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Consumer trust in e-commerce in the United States, Singapore and China

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Abstract

This study examines the antecedents and consequences of consumer trust in the United States, Singapore and China. The results show that reputation and system assurance of an Internet vendor and consumers' propensity to trust are positively related to consumer trust. Consumers' trust has a positive relationship with attitude and a negative relationship with perceived risk. Implications of the results are discussed.

Keywords: e-commerce; Trust; The United States; Singapore; China

1. Introduction

Trust plays an important role in many social and economic interactions involving uncertainty and dependency. Since uncertainties exist in transactions over the Internet, many researchers have stated that trust is a critical factor influencing the successful proliferation of e-commerce [1]. The concept of trust is crucial because it affects a number of factors essential to online transactions, including security and privacy. Moreover, although e-commerce brings benefits to both vendors and customers, it also has limitations, such as the physical separation between buyers and sellers, and between buyers and merchandise. In order to reduce the barriers, vendors must develop a trustworthy relationship to foster customer loyalty.

Consumer trust is an important aspect of e-commerce, and understanding its antecedents and consequences is a prime concern for the following reasons. First, the antecedents of trust enable us to know the relative importance of factors affecting trust. Understanding these factors would play an important role in devising appropriate measures to facilitate trust. Second, the consequences of trust would enable us to better understand the importance of trust and its effect on online buying behavior.

In the organizational trust literature, Mayer et al. [2] proposed a model incoporating both a trusting party (trustor) and a party to be trusted (trustee). They discussed the trustor's perceptions about the trustee's characteristics. In the context of e-commerce, Jarvenpaa et al. [3] examined whether customers' perceptions of an Internet store's reputation and size affect their trust in the store. Meanwhile, drawing on the theory of reasoned action, researchers have also investigated the consequences that trust has on consumers' attitudes, intentions, and behaviors [3–5]. In a similar vein, Bendoly et al. [6] examined the impact of channel integration on consumers' loyalty to a multi-channel firm.

The global nature of the Internet raises questions about the trust effects across cultures as well. Although trust may form in a variety of ways, whether and how trust is established depend on the cultural factors (e.g., societal norms, values, etc.) that guide people's behaviors and beliefs

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(e.g., [7]). Based on Hofstede's [7] four dimensions of national culture, Doney et al. [8] developed a framework of cognitive trust-building processes which illustrated the importance of culture in the development of trust. In a similar vein, Jarvenpaa and Tractinsky [4] suggested that culture might affect the antecedents of consumer trust in an Internet store. Chai and Pavlou [9] developed a cross-cultural e-commerce adoption model and empirically tested it using data collected from the United States and China. They found that trust directly influences consumer attitude across cultures; i.e., trust is important for all cultures studied.

Other research has proposed a typology of trust types [10], developed a measurement scale for trust [11], emphasized the importance of system trust in business-to-consumer transactions [12], proposed trust model [13–15], integrated trust with the technology acceptance model [16,17], examined antecedents of trust [18,19], and examined the importance of social presence on trust dimensions [20].

Although trust has been examined for over 50 years, most of the research on consumer trust focuses on consumers in English-speaking countries and newly industrialized countries. For example, previous research has examined countries such as the US [21] and Australia [3]. Other studies compared the formation of consumer trust between two different countries, e.g., Yamagishi and Yamagishi [22] provided empirical evidence that Japanese citizens often report lower levels of trust compared with their American counterparts. In a similar vein, Jarvenpaa and Tractinsky [4] examined consumer trust in the US and Israel, while Gefen et al. [23] examined cultural diversity and trust in IT adoption between the United States and South Africa.

Sin et al. [24] reviewed recent cross-cultural consumer studies and found that about half of these studies involve only two cultures. However, studies that investigate only one or two cultures may have limited values compared to studies done in several cultures. The reason is that studies done in several cultures would give us a better and deeper understanding of the effects of culture on behavior [25]. Hence, we empirically examine a model of consumer trust in e-commerce vendors using data collected from three countries: the United States, Singapore and China.

2. Research model and hypotheses

Our study extends previous research by examining the antecedents of consumer trust in the context of e-commerce based on a dyad of trustors—the consumers, and trustees—the e-commerce vendors. The consumers' trusting beliefs affect their attitudes to the vendors and their risk perception. Consumers' attitudes to the vendor and their perceived risk, in turn, affect their willingness to buy. The research model and hypotheses are shown in Fig. 1.

2.1. Characteristics of trustees (e-commerce vendors)

2.1.1. Reputation and size

Research in traditional industrial buyer–seller relationships revealed that buyer's perceptions of seller's reputation and size are the factors of trustworthiness [26]. This is because reputation and size provide assurances of the vendor's ability, benevolence, and integrity [4]. Jarvenpaa et al. [3] asserted that customers' perceptions of an Internet store's reputation and size affect their trust in the store.

Reputation is defined as the extent to which buyers believe a seller is professionally competent or honest and benevolent [26]. Researchers have recognized that a firm's reputation is a valuable intangible asset that requires a long-term investment of resources, efforts, and attention to customer relationships. Reputation is vulnerable because it is harder to form a reputation than to lose it [27]. It is a fragile strategic asset that can be easily tarnished or damaged if not carefully protected [28]. Consequently, a vendor with good reputation is perceived to be reluctant to jeopardize their reputation by acting opportunistically [29]. In the traditional marketing literature, reputation has been shown to be positively related to the buyer's trust in the seller [30]. In Internet shopping, perceived reputation of a vendor has also been revealed to be significantly related to consumers' trust in the vendor [3–5]. Therefore, we postulate that:

> H1. The perceived reputation of an e-commerce vendor is positively related to the level of consumers' trust in the vendor.

Doney and Cannon [26] defined a seller's size as its overall size and market share position. Since a large market-share firm must serve a more diverse and heterogeneous set of customers [31], a large overall size and market share suggests that the firm consistently delivers on its promises to its consumers and many consumers tend to trust it. Otherwise, it would not have been able to maintain its position in the industry [26]. Large organizational size also indicates that the firm is likely to possess expertise and necessary support systems that encourage trust and loyalty [32]. Larger firms also tend to have more well-developed Web sites to encourage transactions [33]. Finally, in an e-commerce environment, large size suggests that the vendor is able to assume the risk of product failure or transit losses and to compensate buyers accordingly [3]. Hence, it follows that:

> H2. The perceived size of an e-commerce vendor is positively related to the level of consumers' trust in the vendor.

