

Information self-efficacy and information channels: Decision quality and online shopping satisfaction

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Abstract

Purpose – The purpose of this study is to explore the impact of both information self-efficacy and information acquisition with regard to information channels on decision quality and further on satisfaction, which provides a new view for online shopping satisfaction research and practice alike.

Design/methodology/approach – This study develops a research model drawing upon customer satisfaction theory, information and decision making theory and self-efficacy theory and tests it using questionnaire and Partial Least Squares (PLS) Structural Equation Modeling (SEM).

Findings – Data collected from 331 Chinese online shopping customers were used to test the model. We find that Self-efficacy over Getting Information (SEGI) strongly impacts Perceived Decision Quality (PDQ) and further Satisfaction with Online Shopping. Meanwhile, SEGI negatively moderates the impact of Web Advertising Usage for Getting Information on PDQ and overpowers the effect of Consumer Review Usage for Getting Information on PDQ.

Originality/value – The current research usefully contributes to the theoretical development of the structural model exploring the effect of information self-efficacy and information behavior on decision quality and further satisfaction with online shopping in the specific context of China and beyond more generally.

Keywords Online shopping satisfaction, Decision quality, Information self-efficacy, Information channel

Paper type Research paper

Introduction

With the rapid development of Internet in China, more and more Chinese begin to

favor online shopping due to its benefit, convenience and quick delivery. According to the latest statistics released by China Internet Network Information Centre (2011), the number of netizens in China has hit 513 million among which 194 million had the experience of shopping online, taking up 38% of total netizens. International Data Corporation (2011) reports that in China, total volume of retail sales in 2010 rose by 11.6% while total online retail sales rose by 66%, indicating a quickly increasing trend in online retail sales.

Even though E-commerce (EC) offers customers great convenience, various product choice, and tremendous amount of product information, compared to brick-and-mortar retail stores purchase, online shopping is still in its infancy due to “the lack of direct, face-to-face interaction with the firm and the intangible nature of the products” (Thongpapanl and Ashraf, 2011, p.3). Consequently, “there is a critical need to examine how to improve customers’ satisfaction with the online shopping experience” (Songa *et al.*, 2012, p.221). To reduce risk, online customers rely on the information available online regarding a product’s quality, functionality and business reputation (Pavlou and Fygenon, 2006; Thongpapanl and Ashraf, 2011). Appropriate information channels and effective information providing would usefully motivate online purchases. However, information plays a role of double-edged sword. On one hand, increasing the available information can reduce customers’ perception of risk, enhance online customers’ abilities to consider alternative products and in the end lead to a satisfactory shopping experience (Thongpapanl and Ashraf, 2011). On the other hand, too much information can lead to customers’ information overload (Lee and Lee, 2004) and search complexity, and make it difficult for customers to locate the needed information, thus negatively affecting customers’ decision quality and impeding customers’ ability to make good decisions (Ranganathan and Ganapathy, 2002; Yang *et al.*, 2003).

Effective product information channels would affect customers’ satisfaction, thus facilitating business profitability (Devaraj *et al.*, 2002). From the aspect of customers, an information channel refers to the way of getting product information. In an online environment, customers acquire information mainly from two channels, viz. broadcast media (i.e., Web advertising) and more spontaneous referrals (i.e., consumer review) (Villanueva *et al.*, 2008). Advertising is the product information sent out by the company (Ducoffe, 1996) which is mainly manipulated by marketers. Instead, consumer review is the product information coming from other customers with similar profiles based on their shopping history (Wang *et al.*, 2005). The choice of different information channels to get information would influence customers’ online shopping decision. As suggested by Ives, Olson and Baroudi (1983), customers’ perception about the influence of a channel on the information attributes in a given context (e.g. online shopping), may enrich the theory of customer satisfaction. Decision making is a complexity of many different factors of which information channel is an important one (Park *et al.*, 2007). Customers’ decision making in an online environment has been a focus of research with the continued flourish of EC economy in recent years. The impact of Recommendation agents (RAs) on the quality of purchasing decisions were much explored (Wang and Benbasat, 2009; Kamis *et al.*,

2010; Mandl *et al.*, 2011); however, the impact of getting product information from different information channels on decision quality, which relates to the process of active decision making by customers themselves, is largely overlooked.

In addition to information channels, we suggest that customers' self-efficacy over getting information would also impact the rational evaluation of various alternatives given information overload. Customers with high level of self-efficacy over getting information can gain sufficient product specifications with high efficiency for the purpose of making comparisons to reach the best possible decision, which is thus critical during the process of purchase (Pavlou and Lie, 2006). The objective of this research is to investigate the impact of both information self-efficacy and information acquisition with regard to information channels on decision quality and further on satisfaction, which we think, provides a new view for online shopping satisfaction research and practice alike.

