

AN EXPLORATORY INVESTIGATION OF THE RELATIONSHIPS BETWEEN CONSUMER CHARACTERISTICS AND INFORMATION PRIVACY

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This study investigates the relationships between consumers' characteristics and information privacy concerns. The findings reveal that people with online shopping experience are more tolerant in the Internal and External Unauthorized Use of personal information and less concerned with the possibility of misuse of credit card numbers. The study shows that age is positively correlated with the concerns of misuse of credit card numbers among those who have no online shopping experience. Female respondents are more concerned with the Internal Unauthorized Use of personal information and the possible misuse of credit card information than are male respondents.

INTRODUCTION

As the competition in E-commerce becomes intense, online businesses rely more on personalized Web services and targeted advertising to attract and retain customers. Some Web sites use sophisticated techniques to build profiles of Web users which reveal what products and services the users have purchased, their income levels, educational backgrounds, and hobbies to name a few. Online information brokers collect Web users' personal information and sell it to businesses. These practices have caused growing privacy concerns among consumers. According to a 1999 Louis Harris & Associates study (McCune 1999), 81 percent of Internet users said they were anxious about online threats to their personal privacy. Another recent survey (Purdy 2000) shows that 88 percent of Americans are concerned about their privacy and consider protecting it important. Given these public opinion polls, it is ironical to note that there is no slowdown of consumers' rush to trade their personal information for targeted advertising and free merchandise, and continue to give out their credit-

card numbers over the Internet (Baig et al. 1999; Sykes 1999).

Information privacy is the individual's right to control his or her own personal information. Such a right is a balance between individual freedom and social interest. An individual's level of privacy concerns is constrained by the social-political system and the level of economic development of the society in which he or she lives (Westin 1967). It may also be affected by his or her economic well-being, educational background, age, gender, and experiences. Internet privacy issues involve yet another dimension -- voluntary surrender of personal information in exchange for shopping convenience, personalized Web services, and even free merchandise. Before Web users give out their personal information, they must decide how much their privacy is worth, and how much risk (of identity theft and misuse of their credit card numbers by others) they are willing to take. A number of studies (Camp 1999; Caudill and Murphy 2000; Miyazaki and Fernandez 2000; Milne 2000) have focused on the Internet privacy issues. But most of them approached the issues from the legal and ethical perspectives. There is little research on the factors that influence an individual's level of privacy concern and his/her decision to trade personal information for shopping convenience.

This paper reports a preliminary investigation into the relationships between characteristics of different consumer groups and information privacy concerns. Specifically, the study looks into the impact of sex, age, income, educational background, and online shopping experience on their information privacy concerns. The study also looks into the use of privacy protection tools and the user perceptions of industry's self-regulating practice. It is hoped that the study provides some additional understandings of the Internet privacy issues, which in turn may help businesses better formulate their privacy policies and adjust their practice of personal data collection and usage.

BACKGROUND AND HYPOTHESES

Individual privacy is a socially created need. It is present in virtually every society. According to Westin (1967), privacy provides individuals autonomy, which is vital for functioning and development in society. Individuals seek privacy for emotional release, and the opportunity to be out of the public eye, to express anger, frustration, and grief without fear of repercussion. Individuals need space and time in which to process the information that is constantly confronting them. Privacy provides individuals with a chance for self-evaluation.

Information privacy is defined as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others." (Westin 1967) The demand for privacy differs significantly depending on the level of development in a society and its social-political system (Westin 1967; Cate 1997). For example, the notion of privacy in primitive world has little in common with that in modern societies. Honigsmann (1959) wrote that "The freedom of a primitive man is limited at every point by the pressure of neighbors and kinsmen, living and dead, from whom he cannot escape. He has little privacy."

The movement from primitive to modern societies increases both the physical and psychological opportunities for privacy (Westin 1967). These opportunities are shaped by the social-political systems in a society. In modern totalitarian states, for

example, people have very limited privacy protection and the governments rely on high surveillance and disclosure to demand complete loyalties.

