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Transfer of electronic commerce trust between brick-and-mortar and online business environments

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Abstract

Through experimentation, we establish a causal relationship between trust and the expansion of a retailer from online to brick-and-mortar and vice versa. Trust is multidimensional and contingent on the distribution path first chosen. Vendor trustworthiness (knowledge-based) and technological trustworthiness (institution-based) have different effects depending on the initial and new distribution channel. Expanding from brick-and-mortar to online negatively affects technology-based trust, while transfers from an online to a physical location maintain the same level of technology-based trust. Vendor-based trust is positively affected by transfer from online to the brick-and-mortar location, and is not significantly unaffected by transfers from brick and-mortar to online locations. The perceived “permanence” of a physical location influences consumer beliefs about the location’s trustworthiness.

INTRODUCTION

E-commerce has grown rapidly in recent years and will only continue its ascendancy. It represents 4.9% of total retail sales for the first quarter of 2012 up from 1.6% in the first quarter of 2003 (U.S. Department of Commerce 2012a). (Note: E-commerce sales “are sales of goods and services where an order is placed by the buyer or price and terms of sales are negotiated over the Internet,” but it excludes “operations such as travel agencies, financial service, manufacturers, and wholesalers” (U.S. Department of Commerce 2012b)).

Yet, this channel presents obstacles and opportunities for researchers and practitioners. Without a physical location to visit, product to touch or salesperson to interact with, where transactions occur mostly between strangers, online purchases foster greater uncertainty about trading partners being opportunistic (Ba et al. 1999; Brynjolfsson and Smith 2000; Chen and Dhillon 2003; Gefen 2002; Gefen et al. 2003a, 2003b; Mayer et al. 1995).

Consumers infer quality through diagnostic signals, such as reputation, warranty, return policy, money-back guarantee (Biswas, Dutta, and Biswas 2009). In the virtual environment, trust is critical to success because buyers must rely on sellers to accurately portray products and fulfill transactions (Lee 1998), without the physical presence and face-to-face contact inherent in brick-and-mortar retailers. These physical cues then form the basis for trust. Our paper examines how trust and its antecedents transfer from the online to brick-and-mortar environment and vice versa.

LITERATURE REVIEW

Trust

The psychological expectation that parties will not behave opportunistically is trust (Bradach and Eccles 1989; Bunduchi 2005). A trusting relationship assumes a certain level of risk and dependence (Whitener et al. 1998). To be trusting means to be vulnerable (Mayer et al. 1995). As discussed above, trust is of greater import in the ethereal online environment than the physical environment (Bailey and Bakos 1997), because ‘trust reduces uncertainty or expectations of opportunistic behavior’ (Pavlou and Gefen 2004: 45). It also increases purchase intentions both directly (Gefen 2002), as it does in other buyer–seller relationships (Ganesan 1994), and through reduced perceived risk (Jarvenpaa and Tractinsky 1999; Kollock 1999). For sellers, a lack of trust portends market failure (Granovetter 1985). In the words of Reichheld and Scheffer (2000: 107): ‘Price does not rule the Web; trust does.’ When trust exists, ‘it allows partners to transcend short-run inequities or risks to concentrate

on long-term profits or gains' (Lee, Kang, and McKnight 2007: 729).

Recent conceptualizations of trust have proposed, for instance, that trust beliefs are comprised of benevolence, ability and integrity (Benamati et al. 2010; Chen and Dhillon 2003; Gefen 2002; Zhou 2011). Benevolence or caring is the belief that the vendor has the customer's best interests in mind as a business practice (Gefen 2002). These beneficial motives for the other party's welfare require familiarity and prior interaction. Integrity is the belief that the vendor is honest and ethical in his or her conduct of business. Ability is the belief about vendor skills and competence. Marketing literature, on the other hand, argues that there are two distinct types of trust: benevolence and credibility (Doney and Cannon 1997; Ganesan 1994). Following Gambetta (1988); Bhattacharya et al. (1988); McKnight et al. (1998, 2002); and Wingreen and Baglione (2005), we define trust as the subjective assessment of one party that another party will perform a particular transaction according to his or her confident expectations in an environment characterized by uncertainty. It means the seller's intention and behavior will be dependable, ethical and socially appropriate (Gefen 2002; Hosmer 1995; Kumar et al. 1995; Zucker 1986). In the context of this paper, "trust" refers to e-commerce trust.

