

## TRUST AND TAM IN ONLINE SHOPPING: AN INTEGRATED MODEL<sup>1</sup>

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### Abstract

*A separate and distinct interaction with both the actual e-vendor and with its IT Web site interface is at the heart of online shopping. Previous research has established, accordingly, that online purchase intentions are the product of both consumer assessments of the IT itself—specifically its perceived usefulness and ease-of-use (TAM)—and trust in the e-vendor. But these perspectives have been examined independently by IS researchers. Integrating these two perspectives and examining the factors that build online trust in an environment that lacks the typical human interaction that often leads to trust in other circumstances advances our understanding of these constructs and their linkages to behavior.*

*Our research on experienced repeat online shoppers shows that consumer trust is as important to online commerce as the widely accepted TAM use-antecedents, perceived usefulness and perceived ease of use. Together these variable sets explain a considerable proportion of variance in intended behavior. The study also provides evidence that online trust is built through (1) a belief that the vendor has nothing to gain by cheating, (2) a belief that there are safety mechanisms built into the Web site, and (3) by having a typical interface, (4) one that is, moreover, easy to use.*

**Keywords:** E-commerce, trust, TAM, familiarity, cognition-based trust, trust building processes, Net-enhanced B2C systems

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## Introduction

Retaining customers is a financial imperative for electronic vendors (e-vendors), especially as attracting new customers is considerably more expensive than for comparable, traditional, bricks-and-mortar stores (Reichheld and Schefter 2000). What, then, makes customers return to an e-vendor? Research has used many avenues to look at this, including explanations based on trust (Gefen 2000; Jarvenpaa et al. 1998; Jarvenpaa and Tractinsky 1999; McKnight et al. 2000), technology (e.g., Lederer et al. 2000; Lee et al. 2001), and, to a lesser extent, on individual differences such as demographics and lifestyle (e.g., Bellman et al. 1999).

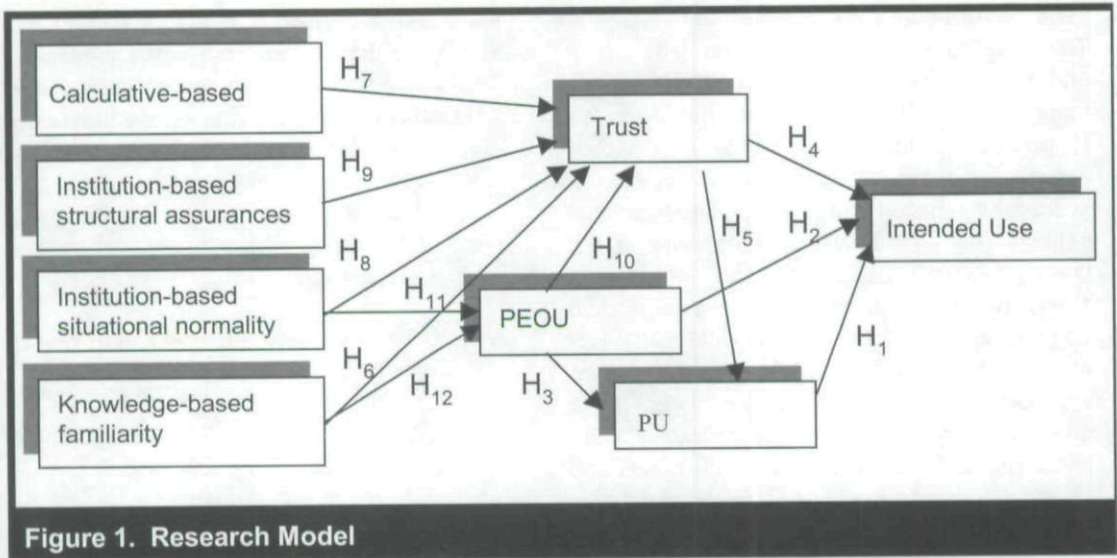
Recognizing that a vital key to retaining these customers is maintaining their trust in the e-vendor (Reichheld and Schefter 2000) and that trust is at the heart of relationships of all kinds (Mishra and Morrissey 1990; Morgan and Hunt 1994), this study examines customer trust as a primary reason for why customers return to an e-vendor. However, unlike the vendor-client relationship in traditional business settings, the primary interface with an e-vendor is an information technology (IT), a Web site. Recognizing the dual nature of this interaction, our study incorporates the perceived technological attributes of the IT as an additional set of explanatory variables in understanding why customers return to an e-vendor.

This inseparable but complementary aspect of an e-vendor's Web site—an IT, on the one hand, and a vendor with whom the customer conducts business, on the other—is reflected in the empirical research that identifies these as two antecedents in the nomological network leading to consumer behaviors like making a purchase, namely (1) the technological attributes of the Web site, and (2) consumer trust in the e-vendor. The first school of thought considers a Web site to be an information technology, and as such argues that

the same use-antecedents that apply across IT, namely perceived usefulness and perceived ease-of-use as identified by TAM (Davis 1989; Davis et al. 1989), apply here as well (Gefen and Straub 2000; Lederer et al. 2000; Lee et al. 2001). Even though TAM is the dominant model, other studies in this vein have extended TAM with constructs such as computer playfulness (e.g., Moon and Kim 2001), cognitive absorption (e.g., Agarwal and Karahanna 2000), and product involvement and perceived enjoyment (Koufaris 2002). Still other research has focused on Web design and has developed models and measures of perceived Web quality and usability (e.g., Agarwal and Venkatesh 2002; Aladwani and Palvia 2002; Loiacono 2000; Palmer 2002; Ranganathan and Ganapathy 2002; Torkzadeh and Dhillon 2002) as predictors of consumer acceptance. This stream of research identified a wide range of factors including download delay, navigability, information content, interactivity, response time, Web site personalization, Internet shipping errors, convenience, customer relations, informational fit to task, intuitiveness, and visual appeal.

The second school of thought focuses on online purchase as an interaction with a vendor, where, extrapolating from other business transactions (Fukuyama 1995; Morgan and Hunt 1994), trust should be *the* defining attribute of the relationship, determining its very existence and nature, even beyond economic factors such as cheaper price (Reichheld and Schefter 2000). This is especially true when an activity involves social uncertainty and risk (Fukuyama 1995; Luhmann 1979). Social uncertainty and risk with an e-vendor are typically high because the behavior of an e-vendor cannot be guaranteed or monitored (Reichheld and Schefter 2000). Similarly, several other studies in this school have focused on trust as a reducer of risk among inexperienced online customers and as a reducer of social uncertainty (e.g., Gefen 2000; Jarvenpaa and Tractinsky 1999; Jarvenpaa et al. 2000), on familiarity and trust (e.g., Gefen 2000), on seals of approval or privacy policy statements (McKnight et al. 2000; Palmer et al. 2000), and on affiliations with respectable companies (e.g., Stewart 1999). Accordingly, the first





objective of this research is to integrate trust-based antecedents and the technological attribute-based antecedents found in TAM into a theoretical model.

Trust is generally crucial in many of the economic activities that can involve undesirable opportunistic behavior (Fukuyama 1995; Luhmann 1979; Williamson 1985). This is even more the case with e-commerce because the limited Web interface does not allow consumers to judge whether a vendor is trustworthy as in a typical, face-to-face interaction (Reichheld and Scheffer 2000). Moreover, trust is also an issue because vendors can easily take advantage of online consumers (Jarvenpaa and Todd 1997; Jarvenpaa and Tractinsky 1999). The recent case of Amazon.com sharing its database of customer activity (Rosenrance 2000a, 2000b) is a good demonstration of the kind of undesirable, yet legal, opportunistic behavior to which online customers are exposed, and hence the need for maintaining and constantly rebuilding their trust. *Examining how customer trust can be maintained in an e-vendor* is, accordingly, the second primary objective of this study.

## Literature Review and Research Model

Given that a Web site is both an IT and the channel through which consumers interact with an e-vendor, technology-based and trust-based antecedents should work together to influence the decision to partake in e-commerce with a particular e-vendor. This section elaborates on the theory base and derives the hypotheses. The research model is depicted in Figure 1.

### TAM and E-Commerce

A Web site is, in essence, an information technology. As such, online purchase intentions should be explained in part by the technology acceptance model, TAM (Davis 1989; Davis et al. 1989). This model is at present a preeminent theory of technology acceptance in IS research. Numerous empirical tests have shown that TAM is a parsimonious and robust model of technology acceptance behaviors in a wide variety of IT (for a summary of this literature, see Gefen and Straub

2000), across both levels of expertise (Taylor and Todd 1995b), and across countries (e.g., Rose and Straub 1998; Straub et al. 1997). Even though considerable TAM research has examined IT acceptance in the context of work-related activity, the theory is applicable and has been successfully applied to diverse non-organizational settings (e.g., Agarwal and Karahanna 2000; Davis et al. 1989, 1992; Mathieson 1991; Sjazna 1994), including e-commerce (Gefen and Straub 2000; Gefen et al. 2000; Lederer et al. 2000; Lee et al. 2001). According to TAM, the intention to voluntarily accept, that is to use, a new IT is determined by two beliefs dealing with (1) the perceived usefulness (PU) of using the new IT and (2) the perceived ease of use (PEOU) of the new IT. PU is a measure of the individual's subjective assessment of the utility offered by the new IT in a specific task-related context.<sup>2</sup> PEOU is an indicator of the cognitive effort needed to learn and to utilize the new IT. TAM has been discussed in great detail in previous research (e.g., Gefen and Straub 2000; Venkatesh and Davis 2000).<sup>3, 4</sup>

<sup>2</sup>Even though PU was originally defined with respect to one's job performance (Davis 1989), PU refers to the performance of any generic task in non-organizational settings. This view is consistent with a number of studies such as Agarwal and Karahanna (2000), Davis et al. (1992), Mathieson (1991), Rose and Straub (1998), Sjazna (1994; 1996), Taylor and Todd (1995a), and others which measured PU in settings other than an organization.

<sup>3</sup>Dropping attitude from the original TAM model is entirely consistent with most TAM-based research. Attitude, in fact, is not part of Davis' (1989) own, more concise, version of TAM.

<sup>4</sup>Recent extensions of TAM (e.g., TAM2, see Venkatesh and Davis 2000) include social norms. However, the effect of social norms on perceptions and behavior is likely to be greater in the absence of any experiential data (Karahanna et al. 1999; Venkatesh and Davis 2000). In such cases, potential consumers of an e-vendor Web site are likely to look to their social environment and the opinions of trusted others for evaluative information and cues to increase their familiarity with the target site and to assess its trustworthiness. For initial purchases, it is likely that the social normative aspects weigh heavily on one's assessment of trust and on purchasing intentions. However, as consumers gain experience with the e-vendor, cognitive considerations based on first hand experience gain prominence and social normative considerations lose significance (Kar-

As shown in previous research (Gefen et al. 2000), we hypothesize that paths predicted by TAM apply also to e-commerce. As in previous TAM studies, the underlying logic is that IT users (in this case, online customers using a Web site) react rationally when they elect to use an IT. The more useful and easy to use is the Web site in enabling the users to accomplish their tasks, the more it will be used:

*H<sub>1</sub>: PU will positively affect intended use of a business-to-consumer (B2C) Web site.*

*H<sub>2</sub>: PEOU will positively affect intended use of a business-to-consumer (B2C) Web site.*

*H<sub>3</sub>: PEOU will positively affect PU of a business-to-consumer (B2C) Web site.*

## **The Importance of Trust in E-Commerce**

An e-vendor is, of course, more than its IT interface. It is a business entity with whom the customers are economically engaged. Trust is crucial in many such transactional, buyer-seller relationships, especially those containing an element of risk, including interacting with an e-vendor (Reichheld and Scheffer 2000). Trust is an expectation that others one chooses to trust will not behave opportunistically by taking advantage of the situation. It is one's belief that the other party will behave in a dependable (Kumar et al. 1995a), ethical (Hosmer 1995), and socially appropriate manner (Zucker 1986). Trust deals with the belief that the trusted party will fulfill its commitments (Luhmann 1979; Rotter 1971) despite the trusting party's dependence and vulnerability (Meyer and Goes 1988; Rousseau et al. 1998). Accordingly, trust is vital in many business relationships (Dasgupta 1988; Fukuyama 1995; Gambetta 1988; Gulati 1995; Kumar et al. 1995b; Moorman et al. 1992; Williamson 1985) and actually deter-

ahanna et al. 1999). Since the focus of the study is on consumers with prior experience with the online vendor, social norms were excluded from the model.



mines the nature of many businesses and the social order (Blau 1964; Fukuyama 1995; Luhmann 1979).<sup>5</sup>

Because of the absence of proven guarantees that the e-vendor will not engage in harmful opportunistic behaviors, trust is also a critical aspect of e-commerce (Gefen 2000; Kollock 1999; Reichheld and Scheffer 2000). Such behaviors include unfair pricing, conveying inaccurate information, violations of privacy, unauthorized use of credit card information, and unauthorized tracking of transactions. Indeed, some researchers have suggested that online customers generally stay away from e-vendors whom they do not trust (Jarvenpaa and Tractinsky 1999; Reichheld and Scheffer 2000).

