

**INITIAL PERCEPTIONS OF COMPANY
TRUSTWORTHINESS ONLINE:
A COMPREHENSIVE MODEL AND
EMPIRICAL TEST**

**Marios Koufaris
William Hampton-Sosa**

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<p>Marios Koufaris Assistant Professor Computer Information Systems Zicklin School of Business Baruch College, CUNY Phone: 646-312-3373 Fax: 646-312-3351 marios_koufaris@baruch.cuny.edu</p>	<p>William Hampton-Sosa Doctoral Student, Information Systems The Graduate Center and Zicklin School of Business Baruch College, CUNY Phone: 646-312-3350 Fax: 646-312-3351 william_hampton-sosa@baruch.cuny.edu</p>
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ABSTRACT

Trust has often been identified as an important factor in Business-to-Consumer (B2C) electronic commerce. Lack of trust in online companies is a primary reason why many web users do not shop online. This study proposes a model of the determinants and effects of perceived company trustworthiness by first-time customers. The model is empirically tested using a questionnaire-based field study. The results indicate that the most important determinant of initial perceptions regarding a company's trustworthiness is how well customers believe the company will protect their privacy. Also significant is the perceived usefulness of the company's web site. Other important determinants include perceived company reputation, the company's willingness to customize, and perceived security control of the web site. Interestingly, while perceived company trustworthiness can increase customer intention to purchase we found no relationship with intention to return.

Keywords: Electronic Commerce, Trust, Company Trustworthiness, Online Customer Loyalty, Purchase Intention, Web Site Characteristics, Privacy, TAM, Web Security

ISRL Categories: AA02, AP, GB03, HD01

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INTRODUCTION

While B2C electronic commerce is no longer a new phenomenon, our understanding of the many factors that affect transactions between online companies and customers is still limited. The number of web users grows daily and has surpassed the 500 million mark (NUA Surveys, 2002). However, only about 15% of those users make purchases online (Taylor Nelson Sofres, 2002). A primary reason for that is their lack of trust in companies that they only experience through the web medium (Hoffman et al., 1999). Therefore, it is imperative, for companies and researchers alike, to study how online customer trust is promoted and cultivated. The virtual nature of the web medium challenges traditional understanding of customer trust and calls for new and more appropriate models.

There has been a great deal of theoretical and conceptual research on online customer trust but less empirical research. Conceptual papers have presented the different technologies and mechanisms already used online to promote trust. These include, among others, trusted third parties (Palmer et al., 2000; Van den Berg and Lieshout, 2001) and online reputation systems (Kollock, 1999; Resnick et al., 2000). Other articles have proposed new methods of increasing trust online such as agents and virtual reality technologies (Cassell and Bickmore, 2000; Papadopoulou et al., 2001), economic incentive

mechanisms (Ba et al., 1999), government involvement (Schoder and Yin, 2000), and video-conferencing (Olson and Olson, 2000). There have also been some studies that developed new theoretical models of trust online without empirically testing them (Ratnasingham, 1998; Friedman et al., 2000). One recent example is of a generic model of trust that consists of two basic components: trust in the other party and trust in the control mechanisms used to ensure successful transactions (Tan and Thoen, 2000-2001).

Empirical research on online trust has also varied. In one of the earlier empirical studies, using data collected in 1997, researchers found that two important reasons why customers do not buy online are lack of trust in the security of online shopping and concern about privacy regarding personal information collected online (Hoffman et al., 1999).

Another empirical study examined the effect of perceived company size and perceived company reputation on customer trust online (Jarvenpaa et al., 2000). The results showed a large effect between reputation and trust and a smaller effect between size and trust. The latter may depend on the type of company (the effect was significant for travel sites but not for bookstores). Trust also had an indirect positive effect on willingness to purchase by improving attitude towards the company and decreasing customer risk perception. The findings of this study were also tested in a cross-cultural context with data from Australia, Israel, and Finland. The results showed no strong cultural differences in the model for trust indicating support for the generalizability of the results (Jarvenpaa et al., 1999).

A different study incorporated trust and risk in the Technology Acceptance Model to predict customer acceptance of e-commerce (Pavlou, 2002). In two empirical studies,

using students and actual online customers, the author found that trust was a significant predictor of customer intention to transact with a web site both directly and through its negative effect on perceived risk. He also found that perceived reputation of the company and past transactions with it were significant determinants of customer trust online.

There have also been some studies that proposed, tested, and validated a measurement instrument for trust. One of those studies developed and validated a measurement instrument for a model of the factors that affect general trust in Internet shopping and its impact on perceived risk (Cheung and Lee, 2001). The model was later partially tested empirically (Lee and Turban, 2001). The results indicated that the perceived integrity of an Internet merchant is positively related to customer trust in Internet shopping in general. That positive effect, however, is moderated by the trust propensity of the customer.

A more recent article also reported the development and testing of a complex, multidisciplinary, and multidimensional measure of trust in web-based commerce (McKnight et al., 1998 and 2002). The model includes four constructs that measure customer trust: disposition to trust, i.e. trust propensity; institution-based trust, i.e. trusting the infrastructure and institutions of e-commerce; trusting beliefs, i.e. specific beliefs about the web company's integrity, benevolence, and competence; and trusting intentions, i.e. intention to engage in trust-related behaviors with the company such as making a purchase. According to the study, each of the four constructs is measured well by a number of sub-constructs and the results partly support a model of web trust with the four constructs.

A third study proposed a three-dimensional instrument to measure trust in online firms and empirically validated it (Bhattacharjee, 2002). The scale measures the

perceptions of the customer regarding the company's ability, benevolence and integrity. After testing the validity of the instrument, the author ended up with a seven-item scale, which he tested in two field studies in online retail and online banking.

Most of the empirical studies on trust that have been published to date have dealt with only few factors that can affect customer trust on the web. The models tested have been limited to either a small number of potential antecedents or they concentrated on measuring the construct of trust alone. The results of these studies have not been easy to compare, so our understanding of how customers develop trust in online commerce has been fragmented at best. In this study, we propose a large and comprehensive model of the antecedents of online customer trust and its effects. Our model builds on the smaller models already tested in the past (Jarvenpaa et al., 2000; Lee and Turban, 2001). Our intention is to understand as many of the variables that influence customer trust online as possible. Therefore, our study looks at how both company characteristics and web site characteristics affect customer trust in the company itself.

The definition and operationalization of trust has been a source of considerable debate. Very often, trust has been defined as a belief regarding the characteristics of the company to be trusted (Kumar et al., 1995; Luhmann, 1979; Mayer et al., 1995; Fung and Lee, 1999; Menon et al., 1999; Stewart, 1999). Those characteristics usually include the company's integrity, benevolence and competence (Mayer et al., 1995), all of which comprise the company's trustworthiness, as perceived by the customer. For our study, we use the term "perceived company trustworthiness" to represent customer trust in the company (Jarvenpaa et al., 2000).