Historically, poverty has lead to less privacy, particularly where big families share common dwellings with thin walls and little, if any, physical separation (Cate 1997). When a person's primary goal is to seek adequate food and shelter, the need for privacy may be secondary. Wealthy people normally possess high social status. They build "high walls" around their houses and hire bodyguards and lawyers to keep a distance from the public and to protect their properties. In a modern society such as United States, economic successes are steadily raising the level of living standards of average citizens. The democratic social-political system has also provided an equal basis for rich and poor in terms of privacy protection. It would be interesting to see how economic well-being affect individuals' privacy concerns.

The level of one's education is generally considered to be positively correlated to economic well-being. The more education one receives, the greater the chance he or she will be economically successful. Educated individuals may place more value on privacy protection. This does not necessarily mean that they will be more concerned or less concerned with a particular privacy threat. A well-educated person may be well informed about the privacy issues and understand the circumstances better. Depending on the privacy issues under consideration, more knowledge can either increase or decrease level of privacy concerns.

Age and experience may also affect one's privacy concerns. Young people are intrinsically more risk-taking. They have fewer privacy concerns because they are young, generally less wealthy, and have no reputation established yet, and therefore, less to lose. A USA WEEKEND poll (Purdy 2000) shows that young people in the age 18 to 24 show a marked tolerance for telemarketing and junk mail. Personal experiences may impact one's concern about information privacy (Culnan 1993). Individuals who had online shopping experience and had not been the victim of personal information misuses may

have a lower level of privacy concerns compared with those who had been a victim.

In this study, we concentrate on two types of organizational practices that can cause privacy concerns (Culnan 1993; Smith et al. 1996): the Internal Unauthorized Secondary Use of personal information and the External Unauthorized Secondary Use of personal information. An example of Internal Unauthorized Secondary use of personal information would be that a bank uses income data collected on loan applications to classify customers into groups for targeted advertising or product offerings. This use of income data for marketing purposes is unanticipated by the customers at the time they filled out the loan application. The External Unauthorized Secondary use of personal information refers to the sharing of customers' personal information between business partners without the customers' permission.

Respondents are asked the following question: To what extent are you concerned about the following situations?

- Q₁ That companies you purchased a product or a service from will use your personal information to send you unwanted promotional materials (Internal Unauthorized Use).
- Q₂ That companies you have never done business with will send you unwanted promotional materials (External Unauthorized Use).
- Q₃ That you might receive unauthorized credit card charges for product or services you did not order (misuse).

To find out who are more likely to trade personal information for targeted advertising and free merchandise, we use the following two questions:

- Q₄ To what extent would you trade your personal information (address, age, income, hobbies, etc.) for targeted advertising which might save you time in searching for product/service?

- Q₅ To what extent would you trade your personal information (address, age, income, hobbies, etc.) for free merchandise such as PC, printer, disks, magazine, music CD, etc.

Based on the above discussions, we have formulated the following hypotheses:

H₁ - H₁₈ (Table 1): There is no correlation between age (income level, educational level) and one's concern for Internal Unauthorized Secondary Use of personal information (External Unauthorized Use, misuse of credit card number) among respondents who have (No) online shopping experience.

H₁₉ - H₂₄ (Table 2): There is no correlation between age (income level, educational level) and one's willingness to trade personal information for targeted advertising (free merchandise).

H₂₅ There is no significant difference of individual concern about the possible misuse of credit card numbers between respondents who have had and those who have not had online shopping experience.

DATA COLLECTION

Subjects. The sample was drawn from an academic and professional mailing list for information systems researchers and educators. Additional data were collected from university students and faculty from two Midwestern and Southwestern state universities in the U.S.

Procedure. A specially developed privacy questionnaire was employed. Initial questions collect respondents' information on gender, age, family income, educational level, and ethnic background. The remainder of the questions solicit respondents' level of concerns about information privacy, willingness to trade personal information, and information on the use of privacy protection tools, etc. All questions were rated on a seven-point Likert scale. The survey was placed on a dedicated

TABLE 1
Hypotheses on Privacy Concerns

Privacy Concerns			
With experience	Internal secondary use	External secondary use	Misuse
Age	H1	H4	H7
Income	H2	H5	H8
Education	H3	H6	H9
Without experience			
Age	H10	H13	H16
Income	H11	H14	H17
Education	H12	H15	H18

TABLE 2
Hypotheses on Willingness to Trade Personal Information

Willingness to Trade Personal Information		
	Targeted advertising	Free merchandise
Age	H19	H22
Income	H20	H23
Education	H21	H24

Web site for the study. Respondents were sent an e-mail requesting their participation in the study. Students in six Information Systems classes also participated in the study. The survey was completed in May 2000.