Trust is a central aspect in many economic transactions because of a deep-seated human need to understand the *social* surroundings, that is, to identify what, when, why, and how others behave. Needless to say, comprehending the social environment is remarkably complicated because people, by their very nature, are free agents and as such their behavior is not necessarily rational or predictable. The combination of such overpowering social complexity with the inherent need to understand others leads people to adopt an assortment of social complexity reduction strategies. When a social environment cannot be regulated through rules and customs, people adopt trust as a central social complexity reduction strategy (Luhmann 1979). By trusting, people reduce their perceived social complexity through a belief that may, at times, be irrational, and that rules out the risk of undesirable but possible future behaviors on the part of the trusted party (Luhmann 1979).

The same argument also holds with the Internet. Lacking effective regulation, consumers have to trust the e-vendor from which they purchase,

assuming, in reality, that the e-vendor will be ethical and behave in a socially suitable manner, or else the overwhelming social complexity will cause them to avoid purchasing (Gefen 2000). Previous research supports this relationship, showing that trust increases purchase intentions both directly (Gefen 2000), as it does in other buyer-seller relationships (Ganesan 1994), and through reduced perceived risk (Jarvenpaa and Tractinsky 1999; Kollock 1999). In the words of Reichheld and Scheffer (2000): "Price does not rule the Web; trust does" (p. 107).

## What Is Trust in E-Commerce?

Trust has been conceptualized by previous research in a variety of ways, both theoretically and operationally, and researchers have long acknowledged the confusion in the field (e.g., Lewis and Weigert 1985b; McKnight et al. 1998; 2002; Shapiro 1987). Table 1 provides a summary of prior conceptualizations of trust along with the measures used to operationalize the construct. As the table shows, researchers view trust as (1) a set of *specific beliefs* dealing primarily with the integrity, benevolence, and ability of another party (Doney and Cannon 1997; Ganesan 1994; Gefen and Silver 1999; Giffin 1967; Larzelere and Huston 1980), (2) a *general belief* that another party can be trusted (Gefen 2000; Hosmer 1995; Moorman et al. 1992; Zucker 1986), sometimes also called *trusting intentions* (McKnight et al. 1998) or "the 'willingness' of a party to be vulnerable to the actions of another" (Mayer et al. 1995, p. 712), (3) *affect* reflected in "feelings" of confidence and security in the caring response" of the other party (Rempel et al. 1985, p. 96), or (4) a combination of these elements.

Some researchers have combined the first two conceptualizations into one construct (Doney and Cannon 1997). Other researchers have split the first two conceptualizations, declaring the specific beliefs as antecedents to the general belief (Jarvenpaa and Tractinsky 1999; Mayer and Davis 1999; Mayer et al. 1995), sometimes naming the specific process beliefs as *trustworthiness* (Jarvenpaa and Tractinsky 1999) and sometimes

<sup>5</sup>This study examines trust as a social construct. Accordingly, trust relates to other people and organizations. Trust in a technology, while dealing with capability and reliability, lacks the essential elements of integrity and benevolence and as such is excluded from the definition in this study.

**Table 1. Previous Conceptualizations of Trust**

| Study                     | Trust Conceptualization   | Trust Object               | Measures  |
|---------------------------|---|----------------------------|---|
| Anderson and Narus (1990) | Expectations about the behavior of the other company.   | Business relationships     | Overall trust   |
| Butler (1991)             | Two sub-constructs:<br>1. Attitude affective trust<br>2. Cognitive specific trust   | Organizational             | Measure of overall trust  |
| Crosby et al. (1990)      | Confidence that the trusted party will behave in the interest of the customer.  | Buyer-seller relationships | Empirical: overall trust, caring, integrity   |
| Doney and Cannon (1997)   | Perceived credibility (integrity) and benevolence.  | Buyer-seller relationships | Honesty, caring, trustworthy  |
| Doney et al. (1998)       | Willingness to rely and be dependable upon another. This encompasses trust as a set of beliefs (Fukuyama 1995; Larzelere and Huston 1980; Rotter 1971) and willingness to behave (Luhmann 1979; McAllister 1995). | Culture                    | Conceptual  |
| Fukuyama (1995)           | Expectations of regular, honest, cooperative behavior.  | Business relationships     | Conceptual  |
| Gambetta (1988)           | Subjective probability that the trusted party will behave in a way that warrants cooperation with them.   | Conceptual                 | Conceptual  |
| Ganesan (1994)            | Willingness to rely on a partner in whom one has confidence based on belief in that party's credibility (integrity and ability) and benevolence.  | Buyer-seller relationships | Empirical:<br>1. Credibility (ability and reliability/honesty)<br>2. Benevolence      |
| Gefen (2000)              | Willingness to depend.  | e-commerce                 | Empirical: overall trust  |
| Gefen (2002a)             | Willingness to depend.  | e-commerce                 | Empirical: overall trust  |
| Gefen (2002b)             | Willingness to depend based on beliefs in ability, benevolence, and integrity.  | Business relationships     | Empirical: a single scale with items dealing with ability, integrity, and benevolence |
| Gefen and Silver (1999)   | Willingness to depend based on beliefs in ability, benevolence, and integrity.  | Business relationships     | Empirical: a single scale with items dealing with ability, integrity, and benevolence |
| Giffin (1967)             | Reliance on the characteristics of another in a risky situation.  | Literature review          | Conceptual: integrity, benevolence, and ability                                       |



**Table 1. Previous Conceptualizations of Trust (Continued)**

| Study                           | Trust Conceptualization   | Trust Object                                   | Measures  |
|---------------------------------|---|--|---|
| Gulati (1995)                   | Expectations that alleviate fear that the other party will be opportunistic.  | Business relationships                         | Empirical: indirect measurement   |
| Hart and Saunders (1997)        | Confidence about the behavior and goodwill of another.  | Business relationships                         | Conceptual  |
| Hosmer (1995)                   | The expectation of ethical behavior, related to the willingness to rely on the trusted party based on optimistic expectations that the trusted party will behave in a morally correct manner. | Literature review                              | Conceptual  |
| Jarvenpaa et al. (1998)         | Willingness to be vulnerable based on expectations that the other party will behave appropriately even without monitoring.  | Online student teams                           | Empirical: overall trust that is built through beliefs in ability, benevolence, and integrity                   |
| Jarvenpaa and Tractinsky (1999) | Willingness to rely when there is vulnerability.  | e-commerce                                     | Empirical: overall trust combined with integrity, and caring  |
| Jarvenpaa et al. (2000)         | A governance mechanism in buyer-seller relationships.   | e-commerce                                     | Empirical: overall trust combined with integrity, and caring  |
| Korsgaard et al. (1995)         | Confidence in the goodwill of the leader, meaning honesty, sincerity, and being unbiased.   | Interpersonal trust in organizational settings | Single item   |
| Kumar (1996)                    | Belief in dependability and honesty.  | Business relationships                         | Conceptual  |
| Kumar et al. (1995a)            | Honesty and benevolence.  | Business relationships                         | Empirical:<br>1. Trust in honesty<br>2. Trust in benevolence<br>Separate from a willingness to invest construct |
| Kumar et al. (1995b)            | Honesty and benevolence.  | Business relationships                         | Empirical:<br>1. Trust in honesty<br>2. Trust in benevolence<br>Separate from a willingness to invest construct |
| Larzelere and Huston (1980)     | Benevolence and honesty.  | Interpersonal trust in close relationships     | Integrity and benevolence   |

**Table 1. Previous Conceptualizations of Trust (Continued)**

| Study                  | Trust Conceptualization  | Trust Object                                   | Measures  |
|------------------------|--|--|---|
| Luhmann (1988)         | Willingness to behave based on expectation about the behavior of others when considering the risk involved.                                | Social life                                    | Conceptual  |
| Mayer et al. (1995)    | A willingness to be vulnerable to another party based on a separate set of trustworthiness beliefs in ability, benevolence, and integrity. | Interpersonal trust in organizational settings | Conceptual  |
| Mayer and Davis (1999) | Willingness to be vulnerable.  | Interpersonal trust in organizational settings | Empirical: overall trust which is separate from trustworthiness that is defined as ability, benevolence, and integrity  |
| McAllister (1995)      | Willingness to depend upon another.  | Interpersonal trust in organizational settings | Empirical:<br>1. Cognitive-based trust (ability, trust, monitor)<br>2. Affect-based trust (share ideas and feelings, emotional investment)  |
| McKnight et al. (1998) | Trusting beliefs dealing with benevolence, competence, honesty, and predictability that lead to a trusting intention.                      | Interpersonal trust in organizational settings | Conceptual  |
| McKnight et al. (2002) | Based on McKnight et al. (1998).   | e-commerce                                     | Empirical:<br>1. Trusting beliefs dealing with benevolence, competence, and integrity<br>2. Resulting in trusting intentions measuring willingness aspects to interact with an e-vendor |
| Mishra (1996)          | Willingness to be vulnerable based on belief that the other party is competent, open, concerned, and reliable.                             | Interpersonal trust in organizational settings | Conceptual  |



**Table 1. Previous Conceptualizations of Trust (Continued)**

| Study                       | Trust Conceptualization   | Trust Object                                   | Measures   |
|-----------------------------|---|--|--|
| Mishra and Morrissey (1990) | Two definitions:<br>1. Integrity, character, ability of others<br>2. Confidence and support                               | Interpersonal trust in organizational settings | Empirical:<br>1. Integrity, character, ability of others<br>2. Confidence and support  |
| Moorman et al. (1992)       | Willingness to depend. It is both a belief about the other party and a behavioral intention.                              | Business relationships                         | Empirical: overall trust   |
| Morgan and Hunt (1994)      | Willingness to depend on a party in whom one has confidence. Same as Moorman et al. (1992).                               | Business relationships                         | Empirical: overall trust and integrity   |
| Pavlou and Gefen (2002)     | Willingness to depend.  | Online auctions                                | Empirical: one factor of being reliable, honest, and trustworthy   |
| Ramaswami et al. (1997)     | Faith that the trusted party will continue to be responsive.  | Interpersonal trust in organizational settings | Empirical: overall trust   |
| Rempel et al. (1985)        | Willingness to depend based on a generalized expectation/confidence about what others will do.                            | Interpersonal trust in close relationships     | Empirical: overall trust, benevolence, predictability, and honesty   |
| Rotter (1971)               | The expectation that one's word or promise can be relied upon.  | Social life                                    | Conceptual   |
| Rousseau et al. (1998)      | Willingness to be vulnerable based on confidence in positive expectations about the intentions and behavior of the other. | Literature review                              | Conceptual   |
| Schurr and Ozanne (1985)    | Belief that promises are reliable and obligations will be fulfilled.  | Buyer-seller relationships                     | Trust was manipulated in an experiment. The manipulation check dealt with trustworthiness combined with fairness, dependability, and openness. |
| Zaheer et al. (1998)        | The expectation that an actor will<br>1. Fulfill its obligations<br>2. Be predictable<br>3. Be fair and not opportunistic | Buyer-supplier Relationships.                  | Empirical: fairness, non-opportunistic, keep promises, and is trustworthy  |
| Zand (1972)                 | Trusting behavior is actions that increase one's vulnerability.   | Experiment with business executives            | Trust was manipulated in an experiment   |
| Zucker (1986)               | Set of expectations, an implicit contract.  | Business relationships                         | Conceptual   |

conceptualizing the specific beliefs as antecedents to trusting intentions (McKnight et al. 1998). This latter stream of work, which is an effort to remove some of the conceptual confusion in the trust field, builds on the social psychology paradigm (specifically, the theory of reasoned action; see Fishbein and Ajzen 1975) that has a long tradition of separating beliefs from intended behavior.

The same diversity in trust conceptualizations is also evident in e-commerce contexts. Trust has been conceptualized as a general belief in an e-vendor that results in behavioral intentions (Gefen 2000); as a combination of trustworthiness, integrity, and benevolence of e-vendors that increases behavioral intentions through reduced risk among potential but inexperienced consumers (Jarvenpaa and Tractinsky 1999); as beliefs in integrity, benevolence, and ability that lead to a general belief in trust (Jarvenpaa et al. 1998); or as specific beliefs in competence, integrity, and benevolence that lead to trusting intentions (McKnight et al. 2002).

