UNDERSTANDING THE SOURCES AND IMPACTS OF TRUST IN E-COMMERCE: A META-ANALYSIS

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UNDERSTANDING THE SOURCES AND IMPACTS OF TRUST IN E-COMMERCE: A META-ANALYSIS

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ABSTRACT
Trust plays a vital role in e-commerce to encourage desired transaction attitudes and behaviors from consumers. Research on trust in e-commerce has employed many different theoretical frameworks and tested a variety of variables, resulting in fragmented findings. This study attempts to synthesize previous empirical findings regarding antecedents and consequents of trust in e-commerce. A meta-analysis is conducted. 52 empirical studies have been identified, and 207 effect sizes are collected and meta-analyzed. Implications for future research are also discussed.

Keywords
Meta-Analysis, Trust, E-Commerce.

INTRODUCTION
Online transactions require customers to provide sensitive information in the absence of formal control mechanisms to monitor such information being appropriately used (Hoffman et al., 1999). Also, compared with the traditional “brick and mortar” retailers, e-vendors lack some common means such as physical proximity and history of being in business to boost customer awareness and confidence (Bhattacherjee, 2002). Therefore, initiating, building, and maintaining trust among customers are widely believed to be the key drivers of success for e-vendors (Ba and Pavlou, 2002; Friedman et al., 2000; Gefen et al., 2003; Pavlou and Gefen, 2004).

E-commerce represents a complex blend of human actors and technological systems (Friedman et al., 2000). The formation and development of trust in such a rich context are shaped by various forces including economic, psychological, social, technological, and environmental factors. It is common for researchers to integrate different theoretical frameworks and develop a comprehensive model to study trust in e-commerce (e.g., Gefen et al., 2003; McKnight et al., 2002; Rousseau et al., 1998). Not surprisingly, empirical research in the field has employed different perspectives and addressed a variety of variables, resulting in fragmented findings in the literature.

This study attempts to systematically review empirical studies that have been conducted on trust in e-commerce. The purpose is to synthesize what we have examined, and make suggestions for future research. To serve the end, meta-analysis is selected as the primary method for the study. The remainder of the paper is organized as follows: first, the theoretical backgrounds of trust research in e-commerce are discussed; then, the meta-analytic procedure is described, and the results are reported. The paper ends with a discussion of the findings and the implications for future research.

THEORETICAL BACKGROUND OF TRUST

Conceptualization of Trust
Trust has been studied in several disciplines including economics, sociology, marketing, and organizational behavior (Rousseau et al., 1998; Bhattacherjee, 2002). Although there is no universally agreed definition of trust, a generic typology proposed by Mayer et al. (1995) has been widely adopted among trust researchers (Rousseau et al., 1998). According to Mayer et al. (1995), the construct of trust consists of three key dimensions of ability (trustor’s perception of trustee’s competencies and knowledge salient to the expected behavior), integrity (trustor’s perception that the trustee will adhere to a set of principles that the trustor finds acceptable), and benevolence (the extent to which a trustee is believed to intend doing good to the trustor, beyond its own profit motive).

Accordingly, IS researchers commonly define and operationalize trust in e-commerce as a collection of beliefs in an e-vendor’s ability, integrity, and benevolence (Bhattacherjee, 2002). There are other aspects of trust being discussed in the literature, such as honesty (Gefen et al., 2003), perceived risks (Connolly and Bannister, 2007), vendor legitimacy (Torkzadeh and Dhillon, 2002) and security (Torkzadeh and Dhillon, 2002; McCloskey, 2007). But the three dimensions of ability, integrity, and benevolence are most adopted in the research of trust in e-commerce.
The Formation and Development of Trust - Antecedents

The research of trust in e-commerce has referenced different theoretical frameworks from economics, sociology, psychology, marketing, and organizational behavior.

Personal Characteristics-based Trust Antecedents

Personal characteristics have been widely studied in the research of organizational behavior, especially in the area of group research (Milliken and Martins, 1996). An assumption of characteristics-oriented research is that people with similar characteristics have comparable experiences and tend to behave in similar ways (Zenger and Lawrence, 1989). In the field of information systems, many researchers recommend to incorporate individual characteristics into a research model either as control variables or as independent variables to study the cognitive, affective, and/or behavioral reactions of individuals to technology (Gefen and Straub, 1997; Venkatesh and Morris, 2000; King and He, 2005a).

