

TRUST AND DISTRUST AS DETERMINANTS OF ONLINE CONSUMER BEHAVIOR

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Abstract

The present paper represents work in progress, the goal of which is to further our understanding of the process through which people come to trust an e-commerce web site enough to engage in a transaction. Following a brief literature review, the authors will examine the role of person-centered mediating factors in the decision to trust or not to trust an e-commerce site. Specific constructs, such as self-efficacy, levels of both computer and Internet knowledge and experience, and trust and distrust will be investigated, leading to the formulation of a research model for the development of tendencies to trust or distrust, and the relationship of these tendencies to high and low risk transaction-relevant behaviors. Preliminary statistical analyses reveal some support for the model. Higher risk online behaviors such as a tendency to make purchases or pay bills online was better predicted by lower levels of Distrust, while Trust was a better predictor for lower risk behaviors such as searching for product-related information, or news and sports information.

Keywords: Trust, distrust, risk perception, e-commerce, self-efficacy

Introduction

The concept of trust has been studied in a number of different contexts, from philosophy to the social science and management literatures. The present paper represents work in progress, the goal of which is to further our understanding of the process through which people come to trust an e-commerce web site enough to engage in a transaction.

Many of the research models of this process from the area of information systems have featured a combination of internal or dispositional factors (e.g., a person's underlying sense of trust) and external or institutional factors (e.g., characteristics of the web site such as the presence of a returns policy). The present research will focus primarily on understanding some of the internal factors involved in the decision to trust an e-commerce web site, while recognizing that external factors play an equally important role in this process.

Therefore, this paper will selectively review research on understanding the relationship between risk perception and trust. This sense of trust has been related to two main outcomes: engaging in a monetary transaction of some kind (e.g., credit card), or giving the site owner some type of personal information (e.g., to sign up for an email newsletter). Some researchers have likened the trust decision-making process to the process of persuasion, and have utilized the Elaboration Likelihood Model from social psychology as part of their explanatory framework. Following this review, the paper will examine the role of internal, person-centered mediating factors in a person's decision whether or not to trust an e-commerce site. Specific constructs, such as self-efficacy, levels of both computer and Internet knowledge and experience, and trust and distrust will be investigated, leading to the formulation of a research model for the development of tendencies to trust or distrust, and the relationship of these tendencies to high and low risk transaction-relevant behaviors.

Risk perception as a component of trust

Several research models in information systems have used 'Perceived Risk' as an explanatory variable. Pavlou and Gefen (2004), for instance, included 'Perceived Risk from the Community of Sellers' as a variable that would affect 'Transaction Intentions,' while Cheung and Lee (2003) proposed 'Perceived Risk' as a consequence of 'Trust in Internet Shopping.' Boyle and Ruppel (2004) suggested that 'Perceived Risk' affects 'Online Purchasing Intention,' and Corritore, Kracher, and Wiedenbeck (2003) included 'Perceived Risk' as part of a set of personal factors determining trust in a web site. Gefen, et al. (2003) also used 'Perceived Risk' as a sub-construct of other constructs such as 'Trust,' while Pavlou (2003) used it as an antecedent of 'Trust.'

While these researchers would implicitly define 'Trust' as a more or less unitary concept that is affected by and affects other variables – purchasing decisions, intention to purchase, risk perception – others have suggested that the concept of trust may need to be expanded to include a more important role for risk perception in determining a person's decision to engage in a transaction with a web site. For example, Patrick, Briggs, and Marsh (2005), in their review of the literature on trust and e-commerce, have suggested that the characteristics of trust are dependent upon the types of underlying risk that are perceived in the situation. Thus, if a person trusts another person to watch a digital camera, does that mean that that person would also trust the same person to watch a child? Probably not,

according to Briggs, et al., the judgments may be related but they are distinct. The former is related to honesty, the latter to competence and kindness. "...we may need to be able to phrase trust not just in terms of 'I trust you *this much*,' but also in terms of 'I trust you *this much* to do *this thing*'" (Patrick, Briggs, and Marsh, 2005).

The role of persuasion and persuasive communication in risk perception and online transactions

Many researchers (e.g., Kong and Hung, 2006; Patrick, Briggs, and Marsh, 2005; Silience, Briggs, Fishwick, and Harris, 2004) have used the Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986) to understand how consumers gain a sense of trust in a web site, either leading to a decision to purchase something, or to trust its content. In the ELM, a person may process persuasive communications in either of two ways (these are often referred to as the *routes* to persuasion). An individual who engages in a careful analysis and comprehension of the persuasive communication, and as a result changes their opinion has followed a *central* route to persuasion, while attitude change resulting from an analysis of persuasive information largely guided by affective or other superficial cues in the situation characterizes a *peripheral* route to persuasion (Petty and Cacioppo, 1986).