DATA ANALYSIS

The total number of responses was 349. After eliminating responses due to missing items, 340 responses were left for analysis. Major demographics on the subjects are presented in Table 3.

Correlation Between Age (Income, Education) and Online Privacy Concerns

Pearson's Product-Moment correlation analysis (Cooper and Emory 1995) was conducted to test if the respondents' age, income, and education are correlated with the level of privacy concerns. The sample data were sorted into two groups: those who

had online shopping experience ($n = 239$) and those who had no online shopping experience ($n = 101$). The results (Table 4) indicate that among respondents who had online shopping experience there is no significant correlation between age and privacy concerns about Internal Secondary Use of personal data, External Secondary Use of personal data, and misuse of credit card number. Among the respondents who never had online shopping experience, no significant correlation was found between age and Internal and External Secondary Use of personal data. However, significant correlation ($r = 0.23$ significant at the 0.05 level using two tailed test) was found between age and the concern about misuse of credit card number (H16 was rejected). This result indicates that the respondents who had no online shopping experience tend to be more concerned about the possible misuse of credit card numbers as their ages increase.

The results show neither significant correlation between respondents' income levels and privacy concerns, nor significant correlation between education levels and privacy concerns.

TABLE 3
Demographic Information

	Number	%
Sex		
Female	162	47.65
Male	178	52.35
Education		
High School	2	0.58
2-Year College	30	8.8
4-Year College	132	38.8
Advanced	162	47.65
Other	14	4.1
Income		
Low(1,2)*	47	13.82
Middle(3,4,5)	258	75.88
High(6,7)	35	10.29
Age		
Below 20	2	0.59
20-25	113	33.23
26-30	47	13.82
31-40	3	0.88
41-55	88	25.88
56-65	20	5.88
Over 65	7	2.06

* Income is rated on a 7-Likert scale, 1 being the lowest

Correlation Between Age (Income, Education) and Willingness to Trade Personal Data

Pearson correlation analysis reveals that age is negatively correlated with willingness to trade personal information for free online merchandise ($r = -.17$ significant at 0.01 level, see Table 5). In other

words, the younger the respondents, the more likely they would trade their personal data for free merchandise. However, the results do not show any significant correlation between income, education and the willingness to trade personal information (H22 was rejected and all other hypotheses in Table 2 were accepted).

Impact of Online Shopping Experience

To find out the impact of experience on the privacy concern, independent sample t-Test was conducted to compare the sample means between those who have online shopping experience and those who do not. Table 6 presents group statistics for the samples. Since the sample sizes are different, Levene's Test was conducted to test the assumption of homogeneous variances (Huck et al. 1974). The test results (Table 7) support the assumption for Internal Secondary Use, but reject the assumption for External Secondary Use and Misuse. Therefore, when we interpret t-Test results, the t-value obtained under equal variances assumption are not used for External Secondary Use and Misuse, and t-value obtained under equal variances assumption are used for Internal Secondary Use.

The t-Tests show a significant higher level of concerns on Internal and External Unauthorized Secondary Use of personal data as well as Misuse of one's credit card number among the respondents who had no online shopping experience. In other words, people with online shopping experience are less concerned with the privacy issues. This indicates that their online shopping experience in general have been positive.

Impact of Gender On Privacy Concern

The same test procedure was used to test the differences of privacy concerns among the female group and the male group. There is a significantly higher level of concern on the Internal Secondary Use and Misuse of credit card number among female respondents than male respondents (Table 8). It was a surprise that the female group is not significantly more concerned with External Secondary Use of their personal data.