Personal characteristics include salient (or observable) attributes such as age and gender, and subtle (or unobservable) attributes such as education and personality (Milliken and Martins, 1996). In e-commerce, the type of personality that receives most research attention is one’s propensity to trust, or the tendency to believe or not to believe in others and so trust them (Gefen et al., 2003). Characteristics-based trust antecedents are most relevant in the initial stage of trust building, when individuals have no direct experience with the target e-vendor (Koufaris and Hampton-Sosa, 2004; Gefen et al., 2003).

Knowledge-based Trust Antecedents

Knowledge-based trust antecedents include knowledge, experience, and self-efficacy with online transactions. These factors can find their theoretical roots in human capital model (Ratchford, 2001) of marketing and social cognitive theory (Bandura, 1977) of sociology. Human capital model treats consumer knowledge as human capital, which affects search activities and consumption prices. Human capital can be acquired through investments in formal or informal education, training, or learning by doing. In contrast, social cognitive theory centers on the concept of self-efficacy as the main mechanism to regulate one’s behavior. Self-efficacy, defined as beliefs about one’s ability to perform a specific behavior, is induced from psychological procedures of deliberating information from various sources including direct and vicarious experiences. Both theories agree that knowledge and experience with target behaviors will help individuals to behave efficiently and decisively in similar contexts. In e-commerce, the more knowledge and experience one has accumulated with a website, the more trust one is likely to form in that website (Gefen et al., 2003).

Deterrence-based Trust Antecedents

Deterrence-based trust is based on the assumption that individuals are rational and will not engage in opportunistic behavior whose consequences of being untrustworthy are possibly severe (Shapiro et al., 1992). Thus, individuals can calculate the consequences of another party’s cheating or cooperating in the relationship, and form beliefs whether the party can be trusted (or, unlikely to perform untrustworthy activities).

Main types of deterrence-based trust antecedents been studied in e-commerce include calculative trust and legal framework. Calculative trust is derived from classic economic theories with a utilitarian tradition (Granovetter, 1985). Trust is viewed as a result of rational calculation of individual gains (Williamson, 1993). In the context of e-commerce, a consumer can trust an e-vendor if he/she believes that “the e-vendor has more to lose than to gain by cheating or has nothing to gain by breaking customer trust” (Gefen et al., 2003; p. 64).

Legal framework also falls in the category of deterrence-based trust antecedents. Legal framework refers to the perceived regulations and law enforcements in online transactions (Connolly and Bannister, 2007). Consumers tend to develop trust in e-vendors if they believe the existing laws and regulations are adequate to protect their interests. E-vendors are unlikely to perform untrustworthy activities in the fear of severe punishments.

Social Influence-based Trust Antecedents

The influence of social factors on trust can find its theoretical ground in the social theory of human behavior. Contrast to economists’ view of human behavior as resulting from rationality and self-interest, sociologists emphasizes on the role of social relations (Granovetter, 1985), and frequently “call attention to the intensity with which men desire and strive for the good opinion of their immediate associates in a variety of situations” (Wrong, 1961; p. 189). People’s purposive actions are constrained by concrete, ongoing systems of social relations including social networks, culture, politics and religion (Granovetter, 2005).

In the research of e-commerce, social norms (Karahanna and Straub, 1999; Venkatesh and Davis, 2000), ratings from fellow consumers (Ziegler and Golbeck, 2007), and references from friends (i.e., word-of-mouth) (Walczuch and Lundgren, 2004) have been studied as important social factors that affecting the formation and development of trust.
Technological Attributes-based Trust Antecedents

Viewing an e-vendor’s website as a special information system, online transaction behaviors can be partially explained by the technological attributes of the website (Gefen et al., 2003). Technological attributes derived from the research of technology acceptance model (TAM) have been widely incorporated into trust model as antecedents. These technical factors include perceived ease of use and perceived usefulness (Davis 1989; Davis et al. 1989), perceived enjoyment (e.g., Hampton-Sosa and Koufaris, 2005; Hwang and Kim, 2007), website quality (e.g., Koufaris and Hampton-Sosa, 2004; Jones and Leonard, 2008) and privacy and security protections (e.g., Walczuch and Lundgren, 2004). All these factors reflect the technical wellness of an e-vendor in terms of supporting transactions.