2.1.2. Multi-channel integration

The emergence of the Internet as a channel for commerce has made companies increasingly recognize the importance of having multiple interaction channels with consumers and increasing the integration level among all the

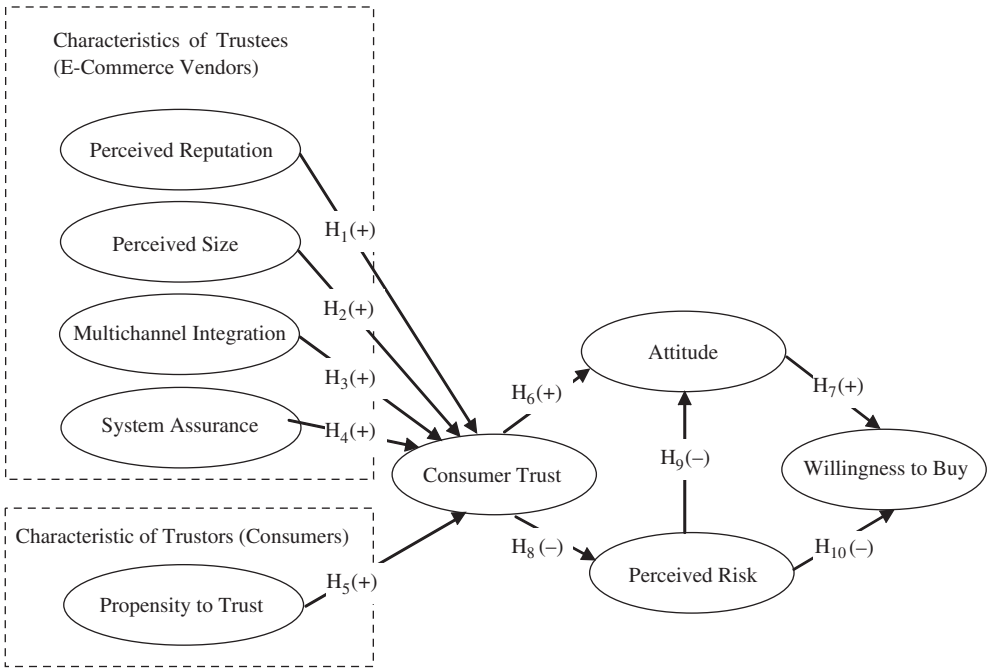


Fig. 1. Research model and hypotheses.

communication channels (e.g., telephone, fax, catalog, physical store, email, Internet Website, etc.). Multi-channel integration is fast becoming a serious source of competitive advantage as consumers demand more and more flexible access to products and services. Gulati and Garino [34] examined the spectrum of strategies to determine the best level of integrating physical and virtual operations and discussed the advantages and trade-offs involved in each choice from the vendors' perspective. Further, Daniel and Wilson [35] identified integration across channels to enable multi-channel service as one of the key dynamic capabilities necessary for e-business transformation.

It is important for vendors to manage customer interactions across different interaction channels using a common set of information and processes, and leveraging information learned on any channel to provide better services or more targeted offers on other channels. It is imperative that vendors always give customers the choice of interacting with them in the manner that is most comfortable for customers. Fully integrated interaction channels would enable vendors to obtain a unified view of customers across all interaction channels and deliver consistent and personalized service. This provides vendors with an effective way of creating a smoother and more satisfying shopping experience for customers and extending assisted service to online customers, which helps to improve customers' satisfaction and trust. Especially, to vendors who have physical stores, the physical distribution ensures that products are available at the right places at the right time in the right quantities to satisfy customer demand [36]. Hence, the physical presence will increase consumers' confidence in a Web vendor's products, no matter whether the products are delivered online or offline.

Typically, customers expect all touch points or interaction channels to provide accurate and unbiased information, easy navigation, and consistent touch [37]. To consumers, provision of different interaction channels would enable them to communicate with the vendor through various means, which in turn would bring them more convenience and increase consumers' confidence in the vendor. For instance, if the integration level of the interaction channels of a vendor is high, consumers can place orders through telephone, fax, Internet Website, or buy directly from physical stores where they can touch and feel the products and take them home immediately. They can call to check the status of the products they have ordered online. They can also return the products they have bought online to any of the Website's corresponding physical stores and get the refund. Meanwhile, consumers can request after-sales services online for any product they have bought from the vendor's physical stores or join online community's discussion about the e-commerce vendor and its products. This indicates that the vendor must have strong self-confidence in its products and the quality of its products should be good enough to cater to picky customers' needs.

Therefore, the fully integrated contact channels of an e-commerce vendor will increase consumers' confidence in the vendor, which in turn would raise the level of consumers' trust in the vendor. Conversely, less integration of interaction channels tend to decrease consumers' trust in the vendor

because of less confidence and communication [38]. In a similar vein, Bendoly et al. [6] provided evidence regarding the role of perceived multi-channel integration on loyalty to a multi-channel firm. Hence, the following hypothesis is proposed:

H3. The level of multi-channel integration of an e-commerce vendor is positively related to the level of consumers' trust in the vendor.

2.1.3. System assurance

We define system assurance as the dependability and security of a vendor's online transaction system, which enables transactions through the Internet be secure and successful. Previous research has demonstrated that a substantial risk perceived by consumers is related to sharing credit or debit card information over the Internet. Ambrose and Johnson [39] found that insufficient trust in the security and reliability of the transactions over the Internet is a commonly expressed concern of consumers. In addition, Kini and Choobineh [40] argued that the assurance properties of the system that consumers interact with are critical in developing and maintaining consumers' trust. It follows that:

H4. The system assurance of an e-commerce vendor is positively related to the level of consumers' trust in the vendor.

2.2. Characteristic of trustors (consumers)

2.2.1. Propensity to trust

In terms of trustor attributes, propensity to trust is the general willingness to trust other people and a measure of an individual's tendency to trust or distrust. It is influenced by cultural background, personality type and previous experiences [2]. Prior research has provided sufficient evidence that individuals differ considerably in their general propensity to trust other people. A person may have dispositional trust because they either believe in the general good nature of people, or they believe that they will achieve better outcomes by tending to trust people [10]. Existing research has revealed that an individual's propensity to trust has a major influence on his/her trust (e.g., [1]). Hence, we hypothesize that:

H5. Propensity to trust is positively related to the level of consumers' trust in the e-commerce vendor.

2.3. Consequences of consumer trust

2.3.1. Consumer trust, attitude, and willingness to buy

Ajzen and Fishbein [41] proposed the theory of reasoned action (TRA) to analyze the psychological processes that reflect observed relationships among beliefs, attitudes, intentions, and behaviors. The theory asserts that intention to perform behavior is determined by the individual's attitude toward the behavior, and a person's attitude is affected by his/her beliefs. TRA has been widely accepted and applied to a broad range of disciplines and contexts. Existing empirical research has revealed that trust is significantly related to attitude, and attitude positively signifies people's purchase intention [32,42]. TRA is also applied as the theoretical base in recent studies on trust formation [10,43], especially in the context of e-commerce [3,5]. Since trust can be seen as a belief, confidence, sentiment, or expectation about an exchange partner's intention and/or likely behavior, it is posited to be directly related to the attitudes toward purchasing from a vendor and indirectly related to consumers' willingness to buy through purchasing attitudes. Trust may lead consumers to focus more on the positive motivation because of a sense of affiliation and identification with the vendor. It follows that:

H6. Consumer trust toward an e-commerce vendor is positively related to favorable attitudes toward purchasing from the vendor.