TABLE 4
Pearson Product-Moment Correlation

Privacy Concerns			
With experience	Internal Secondary Use	External Secondary Use	Misuse
Age	N=239; $r = .039$	N=239; $r = .014$	N=238; $r = -.003$
Income	N=239; $r = .08$	N=239; $r = .062$	N=238; $r = -.02$
Education	N=238; $r = .028$	N=238; $r = .039$	N=237; $r = -.032$
Without experience			
Age	N=101; $r = .141$	N=101; $r = .174$	N=101; $r = .23^*$
Income	N= 101; $r = -.162$	N=101; $r = -.117$	N=101; $r = .016$
Education	N=101; $r = .012$	N=101; $r = .01$	N=101; $r = .082$

* Correlation is significant at the 0.05 level (2-tailed)

TABLE 5
Pearson Product-Moment Correlation

Willingness to Trade Personal Information		
Variables	Targeted advertising	Free merchandise
Age	N=339; $r = -.086$	N=340; $r = -.170^{**}$
Income	N=339; $r = .03$	N=340; $r = .017$
Education	N=338; $r = .038$	N=339; $r = -.046$

** Correlation is significant at the 0.01 level (2-tailed)

TABLE 6
Group Statistics

	Experience	N	Mean	Std. Deviation	Std. Error Mean
Internal Secondary	N	101	5.1683	1.7267	.1718
	Y	239	4.4770	1.8693	.1209
External Secondary	N	101	5.4158	1.5051	.1498
	Y	239	4.9874	1.8753	.1213
Misuse	N	101	6.0792	1.5791	.1571
	Y	238	4.9076	2.1188	.1373

TABLE 7
t-Test for Online Shopping Experience

		Levene's Test for Equality of Variances		t-Test for Equality of Means		
		f	Sig.	t	df	Sig.(2-tailed)
Internal Secondary	Equal variances assumed	2.441	.119	3.186*	338	.002
	Equal variances not assumed			3.291	202.696	.001
External Secondary	Equal variances assumed	8.686	0.03	2.035	338	0.043
	Equal variances not assumed			2.223*	232.245	0.027
Misuse	Equal variances assumed	32.946	.000	4.998	337	.000
	Equal variances not assumed			5.614*	249.676	.000

* Significant at 0.05 level

TABLE 8
t-Test for Female and Male Privacy Concern

	Gender	N	Mean	SD	t
Internal Secondary	F	162	4.9630	1.8412	2.689*
	M	178	4.4727	1.8312	
External Secondary	F	162	5.2963	1.7689	1.798
	M	178	4.9494	1.7828	
Misuse	F	161	5.5652	1.9163	2.682*
	M	178	4.9775	2.1179	

* Significant at 0.05 level (2-tailed)

Additional Survey Results

There are tools that Web users can use to protect their online privacy. For example, an e-mail encryption program can be used to encode messages before sending them out on the Internet. Re-mailer programs forward their subscribers' e-mail messages without revealing any information about the senders. Anonymous Web services conceal Web users' true identity while they are surfing the Internet.

Sixty five percent of the respondents in the study never used an e-mail encryption program. Only 3.2 percent of the respondents indicated that they often use the program. Eighty percent of them never used a re-mailer service and 84.1 percent of them never used an anonymous Web service.

There is no law in the U.S. to stop Web sites from collecting as much personal information about Web users (except children) as they can and selling it to whomever they wish. Advocates of Internet privacy

are urging government to pass laws to regulate Web private data collection and sharing. But many businesses oppose such legislation and argue that such actions will choke the E-commerce in its infancy (Carlson 2001). Instead they call on the industry for self-regulation. As a result, many commercial Web sites have formulated and posted their privacy policies on their Web sites stating how customers' personal information is handled. According to a Federal Trade Commission survey, 66 percent of the companies surveyed have privacy policies posted on their Web sites (Green et al. 2000). But there is little empirical evidence on how many Web users actually read privacy statements and trust companies to do what they promised in their privacy statements.

Our study shows that 34.2 percent of the respondents never read or seldom read Web site privacy statement before they give out their personal information while 34.5 percent of them always read or often read privacy statements before giving out their personal information.

As to the degree of trust, 24.7 percent of the respondents do not or seldom trust companies to protect their privacy right, while 23.5 percent of them responded that they absolutely trust or very trust companies to protect their private information. Close to seventy-eight (77.7) percent of the respondents favor government legislature to regulate how personal information should be collected and used by online businesses, while less than three percent absolutely oppose government regulations.

