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ON INITIAL TRUST BUILDING FOR E-COMMERCE: REVISITING FROM THE PERSPECTIVE OF SIGNAL THEORY AND TRUST TRANSFERENCE

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Abstract

Trust building for consumers has been a main stream of research in e-commerce. However, little research pays attention to how consumers treat the revealed information about warranty, privacy statement, assurance, and related statements. Although this information is provided in real-world settings, their effectiveness has not been fully understood. This study attempts to look into this issue by employing signal theory and perspective of trust transference. Empirical results gathered from lab experiment show that warranty perception, rather than the assurance itself, is the critical antecedent of initial trust building. Once consumers discredit the revealed information in a web site, the signals will fail to induce consumers' trust. Information from a trusted third party may be an efficient way to build consumer trust. However, it should be noted that information from trusted third party will not be effective if consumers fail to notice them, or misunderstand their meanings. Hence, e-tailers should devote to build initial trust by applying assurance and quality signals from independent institutions.

Keywords: Signal Theory, Warranty Perception, Trusted third party, Seal.

1 INTRODUCTION

E-commerce, or specifically on-line retailing, has become a common channel for business due to the rapid proliferation of the Internet. A phenomenal 27% growth, from US\$44 billion to \$56 billion in revenue, from 2002 to 2003 has been reported (eMarketer 2004). However, the e-commerce market is still a dismal 1.9% in 2003, and estimated to reach only 2.9% in 2007 (eMarketer 2004), indicating much room for further expansions. Reports also indicate that despite the media publicities, most consumers have still not adopted e-commerce as the main channel for transactions (Kaplan & Nieschwietz 2003). Most consumers still hesitate to interact with electronic vendors due to insufficient trust on e-tailers (Bathattacherjee 2002, McKnight & Choudhury & Kacmar 2002).

Enhancing the level of trust by consumers on e-commerce will reduce perceived uncertainty and fears. This may be an effective way to lure consumers to online transactions. While information asymmetry in an online setting may be reduced through higher information availabilities, it may also increase since consumers do not have a chance to gain first hand information through physically visiting the stores. These experiences include viewing and touching the target products, experiencing the shopping environment, contacting with salespersons for face-to-face inquiries, and taking immediate possession on purchasing (Gray & Debreceeny 1998). These are the main sources for consumers to judge the vendors, products, and services, especially in an unfamiliar setting. Revealing trustworthy information, which provides an alternative for judging e-tailers, may reduce the uncertainty and risk felt by consumers. Although many e-tailers devote to providing many “trustworthy information” on their web pages, such as privacy statements, detailed product characteristics, post-purchase warranty, security features, etc., little can be said on the effectiveness of these actions.

In this study, we attempt to answer two key research questions. First, how will consumer attitudes towards the information provided by e-tailers on their web sites influence their level of trust to the e-tailer? Second, what types of information provided on web sites will consumers tend to believe and thus resulting in trust on the e-tailer? We hope these will help to provide more understanding to the trust building process.

2 RESEARCH MODEL

2.1 Theoretical Background

Research on the critical role of trust is still an important area in the domain of e-commerce (Friedman & Kahn & Howe 2000, Jarvenpaa & Tractinsky 1999, McKnight & Choudhury & Kacmar 2002). Consumers could overcome their fear derived from perceived risk or uncertainty on online activities by building up trust on a web site, or even on the entire Internet shopping environment. The starting point of trust building is the initial trust, since consumers’ perception of risk and security is most salient in an unfamiliar web setting. Those with prior shopping experiences with a particular web site may assess their risk based on prior engagements. Attracting consumers depends on the extent of initial trust engendered by vendors, and persuading consumers to transact with them in the future, depends on the extent of improvement of initial trust (McKnight & Choudhury & Kacmar 2002). McKnight et al. (2002) propose an initial trust building model to explain the antecedents of initial trust and how the initial trust boosts the consumers’ behavioral intention, as shown in figure 1. The model asserts that structural assurance of web site and two vendors-specific factors influence consumers’ trust beliefs and trust intention, in turn, affect consumers’ behavioral intention. Besides, trust comprised with trust belief and trust intention and perceived web risk derived from structural assurance will influence behavioral intention simultaneously.

