



*Tom Bloom,
New York Times*

Online-consumers and privacy

- a national study of what the e-consumers are willing to share of personal information

E-handel og villighet til å oppgi personinformasjon

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Ingvar Tjøstheim

Kristin S. Fuglerud

Knut Boge

Ragni Arnesen

Mette Langaas

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Forfattere/Authors:
Tjøstheim, Ingvar, Fuglerud, Kristin; Boge, Knut, Arnesen, Ragni & Mette Langaas
Norwegian Computing Center

Abstract:

This report focuses on the privacy concerns among Internet-users in Norway. In the Scandinavian countries, e-commerce and Internet-usage is at the same level as in the USA. Based on two comparable surveys, the usage pattern and attitudes of Internet-users is analyzed. The behavior of the general Internet is compared to a sub-group of the Internet-user with e-commerce experience. The Internet-users with e-commerce experience are less sensitive with regard to privacy than the general Internet users. In order to study privacy concerns a large sample of e-shoppers is used as the basis for a cluster analysis. The cluster-analysis was utilized to study the respondents with e-commerce experience in more detail.

Kort sammendrag:

Denne rapporten gir et bilde av Nordmenns holdninger til og villighet til å oppgi personopplysninger ved bruk av Internett generelt og i forbindelse med elektronisk handel (e-handel) spesielt. Studien bygger på to påfølgende og sammenlignbare spørreundersøkelser om nordmenns Internett bruk og erfaring med e-handel. Internett brukernes holdninger til personvern sammenlignes med holdningene til de som i tillegg har erfaring med e-handel. Den subgruppen av Internettbrukere som har erfaring med e-handel ser ut til å være mindre opptatt av personvern enn de uten denne erfaringen. For å kunne studere holdninger til personvern og det å dele personopplysninger i detalj, blir det foretatt en kluster analyse av respondentene med e-handels erfaring. Denne klusteranalysen viser sammenheng mellom kjøpsmønster, holdninger til personvern og demografi.

Emneord/Keywords: Electronic commerce, Privacy concerns, Internet use, Personal information.

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Satsningsfelt/Research field:

Antall sider/No. of pages: 19

Sammendrag

Introduksjon

Internett brukes av en stor prosentandel Nordmenn, og i mange tilfeller blir den som surfer bedt om å registrere seg for å få tilgang til den informasjon eller de tjenester som nettstedet tilbyr. E-handel vokser også – ca 1 million nordmenn har bestilt eller handlet noe på Internett minst en gang. Nettbrukere som handler på online er vanligvis mere erfarne Internett-brukere enn de som ikke handler online. Det er mulig å surfe på Internett og samtidig opprettholde et høyt anonymitetsnivå. I en handle situasjon er dette mere vanskelig og ofte umulig. Holdninger til personvern og villighet til å dele person-opplysninger var temaet for en analyse som er presentert i denne rapporten.

Undersøkelsene og noen hovedfunn

Studien var basert på en analyse av to postale undersøkelser til medlemmer av et nasjonalt panel rekruttert av MMI – se tabell A. Ifølge MMI er panelet sammensatt slik at det representerer Norges befolkning.

Tabell A Undersøkelsene og antall respondenter

Navn	Tidsperiode	Totalt antall respondenter	Internett-brukere	Internettbrukere med e-handels erfaring.
Vinter 1999/00	November 1999 til Februar 2000	5660	2908 (51%)	1070 (19 %)
Vinter 2000/01	November 2000 til Februar 2001	5376	3094 (58%)	1543 (29 %)

Undersøkelsene inneholdt spørsmål om hva slags informasjon brukeren var villig til å gi fra seg i en online kjøps situasjon. Alternativene var e-post adresse, navn og postadresse, informasjon om handlevaner, informasjon om kjønn, alder og inntekt, personnummer og kredittkortnummer. De som var villig til å oppgi personnummer og kredittkortnummer ble kategorisert som *marginalt bekymrede*, de som var villig til å oppgi hverken e-post adresse eller virkelig navn ble definert som *meget bekymrede*, og de øvrige ble betegnet som *majoriteten* - se tabell B.

Tabell B

Vinter 2000/01	Personer med e-handelserfaring Prosentandel - (antall)
De meget bekymrede	9% (145)
Majoriteten	62% (955)
De marginalt bekymrede	29% (444)
N=	1544

De meget bekymrede er en relativt liten gruppe. Siden alle respondentene (sub-gruppen Internettbrukere valgt ut for denne studien) hadde handlet på Internett, var dette et forventet resultat. Hovedfunnet er at et flertall ikke er villig til å bruke kredittkort eller å gi fra seg personnummer på nettet.