CONCLUSION

This study investigates the relationships between consumer characteristics and information privacy concerns and their willingness to trade personal information for targeted marketing or free merchandises. The study shows that age is positively correlated with the concerns of misuse of credit card numbers among those who have no online shopping experience. It is interesting to note that this study did not find significant correlation between people's education background or income and the levels of information privacy concerns. Online shopping experience seems to play an important role in

determining the level of privacy concerns. People with online shopping experience are more tolerant in the Internal and External Unauthorized Use of personal information and are less concerned with the possibility of misuse of credit card numbers. This provides evidence that media coverage of privacy threats may have increased the level of privacy concerns among people who have not had any online shopping experience. On the other hand, we may conclude that majority of the online shoppers generally have positive experience as far as privacy protection is concerned.

The study also indicated that female respondents are more concerned with the Internal Unauthorized Use of personal information and the possible misuse of credit card information than are male respondents. The study failed to find any significant correlation between age, income, or education and willingness to trade personal information for targeted advertising. However, the study found that age is negatively correlated with the willingness to trade personal information for free merchandises.

Even though the public polls have shown that a growing number of people are concerned with online privacy threats, most people don't use e-mail encryption programs or anonymous e-mail and Web surfing services. This may be another indication that online privacy intrusions are not felt as a real threat to most people. As to the privacy statement, about one third of our respondents do not actually read privacy statement at all. One fourth of them placed no or little trust in the companies to protect their privacy right.

The subjects of this study were mostly information systems (IS) professionals and business students taking IS courses. There is a certain limitation to the generalization of the findings of the study. Given the fact that most Internet users have college degrees and are relatively young, our sample is not as biased as it may seem to be at first. Of course, more efforts should be made to assure that more diverse subjects are included in future investigations.

REFERENCES

- Baig, Edward C., Marcia Stepanek, and Neil Gross (1999), "Privacy," Special Report, *Business Week*, April 5, 84-90.
- Camp, L. J. (1999), "Web Security and Privacy: An American Perspective," *The Information Society*, 15, 249-256.
- Carlson, Caron (2001), "Pondering Privacy - Industry and Privacy Groups Spar over Online Security and Data Access," *eWeek*, January 29, 32.
- Cate, Fred (1997), *Privacy in the Information Age*, Washington D.C.: Brookings Institution Press.
- Caudill, E. M. and P. E. Murphy (2000), "Consumer Online Privacy: Legal and Ethical Issues," *Journal of Public Policy and Marketing*, 19(1), 7-19.
- Cooper, Donald R. and C. William Emory (1995), *Business Research Methods*, Burr Ridge, IL: Irwin.
- Culnan, M.J. (1993), "How Did They Get My Name?: An Exploratory Investigation of Consumer Attitudes Toward Secondary Information Use," *MIS Quarterly*, September, 17(3), 341-363.
- Green, Heather, Mike France, Marcia Stepanek, and Amy Borrus (2000), "It's Time for Rules in Wonderland," *Business Week*, March 20, 83-96.
- Honigmann, John (1959), *The World of Man*, New York: Harper.
- Huck, Schuyler W., W. H. Cormier, and W. G. Bounds, JR. (1974), *Reading Statistics and Research*, New York: HarperCollinsPublishers.
- McCune, Jenny (1999), "Big Brother Is Watching You," *Management Review*, March, 10-15.
- Milne, G. R. (2000), "Privacy and Ethical Issues in Database / Interactive Marketing and Public Policy: A Research Framework and Overview of the Special Issue," *Journal of Public Policy and Marketing*, 19(1), 1-6.
- Miyazaki, A. D. and A. Fernandez (2000), "Internet Privacy and Security: An Examination of Online Retailer Disclosures," *Journal of Public Policy and Marketing*, 19(1), 54-61.
- Purdy, Jedediah (2000), "An Intimate Invasion," *USA WEEKEND*, June 30-July 2, 6-9.
- Smith, Jeff, Sandra J. Milberg, and S. J. Burke (1996), "Information Privacy: Measuring Individuals' Concerns About Organizational Practices," *MIS Quarterly*, June, 20 (2), 167-197.
- Sykes, Charles (1999), *The End of Privacy*, New York: St. Martin's Press.
- Westin, Alan (1967), *Privacy and Freedom*, New York: Atheneum.