Trust Transfer

Information from brick-and-mortar retailers is perceived more credible than equivalent information from online retailers (Johnson and Kaye 2004; Liu 2004). Signals used to infer product quality have higher "standalone" credibility for brick-and-mortar retailers as opposed to online retailers because of the former's physical investments (Biswas, Dutta, and Biswas 2009).

Websites that showed pictures of their brick-and-mortar stores and associated street address increased buying intentions through this trust transfer of a physical cue (Stewart 2003). Transfer from a known to unknown entity is based on relatedness: similarity, proximity and common fate, where the degree they form as a group is called entitativity (Campbell 1958). In addition to proximity, the location of the store is also known to affect initial trust formation (Fisher and Chu 2009). The greater is the perceived similarity and interaction between a trusted and unknown entity the higher the initial trusting beliefs (Stewart 2003). Trust from a brick-and-mortar retailer can be transferred to its online entity. Flow (optimal experience with a task) and structural assurance online can result from trust transfer in a brick-and-mortar retailer, and firms should leverage this relationship (Lee, Kang, and McKnight 2007). The authors believe flow and structural assurance influence coherence (ability to form mental models that approximates reality) and cognitive overhead (additional effort to perform a complex task(s)).

Interactivity, interaction between retailer and customer, is related to trust. Higher levels of interactivity lead to higher levels of trust in brick-and-mortar and online retailers (Chen, Griffith, and Wan 2004). There is a carry-over effect for multi-channel retailers where trust, for example, in brick-and-mortar extends to online and vice versa (Chen, Griffith, and Wan 2004). Trust established in brick-and-mortar increases the likelihood of using the same company online (Flavian, Guinaliu, and Torres 2006). This may be attributable to the sense of permanence and security engendered by the physical presence and human interaction of brick-and-mortar stores (Solomon et al. 1985), where retailers can be held accountable (Quelch and Klein 1996).

Online retailers must supplement with other signals (e.g., reputation, warranty, return policy) to improve trust. Investing heavily in these signals may lead to the perception of market leadership. Whether the majority of consumers had a positive or negative experience with a retailer (consensus information) benefits both hybrids (firms have a physical and online presence) and online retailers. A hybrid strategy is most beneficial for unknown retailers (Benedictus et al. 2010). In summary, the research indicates that the direction of trust transfer matters.

Hypothesis

The convenience and variety offered by ecommerce has led to an explosion of growth, with many brick-and-mortar retailers entering the market and online retailers contemplating brick-and-mortar locations. This paper addresses how trust transfer migrates along those two paths based on upon where the organization starts (i.e., online or brick-and-mortar). Online retailing will continue to grow, and implicitly online retailers will also. We investigate one avenue for improving trust whether that expansion occurs online or at a brick-and-mortar location.

Because of the perceived permanence of brick-and-mortar locations, and because physical locations and live employees foster interactivity, greater levels of trust, predictability, caring, and other positive affects, vendor-

based trust will be positively affected by transfers from the online store to the brick-and-mortar parent brand. The reverse also will hold, specifically that technology-based trust, because of its dependence on the reliability of the infrastructure, and to the extent that reliability is perceived as tied to a vendor's physical presence, will be negatively affected by transfers from the brick-and-mortar brand to the online parent brand.

H1a: Vendor trust will be positively affected by transfers from the online to the brick-and-mortar environment.

H1b: Technology trust will be negatively affected by transfers from the brick-and-mortar to online environment.

Based on our hypotheses, the mathematical models tested are:

$$E(y_1) = \beta_0 + \beta_1x_1 + \beta_2x_2 \quad \text{and}$$

$$E(y_2) = \beta_0 + \beta_1x_1 + \beta_2x_2$$

where y_1 is consumer beliefs in vendor-based trustworthiness, y_2 is consumer beliefs in technology-based trustworthiness, x_1 is knowledge-based trust, and x_2 is technology trust. Both x_1 and x_2 are categorical variables with two levels: 0 = no treatment, 1 = treatment. The hypotheses predict that β_1 and β_2 will be significant (negative) for brick-and-mortar to online and significant (positive) for online to brick-and-mortar.

METHODS

Experimental Design

A fully randomized, paired difference design was employed for both online-to-brick-and-mortar transfer and brick-and-mortar-to-online transfer. Direction of transfer was operationalized by asking the subject to read a scenario for a brick-and-mortar store before responding to the vendor-based trust and technology-based trust instrument, and then to read a scenario describing the brick-and-mortar store's online website, and then responding to the same instrumentation for vendor-based and technology-based trust, or vice-versa for online to brick-and-mortar transfer (Appendices A and C). In other words, subjects were randomly treated for either the online to brick-and-mortar treatment or the brick-and-mortar to online treatment, but not both.