Using the ELM, trust in a web site leading to a purchase with a credit card or divulging of personal information to gain access to content is seen as part of a process of persuasion on the part of the vendor or information holder. For instance, Patrick, et al. (2005) point to Chaiken's research in which *low involvement* participants used 'heuristic' approaches to decision-making, including affective and other superficial cues (a *peripheral* route); whereas *high involvement* participants used more 'systematic' strategies (*direct* route) in their analysis of persuasive materials. Applying these results to an ecommerce situation, people who are involved in low risk purchases, (e.g., CD's or books, involving small amounts of money) might use *low involvement* or *heuristic* strategies for gathering information about the web site in order to decide whether to make a purchase, or to give up personal information to gain access to information on the site. These factors could involve the attractiveness of the site (including product images), low prices compared to sites selling similar products, the ease of searching the site, or the uniqueness of the information contained in the site. These factors would be most likely to engender positive affect about the site, which could lead to a decision to purchase or divulge personal information. Those making high risk purchases (involving several hundred dollars or more) might use *high involvement* or *systematic* strategies, using a much more thorough, analytical strategy when deciding to engage in a transaction. This could involve evaluation of trust indicators such as the vendor's return policy, an analysis of 'feedback' items for sellers (in the case of a marketplace), or the presence of third party support, (e.g., indicated by a Verisign or Paypal seal). The type of 'trust judgment' for a low-risk situation like the purchase of a CD would be different than for a higher-risk purchase – an iPod – involving a more careful evaluation of the features relevant to trust.

The implication of the ELM for trust research in ecommerce is that examining the assessment process performed by the consumer may be important to understanding how a decision to engage in an ecommerce-related transaction is made. The features of a web site such as search capability, product information, attractive graphics, the presence of a privacy policy, a Verisign seal, etc., would seem to be important for most consumers, and particularly those making riskier transactions. However, most consumers may be unaware of the presence of extra security and privacy-related elements, so they may actually play little or no role in the overall risk assessment. Evidence for this comes from a study in which researchers (Turner, Zavod, and Yurcik, 2001) compared the behavior of security experts and ordinary consumers as they performed online tasks and evaluated the security of a series of pre-selected ecommerce web sites (including PayPal, Barnes & Noble, and eBay). Each participant was given a questionnaire to evaluate their experience with the Internet and their knowledge of security. Interviews with each participant were conducted while they were engaged in online tasks. As expected, the differences between security experts and consumers were largely due to their attitudes about security and the differences in their technical knowledge. Of interest for the present paper was the finding that participants' feelings about the security of a site were largely determined by brand reputation. These consumers were, for the most part, unaware of the presence and relevance of security features (Verisign certificates, etc.) on an ecommerce site. While not directly concerned with the nature of trust in online shopping transactions, these findings provide some insight into the process of risk perception that can lead to the extension of trust to a web site.

Thus, it may help to include in the process of risk perception not only external, more institutional criteria such as the cost of a proposed transaction, the type of product being purchased, or the presence of a Verisign seal, but also variables that could help researchers understand the nature of the decision process itself. Using such a framework, we can begin to examine the underlying person-centered variables that may be at work in the process of risk perception in ecommerce transactions, beginning with the nature of trust itself.

Disposition to trust and disposition to distrust and the perception of risk

As suggested above, much of the research in this area has implicitly assumed that trust is a unitary construct. McKnight, Kacmar, and Choudbury (2003) suggested that there is an important distinction between the constructs of trust and distrust, which may have an effect on the way a person decides to enter into an e-commerce transaction. For these researchers, trust and distrust are based on different underlying psychological states which are determined by the level of risk a person perceives in a situation (McKnight, et al., 2003). “While trust is based on feelings of calm and assurance, distrust is based on fears and worries. Feelings of fear and worry are more likely to prevail when an individual is in a situation that he/she perceives to be high risk. Hence, we justify a model that predicts *dispositional trust* will have a greater effect on Web perceptions perceived as low risk (e.g., willingness to explore a web vendor’s site without buying), whereas *dispositional distrust* will have a stronger influence on Web situations perceived as high risk (e.g., a decision to change medical treatment based on advice offered in WebMD.com)” (McKnight, Kacmar, and Choudbury, 2004).