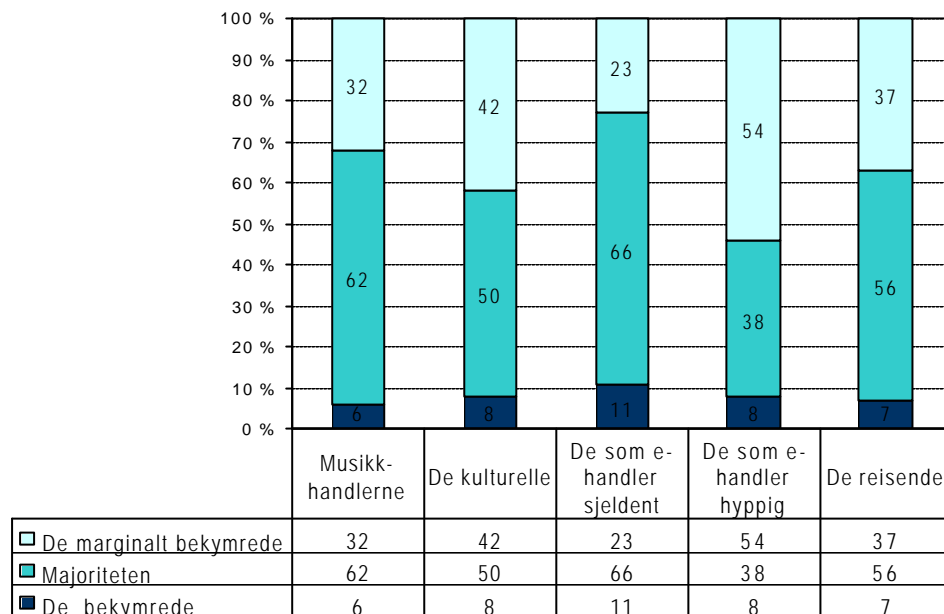
En klusteranalyse av e-handlerne.

For å kunne studere Internettbrukere med e-handelserfaring mer i detalj ble det benyttet en klusteranalyse teknikk for å segmentere respondentene i undersøkelsen gjennomført vinteren 2000/01. Resultatet av klusteranalysen basert på handlemønsteret til respondentene, var fem forskjellige segmenter. Med utgangspunkt i dette resultatet ble det gitt følgende navn til de fem segmentene; *musikk-handlerne* (segment 1), *de kulturelle* (segment 2), *de som e-handler sjeldent* (segment 3), *de hyppige e-handlerne* (segment 4) og *de reisende* (segment 5). Den mest synlige forskjellen mellom segmentene var størrelsen – mer enn 50% av e-handlerne tilhørte segment 3, de som handler sjeldent på nettet.

Det var flest menn blant de hyppige e-handlerne, og musikk-handlerne hadde størst andel av unge respondenter. De kulturelle og de reisende var best utdannet og hadde høyest inntekt. De som handler sjeldent på Internett var de som var mest bekymret, dvs hadde mest restriktive personvern holdninger. Det

var dessuten noen demografiske forskjeller på de tre gruppene *de meget bekymrede*, *majoriteten*, *de marginalt bekymrede*. De tydeligste forskjellene var relatert til kjønn, alder og inntekt. Kvinnene hadde et mer restriktivt syn enn menn og de eldre var mer bekymrede enn de yngre. Det må legges til at mer enn 50% av *de hyppige e-handlerne* hørte til gruppen *marginalt bekymrede*, dvs de med minst restriktive holdninger.

Holdninger til personvern:
en klusteranalyse av ulike e-handels segmenter,
Vinter 2000/01



Holdninger vil endre seg over tid, og det er viktig å øke kunnskapsbasen innen dette området. Det er derfor behov for mer forskning, og i GEM ved NR vil nye studier om personvern bli igangsatt i 2002 og 2003.

Summary

Introduction

The Internet is used by a high percentage of the Norwegian population. In many cases the user or surfer is asked to register in order to get access to information or services. E-commerce is also growing – approximately 1 million Norwegians have ordered something on the Internet at least once. Internet-users that are shopping online are in most cases more experienced Internet-users than the non e-shoppers. It is possible to surf the net and still retain a relative high level of anonymity. However, in a shopping situation this is much more difficult and often not possible. Privacy attitudes and willingness to share personal information is the theme of this report.

The surveys and key findings

This study was based on the analysis of *two postal surveys* to members of a national panel recruited by a market research firm MMI – see table A. According to MMI, the panel is representative for the Norwegian population.

Table A The surveys and number of respondents

Name	Period	Total number of respondents	Internet-users	Internet-users with e-commerce experience
Winter 1999/00	November 1999 to February 2000	5660	2908 (51%)	1070 (19 %)
Winter 2000/01	November 2000 to February 2001	5376	3094 (58%)	1543 (29 %)

The survey-questionnaires contained questions about what kind of information the user was willing to give in an online shopping situation. The alternatives were e-mail address, name and address, information about shopping behavior, information about gender, age, income, Official id-number and credit card number. Those who are willing to give the credit card number or personal id-number are defined as *marginally concerned*, those that are not willing to give neither e-mail address nor real name are defined as *very concerned*, and the rest are the defined as the *majority* – see table B.

