to widespread, regular and fairly time-consuming use. Heavy refers to widespread, very frequent and very time-consuming use.

	<i>Children</i>	<i>Teens</i>	<i>Mother</i>	<i>Father</i>
<i>Games</i>	Popular	Heavy		Light
<i>Simple websurfing</i>	Popular	Popular	Light	Popular
<i>Downloading/ftp</i>		Heavy		Popular
<i>Mail</i>	Light	Popular	Light	Heavy
<i>News (usenet)</i>		Light		Popular
<i>Chat</i>	Popular	Popular	Light	Light
<i>E-commerce/transactions</i>			Light	Heavy
<i>education</i>	Light	Light	Popular	Popular
<i>Own content/Other</i>	Light	Popular		Light
<i>Intranet</i>			Light	Heavy

Table 1 Preferences of user groups

The children and teenagers were the most avid and regular users, but had often a narrower range of use than the adults. This somehow contradicts popular belief that the youngsters are the digital pioneers of every use area. Typically among the parents, the fathers were the more intense Internet users, while the mothers tended to use the Internet less. These women often explained their lack of interest with the lack of interesting 'stuff' on the Internet. On the other hand, many homes had more balance between use across generations and gender. It is our impression that interest for the Internet depends on age and belonging to a social network (work, friends) where regular access and some use of the Internet is a matter of course.

Many adults seemed to prefer a more 'proper' and 'useful' way of using Internet. For nearly all adults news on the Internet was important. On the other side, also children and teenager use it for other purposes than fun, the key words are education and information retrieval on the Web. Our analysis indicates that children and teenagers seemed to use the Internet quite frequently for preparing homework and essays for school. The parents are very positive and supportive about this and it is often an argument for broadband connection.

Traditionally, adults have treated the PC as a workstation, and the children have treated the PC as a fun station (Ling and Thrane 2001). These patterns are also seen in the Stavanger trial, but the data also indicate that this is changing quite rapidly. In several homes, adults were very keen to try out multimedia applications and games. In general, they had a very positive attitude to digital entertainment. In addition, many had extensive and advanced computer user experience from work. This does not mean that the young and the grown ups use the computer in the same way, but that differences derive from differences in taste and available time, more than from fundamental differences in preferences.

3 Conclusion

The general interest in Internet speed was the main focus of the user's evaluations of the packages. This speaks to the central role that the Internet plays in discussions of broadband access. The speed with which one can download multi media material and also the question for more effective use of the Internet lay behind these findings.

The other surprising result here is the gender based differences in user's results of the conjoint analysis. Men largely based their evaluations of the packages on the speed of the Internet connection. In general, it is men who dominate the use of the PC, and Internet, in the home (Ling and Yttri, forthcoming). Thus their interest in this technology is not surprising. In addition, one must note that the trial took place during the development of various MP3 downloading services such as Napster. Thus, the interest in high speed connections was underscored by those persons who were interested in this type of Internet application. This was particularly popular among younger users.

However, the fact that even though they also steered their evaluations of packages by the speed of the Internet, women showed a marked interest in the enhancement of television access in the home. They tended to give relatively higher ratings to packages that included the potential for multiple parallel TV streams into the home and a large selection of TV channels.

Both of these findings can be seen as a comment on the general access to television in the home (Ling and Thrane 2001; Ling and Thrane 2002). In general they seem to point to the notion that in a "multiple TV home" such as those found in the Stavanger trial, the men have prioritized access to the prime TV, i.e. the device in the living room or den that has the greatest access to channels. In turn, women have access to secondary TVs in other portions of the home that, in many cases, are limited in the number of channels that are available. Thus, the potential to enhance the quality of these secondary TVs was seen as a positive aspect of the packages that the women were asked to rate.

In general, these findings point to the type and balance of services that one should consider when developing a broadband, multi-dimensional service offering. They indicate that access to high-speed Internet is a primary driver of the development in this area. This said, there are gender based differences that one must take into account.

4 References

- Fog, J. 1997 (1994). Med samtalen som udgangspunkt. Det kvalitative forskningsinterview. Akademisk Forlag, København.
- Ims, L A, Loktu, H, Elnegaard, N, Stordahl, K, Lähteenoja, M, Olsen, B T, Johannessen, O, Haga, K, Ling, R, Meinich, F, Thrane, K. 2001: *Considering VDSL as a Multiservice Delivery Technology and a Key Weapon for Telecom Operators in the TV- and Video-On-Demand Market*. In Proc. Broadband Access Networks, Amsterdam, The Netherlands, Oct 21-23.
- Kvale, S. 1997. *Det kvalitative forskningsinterview*. Ad Notam Gyldendal, Gjøvik.
- Ling, R. and Thrane, K. 2001. "It actually separates us a little bit, but I think that is an advantage": The management of electronic media in Norwegian households. Presented at ICUST 2001, Paris France, June 2001
- Ling, R. and Thrane, K. 2002. "I don't watch TV to like learn anything": *The leisure use of TV and the Internet*. First Monday 7, Number 1. <http://www.firstmonday.dk/>.
- Ling and Yttri, forthcoming. *Measures of familial and social interaction*. Deliverable 3. E-living project.
- Mante-Meier et al. 2001. *Checking it out with the people – ICT markets and users in Europe*. Final report of the EUROSCOM P903 project. Heidelberg, Euroscm.
- Thrane, K and Ling R. 2000. *IKT-basert underholdning i hjemmet*. Telenor R & D report.
- Lyrics in introduction ...