H7. Favorable attitudes toward an e-commerce vendor is positively related to consumers' willingness to purchase from the vendor.

2.3.2. Consumer trust and risk perception

In an online market, issues such as security, privacy and risk perceptions are important factors affecting consumers' purchasing decision. Unlike the physical market, consumers may be dealing with remote vendors they have never met and products that cannot be touched and felt. Hence, consumers tend to be reluctant to conduct businesses based only on the information provided by e-commerce vendors because such information may not be reliable. Further, in the traditional marketing literature, researchers maintained that the theory underlying the relationship marketing concept suggested that trust is negatively related to perceived risk [44]. Ganesan [30] argued that trust can reduce the consumer's perception of risk associated with opportunistic behavior by the seller. It follows that:

H8. Consumer trust toward an e-commerce vendor is negatively related to the perceived risks involved in purchasing from the vendor.

2.3.3. Risk perception, attitude, and willingness to buy

Bauer [45] argues that once a risk has been perceived in a purchase situation, there seems to be some reasonable evidence that subsequent consumer behavior is shaped by this risk perception. Similar to trust, perceived risk could also be regarded as a belief about situations. For example, Mayer et al. [2, p. 726] defined risk perception as "the trustor's belief about likelihoods of gains and losses outside of considerations that involve the relationships with the particular trustee''. Therefore, in accordance with TRA [41],

Table 1
Measures of model variables

Description	Source
Perceived reputation (PR)	Doney and Cannon [26];
This e-commerce vendor:	Ganesan [30];
Is well known	Jarvenpaa and Tractinsky [4];
Has a good reputation in the market	Jarvenpaa et al. [3]
Has a bad reputation (reverse coded)	
Has a reputation for being honest	
Has a reputation for being fair	
Has a reputation for being consumer-oriented	
Perceived size (PS)	Doney and Cannon [26];
This e-commerce vendor:	Jarvenpaa and Tractinsky [4];
Is a very large company	Jarvenpaa et al. [3]
Is one of the industry's biggest suppliers on the Web	
Is a small player in the market (reverse)	
Has regional presence	
Has global presence	
Multi-channel integration (MI)	Gulati and Garino [34];
I can order online and collect products in the physical stores of this e-commerce vendor.	ICSC [64]
I can return the products I have bought online to any of this vendor's physical stores and get the refund.	
I can request after-sales services offline for any product I have bought online from this vendor.	
I can request after-sales services online for any product I have bought offline from this vendor.	
The pricing of this e-commerce vendor's online and physical stores is usually the same.	
I can choose the most convenient way of interacting with this vendor (e.g., searching and purchasing products) offline or online.	
System assurance (SA)	Kini and Choobineh [40]
The online transaction system of this e-commerce vendor is:	
Stable	
Reliable	
Dependable	
Secure	
Propensity to trust (PTT)	Gefen [1]
I feel that people are generally reliable.	
I feel that people are generally dependable.	
I feel that people are generally trustworthy.	
I generally trust other people unless they give me reason not to.	
Consumer trust (CT)	Doney and Cannon [26]; Gefen [1];
This e-commerce vendor is trustworthy.	Jarvenpaa et al. [3];
This e-commerce vendor provides reliable information.	Jarvenpaa and Tractinsky [4];
This e-commerce vendor keeps promises and commitments.	Jarvenpaa et al. [3];
This e-commerce vendor keeps my best interests in mind.	Macintosh and Lockshin [42]
This e-commerce vendor's behavior meets my expectations.	

Table 1 (*continued*)

Description	Source
Attitude (ATTD)	Jarvenpaa and Tractinsky [4];
Using the Internet to shop from this vendor is pleasant.	Jarvenpaa et al. [3];
Using the Internet to shop from this vendor is a good idea.	Taylor and Todd [65]
The idea of using the Internet to shop from this vendor is appealing.	
I like the idea of using the Internet to shop from this vendor.	
Willingness to buy (WTB)	Jarvenpaa and Tractinsky [4];
The likelihood that I would return to this vendor's Website is:	Jarvenpaa et al. [3];
The likelihood that I would purchase online from this e-commerce vendor is:	Macintosh and Lockshin [42]
The likelihood that I would purchase online from this e-commerce vendor in the next 3 months is:	
The likelihood that I would purchase online from this e-commerce vendor in the next year is:	
My willingness to buy product(s)/service(s) online from this vendor is:	
The probability that I would consider buying online from this vendor is:	
Perceived risk (PRISK)	Houghton et al. [66];
I believe that the risk of purchasing online from this e-commerce vendor is very high.	Simon et al. [67]
There is a high probability of losing a great deal by purchasing online from this e-commerce vendor.	
There is great uncertainty associated with purchasing online from this e-commerce vendor.	
Overall, I would label the option of purchasing online from this e-commerce vendor as something negative.	

consumer's perceived risk might have a negative relationship with their attitudes toward the purchasing behavior. Recent research has confirmed that risk perception and attitudes are closely related. For example, Ruyter et al. [46] empirically verified that perceived risk has an impact on consumers' attitudes toward e-service. McKnight et al. [43] stated that trusting intention is likely to be fragile if the perceived risk is high. Consequently, purchase likelihood tends to be low. Therefore, we hypothesize that:

H9. Consumers' perceived risk associated with purchasing from an e-commerce vendor is negatively related to favorable attitudes toward buying from the vendor.

H10. Perceived risk associated with purchasing from an e-commerce vendor is negatively related to consumers' willingness to buy from the vendor.

3. Method

An online survey, targeted at general Internet users, was utilized to collect data. The survey Websites were hosted at three homepages designed for respondents in the US, Singapore, and China respectively. In order to attract more respondents to participate in this survey, a lucky draw with prizes up to US$120 was offered. In the survey, items of various constructs were developed by adapting existing measures to the research context. Table 1 summarizes the list of items and the source. All items were scored on a seven-point Likert-type scale ranging from (1) Strongly Disagree to (7) Strongly Agree.

The survey questionnaire consisted of three sections. In the first section, respondents were asked to answer questions on their online purchasing experience (i.e., whether they had bought products/services online), the possible types of products/services that they had bought or would buy online, and the average price of the products/services that they had bought or would buy online. In the second section, respondents were asked to choose one of the three categories—books, music, or travel as the frame of reference when they answered questions in this part. The category chosen was preferably the one that they had recently purchased. If they had never bought any product/service online, they were asked to choose a commercial Web vendor that they were familiar with. Respondents were asked to indicate the extent to which they agree or disagree with the statements about this specific e-commerce vendor.

The third section contained basic demographic characteristics including age, gender, nationality, education level, occupation, monthly personal income, Internet experience, etc. Respondents were required to provide a valid email address for the lucky draw. They were also encouraged to fill in any suggestions and comments at the end of the questionnaire.