Table B

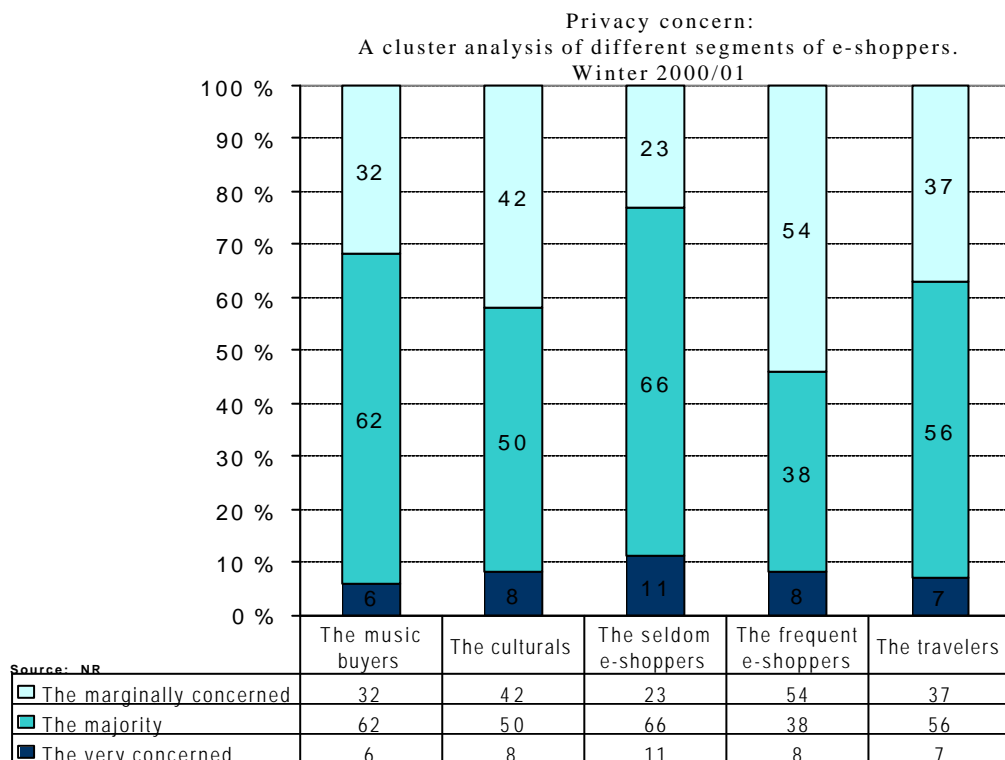
Winter 2000/01	The e-shoppers % - (number of respondent)
The very concerned	9% (145)
The majority	62% (955)
The marginally concerned	29% (444)
N=	1544

The very concerned is a quite small group. Since all the respondents, (the sub-group of Internet-users chosen for this study) had ordered or bought something online, this was an expected result. The main result is that the majority is not willing to use their credit card or their personal id-number online.

A clustering of the e-shoppers

In order to study the Internet-users with e-commerce experience in detail, a cluster analysis technique was used to segment the respondents in the 2000/01 Winter-survey. The result of clustering the e-shoppers according to their purchase patterns, was five different segments. Based on the output of the clustering the segments were labeled in the following way (e.g. names are given to the five segments); *the music buyers* (segment 1), *the culturals* (segment 2), *the seldom e-shoppers* (segment 3), *the frequent e-shoppers* (segment 4) and *the travelers* (segment 5). The most noticeable difference between the segment was the difference in size – more than 50% of the e-shoppers belonged to the cluster named the *seldom e-shoppers*.

The *frequent e-shoppers* were mostly men. The *music buyers* contained the highest share of the young respondents. The *culturals* and *the travelers* were the best educated and had the highest reported income. The *seldom e-shoppers* were most concerned about privacy and the *frequent e-shoppers* were least concerned about privacy. The three groups of e-shoppers *the very concerned*, *the majority* and *the marginally concerned* had some differences with regard to demography. The most distinct differences were related to gender and income. The *marginally concerned* were primarily men with a relatively high income. There was a correlation between gender and age, and privacy concerns. The women were more concerned than the men, and the elderly seemed to be more concerned than the younger e-shoppers. It should be underlined that more than 50% of the *frequent e-shoppers* belong to the group *marginally concerned*.



Attitudes will change over time, and it is important to increase the basis of knowledge in this area. Hence more research is warranted. In the GEM-department at NR, studied in the field of privacy will be continued in 2002 and 2003.

Introduction

An individual's information privacy is the right to determine when, how, and to what extent information about a person is communicated to others (Westin 1967). In other words, it has to do with the control on access that others have to personal information. According to Goodwin (1991) consumers are concerned about two dimensions, environmental control and social use of information. In the context of e-commerce, the focus is primarily on the first dimension.

There are primarily two ways to study privacy and e-commerce. Firstly, the Internet-users can be asked about their experience on the web and their opinions regarding privacy. Secondly, the users' actual behavior at the web sites can be studied by experts, for instance through analysis of the web sites' log files. "The Internet Life Report" by The Pew Internet & American Project (Fox et. al. 2000) is an example of the first method. Their study is based on a CATI survey of a random sample of Americans, 18 years or older. The report "Privacy@net" by Consumers International (Scribbins 2001) is based on the second method. It can be argued that the second method gives more correct information compared to the first one. However, for the consumers or Internet-users in general, it is "perceived reality" that matters and influences future behavior. Our study is done through the first method. It is a study of the respondents' self-reported behavior.

The study by Ackerman et. al. (1999) is a study of Internet users and their attitudes towards different commercial scenarios. Even if Ackerman et. al.'s sample is not representative for the US population, there are characteristics that are common to the Norwegian sample. The number of frequent Internet users turns out to be high in both samples.

None of the American studies we have looked at have clustered e-shoppers based on their online shopping habits. Hence, it was not possible to compare the results directly with the American survey results.

The report is organized in the following way. First, the survey method is described. Second, a brief overview of the Norwegian Internet population's Internet usage pattern is given. Third, the respondents' willingness to reveal information about themselves is discussed. Fourth, the respondents' attitudes towards privacy are discussed. Fifth, we look into the results of the cluster analysis and the characteristics of the different clusters that came out of the analysis.

Methodology

This study is based on the analysis of *two postal surveys* to members of a national panel recruited by a market research firm.¹ According to this market research firm, the panel is representative for the Norwegian population.