Vendor-image-based Trust Antecedents

Derived from consumer behavior theories, vendor-image-based trust antecedents include reputation, company size, and product choices of a target e-vendor. These factors are able to convey to consumers an image of the e-vendor, helping them develop “brand” awareness and make favorable decisions toward the e-vendor by employing simple heuristic choices (Hoyer and Brown, 1990). These vendor-image factors are particularly important for first-time visitors, who have no previous experience with the target website but rely heavily on website cues and company reputation to form their initial trust beliefs (Koufaris and Hampton-Sosa, 2004).

Institution-based Trust Antecedents

In the research of e-commerce, institution-based trust refers to a buyer’s perception that third-party guarantees are in place to facilitate online transactions (Pavlou and Gefen, 2004). Certain design of IT infrastructure and artifacts, such as strategic alliance, third-party assurance and certification (including credit card guarantees), can effectively boost institution-based trust and create conditions that will facilitate transaction success (Gefen et al., 2006).

Situational normality (and similar concepts of compatibility as in (Poong et al., 2009; Slyke et al., 2010), defined as the assessment that the transaction will be a success based on how normal or customary the situation appears to be (Baier, 1986), also falls into the category of institution-based trust antecedents (Gefen et al., 2003). Situational normality helps assure people that everything in a standard setting is as it ought to be (McKnight et al., 1998) and strange behaviors (e.g., cheating) are unlikely to happen.

The Effects of Trust – Consequents

In contrast with the complicated nature of the formation and development of trust, trust consequents that have been studied in e-commerce are comparatively cohesive – encouraging online consuming activities by affecting the attitudes, intentions, and eventually the actual behaviors of online transaction (Gefen et al., 2003). Trust effects on these consequents can find strong support in behavior research about behavior formation (e.g., the theory of reasoned action (Ajzen, 1987) and psychology research about behavior regulation and change (e.g., the social cognitive theory (Bandura, 1977). In addition, TAM also provides theoretical support that favorable beliefs (including trusting beliefs) help to form positive attitudes and intentions, and ultimately lead to desired behaviors (Davis 1989, Davis et al. 1989).

An Integrated Model of Trust

The discussion of trust antecedents and trust consequents is summarized in Figure 1. The model integrates different theoretical perspectives regarding the formation and development of trust in e-vendors without probing any possible interwoven relationships among the suggested factors. The model also implies that trust plays an important role in e-commerce by mediating the effects of various factors on individual behaviors in online transactions.
RESEARCH METHOD – META-ANALYSIS

This study attempts to systematically review what we have empirically examined in the literature of trust in e-commerce. Meta-analysis is employed for its unique strength of viewing the “whole picture” in a research context by combining and analyzing the quantitative results of many empirical studies (Glass, 1976). Comparing with other literature review methods such as narrative review, meta-analysis is less judgmental and subjective with a focus on data and the use of rigorous statistical procedures (King and He, 2005b).

Selection of Relevant Studies

To systematically sample relevant studies, two popular business research databases – ABI/INFORMS and Social Science Citation Index (SSCI) – were searched using the keywords of “trust”, and “e-commerce” or “online transactions.” The search resulted in 172 articles in total. Of these, 120 articles were eliminated because they (a) were not empirical studies, (b) did not study e-commerce, (c) did not measure trust, or (d) did not report the effects (as explained below) that can be used for the meta-analysis. The resulting 52 studies provided 207 effect sizes for this meta-analysis.

The Treatment of Effect Sizes

Effect sizes used in this meta-analysis were Pearson’s correlation coefficients. Most studies reported correlation coefficients between trust and antecedents/consequents. If such correlation coefficients were not available, other statistics (e.g., descriptive statistics, p-values, T-tests, F-tests, and d-tests) were examined for possible conversion to correlation coefficients by following the procedures described by Rosenthal and DiMatteo (2001).