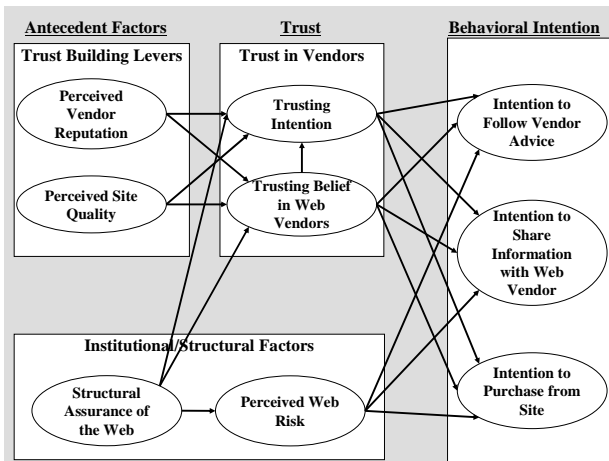


Figure 1. Trust building model (McKnight & Choudhury & Kacmar 2002)

While McKnight et al.'s model is sound; it does not address the effects of third party information on trust and intention. We hereby propose to extend the model based on signal theory and trusted third party perspective rooted in the trust transference process.

In the “initial” stage, while a consumer may have a general feeling about the e-tailing environment, it is unlikely that one can gather sufficient information to assess the quality and reputation of an unfamiliar web site, unless s/he is a frequent web surfer who purposely search for reference materials on that target web site well in advance. Therefore, it is likely that a consumer new to a web site is unable to assess the quality and reputation based on the web content provided only by the vendor self. Thus, external signals, such as the assurance by independent public parties may be good sources of information for this purpose. Doney and Cannon (1997) suggests that vendors may cultivate trust transferred from trusted third party, such as friends, certified institutions, government offices, etc. Moreover, structural assurance implies that a web site has protective legal (e.g. privacy warranty) or technological structures (e.g. SSL) based on the institution-based trust perspective (McKnight & Choudhury & Kacmar 2002, Shapiro 1987, Zucker 1986). Yet, merely providing privacy or other company policies is insufficient for safe and secure transaction environment (Kaplan & Nieschwietz 2003). Consequently, a vendor may employ web-based assurances by displaying certified web seals issued by a trusted third party (e.g. BBBOnline, TRUSTe, and WebTrust) to enhance the creditability for its web site (Kaplan & Nieschwietz 2003, McKnight & Cummings & Chervany 1998).

The issue here is, whether these structural assurances and third party seals can be effective in trust building. Generally, in order to reduce uncertainty perceived by the consumers, an e-tailer often employ a signalling approach to send out signals, persuading consumers into believing that its site provides good quality products and services provided by vendors. The signals may be on third-parties assurance, differentiation through branding and reputation, indemnity strategies, and so on (Sporleder & Goldsmith 2001). However, consumers may be sceptical about the credibility of the information. Akerlof (1970) presents the signal theory and the concept of “lemons principle”, indicating that if the creditability of the signals cannot be established, it may expel better quality products and services, instead of worse products and services. Signals will fail if consumers discredit it. To establish the creditability of a signal, its cost should be high, such that only high quality e-tailers are allowed to use it (Boulding & Kirmani 1993, Krimani & Rao 2000). Consequently, we believe that the signals will affect trust through warranty perception, indicating the extent of consumers’ belief on the signals, such as warranty, structural assurance, or web seal (Erevelles & Roy & Yip 2001, Kaplan & Newschweitz 2003).

While McKnight et al. (2002) separates the constructs of “trusting intention” and the various behaviour intentions, a related empirical study by McKnight and Chervancy (2001-2002) reveals that trusting intention is the critical antecedent of real behavior and affect trust-related behavior directly.

We suspect that the constructs of “trusting intention” and the various behaviour intentions are tautological in nature, since the evidence presents high correlation among trusting intention, behavioural intention and real behaviour. Hence, we propose that trust itself has an influence on behavior intention directly. Although the influence of trust and risk on behavior intention is less than conclusive (Gefen & Rao & Tractinsky 2003), we adopt the position that the relationship between risk and trust is explained by “threshold” model, indicating that the trustors will still engage in risky relationship, once the level of trust overwhelm the perceived risk (Friedman & Kahn & Howe 2000, McKnight & Cummings & Chervany 1998).

Following the previous lines of thought, an extension to McKnight et al.’s model is proposed, based on signal theory and trust transference and depicted in figure 2.