The distinction between trust as a set of specific beliefs and trust as a general belief has been made primarily in studies dealing with interpersonal interactions, such as those occurring within an organization (e.g., Mayer et al. 1995; McKnight et al. 1998). However, in ongoing economic transactional settings, such as those between buyers and sellers (e.g., Crosby et al. 1990; Doney and Cannon 1997; Ganesan 1994; Schurr and Ozanne 1985), this distinction is seldom articulated. A possible reason for why this distinction between trusting intentions and specific beliefs is not made with respect to economic transactions is that the very nature of trust in these transactions is an extension, rather than direct implementation of the original definition of interpersonal trust (Hosmer 1995). The key to successful economic transactions is avoiding opportunistic behavior (Hosmer 1995; Williamson 1985), unlike interpersonal trust where trust serves more to solidify social relationships (Blau 1964). Consequently, some researchers claim that actual behavior in ongoing economic alliances is a proxy for trust, defined in that context as confidence or an overall belief (e.g., Gulati 1995).

With such distinctions in mind, the current study has adopted the conceptualization of trust as a set of *specific beliefs*. Our definition relies on separation between trust and actual behavioral intentions in the ongoing economic relationship of customers and e-vendors. This conceptualization is akin to that of other studies dealing with ongoing economic relationships (Crosby et al. 1990; Doney and Cannon 1997; Ganesan 1994; Gefen 2002b; Schurr and Ozanne 1985), including those with e-vendors (Jarvenpaa et al. 2000). Furthermore, the separation between beliefs and behavior is consistent with the theoretical foundations of TAM in social psychology (i.e., the theory of reasoned action) and allows for a theoretically sound integration of the two streams of research. Based on previous studies dealing with buyer-seller and business interactions, this set of specific beliefs includes integrity, benevolence, ability, and predictability, which together comprise the most widely used specific beliefs in the literature (see in Table 1 for details). Trust as a *feeling* (Rempel et al. 1985, p. 96) has been previously studied in the context of interpersonal relationships, such as friendship and love. It is arguably irrelevant to a business transaction.

### Trust Consequents

Based on prior work, it is hypothesized that heightened levels of trust, as specific beliefs about the e-vendor, are also associated with heightened levels of intended use. As in other commercial activities, interaction with a vendor requires the online consumer to deal with the social complexity embedded in the interaction and to take psychological steps to reduce it. Trust is a significant antecedent of participation in commerce in general, and even more so in online settings because of the greater ease with which vendors can behave in an opportunistic manner (Reichheld and Scheffer 2000). Trust helps reduce the social complexity a consumer faces in e-commerce by allowing the consumer to subjectively rule out undesirable yet possible behaviors of the e-vendor, including inappropriate use of purchase information. In this way trust encourages online customer business activity.



*H<sub>4</sub>: Trust in the e-vendor will positively affect intended use of a business-to-consumer (B2C) Web site.*

Trust should also increase certain aspects of the perceived usefulness of a Web site. The usefulness of a Web site depends on both the effectiveness of its relevant technological properties, such as advanced search engines, and on the extent of the human service behind the IT, which makes the non-technological aspects of the IT effective. Viewed in this manner, the benefits of a Web site can be classified as benefits relating to the current activities, such as the usefulness of the technology itself, and to benefits relating to future benefits, such as getting the items that were ordered. Regarding the longer term benefits, trust should increase the perceived usefulness of the interaction through the Web site by increasing the ultimate benefits, in this case getting the products or services from an honest, caring, and able vendor, as expected. This ties into the dual nature of a Web site as both an IT and a social interface to the e-vendor. When the e-vendor is viewed as trustworthy, trust is related to the latter, it makes the Web site beneficial to the extent that customers are often willing to pay a premium price for just that added special relationship with an e-vendor that they trust (Reichheld and Schefter 2000).

In general, when there is social uncertainty as to how others will behave, trust is a prime determinant of what people expect from the situation, both in social interactions (Blau 1964) and in business interactions (Fukuyama 1995). This is especially true in business interactions where people depend upon the other party to fulfill commitments in order to benefit from the interaction, and yet find themselves in a situation where monitoring or legal guarantees are impractical. In such cases, trust determines the very nature of the utility expected (Fukuyama 1995).

The prominence of trust in these relationships is explained through social exchange theory, or SET (Homans 1961; Kelley 1979; Kelley and Thibaut 1978; Thibaut and Kelley 1959). In essence, SET

exchange: being composed of costs paid and rewards received. As in an economic exchange, people take part in an activity only if their *outcome* from it is satisfactory, i.e., if their perceived subjective expected rewards exceed their subjective costs (Blau 1964; Homans 1961) or at least satisfy their expectations and exceed their alternative investments (Thibaut and Kelley 1959). Unlike an economic exchange, however, a social exchange deals with situations where there is no explicit or detailed contract binding the parties or when the contract is insufficient to provide a complete legal protection to all of the parties involved. Thus, because rewards cannot be guaranteed in a social exchange, trust is essential and determines people's expectations from the relationship (Blau 1964; Konovsky and Pugh 1994; Lewis and Weigert 1985a; Luhmann 1979). Trust increases the perceived certainty concerning other people's expected behavior (Luhmann 1979; Zand 1972) and reduces the fear of being exploited (Zand 1972), especially when the social exchange involves *current* costs invested in exchange for expected *future* unguaranteed rewards (Kelley 1979), as is the case with online purchase. Research has shown that SET also explains how the PU of an IT is affected by trust in its vendor (Gefen 1997) and its technical support (Gefen and Keil 1998).

In fact, developing a business relationship based on trust is a prime asset in its own right. In a trusting relationship, people do not need to invest resources in monitoring and in maintaining complex legal contracts to gain their fair share (Fukuyama 1995; Kumar 1996), an action which would entail transaction costs (Ganesan 1994; Gulati 1995; Kumar 1996). Such trusting relationships also provide a measure of indirect control and of assurance that the outcome will be fair to all parties involved (Korsgaard et al. 1995; Kumar 1996); that all parties are in the relationship for the long run (Fukuyama 1995); and that all parties will refrain from taking unfair or opportunistic advantage (Williamson 1985). Basically, trust creates a "reservoir of goodwill" (Kumar 1996, p. 97). Not surprisingly, the benefits of such a trusting relationship are such that customers, even online ones, are often willing to pay higher

prices for the benefits of buying from such a vendor through its Web site (Reichheld and Scheffer 2000).

Even with one-time purchases where these benefits (such as increased usefulness) may be small, it is only by believing that the e-vendor will behave with integrity, caring, and acceptable ability that consumers can rule out socially unacceptable yet conceivable behavior on the part of the e-vendor. Only with an e-vendor who can be trusted will the consumer be able to successfully accomplish their tasks on the Web site (e.g., search for product information and place an order). If the e-vendor does not know its market and its goal, has low ability, is not honest, or does not care about the consumer, accomplishing such a task will be much harder. Trust establishes the credibility of the vendor in providing what has been promised (Ganesan 1994). Thus, trust provides a measure of subjective guarantee that the e-vendor can make good on its side of the deal, behave as promised, and genuinely care. All of these increase the likelihood that the consumer will gain the expected benefits from the Web site through which the e-vendor communicates with its consumers. Conversely, doing business with an e-vendor who cannot be trusted could result in detrimental consequences, i.e., reduced usefulness. This could occur, for example, when the e-vendor shares customer activity databases. Accordingly, a trusting relationship is in itself a benefit of the interaction with the e-vendor (Reichheld and Scheffer 2000), an interaction manifested in the Web site, typically the only interaction medium consumers have with an e-vendor.

*H<sub>5</sub>: Trust will positively affect PU.*

## Antecedents of Trust

Drawing from several theoretical streams, research on trust has identified a number of trust antecedents: knowledge-based trust, institution-based trust (specifically, structural assurance beliefs and situational normality beliefs), calculative-based trust, cognition-based trust (specifically, categorization processes and illusion of

control processes), and personality-based trust (specifically, faith in humanity and a trusting stance).<sup>6</sup> The first three types of trust antecedents are the focus of this study and will be discussed extensively below. The other two trust antecedents, personality-based and cognition-based, are more relevant for initial trust formation (McKnight et al. 1998) and will thus be excluded from the current study, which focuses on consumers who had prior experience with a particular e-vendor.<sup>7</sup> For the sake of completeness, we discuss these briefly next.

## Personality-Based Trust

Trust is the product of many antecedents, including personality. Personality-based trust or propensity to trust refers to the tendency to believe or not to believe in others and so trust them (Farris et al. 1973; Mayer et al. 1995; McKnight et al. 1998, 2000; Rotter 1971). This form of trust is based on a belief that others are typically well-meaning and reliable (Rosenburg 1957; Wrightsman 1991). These beliefs are a trust *credit* that is given to others before experience can provide a more rational interpretation. Such a disposition is especially important in the initial stages of a relationship (Mayer et al. 1995; McKnight et al. 1998; Rotter 1971). Later, as people interact with the trusted party, these dispositions become of lesser importance because people are more influenced by the nature of the interaction itself (McKnight et al. 1998; Rotter 1971; Zand 1972).

<sup>6</sup> An alternative view of cognitive trust-building processes is provided by Doney et al. (1998): calculative-based, prediction, intentionality, capability, and transference. Since, prediction, intentionality, and capability refer to the specific trusting beliefs of predictability, benevolence, and ability that we use to operationalize trust in our study, McKnight et al.'s (1998) classification of trust-building processes is more consistent with our conceptualization of trust.

<sup>7</sup> There are many other variables that could influence trust, especially initial trust. Among them are risk, vendor size, and reputation (Jarvenpaa and Tractinsky 1999), and trust transference (Doney and Cannon 1997). In the interests of parsimony, these were deemed to be outside the scope of the research. They should be studied in future work, however.



Arguably, this disposition should be especially important for inexperienced online consumers, since, in the absence of social cues and experience with an e-vendor (Gefen 2000; Reichheld and Schefter 2000), new consumers are forced to base their trust primarily on their socialized disposition to trust (Gefen 2000). Research suggests, however, that among experienced consumers these dispositions are immaterial (McKnight et al. 2000). Thus, since the current study focuses on consumers with prior experience with the online vendor, this construct is excluded from the theoretical model of the study.

### Cognition-Based Trust

Cognition-based trust research offers a different set of antecedents of trust. This view examines how trust is built on first impressions rather than through experiential personal interactions (Brewer and Silver 1978; Meyerson et al. 1996). According to this research tradition, cognition-based trust is formed via categorization and illusions of control. Categorization processes (McKnight et al. 1998) suggest that individuals place more trust in people similar to themselves and assess trustworthiness based on second-hand information and on stereotypes (Morgan and Hunt 1994; Zucker 1986). Illusions of control describes how, in the absence of significant first-hand information, trusting beliefs can be over-inflated. In an effort to gain some sense of personal control in an uncertain situation, individuals will assess a person's trustworthiness (Langer 1975) by observing and attending to cues that might confirm this person's trustworthiness (McKnight et al. 1998). The mere process of observing, even in the absence of any evidence, tends to over-inflate trust beliefs (Davis and Kottelman 1994).

The current study focuses on consumers who have had prior first-hand experience with the online e-vendor. Therefore, as in the case of disposition to trust, this construct will not be part of the research model for the study since it mostly relates to trust formation in the absence of first-hand experience with the trusted party (McKnight et al. 1998).

### Knowledge-Based Trust Antecedents: Familiarity with the E-Vendor

Familiarity is experience with the what, who, how, and when of what is happening. While trust reduces social complexity relating to future activities of the other party, familiarity reduces social uncertainty through increased understanding of what is happening in the present (Luhmann 1979). Familiarity with the way other business partners work and their limitations is also an important antecedent of trust in ongoing business interactions (Kumar 1996; Kumar et al. 1995b). Familiarity counteracts concerns that the other party may be opportunistic, based on a reliance on past joint activities when that did not happen (Gulati 1995). Doney et al. (1998), referring to this antecedent as a prediction process, argue that trust is created in this process when the trustor's knowledge about the other party allows it to predict the behavior of the other party. In e-commerce, consumer familiarity, for example, corresponds to how well a consumer comprehends the Web site procedures, including when and how to enter credit card information (Gefen 2000). Trust, on the other hand, deals with beliefs about the e-vendor's future intentions and behavior (Gefen 2000).

Luhmann (1979) argues that with an *a priori* trustworthy party, familiarity builds trust because it creates an appropriate context to interpret the behavior of the trusted party (Luhmann 1979). This argument has been supported by empirical work on e-commerce which shows that familiarity with how to use a Web site as well as with the e-vendor increases trust in the e-vendor (Gefen 2000). With a trustworthy e-vendor, familiarity also lessens confusion about the Web site procedures and, in doing so, reduces the possibility that the customer may mistakenly sense that he or she is being taken unfair advantage of (Gefen 2000). Knowledge-based trust antecedents such as familiarity with the e-vendor suggest that trust develops over time with the accumulation of trust-relevant knowledge resulting from experience with the other party (Holmes 1991; Lewicki and Bunker 1995). Thus, the development of trust between parties requires time and an interaction history (Blau 1964; McKnight et al. 1998).