A total of $n = 91$ subjects participated in the experiment. All subjects were undergraduate students at two southeastern universities in the U.S. All subjects had prior experience in the campus textbook market, 67% had purchased a textbook over the Internet, and 96% of the subjects have prior Internet purchasing experience.

Instrumentation

The study's dependent variables, vendor-based trust and technology-based trust, were measured with instrumentation developed from previous research (Gefen 2002; Gefen et al., 2003; McKnight et al., 2002 & 2004; Wingreen and Baglione, 2005). The instrumentation has consistently shown adequate reliability by Cronbach's Alpha ($\alpha > 0.70$) and discriminant validity as demonstrated by factor analysis. The instrumentation is reported in Appendix A.

Prior research has also demonstrated that some consumers are innately more prone to trust an e-vendor than others, or that any given consumer comes to a situation with an initial trust (McKnight et al. 1998, 2002; Wingreen and Baglione, 2005). Initial trust is defined as the trust a consumer has in an unfamiliar stimulus. It is one's general propensity to trust (Lee and Turban 2000), and is affected by store location (Fisher and Chu, 2009). Therefore, this study will control for the consumer's initial level of trust as a covariate. Initial trusting belief was operationalized in this study as the subject's response to a summated general-trust scale composed of Likert-type items (Cheung and Lee 2001; Lee and Turban 2000). "Familiarity with Internet" has previously demonstrated significance as a covariate, and therefore will also be controlled in this experiment using instrumentation validated in prior research (Wingreen and Baglione, 2005).

A knowledge-based trust scale that incorporates benevolence, integrity/credibility and ability (Gefen et al. 2003b) was adopted to measure the consumer's trust in the online vendor. Consumer trust in marketplace technology (institution-based trust) is operationalized by adapting an institution-based trust subscale that was initially developed in prior research as part of a larger instrument for institution-based trust (McKnight et al.

2002 & 2004), and subsequently expanded to include statements about website security, encryption and related technological 'safety' features that fit the general definition of institution-based trust, but had not been a part of either the formal theory of institution-based trust (Wingreen and Baglione, 2005).

Experimental Procedure

The treatment scenarios were printed on the questionnaire in the instructions at the top of the section containing the instrumentation for beliefs in vendor (knowledge-based trust), and technology trustworthiness (institution-based trust), and initial trust. The familiarity scale preceded the treatment manipulations. The questionnaires were then randomly assigned and administered to the subjects, who then completed and returned the questionnaires immediately so as to control the various threats to internal validity that may result from information about the experiment being shared between the subjects. In order to reinforce manipulation validity, the subjects were encouraged to carefully read the questionnaire instructions, which included the treatment scenarios, before providing their responses to the trust items.

Treatments

Written treatment scenarios were developed for both brick-and-mortar and electronic marketplaces (Appendix C). Control conditions are operationalized by the paired-difference design for both directions of transfer by instructing the subject to simply respond to the survey first for one and then the other type of store.

Manipulation validity

Following the recommendations for experimental research, tests were conducted for manipulation validity. Approximately 76% of the subjects responded affirmatively about whether they were aware that the questionnaire instructions included the information provided in the treatment, which well exceeds the general rule of thumb that more than 50% of experimental subjects should be aware that a treatment had been administered (Gefen, Boudreaux, and Straub 2004). Furthermore, tests of significance confirmed ($\alpha < 0.05$) that subjects believed the treatment scenarios represented instances of independent variables, thus indicating that members of the experimental population believed that the treatment scenarios adequately represented the constructs of interest. Based on these results, the criteria for manipulation validity appear to be satisfied.

ANALYSIS

Descriptive Statistics

Table 1 reports the descriptive statistics, n , mean difference, and standard deviation across all groups of the independent variables. Levene's Test of Equality of Error Variances, which tests the null hypothesis of equal error variance of the dependent variable across all groups of the independent variable, is not statistically significant for either variable ($p < 0.74$ and 0.09 , for technology-based and vendor-based trust, respectively). Across all subjects in all groups, for vendor-based trust there were $n = 91$, grand mean difference $\mu = 0.25$, and standard deviation $s = 7.46$; for technology-based trust there were $n = 89$, grand mean difference $\mu = 0.06$, and standard deviation $s = 5.83$.