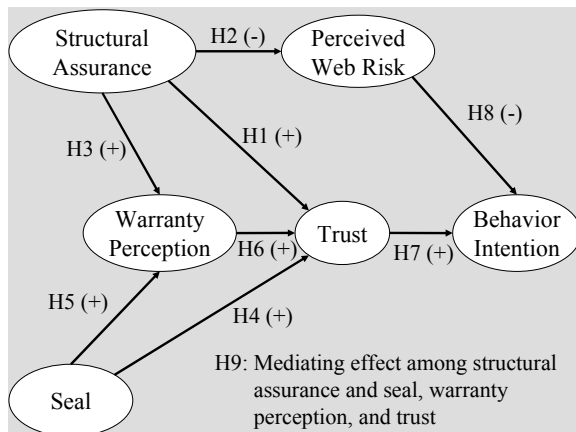


Figure 2. Research Framework

2.2 Hypotheses

Structural assurance provides assurance that the web business could be conducted in a secure and safe environment that protects consumers from financial losses or privacy exposure by establishing protective and technological structures (Hoffman & Novak & Peralta 1999, McKnight & Choudhury & Kacmar 2002). Higher level of structural assurance may assist consumers in overcoming the fear for online shopping in general, and increase their level of trust on a particular web site. On the other hand, perceived web risk comes from the feeling of insecurity in exposure of privacy, personal information, and financial information (Grazioli & Jarvenpaa 2000). McKnight et al. (2002) proposes that the regulatory bases provided by structural assurance could protect consumers and enable them to predict the service provider’s behaviour, in turn, lower their perceived web risk. However, the efficacy of structural assurance should rely on the extent of consumers’ faith. If consumers believe that, to avoid institutional punishment, e-tailers will not provide misleading assurances, they will tend to believe the e-tailer when they perceived higher structural assurance (Erevelles & Roy & Yip 2001). Hence, we propose the following hypotheses.

Hypothesis 1: Structural assurance is positively associated with trust on e-tailers.

Hypothesis 2: Structural assurance is negatively associated with perceived web risk on e-tailers.

Hypothesis 3: Structural assurance is positively associated with warranty perception on e-tailers.

Kimery and McCord (2002) define “web seal” as the assurance procedures developed by a public third party. If an e-tailer is certified to conform to the regulation and technical standards put forward by such a third party, they could display a corresponding identification mark on their web site. Based on perspective of trust transference, consumer will transfer their trust on a seal issuing trusted third party into the web site having that seal. Empirical evidences reveal the existence of web seal could enhance

the extent of trust on e-tailers (e.g. Kaplan & Newschwietz 2003, McKnight & Chervany 2001-2002). Besides, following the signal theory, a warranty provided by e-tailers will fail if consumers do not have faith in it. Consumers may have more faith in the warranty when they see a web seal they trust, as they may believe in the seal certification procedure. Warranty perception is the degree of consumers' faith on warranty information (signals) of e-tailers (Erevelles & Roy & Yip 2001). Furthermore, if consumers believe the signals they received on a web site, they will believe this web site is predictable, benevolent, and reliable based on signal theory. This warranty perception in turn builds up trust. Hence, high warranty perception rooted in high consumers' faith on signals will boost trust on e-tailers (Doney & Cannon 1997, Kaplan & Newschwietz 2003). These lead us to propose the following hypotheses.

Hypothesis 4: The presence of web seal leads to higher levels of trust on e-tailers.

Hypothesis 5: The presence of web seal leads to higher level of warranty perception.

Hypothesis 6: Warranty perception is positively associated with trust on e-tailers.

Following the "threshold" model of influence of trust and risk on behavior intention described by Gefen et al. (2002), the two rivalry forces, namely trust and perceived risk, will influence behavioural intention separately. If a consumer trusts an e-tailer, that is, believing that the e-tailer will protect his/her personal information and privacy, s/he will be willing to transact with this vendor online, including sharing information and purchasing products or services (McKnight & Choudhury & Kacmar 2002). In contrary, consumers who are concerned that their personal information and privacy will be exposed and abused and will be unwilling to transact with this e-tailer, if they consider a web site insecure, or have negative expectation on interacting with this vendor (McKnight & Choudhury & Kacmar 2002, Grazioli & Jarvenpaa 2000). Hence we propose the following hypothesis.

Hypothesis 7: Trust on e-tailers is positively associated with behavior intention.

Hypothesis 8: Perceived web risk on e-tailers is negatively associated with behavior intention.

Finally, there is still an issue of the ways the causal effects exist. Do structural assurance and presence of web seals have direct effects on trust (as in H1 and H4), or do they affect trust indirectly, mediated by warranty perception (as in H3+H6 and H5+H6)? While the earlier arguments may lead to individual effects, they can also support the indirect effects. We propose the following hypotheses to clarify the issue.

Hypothesis 9: The influence of structural assurance and presence of web seal on trust is mediated by warranty perception.

3 METHODOLOGY

Following the research design by McKnight et al. (2002), a similar lab experimental design was employed in this study. Data were collected based on a survey administered to each subject after the experimental session.

3.1 Experimental settings

Since our research goal is to investigate initial trust, we wanted to avoid the threats from the effects of brand name and prior experiences with a given product or service to become a source of contamination. Thus, an artificial web setting, unfamiliar to the subjects was built for our study. In addition, as McKnight et al. (2002) suggested in their study, the product or service provided by e-tailer should be risky and insecure to increase variance, and subjects should not be capable of detecting genuineness (Grazioli & Jarvenpaa 2000).

