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# THE ROLE OF TRUST AND ASSURANCE SERVICES IN ELECTRONIC CHANNELS: AN EXPLORATORY STUDY

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## Abstract

This exploratory study addresses the impact of various conditions on the likelihood of purchase behavior of consumers in electronic channels. Trust and issues around privacy are considered main inhibitors of consumer buying on the Internet. To respond to trust and related privacy concerns, various parties have introduced so-called Web assurance services. The effect of such measures has not been addressed by many studies and has not been tested empirically in a controlled experiment. The likelihood of purchase in conducting a Web-based transaction is tested for a set of goods, with different vendor types, and assurance services. The results of the study show that there are significant differences in the likelihood of purchasing, the concern about privacy across vendor types, product types, and Web assurance seal providers.

**Keywords:** Consumer trust, assurance services, electronic channels, online buying behavior

## 1. INTRODUCTION AND MAIN RESEARCH QUESTIONS

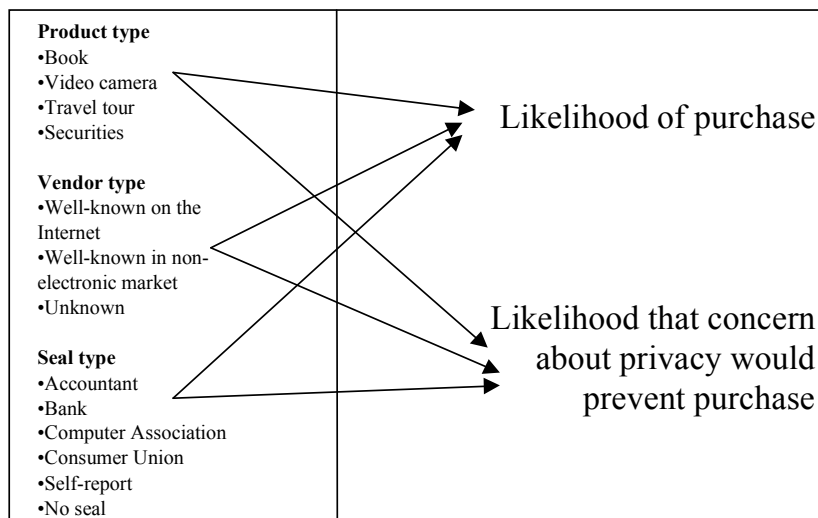
Design of electronic channels is an important issue in today's increasingly electronic markets. The reasons behind customer buying behavior in online environments and electronic channels are important issues for researchers and practitioners interested in the effects of electronic commerce developments. As information technology is rapidly changing traditional marketing, distribution, and sales strategies and practices, channel behavior can be altered, redirected, or monitored (Christiaanse and Venkatraman 1998). The strategy of pushing commodity products through a single sales and delivery channel to an undifferentiated mass-market is no longer an appropriate business model. A firm that has invested in the wrong channel configuration can find itself trapped in an inappropriate delivery system, which can be very costly to reconfigure. Thus, it is of vital importance to carefully design electronic channel strategies and position products and services in such a way in these online environments that the likelihood of purchasing is maximized. The careful design of such customer interaction and channel configuration is crucial to most firms (Mohr, Fischer and Nevin 1996). A recurring issue in all electronic commerce research is the role of customer trust and perceived risk in relation to the likelihood of purchase (Houston and Taylor 1999; Jarvenpaa, Tractinsky and Vitale 1999). To respond to risk related concerns, various parties have introduced so called Web assurance services. Among others, accounting firms who are faced with declining revenues from traditional financial audits are encouraged to develop new assurance services. The AICPA believes that CPAs can provide credible electronic commerce assurance services because of their education and experience with providing assurance services and the profession's reputation for integrity, confidentiality, and objectivity (AICPA 1998). Assurance seals added to a Web site are one way of gaining consumer trust. Houston and Taylor, however, found that consumers often interpret the existence of a seal incorrectly, i.e., they perceive the product quality (instead of the seal quality) to be higher for Web sites with a Web Trust seal. In line with this research, we tested whether knowing the product vendor as a trusted party made a difference to consumers. Important questions are: Under what

conditions are consumers willing to purchase certain products through electronic channels from known or unknown vendors? How do perceived risk and privacy concerns prevent customers from buying on the Internet (Quelch and Klein 1996, p. 70; Jarvenpaa, Tractinsky and Vitale 1999)? The experiment conducted with 1,109 respondents thus addressed the following main questions:

- Research Question 1:** What products are consumers more likely to buy in online environments?
- Research Question 2:** To what extent does the fact that a consumer knows a vendor (or a brand) influence the likelihood of purchasing and the perception of privacy?
- Research Question 3:** To what extent do differences in the origin of the assurance seal provided influence purchasing and the perception of privacy in online environments?

## 2. RESEARCH MODEL AND HYPOTHESES

Figure 1 depicts the research model used for this study, followed by the three hypotheses.



**Figure 1. Research Model**

Consumer responses may be influenced by the type of product or service that is to be purchased online. In this study, four types of products with a certain diversity are considered. Peterson, Balasubramanian and Bronnenberg (1997) take into account the categorization into tangibility and frequency of product purchase. The four products used in this study are a best-selling novel, a video camera, the purchase of a comprehensive intercontinental travel tour package, and a comprehensive financial services package that includes buying, selling, and transferring of securities and mutual funds for the purchaser’s entire investment portfolio.

- H1: There will be no difference among the types of products (books, video cameras, travel tours, securities) on likelihood of purchase and likelihood that concern about privacy would prevent purchase.**

Studies have shown that the reputation of the merchant is a decision factor for consumers. The vendor types chosen for this study are “well-known for electronic sales of the product,” “well-known only for non-electronic sales but not for electronic commerce,” and “completely unknown.” Thus follows hypothesis 2.

**H2: There will be no difference among the types of vendors (unknown, well-known on Internet, well-known in non-electronic market) on likelihood of purchase and likelihood that concern about privacy would prevent purchase.**

As mentioned in the introduction, problems do occur in Web-based transactions and these concerns inhibit the growth of electronic commerce. To counter this problem, vendors can offer risk relievers with the intention to calm their consumers and soothe their fears. Poel and Leunis (1999) mention several risk relievers such as providing a money-back guarantee, offering well-known brands, and selling at reduced prices on the Web. Similar initiatives have been developed, called seals of assurance, of which the Web Trust seal is a well-known example. The six assurance-provider types used in the research are: (1) independent accountants, (2) banks, (3) computer industry, (4) consumer unions, (5) self-reporting statement of compliance with “established” electronic-commerce standards, and (6) no assurance.

**H3: There will be no difference among the types of Web assurance that the likelihood of purchase and likelihood that concern about privacy would prevent from purchase.**

### 3. METHOD AND RESEARCH DESIGN

**Independent variables:** The independent variables used in this study are (1) *product types* (books, video cameras, travel tours, securities), (2) *vendor types* (unknown, well-known on Internet, well-known in non-electronic market), and (3) *seal provider types* (accountant’s assurance, banker’s assurance, consumer union’s assurance, computer industry’s assurance, self-proclaimed assurance, and no assurance). A total of 72 scenarios were thus generated in a 4 x 3 x 6 matrix.

**Dependent variables:** The dependent variables used in this study are the consumer responses regarding likelihood of purchase and likelihood that concern about privacy would prevent purchase. This concern was chosen as being significant, based on previous studies conducted in the field of consumer acceptance of electronic commerce. For example, AICPA (1998) and Novak, Hoffman and Peralta (1998) describe privacy as one of the main barriers to electronic commerce.