Following this introduction, we review the theoretical background and literature, focusing on customer satisfaction theory, information and decision making theory and self-efficacy theory. Then, we develop the research model and hypotheses; describe the research methodology, the results of the research and a discussion of these results. Finally, we discuss the implications for the theory and practice.

Theoretical background and research model

Customer satisfaction

Satisfaction was initially defined in the context of job performance as “a pleasurable or positive emotional state resulting from the appraisal of one’s job” (Sempane *et al.*, 2002, p.23) and then defined in the context of consumption as “an ex post evaluation of customers’ initial (trial) experience with the service, and is captured as a positive feeling (satisfaction), indifference, or negative feeling (dissatisfaction)” (Kort and Gharbi, 2008, p.3). The American Customer Satisfaction Index (ACSI) suggests that customer satisfaction is primarily driven by quality (Fornell *et al.*, 1996). In an online environment, customer satisfaction is determined by the usefulness of information and the degree to which customers can use the information obtained prior to purchase (Pingol and Miyazaki, 2005; Chen and Tseng, 2011). Previous researchers have also identified and considered the impact of individual factors such as shopping habit and shopping experience on satisfaction (Athanasopoulos *et al.*, 2001; Khalifa and Liu, 2007). Consequently, customer satisfaction results from purchasing decision quality and sufficient product-related information and information channels (Devaraj *et al.*, 2002).

Information and decision making theory

The direct relationship between information and decision making quality has long been the focus of applied psychology and business researchers (Jacoby *et al.*, 1978; Flavián *et al.*, 2009; Mandl *et al.*, 2011). Nevertheless, most studies have been done with neglect of the “real-world” customer environment but under controlled and overly structured laboratory conditions, thus unable to explore how decision makers actually obtain information from information channels used in decisions making. With the rapid growth of EC, studies on the relationship between information and decision

making were placed under the setting of online shopping environment which is often regarded as “unstructured” or “ill-structured” decision environment consisting of several decision variables (Kohli *et al.*, 2004, p.117). Previous studies documented differences among individuals regarding their preferences for information channels (Kohli *et al.*, 2004; Ariely, 2000) and their different abilities to cognitively make a purchase decision (Verhagen and Dolen, 2011).

Self-efficacy theory

Bandura (1982, p.122) developed self-efficacy theory and defined self-efficacy as “concerned with judgments of how well one can execute courses of action required to deal with prospective situations”. Much of customer self-efficacy research focused on service development and delivery (McKee *et al.*, 2006), technology-based self-service (Beuninger *et al.*, 2009) and online channel extension (Yang *et al.*, 2011). Due to the importance of getting product information during the process of purchase, customers with different levels of self-efficacy over getting information would probably perceive different decision quality (Pavlou and Fygenson, 2006). Moreover, previous studies explored moderating effects of self-efficacy in an online environment. For example, Yi and Gong (2008) suggested customer self-efficacy was an important moderator in human computer interaction and its moderating effects should be further explored. Lee, Choi and Kang (2009) suggested self-efficacy moderates the relationship between customer’s evaluation and cognitive effort.

Research model and hypotheses

Building on customer satisfaction theory, information and decision making theory and self-efficacy theory, we develop our research model. The complete research model is presented in Figure 1. Definitions of the principal constructs are provided in Table I.