We carried out a pre-test to make sure the meaning and wording of measured items for our targeted context. We decided on "legal advice" as our web domain following McKnight et al.'s (2002)

experimental design. A legal consultation service web site was built, using techniques, such as ASP, HTML, Flash, IIS, and SQL server. Web-based legal consultation services provided by law offices were used as model for such an exercise. Law related information and advices were also obtained from related professionals. Two versions of the web site were built. The only difference between them is that one version has several well-known web seals displayed at the location where web seals normally appear, while the second version has mimic company logos displayed at the same locations. One of the well-known web seals is shown in Figure 3.



Figure 3. Example of one well-known web seal

3.2 Experiment Design and Data Collection

The experiment was administered to 110 senior undergraduate students enrolled in three electronic commerce related courses at National Central University and Takming College in Taiwan during the Spring Semester of 2004. The subjects were unfamiliar with legal service, law, and regulations.

The experiment was conducted in four steps. First, a lecture session on web seal was embedded in each of the electronic commerce class, explaining the meaning and values of web seals. A short hands-on exercise at the end of the lecture was given to the subjects in a computer classroom, in order to reinforce their understanding on web seals. Second, during a subsequent class session, subjects were taken to a computer classroom where each of them has access to a networked computer. A web-based questionnaire was administered to measure their perceptions on structural assurance and web risk in the Internet environment. Third, they were introduced to the experimental legal service web site, and were given an assignment to resolve a landlord/tenant dispute scenario presented to them. They were randomly assigned with a version of the web site (with or without web seals) to help them with the assignment. Finally, after they finished the assignment, which supposedly exposed them to the web-based service as if they were online consumers, they were given a second web-based questionnaire, designed to measure their perceptions on warranty, trust, and behavioural intention.

3.3 Operationalization

The “Web Seal” construct was the experimental treatment with two levels: with seal and without seal. Apart from that, all other constructs were measured with the two parts questionnaire, which included the various constructs necessary to perform the analysis for model testing. The instruments for the constructs were adapted from the literature (summarized in Table 1), and were revised to fit our research context. All items were anchored on seven-point Likert type scales.

Construct	Definition	Source of Measurement
Structural Assurance	Structural assurance refers to the degree of security which consumers perceive from web environment, such as contract, regulation, warranty, etc.	McKnight et al. (2002)
Perceived Web Risk	Perceive web risk emerges when consumers are asking for personal information, such as ID, credit card number, and others related privacy.	McKnight et al. (2002)

Warranty Perception	Warranty perception refers to the level of reliability and adequacy about warranty consumers perceived.	Erevelles et al. (2001)
Trust	Trust refers to the extent of consumers' willingness to be vulnerable to provide personal information or private information in exchange for goods or services.	Bhattacharjee (2002)
Behavioral Intention	Behavioral intention refers to the consumers' intention to engage in sharing personal information with web sites and buying products or service from web sites.	McKnight et al. (2002)

Table 1. Operationalization for constructs

According to the typology of trust proposed by Mayer et al. (1995), Bhattacharjee (2002) developed a scale of trust for e-commerce. Both Bhattacharjee (2002) and McKnight et al. (2002) base their definition on Mayer et al. (1995), but the scale proposed by Bhattacharjee's (2002) scale went through a scale development procedure and declared for the e-commerce context. This scale is shown to achieve an adequate level of reliability, convergent validity, discriminant validity, and nomological validity by iteration testing and refinement procedures. Hence, we adopt this measurement. A short interview with several colleagues and a pre-test were carried out to ensure face validity and content validity for the compiled questionnaire.

4 RESULTS

Out of 110 subjects participating in this experiment, six responses were discarded due to incomplete answers. One hundred four usable responses were collected, with 54 responses in the "with web seal" group and 50 responses for the "without web seal" group.

4.1 Measurement Model

We performed confirmatory factor analysis to assess reliability, convergent validity, and discriminant validity for the five measured constructs simultaneously, using LISREAL 8.50. Following Fornell and Larcker's (1981) recommendation, we drop one item in the construct of warranty perception due to insignificant factor loading, and one item in the construct of trust due to low factor loading (0.37) as compared to the suggested 0.5 threshold. The final measurement model statistics is shown in Table 2. The factor loadings of all remaining indicators are significant ($p \leq 0.01$), and Cronbach's α for all constructs are all above 0.7, indicating acceptable reliability (Nunnally 1978). In addition, values of the composite reliability and average extracted variance for each construct are all above the threshold suggested by Bagozzi's (1980): 0.7 and 0.5 respectively, indicating acceptable convergent validity.