Further evidence for the role of underlying psychological states in the perception of risk comes from social psychology. A study by Johnson and Tversky (1983) indicated that a negative affective state caused by reading a newspaper story about a tragic event caused participants to increase their estimates of the frequency of risky events such as fire, homicide, and lung cancer. Participants who read happy news stories produced comparable decreases in the judged frequency of risky events.

Thus, in addition to proposing models that include ‘institutional’, more externally focused variables, and unitary conceptions of trust, which lead to intentions to purchase, researchers should begin to examine the nature of the underlying perception of risk in the on-line transaction itself. How do people decide whether a transaction is high or low risk? The present study, therefore, will focus on a small set of internal, more person-centered variables. The set of variables that will be investigated include: self-efficacy, which will be reviewed below, levels of both computer and Internet knowledge and experience, and, following McKnight, et al., disposition to trust and disposition to distrust.

Self-efficacy

Computer self-efficacy has emerged in recent years as an important explanatory variable in studies of the effectiveness of software training programs (Campeau and Higgins, 1995). Originally developed in Cognitive Social Learning Theory (Bandura, 1986), the construct, with reference to computing, refers to an individual judgment of one’s capability to use a computer (Marakas, Yi, and Johnson, 1998). As with the original construct, though, self-efficacy refers to one’s self-reported judgment of ability, rather than to an independently assessed measure of ability.

Campeau and Higgins (1995), in their original model of computer self-efficacy, suggested that prior experience with computers plays a critical role in self-efficacy judgments. This relationship has been empirically demonstrated in studies of computer and Internet use by undergraduate students (Bullington, Case, and Han, 2005), computer use by teacher education students (Albion, 2001), in the effectiveness of computer based training in a general university population (Quinonez and Guthrie, 2002), and in the training and use of an individual software package in MBA students (Hartzel, 2003).

In the present research context, Boyle and Ruppel (2004) found a significant relationship between computer self-efficacy and online purchasing intent. This finding suggests that a sense of confidence in one’s ability to use computers can potentially contribute to a sense of trust or distrust as one interacts with an ecommerce web site and decides whether to make a purchase, or reveal personal information. Further, one’s feelings of self-efficacy may be separate from the amount of knowledge or experience one has had with computers and the Internet, so it is important to look at the contribution of each construct independently.

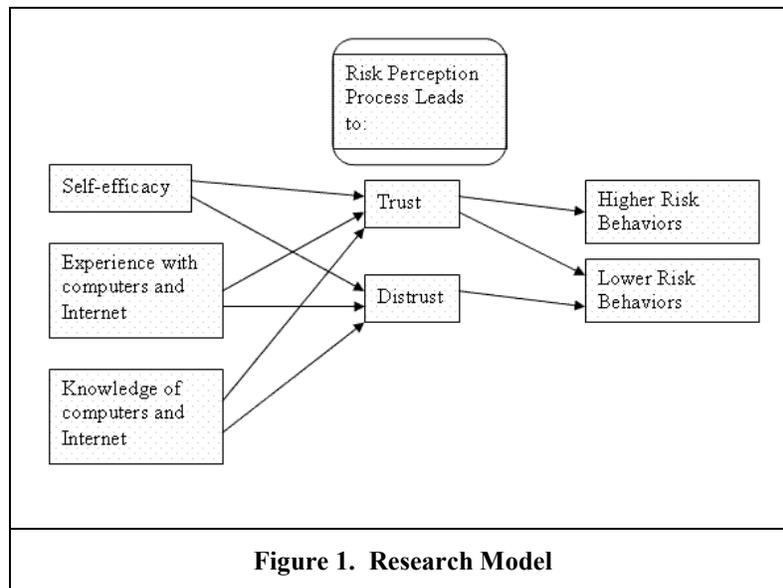
Research questions

Following McKnight, et al. (2003), measures of trust and distrust should reveal different patterns of responding and different relationships with variables related to ecommerce transactions. For example, one potential determining factor in the decision-making process leading to the risk perception decision is experience using computers and the Internet, as well as self-reported knowledge of computers and the Internet. As suggested above, a relationship between self-efficacy and computer and Internet knowledge has been established (Bullington, Case, and Han, 2005).

Experience and knowledge would also presumably guide a person as they evaluate the level of risk of a transaction. The greater the amount of experience a person has with computers and the Internet, the more likely they would be to feel comfortable with ecommerce transactions, and thus, the greater the sense of trust they would experience. Low levels of experience and knowledge, then, should be related to a sense of distrust.