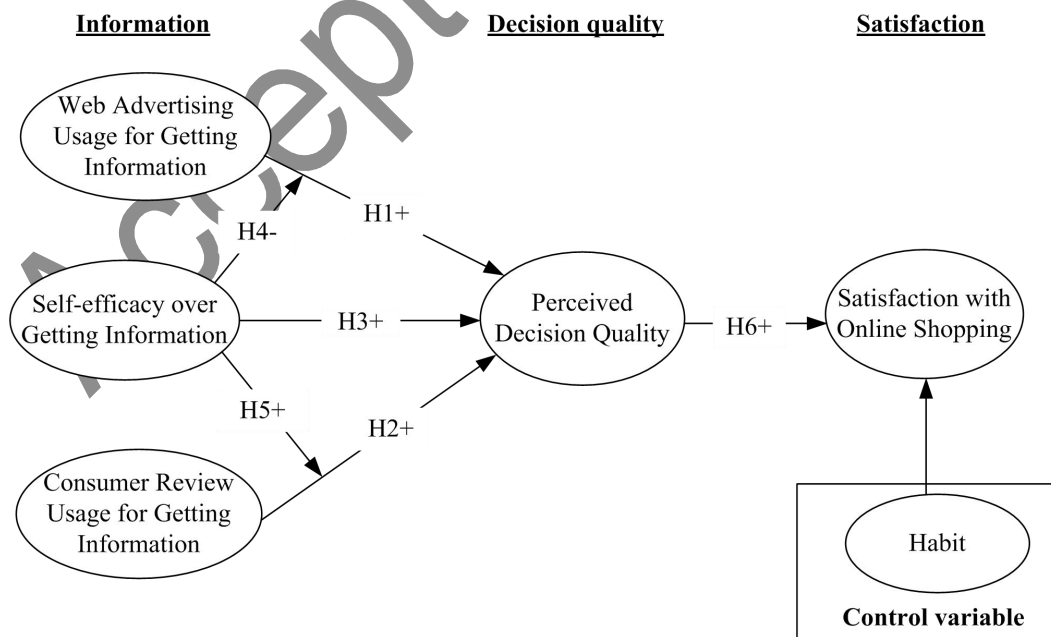


Figure 1. Research model

Table I.

Principal constructs and definitions

Principal constructs	Definitions	Source
Perceived Decision Quality	“The degree of match or fit between heterogeneous customer preferences and differentiated products”	Haubl and Trifts, 2000, p.8
Self-efficacy over Getting Information	Customers’ judgments of their own capabilities to search, compare and evaluate product information to make purchasing decision	Pavlou and Fygenson, 2006
Web Advertising Usage for Getting Information	Customers’ use of Web Advertising for getting product information in respect to the frequency of use and the amount of time involved	Kankanhalli <i>et al.</i> , 2005; Venkatesh <i>et al.</i> , 2003; Pavlou and Fygenson, 2006
Consumer Review Usage for Getting Information	Customers’ use of Consumer Review for getting product information in respect to the frequency of use and the amount of time involved	Kankanhalli <i>et al.</i> , 2005; Venkatesh <i>et al.</i> , 2003; Pavlou and Fygenson, 2006
Satisfaction with Online Shopping	A positive evaluation of customers’ experience with online shopping	Kort and Gharbi, 2008; Bhattacharjee, 2001
Habit	Learned sequences of acts that become automatic responses to online shopping	Limayem and Hirt, 2003; He and Wei, 2009

The quality of purchase decisions in online shopping is conceptualized as per Table I. In the stream of RAs research, decision quality is one dimension of decision outcomes (Xiao and Benbasat, 2007), measured by “how closely the user’s choice or selection from a group of alternatives, matches the ideal outcome or selection” (Hostler *et al.*, 2005, pp.316). RAs have the potential to support and improve decision quality by customers (Xiao and Benbasat, 2007). Similar to the efficacy of RAs, we suggest online information channels have the potential to support and improve decision quality. Web advertising and consumer review each is a kind of information channel (Chen *et al.*, 2002; Chen and Wells, 1999; Ducoffe, 1996). Specifically, Web advertising has the ability to present a true picture of products and inform customers of product alternatives so that purchases yielding the best possible decision quality can be made (Ducoffe, 1996). Consumer reviews provide product advice based on other consumers’ shopping history with similar profiles which has the potential to reduce consumers’ search complexity, while at the same time improve purchase decision quality (Chiasson *et al.*, 2002; Hanani *et al.*, 2001; Haubl and Trifts, 2000). Using Web advertising and consumer review can both bring richer product information, thus helping customers compare different alternatives, and effectively locate products that closely match their preferences. In this study, Web Advertising Usage for Getting Information and Consumer Review Usage for Getting Information refer to two kinds of information behavior. We suggest that more use of Web Advertising (Consumer Review) for getting product information is more likely to increase the available information which would reduce customers’ perception of risk

and thus enhance decision quality. This leads to our hypotheses:

H1. Web Advertising Usage for Getting Information has positive relationship with Perceived Decision Quality.

H2. Consumer Review Usage for Getting Information has positive relationship with Perceived Decision Quality.