If a study had more than one effect size regarding a particular relationship in terms of the previously-discussed classification of variables, the effect sizes were treated by following the decision rules suggested by King and He (2006): multiple effect sizes are averaged if they are homogeneous in both magnitudes and research contexts; otherwise, they will be treated separately.

Meta-Analytic Calculations

This meta-analysis collected 207 effect sizes from 52 studies. Hedges-Olkin’s (1985) random effects method was used as the calculation procedure. Hedges-Olkin is one of three well-developed meta-analytic procedures that have been widely applied in the social and behavioral sciences (Field, 2001; 2003). Basically, effect sizes are first transformed into Fisher’s z; weights of individual studies are calculated basing on sample sizes (using a chi-square analysis of sampling errors); a homogeneity test (Q test) is performed to justify the use of an effect-size-integration model (in this case, the random model); then, a weighted average is calculated from transformed effect sizes, the associating standard deviation, Z-statistic, and 95% confidence intervals. Finally, these statistics are transformed back to their standard forms for interpretation.

Results of the meta-analysis are presented in Table 1-7 for trust antecedents, and Table 8 for trust consequents.
Despite the call for incorporating personal characteristics into IS research (Gefen and Straub, 1997; Venkatesh and Morris, 2000; King and He, 2005a), not many studies have examined the effects of demographics and personalities in their research of trust in e-commerce. The extensive search in the literature has identified 21 studies in this particular area. The focus has been mostly placed on trust propensity (16 out of 21 sampled studies); other demographic factors, including gender, age, education, and income, have received less research attention.

The direct effects of gender, age, and education on trust are found to be frivolous ($r$ close to 0), while trust propensity is found to exert a notable, although small in magnitude, influence on trust ($r=0.201$, $p<0.001$). Interestingly, income level is also found to significantly correlate with one’s trust in e-commerce; high-income individuals are more likely to trust e-vendors and purchase online than low-income individuals are (Qureshi et al., 2009). However, the lack of repeated empirical tests in various research contexts excludes the factor from being meta-analyzed.

<table>
<thead>
<tr>
<th>Familiarity with E-vendor</th>
<th>Self-Efficacy</th>
<th>Internet Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td># of sampled studies</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Total sample size</td>
<td>2358</td>
<td>1318</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>4.934</td>
<td>3.776</td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.668</td>
<td>0.437</td>
</tr>
<tr>
<td>Avg ($r$)</td>
<td>0.442</td>
<td>0.267</td>
</tr>
<tr>
<td>$Z$</td>
<td>3.184</td>
<td>3.586</td>
</tr>
<tr>
<td>p (effect size)</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>95% Low ($r$)</td>
<td>0.181</td>
<td>0.123</td>
</tr>
<tr>
<td>95% High ($r$)</td>
<td>0.645</td>
<td>0.400</td>
</tr>
</tbody>
</table>

Table 2: Knowledge-based Antecedents of Trust

Knowledge-based antecedents of trust include familiarity with the e-vendor, self-efficacy, and Internet experience. The former two factors are found to strong antecedents of trust, with notable effect sizes ($r=0.442$ and 0.267 respectively) and strong statistic significance ($p<0.001$). Interestingly, Internet experience is found to have limited effects on the formation and development of trust in e-commerce ($r=0.109$, $p=0.144$). This finding suggests that trust in e-commerce is more relevant with the special knowledge of target e-vendors (i.e., familiarity with e-vendor) and confidence in conducting online transactions (i.e., self-efficacy), and less relevant with the general knowledge of Internet. In other words, knowing Internet is an insufficient condition for one to embrace e-commerce if the person does not have the special knowledge of conducting transactions with certain e-vendors.