Accordingly, familiarity with an *a priori* trustworthy e-vendor should increase consumer trust because more familiarity implies an increasing amount of accumulated knowledge derived from experience from previous successful interactions through the Web site (Gefen 2000). In general, familiarity with what is going on, with why it is happening, and with the parties involved creates trust in business relationships (Kumar 1996). This accumulated trust-relevant knowledge and successful previous interactions lead to higher levels of trust (Blau 1964).

*H<sub>6</sub>: Familiarity with a trustworthy e-vendor will positively affect trust in that e-vendor.*

### **Calculative-Based Trust Antecedents**

Based on economic principles, a second type of trust-building mechanism involves a calculative process (Hosmer 1995). According to the *calculative-based* trust paradigm, trust can be shaped by rational assessments of the costs and benefits of another party cheating or cooperating in the relationship (Buckley and Casson 1988; Coleman 1990; Dasgupta 1988; Lewicki and Bunker 1995; Shapiro et al. 1992; Williamson 1993). Trust in this view is derived from an economic analysis occurring in ongoing relationships, namely that it is not worthwhile for the other party to engage in opportunistic behavior (Doney et al. 1998; Williamson 1985). If the costs of being caught outweigh the benefits of cheating, then trust is warranted since cheating is not in the best interest of the other party (Akelof 1970). Therefore, according to this paradigm, the recognition that the trusted party has nothing to gain from not being trustworthy builds trust. This approach to trust is based on the assumption that while other people may not be necessarily good, they are rational, calculative, act in their own best self-interest, and, as such, will refrain from inflicting harm upon themselves. Thus, according to Shapiro et al. (1992), calculative trust is *deterrence-based* in that individuals will not engage in opportunistic behavior out of fear of facing the adverse consequences of being untrustworthy. In the context of e-commerce, a customer can be

expected to trust an e-vendor more when the customer believes that the e-vendor has more to lose than to gain by cheating or has nothing to gain by breaking customer trust.

*H<sub>7</sub>: Calculative-based beliefs will positively affect trust in an e-vendor.*

### **Institution-Based Trust Antecedents: Situational Normality and Structural Assurances**

Another trust-building process that may apply to online settings is institution-based trust. This refers to one's sense of security from guarantees, safety nets, or other impersonal structures inherent in a specific context (Shapiro 1987; Zucker 1986). The two types of institution-based trust discussed in the literature are situational normality and structural assurances (McKnight et al. 1998).

Situational normality is an assessment that the transaction will be a success, based on how normal or customary the situation appears to be (Baier 1986; Lewis and Weigert 1985b). This assures people that everything in the setting is as it ought to be and that a shared understanding of what is happening exists (McKnight et al. 1998; Zucker 1986). Bricks-and-mortar stores that look like a store, with salespeople that look like salespeople, build customer trust, while stores that do not look that way erode customer trust. This is because a person's trust disappears when a situation is not normal (McKnight et al. 1998). In this view, people tend to extend greater trust when the nature of the interaction is in accordance with what they consider to be typical and, thus, anticipated. This is in accord with sociologists such as Luhmann (1979) and Blau (1964) who view trust as the product of fulfilled expectations. In the context of the Internet, this view carries weight in that a Web site represents what customers expect based on their experience and knowledge of other similar Web sites, and for this reason, they will be more inclined to trust the e-vendor. On the other hand, when the Web site has a suspicious interface and requires customers to go through an



unexpected procedure or provide atypical information, consumers will understandably be more inclined not to trust the e-vendor. In contrast with familiarity, however, situational normality does not deal with knowledge about the actual vendor; rather, it deals with the extent that the interaction with that vendor is normal compared with similar sites.

*H<sub>8</sub>: Perceptions of situational normality will positively affect trust in an e-vendor.*

Structural assurances or structural safeguards refer to an assessment of success due to safety nets such as legal recourse, guarantees, and regulations that exist in a specific context (McKnight et al. 1998; Shapiro 1987; Zucker 1986). According to this view, structural assurances built into the Web site, such as the Better Business Bureau's BBBOnline Reliability seal ([www.bbb.com](http://www.bbb.com)), the TRUSTe seal of eTrust ([www.etrust.com](http://www.etrust.com)), or a 1-800 number, should build trust (Gefen 1997). In this view, trust emanates from the security that one feels about the situation as a result of such guarantees, safety nets, or other structures (McKnight et al. 2000; Shapiro 1987; Zucker 1986). On the Web, cues appear on the Web page, and may include seals of approval (McKnight et al. 2000; Noteberg et al. 1999), explicit privacy policy statements (McKnight et al. 2000; Palmer et al. 2000), guarantees, affiliations with respected companies (Stewart 1999), and "contact us" clickable icons. Having a third party like the reputable Better Business Bureau vouch for the e-vendor as a trusted vendor should arguably build trust in that such assurances have typically been one of the primary methods of building trust in business (Zucker 1986). Moreover, the popularity of the Better Business Bureau's eTrust program attests to its success. The Better Business Bureau's program also builds trust by giving the customers recourse when there are disagreements about the quality of the products or services (see [www.bbbonline.org](http://www.bbbonline.org) for details). Indeed, experimental research shows that adding a structural assurance, such as a 1-800 number, to a Web site increases trust in that Web site (Gefen 1997). Such third-party certifications should build trust online just as they do in other commerce activities (Zucker 1986).

*H<sub>9</sub>: Perceptions of structural assurances built into a Web site will positively affect trust in an e-vendor.*

## Nature of the Interaction

A key to creating trust in business interactions is to treat the weaker party fairly, without taking advantage of its dependency or lack of knowledge (Hart and Saunders 1997; Kumar 1996). In a business environment, this translates, among other things, into providing due process with regard to the procedures and policies that handle the relationship and providing explanations for what is going on (Kumar 1996). This is important because, when engaging with another person or persons, people subconsciously look for cues as to whether they can trust the other party (Blau 1964). Some cues relate to behavior, as indicated in hypotheses H<sub>6</sub> through H<sub>9</sub>; other cues relate to appearance. Extrapolating from these findings to an e-commerce world, where the only real vendor interaction a customer has is through the Web site, implies that an easy-to-understand Web site (equivalent to perceived ease of use) that also explains what is going on should lead to the creation of trust. Arguably, one of the most prominent aspects of appearance in an e-vendor is the ease of use of its Web site. Conversely, a site that does not bother to help the user understand what is happening should, by virtue of not signaling due process, detract from accumulated trust. Moreover, well explained and easy to understand processes are a recipe for creating trust in business transactions (Kumar 1996) as well as reducing the misunderstandings that undermine it (Blau 1964).

PEOU should also increase trust through the perception that the e-vendor is investing in the relationship, and in so doing signals a commitment to the relationship. This applies in both social settings (Blau 1964) and in buyer-seller relationships (Ganesan 1994). In a Web environment, where the main interaction consumers have with the e-vendor is through the Web site, an obvious way to signal such a commitment is through the character of the Web site. If more

effort is placed in configuring the Web site so that it is usable and navigable, users will conclude that it is both easy to use and that the e-vendor is investing in the relationship. Conversely, a Web site that is unnecessarily hard to use does not connote ability or caring, let alone benevolence. A hard to use Web site might even insinuate that the e-vendor is not being straightforward (i.e., being dishonest), and is hiding something through an unnecessarily intricate interface. Consequently, although PEOU is not the sole determinant of trust, it can be posited that it contributes to trust.

*H<sub>10</sub>: PEOU will positively affect trust in an e-vendor.*

### **Some Trust-Related Antecedents of PEOU**

Situational normality, that is, creating the Web site so it looks and behaves in a typical manner, should increase PEOU since consumers' prior knowledge of how to use the Web will be directly applicable to the task of purchasing from the present e-vendor's Web site. Thus, little cognitive effort will need to be expended to learn how to use the present Web site. In contrast, a Web site that has a unique, unusual interface implies that consumers cannot utilize their previous knowledge and will thus experience a higher cognitive load in using the site. The reason for this is that people typically address problems and tasks by applying their previously acquired cognitive maps of the world (Anderson 1985). When a task, such as using a Web site, maps neatly into an existing cognitive map, it is easy to solve, because solving it only requires applying an existing, previously learned pattern. The more normal a task is, the more a person can extrapolate from existing cognitive maps, making the solution easier. This ability to remember cognitive maps and apply them to problem solving is why experts can solve problems with greater ease and with a smaller number of errors (Simon and Gilmartin 1973). In this case, the Web site will be easier to use, i.e., require less cognitive learning effort, if existing well-established cognitive patterns apply. When,

on the other hand, the specific site is unique, previously learned cognitive patterns may even hinder the process by leading the user into inefficient paths and, in doing so, render the Web site even harder to use.

*H<sub>11</sub>: Situational normality will positively affect PEOU.*

Indeed, the more familiar consumers are with a Web site as a result of prior visits, the more they will perceive the site to be easy to use. In that they already have an understanding of how to use the Web site as well as a knowledge of the basic structure and procedures used on the Web site, they will need to expend less cognitive effort to utilize it. Supporting this proposition, research shows that, with experience, users find an IT easier to use (Karahanna et al. 1999). Here too, cognitive maps can explain the process. An acquired cognitive map of the procedures involved, i.e., familiarity, provides the user with additional tools to solve the problem quicker, with greater ease, and with fewer errors (Simon and Gilmartin 1973). Extrapolating to the e-vendor's site, such a cognitive map should increase user skill at using it and reduce errors, effectively increasing the perceived ease of use of the site.

*H<sub>12</sub>: Familiarity with the e-vendor will positively affect PEOU.*

## **Research Method**

To examine the effects of trust and TAM on intentions to purchase from a Web site, a field study technique was employed. Our sampling and instrument development and validation processes (Straub 1989) are described next.

### **Instrument Development**

To gather data, a pretested instrument was administered to experienced online shoppers asking them to assess the last online book or CD vendor from whom they had made a purchase.



Respondents were graduate or undergraduate students at a leading business school in the mid-Atlantic region of the United States. Books and CDs are among the most sought after products in e-commerce and are "low touch" items (*The Economist* 2000). Low touch products are the kind of products that typically require little examination before purchase and, as such, require less trust in the vendor than other products, such as used cars. The sample for analysis in this study was drawn from those who were experienced users of such sites. Our research design deliberately aimed to capture reactions to such products. If consumer trust is significant even when little trust is required, then trust should be a key antecedent, in general. In short, the approach here is conservative, and a robust test of the theoretical model.

The questionnaire contained the standard TAM scales of PU and PEOU adapted from Davis' scales (1989). These were previously shown to apply well to e-commerce purchase intentions for books (Jarvenpaa and Tractinsky 1999; Jarvenpaa et al. 2000) and airline tickets (Gefen et al. 2000). Intended use of a B2C Web site was assessed by two items. Since purchasing from an e-vendor is not a monolithic concept, but rather consists of a number of different activities, these two items were designed to capture two central activities that relate to and are essential aspects of purchasing products and services online. One item deals with a willingness to provide the e-vendor with credit card information for purchases and the other with a willingness to provide the e-vendor with the information it needs to provide good service. Examining behavioral intentions as they relate to specific outcome behaviors (i.e., not examining intentions toward a single general monolithic behavior) is consistent with the way that Crosby et al. (1990) and Morgan and Hunt (1994) examined trust-related behavioral intentions and with the manner in which McKnight et al. (2002) operationalized trusting intentions in the context of e-commerce.<sup>8</sup> Trust items were com-

posed to reflect specific beliefs of consumers in the e-vendor's integrity, benevolence, ability, and predictability as in the extensive previous empirical research on buyer-seller relationships (Crosby et al. 1990; Doney and Cannon 1997; Ganesan 1994; Gefen 2002b; Jarvenpaa et al. 2000; McKnight et al. 2002; Schurr and Ozanne 1985).

Calculative-based trust-building items represent the calculation made by the consumer that the e-vendor has nothing to gain by being dishonest, uncaring, or unknowledgeable (lacking ability). The familiarity items deal with customer familiarity with an e-vendor. The scale was created by expanding on the familiarity with the vendor themes used by Gefen (2000). Situational normality items deal with the assessment that the interaction is typical of that type of e-vendor. Structural assurance items capture some of the typical steps taken by many Web sites to reassure their customers that the interaction is safe. Namely, these items deal with (1) a 1-800 number being provided, which has been previously shown to build trust (Gefen 1997), with (2) the belief that the Better Business Bureau (BBB) will help in case of trouble (such service has become quite commonplace with the BBB issuing various trust seals<sup>9</sup>), with (3) the e-vendor providing a written statement of its guarantees, and with (4) the belief that the online transaction is safe. We chose to word these items as "I feel safe" because that is the wording of choice in the Better Business Bureau Web site. All of the items were on a seven-point scale ranging from strongly disagree (1) through neutral (4) to strongly agree (7). The questionnaire also collected demographic data.