A second factor that may be involved is one's confidence in the ability to use computers, as measured by a Computer Self-Efficacy scale. Low self-efficacy (independent of one's self-reported levels of knowledge and experience with computers and the Internet) may lead to feelings of discomfort, and thus, the experience of distrust as one engages in an ecommerce transaction. On the other hand, high self-efficacy may be associated with an experience of trust.

Thirdly, measures of trust and distrust should be related to actual self-reported shopping behavior and a tendency to use services such as bill paying and online banking over the Internet. A sense of trust should be related to a tendency to engage in low risk behaviors (e.g., looking for shopping-related information, news, or investment information), as well as higher risk behaviors such as shopping, bill paying, and banking over the Internet. Distrust should be related to a tendency to engage in lower risk behaviors only. These research questions are summarized by the research model shown in Figure 1.



Methodology

Participants

The online questionnaire constructed for this study was available to undergraduate students enrolled in four different sections of IS-related courses at a regional university in the southeastern United States during Fall Semester. The IS courses were taught by three professors, using WebCT to supplement traditional course activities. All student participants were familiar with WebCT, and the questionnaires were available to them online throughout the semester using WebCT's survey feature. This feature allows enabled students to read and submit answers to the questions online. Extra credit was offered to students as an incentive for completing the surveys.

Three hundred forty students participated in this investigation. Fifty eight percent of the participants were male and 42% were female; the average age of the participants was 20.16. Though the sample is not representative of the population at large, it has been reported that the average online consumer is younger and more educated than most consumers (OECD, 1998), therefore, the present group would fall into the category of those most likely to use the Internet for ecommerce related transactions.

Research Instruments

Measurement items were grouped into two categories. First, a set of items represented a combination of standard demographic questions combined with items designed to probe the participants experience and knowledge of the Internet and computer systems. The latter included items reflecting the amount of purchasing over the Internet the participants had engaged in, as well as the use of the Internet as a source of entertainment and information from which purchasing decisions could be made. Second, a series of scales adapted from the literature were used. These included measures of Computer Self-Efficacy (Campeau and Higgins, 1995), and Perceptions of Trust and Distrust of the Internet as a shopping medium (Cheung and Lee, 2003). A revised version of the latter scale was divided into independent measures of Trust and Distrust in Internet shopping based on the results of a factor analysis that revealed the two-dimensional character of the unified scale.

Preliminary Results

A series of questions designed to measure prior experience with computers and the Internet were asked of each participant, along with questions about their self-reported knowledge of computers and the Internet. Descriptive statistics are reported in Table 1. For 'Knowledge' questions, responses ranged from 1=No Knowledge to 5=Expert. 'Frequency' responses ranged from 1=Do Not Use to 6=Daily > 3hrs. Finally, 'Experience' ranged from 1=Less than a year to 6=more than 15 years. The participants then, on average, see themselves as possessing 'Reasonable' knowledge of computers and the Internet; use computers and the Internet between one and three hours a day, and have between six and 10 years of Internet experience.

	Mean	Median	Std. Dev.
Self-Reported Computer Knowledge	3.04	3.00	.678
Self-Reported Internet Knowledge	3.23	3.00	.661
Frequency of Computer Use	4.60	5.00	.985
Frequency of Internet Use	4.43	5.00	.969
Years of Computer Experience	4.19	4.00	.796
Years of Internet Experience	3.70	4.00	.603

A series of preliminary regression analyses were undertaken in order to explore the nature of the support for the proposed research model. In general, these preliminary results reveal some support for the model, however, the authors plan to undertake a more rigorous set of analyses for the final version of this paper.

Two regression analyses were performed to assess the contribution of prior computer experience/knowledge and Self-efficacy to measures of Trust and Distrust. The first regression employed several classification variables as predictors: years of computer experience, computer knowledge, frequency of computer use, and self-efficacy, with Trust as the dependent variable. The resultant regression model was highly significant [$F(7,316) = 7.094$; $p < .001$] and yielded an R of .37 and a R Square of .136. As shown in Table 2, predictor variables that achieved significance were self-reported computer knowledge, self-reported Internet knowledge, and self-efficacy. Somewhat surprisingly, computer knowledge was negatively related to Trust.

The second regression employed the same predictors, with Distrust as the dependent variable. The resultant regression model was also highly significant [$F(7, 317) = 4.796$; $p < .001$] and yielded an R of .31 and a R Square of .1. Three of the computer experience/knowledge dimensions, and self-efficacy, were found to be significant predictors. These are summarized in Table 3.