<table>
<thead>
<tr>
<th># of sampled studies</th>
<th>Calculative Trust</th>
<th>Legal Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1745</td>
<td>2398</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>3.631</td>
<td>2.841</td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.458</td>
<td>0.585</td>
</tr>
<tr>
<td>Avg ($r$)</td>
<td>0.453</td>
<td>0.358</td>
</tr>
</tbody>
</table>
Table 3: Deterrence-based Antecedents of Trust

In the literature, two factors - calculative trust and legal framework – have been examined as deterrence-based antecedents of trust. The two factors present strong influence on trust ($r=0.453$ for calculative trust, and $r=0.358$ for legal framework; both with $p<0.001$). The results suggest that people are likely to trust a website if they are convinced that the website is held accountable for any misbehavior either by economic means or by law enforcements.

<table>
<thead>
<tr>
<th></th>
<th>Reference/Word-of-mouth</th>
<th>Negative Rating</th>
<th>Social Norms</th>
</tr>
</thead>
<tbody>
<tr>
<td># of sampled studies</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total sample size</td>
<td>1382</td>
<td>1181</td>
<td>0</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>5.044</td>
<td>2.83</td>
<td></td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.411</td>
<td>0.419</td>
<td></td>
</tr>
<tr>
<td>Avg (r)</td>
<td>0.264</td>
<td>-0.46</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>1.711</td>
<td>-3.878</td>
<td></td>
</tr>
<tr>
<td>p (effect size)</td>
<td>0.087</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>95% Low (r)</td>
<td>-0.039</td>
<td>-0.635</td>
<td></td>
</tr>
<tr>
<td>95% High (r)</td>
<td>0.522</td>
<td>-0.241</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Social-based Antecedents of Trust

Social-based antecedents of trust include reference/word-of-mouth from others, negative rating, and social norms. Of these antecedents, negative rating presents a strong negative effect on trust ($r=-0.46$, $p<0.001$), highlighting the detrimental effects of disapproving information to a website. Contradictory to common understanding, references or word-of-mouth from others demonstrate a marginal effect on trust ($r=0.264$, $p=0.087$). As for social norms, no study has been found to address the particular factor.

<table>
<thead>
<tr>
<th></th>
<th>Perceived Usefulness</th>
<th>Website Quality</th>
<th>Perceived Enjoyment</th>
<th>Feedback Mechanisms</th>
<th>Privacy &amp; Security</th>
</tr>
</thead>
<tbody>
<tr>
<td># of sampled studies</td>
<td>12</td>
<td>15</td>
<td>13</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total sample size</td>
<td>2776</td>
<td>3740</td>
<td>7505</td>
<td>854</td>
<td>848</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>8.664</td>
<td>14.403</td>
<td>15.280</td>
<td>4.081</td>
<td>2.971</td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.653</td>
<td>0.420</td>
<td>0.226</td>
<td>0.395</td>
<td>0.563</td>
</tr>
<tr>
<td>Avg (r)</td>
<td>0.444</td>
<td>0.491</td>
<td>0.413</td>
<td>0.403</td>
<td>0.381</td>
</tr>
<tr>
<td>Z</td>
<td>5.750</td>
<td>9.159</td>
<td>9.815</td>
<td>5.353</td>
<td>2.693</td>
</tr>
<tr>
<td>p (effect size)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.004</td>
</tr>
<tr>
<td>95% Low (r)</td>
<td>0.305</td>
<td>0.399</td>
<td>0.338</td>
<td>0.265</td>
<td>0.109</td>
</tr>
<tr>
<td>95% High (r)</td>
<td>0.565</td>
<td>0.574</td>
<td>0.483</td>
<td>0.526</td>
<td>0.601</td>
</tr>
</tbody>
</table>

Table 5: Technological Attributes-based Antecedents

Studying the technological attributes of a target e-vendor’s website is found to be popular in the research of trust in e-commerce. The factors that have been examined in the literature include perceived ease of use, perceived usefulness, website quality, perceived enjoyment, feedback mechanisms, privacy and security. Overall, these technological attributes are found to be very influential for one to develop trust beliefs toward the target website.
Reputation Company Size Product Choices