### 4. DESIGN AND PROCEDURE

In order to gather data, a field experiment was designed and conducted on the Internet (the experiment is still online for reference purposes: <http://www.im-net.nl/vragen/>). Each subject was confronted with three different scenarios and asked to give feedback on the four main questions (dependent variables) with regard to each scenario. Each scenario was presented through simulated commercial Web sites, offering a certain product (IV 1) from a certain vendor (IV 2), assured by a certain seal provider (IV 3). Subjects ( $n = 1,109$ ) were attracted to the online field experiment through banners situated at several Web sites, such as universities, research institutes, and companies. Participating in the experiment offered subjects a chance on winning a PC. Therefore, the researchers had clear expectations on subjects’ nature from the beginning: Subjects were expected to be rather young, highly educated, and computer/Internet literate people. The experiment was run over a period of three months in spring 1999. First, subjects were shown information on the seal/vendor/product scenario. The participants were then asked to provide feedback on the dependent variables, which include likelihood of purchase and likelihood that concern about privacy would prevent purchase. Both independent variables were measured using a seven-point Likert-type scale, ranging from 1 (corresponding “extremely likely”) to 7 (corresponding “extremely unlikely”). Subjects were also asked to provide feedback on several demographic questions, such as age, gender, Internet and electronic commerce experience.

### 5. RESULTS

*Hypothesis 1* posited that there would be no difference across products (books, video cameras, travel tours, securities) on either of the two dependent measures (likelihood of purchase and likelihood that concern about privacy would prevent purchase). Table 1 summarizes the results.<sup>1</sup>

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<sup>1</sup>Due to space restrictions, only the significant comparisons are shown in the tables.

**Table 1. ANOVA and Post-Hoc on Product Type and Likelihood of Purchase**

<b>Panel A: “Likelihood of purchase” as the dependent variable: means (and standard deviations)</b>				
	Book n = 394	Video Camera n = 323	Travel tour n = 414	Securities n = 479
“Likelihood of purchase”	5.3 (1.75)	4.27 (1.91)	4.64 (1.81)	4.38 (1.94)
<b>Panel B: Summary of ANOVA table</b>				
	Df	Mean sq.	F-statistic	Probability
Between groups	3	82.901	34.091	.000
Within groups	1609	3.441		
<b>Panel C: Post-Hoc (Tukey HSD)</b>				
Product type	Mean difference	Std. Error	Sig.	
Book vs. video camera	1.03	.14	.000	
Book vs. travel tour	.66	.13	.000	
Book vs. securities	.92	.13	.000	
Travel tour vs. video camera	.38	.14	.032	

Table 1 presents results of a one-way ANOVA, using likelihood of purchase as the dependent variable, that examines the first part of hypothesis 1. Panel B illustrates a significant ANOVA ( $F = 34.091, p < 0.05$ ), indicating one or more significant differences among the conditions. The post-hoc tests show that the mean of “book” differs significantly from all the other product types, the likelihood to purchase a book is thus significantly higher than for the other products. The order of likelihood is (1) book (5.3), (2) travel tour (4.64), (3) securities (4.38), and (4) video camera (4.27); however, the only other pair of products with significantly different means is travel tour and video camera ( $p < 0.05$ ). The same one-way ANOVA was conducted on the dependent variable likelihood that concern about privacy would prevent purchase; however, no significant differences among the conditions were found ( $F = 2.025, p > 0.05$ ).

*Hypothesis 2* posited that there would be no difference across vendors (well-known on Internet, well-known in non-electronic market and unknown) on either of the two dependent measures (likelihood of purchase and likelihood that concern about privacy would prevent from purchase).

**Table 2. ANOVA and Post-Hoc on Vendor Type and Likelihood of Purchase**

<b>Panel A: “Likelihood of purchase” as the dependent variable: means (and standard deviations)</b>				
	Well-known on Internet n = 558	Well-known in non-electronic market, n = 556	Unknown n = 496	
“Likelihood of purchase”	5.06 (1.69)	5.03 (1.71)	3.77 (2.02)	
<b>Panel B: Summary of ANOVA table</b>				
	df	Mean sq.	F-statistic	Probability
Between groups	2	280.236	86.359	.000
Within groups	1607	3.245		
<b>Panel C: Post-Hoc (Tukey HSD)</b>				
Vendor type	Mean difference	Std. Error	Sig.	
Well-known on Internet vs. Unknown	1.29	.11	.000	
Well known in non-electronic market vs. Unknown	1.26	.11	.000	