Construct (d.f.=316)	Items	Factor Loadings	Cronbach's α	Composite Reliability	Average Extracted Variance
Structural Assurance	IBT01	0.91**	0.85	0.94	0.79
	IBT02	0.83**			
	IBT03	0.73**			
	IBT04	0.66**			
Perceived Web Risk	PWR01	0.87**	0.88	0.96	0.78
	PWR02	0.82**			
	PWR03	0.82**			
	PWR04	0.84**			
	PWR05	0.65**			
	PWR06	0.65**			
Warranty Perception	PW01	0.87**	0.90	0.98	0.95
	PW02	0.90**			
	PW03	0.91**			

Trust	TIV01	0.99**	0.93	0.96	0.82
	TIV02	0.83**			
	TIV03	0.99**			
	TIV04	0.78**			
	TIV06	0.59**			
	TIV07	0.74**			
Behavioral Intention	TBI01	0.80**	0.90	0.96	0.79
	TBI02	0.70**			
	TBI03	0.80**			
	TBI04	0.77**			
	TBI05	0.76**			
	TBI06	0.81**			

Table 2. Reliability, convergent validity, and discriminate validity (** $p \leq 0.01$)

As for discriminant validity, Fornell and Larcker (1981) suggest that the correlations between distinct constructs should be lower than the square root of the average variance extracted. Results presented in Table 3 indicate acceptable discriminant validity. In summary, reliability, convergent validity, and discriminant validity of the measurement model seems to be adequate.

	Structural Assurance	Perceived Web Risk	Warranty Perception	Trust	Behavioral Intention
Structural Assurance	0.89				
Perceived Web Risk	-0.13	0.88			
Warranty Perception	0.42	0.12	0.97		
Trust	0.35	0.13	0.76	0.91	
Behavior Intention	0.50	-0.12	0.69	0.72	0.89

Table 3. Discriminant validity (diagonal represent square root of AVE of each construct)

4.2 Hypotheses Testing

The structural model was also analysed using LISREL 8.50. The model fit statistics are presented in Table 4 and the summary results including path coefficients and explained variances are present in Figure 3. Most of fit indices are above the desired level recommended by Bentler (1990). Although the SRMR does not comply with suggestion, it is very close to the desired levels. In total, this result reveals that this model fit well with the observed data.

	χ^2	d.f.	$\chi^2/d.f.$	SRMR	RMSEA	CFI	IFI	PGFI
Model	494.14	287	1.72	0.09	0.08	0.90	0.90	0.60
Desired Level	Not significant	--	< 3.0	0.05 ~ 0.08	0.05 ~ 0.08	> 0.90	> 0.90	> 0.50

Table 4. Model Fit indices for structural model

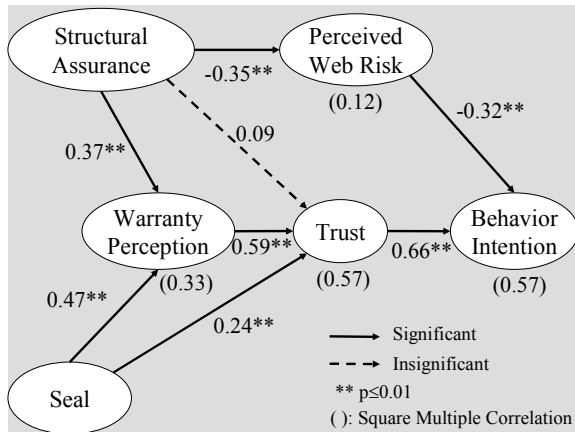


Figure 3 Structural model evaluation

In Figure 3, where solid lines denote significant associations and dotted lines denote insignificance. Except for the line denoting the direct effect of structural assurance on trust, all other path coefficients are significant at the 0.05 level, and the directions are consistent with the predictions. Thus, Hypotheses H2 through H8 are all supported. As shown in Figure 3, the explained variances of perceived web risk, warranty perception, trust, and behaviour intention are 12%, 33%, 57%, and 57%, respectively.

As for hypothesis testing of mediating effects for H9, the procedure of assessing mediating effect proposed by Kelloway (1998) was adopted. Two more path models were constructed to do the testing. Figure 4 presents simplified path diagrams among the four constructs involved, omitting perceived web risk and behavioural intention constructs, both unrelated to the mediating effects. The top diagram is the original model presenting a partial mediation case where both direct and mediating effects are presence. The middle diagram is a full mediation case where only the mediation effects are presence. The bottom diagram is a no mediation case where warranty perception does not affect trust. For brevity, path coefficients are not reported here.