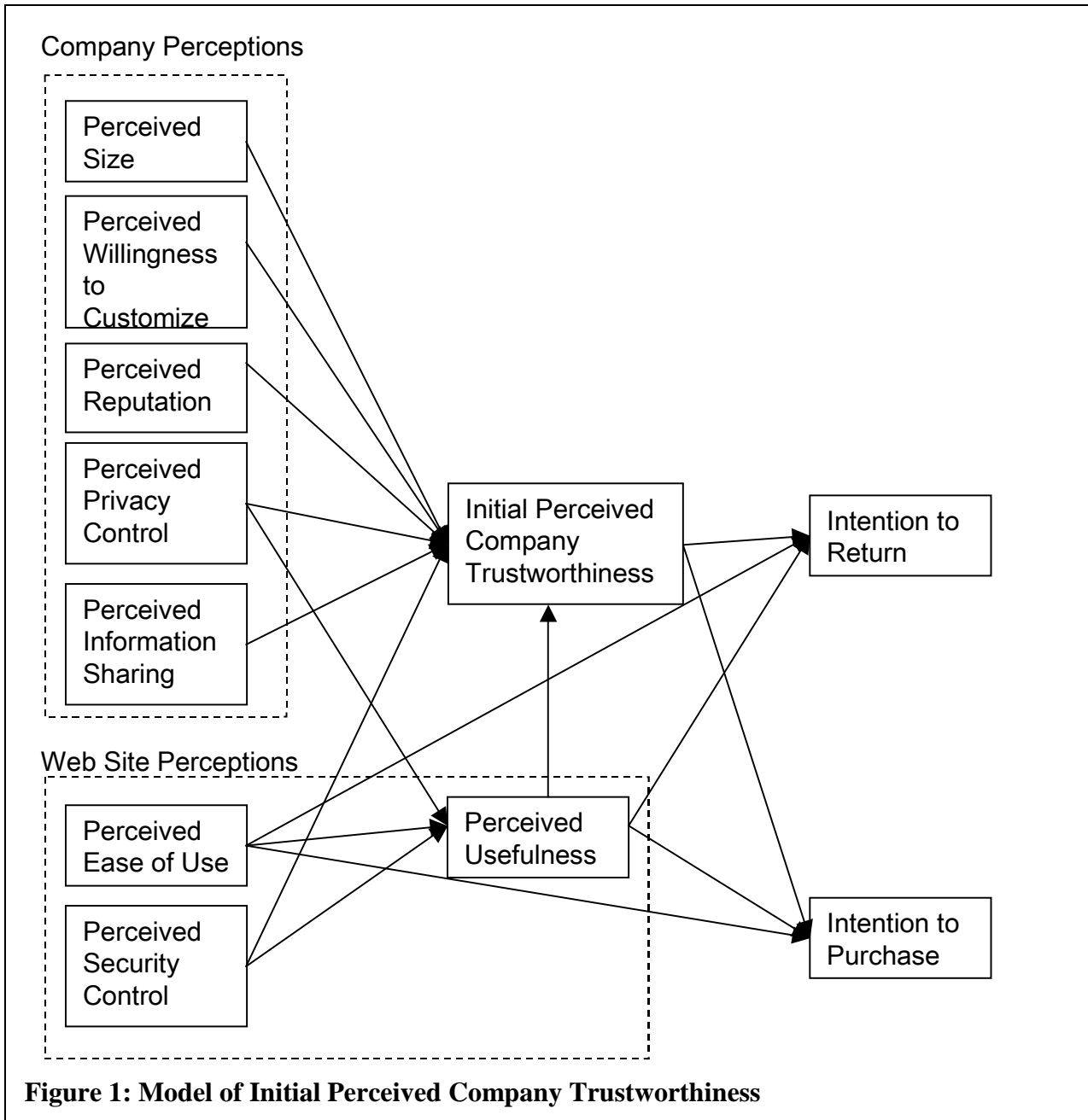
We further isolate the type of perceived company trustworthiness we examine by using only new customers in our sample. Therefore, our results indicate how customers develop initial trust beliefs in a company online after only their first visit and without having any prior experience with the company (McKnight et al., 1998; McKnight et al., 2002). We recognize that past experience with a company is an important determinant of customer trust but our study does not examine it. Instead we look at how information gathered during an initial interaction with the web site can affect the customer's initial perceptions of the company's trustworthiness.

MODEL AND HYPOTHESES

Our model, seen in Figure 1, consists of two sets of factors that can affect company trustworthiness: customer perceptions about the company and customer perceptions about the web site. We believe that a complete model must include variables from both of those sets. The effect of perceptions regarding the company on customer trust beliefs has been documented both online and offline (Jarvenpaa et al., 2000; Doney and Cannon, 1997). Our model includes customer perceptions on company size, reputation, privacy control, willingness to customize, and information sharing. The effect of web site perceptions has also been documented (McKnight et al., 2002). While in offline commerce it is the salesperson that often influences the buyer's trust in the seller (Doney and Cannon, 1997), online it is the website that does that (Lohse and Spiller, 1998). Therefore, one would expect that the customer experience with and perceptions of the web site would also have a strong effect on customer perceptions of the company's trustworthiness. In our study, we

examine the impact of customer perceptions on three web site characteristics: usefulness, ease of use, and security control.

The Technology Acceptance Model (TAM) has long been considered a robust model for understanding how users develop attitudes towards technology and when they decide to adopt it (Davis, 1989; Mathieson, 1991; Straub et al., 1995; Szajna, 1996; Hu et al., 1999; Agarwal and Karahanna, 2000; Koufaris 2002). The two main belief variables of TAM are perceived usefulness and perceived ease of use of the technology. Since a company's web site is an example of a particular type of technology, we expect that the two TAM belief variables will also have an impact on customer trust beliefs online.



In the marketing literature, characteristics of the salesperson have been shown to influence customer trust in the salesperson and the company (Andaleeb and Anwar, 1996). For example, salesperson expertise (Crosby et al., 1990; Doney and Cannon, 1997) and likeability (Hawes et al., 1989; Doney and Cannon, 1997) are positively related with

customer trust in the salesperson that, in turn, has strong positive association with trust in the company (Doney and Cannon, 1997). Online, there is no salesperson but the customer interacts with the web site instead. Just as perceiving the salesperson as useful and helpful can increase customer trust in the company, we expect that perceiving the web site as useful will also have the same effect.

A well-designed web site that is both useful and easy to use can also be seen as proof of the company's capabilities. Believing that a company has the resources and capabilities to fulfill its promises can increase customer trust in it (Chow and Holden, 1997). The company's web site is also its main control mechanism, i.e. the tool it uses to enable and secure transactions with its customers. Customer trust in an online company is partly determined by trust in its control mechanisms (Tan and Thoen, 2000-2001). Therefore, a positive perception of a useful web site can increase belief in the company's trustworthiness and trusting intentions by the customer (Friedman et al., 2000; Tan and Thoen, 2000-2001; McKnight et al., 2002). Specifically, we expect that perceived usefulness of the web site will have a positive relationship with perceived company trustworthiness. According to classic TAM research, perceived ease of use also has a direct effect on perceived usefulness, so our model reflects that (Davis 1989).

H1: Perceived usefulness of the web site is positively associated with perceived company trustworthiness.

H2: Perceived ease of use is positively related to perceived usefulness of the web site

Perceived usefulness and ease of use have also been found to directly influence customer intention to return to a web site. By viewing the web site as a system, TAM can

be used to predict intention to use the system, i.e. intention to return to the web site. Some studies have shown that perceived usefulness is positively related to intention to return but perceived ease of use is not (Koufaris, 2002). Other studies, however, found that perceived ease of use is also a significant predictor of attitude towards and intended use of a web site (Moon and Kim, 2001; Chen et al., 2002). We also expect that initial perceptions about the web site will influence customer intention to return. Specifically, we predict that both usefulness and ease of use of the web site will encourage customers to return.

H3a: Perceived usefulness is positively related to customer intention to return

H3b: Perceived ease of use is positively related to customer intention to return

What makes customers decide to make a purchase is of paramount importance to every company. In the context of our study, we look at how perceptions about the web site can influence those decisions. One of the reasons online customers do not buy online is because the web sites are complicated and difficult to use (Lynch et al., 2001; Benbunan-Fich, 2001). The web site is the only interface they have to interact with the company's product catalog and complete a purchase. Therefore, an easy to use web site and one that is perceived as useful will make customers more likely to purchase.