Table 1 Two postal surveys

	Period	Total number of respondents	Internet-users	Percentage of Internet-users with e-commerce experience
Winter 1999/00	November 1999 to February 2000	5660	2908 (51%)	1070 (19 %)
Winter 2000/01	November 2000 to February 2001	5376	3094 (58%)	1543 (29 %)

¹ MMI, www.mmi.no

In the last part of the paper a cluster analysis technique is used to segment the respondents into subsets. The clustering is done in order to study the Internet-users with e-commerce experience in detail. The clustering was done by use of a partitioning clustering method. The method is called *cbos* and is an extension to the standard k-means algorithm to handle categorical data (Huang 1998).²

A brief overview of the Norwegian Internet users

The respondents in the two surveys were asked if and when they last used the Internet, and if they had purchased anything online. The subset of respondents who did use the Internet was divided into three groups during the analysis. The first group is the subset of the total number of respondents in the surveys, who answered they are Internet users. The second group is a subset of the respondents who are Internet users. This group is those with e-commerce experiences. The third group is a subset of the respondents with e-commerce experience. This third subset is those who have purchased online the month before the survey(s).

Table 2 When was the last time that you used the Internet?

	Internet-users Winter 1999/00	Internet-users Winter 2000/01	E-commerce experience 1999/00	E-commerce experience 2000/01	Has purchased online the last month 1999/00	Has purchased online the last month 2000/01
Yesterday	43%	51%	58%	62%	67%	70%
Two days ago	16%	15%	16%	15%	12%	14%
3 – 7 days	19%	17%	15%	14%	13%	10%
8 – 30 days	15%	10%	7%	7%	6%	4%
More than a month ago	9%	6%	3%	2%	2%	1%
N=	2908 (51%)	3094 (58%)	1070 (19%)	1543 (29%)	460 (8%)	639 (12%)

There are several interesting observations when comparing the two subsequent years. Respectively 51% and 58% of the grand total in the two surveys are Internet users (bottom of column two and three). This indicates an increase of 7 percent points in the total Internet use in Norway from the winter 1999/00 survey to the winter 2000/01 survey. At the same time, the category that used the Internet yesterday increased with 8 percent points.

Also one can see that 19% of the respondents in the 1999/00 survey and 29% of the respondents in the 2000/01 survey considered themselves to be users with some e-commerce experience. This is an increase of 10 percent points, and represents a nearly 30 percents increase in the reported e-commerce experience in one year.

If we study the relations between the respondents that used Internet, the respondents with e-commerce experience and the respondents who had purchased online the last month before the surveys in 1999/00 and 2000/01, there are also some interesting observations. It seems that the e-shoppers primarily are the frequent Internet users. For instance, of those reported that they had shopped online the last month, 84 percent had used the Internet yesterday or two days compared to 66 percent of the “average” Internet-user. (Winter 2000/01 – figures)

² The **cbos code** was obtained from Dr. Joshua Z Huang at E-Business Technology Institute at The University of Hong Kong (email:jhuang@eti.hku.hk).

The respondents' willingness to reveal personal information to get information and to buy goods and services on the Internet

Table 3a and 3b contain information about the respondents' willingness to reveal information that may be sensitive for the respondents' privacy. Table 3a contains information of what kind of information the respondents are willing to reveal *to get information* about products and services on the Internet. Table 3b has the same answer alternatives, but the question is here rephrased to what kind of information the respondents are willing to reveal *to buy* something on Internet.

Table 3a

What kind of information are you willing to give in order to get information about products and services on the Internet?

	Internet-users Winter 1999/00	Internet-users Winter 2000/01	E-commerce experience 1999/00	E-commerce experience 2000/01
E-mail address	81%	83%	91%	90%
Name and address	59%	58%	71%	65%
Information about shopping behavior	28%	29%	33%	31%
Information about gender, age, income	26%	30%	32%	34%
Official id-number (equiv. to social security number)	3%	3%	4%	4%
Credit card number	2%	2%	3%	5%
N=	2908	3094	1070	1620 ³

Table 3a contains the answers from the general Internet users and from the Internet users with e-commerce experience in the survey of the winter 1999/00 and the winter 2000/01. In the survey from winter 2000/01, the sub-segment of Internet users with e-commerce experience increased to 30% (1620/5376) of the grand total and to 52% (1620/3094) of the Internet users.

Approximately 80% of the Internet users are willing to reveal their e-mail address, and those with e-commerce experience are most willing to reveal it. This was expected, since e-mail addresses are used widely on the Internet. The respondents are a bit less willing to reveal their name and address (closed to 60%), but again the Internet users with e-commerce experience are most willing to reveal this information.

When we move to the question about shopping behavior, then the willingness to reveal information drops dramatically down to the area around 30% for all the categories of Internet users. The figures are approximately similar for demographic information like gender, age and income. The willingness to reveal information drops dramatically again when it comes to questions about their official ID-number (for instance the social security number) or credit card number. This is similar to the findings of Ackerman et. al. (1999) in their study of American Internet users' attitudes to privacy in a survey in 1998. Only 5% or less of the Norwegian respondents are willing to give such information in order to receive information about goods and services on the Internet. Personal ID and credit card number seems to be considered as very sensitive for all the segments of respondents in both surveys.

³ . The number of respondents with e-commerce experience is a little bit higher in this table than in table 1 as a result of incompleteness and the fact that some have stop using the Internet.

Overall the behavior of the general Internet-user and the e-shopper did not change from 1999/2000 to 2000/2001. The e-shoppers seem to be somewhat more willing to reveal their e-mail address and their names than the average Internet-user. But the key finding is that the majority in both segments does not regard this kind of information as sensitive. However, based on the figures in table 3a, it can be concluded that information about shopping behavior, gender, age and income is regarded as sensitive for the majority of the respondents.