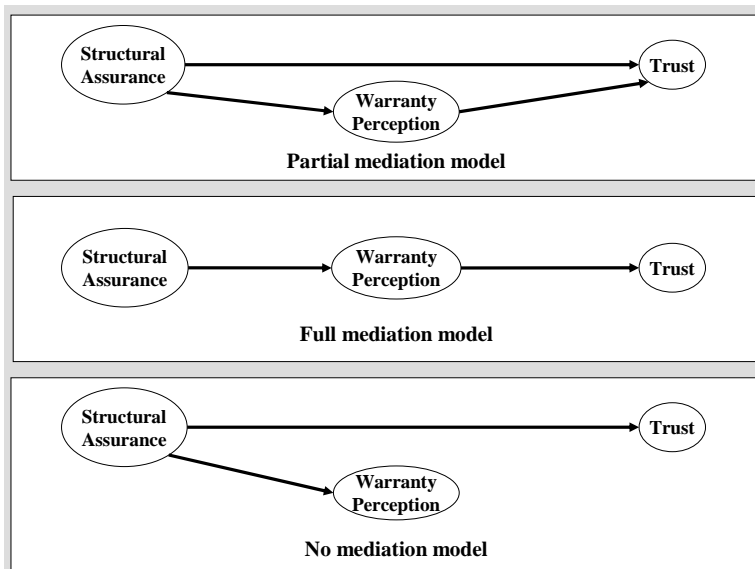


Figure 4 Mediating Models

The results of model fit statistics for the original model and the plausible rival specified models, as well as the comparisons in χ^2 difference are presented in Table 5. The fit indices of the no-mediation model are the worst among three models. Based on the assessment of χ^2 difference, full-mediating

model is better than partial-mediating model, and partial-mediating model is better than no-mediating model. Hence, we should accept the full-mediating model, although our research framework is partial-mediating model. This result supports Hypothesis 9 related to mediating effect of warranty perception, and could explain the insignificant of Hypothesis 1, which has to do with positive association between structural assurance and trust. In conclusion, our research model should be revised based on the full-mediation model, that is, without H1 and H4.

	χ^2	d.f.	CFI	IFI	PGFI	SRMR	RMSEA
M–partial mediation	494.14	287	0.90	0.90	0.60	0.09	0.08
M–full mediation	498.51	289	0.90	0.90	0.60	0.10	0.08
M–no mediation	504.04	288	0.89	0.89	0.60	0.13	0.09
χ^2 difference test results							
M–partial mediation vs. M–full mediation	χ^2 diff = 4.37 < 5.99 _(0.05, 2)				Accept full mediation		
M–partial mediation vs. M–no mediation	χ^2 diff = 9.9 > 3.84 _(0.05, 1)				Accept partial mediation		
Result: M–full mediation > M–partial mediation > M–no mediation							

Table 5. Comparison for mediating effect evaluation

5 DISCUSSIONS AND IMPLICATIONS

5.1 Academic Implication and Future Research

Our results strengthen the understandings about the relationship among perception of warranty and risk, trust, and behavioral intention, as well as the effects of trust transference. Our findings also add to the signal theory by showing the mediating effect of warranty perception and the relations between warranty perception and trust.

In line with McKnight et al. (2002) and Gefen et al. (2002), we demonstrate that trust and perceived web risk each independently affect trust and behavioural intention; and that trust and risk are the most critical antecedents of behavioural intention, where more than half of the variances are accounted for. When consumers perceive low web risk, they are more willing to carry out online transactions. Our study also reveals that consumers have more faith on web site with trusted third party web seal based on trust transference. This is inconsistent the study by Kimery and McCord (2002), where insignificant association between seal and trust is reported. Our result based on perceived warranty may resolve this inconsistency. When we launched the study, we suspected that it resulted from subjects' unfamiliarity for third party seal. We believe that in order for the trust transference concept to work, an important issue here may not only be the presence of seals, but also the awareness of its presence and understanding of its meaning. Those unaware of the presence of the seals, and those unfamiliar with their meaning, will have lower level of perceived warranty. Thus, in our study, we purposely had a lecture session and hand-on exercise introducing the concept and application of web seal, so that our results is less prone to the threats derived from subjects' unfamiliarity with web seals.

Another interesting finding in our results is the absence of direct effect between structural assurance and trust. While the results also support our position that perceived warranty plays an important part as a mediator, this issue may justify further research. Consistent with the signal theory, our findings indicate that consumers will trust a target web site, only when they have faith on the warranty, policies, assurance, or statement provided by e-tailers, indicating high degree of warranty perception for structure assurance. Consequently, high structural assurance could merely reduce the perceived web risk, excluding trust building, unless consumers believe in the structural assurance. In addition to the mediating effect of warranty perception, our results also reinforce the argument of signal theory, indicating that consumers who believe in the assurance and warranty of e-tailers will tend to trust them.