Table 2 presents results of a one-way ANOVA, using likelihood of purchase as the dependent variable, that examines the first part of hypothesis 2. Panel B illustrates a significant ANOVA ( $F = 86.359, p < 0.05$ ), indicating one or more significant differences

among the conditions. The post-hoc tests show that the mean of “unknown” differs significantly from the two other vendor types, the likelihood to purchase from an unknown vendor is thus significantly higher than from the other vendors. Panel A shows that likelihood of purchase is lowest from an unknown vendor. There is no significant difference between the two other types.

**Table 3. ANOVA and Post-Hoc on Vendor Type and Likelihood that Concern about Privacy would Prevent Purchase**

<b>Panel A: “Likelihood that concern about privacy would prevent purchase” as the dependent variable: means (and standard deviations)</b>				
	Well-known on Internet n = 557	Well-known in non- electronic market, n= 555	Unknown n = 493	
“Likelihood that concern about privacy would prevent purchase”	4.41 (1.85)	4.36 (1.9)	4.84 (1.83)	
<b>Panel B: Summary of ANOVA table</b>				
	df	Mean sq.	F-statistic	Probability
Between groups	2	35.663	10.289	.000
Within groups	1602	3.466		
<b>Panel C: Post-Hoc (Tukey HSD)</b>				
Vendor type	Mean difference	Std. Error	Sig.	
Well-known on Internet vs. Unknown	-.43	.12	.001	
Well known in non-electronic market vs. Unknown	-.48	.12	.000	

Table 3 presents results of a one-way ANOVA, using likelihood that concern about privacy would prevent purchase as the dependent variable, that examines the second part of hypothesis 2. Panel B illustrates a significant ANOVA ( $F = 10.289$ ,  $p < 0.05$ ), indicating one or more significant differences among the conditions. The post-hoc tests show that the mean of “unknown” differs significantly from the two other vendor types ( $p = .001$  and  $p = .000$ , respectively). Panel A shows that likelihood that concern about privacy would prevent purchase is highest with an unknown vendor. There is no significant difference between the two other types.

*Hypothesis 3* posited that there would be no difference across Web assurance seals (accountant, bank, consumer union, computer industry, self-report, and no assurance) on either of the two dependent measures (likelihood of purchase and likelihood that concern about privacy would prevent from purchase).

Table 4 presents results of a one-way ANOVA, using likelihood of purchase as the dependent variable, that examines the first part of hypothesis 3. Panel B illustrates a significant ANOVA ( $F = 28.157$ ,  $p < 0.05$ ), indicating one or more significant differences among the conditions. The post-hoc tests show that the mean of “no assurance” is significantly different from all the other seal types: Likelihood of purchase is thus by far the lowest when no seal is displayed. The only additional pair of types that shows significant differences is consumer union vs. self-report.

Table 5 presents results of a one-way ANOVA, using likelihood that concern about privacy would prevent purchase as the dependent variable, that examines the second part of hypothesis 3. Panel B illustrates a significant ANOVA ( $f = 5.169$ ,  $p < 0.05$ ), indicating one or more significant differences among the conditions. The post-hoc tests show that the mean of “no assurance” is significantly different from the accountant’s seal, the bank’s seal and the consumer union’s seal. As shown in Panel A, the mean of likelihood that concern about privacy would prevent purchase is highest for “no assurance” (mean = 4.95). Further results of the data analyses, such as subject demographics and manipulation, will be presented at the Conference.