Table 3b

What kind of information are you willing to give in order to buy something on the Internet?

	Internet-users Winter 1999/00	Internet-users Winter 2000/01	E-commerce experience 1999/00	E-commerce experience 2000/01
E-mail address	66%	69%	83%	80%
Name and address	65%	67%	83%	80%
Information about shopping behavior	23%	23%	28%	26%
Information about gender, age, income	23%	26%	33%	32%
Official id-number (equiv. to social security number)	5%	5%	7%	7%
Credit card number	13%	16%	25%	25%
N=	2908	3094	1070	1620

Table 3b contains the same answer categories as table 3a, but the question is now reformulated to “What kind of information the Internet users are willing to reveal in order to buy something on the Internet”.

If we look at the answers across the surveys and across the segments, the pattern from table 3a seems to be repeated. Most of the respondents are willing to reveal their e-mail address to buy something on the Internet (close to 70%). The figures are rather similar when it comes to the willingness to reveal their name and address. There is a decrease in willingness to reveal information about the shopping behavior (23%), and there are relatively small differences between the general Internet users and the Internet users with e-commerce experience. The figures are quite similar when it comes to demographic information like gender, age and income (23-26%). The respondents seem to be least willing to reveal their official ID-number (5%).

When it comes to the willingness to reveal the credit card number there is a significant difference between the general Internet users and the Internet users with e-commerce experience. The figures vary from 13-16% for the Internet users without e-commerce experience, and are 25% for the Internet users with e-commerce experience in both surveys. The willingness to reveal the credit card number seems to be one of the distinguishing differences between the group of general Internet users and the group of Internet users with e-commerce experience. The Internet users with e-commerce experience seems to be willing to shoot when it is needed, while the general Internet users seems to prefer sitting on the fence. This finding is different from Ackerman et. al. (1999). The American Internet users were very little interested in revealing this sort of information. The American Internet users in 1998 seem to be far more aware of the privacy concerns than the Norwegian Internet users are found to be in the surveys of 1999/00 and of 2000/01. The tendency to a difference between the general Internet users and the Internet users with e-commerce experience is also found when it comes to willingness to reveal e-mail address, name and address. There are less visible differences when it comes to willingness to reveal information about shopping behavior and demographic information. The general Internet users and the Internet users with e-commerce experience are almost identical when it comes to willingness to reveal official ID-number. Only very few are willing to reveal this information to buy goods and services on the Internet.

General privacy attitudes

The kind of information an e-shopper is willing to give **when buying** something online is described in table 4. The next step was to use this information in order to make a privacy variable. Those who are willing to give the credit card number or personal id-number are defined as *marginally concerned*, those that are not willing to give neither e-mail address nor real name are defined as *very concerned*, and the rest are defined as the *majority*. Approximately 95% (1544/1620) of the e-shoppers are included in this variable. The classification in table 4, with regard to privacy, is fairly similar to Ackerman et. al.'s (1999) classification into the categories "privacy fundamentalists", "pragmatic majority" and the "marginally concerned". Ackerman et. al. (1999) categorized 17% of their respondents as "privacy fundamentalists", 56% as the "pragmatic majority" and 27% as "marginally concerned". The Norwegians in table 4 seems to be more relaxed about privacy than their American counterparts. However, it should be added that the surveys are not directly comparable, and other factors might explain the differences.

Table 4

Winter 2000/01	The e-shoppers % - number of respondent
The very concerned	9% (145)
The majority	62% (955)
The marginally concerned	29% (444)
N=	1544

The very concerned is a quite small group. Since the members of this segment has ordered or bought something online, we expected this segment to be small. It is possible to be anonymous when shopping online by using a trusted third party, an intermediate. The actual size of the segment is of less important compared to the fact that three distinct segments could be identified. The demographic characteristics of the segments are described in table 5.

Table 5 – characteristics of the three segments based on privacy attitude.

	Winter 2000/01 The very concerned	Winter 2000/01 The majority	Winter 2000/01 The marginally concerned
Gender			
men	40%	47%	68%
women	60%	53%	32%
Age groups			
< 30	20%	22%	28%
30 – 39	21%	33%	33%
40 – 49	26%	25%	23%
50 – 59	23%	16%	12%
60 or older	10%	5%	4%
Level of education			
Student	9%	11%	13%
High school & professional training	41%	45%	30%
University level	50%	43%	57%
Income			
under 25000 EURO	20%	24%	17%
25 – 50000 EURO	59%	57%	52%
Over 50000 EURO	9%	11%	26%
Un-answered	12%	7%	5%
	N = 145	N=955	N=444

Of the 1544 with e-commerce experience, 52% were men and 48% women. In Table 5 some differences with regard to gender can be identified. There seems to be more women than men (60/40) among the very concerned segment, while the men are in majority (68%) in the marginally concerned segment. There is a higher number of respondents aged 50 or more (33%) in the very concerned segment, than in any of the other segments (21% and 16%). There is a higher number of respondents aged below 30 in the marginally concerned segment (28%) than in any of the other segments. The level of education is approximately the same in all segments, but there are a higher number of individuals with a university level education in the marginally concerned segment (57%) than in the other segments. There are more respondents that refuse to inform about their income in the very concerned segment than in the other segments (12%)

Attitudes to advertisement

Most of the consumers know that the companies with online presence want to market their products and services towards potential customers. The email address of an Internet-user can for instance be used for this purpose. Hence, the Internet-users' attitudes to advertisement give some information about their privacy concerns. Table 6 shows the respondents' attitudes to register and receive advertisement. The framing of the question can have strong influence on the results. (Tversky & Kahneman 1986) Therefore, four different statements have been collected in order to get information about this issue, and to reduce the potential framing effect.