H4a: Perceived usefulness is positively related to customer intention to purchase

H4b: Perceived ease of use is positively related to customer intention to purchase

Company size, as perceived by the customer, is another variable that can increase a company's trustworthiness, as research in offline commerce has shown (Doney and Cannon, 1997). Customers often assume that a large company has the capabilities necessary to provide them with the services and support they desire thereby increasing

their trust in the company (Chow and Holden, 1997). Also, large size may indicate to customers that the company is better able and more willing to compensate them in the case of product failure, especially since it has invested more on its reputation in the market (Jarvenpaa et al., 2000). The relationship between perceived company size and customer trust in web-based commerce has been examined in one empirical study. According to the study's findings, company size had a positive relationship with customer trust when the online company was an air travel service but it had no relationship with trust when the company was an online bookstore (Jarvenpaa et al., 2000). One reason for the difference may be the inherent low risk in book buying as opposed to travel buying. We expect that perceived size would be positively related to company trustworthiness, especially for big ticket items such as expensive laptops and airline tickets.

H5a: Perceived company size is positively related to perceived company trustworthiness.

Customization has been a buzzword in electronic commerce from its early beginnings (Roth, 1998; Liechty et al., 2001). Innovations such as recommender systems, personalized home pages (e.g. My Yahoo), and news tickers have made it easy for online companies to provide customized information tailored to each individual customer's preferences and needs. Companies have also started to offer mass customization of physical products. Nike allows its customers to customize their own shoes at NikeID (<http://nikeid.nike.com>). Reflect.com, a Procter & Gamble backed company, allows customers to create their own customized cosmetics, from perfumes to mascara. As a result, customers have come to expect personalized service from online companies.

A company's willingness to customize its services has been shown to be a positive antecedent to customer trust in offline commerce (Doney and Cannon, 1997). A company that provides customized information or services, signals to its customers that it cares about them and that it is willing to make an extra effort to provide them with the best service possible. We expect that the same relationship would also apply online:

H5b: Willingness to customize is positively related to perceived company trustworthiness

Customer trust can be significantly increased when the company is perceived to have a good reputation (Doney and Cannon, 1997; Jarvenpaa et al., 2000). Reputation is defined as the degree in which people believe in both the company's honesty and concern towards its customers (Doney and Cannon, 1997). This is consistent with the notion that trust can be determined by a belief in the firm's benevolence towards its customers, a belief in the integrity regarding a firm's business practices, and the perception of the ability of a firm to deliver on its promises (Mayer, et al., 1995).

Reputation has been found readily transferable among people and firms meaning that customers can assume a certain degree of trust towards a vendor based on the behavior of that vendor towards others (Ganesan, 1994). Building a positive reputation is a difficult, expensive, and time-consuming process and, as a result, customers generally believe that companies are reluctant to risk their investment by pursuing opportunistic short-term gains at the expense of the customer (Telser, 1980; Dasgupta, 1988).

The positive relationship between reputation and trust has been shown in an online environment as well (Jarvenpaa et al., 2000). The relevance of reputation in a virtual online context has been further established, as evidenced by the success of reputation-feedback

systems used by eBay. Feedback information influences buyer trust and behavior while the expectation of additional future business, and the threat of retaliation from dissatisfied buyers influence seller behavior (Resnick et al., 2000; Ba and Pavlou, 2002).

H5c: Perceived reputation is positively related to perceived company trustworthiness

Privacy issues have been shown in several studies to be an important concern among customers, and a major determinant of trust, in both online and offline buyer-seller relationships. If a customer is unable to control the actions of a web merchant with respect to personal information, or if a customer perceives a lack of control over secondary uses of their personal information not specifically related to the immediate transaction, trust can be significantly impaired (Hoffman et al., 1997; Culnan and Armstrong, 1999).

Customers also worry about the risk of having their sensitive information, such as their address and credit card numbers, revealed to unauthorized users. This fear has been identified as a major reason why customers choose not to engage in online commerce, refusing to provide information to companies and not purchasing products or services online (Warrington, 1999; Stewart and Segars, 2002). The issue of privacy is also indicated by concerns customers have with the risk of the indecent disclosure of their private information, which can also erode a sense of trust in an online merchant (Ratnasingham, 1998). We believe, therefore, that perceived privacy control is positively related to perceived company trustworthiness.

H5d: Privacy control is positively associated with perceived company trustworthiness.

In any context, information sharing between two negotiating parties can increase the climate of trust between them (Butler, 1999). In studies of offline buyer-seller relationships, communication, i.e. sharing of information, has been found to significantly increase buyer trust in the seller (Anderson and Narus, 1990; Selnes, 1998). We believe that the same applies to the relationship between online companies and their customers.

Research has already shown that the availability of clear and relevant information on a company's web site is a very important determinant of customer attitudes towards the web site and the company itself (Eighmey, 1997; Koufaris et al., 2001-2002; Agarwal and Venkatesh, 2002). Accordingly, we expect that better information sharing will specifically influence customer perceptions of the usefulness of the web site. Furthermore, the importance of such communication in building trust online has already been highlighted in the literature but it has not been tested empirically (Urban et al., 2000; Chadwick, 2001). We propose the same relationship and test it empirically.

H5e: Information sharing is positively related to perceived company trustworthiness

H6: Information sharing is positively related to perceived usefulness of the web site

A major concern of online customers is how secure their transactions on the web are. Customers expect that an online company's web site will provide methods for secure exchange of financial information with them (Ranganathan and Ganapathy, 2002) but many times security concerns, such as fears of stolen credit card numbers, have been a leading reason for many web users' decision not to buy online (Hoffman et al., 1999). When companies use technologies like encryption and authentication techniques to secure transactions from unauthorized access it ensures that customers perceive the web site as a

secure place to do business and it increases their trust in the company itself (Ratnasingham, 1998; Warrington et al., 2000; Tan and Thoen, 2000-2001).

When security concerns stop web users from using a web site, the site itself becomes less useful to the users. If, on the other hand, online customers perceive a web site as having good security control, that becomes an enabling factor for them to use the site. Therefore, online customers would perceive a secure web site as more useful than a non-secure web site.

H7: Perceived security control of the web site is positively related to perceived company trustworthiness

H8: Perceived security control of the web site is positively related to perceived usefulness of the web site

Customer trust in a company is an important determinant of the customer's actions regarding that company. Trust is often defined as the customer's belief in the company's benevolence, integrity, and ability (Kumar et al., 1995; Luhmann, 1979; Mayer et al., 1995; Fung and Lee, 1999; Menon et al., 1999; Stewart, 1999). The Theory of Planned Behavior (Ajzen, 1991) has shown beliefs to be significant predictors of a person's intentions and subsequent actions. Therefore, a customer's perceptions of the company's trustworthiness, a belief in its benevolence, integrity, and ability, should also affect customer intentions to return and purchase from the company. There has been some empirical research that has shown that trust increases customer intention to purchase a product from a company on the web and we expect our study to show the same (Jarvenpaa et al., 2000; Lynch et al., 2001). We also expect that company trustworthiness can increase

customer intention to return to the company's web site (Lynch et al., 2001; Gefen, 2002). This has been demonstrated extensively for offline customers (Reicheld and Sasser, 1990; Fukuyama, 1995; Doney and Cannon, 1997).

H9a: Perceived company trustworthiness is positively associated with customer intention to purchase

H9b: Perceived company trustworthiness is positively associated with customer intention to return

METHODOLOGY

In order to test our model, we conducted a field study and collected data via an online questionnaire. Subjects browsed a web site they had never visited before and searched for a particular product. Subsequently, they answered a series of questions regarding their experience on that site. The subjects were undergraduate and graduate students of a major Northeastern U.S. university. Participation was voluntary and each participant was paid \$10 and made eligible for a drawing of \$100 for completing the study, which took approximately thirty to forty-five minutes to finish.

During the sessions, each participant was first asked to indicate which web sites, out of a list of eight, they had visited in the past. This served as a screening procedure that enabled us to send each subject to a web site they had not visited before. This way, we eliminated the effects of prior experience with the company and its web site on customer trust (Doney and Cannon, 1997; Gulati, 1995). We directed each subject to a website they had not visited before and gave them a set of instructions that asked them to search for either a laptop or flight tickets for a trip to California.