Customers' self-efficacy in the context of online purchase can be defined as "customers' judgments of their own capabilities to get product information and purchase products online" (Pavlou and Fygenson, 2006, p.119). Customers do not make a single, inclusive decision, they must first engage in getting product information before purchasing. In a completed transaction, Self-efficacy over Getting Information reflects how confident customers are about searching, comparing and evaluating product information to make purchasing decision. Self-efficacy judgments are positively related to outcome expectations (Luszczynska *et al.*, 2005) and future online shopping behavior (Hernández *et al.*, 2011). Cervone, Jiwani and Wood (1991, p.259) also pointed that customers with high self-efficacy "learn more from feedback, respond more adaptively to the decision environment, and, over time, are better able to translate their learning into improved performance". We suggest that higher Self-efficacy over Getting Information is more likely to reduce information overload which would help customers get useful information about the product they intend to purchase and thus enhance decision quality. This leads to our hypothesis:

H3. Self-efficacy over Getting Information has positive relationship with Perceived Decision Quality.

Online marketplaces offer customers immense product choice and a significant amount of product related information. Judgment, cognitive abilities and confidence in transaction are essential to make rational evaluation and good decision of various alternatives and identify products that meet customers' wishes and needs. Web advertising "puts the customer in control" (Joines *et al.*, 2003, p.91) where customers generally passively receive product-related information from vendors without being involved much cognitive efforts. In contrast, obtaining efficient information from consumer review may be a more "arduous task" (Bounie *et al.*, 2005, p.4) due to its anonymous contributions (Chin and Xie, 2008) and sincerity (Yayi and Bayrame, 2012). For customers with high level of self-efficacy over getting information, they would be more likely to be confident in their purchasing decision quality and thus motivated to head for getting information through more challenging information channels such as consumer review. In this case, higher Self-efficacy over Getting Information would be more likely to lead to stronger impact of Consumer Review Usage for Getting Information on Perceived Decision Quality, suggesting a positive moderating effect. Meanwhile, for customers with low level of Self-efficacy over Getting Information, they would be more likely to depend on Web advertising,

suggesting a negative moderating effect. Hence, we hypothesize:

H4. The impact of Web Advertising Usage for Getting Information on Perceived Decision Quality is negatively moderated by Self-efficacy over Getting Information: the effect of Web Advertising Usage for Getting Information on Perceived Decision Quality is weaker when a high level of Self-efficacy over Getting Information is present.

H5. The impact of Consumer Review Usage for Getting Information on Perceived Decision Quality is positively moderated by Self-efficacy over Getting Information: the effect of Consumer Review Usage for Getting Information on Perceived Decision Quality is stronger when a high level of Self-efficacy over Getting Information is present.

A high level of Perceived Decision Quality sends a strong signal to the customer that the transaction will be performed properly and thus contributing to customer satisfaction. Kohli *et al.* (2004) suggested that high quality decision would lead to higher customer satisfaction in the context of EC. This leads to our hypothesis:

H6. Perceived Decision Quality has positive relationship with Satisfaction with Online Shopping.

Measures development and data collection

Measures development

All the constructs in the research model are based on the previous literature and all the corresponding measure items are adapted from the previous literature to fit the context of online shopping environment. Specifically, the items of Web Advertising Usage for Getting Information and Consumer Review Usage for Getting Information were adapted from Kankanhalli, Tan and Wei (2005), Venkatesh, Morris, Davis and Davis (2003) and Pavlou and Fygenson (2006). The items of Self-efficacy over Getting Information were adapted from Pavlou and Fygenson (2006). The items of Perceived Decision Quality were adapted from Xiao and Benbasat (2007), Fasolo, McClelland and Lange (2005) and Hostler *et al.* (2005). The items of Satisfaction with Online Shopping were adapted from Bhattacharjee (2001). The items of Habit were adapted from He and Wei (2009).

The complete instrument can be found in Appendix 1. All items were measured with a 7-point disagree-agree Likert scale.

Data collection

The research methodology and data collection process consisted of two stages. Firstly, we invited 14 candidates for PhD and 15 candidates for master degree who had rich experience with and habit of shopping online to respond as the pilot survey. We thus also had the opportunity to interact with some of these respondents if they experienced any problems completing the survey. Based on our experiences in

administering the pilot survey, we adjusted wordings in several items. Then, we undertook a larger scale survey.

The large scale survey data collection lasted for 6 weeks. We published our online survey on a commercial survey website which provides high usability so as to increase response rate and accuracy. We randomly invited customers of several well known Chinese online shopping websites to visit the online survey. Data collection was undertaken on a voluntary basis. As one of the incentives for participation, the respondents were informed that in return for completing the survey, they would receive a general report of the results. Finally, 331 valid questionnaires were completed online in this fashion. The t-test of the demographic characteristics of the participants who responded in the first week did not significantly differ from those who responded in the last week. On this basis, response bias was not considered to be a concern (Pavlou and Genfen, 2004). Table II documents the demographic information of these 331 respondents.