Table 6 – attitudes to advertisement

To what extent do you agree to the following statements;

	Internet-users Winter 1999/00	Internet-users Winter 2000/01	Internet-users with e-commerce experience 1999/00	Internet-users with e-commerce experience 2000/01
<i>It is OK to receive advertisement from a company in e-mails even though I haven't approved it in advance</i>				
Strongly disagree	64%	65%	64%	64%
Partly disagree	18%	16%	20%	17%
Partly agree	12%	11%	10%	11%
Strongly agree	5%	6%	5%	6%
Impossible to answer	2%	1%	1%	1%
N=	2626	2889	1064	1606
<i>For goods & services of special interest to me, I am positive to register and receive advertisement.</i>				
Strongly disagree	38%	37%	26%	29%
Partly disagree	14%	15%	15%	15%
Partly agree	28%	28%	33%	32%
Strongly agree	18%	18%	25%	23%
Impossible to answer	2%	1%	1%	1%
N=	2616	2887	1062	1608
<i>I think it is OK to register in order to get access to information on the Internet if the information is interesting</i>				
Strongly disagree	15%	15%	9%	11%
Partly disagree	11%	11%	9%	9%
Partly agree	37%	36%	36%	35%
Strongly agree	35%	36%	45%	43%
Impossible to answer	2%	1%	1%	1%
N=	2615	2882	1061	1603
<i>I am positive to become a member/registered customer (on the Internet) of a supplier of a brand that I like and use.</i>				
Strongly disagree	36%	36%	23%	26%
Partly disagree	16%	17%	14%	16%
Partly agree	28%	29%	34%	33%
Strongly agree	18%	17%	27%	23%
Impossible to answer	3%	2%	1%	2%
N=	2617	2873	1064	1598

The differences within each segment, the Internet-users and the e-shoppers, are very small. Moreover, it seems that the attitudes have not changed in a 12 months time. However, there are differences between the Internet-users and the e-shoppers. The first statement is about advertisement in general, and of the four statements this is only one with no difference between the Internet-users and the e-shoppers. As expected the respondents showed the most negative attitude to advertisement in general. For the other three statements, the e-shoppers are more positive to register and receive information or advertisement than the Internet users in general.

If *partly agree* and *strongly agree* are viewed as one group, 6 to 10 percent more of the e-shoppers answered “agree” compared to the Internet-users in general. Since it is likely that the e-shoppers are more used to register and give information about them selves, these differences were expected. Moreover, since the e-shoppers are a sub-group of the Internet-users, this difference would have been more significant – see table 6b. There is one exception – both segments are equally negative to advertisement received in e-mails.

Table 6b – attitudes to advertisement

To what extent do you agree to the following statements;

	Internet-users Winter 2000/01 without e- commerce experience	Internet-users Winter 2000/01 with E-commerce experience
<i>It is OK to receive advertisement from a company in e-mails even though I haven't approved it in advance</i>		
Strongly disagree	64%	64%
Partly disagree	16%	17%
Partly agree	11%	11%
Strongly agree	5%	6%
Impossible to answer	3%	1%
N=	1532	1606
<i>For goods & services of special interest to me, I am positive to register and receive advertisement.</i>		
Strongly disagree	47%	29%
Partly disagree	15%	15%
Partly agree	25%	32%
Strongly agree	12%	23%
Impossible to answer	2%	1%
N=	1527	1608
<i>I think it is OK to register in order to get access to information on the Internet if the information is interesting</i>		
Strongly disagree	21%	11%
Partly disagree	13%	9%
Partly agree	37%	35%
Strongly agree	27%	43%
Impossible to answer	2%	1%
N=	1528	1603
<i>I am positive to become a member/registered customer (on the Internet) of a supplier of a brand that I like and use.</i>		
Strongly disagree	47%	26%
Partly disagree	16%	16%
Partly agree	23%	33%
Strongly agree	10%	23%
Impossible to answer	4%	2%
N=	1525	1598

Payment methods and privacy concern

The next section focuses on e-shoppers. As in the off-line world, the e-consumers normally have several alternatives when it comes to payment methods. The preferences between these alternatives might give some information about how sensitive a person is regarding privacy. Some payment alternatives are normally more favorable for the customers than others. For instance it can be expected that a large percentage prefer to receive the goods before paying, and not the opposite.

Table 7

*Which payment solutions do you **normally use** when ordering goods or services on the Internet?*

*Which payment solutions do you **prefer** when ordering goods or services on the Internet?*

	Winter 1999/00 "normally use"	Winter 2000/01 "normally use"	Winter 1999/00 "prefer"	Winter 2000/01 "prefer"
By getting an invoice together with the goods	34%	37%	48%	50%
By paying at the post office when receiving the goods (COD)	29%	28%	26%	26%
By using a bank-card /debit-card such as VISA	14%	15%	10%	10%
By using credit card	14%	13%	10%	9%
By using the telephone	2%	1%	2%	1%
Other	8%	7%	5%	4%
N=	1070	1563	1119	1564

It seems that there has not been any development in the 12 months period between the two surveys. As expected the majority chose the first two alternatives. The percentages increased 11 percent points from "normally use" to "prefer" if *by getting an invoice together with the goods* and *by paying at the post office when receiving the goods* are merged. It means that the customers do not want to take the risk of paying before receiving the goods if they do not have to.