## Pretest

The instrument was pretested with 72 undergraduate students to check the psychometric properties of the scales (Straub 1989). Respondents were not informed about the objective of the study. They were requested to complete the

<sup>8</sup>In addition to specific intended behaviors, McKnight et al. (2002) also had a general measure of trusting intentions.

<sup>9</sup>See <http://www.bbbonline.org/> for details of these programs.

questionnaire with regard to the last online book vendor or online CD vendor Web site at which they had made a purchase. Respondents were also asked to state the name of that e-vendor. Of the 72 questionnaires, 22 were discarded because respondents had not purchased books or CDs online, and so could not really assess any of the constructs that relate to the e-vendor.

The convergent validity of each scale in the remaining 50 items was verified with a principal components factor analysis (PCA). A separate PCA was run for each construct. A *single* eigenvalue above 1 for each construct verified that the construct was unidimensional, showing the convergent validity of each scale. Discriminant validity could not be assessed at this stage because of the much larger sample size that is required (Hair et al. 1998). The Cronbach's  $\alpha$  of all the scales was acceptable (Nunnally and Bernstein 1994), with the lowest being intended use at .71. All other alpha coefficients were at least .88.

### **Primary Data Analysis and Descriptive Statistics**

The main data collection aimed at the same population, that is, experienced online shoppers who were undergraduate and graduate business students at a leading business school in the mid-Atlantic region of the United States. As in the pretest, respondents were requested to complete the questionnaire by answering questions regarding the last online book vendor or online CD e-vendor at which they made a purchase, and to indicate its name. The questionnaire was administered to 400 students. As in the pretest, questionnaires from respondents who had not previously purchased books or CDs online were discarded. This resulted in a dataset of 213 responses.

Of the respondents, 86 were women and 110 were men, with some missing values in the dataset. Respondents had purchased online an average of 7.18 times during the previous year. Most respondents were in their early 20s ( $n = 157$ )

or late 20s ( $n = 31$ ). The most frequent sites for last purchase were Amazon.com (26%), half.com (3%), bn.com (11%), cdnow.com (10%), ecampus.com (3%), and bmg.com (3%). Data were pooled from 172 senior undergraduate students and 41 graduate students. Pooling was justified in that there were no significant differences between the senior undergraduate students and the graduate students in the answers to questionnaire items measuring key dependent and independent variables (Wilks'  $\lambda = .70407$ ,  $p$ -value = .099). Descriptive data are shown in Table 2. All items ranged from 1 (strongly disagree) to 7 (strongly agree), and showed a reasonable dispersion in their distributions across the ranges, as seen in the standard deviations.

### **Data Analysis**

LISREL was used for data analysis because it has distinct advantages over other techniques. LISREL accounts for all of the covariance in the data and so allows for the examination of all of the correlations, shared variances, and paths in the model when estimating the significance level and coefficient of the paths (Bollen 1989). The result is more accurate parameter estimation and a "more realistic" (Bollen 1989, p. 19) analysis. LISREL also enables *unidimensionality* analysis, an examination not possible using PCA or Cronbach's  $\alpha$  reliability tests (Gerbing and Anderson 1988; Segars 1997).

Data analysis was carried out in accordance with a two-stage methodology (Gerbing and Anderson 1988) where "the measurement model first is developed and evaluated separately from the full structural equation model" (p. 191). Accordingly, the first step in the data analysis was to establish the convergent and discriminant validity of the constructs with a LISREL confirmatory factor analysis (CFA). The measurement model in the CFA was revised by dropping items, one at a time, that shared a high degree of residual variance with other items, according to the standard LISREL methodology (Gefen et al. 2000; Gerbing and Anderson 1988), and Churchill's (1979) scale



**Table 2. Descriptive Statistics**

| Construct                     | Mean (Std.) of Construct |
|-------------------------------|--------------------------|
| Intended Use                  | 4.18 (1.46)              |
| PU                            | 4.28 (1.31)              |
| PEOU                          | 4.76 (1.13)              |
| Trust                         | 3.15 (1.21)              |
| Structural Assurances         | 3.18 (1.21)              |
| Situational Normality         | 4.13 (1.13)              |
| Familiarity with the e-Vendor | 4.05 (1.49)              |
| Calculative Based             | 3.58 (1.43)              |

development paradigm. Items were dropped depending on reported standardized residuals, that is, those showing a significant degree of shared nonspecified variance among the measurement items. Every item dropped was also carefully read to verify that its residual variance also made sense from a theoretical perspective.<sup>10</sup>

After dropping items, the CFA showed acceptable model fit. The  $\chi^2$  of 364.31 with 247 degrees of freedom showed a  $\chi^2$  to degrees of freedom ratio of less than the recommended 1:3. The AGFI at .85, NFI at .91, CFI at .97, RMR at .041, and MESEA at .048 are all within the accepted thresholds for CFA.<sup>11</sup> Only the GFI at .88 was slightly

below the .90 benchmark. GFI can be brought to .90 by dropping additional items, but, in the interest of content validity, it was decided to stop dropping items at this stage.<sup>12</sup> The composite construct reliabilities, shown in Table 3, are also within the commonly accepted range greater than .70 (Gefen et al. 2000). Appendix A contains item loadings before and after cleaning the CFA. Appendix B contains the correlation matrix generated by LISREL.

Additionally, discriminant validity of the resulting scales was verified employing the guidelines advanced by Segars (1997). All of the modification indices in the  $\lambda$  matrix were well below the critical threshold of 5, meaning that adding a path from any measurement item to any other latent variable, other than the one to which it was assigned, would not cause a significant change in the model's overall  $\chi^2$  statistic. This shows that no cross loading of any measurement item on any other construct but its own is significant. Discriminant validity of the constructs was further validated by comparing the  $\chi^2$  of the original CFA with its eight latent variables against other CFAs with only seven latent variables where every possible combination of two constructs was

<sup>10</sup>As a result of dropping the two trust items the trust scale overlaps in meaning with Doney and Cannon (1997) and Jarvenpaa, et al. (2000). The one structural assurance item that was dropped dealt with a portal while the other items dealt with the guarantees and procedures. The one situational normality item that was dropped dealt with the interaction rather than the requested information. The familiarity item dropped referred to familiarity gained through secondary sources such as magazines. In addition, two PU and two PEOU items were dropped.

<sup>11</sup>GFI, CFI, and NFI are best if above .90, AGFI above .80, and RMR below .050, and the ratio of  $\chi^2$  to degrees of freedom below 1:3, according to the majority of references in Gefen et al. (2000) and Hair et al. (1998). There is some disagreement in the literature about the cutoff value of RMSEA. Hu and Bentler (1999) argue for a cutoff around .06 while Jarvenpaa et al. (2000) claim that it should be at or below .08.

<sup>12</sup>It is common that LISREL models, including those published in leading MIS journals, seldom show excellent fit values in all the indices. See the recent analysis by Boudreau et al. (2001).

**Table 3. Composite Construct Reliabilities**

| Construct                     | Reliability<br>When All the Items Are<br>Included in the Model | Reliability<br>When Items are Dropped |
|-------------------------------|--|---------------------------------------|
| Intended Use                  | .83  | .83                                   |
| Perceived Ease of Use         | .90  | .90                                   |
| Perceived Usefulness          | .89  | .90                                   |
| Trust                         | .83  | .83                                   |
| Calculative-based             | .79  | .79                                   |
| Familiarity with the e-Vendor | .78  | .87                                   |
| Structural Assurances         | .76  | .77                                   |
| Situational Normality         | .85  | .88                                   |

examined, thus considering every possible pairwise discriminant validity check. The  $\chi^2$  of the original CFA with its eight latent variables was significantly better than any possible union of any two latent variables<sup>13</sup> (see Appendix C). Unidimensional validity was assessed by examining standardized residual variance, the RMR, and the standardized modification indexes, based on guidelines provided by Gerbing and Anderson (1988) and by Segars (1997).<sup>14</sup>

Next, the structural model (which includes hypotheses in addition to the paths between the item and its latent construct) was examined on the cleansed measurement model. The fit indexes are within accepted thresholds, except for GFI, which is slightly lower than the commonly cited

threshold:  $\chi^2$  to degrees of freedom ratio of 1:1.52 ( $\chi^2_{257} = 389.77$ ), CFI = .96, RMR = .050, RMSEA = .049, GFI = .88, AGFI = .84, and NFI = .90. Figure 2 shows the standardized LISREL path coefficients and the overall fit indexes. Squared multiple correlations were: intended use, 61 percent; PU, 53 percent; PEOU, 41 percent; and trust 59 percent. All the paths are significant except the path between familiarity in the e-vendor and trust which is insignificant ( $\Gamma = -.01$ ,  $t = -.08$ ).<sup>15</sup>

<sup>13</sup>This is shown statistically when the  $\chi^2$  of the original CFA is significantly smaller than the CFA of any alternative model. In this case, since uniting any two latent variables adds seven degrees of freedom to the model, the  $\chi^2$  of the original CFA should be at least 16.01 smaller than the  $\chi^2$  of any alternative model. The differences in  $\chi^2$  were all above 300.

<sup>14</sup>There were six standardized residuals slightly above the 2.58 threshold, the highest being 3.14. However, the RMR at .040 was well within the threshold and all the expected change statistics were insignificant. Moreover, rerunning the analysis specifying a slightly smaller sample size resulted in no standardized residuals above 2.58.

<sup>15</sup>Contrary to previous research (Gefen 2000), there was a surprising lack of effect of familiarity on both trust and intended use. A *post hoc* analysis explored this further by excluding from the model all of the constructs except for familiarity, trust, and intended use. This tests whether familiarity may be important but that its effect is mitigated by other constructs. This model, using the same items as in the latter LISREL analysis, showed that intended use was increased by both trust and familiarity (standardized  $\beta$  and  $\gamma$  being .52 and .22, respectively), explaining 43 percent of its variance, and that trust was increased by familiarity (standardized  $\gamma = .49$ ), explaining 24 percent of its variance. The model showed very good overall fit indexes. GFI at .98, AGFI = .95, RMR at .032, RMSEA at .034, NFI at .98, and CFI at .99 are all well within their accepted thresholds. This analysis combined with the previous one suggests that, after all, familiarity does increase both trust and intended use, as suggested by previous research, but that this effect is channeled through other constructs.



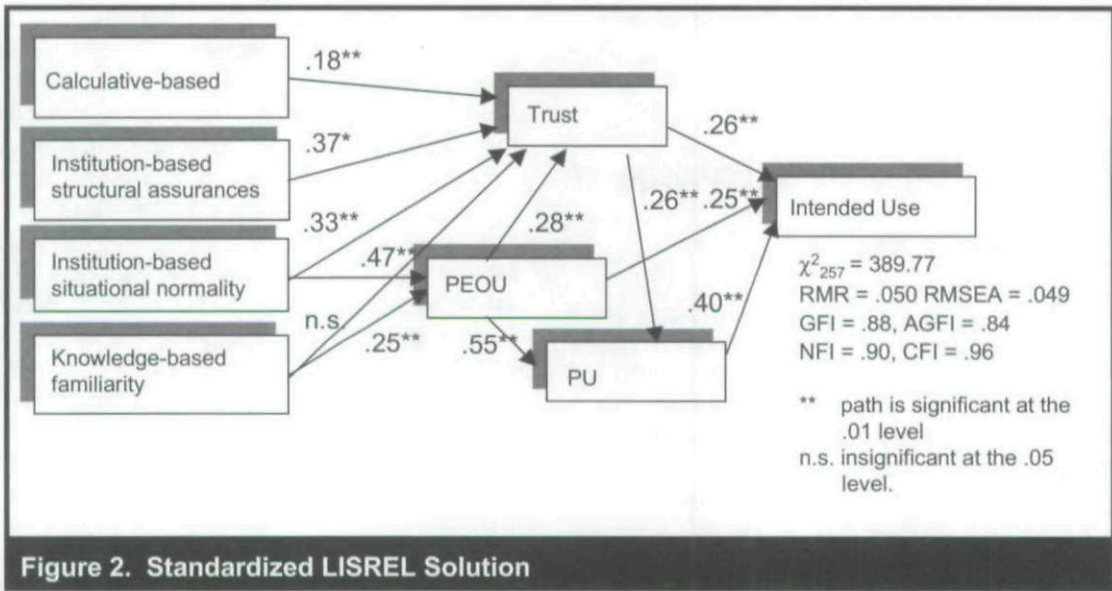


Figure 2. Standardized LISREL Solution

Table 4. LISREL Standardized Correlation Matrix

|                       | Intended Use | PEOU | PU   | Trust | Calculative-Based | Knowledge-Based | Institutional-Based | Situational-Based |
|-----------------------|--------------|------|------|-------|-------------------|-----------------|---------------------|-------------------|
| Intended Use          | 1.00         |      |      |       |                   |                 |                     |                   |
| PEOU                  | 0.67         | 1.00 |      |       |                   |                 |                     |                   |
| PU                    | 0.72         | 0.70 | 1.00 |       |                   |                 |                     |                   |
| Trust                 | 0.62         | 0.56 | 0.57 | 1.00  |                   |                 |                     |                   |
| Calculative-based     | 0.18         | 0.13 | 0.16 | 0.32  | 1.00              |                 |                     |                   |
| Knowledge-based       | 0.41         | 0.51 | 0.41 | 0.48  | 0.22              | 1.00            |                     |                   |
| Institutional-based   | 0.25         | 0.15 | 0.21 | 0.49  | 0.13              | 0.32            | 1.00                |                   |
| Situational-normality | 0.50         | 0.61 | 0.49 | 0.58  | 0.17              | 0.56            | 0.15                | 1.00              |

Table 4 contains the LISREL-calculated correlations among the constructs.<sup>16</sup>

## Discussion

### Summary of Results

There are many issues affecting consumer decisions to return to an e-vendor. This study examined two aspects of this decision, trust and TAM, and showed how these aspects are related to purchase intentions of low-touch low-risk items from e-vendors. The underlying premises of this study were (1) that online customers are influenced by both their trust in the e-vendor and technological aspects of the Web site interface, and (2) that consumer trust is increased by aspects of the interaction. It was also hypothesized that (3) some aspects of the interaction increase customer assessments of ease-of-use of the e-vendor Web site. The data show that experienced consumers' intentions to transact with the last e-vendor from whom they purchased depends on both trust and the two beliefs identified by TAM, perceived usefulness (PU) and perceived ease of use (PEOU). This result corroborates the findings of previous research on the need for trust in Internet activity (Gefen 2000; Jarvenpaa and Tractinsky 1999; Salisbury et al. 1998).