<i>Vendor-based trust</i>		
	Brick-and-mortar to online transfer	Online to brick-and- mortar transfer
N	46	45
Mean diff.	-0.89	2.22
Std. dev.	5.99	5.22

<i>Technology-based trust</i>		
	Brick-and-mortar to online transfer	Online to brick-and- mortar transfer
N	45	44
Mean diff.	-1.78	0.77
Std. dev.	4.60	3.85

Table 1. Descriptive Statistics: n, mean, standard deviation by experimental group, by dependent variable

Reliability and Discriminant Validity

Reliability and discriminant validity were re-examined and the instrumentation was subsequently re-validated for this study. As determined by Cronbach's alpha, the reliability of both the vendor-based trust instrument ($\alpha = 0.84$) and the technology-based trust instrument ($\alpha = 0.92$) were adequate, and factor loadings demonstrate strong evidence of discriminant validity (Appendix B). Based on the results of these tests, both scales were judged adequate to be summated for modeling purposes as dependent variables.

Results

Hypothesis 1a and 1b: Direction of transfer

The hypotheses, which propose that brick-and-mortar to online transfer of technology trust is negative, and online to brick-and-mortar transfer of vendor trust is positive, was tested using MANOVA to compare the two directions of transfer against each other across both dependent variables simultaneously, and simple t-tests individually for each direction of transfer, for each dependent variable. The control group mean differences were each compared by t-tests against a null hypothesis ($\mu = 0$), which would indicate that no difference is attributable to the direction of transfer. The results of this procedure are reported in Table 2. Wilks' Lambda, Pillai's Trace, and the Hotelling-Lawley Trace are all significant ($p = 0.0067$), which indicates that the combined dependent variables were significantly affected by the treatments. The results indicate general support for the hypotheses, since both ANOVA tests are significant, and the mean differences are in the hypothesized directions. This experiment is not able to determine the extent to which the non-significant effects are truly non-significant, although the non-significant effects observed here are consistent with the hypotheses, and at most trivial in scale.

<i>Vendor-based trust</i>	R ²	Mean: Brick-and-mortar to online	Mean: online to brick-and-mortar	F	p-value
MANOVA	0.09	-0.88 (n = 43)	2.42 (n = 43)	8.37	0.005
	n	Std dev	Mean diff	T	p-value
Brick-and-mortar to online	46	5.99	-0.89	1.01	0.159
Online to brick-and-mortar	45	5.22	2.22	2.85	0.003

<i>Technology-based trust</i>	R ²	Mean: Brick-and-mortar to online	Mean: online to brick-and-mortar	F	p-value
MANOVA	0.08	-1.58 (n = 43)	0.88 (n = 43)	7.65	0.007
	n	Std dev	Mean diff	T	p-value
Brick-and-mortar to online	45	4.60	-1.78	2.59	0.013
Online to brick-and-mortar	44	3.85	0.77	1.33	0.190

Table 2. Hypothesis 1, ANOVA and t-tests for direction of transfer

DISCUSSION

Established organizations expanding into a new distribution channel must recognize that trust is multidimensional and contingent on the distribution path first chosen. Vendor trustworthiness (knowledge-based) and technological trustworthiness (institution-based) have different effects depending on the initial and new distribution channel. Expanding from brick-and-mortar to online negatively affects technology-based trust, thus indicating that the consumers' perception that the online space requires technical expertise not available from a brick-and-mortar only outlet, and consumers' perceived safety in the transaction suffers a corresponding decline. Transfers from an online to a physical location maintain the same level of technology-based trust, since the perceived technological sophistication of an online store transfers to a physical location. Brick-and-mortar locations, although they receive the benefit of their association with the technological sophistication of their online extension, should reinforce their ability to make a transaction safe online so as to soften the negative effect associated with transfers to the online environment. The downside is the cost associated with a physical location and financial commitment.

Vendor-based trust is positively affected by transfer from online to the brick-and-mortar location, and is not significantly unaffected by transfers from brick and-mortar to online locations. Consumers appear to believe an honest and trustworthy store that operates in a non-opportunistic fashion will do so regardless of the distribution path, although the results indicate a clear preference for brick-and-mortar locations with regard to trust. Expertise and market knowledge appear to be instrumental in the facilitation of trust transfer. For transfers in either direction, the physical location is seen as more trustworthy, knowledgeable, and competent, and credible. The perceived "permanence" of a physical location influences consumer beliefs about the location's trustworthiness.

Building a brick-and-mortar outlet for an online-only retail outlet enhances vendor-based trust. This is an expensive mechanism for achieving this, and would require substantial strategic input before deciding. Conversely, moving online from a brick-and-mortar-only outlet diminishes technology-trust, and may force the brick-and-mortar retailer expand into the online space to instill faith in the company's new online venture.