The subjects searching for a laptop were asked to imagine that they had enough money to buy a laptop that would serve their needs for the next two years. They were told to use their assigned web site only and try and find what they felt was the best model for them. We required the subjects to indicate the model, price, and certain product specifications of their final laptop choice. The subjects shopping for the airline tickets were asked to imagine they were planning a vacation to California for the summer and they had enough money to pay for it. They were told to use only their assigned web site and try to find a pair of tickets that was satisfactory. They were then required to indicate the airline, flight numbers, departure and arrival dates, and ticket price of their final choice. The subject instructions for the two tasks can be seen in Appendix B. We chose to be very specific regarding the shopping tasks and required the subjects to provide us with the details of their final choices in order to ensure that the participants browsed the site extensively, becoming familiar with it, and thus increasing the validity of their survey responses. The sites used for laptops were PCPricelist (www.pcprielist.com) and BCD2000 (www.bcd2000.com). The travel site choices were Expedia (www.expedia.com) and Trip.com (www.trip.com).

Once the participants found their products and completed their responses on the instruction form, they were asked to fill out an online questionnaire. The questionnaire was set up so that the participants were required to answer all the questions before they could submit their responses, eliminating any potential missing values in the dataset. Our questionnaire used seven-point Likert items for all constructs measured. The scales were adapted from prior literature with the exception of the scale for perceived willingness to customize that included some new items added by the researchers. This was necessary

since that scale was adapted from a study examining buyer-supplier relationships in an industrial setting (Doney and Cannon, 1997). The full questionnaire with explanations on the origin of each item can be seen in Appendix A.

RESULTS

Our sample size was 212 of whom 128 were male and 84 were female. 84% of the subjects were 25 years old or younger. The subjects were divided almost equally between the four sites: 51 for BCD200, 52 for Expedia, 55 for PC-Pricelist, and 54 for Trip.com. We tested the validity of our instrument using a two-stage factor analysis using first principal components analysis (PCA) and then structural equation modeling (SEM) to test for convergent and discriminant validity (McKnight et al., 2002). We also tested the reliability of each scale using Cronbach's alpha. For both stages of our analysis we separated our constructs into three groups:

- a) perceptions about the company's characteristics: company size, company reputation, initial company trustworthiness
- b) perceptions about the company's actions: willingness to customize, information sharing, privacy control
- c) perceptions about the company's web site: usefulness, ease of use, security control

This served two purposes. First, it enabled us to perform the analysis with both methods without problems caused by insufficient sample size. Second, it allowed us to test the validity of each scale in the context of other scales measuring related constructs. This was especially important when testing discriminant validity. One would expect that testing

for discriminant validity using related constructs would be a stricter test than testing for it using unrelated constructs. In other words, it would be easier to show discriminant validity when testing the scales of unrelated constructs than related ones.

The first stage of our factor analysis was exploratory. We used SPSS v10.0 to conduct PCA with direct oblimin rotation, an appropriate method when there is reason to expect the factors to be correlated (Pedhazur and Schmelkin, 1991). We looked for any items not loading on their expected factor but cross-loading higher on other factors (Hair et al., 1998). We removed those items and reran the PCA. Figures 2,3, and 4 show the final results with the factor loadings for all the items retained as well as the reliability factors of the scales as indicated by their Cronbach's alpha scores. All final items load on their

<i>Scale Item</i>	Factor		
	Initial Trustworthiness	Size	Reputation
TRUST1	0.880		
TRUST2	0.849		
TRUST4	0.789		
TRUST6	0.810		
SIZE1		0.845	
SIZE2		0.891	
SIZE3		0.740	
REP2			-0.719
REP3			-0.759
Cronbach's Alpha	<i>0.854</i>	<i>0.770</i>	<i>0.780</i>

Structure Matrix - Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Figure 2: Factor analysis for perceptions about company characteristics

expected factors and do not cross-load higher on any other factors. All Cronbach's Alpha values are above 0.60 indicating that the scales have good reliability (Pedhazur and Schmelkin, 1991).

Scale Item	Factor		
	Willingess to Customize	Privacy Control	Information Sharing
CUSTOM1	0.860		
CUSTOM2	0.742		
CUSTOM3	0.766		
PRIVACY2		0.808	
PRIVACY4		0.860	
INFO2			0.740
INFO3			0.913
Cronbach's Alpha	<i>0.735</i>	<i>0.606</i>	<i>0.620</i>

Structure Matrix - Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Figure 3: Factor analysis for perceptions about company actions

After, refining our scales using exploratory factor analysis, we performed confirmatory factor analysis (CFA) on the new scales using structural equation modeling

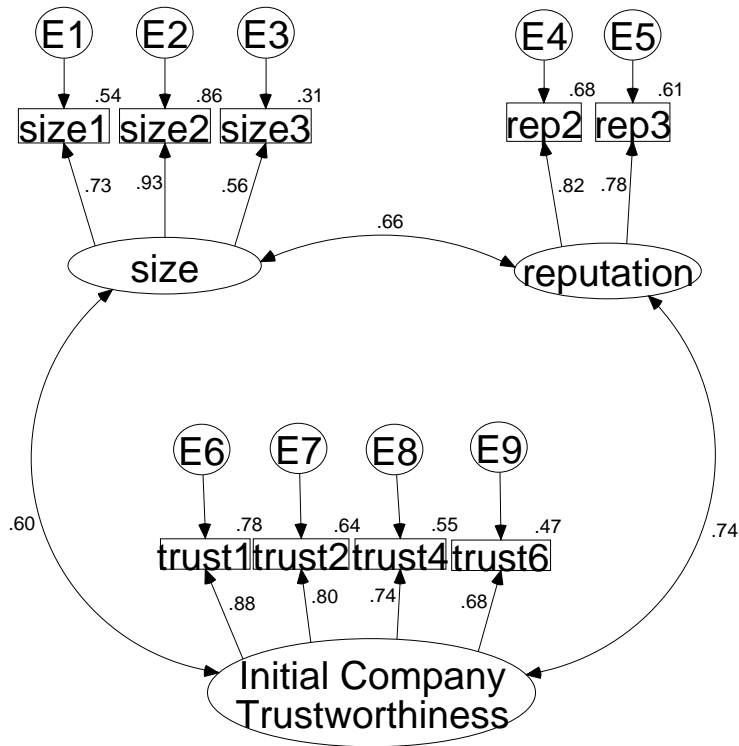
Scale Item	Factor		
	Ease of Use	Security Control	Usefulness
EASE1	0.889		
EASE2	0.835		
EASE3	0.861		
EASE4	0.878		
SECURE1		0.880	
SECURE2		0.772	
SECURE3		0.838	
SECURE4		0.755	
USEFUL1			-0.936
USEFUL2			-0.904
USEFUL3			-0.917
USEFUL4			-0.847
Cronbach's Alpha	<i>0.892</i>	<i>0.824</i>	<i>0.930</i>

Structure Matrices - Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Figure 4: Factor analysis for perceptions about company web site

to further test their convergent and discriminant validity. Using AMOS 4.0, we tested three measurement models for the same three groups of variables we used for PCA. In CFA we are looking for a measurement model that shows good fit. Convergent validity is shown by large significant correlations between each latent variable and its reflective indicators. If correlations between the latent variables themselves are significantly less than one, then that is an indication of discriminant validity between the constructs (Bagozzi and Phillips, 1982; Kline, 1998; Barki and Hartwick, 2001).