<table>
<thead>
<tr>
<th># of sampled studies</th>
<th>6</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample size</td>
<td>2756</td>
<td>692</td>
<td>421</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>6.533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.258</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg (r)</td>
<td>0.471</td>
<td>0.44</td>
<td>0.21</td>
</tr>
<tr>
<td>Z</td>
<td>7.451</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p (effect size)</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Low (r)</td>
<td>0.360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% High (r)</td>
<td>0.569</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Vendor-image-based Antecedents of Trust

The comprehensive search of the empirical studies in the literature of trust in e-commerce shows that IS researchers have placed limited attention on the vendor-image-based antecedents such as reputation, size, and product choices. The latter two factors have each received only one empirical test in the literature. However, the three factors demonstrate remarkable effect sizes, with reputation having $r=0.471$, company size having $r=0.44$, and product choices having $r=0.21$. More research attention needs to be placed on this group of factors for studying trust in e-commerce.

<table>
<thead>
<tr>
<th># of sampled studies</th>
<th>Assurance /Certification</th>
<th>Alliance</th>
<th>Situational Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample size</td>
<td>1293</td>
<td>520</td>
<td>1813</td>
</tr>
<tr>
<td>Homogeneity Test (Q)</td>
<td>4.153</td>
<td>1</td>
<td>4.135</td>
</tr>
<tr>
<td>p (heterogeneity)</td>
<td>0.528</td>
<td>0.317</td>
<td>0.388</td>
</tr>
<tr>
<td>Avg (r)</td>
<td>0.435</td>
<td>0.383</td>
<td>0.546</td>
</tr>
<tr>
<td>Z</td>
<td>3.417</td>
<td>5.741</td>
<td>11.251</td>
</tr>
<tr>
<td>p (effect size)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>95% Low (r)</td>
<td>0.196</td>
<td>0.260</td>
<td>0.467</td>
</tr>
<tr>
<td>95% High (r)</td>
<td>0.626</td>
<td>0.494</td>
<td>0.616</td>
</tr>
</tbody>
</table>

Table 7: Institution-based Antecedents

At a conference panel discussion, Gefen and colleagues (2006) highlighted the importance of studying institutional trust in IS research. Since then, institution-based antecedents of trust have received increased attention among IS researchers. However, as demonstrated in Table 7, limited attempts have been conducted in the context of e-commerce. Similar to that of vendor-image-based antecedents, the three institution-based antecedents present strong influences on the formation and development of trust in e-commerce, with notable effect sizes (ranging from 0.383 to 0.546) and distinct significance ($p<0.001$). More research attention needs to be placed on this group of factors in the future research of trust in e-commerce.
The importance of studying trust in e-commerce centers on the arguments that trust facilitates online consuming activities by affecting the attitudes, intentions, and eventually the actual behaviors of online transaction (Gefen et al., 2003). Thus, the constructs of attitude, behavioral intention, and/or actual behavior are widely accepted as key consequents of trust in the e-commerce literature of trust research. In the meta-analysis, 30 out of 33 studies that have tested trust effects in e-commerce select one or more of the three constructs as the dependent variables in their empirical investigations.

Some researchers have extended their investigations to other trust-triggered attitudes and behaviors such as user loyalty and the acceptance of price premiums. Overall, trust exerts large effects on attitudinal and intentional factors (absolute effect sizes ranging from 0.437 to 0.537, with the exception of user loyalty of 0.27), and moderate effects on actual transaction behaviors (Avg($r$) = 0.252, $p=0.001$), lending support to the importance of studying trust in the research of e-commerce.

With limited attempts (6 out of the 33 sampled studies that have tested trust effects in e-commerce), the literature has tested the extent to which trust reshapes consumers’ perceptions of target e-vendors. The effects of trust on perceived risks and perceived usefulness are found to be large. In contrast, perceived ease of use of a website is found to be little affected by the development of trust.

**DISCUSSIONS**

This study intends to synthesize the empirical findings of previous trust studies in the context of e-commerce. 52 relevant studies were identified from the literature, and 207 effect sizes were collected and analyzed. The results demonstrate the importance of studying trust as a key intervening mechanism of shaping one’s behaviors in the context of e-commerce.