As the survey was conducted in three countries (US and Singapore being predominantly English-speaking, and China being predominantly Chinese-speaking), two versions of the questionnaire were administered. The questionnaire, originally written in English, was translated into Chinese by a bilingual person whose native language is Chinese. The Chinese questionnaire was then translated back in English by another bilingual person whose native language is English. These two English versions were then compared and no item was found to pertain to a specific cultural context in terms of language. This process was conducted not only because it can prevent any distortions in meaning across cultures where necessary, but also because it can enhance the translation equivalence [47]. The questionnaire was pre-tested with 20 Internet users and there were no major problems with understanding, wording, etc. The same data-collection procedures were used in the three countries and by the same researchers to improve measurement equivalence across cultures. The survey was announced through email, newsgroups, online forums, search engines, and online banner.

4. Results

4.1. Demographic profile of respondents

The profile of the respondents is shown in Table 2. The sample consisted of 544 (US), 1381 (Singapore), and 988 (China) valid responses. The gender of the US and Singapore respondents was evenly mixed (US: 50% males; Singapore: 52% males), while majority of the China respondents (73.1%) were males. The gender percentage of the US respondents was comparable to the results of Spooner [48], which revealed that 52% of the Internet users in the US were males. The gender distribution of the Singapore respondents was similar to the findings of Nielsen/NetRatings [49], which showed that 58% of the Singapore Internet users were males. The gender percentage of the China respondents was comparable to the result of China Internet Network Information Center [50], which reported that 74.7% of the respondents were males.

In addition, most of the respondents of the three groups were young (say, < 40 years old). About 60% of the US respondents and majority of the Singapore (93.9%) and China (97.2%) respondents were in the age of 16–40 years old. The US had a much higher percentage of respondents in the age range of over 40 years old than Singapore and China (US: 40.4%, Singapore: 4.9%, China: 2.6%). The gender and age distributions of these three countries confirm the findings of Graphic, Visualization, and Usability Center's (GVU) WWW User Survey [51] that there exists a trend for the Web towards more balanced gender ratios and an increasing percentage of older users (say, > 40 years old), revealing that the development of the Internet is more mature in the US than in Singapore and China.

Moreover, a majority of the respondents was well educated. The education level of 95.6% of the US respondents, 92.7% of the Singapore respondents, and 99.4% of the China respondents was higher than junior college (including junior college). Results also showed that the US and Singapore respondents had more Internet experience than their China counterpart. Only 7.9% and 19.6% of the US and Singapore respondents, respectively reported that they had used the Internet for less than 4 years, compared to 49.3% of the China respondents. Conversely, a higher percentage of the US (42.8%) and Singapore (18.2%) respondents reported that they had over 7 years of Internet experience compared to China (3.5%). Moreover, about two-thirds of the respondents in the three countries said their daily usage of the Internet was about 1–5 h per day.

4.2. Test for common method variance

As both dependent and independent variable data were collected from a single informant, common method variance could be a potential problem. Following Podsakoff and Organ [52], we used the Harman's one-factor test to examine the extent of the bias. The results of principal component analyses indicate common method variance is not a problem because several factors with eigenvalue greater than 1 were identified and because no factor account for almost all the variance [52].

4.3. Means, standard deviations, and correlation matrices

Tables 3a–c show the means, standard deviations, and bivariate correlation coefficients of the constructs. According to Judge et al. [53, p. 620], multi-collinearity typically is considered to be a serious problem only "if the correlation coefficient between the values of two regressors is greater than 0.8 or 0.9.'' All correlation coefficients in this study were less than 0.8. Another indicator of multi-collinearity—Variance Inflation Factors (VIF) was used in this study. VIF is the reciprocal of the tolerance value. As VIF increases, so does the variance of the regression coefficient, making it an unstable estimate. Large VIF values indicate a high degree of collinearity or multi-collinearity among the independent variables. Results in Table 4 show that all independent variables have VIFs less than 2.0, which is well below the usual cutoff level of 10 [54]. This suggests that no multi-collinearity problem among independent variables exists in this study.

Table 2
Demographic profile of respondents

		Number (percent)							
		US		Singapore		China		Total	
Gender	Male	272	(50.0)	718	(52.0)	722	(73.1)	1712	(58.8)
	Female	272	(50.0)	663	(48.0)	266	(26.9)	1201	(41.2)
Age	Under 15	0	(0)	15	(1.1)	2	(0.2)	17	(0.6)
	16–20	41	(7.5)	333	(24.1)	67	(6.8)	441	(15.1)
	21–25	108	(19.9)	645	(46.7)	486	(49.2)	1239	(42.5)
	26–30	69	(12.7)	167	(12.1)	274	(27.7)	510	(17.5)
	31–35	53	(9.7)	90	(6.5)	107	(10.8)	250	(8.6)
	36–40	53	(9.7)	62	(4.5)	26	(2.6)	141	(4.8)
	41–45	56	(10.3)	25	(1.8)	12	(1.2)	93	(3.2)
	46–50	61	(11.2)	24	(1.7)	6	(0.6)	91	(3.1)
	Above 50	103	(18.9)	20	(1.4)	8	(0.8)	131	(4.5)
Education level	Primary	0	(0)	6	(0.4)	1	(0.1)	7	(0.2)
	Secondary	21	(3.9)	81	(5.9)	4	(0.4)	106	(3.6)
	Junior college	16	(2.9)	663	(48.0)	31	(3.1)	710	(24.4)
	Poly/Diploma	123	(22.6)	148	(10.7)	117	(11.8)	388	(13.3)
	Bachelor	140	(25.7)	364	(26.4)	496	(50.2)	1000	(34.3)
	Master	152	(27.9)	91	(6.6)	279	(28.2)	522	(17.9)
	PhD	90	(16.5)	14	(1.0)	60	(6.1)	164	(5.6)
	Others	2	(0.4)	14	(1.0)	0	(0)	16	(0.5)
Internet experience (Years)	<4	43	(7.9)	271	(19.6)	487	(49.3)	801	(27.5)
	4 to <7	268	(49.3)	859	(62.2)	466	(47.2)	1593	(54.7)
	7 to <10	130	(23.9)	206	(14.9)	33	(3.3)	369	(12.7)
	$>=10$	103	(18.9)	45	(3.3)	2	(0.2)	150	(5.1)
Daily usage of Internet (Hours)	<1	112	(20.6)	249	(18.0)	87	(8.8)	448	(15.4)
	1 to <3	240	(44.1)	626	(45.3)	443	(44.8)	1309	(44.9)
	3 to <5	121	(22.2)	280	(20.3)	201	(20.3)	602	(20.7)
	5 to <7	35	(6.4)	98	(7.1)	113	(11.4)	246	(8.4)
	7 to <9	17	(3.1)	43	(3.1)	78	(7.9)	138	(4.7)
	$>=9$	19	(3.5)	85	(6.2)	66	(6.7)	170	(5.8)

4.4. Structural equation modeling (SEM)

SEM was conducted using AMOS 4. A multiple-group confirmatory factor analysis (CFA) [55] was conducted to test the cross-cultural measurement invariance and the hypothesis that the same model form and parameter structure applies to the United States, Singapore, and China samples. First, the three datasets were tested separately to ensure that the model fit the data for each group. Then the multiple-group models without constraints on the parameters were estimated simultaneously to test if the same model form holds across groups. This unconstrained model was then compared with a constrained one, in which equality constraints on factor structure were placed across the three samples. If the fit of the unconstrained model is not significantly different from the fit of the constrained one, then the factor structure does not differ across the samples [55,56]. The results indicate that the fit of the unconstrained and constrained were not significantly different, thereby implying similar factor structure across samples.