Figures 5, 6, and 7 show the results of the three measurement models. The chi-square value for all models is significant which could indicate poor model fit. This is because a significant chi-square value indicates that the observed covariance matrix and the estimated covariance matrix given by the model differ significantly. Therefore, a non-significant chi-square value would indicate that our model predicts the observed covariance matrix of the data very well and thus it has good fit. However, this statistic is very sensitive to sample size and it is often significant even for models with good fit (Jöreskog and Sörbom, 1988; Kline, 1998). The other fit indices for all three measurement models exceed the recommended threshold levels: GFI, NFI, CFI >0.90; AGFI >0.80 (McKnight et. al, 2002; Kline, 1998; Gefen et al., 2000). The only exception is the root mean square of approximation (RMSEA) that should be lower than 0.08 for good fit (Brown and Cudeck, 1992). Since the rest of the indices are well above their threshold levels and the RMSEA is at its threshold level, we find the models to have reasonably good fit.



Fit statistics:

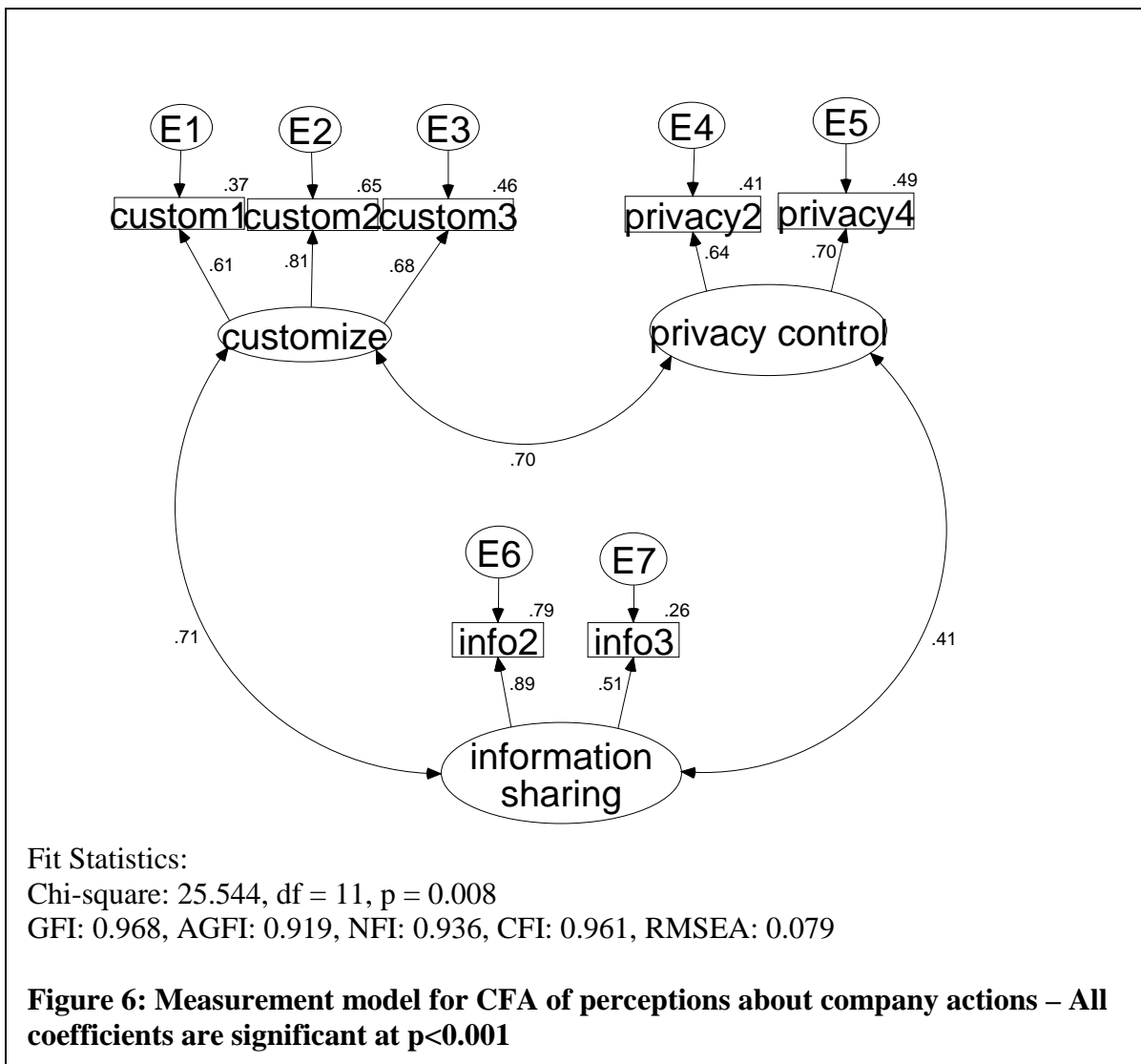
Chi-square: 57.688, df = 24, $p < 0.001$

GFI: 0.944, AGFI: 0.894, NFI: 0.939, CFI: 0.963, RMSEA: 0.082

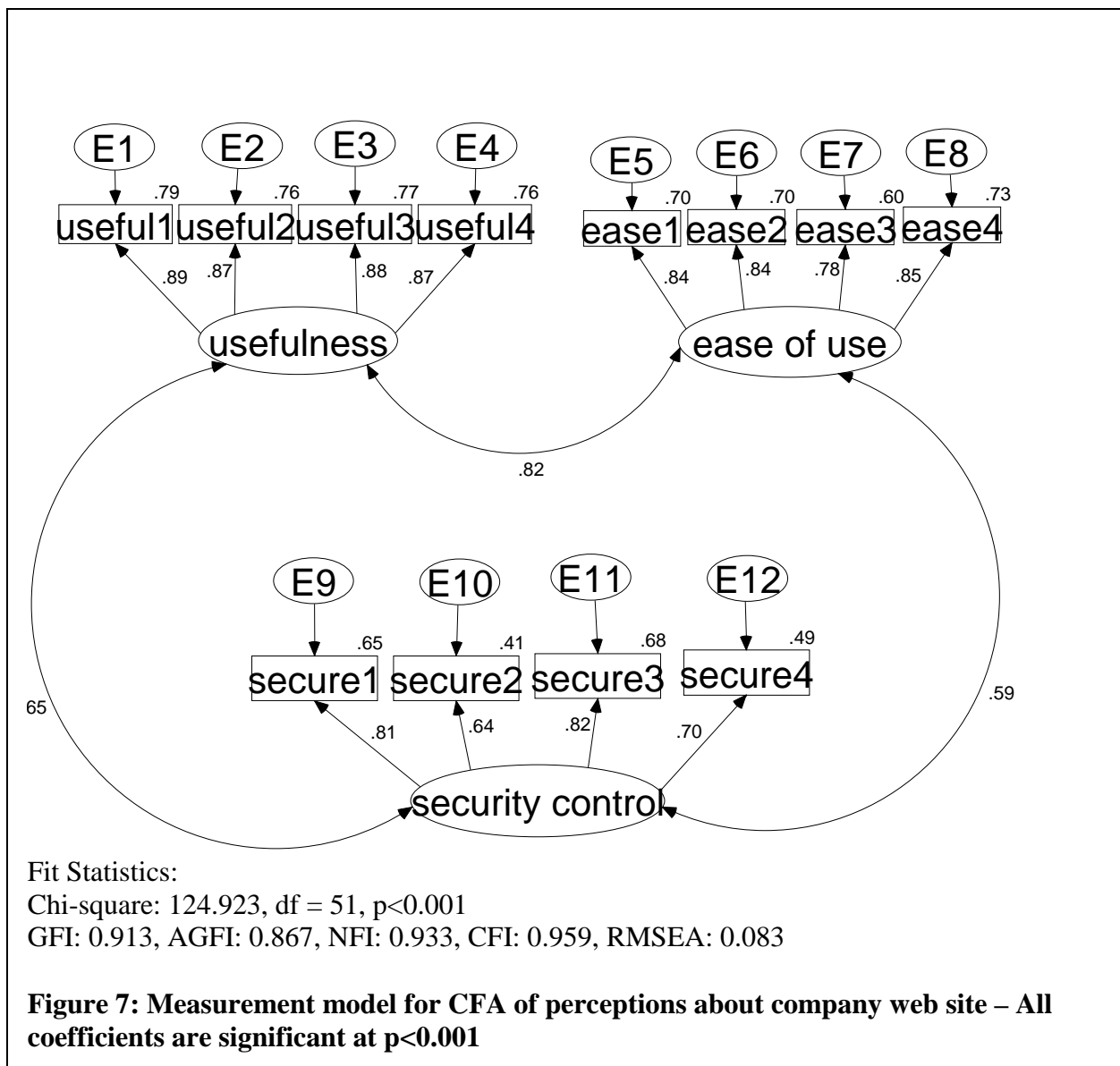
Figure 5: Measurement model for CFA of perceptions about company characteristics – All coefficients are significant at $p < 0.001$