Table 2. Predictors of Trust			
	Beta	t	p <
Self-Reported Computer Knowledge	-.203	-2.707	.007
Self-Reported Internet Knowledge	.253	3.288	.001
Frequency of Computer Use	.142	1.428	.154
Frequency of Internet Use	-.049	-.493	.622
Years of Computer Experience	.041	.630	.529
Years of Internet Experience	.031	.494	.621
Self-efficacy	.215	3.441	.001

Table 3. Predictors of Distrust			
	Beta	t	p <
Self-Reported Computer Knowledge	.102	1.335	.183
Self-Reported Internet Knowledge	-.144	-1.827	.069
Frequency of Computer Use	-.181	-1.778	.077
Frequency of Internet Use	.073	.721	.472
Years of Computer Experience	.090	1.354	.177
Years of Internet Experience	-.192	-2.967	.003
Self-efficacy	-.143	-2.240	.026

A final set of regression analyses was performed using Trust and Distrust as independent variables, and composite ‘frequency of use’ measures representing higher risk (e.g., making online purchases, banking online, online bill paying) and lower risk (e.g., educational/academic research, shopping information such as prices and product features, news and sports information) usage behaviors respectively. Descriptive statistics for these measures are given in Table 4. Responses for all frequency of use scales ranged from 1=Do not use to 5=multiple times per day.

Table 4. Descriptive Statistics for Frequency of Use Measures			
	Mean	Median	Std. Dev.
Making Purchases (Hi Risk)	1.78	2.00	.841
Bank Online (Hi Risk)	2.23	2.00	1.212
Online Bill Paying (Hi Risk)	1.46	1.00	.798
Invest Online (Hi Risk)	1.17	1.00	.632
Educational Research (Lo Risk)	3.32	3.00	1.069
Shopping Info (Lo Risk)	2.37	2.00	1.026

News (Lo Risk)	2.77	3.00	1.195
Weather Info (Lo Risk)	2.41	2.00	1.138
Sports Info (Lo Risk)	2.29	2.00	1.338
Investment Info (Lo Risk)	1.30	1.00	.731

The first regression model (using a composite measure of lower risk behaviors as a dependent variable) was significant [$F(2, 337) = 5.793$; $p < .003$] and yielded an R of .18 and a R Square of .03. Trust was found to be a significant predictor. These results are summarized in Table 5.

	Beta	t	p <
Distrust	-.032	-.522	.602
Trust	.165	2.718	.007

The second regression model (using a composite measure of higher risk behaviors as a dependent variable) was also significant [$F(2, 336) = 4.093$; $p < .018$] and yielded an R of .15 and a R Square of .02. In this case, Distrust was found to be a significant predictor. These results are summarized in Table 6.

	Beta	t	p <
Distrust	-.158	-2.589	.01
Trust	-.009	-.150	.881

Conclusion

The preliminary results suggest some support for the research model presented above (The present authors are aware that our preliminary analyses represent violations of statistical assumptions in some cases; the final analyses for this project will be undertaken using structural equation modeling in order to provide a more direct test of our research model). Overall these preliminary regression analyses suggest that the constructs of Trust and Distrust are predicted by differing patterns of background experience and self-efficacy scores. Whereas high self-efficacy, along with higher levels of Internet knowledge and lower levels of computer knowledge seem to predict Trust, Distrust is better predicted by low self-efficacy, and lower levels of Internet knowledge and experience.

The patterning of results with respect to the use of Trust and Distrust as predictors of behavior also revealed some interesting differences. Higher risk behaviors such as a tendency to make purchases or pay bills online was better predicted by lower levels of Distrust, while Trust was a better predictor for lower risk behaviors such as searching for product-related information, or news and sports information.

Overall, the preliminary findings of the present study provide some support for the idea that trust is better viewed as a two-dimensional construct that can be used to provide an explanation for the psychological underpinnings of a person's decision to engage in ecommerce transactions. Understanding this more person-centered process could, along with our knowledge of the role of institutional variables, contribute to a better overall understanding of the nature of ecommerce transactions.

While the present research has concentrated on establishing psychometric relationships between variables such as trust and distrust, self-efficacy, and past experience and behaviors through self-report, such data collection methods rely heavily on the memories of participants for the accuracy of their reports. A more direct test of these research issues would involve the observation of research participants as they actually engage in the behaviors in question. One of the methods cognitive psychologists have used with success is protocol analysis (Ericsson & Simon, 1993),

where a participant actively verbalizes their thought processes while engaging in some activity, in this case, shopping or searching for information online. Such methods could be used productively in the present context.

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