One limitation of this research is that the experimental conditions and controls imposed for the sake of isolating the causality of the treatments have probably resulted in diminished effect sizes. This is a common consequence of controlled experiments, and we would expect larger effect sizes to be observed in correlational or field research studies.

FUTURE RESEARCH

Brick-and-mortar and online shoppers do differ: online are more quality oriented, which may be a trust signal for the permanence of brick-and-mortars (Schramm-Klein, Swoboda and Morschett 2007). Online offers greater variety, but must be balanced with longer wait times (Beauchamp and Ponder 2010). Future research could investigate these effects in field studies and case research to deepen our understanding of how consumers transfer trust between different environments. Furthermore, there are opportunities to explore whether or not there are different groups of consumers with regard to location preferences, and how the dynamics of trust transfer operate within those groups.

CONCLUSION

Trust is clearly enhanced for brick-and-mortar locations that brand from established websites, and the results of this experiment reveal that the direction of transfer is a manifest cause in the outcome. For the converse, the result is, basically, the opposite. Brand equity transfer from one distribution channel to another is nuanced. It does not transcend the distribution path always. Trust rules business, it is multidimensional and depends on what is emphasized by the business, and what distribution channel the business was started in.

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APPENDIX A. INSTRUMENTATION

Vendor-based trust

- vtrust1 I know the vendor is honest.
- vtrust2 I know the vendor cares about customers.
- vtrust3 The vendor has the ability to handle sales transactions.
- vtrust4 I know the vendor is not opportunistic.
- vtrust5 The vendor has sufficient expertise and resources to do business.
- vtrust6 I know the vendor is predictable.
- vtrust7 The vendor has adequate knowledge to manage their business.
- vtrust8 I know the vendor knows the market.

Technology-based trust

- ttrust1 I feel safe conducting business with the vendor because I believe that my personal information will be secure and confidential.
- ttrust2 I feel safe conducting business with the vendor because the transaction is conducted at a physical “brick-and-mortar” store.
- ttrust3 I feel safe conducting business with the vendor because I believe my transactions are completely secure and confidential.
- ttrust4 I feel safe conducting business with the vendor because it’s physically secure.

APPENDIX B. FACTOR ANALYSIS OF VENDOR-BASED TRUST AND TECHNOLOGY-BASED TRUST

	Factor1	Factor2
vtrust1	0.30384	0.53884
vtrust2	-0.00441	0.67669
vtrust3	0.12389	0.63372
vtrust4	-0.27091	0.80859
vtrust5	0.09047	0.69015

vtrust6	0.17197	0.501
vtrust7	0.20949	0.65332
vtrust8	0.31945	0.46205
ttrust1	0.72389	0.24072
ttrust2	0.87031	0.00605
ttrust3	0.86478	0.1194
ttrust4	0.9296	-0.05548

APPENDIX C. TREATMENTS.

Brick-and-mortar to Online	<i>Brick and mortar treatment:</i> For the following questions, you are asked to imagine that you are an incoming freshman who is about to buy textbooks during the first week of class. On the first day of class, the professor hands out the course syllabus, which lists the textbook and informs you of its availability through the campus bookstore. The final cost of the book, including shipping and handling is equal to its price listed through other sources (e.g. other local bookstores, Amazon, or publisher’s website).
	<i>Online treatment:</i> Before answering the following questions, continue your consideration of the campus bookstore’s website as described on the previous page. The same campus bookstore has opened a website to sell its books on the Internet. The final cost of the book, including shipping and handling, is equal to its price listed through other sources (e.g. other local bookstores, Amazon, or publisher’s website).
Online to Brick-and-mortar	<i>Online treatment:</i> For the following questions, you are asked to imagine that you are an incoming freshman who is about to buy textbooks during the first week of class. On the first day of class, the professor hands out the course syllabus, which lists the textbook and informs you of its availability through the campus bookstore’s website. The final cost of the book, including shipping and handling, is equal to its price listed through other sources (e.g. other local bookstores, Amazon, or publisher’s website).
	<i>Brick and mortar treatment:</i> Before answering the following questions, continue your consideration of the campus bookstore’s website as described on the previous page. The same campus bookstore has a physical “brick-and-mortar” store on campus. The final cost of the book, including shipping and handling, is equal to its price listed through other sources (e.g. other local bookstores, Amazon, or publisher’s website).

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