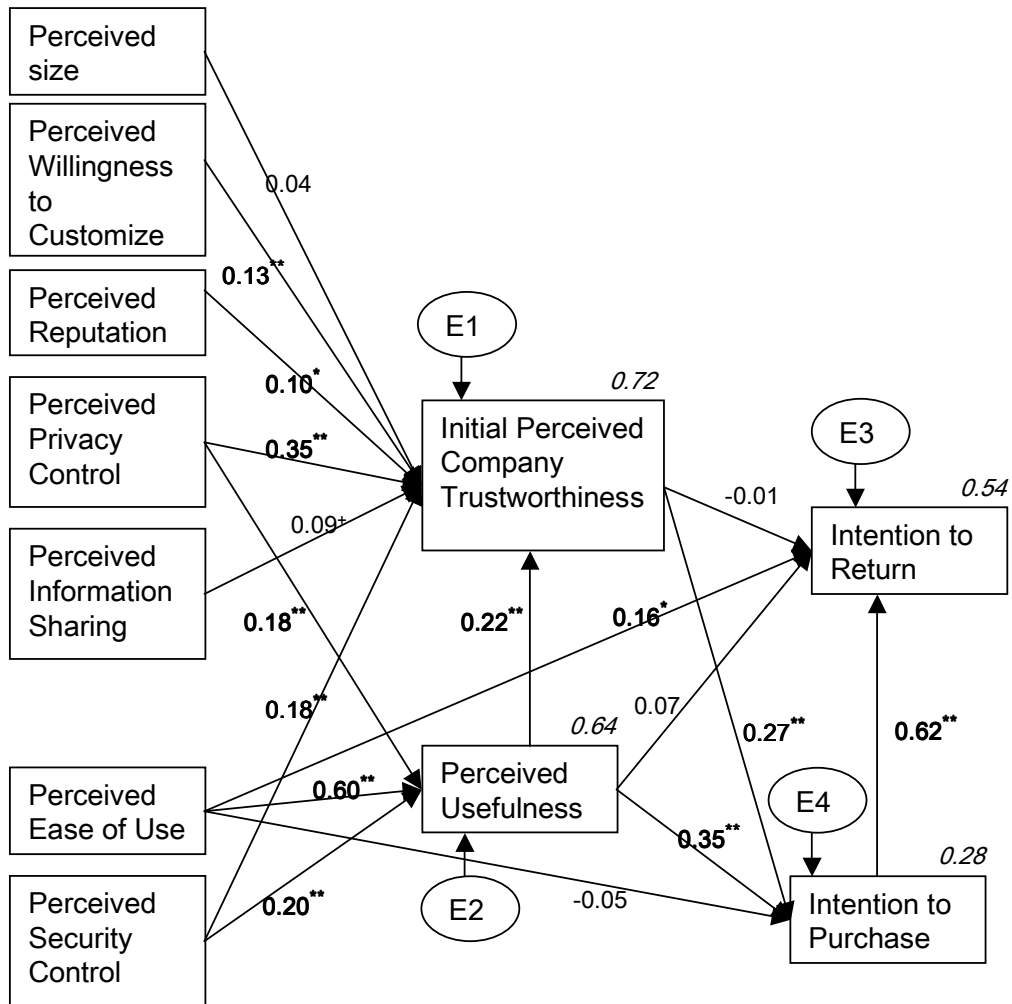
The correlations between all exogenous variables and their respective latent variables are all high and significant with values ranging from 0.51 to 0.93. This indicates good convergent validity for all the constructs. The correlations between the latent variables themselves are all significant but well below 1.0 indicating good discriminant validity (Barki and Hartwick, 2001).

Ideally, a hybrid model, combining the measurement and structural models, would be used to test the relationships between the latent variables. However, when we attempted to test such a model, AMOS 4.0 reported that the solution was not admissible due to an insufficient sample size (Arbuckle and Wothke, 1999). Therefore, we tested our model using the average values of the scales as we finalized them in our two-staged factor analysis described above. The model had reasonably good fit but the modification indices showed that the model fit would improve considerably if we added a path in the model between intention to purchase and intention to return. While additions to the model should



not be made solely based on the modification indices, it is acceptable to do so if there is good theoretical justification (Hair et al., 1998). In this case, we felt that this was the case. If a new customer intends to make a purchase from the store he/she visits for the first time, it is reasonable to assume that he/she is more likely to return to that store than a customer who would make a purchase (Morwitz, 2001). Therefore, we added the path between the two variables and reran the analysis. The results of the final model can be seen in Figure 8.





Fit Statistics:

Chi-square: 22.814, df = 17, p=0.178

GFI: 0.982, AGFI: 0.929, NFI: 0.983, CFI: 0.996, RMSEA: 0.038

Numbers in italics over dependent variables are percentages of variance explained by antecedents.

** p<0.01, * p<0.05, + p<0.1

Figure 8: Structural Model for Initial Perceived Company Trustworthiness – Standardized estimates

The model has excellent fit. The χ^2 of 22.814 with $df=17$ was not significant ($p=0.178$). The other fit indicators were also excellent with $GFI=0.982$, $AGFI=0.929$, $NFI=0.983$, and $CFI=0.996$. A value greater than 0.90, with a maximum value of 1.0, for all these indices indicates a good fit for the model (McKnight et. al, 2002; Kline, 1998; Gefen et al., 2000). The root mean square of approximation (RMSEA) value was 0.038 where a value less than 0.05 indicates excellent fit of the model.

All the antecedents to company trustworthiness had significant coefficients except perceived information sharing which was borderline significant ($p=0.051$) and perceived size which was not significant. Therefore, there was support for H1, H5b, H5c, H7, and H5d but no support for H17 or H6. The largest standardized coefficient was that for privacy control at 0.35 followed by perceived usefulness of the web site at 0.22, perceived security control at 0.18, perceived willingness to customize at 0.13, and perceived reputation at 0.10.

As we predicted, all three antecedents of perceived usefulness of the web site had significant coefficients. Consistent with past TAM research, perceived ease of use had a large standardized coefficient of 0.60. Perceived security control and information sharing had significant coefficients of 0.20 and 0.18 respectively. Therefore, hypotheses H2, H8, and H6 were supported.

Surprisingly, the coefficient between trustworthiness and intention to return was not significant, lending no support to H9b. Neither was the coefficient between perceived usefulness and intention to return indicating no support for H3a. The two antecedents of intention to return that had significant coefficients were perceived ease of use with a

standard value of 0.16 (supporting H3b) and intention to purchase with a standardized value of 0.62, as expected from the modification index of the first run of our model.

Finally, intention to purchase had two significant antecedents. Company trustworthiness had a standardized coefficient of 0.27 and perceived usefulness one of 0.35. Both hypotheses H4a and H9a were supported. The coefficient between perceived ease of use and intention to purchase was not significant indicating no support for H4b.

The structural model also shows the variance explained in the four dependent variables by their antecedents. Company trustworthiness had 72% of its variance explained by its antecedents. Perceived usefulness had 64% of its variance explained. These numbers indicate that our model was very good at capturing most of the factors that contribute to customer perceptions about the company's trustworthiness and the web site's usefulness after a first visit.