<sup>16</sup>To verify that the pattern of significant paths was not changed by dropping the items, the structural model analysis was rerun with all of the measurement items. The analysis shows the same pattern of significant paths, albeit with fit indexes slightly below the accepted thresholds. The analysis supported all hypotheses, except for  $H_6$ , i.e., that familiarity with the e-vendor increases trust. Explained variance of intended use is 62 percent, of PU is 53 percent, of PEOU is 44 percent, and of trust is 58 percent. Some of the overall fit indexes were within accepted thresholds with CFI at .93 and the ratio of  $\chi^2$  to degrees of freedom at 1:1.73 ( $\chi^2_{509}$  at 882.54). The other fit indexes were slightly lower than commonly cited thresholds: GFI at .80, NFI at .86, AGFI at .76, RMR at .063, and RMSEA at .064. Table 3 contains the LISREL composite construct reliabilities, which are all at acceptable levels. Appendix A contains the items and their standardized loadings.

The study also reveals some of the antecedents of trust in an online environment, namely: (1) a belief that the vendor has nothing to gain by cheating (i.e., calculative-based beliefs), (2) the belief that there are safety mechanisms built into the Web site (i.e., structural assurances), and having a (3) typical (i.e., situational normality) and (4) easy-to-use interface. Although significantly correlated with trust, familiarity with the e-vendor (i.e., knowledge-based assessments) *per se* did not significantly increase trust when the other antecedents were included in the model. Having a conventional and familiar site did, however, increase its perceived ease of use. In the research model for this study, the effect of familiarity on trust was fully mediated, an interesting modification to existing theory.

A possible explanation of this finding may be the following. The familiarity construct used in the present study had two facets: (1) familiarity with the e-vendor gained through ads and articles in the popular press, and (2) familiarity with the e-vendor gained through visiting the site. Due to poor loadings, only the familiarity with the e-vendor via visiting the Web site items were retained. This may explain the mediating effect of PEOU in the relationship between familiarity and trust; it also suggests that future research may be warranted. It is possible that each of the two facets of familiarity has a different set of antecedents and consequents. In other words, it is possible that the reason familiarity did not directly increase trust in the research model is that the increased understanding it provides, and through it the increased trust, was mainly related to understanding how to apply the technology. Additionally, the data support the hypotheses that trust increases the perceived usefulness of the Web site and that familiarity and situational normality contribute to customer assessments of the ease of use of the Web site.

Examining the relative importance of the four trust-building antecedents identified in the study, we found that institution-based beliefs of structural assurances and situational normality have by far the most effect on trust. The standardized path coefficients of these two trust-building mechanisms were .37 and .33 respectively, whereas the



path coefficient from calculative-based beliefs to trust was less at .18; moreover, the relationship between trust and knowledge-based familiarity was nonsignificant.

There is perhaps nothing surprising in these results. The perception of fair play is one of the major forces building trust in ongoing business interactions (Kumar 1996). Structural assurances and situational normality are both indicative of fair play, the first through outside guarantors, and the second through lack of suspicious elements. This conclusion supports the current industry trends to add both structural assurances, such as the Better Business Bureau's eTrust and BBB online seal, and to apply standardized and easy to use interfaces. Given their importance as trust antecedents, institution-based mechanisms warrant additional research into their nature and effects.

In addition, the TAM construct PU remains an important predictor of intended use, as in many past studies. In terms of the significant standardized  $\beta$  coefficients, trust is .26 and PU is .40. What this suggests is that while both are important, PU is a stronger direct predictor than trust, at least for experienced repeat consumers of an e-vendor.

## Limitations

The study investigated experienced consumers who were working on undergraduate or MBA degrees. To the extent that these consumers are typical of online consumers, the results will hold across a more general population (Gordon et al. 1986). Remus (1986) found that business students were good surrogates for managers, but no one has reported on the extent to which they are good surrogates for online consumers. In brief, this might be a threat to the external validity of the study.

Since measures of all constructs in the study were collected at the same point in time and via the same instrument (method), the potential for common method variance exists (Straub et al. 1995). Due to the cross-sectional nature of the study,

causality can only be inferred through the theory. In addition, even though measures of behavioral intent captured two essential aspects of online purchasing (viz., intentions of providing one's credit card number to the e-vendor to purchase a product/service and providing information to the e-vendor), they did not focus on an *overall* measure of intention to shop from the e-vendor again. Thus, results of the study should be interpreted by keeping in mind this narrower conceptualization of intended behavior.

In addition, the relationship between familiarity with an e-vendor and trust is likely to be moderated by whether or not the e-vendor is indeed trustworthy. If the e-vendor is trustworthy then increased familiarity should enhance perceptions of trust in the e-vendor resulting in a positive relationship between the two constructs. On the other hand, if the e-vendor is not trustworthy, increased familiarity will likely be negatively related to trust. The respondents of the current study focused on vendors who happened to be trustworthy. Thus, we had posited a positive relationship between familiarity and trust. Future research is needed to explore this moderating relationship and to assess generalizability of our results to vendors who are *not* trustworthy.

Furthermore, measures of calculative trust focused on the final outcome of the rational assessment process (i.e., the extent to which consumers believe that an e-vendor has nothing to gain by cheating) rather than on specific costs and benefits or on an explicit assessment of overall costs and benefits. We believe that our measures effectively capture the essence of the construct. Future research may explore alternative operational definitions of this construct in order to focus on (1) the identification and assessment of specific costs and benefits associated with an e-vendor's opportunistic behavior, or (2) an explicit assessment of whether the vendor has more to lose than to gain by engaging in opportunistic behavior (e.g., "the e-vendor has more to lose than to gain by being dishonest in its interactions with me" rather than "the e-vendor has nothing to gain by being dishonest in its interactions with me").

Another limitation that is pertinent to LISREL analysis in general is that when items are dropped in a purely data-driven manner, the meaning of the constructs may change (Bagozzi 1984). Revalidating the trimmed scales with new data can be argued to increase validity of the scales as well as of the nomological network. While a common practice in LISREL analyses (Gerbing and Anderson 1988), dropping measurement items to improve model fit may have caused an over fitting of the model to the data (Gefen et al. 2000) and may have increased the risk that the model as shown in Figure 2 may be affected by the specific characteristics of the sample (Chin and Todd 1995; MacCallum et al. 1992). Addressing this concern, we employed theory-based reasoning in dropping items. Great care was taken during the analysis to ensure that items were dropped based on likely problems with wording, rather than only on statistics. Moreover, it was verified that the pattern of significant paths was not changed as a result of dropping these items.

Another topic that requires additional study is the conceptualization of trust. Trust was defined in this study as a set of specific beliefs, in accordance with other research on buyer-seller ongoing relationships that deal with integrity, benevolence, ability, and predictability (e.g., Doney and Cannon 1997; Jarvenpaa et al. 2000). In addition, consistent with recent research (e.g., McKnight et al. 2002), these beliefs lead to intended behavior (or trusting intentions). As discussed earlier, there are alternative conceptualizations of trust in the management and psychology arenas. Some researchers in these arenas (e.g., Mayer et al. 1995) make a distinction between (1) the beliefs that our study calls trust and what Mayer et al. call antecedents of trust, and (2) a willingness to depend, which Mayer et al. call trust and we call intended behavior. Examining these additional perspectives in the context of the proposed model could shed additional light on how trust and TAM relate to e-commerce.

Furthermore, our study focuses on consumers who had previously purchased from and had experience with an e-vendor's Web site. Results

such as the relative importance of the various trust building mechanisms and TAM may be at variance with inexperienced consumers (Karahanna et al. 1999), or with experienced consumers who have never purchased from a site, and additional trust antecedents may become salient. Thus, the generalizability of results to potential consumers of an e-vendor who (1) have never visited the e-vendor's Web site and/or (2) have never purchased from the e-vendor is not immediately obvious and warrants further investigation.

Finally, the study focused on relatively simple, low-touch products that require relatively less trust. As such, the study provides a more robust test for the model than focusing on more complex, high-touch products for which trust issues are expected to be more dominant. Future research needs to assess the generalizability of the model to the purchase of complex products and online services, including applicability to other unrelated online industries, such as financial services.

### ***Implications: Theoretical and Practical***

Trust is crucial in e-commerce, a finding already known from previous research (Gefen 2000; Jarvenpaa and Tractinsky 1999; Jarvenpaa et al. 2000) and from industry reports (Cole 1998). Empirical evidence on how it can be built in an online environment, however, has been largely an open question. This study sheds some light on this issue by showing, that among repeat consumers, trust is the product of several aspects of the Web site that are well within the control of the e-vendor. First, perceived ease of use emerges as a central aspect of e-commerce since it has both direct effects on intended use as well as indirect effects through trust and perceived usefulness. Designing easy-to-use Web sites is under the control of the e-vendor. Second, Web site ease of use is enhanced by e-vendors providing Web sites with interfaces that are typical and customary (i.e., situational normality) and via increased familiarity with the e-vendor and its procedures. Increased familiarity can be achieved, for example, through advertising, through articles



in the popular press, through linkages with well known Web sites, and through providing incentives to use the e-vendor's Web site (e.g., Delta provides an incentive to use the delta.com Web site to make ticket reservations by awarding additional frequent flyer miles). Third, situational normality (i.e., having a typical interface) also directly contributes to the building of consumer trust.

In the short run, e-vendors should attempt to understand the sequence of activities, functionality, and types of information that match consumer mental models of "typical Web sites." This can be achieved through a review of successful e-vendor Web sites or through focus groups of consumers. In the long run, this might imply less variability in Web site design. Additional research is needed to identify the aspects of a Web site that are salient in terms of assessing similarity so that Web sites can engender trust and maintain their individual character at the same time.

Another way of increasing trust is by incorporating institution-based structural assurances into the Web site, assurances such as statements of guarantees, contact telephone numbers, and Better Business Bureau seals. Finally, convincing the consumers that the e-vendor has nothing to gain by not being trustworthy also builds trust. Convincing consumers of this might be achieved, as in other business interactions, through increased publicity of legal action taken by the authorities as well as by meaningful sanctions for untrustworthy vendors by consumer protection agencies such as the Better Business Bureau. The publicity that the IFCC<sup>17</sup> recently received (e.g., Sullivan 2002) is one step in that direction. The emerging trend of online vendors to incorporate consumer protection seals, such as those given by the Better Business Bureau, and

meaningful sanctions for breaching these obligations by these consumer protection agencies is another. It is quite reassuring in this regard that gaining consumer trust is largely under the control of the e-vendor, meaning that e-vendors can influence consumer trust. The success of some e-commerce companies such as e-Bay has indeed been attributed to such trust-building mechanisms, namely institution-based structural assurances (Hof 2001).

An online vendor is represented by features of its IT, that is, its Web site. This study shows that recognizing both technological and trust issues is important in increasing consumers' intended use of the Web site and, through it, transactions with the e-vendor. The TAM beliefs and consumer trust are shown to be two distinct sets of beliefs, each contributing in its own right to use intentions, meaning that e-vendors need to pay attention to both aspects. Increasing familiarity with the e-vendor may actually be a way of increasing both aspects.