Although structural assurance will still reduce the perceived web risk, the low explanation power of structural assurance (10%) drives us to look for more antecedents of perceived web risk in the future.

It is interesting to note that warranty perception presents partial mediating effect on the relation between seal and trust. The possible explanation may again be rooted in trust transference. Consumers may have high level of faith in the creditability of seal than any other institutional factors because the seal is issued by public and certificated institutions. Therefore, the presence of web seal results in higher warranty perception, and in turn results in higher level of trust through a transference process. However, this issue related to why web seal affects warranty perception and trust simultaneously should be investigated in the future.

5.2 Practical Implication

Our findings may lead to suggestions to e-tailers, who may have initiatives to attract new comers and retaining customers by sorting out the impact of trust and risk and the antecedents of trust building trust. We hereby propose three suggestions.

First, while higher level of trust elevates behavioural intention, perceived risk is also an important antecedent. E-tailers could either attempt to increase trust or decrease the perceived risk, or maintaining higher level of trust than risk, so that consumers are more willing to engaging in a risky relationship (Gefen & Rao & Tractinsky 2002). On the one hand, e-tailers could provide more structural assurance to lessen the perceived risk, such as protective legal, security technology (DES or SSL), privacy statement, and so on. On the other hand, e-tailers could employ some trustworthy signals to give consumers hints about the reliability and quality of web site, such as information provided by trusted third parties.

Secondly, e-tailers should pay more attention on dispersing trustworthy signals. Due to the phenomena of information asymmetry between buyers and sellers in e-commerce, buyers may not necessarily believe in all signals and cues related to the quality of product and services. According to the lemon principle (Akerlof 1970), high quality vendors, which could not differentiate themselves from low quality vendors by signals, will be expelled from the market. Hence, vendors should develop trustworthy signals by information provided by trusted third parties, such as recommendation from experts, government institutions, and so on, so as to increase the degree of reliability and creditability of signals efficiently.

Finally, we recommend e-tailers to rely on “third party web seals” as the critical factors for building trust. Relative to structural assurance, seal could boost the extent of consumers’ trust more directly since the sanction against vendors’ deception may be perceived to be more serious than any other assurances. The seal is issued by the certificated institution and could be revoked whenever vendors fail to conform to the regulations. Hence, seal itself is one of the trustworthiest signals in our research domain. But, the effectiveness of seal relies on the consumers’ understanding and awareness. Apparently, an important issue is how to enhance consumers’ attention to the seal on web pages, and understand the significance of each seal.

References

- Akerlof, G.A (1970). The market for “Lemons”: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3), 488-500.
- Bagozzi, R.P. (1980). *Casual Models in Marketing*. John Wiley and Sons, New York.
- Bentler, P.M. (1990). Multivariate analysis with latent variables: Casual modelling. *Annual Review of Psychology*, 31, 419-456.
- Bhattacharjee, A. (2002). Individual trust in online firms: Scale development and initial test. *Journal of Management Information Systems*, 19(1), 211-42.