4.4.1. Measurement equivalence

Establishing data equivalence prior to the interpretation of results is important to cross-cultural comparison. Measurement equivalence examines whether the same model hold across different cultures [57]. Translation equivalence, sample equivalence, and metric equivalence are three main types of measurement equivalence [24]. *Translation equivalence* seeks to assure that the translated version of the questionnaire has the same meaning with the version in original language [57]. This is usually satisfied by back-translation [24]. Other methods of testing translation equivalence

Table 3
Means, standard deviations and correlations

Measure	*Mean*	*SD*	*1*	*2*	*3*	*4*	*5*	*7*	*8*	*9*
(a) US sample										
1. PR	*5.988*	*1.085*								
2. PS	*5.423*	*1.405*	*0.4 0***	—						
3. IIC	3.438	1.697	−0.056	−0.100*	—					
4. SA	6.184	1.077	0.653**	0.420**	−0.062	—				
5. PTT	4.986	1.193	0.323**	0.164**	0.002	0.401**	—			
6. CT	5.899	1.043	0.676**	0.286**	−0.005	0.772**	0.461**	—		
7. ATTD	6.105	1.088	0.537**	0.321**	−0.086*	0.718**	0.395**	0.724**	—	
8. WTB	6.146	1.085	0.456**	0.340**	−0.130**	0.640**	0.247**	0.578**	0.707**	—
9. PRISK	1.906	1.199	−0.411**	−0.201**	0.093*	−0.564**	−0.279**	−0.572**	−0.592**	−0.596**	—
(b) Singapore sample										
1. PR	5.302	0.990	—							
2. PS	5.050	1.410	0.488**	—						
3. IIC	3.858	1.250	0.130**	0.010	—					
4. SA	5.327	1.174	0.629**	0.341**	0.167**	—				
5. PTT	4.431	1.055	0.325**	0.208**	0.152**	0.342**	—			
6. CT	5.167	1.080	0.669**	0.351**	0.178**	0.769**	0.425**	—		
7. ATTD	5.146	1.215	0.521**	0.252**	0.137**	0.653**	0.329**	0.720**	—	
8. WTB	4.897	1.370	0.437**	0.093**	0.116**	0.565**	0.249**	0.591**	0.723**	—
9. PRISK	2.988	1.297	−0.288**	−0.052	0.046	−0.383**	−0.105**	−0.372**	−0.396**	−0.403**	—
(a) China sample										
1. PR	5.396	1.056	—							
2. PS	4.589	1.350	0.372**	—						
3. IIC	3.812	1.403	0.198**	0.193**	—					
4. SA	5.428	1.239	0.643**	0.324**	0.212**	—				
5. PTT	4.693	1.261	0.267**	0.143**	0.139**	0.379**	—			
6. CT	5.338	1.148	0.691**	0.290**	0.228**	0.777**	0.406**	—		
7. ATTD	5.294	1.254	0.566**	0.230**	0.162**	0.675**	0.393**	0.736**	—	
8. WTB	5.420	1.267	0.499**	0.178**	0.100**	0.556**	0.289**	0.607**	0.652**	—
9. PRISK	2.764	1.353	−0.365**	−0.061	0.127**	−0.368**	−0.117**	−0.407**	−0.371**	−0.375**	—

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 4
Collinearity statistics

Independent variable	US		Singapore		China	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
PR	0.527	1.899	0.511	1.958	0.555	1.803
PS	0.758	1.319	0.754	1.327	0.837	1.194
IIC	0.989	1.011	0.957	1.045	0.932	1.073
SA	0.515	1.941	0.577	1.733	0.531	1.884
PTT	0.831	1.203	0.852	1.174	0.852	1.174

Table 5
Construct reliability analysis

Construct	No. of items	Composite reliability			Variance extracted		
		US	Singapore	China	US	Singapore	China
PR	4	0.91	0.89	0.90	0.72	0.67	0.70
PS	3	0.88	0.84	0.81	0.71	0.65	0.59
MI	2	0.76	0.77	0.67	0.61	0.63	0.50
SA	4	0.96	0.96	0.94	0.84	0.85	0.79
PTT	3	0.96	0.94	0.96	0.90	0.84	0.88
CT	4	0.95	0.93	0.92	0.81	0.78	0.75
ATTD	4	0.96	0.94	0.91	0.85	0.81	0.72
WTB	5	0.94	0.94	0.92	0.75	0.77	0.71
PRISK	4	0.92	0.91	0.91	0.74	0.72	0.72

include visual examination of factor patterns for similarity [47] and common form test of multiple group measurement models [55]. *Sample equivalence* addresses the extent to which the samples from different cultures are comparable, such that cross-cultural difference cannot be attributed to heterogeneous sample characteristics. Sample equivalence can be satisfied by using similar sampling frames and sampling methods in all cultural groups [24]. *Metric equivalence* examines whether the psychometric properties of data from various groups exhibit the same coherence and structure. If measures satisfy the requirement of metric equivalence, conclusions made would not be influenced by measure unreliability or differing dimensionality. Metric equivalence can be tested by constraining the loadings to be the same across countries [58]. In this study, translation equivalence and sample equivalence were enhanced by the deliberate design of the translation and back-translation procedure and the same sampling methods across the three countries. Metric equivalence was tested via multiple-group CFA.

4.4.2. Measurement model

In order to assess the validity of the measures, Bollen [55] suggested examining the factor loadings and the squared multiple correlations (SMC, which is equivalent of R^2 in linear regression) between the items and the constructs. All factor loadings were highly significant ($p < 0.01$ for all cases). Items that had SMC lower than 0.4 were dropped. The same items were eliminated from the three samples to ensure that the form structure was equivalent across countries. Composite reliability and variance extracted measures were used to test the reliability of model constructs. All composite reliabilities except multi-channel integration for China sample are above 0.7 while variance extracted measures were above 0.5 suggested by Hair et al. [54] (see Table 5). Hence, the model constructs are deemed reliable.