Trust is a social antecedent. Perceived ease of use and perceived usefulness are technological antecedents. These two distinct sets of antecedents are intertwined in this case. As the supported hypotheses indicate, perceived ease of use is associated with increased trust, and increased trust, in turn, is associated with increased perceived usefulness above and beyond the increase in perceived usefulness caused by perceived ease of use. Moreover, antecedents of trust are also antecedents of perceived ease of use, suggesting that e-vendors who invest in increased trust may achieve, as a desirable albeit inadvertent addition, increased user acceptance of their Web site through the rational antecedents advocated by TAM. At least in this case, the distinctive social process versus rational process distinction may be less than a chasm after

<sup>17</sup>The Internet Fraud Complaint Center ([www1.ifccfbi.gov](http://www1.ifccfbi.gov)), operated jointly by the FBI and the National White Collar Crime Center, allows consumers to file fraud complaints and alert the authorities of online scams. Complaints to this center have resulted in legal action within the United States and in international pressure on foreign governments when the scams were managed from abroad (Sullivan 2002).

Traditionally, antecedents of perceived usefulness consisted of social influences (e.g., Karahanna and Straub 1999; Venkatesh and Davis 2000), and characteristics of the system and of the task (e.g., Goodhue and Thompson 1995; Karahanna and Straub 1999). Goodhue and Thompson sug-

gest, for instance, that a system will be perceived as more useful and job performance is likely to be enhanced if characteristics of the system match the requirements of the task. The relationship between trust and perceived usefulness in the current study suggests that the set of antecedents, in cases where the technology is the interface via which a business (or social) relationship is manifest, should be expanded to include characteristics of the *relationship* such as trust. This is likely to be so, not just in B2C e-commerce, but in other business-to-business (B2B) supply chain management activities as well.

The finding that there is a considerable overlap between the antecedents of trust and perceived ease of use in this study can be attributed to the fact that, in online shopping, the e-vendor's Web site is the main means by which familiarity with the e-vendor is achieved and situational normality is assessed. Thus, becoming familiar with the e-vendor largely implies gaining experience with the e-vendor's Web site. Similarly, if the e-vendor's Web site (in terms of procedures and information required) is typical of other Web sites, a user's accumulated online experience is applicable and transferable to the e-vendor's Web site. Both of these effects translate to heightened ease-of-use perceptions. Thus, the processes by which trust is assessed and built are inexorably intertwined with the experience and cognitive map building processes leading to ease of use. Future research is required to examine how these relationships may vary in cases where (1) familiarity with an e-vendor is acquired via means other than an e-vendor's Web site, and (2) familiarity suggests that the e-vendor is untrustworthy, yet this same familiarity leads to heightened ease of use perceptions.

### **Additional Research**

Although explaining a great deal of the variance in trust, the scope of this study can be expanded to gain a more complete picture of trust in e-commerce. The current study has focused on consumers who have previously transacted with the e-vendor. Both the trust (e.g., McKnight et al.

1998) and the IS literatures (e.g., Karahanna et al. 1999) suggest that determinants of intended behavior change based on the users' level of experience. Therefore, it is not immediately obvious that the results of the current study generalize to inexperienced consumers. Additional research, both longitudinal and cross-sectional, is needed to examine how antecedents and relationships of trust evolve as consumers progress from being aware of the e-vendor, to having experience with the e-vendor via having visited the e-vendor's Web site, to being repeat consumers having previously purchased from the e-vendor. For instance, factors such as social norms (Karahanna and Straub 1999; Venkatesh and Davis 2000), personality-related dispositions, such as disposition to trust and belief in humanity (McKnight et al. 1998; Rotter 1971) as well as vendor characteristics such as size and reputation of the vendor (Jarvenpaa and Tractinsky 1999) are likely to affect initial trust formation. Furthermore, the dichotomy between initial trust formation and ongoing trust may not be sufficient to capture how trust in an e-vendor evolves since trust is influenced by both aspects of the e-vendor and by aspects of the Web site. Thus, initial trust may be formed (1) in the absence of any interaction with the e-vendor's Web site and based on such factors as size and reputation of the e-vendor and (2) based on actual user interaction with the e-vendor's Web site. Accordingly, further theoretical development is required in the initial trust versus on-going trust distinction to capture the nuances of this evolution and assess the implications to trust antecedents and consequents.

The study also examined trust as a direct predictor of behavioral intentions. This is in line with other research that views trust as having a direct impact on behavioral intentions in business relationships, irrespective of risk (Doney and Cannon 1997; Fukuyama 1995; Ganesan 1994; Moorman et al. 1992; Morgan and Hunt 1994; Schurr and Ozanne 1985) and IT adoption (Gefen 1997; Hart and Saunders 1997; Jarvenpaa et al. 1998). Other conceptualizations of trust, however, include risk as a mediator of the effect trust has on behavioral intentions in both theory (Mayer et al. 1995) and e-commerce practice (Jarvenpaa



and Tractinsky 1999; Kollock 1999). In that the objective of the study was to examine how e-vendors can create trust, examining risk and its relationship with trust was beyond the scope of this study. Clearly, additional research is needed in this area. Further research is also needed in examining other possible beliefs that are a part of trust. Based on the marketing and MIS literatures cited above, this study defined trust as belief in the integrity, benevolence, ability, and predictability of the e-vendor. Other beliefs have also been suggested, including loyalty, reliability, and openness (Hosmer 1995). More research would also be useful in examining whether the conceptualization of trust in e-commerce can be extended.

## Conclusions

E-vendors should build Web sites that are not only useful and easy to use, as TAM suggests, but that also include trust-building mechanisms. Creating a trust-based connection to customers is a primary benefit which is nearly as important as the technical attributes of the Web site such as usefulness. Some effective methods of doing so within an integrated model of trust and TAM have been identified in this study, namely, situational normality, structural assurances, calculative-based, and familiarity with the e-vendor.

Both trust and technology acceptance antecedents have been studied for years in traditional physical commercial environments. In the marketing and management literatures, trust is strongly associated with attitudes toward products and services and toward purchasing behaviors. IT research has looked at the systems interface and characteristics of systems that are expected to have an impact on productivity. The current research has combined these research streams by placing use of a system into a context of usefulness and ease of use variables and trust variables. Both prove to be not only excellent predictors but also inexorably intertwined. Future research will hopefully paint a more complete picture of why and when consumers are willing to buy from a Web shop.

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# Appendix A

## Standardized Item Loadings

| Item | Wording   | All Items | After Dropping Items |
|------|---|-----------|----------------------|
|      | <b>Intended Use</b>   |           |                      |
| USE1 | I would use my credit card to purchase from the online vendor.  | .85       | .85                  |
| USE2 | I am very likely to provide the online vendor with the information it needs to better serve my needs. | .78       | .78                  |
|      | <b>Perceived Ease of Use</b>  |           |                      |
| EOU1 | The Web site is easy to use.  | .87       | Dropped              |
| EOU2 | It is easy to become skillful at using the Web site.  | .91       | .89                  |
| EOU3 | Learning to operate the Web site is easy.   | .90       | .92                  |
| EOU4 | The Web site is flexible to interact with.  | .90       | .89                  |
| EOU5 | My interaction with the Web site is clear and understandable.   | .90       | .90                  |
| EOU6 | It is easy to interact with the Web site.   | .90       | Dropped              |
|      | <b>Perceived Usefulness</b>   |           |                      |
| PU1  | The Web site is useful for searching and buying CDs/books.  | .79       | Dropped              |
| PU2  | The Web site improves my performance in CD/book searching and buying.                                 | .88       | .87                  |
| PU3  | The Web site enables me to search and buy CDs/books faster.   | .90       | .90                  |
| PU4  | The Web site enhances my effectiveness in CD/book searching and buying.                               | .92       | .93                  |
| PU5  | The Web site makes it easier to search for and purchase CDs/books.                                    | .90       | Dropped              |
| PU6  | The Web site increases my productivity in searching and purchasing CDs/books                          | .88       | .86                  |
|      | <b>Trust</b>  |           |                      |
| KB1  | Based on my experience with the online vendor in the past, I know it is honest                        | .82       | .85                  |
| KB2  | Based on my experience with the online vendor in the past, I know it cares about customers            | .83       | .86                  |
| KB3  | Based on my experience with the online vendor in the past, I know it is not opportunistic             | .68       | .73                  |



| Item                                 | Wording  | All Items | After Dropping Items |
|--------------------------------------|--|-----------|----------------------|
| KB4                                  | Based on my experience with the online vendor in the past, I know it provides good service                                 | .89       | Dropped              |
| KB5                                  | Based on my experience with the online vendor in the past, I know it is predictable  | .83       | .79                  |
| KB6                                  | Based on my experience with the online vendor in the past, I know it is trustworthy  | .91       | Dropped              |
| KB7                                  | Based on my experience with the online vendor in the past, I know it knows its market                                      | .72       | .70                  |
| <b>Calculative-Based</b>             |  |           |                      |
| CB1                                  | The online vendor has nothing to gain by being dishonest in its interactions with me.                                      | .69       | .69                  |
| CB2                                  | The online vendor has nothing to gain by not caring about me.  | .87       | .87                  |
| CB3                                  | The online vendor has nothing to gain by not being knowledgeable when helping me.  | .73       | .73                  |
| <b>Familiarity with the E-Vendor</b> |  |           |                      |
| FV1                                  | I am familiar with the online vendor through reading magazines/newspaper articles or ads.                                  | .49       | Dropped              |
| FV2                                  | I am familiar with the online vendor through visiting the site and searching for CDs/books.                                | .91       | .89                  |
| FV3                                  | I am familiar with the online vendor through purchasing CDs/books at this site.  | .82       | .84                  |
| <b>Structural Assurances</b>         |  |           |                      |
| IB1                                  | I feel safe conducting business with the online vendor because the Better Business Bureau will protect me.                 | .64       | .64                  |
| IB2                                  | I feel safe conducting business with the online vendor because of it provides a 1-800 number.                              | .73       | .70                  |
| IB3                                  | I feel safe conducting business with the online vendor because of its statements of guarantees.                            | .85       | .89                  |
| IB4                                  | I feel safe conducting business with the online vendor because I accessed its site through a well-known, reputable portal. | .72       | Dropped              |
| <b>Situational Normality</b>         |  |           |                      |
| SN1                                  | The steps required to search for and order a CD/book are typical of other similar Web sites.                               | .88       | .90                  |
| SN2                                  | The information requested of me at this Web site is the type of information most similar type Web sites request.           | .86       | .84                  |
| SN3                                  | The nature of the interaction with the Web site is typical of other similar type Web sites.                                | .78       | Dropped              |

# Appendix B

Correlation Tables

|     | CB1    | CB2    | CB3     | EO1    | EO2    | EO3    | EO4    | EO5    | EO6    | FV1    | FV2    | FV3    | IB1    | IB2    |
|-----|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| CB1 | 1      |        |         |        |        |        |        |        |        |        |        |        |        |        |
| CB2 | 0.6066 | 1      |         |        |        |        |        |        |        |        |        |        |        |        |
| CB3 | 0.4735 | 0.6408 | 1       |        |        |        |        |        |        |        |        |        |        |        |
| EO1 | 0.1527 | 0.1514 | 0.1661  | 1      |        |        |        |        |        |        |        |        |        |        |
| EO2 | 0.1617 | 0.1649 | 0.1421  | 0.8543 | 1      |        |        |        |        |        |        |        |        |        |
| EO3 | 0.1713 | 0.1485 | 0.109   | 0.7624 | 0.8386 | 1      |        |        |        |        |        |        |        |        |
| EO4 | 0.1831 | 0.1609 | 0.1762  | 0.7982 | 0.7869 | 0.8128 | 1      |        |        |        |        |        |        |        |
| EO5 | 0.135  | 0.1382 | 0.1047  | 0.7476 | 0.7874 | 0.8147 | 0.8261 | 1      |        |        |        |        |        |        |
| EO6 | 0.1585 | 0.1024 | 0.1571  | 0.7538 | 0.8037 | 0.7919 | 0.8125 | 0.8502 | 1      |        |        |        |        |        |
| FV1 | 0.2758 | 0.2009 | 0.1652  | 0.2759 | 0.2629 | 0.3117 | 0.3422 | 0.2707 | 0.2581 | 1      |        |        |        |        |
| FV2 | 0.2215 | 0.1433 | 0.1119  | 0.3906 | 0.3972 | 0.4336 | 0.4157 | 0.3866 | 0.3924 | 0.4597 | 1      |        |        |        |
| FV3 | 0.1809 | 0.1388 | 0.1244  | 0.3825 | 0.3823 | 0.3893 | 0.4107 | 0.3323 | 0.3436 | 0.3452 | 0.7483 | 1      |        |        |
| IB1 | 0.0958 | 0.0319 | 0.0306  | 0.0745 | 0.0800 | 0.0797 | 0.1122 | 0.1661 | 0.1415 | 0.1886 | 0.305  | 0.2703 | 1      |        |
| IB2 | 0.0427 | 0.017  | -0.0235 | 0.0495 | 0.0203 | 0.0253 | 0.1031 | 0.0996 | 0.0849 | 0.0859 | 0.1952 | 0.1969 | 0.4795 | 1      |
| IB3 | 0.2026 | 0.0937 | 0.1141  | 0.0407 | 0.0298 | 0.0205 | 0.1104 | 0.1276 | 0.144  | 0.239  | 0.2347 | 0.221  | 0.5494 | 0.6261 |
| IB4 | 0.1103 | 0.0965 | 0.1056  | 0.162  | 0.1825 | 0.1581 | 0.2363 | 0.2478 | 0.2222 | 0.2179 | 0.2237 | 0.1731 | 0.4114 | 0.5499 |