Our model also includes variables that capture a large percentage of variance in customer intention to return with 54% explained. Intention to purchase was not covered as well with only 28% of variance explained. Normally, such a number would be satisfactory for a behavioral study of this nature even though compared to the numbers of the other three variables it seems small.

DISCUSSION AND IMPLICATIONS FOR RESEARCH

Our study is one of the first to examine a large and comprehensive set of antecedents to perceived company trustworthiness online. We developed a model that incorporated variables previously proposed or tested as antecedents in smaller fragmented models or in offline research. Our results enable us to see for the first time how each of

these antecedents compare to each other in terms of the strength of their relationship with company trustworthiness.

We found that both perceptions about the company as well as perceptions about the web site can determine initial beliefs regarding the company's trustworthiness. Of all the variables we tested, the most important determinant of trustworthiness, according to our model, is perceived privacy control. Its effect was significantly larger than that of the next most important determinant, perceived usefulness of the web site. The standardized coefficient for privacy control was 0.35 and for perceived usefulness of the web site it was 0.22. Three other variables were significant antecedents of trustworthiness: perceived company reputation, perceived willingness to customize, and perceived security control. We also found that along with perceived ease of use, perceived security control and perceived information sharing were significant antecedents to the perceived usefulness of the web site. Finally, we found that customer intention to return was only determined in our model by perceived ease of use of the web site, whereas intention to purchase was determined by perceived company trustworthiness and perceived usefulness of the web site.

Our findings have important implications for researchers. We have demonstrated that both perceptions about the company as well as the web site can have an impact on initial perceptions about a company's trustworthiness. Therefore, any study on online customer trust must consider both sets of factors to be complete. While our model could not include all the factors that determine initial perceived company trustworthiness, it did account for a very large percentage of variance in it (72%) indicating that our model captured most of the important determinants of trustworthiness.

The model we used in this study also enables researchers to understand the relative importance of the antecedents of perceived company trustworthiness. For example, there have been many articles discussing how important privacy concerns are to online customers and how they can affect their online shopping intentions and behavior (Hoffman et al., 1999; Ratnasingham, 1998; Warrington et al., 2000). Our study has not only verified that empirically but it has also shown that for first time customers, it is indeed the number one determinant of how trustworthy they perceive the company to be.

The second most important determinant of trustworthiness was perceived usefulness of the web site. This is an indication that online customers do see the web site as a representation of the company itself and its resources and capabilities. It suggests that perceptions about the web site could possibly transfer to perceptions about the company itself. This is common in offline commerce where perceptions about the salesperson influence perceptions about the company (Crosby et al., 1990; Doney and Cannon, 1997; Hawes et al., 1989). Research on online customers should examine this transference effect of a web site in more detail.

Also important in determining customer perceptions of the company's trustworthiness is perceived security control. A web site that appears to provide for secure transactions inspires more trust in the company itself. This finding makes intuitive sense but the unexpected finding is that it is not as important as the company's privacy control. In fact the standardized coefficient for security control was half that of privacy control. One explanation may be that customers in the U.S. are not as concerned about the security of their transactions since federal law protects them from fraudulent use of their credit

cards. On the contrary, the law offers little protection against use of personal information by the company for marketing purposes.

A company's willingness to customize its services and products also came out significant in our model. As customers become more demanding for customized services and products they are likely to see a company's willingness to provide them as a sign of its capabilities and resources. It may also be an indication of the company's benevolence or concern towards its customers. That can increase the customer's perceptions of the company's trustworthiness. Perceived reputation was also significant though not as strong as the other determinants. This confirmed the results of Jarvenpaa et al. (2000) but has shown that while reputation is significant it is not the most important determinant of company trustworthiness. In fact, in our model, it is the least important one.

Perceived size of the company and willingness to share information with customers were not significant. Online customers may not depend so much on the company's size to determine its trustworthiness since a small company can be just as trustworthy as a large one. In the context of the recent accounting scandals of large corporations, this seems even more reasonable. The non-significant coefficient for information sharing was surprising. It may be the result of a general distrust by customers regarding any information provided to them by the company itself regarding its products.

Our results regarding the effects of perceived company trustworthiness on customer intentions were unexpected. Contrary to our predictions, trustworthiness did not influence customer intention to return. It did, however, have a positive relationship with intention to purchase. One possible explanation is that it makes sense that customers would need to feel like they can trust the company in order to make a purchase there, especially on their first

visit. However, their decision to return to the web site in the future does not depend on the company's perceived trustworthiness because simply visiting the web site again poses no risk to the customer. A different, and equally likely explanation is that this is the result of our artificial setting. Since our subjects were not actual customers but students asked to imagine they were making a purchasing decision, it might have been difficult for them to really be concerned with a possible future visit to the web site. The question of whether they would purchase or not was more immediate and therefore felt more real whereas the decision to return may have been irrelevant to the subjects who would not think about or use the web site once the study was over.

Also important for researchers is our contribution to the TAM field of research. The model contributes further to the extensive TAM research by examining two new antecedents to perceived usefulness of a commercial web site after the first visit. Consistent with past TAM research, we found that perceived ease of use was the biggest determinant of perceived usefulness. However, we also found that perceived security control of the web site and perceptions about how much information the company is willing to share through its web site were significant antecedents as well. It is important to point out that these variables have been tested here in the context of online shopping with first time customers so they cannot be easily generalized in the TAM research body. However, they do show that customers want to experience a secure site and one that provides valuable information in order to perceive it as a useful one. As TAM is applied more and more in the context of B2C electronic commerce, it is necessary to expand the model with variables that are specific to that environment. Web site security and

information availability are two such variables and can now be added as antecedents in the traditional TAM framework when used in web-based commerce studies.

The results on the impact of the TAM variables on customer intentions were mixed. Perceived usefulness was not a significant determinant of intention to return but perceived ease of use was. Intention to purchase had the opposite results. According to our results, when customers are considering making a purchase they want the web site to be as useful as possible so that their purchase will be a successful one. However, when they are considering whether they will visit the web site in the future, they are more concerned with how easy it is to use since that could make future interactions with the site more efficient. Once again, this may be the result of our artificial setting. Since our subjects were not actual customers, their feelings towards returning to the web site may have not been strong enough to produce the expected results. Our findings here are certainly not conclusive and they add to the mixed results from prior studies (Moon and Kim, 2001; Chen et al., 2002; Koufaris, 2002). They highlight the need for more research to clarify how the TAM variables affect customer intention to return and purchase.

IMPLICATIONS FOR PRACTICE

Our results have important implications for online companies that seek to retain new customers and increase their sales. We have empirically proven what is commonly assumed: that online customers really value their privacy. Online companies need to make it clear that they do as well, through posted privacy statements and clearly specified uses of personal information. New customers will judge a company's trustworthiness first by its commitment to respect their privacy. Furthermore, our findings indicate that online

companies should heed the call for customization of products and services. Online customers expect more tailor-made products and information and the companies that provide them appear trustworthier in their eyes perhaps because they appear to have more resources and capabilities than companies who do not customize.

In addition, online companies need to concentrate on the quality of their web site. A site that is useful can lead new customers to trust the company that runs it. Our findings have shown three ways companies can make a web site more useful and therefore increase their trustworthiness. First, web sites need to be easy to use without complex navigation schemes and disorganized layouts. Second, they need to be secure. When customers feel that a web site is secure, they trust the company more. Also, use of encryption mechanisms, mainly through the Secure Sockets Layer Protocol, as well as assurances that the company will safeguard the financial information of customers can increase the perceived usefulness of the site, which also increases the company's trustworthiness. Third, companies need to provide substantial information to help customers with their purchase decisions. Especially important is information regarding its products and services that is provided by third parties, such as customer reviews.