We estimated two sets of measurement models for exogenous and endogenous variables respectively and the following model fit indices were employed: Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). The obtained GFIs were higher than the 0.9 benchmark recommended by Bagozzi and Yi [59] for the three samples. AGFIs were also higher than the threshold of 0.8. In addition, the obtained NFIs, TLIs, CFIs were all above the benchmark of 0.9. An RMSEA of 0.05 or less had been suggested as an indicator of close fit, whereas values between 0.05 and 0.08 suggested a reasonable fit of the model to the data [60]. All obtained RMSEAs fall within the acceptable standards. Therefore, all the model fit indices are indicative of good fit for the exogenous and

Table 6
Fit indices of multiple-group CFA analysis for measurement models

Fit indices	Exogenous			Endogenous		
	Model A	Model B	Model C	Model A	Model B	Model C
χ^2	1658.36	1744.30	1882.72	1998.90	2081.63	2285.69
df	282	304	334	336	362	384
p	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GFI	0.93	0.93	0.92	0.92	0.92	0.92
AGFI	0.90	0.91	0.91	0.90	0.90	0.90
NFI	0.96	0.95	0.95	0.96	0.96	0.95
TLI	0.95	0.96	0.96	0.96	0.96	0.96
CFI	0.96	0.96	0.96	0.97	0.96	0.96
RMSEA	0.04	0.04	0.04	0.04	0.04	0.04

Model A: unconstrained model.
Model B: factor loadings are constrained to be equal.
Model C: factor loadings, factor variances, and factor covariances are constrained to be equal.

endogenous parts of the measurement models for the three countries.

Next, the multiple-group CFA analytic procedure was employed to test the cross-national invariance of the instrument. We chose the nested testing hierarchy suggested by Bollen [55]. An unconstrained model (Model A), in which no constraints were placed across groups, was first estimated. Table 6 shows that although χ^2 was significant for both the exogenous and endogenous parts, all other indices of the model fit fall within the recommended ranges, indicating that the form of measurement models was appropriate for all the three countries.

The unconstrained model (Model A) was then compared with a constrained one (Model B), in which the factor loadings were constrained to be invariant across samples [55]. The differences of χ^2 between Model B and Model A for exogenous and endogenous parts were significant ($\Delta_{\chi^2_{\text{Exo}}} = 85.943$, $\Delta\text{df} = 22$, $p < 0.05$; $\Delta_{\chi^2_{\text{Endo}}} = 82.737$, $\Delta\text{df} = 26$, $p < 0.05$). However, because χ^2 difference test is sensitive to the sample size, we compared the differences in CFI. The differences of CFI between Model B and Model A for the exogenous and endogenous parts were 0.002 and 0.001, respectively, which fall within the 0.01 benchmark recommended by Cheung and Rensvold [61], indicating that the factor loadings were the same for the three groups.

Then we estimated Model C, in which all factor loadings, factor variances, and factor covariances were declared invariant across groups. Since Model C was nested within Model B, Model C was subsequently compared with Model B using the test of differences in CFI values. The differences in CFI between Model C and Model B for the exogenous and endogenous parts were 0.003 and 0.004, respectively. Therefore, the model structure was deemed the same across the US, Singapore, and China groups, indicating that the measurement equivalence was satisfied.

Table 7
Fit indices of multiple-group SEM analysis for structural model

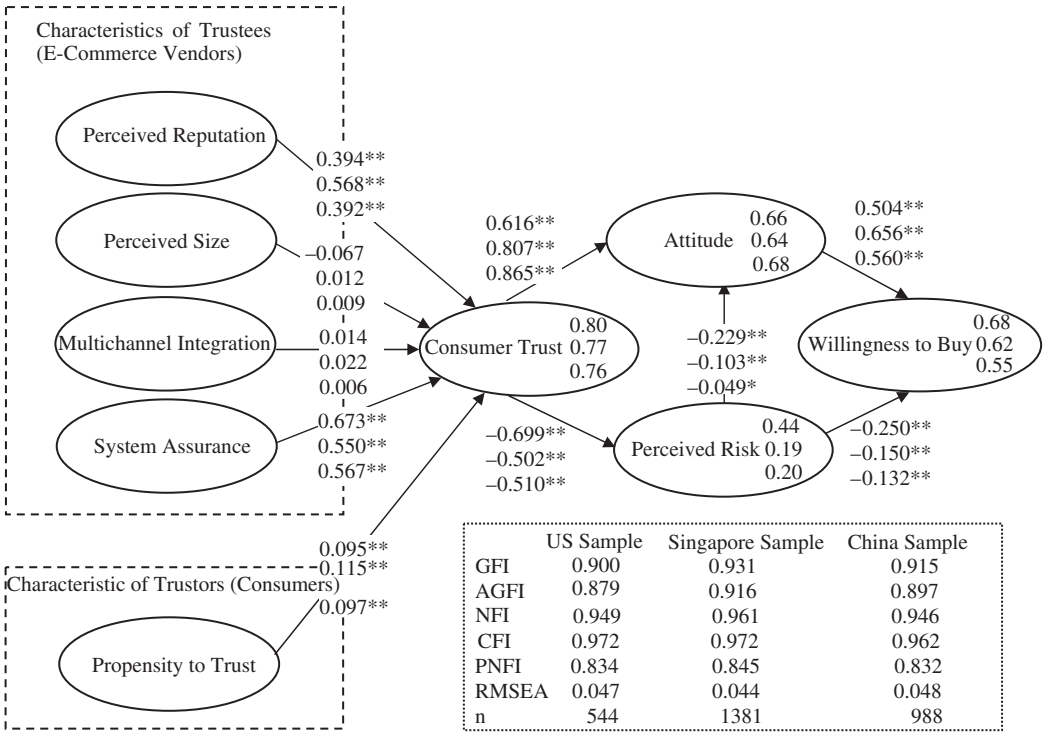
Fit indices	Model A	Model B
χ^2	4208.28	4294.27
df	1392	1412
p	<0.05	<0.05
GFI	0.92	0.92
AGFI	0.90	0.90
NFI	0.96	0.95
TLI	0.97	0.96
CFI	0.97	0.97
RMSEA	0.03	0.03

Model A: unconstrained model.
Model B: structural paths are constrained to be equal.

4.4.3. Structural model

After establishing measurement invariance across samples, the structural model was then tested. First, the US, Singapore, and China samples were estimated separately. Overall, the fit statistics indicate that the consumer trust model provides a good fit to the data for the three countries.

Similar to the procedure conducted for measurement models, multiple-group SEM was then used to determine whether the strengths of relationships among constructs hold across countries [56]. We first estimated an unconstrained model (Model A), in which data of the three groups were analyzed simultaneously and no constraints were imposed. Again all fit statistics fall within the accepted ranges except χ^2, indicating that the same structural model form applies to both countries (see Table 7). Next, a constrained model (Model B) was estimated in which all the structural paths were imposed to be equal across the three samples [55]. The difference of CFI between Model A and Model B is only 0.001, supporting the hypothesis that the structural paths are the same in the three countries.



	US Sample	Singapore Sample	China Sample
GFI	0.900	0.931	0.915
AGFI	0.879	0.916	0.897
NFI	0.949	0.961	0.946
CFI	0.972	0.972	0.962
PNFI	0.834	0.845	0.832
RMSEA	0.047	0.044	0.048
n	544	1381	988

Fig. 2. Structural model. Unstandardized path coefficients appear on arrows and squared multiple correlations appear inside each latent variable's ellipse. The estimates of the US sample are shown above those of the Singapore and China samples. $^{**}p < 0.01$, $^{*}p < 0.05$.