**Table 4. ANOVA and Post-Hoc on Seal Type and Likelihood of Purchase**

<b>Panel A: “Likelihood of purchase” as the dependent variable: means (and standard deviations)</b>						
	Accountant n = 318	Bank n = 326	Computer A. n = 86	Consumer U. n = 340	Self-report n = 298	No assurance n = 242
“Likelihood of purchase”	4.92 (1.82)	4.94 (1.78)	4.64 (1.76)	5.09 (1.7)	4.53 (1.92)	3.45 (1.93)
<b>Panel B: Summary of ANOVA table</b>						
	df	Mean sq.	F-statistic	Probability		
Between groups	5	93.201	28.157	.000		
Within groups	1604	3.31				
<b>Panel C: Post-Hoc (Tukey HSD)</b>						
Seal type	Mean difference	Std. Error	Sig.			
Accountant vs. No assurance	1.47	.16	.000			
Bank vs. No assurance	1.48	.15	.000			
Computer A. vs. No assurance	1.18	.23	.000			
Consumer U. vs. Self-report	.56	.14	.002			
Consumer U. vs. No assurance	1.63	.15	.000			
Self-report vs. No assurance	1.08	.16	.000			

**Table 5. ANOVA and Post-Hoc on Seal Type and Likelihood that Concern about Privacy would Prevent Purchase**

<b>Panel A: “Likelihood that concern about privacy would prevent purchase” as the dependent variable: means (and standard deviations)</b>						
	Accountant n = 317	Bank n = 327	Computer A. n = 83	Consumer U. n = 340	Self-report n = 296	No assurance n = 242
“Likelihood that concern about privacy would prevent purchase”	4.31 (1.91)	4.38 (1.9)	4.72 (1.73)	4.35 (1.88)	4.72 (1.81)	4.95 (1.83)
<b>Panel B: Summary of ANOVA table</b>						
	df	Mean sq.	F-statistic	Probability		
Between groups	5	17.893	5.169	.000		
Within groups	1599	3.461				
<b>Panel C: Post-Hoc (Tukey HSD)</b>						
Seal type	Mean difference	Std. Error	Sig.			
Accountant vs. No assurance	-.63	.16	.001			
Bank vs. No assurance	-.57	.16	.004			
Consumer U. vs. No assurance	-.60	.16	.002			

## 6. LIMITATIONS AND CONCLUSIONS

This study is one of the first to address online purchasing from a consumer point of view with all the associated problems of exploratory studies such as appropriate and reliable measures, research model, etc. The 1999 study by Jarvenpaa, Tractinsky and Vitale suggests that the presence of a physical store or merchant name recognition might affect consumer trust in online purchasing decisions. The paper addressed the likelihood of purchase for consumers of various products under a set of different conditions regarding assurance services and vendor types. The research questions were tested by a field experiment involving 1,109 respondents. Unlike previous research on assurance services (Houston and Taylor 1999), the results of this study show that assurance services do provide an additional effect on the likelihood of purchase; however, interestingly, it does not seem to matter much who provides the seal. Also, the finding that it doesn't seem to make a difference whether the vendor in the electronic transaction is well-known for his sales on the Internet or in the non-electronic market is striking. The study shows that likelihood of purchase is equally high for both, and higher than when dealing with an unknown vendor. When it comes to seal types, differences were found only at the extremes regarding purchasing likelihood: respondents were by far less likely to purchase without a seal. The other interesting finding here is that the type of seal doesn't seem to make a difference.

Regarding likelihood that concern about privacy would prevent a purchase, respondents had about the same responses to all product types (no significant differences). As to vendor types, concern about privacy would be perceived as significantly higher when dealing with an unknown vendor, while respondents would feel more secure about privacy with well-known vendors. Only the accountant's, the bank's, and the consumer union's seals make respondents feel significantly safer with regard to privacy than the other options. It is important to realize, however, that we measured the perception or attitude of possible consumers toward the likelihood of buying under certain conditions and not the actual behavior in real buying situations. Research in behavioral psychology (Ajzen and Fishbein, 1980) addressed the issue that attitudes are very bad predictors of individual behavior. We are aware of these limitations and admit that the experiment under real buying conditions would have been much stronger; however, we did not have the opportunity to design the study in this phase in such a manner. We hope that this paper raises interesting issues for further exploration and testing in research and that it stimulates further research in this new and challenging area.

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