|      | CB1    | CB2    | CB3    | EO1    | EO2    | EO3    | EO4    | EO5    | EO6    | FV1    | FV2    | FV3    | IB1    | IB2    |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| KB1  | 0.2503 | 0.2003 | 0.2123 | 0.3628 | 0.3913 | 0.4305 | 0.4439 | 0.4462 | 0.4824 | 0.3072 | 0.3046 | 0.347  | 0.1949 | 0.2041 |
| KB2  | 0.3004 | 0.2057 | 0.2936 | 0.3511 | 0.3793 | 0.4025 | 0.4196 | 0.4203 | 0.4339 | 0.3509 | 0.3389 | 0.3469 | 0.2509 | 0.13   |
| KB3  | 0.2162 | 0.1595 | 0.2342 | 0.3092 | 0.3192 | 0.2506 | 0.3592 | 0.3375 | 0.3466 | 0.2927 | 0.2395 | 0.2949 | 0.275  | 0.2503 |
| KB4  | 0.1787 | 0.2189 | 0.2751 | 0.5172 | 0.5429 | 0.5094 | 0.505  | 0.5021 | 0.5499 | 0.2604 | 0.3695 | 0.4063 | 0.1921 | 0.1615 |
| KB5  | 0.2581 | 0.21   | 0.2617 | 0.3905 | 0.4159 | 0.389  | 0.3976 | 0.3964 | 0.4466 | 0.2525 | 0.3205 | 0.3402 | 0.2649 | 0.2336 |
| KB6  | 0.2181 | 0.2656 | 0.3114 | 0.4323 | 0.4431 | 0.4472 | 0.4507 | 0.4829 | 0.4824 | 0.2651 | 0.3679 | 0.3934 | 0.2696 | 0.2243 |
| KB7  | 0.1899 | 0.1512 | 0.1716 | 0.4216 | 0.4144 | 0.3999 | 0.4296 | 0.454  | 0.4412 | 0.31   | 0.3885 | 0.4174 | 0.2325 | 0.1751 |
| PU1  | 0.2045 | 0.1281 | 0.1709 | 0.5936 | 0.6529 | 0.6673 | 0.644  | 0.6235 | 0.6265 | 0.3129 | 0.4948 | 0.4544 | 0.172  | 0.1568 |
| PU2  | 0.1484 | 0.0613 | 0.1371 | 0.5141 | 0.5829 | 0.4916 | 0.5596 | 0.5492 | 0.5548 | 0.2685 | 0.3706 | 0.3912 | 0.1427 | 0.2205 |
| PU3  | 0.1147 | 0.0642 | 0.0876 | 0.4964 | 0.5662 | 0.579  | 0.5817 | 0.6017 | 0.588  | 0.2974 | 0.445  | 0.4428 | 0.1989 | 0.2298 |
| PU4  | 0.1743 | 0.0754 | 0.1403 | 0.5264 | 0.5806 | 0.564  | 0.5802 | 0.5636 | 0.5736 | 0.308  | 0.3885 | 0.4296 | 0.192  | 0.1993 |
| PU5  | 0.1043 | 0.0679 | 0.1253 | 0.5174 | 0.5749 | 0.4799 | 0.5064 | 0.5556 | 0.544  | 0.2449 | 0.3821 | 0.4083 | 0.1837 | 0.2055 |
| PU6  | 0.1578 | 0.0432 | 0.1216 | 0.4991 | 0.5696 | 0.4845 | 0.5201 | 0.5144 | 0.5442 | 0.2771 | 0.3921 | 0.3838 | 0.2098 | 0.2046 |
| SN1  | 0.1297 | 0.1168 | 0.1453 | 0.4847 | 0.5214 | 0.5088 | 0.4478 | 0.4941 | 0.508  | 0.2336 | 0.443  | 0.3851 | 0.1254 | 0.093  |
| SN2  | 0.0709 | 0.0962 | 0.0868 | 0.4409 | 0.4635 | 0.4092 | 0.4142 | 0.4746 | 0.4841 | 0.1831 | 0.4293 | 0.4448 | 0.1283 | 0.1042 |
| SN3  | 0.1284 | 0.1322 | 0.0841 | 0.4657 | 0.5132 | 0.5281 | 0.466  | 0.4959 | 0.4813 | 0.215  | 0.3659 | 0.3854 | 0.1605 | 0.117  |
| USE1 | 0.1534 | 0.1019 | 0.1175 | 0.444  | 0.4716 | 0.5296 | 0.4646 | 0.5035 | 0.5273 | 0.2375 | 0.3552 | 0.3547 | 0.147  | 0.1225 |
| USE2 | 0.0977 | 0.0255 | 0.1355 | 0.4469 | 0.4513 | 0.4748 | 0.4996 | 0.505  | 0.5666 | 0.2028 | 0.323  | 0.3154 | 0.1856 | 0.196  |

|      | IB3    | IB4    | KB1    | KB2    | KB3    | KB4    | KB5    | KB6    | KB7    | PU1    | PU2    | PU3    | PU4    |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| IB3  | 1      |        |        |        |        |        |        |        |        |        |        |        |        |
| IB4  | 0.6009 | 1      |        |        |        |        |        |        |        |        |        |        |        |
| KB1  | 0.3546 | 0.3957 | 1      |        |        |        |        |        |        |        |        |        |        |
| KB2  | 0.3545 | 0.4118 | 0.7628 | 1      |        |        |        |        |        |        |        |        |        |
| KB3  | 0.4319 | 0.4586 | 0.5773 | 0.6475 | 1      |        |        |        |        |        |        |        |        |
| KB4  | 0.2237 | 0.3511 | 0.742  | 0.7525 | 0.566  | 1      |        |        |        |        |        |        |        |
| KB5  | 0.3589 | 0.3727 | 0.671  | 0.6303 | 0.5931 | 0.7309 | 1      |        |        |        |        |        |        |
| KB6  | 0.3411 | 0.4156 | 0.734  | 0.7289 | 0.5845 | 0.8218 | 0.8014 | 1      |        |        |        |        |        |
| KB7  | 0.2717 | 0.3325 | 0.5404 | 0.6003 | 0.4788 | 0.6774 | 0.5819 | 0.6671 | 1      |        |        |        |        |
| PU1  | 0.1856 | 0.2602 | 0.4923 | 0.4706 | 0.3578 | 0.5321 | 0.429  | 0.4708 | 0.423  | 1      |        |        |        |
| PU2  | 0.1688 | 0.329  | 0.385  | 0.3839 | 0.4575 | 0.4561 | 0.3867 | 0.3983 | 0.4222 | 0.7049 | 1      |        |        |
| PU3  | 0.2118 | 0.3848 | 0.4617 | 0.416  | 0.3878 | 0.4437 | 0.3697 | 0.4506 | 0.4319 | 0.7376 | 0.7767 | 1      |        |
| PU4  | 0.1752 | 0.3409 | 0.4019 | 0.4112 | 0.4407 | 0.4463 | 0.4116 | 0.4623 | 0.4243 | 0.7218 | 0.807  | 0.8411 | 1      |
| PU5  | 0.1719 | 0.3191 | 0.3336 | 0.3255 | 0.4002 | 0.4103 | 0.3792 | 0.4182 | 0.4105 | 0.6774 | 0.7967 | 0.7937 | 0.8265 |
| PU6  | 0.1554 | 0.295  | 0.3379 | 0.3171 | 0.3207 | 0.4039 | 0.3536 | 0.4056 | 0.383  | 0.6618 | 0.7783 | 0.765  | 0.8024 |
| SN1  | 0.1114 | 0.2824 | 0.4522 | 0.4412 | 0.3431 | 0.5341 | 0.4302 | 0.4955 | 0.3875 | 0.5848 | 0.5259 | 0.5009 | 0.4801 |
| SN2  | 0.1227 | 0.235  | 0.3551 | 0.3828 | 0.3474 | 0.4685 | 0.3887 | 0.5209 | 0.4157 | 0.4759 | 0.4936 | 0.5213 | 0.4863 |
| SN3  | 0.14   | 0.2561 | 0.4017 | 0.3354 | 0.2843 | 0.4561 | 0.4318 | 0.4708 | 0.3803 | 0.4699 | 0.3823 | 0.4675 | 0.4376 |
| USE1 | 0.1631 | 0.3219 | 0.4302 | 0.4453 | 0.3781 | 0.4741 | 0.4495 | 0.5089 | 0.3655 | 0.4937 | 0.4995 | 0.5927 | 0.5626 |
| USE2 | 0.2458 | 0.321  | 0.3987 | 0.3693 | 0.2764 | 0.4234 | 0.3939 | 0.451  | 0.4119 | 0.4458 | 0.4692 | 0.5163 | 0.4877 |



|      | PU5    | PU6    | SN1    | SN2    | SN3    | USE1   | USE2 |
|------|--------|--------|--------|--------|--------|--------|------|
| PU5  | 1      |        |        |        |        |        |      |
| PU6  | 0.8517 | 1      |        |        |        |        |      |
| SN1  | 0.4928 | 0.4575 | 1      |        |        |        |      |
| SN2  | 0.4961 | 0.4904 | 0.7592 | 1      |        |        |      |
| SN3  | 0.4174 | 0.3708 | 0.6744 | 0.6696 | 1      |        |      |
| USE1 | 0.5486 | 0.5274 | 0.4325 | 0.4801 | 0.4324 | 1      |      |
| USE2 | 0.4838 | 0.4768 | 0.368  | 0.4355 | 0.3677 | 0.6584 | 1    |

## Appendix C

### Pairwise Discriminant Analyses

| Model   | $\chi^2_{df}$           |
|---|-------------------------|
| Original Model                                    | $\chi^2_{247} = 364.32$ |
| Combining Intended Use with PU                    | $\chi^2_{254} = 442.62$ |
| Combining Intended Use with PEOU                  | $\chi^2_{254} = 469.41$ |
| Combining Intended Use with Trust                 | $\chi^2_{254} = 488.38$ |
| Combining Intended Use with Calculative-based     | $\chi^2_{254} = 578.55$ |
| Combining Intended Use with Knowledge-based       | $\chi^2_{254} = 499.48$ |
| Combining Intended Use with Institutional-based   | $\chi^2_{254} = 567.90$ |
| Combining Intended Use with Situational-normality | $\chi^2_{254} = 464.71$ |
| Combining PU with PEOU                            | $\chi^2_{254} = 804.14$ |
| Combining PU with Trust                           | $\chi^2_{254} = 781.37$ |
| Combining PU with Calculative-based               | $\chi^2_{254} = 587.76$ |
| Combining PU with Knowledge-based                 | $\chi^2_{254} = 523.48$ |
| Combining PU with Institutional-based             | $\chi^2_{254} = 578.58$ |
| Combining PU with Situational-normality           | $\chi^2_{254} = 511.50$ |
| Combining PEOU with Trust                         | $\chi^2_{254} = 800.31$ |
| Combining PEOU with Calculative-based             | $\chi^2_{254} = 580.28$ |
| Combining PEOU with Knowledge-based               | $\chi^2_{254} = 533.68$ |
| Combining PEOU with Institutional-based           | $\chi^2_{254} = 602.65$ |
| Combining PEOU with Situational-normality         | $\chi^2_{254} = 530.42$ |

| Model  | $\chi^2_{df}$           |
|--|-------------------------|
| Combining Trust with Calculative-based                   | $\chi^2_{254} = 544.48$ |
| Combining Trust with Knowledge-based                     | $\chi^2_{254} = 532.54$ |
| Combining Trust with Institutional-based                 | $\chi^2_{254} = 533.01$ |
| Combining Trust with Situational-normality               | $\chi^2_{254} = 539.49$ |
| Combining Calculative-based with Knowledge-based         | $\chi^2_{254} = 609.39$ |
| Combining Calculative-based with Institutional-based     | $\chi^2_{254} = 601.41$ |
| Combining Calculative-based with Situational-normality   | $\chi^2_{254} = 661.74$ |
| Combining Knowledge-based with Institutional-based       | $\chi^2_{254} = 553.95$ |
| Combining Knowledge-based with Situational-normality     | $\chi^2_{254} = 497.31$ |
| Combining Institutional-based with Situational-normality | $\chi^2_{254} = 656.40$ |



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