The SMC results indicate that the five antecedents of consumer trust explain 80%, 77%, and 76% of the variance of consumer trust for the US, Singapore, and China samples respectively. Sixty-six percent (US sample), 64% (Singapore sample), and 68% (China sample) of the variance of attitude is accounted for by the variance in consumer trust and perceived risk. Sixty-eight percent, 62%, and 55% of the variance in willingness to buy can be indicated by attitude and perceived risk for the US, Singapore, and China groups, respectively. In addition, 44% (US sample), 19% (Singapore sample), and 20% (China sample) of the variance in perceived risk is explained by consumer trust. Hence, the consumer trust model proposed in this study can be deemed to explain a large proportion of the variance in consumer trust, attitude, and willingness to buy.

4.5. Hypotheses testing

The unstandardized weights were used to discuss the results because although the standardized coefficients are useful for determining relative importance, they are sample specific and not comparable across samples. Conversely, the unstandardized coefficients are comparable across samples and retain their scale effect [54]. The results in Fig. 2 show that three of the five hypotheses regarding antecedents of consumer trust are supported by the data of the three samples.

As predicted, perceived reputation (H_1: $\gamma_{US} = 0.394$, $\gamma_{Singapore} = 0.568$, $\gamma_{China} = 0.392$, $p < 0.01$), system assurance (H_4: $\gamma_{US} = 0.673$, $\gamma_{Singapore} = 0.550$, $\gamma_{China} = 0.567$, $p < 0.01$), and propensity to trust (H_5: $\gamma_{US} = 0.095$, $\gamma_{Singapore} = 0.115$, $\gamma_{China} = 0.097$, $p < 0.01$) have significantly positive relationships with consumer trust in e-commerce vendors. The high γ's of H_4 suggest that the system assurance of an e-commerce vendor have a major influence on consumers' trust in the vendor. In contrast, consumers' perceived size (H_2: $\gamma_{US} = -0.067$, $\gamma_{Singapore} = 0.012$, $\gamma_{China} = 0.009$, $p > 0.05$) does not show positive relationship with consumer trust for the three samples. In addition, multi-channel integration (H_3: $\gamma_{US} = 0.014$, $\gamma_{Singapore} = 0.022$, $\gamma_{China} = 0.006$, $p > 0.05$) is unrelated to consumer trust for the three samples.

Consumers' trust has a significant positive relationships with their attitude toward the vendor (H_6: $\beta_{US} = 0.616$, $\beta_{Singapore} = 0.807$, $\beta_{China} = 0.865$, $p < 0.01$). Subsequently, consumers' attitude has a strong positive relationship with their willingness to buy from the vendor (H_7: $\beta_{US} = 0.504$, $\beta_{Singapore} = 0.656$, $\beta_{China} = 0.560$, $p < 0.01$). As expected, the negative effect of consumer trust on their perceived risk associated with purchasing from the vendor is also

highly significant (H_8: $\beta_{US} = -0.699$, $\beta_{Singapore} = -0.502$, $\beta_{China} = -0.510$, $p < 0.01$). The findings for H_9 ($\beta_{US} = -0.229$, $\beta_{Singapore} = -0.103$, $p < 0.01$; $\beta_{China} = -0.049$, $p < 0.05$) suggest that the negative relationship between consumers' risk perception and their attitude exists for the three samples. Perceived risk is also revealed to have a strong negative relationship with willingness to buy (H_{10}: $\beta_{US} = -0.250$, $\beta_{Singapore} = -0.150$, $\beta_{China} = -0.132$, $p < 0.01$) for the three samples.

5. Discussion

Overall, the results provide support for the proposed model of consumer trust in e-commerce vendors for the US, Singapore, and China groups. As expected, characteristics of both e-commerce vendors (perceived reputation and system assurance) and consumers (propensity of trust) are found to be determinants of consumer trust in Web vendors and have similar loadings across countries.

In addition, results of the three countries are consistent with the findings of Jarvenpaa et al. [3], which revealed that perceived reputation is positively related to consumer trust but perceived size is not related to trust. One possible explanation for the lack of support for the positive relationship between perceived size and consumer trust could be that the perceived size of an e-commerce vendor does not influence consumers' trust as heavily as the perceived size of a traditional business does. Size of an online vendor is less easily perceived on the Web than size of a physical store. In the physical world, it is easy for consumers to assess a company's size themselves through its physical presence. That is, they can personally judge the size of a vendor. But in the online world, this becomes difficult as size of a vendor cannot be easily and correctly judged through its website. Hence, consumers may not care much about the size of e-commerce vendors.

Results on consequences of consumer trust are also consistent with the findings of Jarvenpaa et al. [3]. Positive relationships exist between consumer trust and their attitude toward a vendor and between consumers' attitude and their willingness to buy from the vendor. Consumer trust mitigates the perceived risk associated with online purchase while perceived risk is negatively related with consumers' attitude and their willingness to buy. TRA is confirmed by the results of this study, which reveal that consumers' trust toward an e-commerce vendor is significantly positively related to their attitude toward the vendor, and favorable attitude is positively related with customers' willingness to buy. This finding is consistent with the results reported in previous empirical studies (e.g., [3,32]). As predicted, results show that there is a strong negative relationship between consumer trust and their risk perception across countries. In other words, high level of consumers' trust in an e-commerce vendor decreases consumers' perception of risk associated with purchasing online from the vendor. This result is consistent with that of Jarvenpaa et al. [3] and Shemwell et al. [44]. Moreover, perceived risk is found to be negatively associated with consumers' attitude toward the vendors and their willingness to buy from the vendor.

Another interesting finding is that risk perception has the least negative relationships with attitude and with willingness to buy for the China sample, followed by the Singapore and the US samples. The risk attitude of China consumers has long been a controversial topic. Yamagishi and Yamagishi [22] suggested that collectivists (e.g., Chinese) are less trusting and more risk-averse. Conversely, Chinese respondents were found to be significantly less risk-averse and more risk-seeking than Americans and other Western respondents in their choices between risky options and sure outcomes [62]. The individualism index of Singapore is higher than that of China, but lower than that of the US. Hence, the negative effect of risk perception on consumers' attitude of the Singapore sample is at the middle of the three samples.

In addition, the different development stages of e-commerce in the three countries may lead to the fact that risk perception has different effect on attitude and purchase intention. The online transaction system is the most mature in the US among the three countries, followed by Singapore and China. Consequently, US and Singapore consumers generally pay online if they purchase some products from Web vendors. Conversely, because credit card penetration in China is still very low, the main way for China consumers to utilize the advantages of the Internet is to search and order online and then pay offline when they receive the products. Most of the China consumers regard this procedure (order online and pay offline) as "purchase online''. Because of this special method of conducting e-commerce transactions, it is possible that even if China consumers observe risks, they still have a comparably positive attitude toward e-commerce vendors and are more willing to buy from them. Moreover, the continuous effort of the China Government to develop e-commerce in China and the mass positive reports published in the media could be another possible reason to explain the less negative relationships between risk perception and attitude and between risk perception and willingness to buy in the China group.