As many as 25 trust antecedents were analyzed. The broad range of antecedents suggests that forming and developing trust in e-commerce is a complicated phenomenon influenced by affective, cognitive, technological, and social forces beyond the boundary of any single theory. Among these factors, deterrence-based, social and institution-based, and technological attributes-based antecedents are found to be the most influential forces on the formation and development of trust. This finding suggests that trust in e-commerce is much in line with technology usage (Friedman, et al., 2000; Gefen et al., 2003), cognitive and rational transaction behavior (Shapiro et al., 1992; Ratchford, 2001), and social and institutional influences (Granovetter, 1985; Pavlou and Gefen, 2004), probably because e-commerce is in nature a technology-driven and transaction-driven environment.

Some factors have received limited attention in the literature. The exhaustive search of empirical studies on trust in e-commerce has not located any test for the effect of social norms, a widely acknowledged factor for shaping individual’s behavior in technology adoption and usage (Venkatesh et al., 2003). The search has located only one test for the effects of company size, product choices, and income, two tests for the effects of alliance, education, and gender, and three tests for the effect of age. As results from few studies cannot serve as the basis for strongly generalizable conclusions, future research that refines and replicates the testing of these factors should be encouraged.

The small direct effects of personal characteristics on trust need further investigation. The effects of personal characteristics observed in the literature are typically small or negligible. Even the effect of trust propensity, which is widely acknowledged as a strong trust antecedent evidenced by the large number of empirical tests, is limited in magnitude (Avg ($r$) =0.2). The influence of personal characteristics on trust is based on the assumption that people with similar backgrounds and experiences will behave in similar ways. Such a contention suggests that personal characteristics exert a moderating role in the development of trust. However, it is a rare endeavor in the literature to examine personal characteristics as moderators rather than determinants of trust in e-commerce. One exception is Qureshi et al. (2009), in which gender and age were found to indirectly influence one’s trust in e-vendors by affecting his/her perception of vendors’ website and service quality. Thus, studying the mechanisms through which personal characteristics affect individual trust beliefs and behaviors will be a promising area for future research.

Another promising area in trust research will be to develop complex trust models that integrate different theoretical perspectives. Although meta-analysis can help us view the “whole picture” of a literature by systematically synthesizing effect sizes studied in the area, the effect sizes are primarily zero-order correlations (Rosenthal and DiMatteo, 2001); structural relationships among the investigated factors are not examined. Studies that integrate different theoretical perspectives and test the structural relationships among key trust antecedents will enrich our understanding of the complicated phenomenon.
As for the consequents of trust, the literature is quite coherent on what trust may affect in the context of e-commerce. Most empirical studies select consumers’ attitude, behavioral intention, and/or actual behavior as the dependent variables. Some researchers have studied the extent to which trust re-shapes one’s perceptions toward a target website such as perceived risk, perceived usefulness, and perceived ease of use. As Bem (1972) pointed out, the behavioral experiences, if they are mindful and reflect the person’s willingness, define and change attitudes, and direct the performance of future behaviors. Thus, the antecedents-trust-behavior relationship can therefore be viewed as a comprehensive interactive system in which the antecedents, trust, and behaviors exert reciprocal influences on one another. The investigation of the interactive system especially on the reciprocal relationships between trust and trust antecedents will strengthen the theoretical foundations of trust research in e-commerce.

To my knowledge, this study is so far the most comprehensive attempt to quantitatively synthesize research findings of trust in e-commerce. However, some limitations of the study should also be acknowledged. One limitation is about the coverage of sampled papers. The exhaustive search does not cover all research databases and may have failed to found some articles online or through the employed university research library system. However, given the overall large number of sampled studies, adding a few additional studies would unlikely to alter the conclusions.

Another limitation is about the treatment of effect sizes. This study used reported effect sizes without adjustments on their measurement errors, such as perception-perception bias, single-method bias, and “attenuation effect” caused by imperfect construct reliabilities. Techniques of estimating and reducing these measurement errors are available, but require additional examination of each sampled study of its detailed research setting and methods, and probably over-modified statistical procedures, which are beyond the scope of the current study. Both the number of the sampled studies and the total cumulated sample size are satisfactorily large, granting credibility to these results.

REFERENCES