What makes customers buy on their first visit? Our results show that the company's trustworthiness and the usefulness of the web site are very important for the customers' decision to buy. What makes customers return after their first visit? An easy to use web site can be a very big incentive to return. As customers get frustrated with complicated web sites, companies can achieve a competitive advantage by making theirs simple. Yahoo! and Google proved this by resisting the trend to fill up their sites with bells and whistles and

instead kept it simple and easy to use. Today they are two of the most popular sites on the web.

LIMITATIONS AND FUTURE RESEARCH

Our study is not without limitations. Our sample consisted of students that may not be representative of the general online customer population. More research should test our model with a more varied population. Also, our subjects were not actual customers but simulated ones. They were given an imaginary shopping task that could have influenced their perceptions and decisions in different ways than if they were actual customers. This may be a reason for the surprising results regarding the antecedents of intention to return in our model. While using students to simulate customers is not ideal, it is common in a lot of research in the area of online consumer behavior (e.g. Jarvenpaa et al., 2000; Koufaris, 2002). Furthermore, university students are often themselves online customers.

Also, some of our scales had only two items in the final model. Once again, this is not ideal but we feel that a two-item scale can measure a construct well, as has been done in past research (Jarvenpaa et al., 2000). This is also a call for the development of better instruments in the area of online customer trust since, although our scales were adapted from past research, they did not prove as robust as would have been desirable. Although, there have been some studies that have proposed and empirically validated measurement instruments for customer trust (McKnight et al., 2002; Bhattacharjee, 2002), only one that has done so for the large number of antecedents to trust online (Cheung and Lee, 2001).

A model on trust should ideally include certain control variables. Most important of those are customer trust propensity and customer trust in online shopping in general

(McKnight et al., 2002; Cheung and Lee, 2001; Lee and Turban, 2001). Indeed, we measured both of those variables as well as the customers' individual web skills. We believe that all three of those variables would act as moderators in our model. The higher a customer's trust propensity, for example, the stronger the relationship between his/her trust beliefs and its antecedents. The same would apply in the case of trust in online shopping in general as well as web skills, the latter dealing specifically with the relationships between web site perceptions and trust beliefs. Even though we measured these variables, we could not test them statistically in our model because SEM still has no practical and widely accepted method of testing moderating variables. Therefore, we did not include the three variables in our model.

Our study examined initial perceptions of company trustworthiness and did not look at how trust develops over time through repeated experiences with a company. There is an obvious need for further longitudinal research to examine the temporal nature of customer trust. Also, future work can determine how web site perceptions influence company perceptions such as reputation and size. A lot of research on online trust assumes that the transference of trust from salesperson to company also applies when the salesperson is replaced by a web site. This assumption needs to be empirically validated. Furthermore, there are many opportunities for further research to determine how the antecedents of trust in our model are determined. Are online privacy statements enough? Do third party seals work? How does a web site project an image of a reputable company? Experimental and field studies can examine how company web sites can increase the antecedents of trust.

As electronic commerce becomes more and more common in our lives it is necessary for researchers and companies to understand the factors that influence customer behavior online. One such factor is customer trust. We conducted an empirical study to determine how new customers of online companies determine the trustworthiness of a company they have not had any past experience with. Our results have shown how both company and web site characteristics can play a role and how trustworthiness itself can affect customer intentions to return to and purchase from a web site.

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APPENDIX A

Questionnaire

Perceived Reputation:

REP1: This company has a bad reputation in the market^{DJR}

REP2: This company has a reputation for being honest^{DJ}

REP3: This company is known to be concerned about customers^{DJ}

Perceived Size:

SIZE1: This company is a very large company^{DJ}

SIZE2: This company is one of the industry's biggest suppliers on the web^{DJ}

SIZE3: This company is a small player in the market^{DJR}

Perceived Willingness to Customize:

CUSTOM1: Just for me, this company is willing to customize its products^D

CUSTOM2: This company will respond to my individual needs and desires^N

CUSTOM3: This company is willing to provide customized services to its customers^N

Perceived Information Sharing:

INFO1: This company will share confidential information to help me^D

INFO2: This company shares proprietary information about products and services with me^D

INFO3: This company provides third party reviews about its products and services^N

Perceived Privacy Control:

PRIVACY1: This company will sell my personal information to third parties without my permission^C

PRIVACY2: This company is concerned about consumer privacy^C

PRIVACY3: This company will not divulge consumer personal data to other parties^C

PRIVACY4: I feel safe about the privacy control of this company^C

Initial Perceived Company Trustworthiness:

TRUST1: This company is trustworthy^{DJ}

TRUST2: I trust this company keeps my best interests in mind^{DJ}

TRUST3: I find it necessary to be cautious with this company^{DJR}

TRUST4: This company will keep promises it makes to me^D

TRUST5: This company will not always be honest with me^{DR}

TRUST6: I believe in the information that this vendor provides me^D

TRUST7: This company is genuinely concerned about me^D

TRUST8: This company wants to be known as one who keeps promises and commitments^J

Perceived Usefulness:

USEFUL1: Using this web site can improve my shopping performance^K

USEFUL2: Using this web site can increase my shopping productivity^K

USEFUL3: Using this web site can increase my shopping effectiveness^K

USEFUL4: I find using this web site useful^K

Perceived Ease of Use:

EASE1: Learning to use this web site would be easy for me^K

EASE2: My interaction with this web site is clear and understandable^K

EASE3: It would be easy for me to become skillful at using this web site^K

EASE4: I find this web site easy to use^K

Perceived Security Control:

SECURE1: The web site implements security measures to protect its online shoppers^C

SECURE2: The web site has the ability to verify online shoppers' identity for security purposes^C

SECURE3: The web site usually ensures that transactional information is protected from being accidentally altered or destroyed during transmission on the Internet^C

SECURE4: I feel secure about the electronic payment system of the web site^C

Intention to Return:

RETURN: If you needed to purchase a similar product in the future, how likely is it that you would return to this web site?^K

Intention to Purchase:

PURCHASE: If you actually had the money, how likely is it that you would buy the product from *this* web site?^K

^D Adapted from Doney and Cannon (1997)

^J Adapted from Jarvenpaa et al. (1999)

^C Adapted from Cheung and Lee (2001)

^K Adapted from Koufaris (2002)

^N New item

^R Reversed item

~~ITEM~~ – Item not included in final scale calculation

APPENDIX B

Instructions for Subjects – Travel Sites

Imagine that you are planning a vacation to California for the summer. You can assume that you have enough money to pay for such a vacation. Use the online travel site you have been assigned to research possible flights to California during the summer break. **DO NOT ACTUALLY BUY** anything from the travel agency. You will **NOT** be reimbursed for any purchases that you make. You are only required to research the information available and see if you can find a flight that you like. Do not research information at any other online travel site. Once you have found a flight that you are satisfied with, please fill out the following information and raise your hand to let the researchers know that you are ready to proceed to the second part of the study:

Flight to California

Airline _____ Flight# _____

Departure date _____

Return flight from California

Airline _____ Flight# _____

Return date _____

Round trip fare _____

Instructions for subjects – Laptop sites

Imagine that you are planning to purchase a laptop computer for your personal use. This computer should serve all your anticipated needs for at least the next 2 years. You can assume that you have enough money to pay for a laptop. Use the online store you have been assigned to research possible laptops you would consider buying. **DO NOT ACTUALLY BUY** anything from the online store. You will **NOT** be reimbursed for any purchases that you make. You are only required to research the information available and see if you can find a laptop that you like. Do not research information at any other online store. Once you have found a laptop that you are satisfied with, please fill out the following information and raise your hand to let the researchers know that you are ready to proceed to the second part of the study:

Laptop Model Name and Number _____

Processor Type _____

Memory (RAM) size _____

Hard Drive size _____

Operating System

Check which of the following features are available in the laptop you have selected

(Check all that apply):

Floppy Drive

Removable Media:

CD-ROM

CD-RW

DVD

CDRW/DVD Combo Drive (

Other (

Total System Price _____