Table 8

*Which payment solutions do you **prefer** when ordering goods or services on the Internet?*

	Winter 2000/01 The very concerned	Winter 2000/01 The majority	Winter 2000/01 The marginally concerned
By getting an invoice together with the goods	50%	57%	40%
By paying at the post office when receiving the goods (COD)	26%	30%	15%
By using a bank-card /debit-card such as VISA	9%	5%	21%
By using credit card	4%	3%	23%
By using the telephone	2%	2%	0%
Other	9%	3%	1%
N= 1314	92	815	407

The information about willingness to give information in table 4 was used to make the three groups of e-shoppers; *the very concerned*, *the majority* and *the marginally concerned*. Since the members of the last group were those willing to use their credit card online, a significantly higher percentage was expected to prefer this payment method compared to *the very concerned*, and *the majority*. A much higher percentage of *the marginally concerned* prefers credit or debit card than the two other groups, while the very concerned and the majority prefers invoice or cash on delivery (COD).

Cluster analysis of the online shoppers

In order to study the Internet-users with e-commerce experience in detail, a cluster analysis technique was used to segment the respondents in the winter 2000/01 survey. 1544 of 1620 or 95% of the respondents answered that they had ordered or bought at least one of 12 most popular e-commerce categories in the survey (table 13). These 12 categories were used to cluster the respondents. The 12 product categories were tabulated as “has not ordered (No)”, has ordered 1 to 3 times (Se)” and “has ordered more than 3 times (Fr).”

Table 13

Winter 2000/2001		
1. Books (399)	7. Information services (327)	13. Shares and bonds (161)
2. Air tickets (397)	8. Tickets (ex. air tickets) (328)	14. Flowers & gifts (159)
3. Holiday packages (396)	9. Software (267)	15. Entertainment (154)
4. Other (390)	10. Electric articles (235)	16. Sports &leisure products (142)
5. Music/CD (389)	11. Apparels & shoes (200)	17. Food & liquor (49)
6. Accommodation (348)	12. Hardware (191)	18. Cars (38)
		19. Furniture (25)
		20. Real estate (24)
Number of respondents in parenthesis N= 1620		

Table 13 shows the 20 product categories from the survey. The number of respondents for each of the 12 chosen categories varies from 191 respondents, who answered that s/he had purchased hardware over Internet, to 399 respondents, who answered that s/he had purchased books over Internet.

The clustering gave 5 different segments of Internet users with e-commerce experience – see table 14.

Table 14 – the profile of the segments

Winter 2000/2001	Segment 1 Fr - Se - No	Segment 2 Fr - Se - No	Segment 3 Fr - Se - No	Segment 4 Fr - Se - No	Segment 5 Fr - Se - No
Frequent (Fr) – Seldom (Se) – Never (No)					
Books (7 – 17 - 75)	11 - 19 - 70	13 - 57 - 30	5 - 14 - 81	39 - 42 - 19	8 - 6 – 86
CDs/music (8 - 16 - 76)	24 - 76 - 0	11 - 5 - 84	0 - 0 - 100	77 - 12 - 12	6 - 5 – 89
Air tickets (5 - 19 - 76)	4 - 11 - 85	9 - 28 - 63	5 - 11 - 83	15 - 15 - 69	5 - 79 – 16
Holiday packages (2 - 22 - 76)	3 - 12 - 85	4 - 68 - 27	1 - 9 - 90	12 - 21 - 67	3 - 82 – 15
Accommodation (2 - 19 - 79)	2 - 9 - 89	6 - 34 - 60	1 - 10 - 88	12 - 52 - 36	3 - 78 – 19
Information services (6 -14 -79)	6 - 14 - 80	8 - 23 - 69	7 - 13 - 80	4 - 44 - 52	12 - 16 – 72
Tickets (not air tickets)(4-16-80)	4 - 13 - 83	10 - 77 - 13	2 - 11 - 87	12 - 16 - 72	7 - 16 – 77
Software (3 - 13 - 84)	5 - 17 - 78	2 - 16 - 82	2 - 13 - 85	35 - 19 - 46	4 - 16 – 80
Hardware (4 - 8 - 88)	7 - 10 - 83	5 - 5 - 90	3 - 8 - 89	19 - 54 - 27	3 - 8 – 89
Electronic articles (2 - 12 - 86)	5 - 19 - 76	0 - 13 - 87	1 - 11 - 88	20 - 68 - 12	1 - 9 – 90
Apparel & shoes (2 - 10 - 88)	4 - 11 - 85	5 - 8 - 87	2 - 13 - 85	4 - 16 - 80	1 - 6 – 93
Other (6 – 18 - 76)	9 - 18 - 73	6 - 12 - 82	5 - 23 - 72	28 - 48 - 24	7 - 20 – 73
	N = 325	N = 136	N = 869	N=26	N= 188

Based on the results of the clustering the segments can be labeled. In the following we will use the names; *the music buyers* (segment 1), *the culturals* (segment 2), *the seldom e-shoppers* (segment 3), *the frequent e-shoppers* (segment 4) and *the travelers* (segment 5).