- Boulding, W. and Kirmani, A. (1993). A consumer-side experimental examination of signaling theory. *Journal of Consumer Research*, 20 (1), 111-123.
- Doney, P. M. and Cannon, J. P. (1997). An examination of the nature of trust in buyer-seller relationships. *Journal of Marketing*, 61, April, 35-51.
- eMarketer, (2004). B2C e-commerce in the US. <http://www.emarketer.com/report.aspx>, July.
- Erevelles, S., Roy, A., and Yip, S.C. (2001). The universality of the signal theory for product and services. *Journal of Business Research*, 52, 175-187.
- Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 36(10), 1246-1255.
- Friedman, N., Kahn, P.H.Jr., and Howe, D.C. (2000). Trust online. *Communications of the ACM*, 43(12), 34-40.
- Gefen, D., V.S. Rao, and N., Tractinsky (2003). The conceptualization of trust, risk and their relationship in electronic commerce: The need for clarifications. In *Proceedings of the 36th Hawaii International Conference on System Sciences*, IEEE Computer Society.
- Gray, G.L. and Debreceny, R. (1998). New assurance services: The electronic frontier. *Journal of Accountancy*, 185, 32-38.
- Grazioli, S. and Jarvenpaa, S. (2000). Perils of Internet fraud: An empirical investigation of deception and trust with experienced Internet consumers. *IEEE Transaction on System, Man, and Cybernetics*, 30 (4), 395-410.
- Hoffman, D.L., Novak, T.P., and Peralta, M.A. (1999). Building consumer trust online. *Communications of the ACM*, 42(4), 80-85.
- Jarvenpaa, S. L., and Tractinsky, N. (1999). Consumer trust in an Internet store: A cross-cultural validation. *Journal of Computer Mediated Communication*, 5 (2), 1-35.
- Kaplan, S.E. and Nieschwietz, R.J. (2003). A web assurance services model of trust for B2C e-commerce. *International Journal of Accounting Information Systems*, 4, 95-114.
- Kelloway, E.K. (1998). *Using LISREL for Structural Equation Modeling: A Researcher's Guide*. Sage Publication, Inc.
- Kimery, K.M. and McCord M. (2002). Third-party assurances: Mapping the road to trust in e-retailing. *Journal of Information Technology Theory and Application*, 4 (2), 63-82.
- Krimani, A. and Rao, A.R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable product quality. *Journal of Marketing*, 64 (2), 66-79.
- Mayer, R.C., and Davis, J.H., and Schoorman, F.D. (1995). An integration model of organizational trust. *Academy of Management Review*, 20(3), 709-734.
- McKnight, D. H., Cummings, L. L., and Chervany, N. L. (1998). Initial trust formation in new organizational relationships. *Academy of Management Review*, 23(3), 472-490.
- McKnight, D.H. and Chervany, N.L. (2001-2002). What trust means in E-Commerce customer relationships: An interdisciplinary conceptual typology. *International Journal of Electronic Commerce*, 6(2), 35-59.
- McKnight, D.H., Choudhury, V., and Kacmar, C. (2002). The impact of initial consumer trust on intentions to transact with a web site: A trust building model. *Journal of Strategic Information Systems*, 11, 297-323.
- Nunnally, J.C. (1978). *Psychometric Theory*. 2nd Edition. McGraw-Hill, New York.
- Shapiro, S.P. (1987). The social control of impersonal trust. *American Journal of Sociology*, 93 (3), 623-658.
- Sporleder, T.L. and Goldsmith, P.D. (2001). Alternative firm strategies for signalling quality in the food system. *Canadian Journal of Agricultural Economics*, 49(4), 591.
- Zucker, L.G. (1986). Production of trust: Institutional sources of economic structure, 1840-1920. In *Research in Organizational Behavior* (Staw, B.M. and, L.L., Cummings Eds.), Vol. 8, Greenwich: JAI Press.

APPENDIX – INSTRUMENT

Section I: A lecture session on web seal was held in the electronic commerce class, explaining the meaning and values of web seals.

Section II: Fill in these items according to the perception of Internet environment.

Structure Assurance (1-Strong disagreement; 7-Strong agreement)

Adapted from McKnight et al. (2002)

1. The Internet has enough safeguards to make me feel comfortable using it to transact personal business.
2. I feel assured that legal and technological structures adequately protect me from problems on the Internet.
3. I feel confident that encryption and other technological advances on the Internet make it safe for me to do business there.
4. In general, the Internet is now a robust and safe environment in which to transact business.

Perceived Web Risk (1-Strong disagreement; 7-Strong agreement)

Adapted from McKnight et al. (2002)

1. Entering credit card information over the web is unsafe.
2. I think it is risky to provide one's credit card.
3. I hesitate to enter my credit card information on the web.
4. Entering personal information over the web is unsafe.
5. I think it is risky to provide one's social security number to web-based vendors.
6. I would hesitate to enter personal information like my name, address and phone number on the web.

Section III: Finish two tasks in a random assigned legal web site (with or without web seal)

Section IV: fill in these items according the perception of the assigned legal web site.

Perceptions on Warranty (1-Strong disagreement; 7-Strong agreement)

Adapted from Erevelles et al. (2002)

1. The warranty of this web site is above the average coverage of similar set.
2. This web site provides adequate warranty coverage.
3. This web site provides credible warranty coverage.
4. The warranty coverage of this web site is less than one would expect.

Trust (1-Strongly disagree; 7-Strongly agree)

Adapted from Erevelles et al. (2002)

1. I believe that this web site will act with high business standards.
2. I can count on the people at this web site to behave with high business standards.
3. I think that this web site can be relied upon to fulfil their obligations to customers like me.
4. I feel that this web site is dependable.
5. I feel that this web site will not take unfair advantage of me, in such a situation arises.
6. I do not think that this web site has ill intentions about any of their customers.
7. Overall, I trust this web site.

Behavioural intention (1-Strong disagreement; 7-Strong agreement)

Adapted from McKnight et al. (2002)

1. I would be willing to provide information like my name, address, and phone number to this web site.
2. I would be willing to provide my social security number to this web site.
3. I would be willing to share the specifics of my legal issue with this web site.
4. Faced with a difficult legal situation, I would be willing to pay to access information on this web site.
5. I would be willing to provide credit card information on this web site.
6. Given a tough legal issue, I would be willing to pay for a 30 min phone consultation with a lawyer of this web site.