Results indicate that system assurance has the strongest influence on consumer trust among all the antecedents of trust for the US and China samples. The structural loadings of system assurance are > 0.55 for the three countries, followed by those of perceived reputation (> 0.39) and consumers' propensity to trust (> 0.09). This reveals that the reliability and security of an e-commerce vendor's online transaction system is a vital factor in developing and maintaining consumers' trust in Internet vendors. For consumers who conduct transactions online, privacy and security are prime concerns. Although many researchers have emphasized the important role that the properties of online vendors' transaction system plays in e-commerce, little empirical research has been done to test the relationship between

system assurance and consumer trust. Our study fills in the gap and facilitates future research in trust, especially in the context of Internet shopping.

Results indicate that consumers' propensity to trust has a significantly positive relationship with their trust in Web vendors for the three countries. This is consistent with previous research e.g., Gefen [1] empirically revealed that individual's general trusting propensity, which is the product of a lifelong socialization process, is positively related to individual's trust. This is because individual's general experiences and perceptions of whether others can be relied on to deliver promised outcomes will play an important role in influencing their trust in others. Hence, individuals who are trusting will be more likely to be open with others and trust others.

Surprisingly, multi-channel integration is not related to consumer trust. It is possible that the low price of the products/services that most consumers tend to buy online may decrease consumers' tendency to assort communication from vendors across different interaction channels. In addition, because company size and multi-channel integration are related, consumers may not care much about the integration of interaction channels because they do not care about the size of the vendors. Another possible reason may be that although companies increasingly recognize the importance of integrating interaction channels with consumers, the efforts made on increasing the integration level is still much less than those emphasized on other aspects (e.g., product information, site design). Consequently, most consumers do not have a clear concept on this special service, even if the vendor has fully integrated their communication channels. All these lead to the findings that consumers focus more on the reputation or branding and the system assurance of e-commerce vendors instead of the perceived size and multi-channel integration.

6. Implications and conclusions

As some researchers have argued, theory-guided empirical studies of consumer trust in Internet shopping are relatively rare, which critically impedes an understanding of consumer trust in Internet shopping [13]. Our research fills in the gap by proposing a theoretical model regarding the formation of consumer trust and the consequences of it in e-commerce, empirically testing if it holds across countries, and comparing consumer-related attributes among the US, Singapore, and China. It mainly contributes to trust literature in several aspects.

First, this study extends prior research in trust by including characteristics of both trustors (e-commerce vendors) and trustees (consumers) in the same empirical study and exploring the formation of trust in a new context. Our results show that the characteristics of the trustees (i.e., perceived reputation and system assurance of an e-commerce vendor) and the characteristic of trustors (i.e., consumers' propensity to trust) are important determinants of trust across countries. These findings confirm the conceptual model proposed by Mayer et al. [2], which described the effect of dyadic attributes of trustees and trustors on trust. This study is one of the first to empirically examine attributes of both vendors and consumers in e-commerce application. In addition, although some researchers have emphasized the important role that the properties of online transaction system plays on the formation of trust [40] in e-commerce, previous research has not involved investigating the effect of system assurance. Our study includes system assurance as a unique determinant of consumer trust in the model and shows that system assurance of a Web vendor has the strongest influence on consumer trust among all the antecedents of trust, which reveals a distinct difference from the antecedents of trust in the traditional marketing literature. We also propose a new construct—multi-channel integration as a characteristic of e-commerce vendors in the research model. Though the integration level of multiple communication channels of vendors has drawn researchers' and practitioners' attention, previous research has not involved examining its effect on consumers' trust. Although the results of this study did not show positive relationship between multi-channel integration and consumer trust, our model could be a reasonable foundation for future research to explore the effect of multi-channel integration on trust under certain situations (e.g., purchase of expensive products/services) or in more advanced development stage of e-commerce.

Second, this study confirms that consumers' attitude and intention to participate in e-commerce behaviors can be studied effectively using the traditional psychological theory of TRA. Specifically, the results show that consumers' trust in e-commerce vendors and their risk perception can also be regarded as behavioral beliefs that affect consumers' behavioral attitude. Our empirical results for the three countries are consistent with TRA, indicating its generalizability in e-commerce application.

Third, researchers have stated that in the context of Internet shopping, whether and how trust affects perceived risk is still very much an open issue [13]. However, similar to our study, a recent study by Pavlou and Gefen [63] found that trust reduces perceived risk. Our study is one of the few studies to examine both trust and risk in one theoretical model in the context of e-commerce. Moreover, the structural weights of the three samples are all over 0.5, revealing that the effect of consumer trust on mitigating risk perception is strong. Hence, this study could also be a reasonable starting point for exploring the relationship between consumer trust and risk perception in the context of e-commerce.

Fourth, for Internet vendors who want to leverage the benefits of online transactions, the study provides a number of strategies that they might deploy. Since system assurance is a unique factor in online business and is found to have a strong influence on consumers' trust across countries, online retailers may need to stress the security and reliability of their online transaction systems. In addition, they may

increase their perceived reputation through advertising and publicity. The design of the Websites should also focus on the information that conveys good reputation of the company and measures taken to protect consumers' privacy and provide security associated with conducting transactions online.

Fifth, in order to encourage consumers to conduct transactions online, vendors also need to use various strategies to build trust. For example, vendors should provide prompt delivery, better after-sales service, and more accurate product information. Vendors should also make an effort to decrease consumers' risk perception to promote online purchase.

Although our empirical evidence does not support the relationship of consumers' perceived size and multi-channel integration of a vendor with consumer trust, further research may need to explore the in-depth reasons. For example, the insignificant relationship between the perceived size and consumer trust of this research is inconsistent with the results of traditional marketing research. Does perceived size only influence consumer trust in traditional business? Is there any other factor that restricts the effect of perceived size on trust in e-commerce vendor (e.g., product catalog, product value, etc.)? Although multi-channel integration does not show the proposed relationship with consumer trust in this study, it is not clear if this construct has a significant effect on trust in other countries. Hence, further examination of the consumer trust model in other countries is necessary to check its generalizability. In addition, further research using a longitudinal design may give us a better understanding of the dynamics of the development of trust in e-commerce applications.

An interesting finding of this study is that similar results were obtained across three cultures. This demonstrates the generalizability of the model across cultures. Future research can examine the proposition that culture does not make a difference on trust among educated people from various cultures. This proposition, though contrary to Doney et al. [8] arguments on the importance of national culture on trust, warrants further investigation. In fact, in a study on consumer trust, Jarvenpaa and Tractinsky [4] found that trust seems to work the same in the US and Israel. Similarly, in a study of cultural diversity and trust in IT adoption, Gefen et al. [23] found that trust seems to work almost the same in both South Africa and the United States.

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