If we look at the first segment, the music buyers, we discover that everybody in this segment has bought CDs/music online. They also buy some books, software and electronic articles. This is the second largest segment with 325 respondents. If we take a similar look at the second segment, the culturals; books, holiday packages and other tickets than airline tickets are typical for their online purchase behavior. The culturals are the second smallest of the segments. The third segment, the seldom e-shoppers, is the absolutely largest segment, consisting of 869 respondents. This segment is larger than the other segments together. Their main characteristic is that they have not bought CDs/music on the Internet, and the only category that is popular among the member of this segment is “other” products or services. The fourth segment is the frequent e-shoppers. This is the absolutely smallest segment with only 26 respondents. They are frequent buyers of books, CDs/music, accommodations, software, hardware, electronic articles and other products or services. Since this segment or cluster is very different from the other segments it is included in the analysis below even though we know it is a very small cluster. The last segment, the travelers, is the third largest segment with 188 respondents. Their purchases online are primarily airline tickets, holiday packages and accommodations.

The characteristics of the different segments

In table 13 and 14 key the key findings in our analysis are presented. It is the essence of our study and shows important differences between the five segments with regard to demography and privacy attitudes.

Table 13 – the demographic profile of the members of the e-commerce segments

Winter 2000/01	The music buyers	The culturalists	The seldom e-shoppers	The frequent e-shoppers	The travelers
Sex					
men	58%	56%	48%	88%	55%
women	42%	44%	52%	12%	45%
Age groups					
< 30	33%	21%	22%	27%	18%
30 - 39	36%	27%	31%	31%	30%
40 - 49	19%	31%	26%	27%	23%
50 or older	12%	20%	22%	15%	29%
Level of education					
Student	14%	13%	11%	19%	8%
High school & professional training	42%	26%	44%	31%	32%
University level	44%	61%	45%	50%	69%
Income					
under 25000 EURO	27%	19%	22%	12%	15%
25 – 50000 EURO	55%	57%	58%	35%	52%
Over 50000 EURO	10%	21%	13%	35%	27%
Un-answered	8%	3%	7%	19%	6%
N=1544	N = 325	N = 136	N = 869	N=26	N= 188

The size of the segments are; 21% *music buyers*, 9% *culturalists*, 58% *seldom e-shoppers*, 2% *frequent e-shoppers* and 12% *travelers*. The distribution between the gender in the different segments is almost as expected. In general there are more male than female e-shoppers. Even though 46% of the respondents in the survey (5376) were men, a somewhat higher percent, 52%, of the e-shoppers were men. Moreover, there are significant differences between the segments. In the small segment with *frequent e-shoppers* only 12% were women. On the other hand, the women is in majority in the largest segment, the *seldom e-shoppers*. If we look at the age distribution in the different segments, the age-profile is also as expected. The youngsters are found among the *music buyers* and *frequent e-shoppers* (33% and 27%). With one exception, the 30 to 39 years old are the largest subgroup in all the segments. The segment named *the travelers* has the highest share of people that are 50 years or older.

If we look at the different segments' level of education, the best educated is *the travelers* and *the culturalists* with 77% and 73% students & university education, respectively. When it comes to income, the *music buyers* are the low-income group (27%). This is as expected since this the members of this segment are younger than the members of the other segments. It seems that *the frequent e-shoppers* and *the travelers* are the two segments with most members with high income.

With regard to privacy concern we expected to find a major difference between the *seldom e-shoppers* and *the frequent e-shoppers*. Overall, the results were as expected. The highest percentage unwilling to give either e-mail address or real name, is found in the segment *seldom e-shoppers* (11%). However, this is only slightly more than in the other segments.

The *music buyers* seem to be least concerned with privacy, with only 6% defined as very concerned. The majority, defined as those neither very concerned or marginally concerned, are primarily found among the *seldom e-shoppers* (66%) and the *music buyers* (62%). The marginally concerned about privacy, defined as those who are willing to give the credit card number or personal id-number, are found among *the frequent e-shoppers* (54%) and the *culturals* (42%).

Even though some of these findings were expected, the cluster analysis gives a more detailed picture of the privacy attitudes of the Norwegian e-shoppers.

Concluding remarks

This study of the Norwegian e-shoppers gives insight into privacy concerns and attitudes. There were only minor differences between the two surveys from the winter 1999/00 and the winter 2000/01. It seems that the attitudes are not changing much in a 12 months period.

The three segments of e-shoppers *the very concerned*, *the majority* and *the marginally concerned* had some demography differences. The most distinct differences were related to gender and income. The *marginally concerned* were primarily men with a relatively high income. The segment named *very concerned*, was quite small. However, a hypothesis is that the most privacy concerned people are non e-shoppers while the three segments in this study only included e-shoppers.

The result of clustering of the e-shoppers according their purchase patterns was five segments with some minor and some major differences between the members of clusters. However, the most noticeable difference was the difference in size – more than 50% of the e-shoppers belonged to the cluster named the *seldom e-shoppers*. Most of the findings very expected. The *frequent e-shoppers* were mostly men. The *music buyers* contained the highest share of the young respondents. The *culturals* and *the travelers* were the best educated and had the highest reported income. The *seldom e-shoppers* were most concerned about privacy and the *frequent e-shoppers* were least concerned about privacy.

There is a correlation between gender and age and the privacy concerns. The women seem to be more concerned than the men, and the elderly seems to be more concerned than the younger e-shoppers. For the general Internet user there is a small *increase* in the willingness to reveal information about them selves. For the Internet users with e-commerce experience on the other hand, there is either a small *reduction* or no change in the willingness to reveal information in about them selves. This may indicate some unpleasant incident among the Internet users with e-commerce experience.

E-commerce is still in an early stage and privacy concerns might increase in the future and further research about privacy concerns is warranted.

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