Table II.

Demographic information of respondents

Measure	Items	Frequency	Percent
Gender	Male	173	52.3
	Female	158	47.7
Age	18-30	281	84.9
	31-40	43	13.0
	41-50	7	2.1
	51-60	0	0
	>60	0	0
Internet Experience (year)	<1	6	1.8
	1-3	49	14.8
	3-5	81	24.5
	>5	195	58.9
Online Shopping Experience (year)	<1	92	27.8
	1-3	143	43.2
	3-5	65	19.6
	>5	31	9.4
From which channel you get product information first	Web advertising	123	37.2
	Consumer review	208	62.8

Data Analysis and Result

Measurement model validation

PLS (Partial Least Squares) algorithm is a component-based structural equation modeling technique, “allowing each indicator to vary in how much it contributes to the composite score of the latent variable”, thus being “preferable to other techniques” (Chin *et al.*, 2003, p.197). PLS is in essence exploratory and emphasizes explaining variances (Gefen *et al.*, 2011). In this sense, PLS is appropriate for this research since we have new relationships and are interested in the explanatory power of the research

model. Specifically, we employed SmartPLS 2.0 (Ringle *et al.*, 2005) to verify our measurement and theoretical model.

Before testing the hypothesized relationships, we first assessed measurement validity. The measurement validity was assessed through content validity, convergent validity and discriminant validity (Straub *et al.*, 2004). With regard to content validity, all constructs and items in this study are based on the previous literature. So, we believe these constructs and items each have clear and correct meaning.

The whole measurement model consists of 6 reflective constructs. Table III lists the values of AVE (Average Variance Extracted), CR (Composite Reliability) and Cronbach's α . Reliability and convergent validity were assessed with CR and Cronbach's α and can be established with a score greater than 0.7 (Straub *et al.*, 2004). As shown in Table III, all the values of CR are bigger than 0.896 and all the values of Cronbach's α are bigger than 0.788, suggesting higher reliability and convergent validity of all the reflective constructs. Furthermore, convergent validity can be assessed with AVE and can be established with a score larger than 0.5 (Straub *et al.*, 2004). From Table III, we can see all the values of AVE are much larger than 0.5, suggesting sufficient convergent validity of all the reflective constructs.

Table III.
Overview of measurement model

Constructs	Items	AVE	CR	Cronbach's Alpha
Consumer Review Usage for Getting Information (CRGI)	2	0.893	0.943	0.880
Web Advertising Usage for Getting Information (WAGI)	2	0.812	0.896	0.788
Habit (HAB)	3	0.890	0.960	0.938
Perceived Decision Quality (PDQ)	3	0.851	0.945	0.912
Satisfaction with Online Shopping (SAT)	4	0.904	0.974	0.965
Self-efficacy over Getting Information (SEGI)	2	0.949	0.974	0.947

The left section of Table IV shows the Mean and Standard Deviation (SD) of each construct. The right section shows the correlations between constructs and square roots of AVE. We can see that the square root of each construct's AVE is larger than its correlations with other constructs, suggesting sufficient discriminant validity (Straub *et al.*, 2004).

Table IV.
Descriptive statistics, correlations between constructs and square roots of AVEs

	Mean	SD	CRGI	WAGI	HAB	PDQ	SAT	SEGI
CRGI	4.457	1.418	0.945					
WAGI	3.492	1.322	0.263	0.901				
HAB	4.247	1.569	0.357	0.275	0.943			
PDQ	4.324	1.279	0.382	0.230	0.713	0.922		

SAT	4.564	1.265	0.407	0.251	0.760	0.833	0.951	
SEGI	4.734	1.359	0.556	0.196	0.509	0.639	0.613	0.974

Note: Diagonal elements in the correlation matrix are the square roots of the AVE of each construct

Table V shows the loadings and cross loadings where all items load much higher on their specified constructs than on other constructs, further suggesting sufficient discriminant and convergent validity for all constructs used in this study (Straub *et al.*, 2004).

Table V.

Loadings and cross loadings

	CRGI	WAGI	HAB	PDQ	SAT	SEGI
CRGI1	0.942	0.251	0.333	0.351	0.387	0.562
CRGI2	0.948	0.246	0.341	0.369	0.383	0.490
WAGI1	0.281	0.958	0.271	0.251	0.272	0.248
WAGI2	0.167	0.841	0.216	0.134	0.151	0.052
HAB1	0.334	0.275	0.935	0.666	0.690	0.457
HAB2	0.335	0.247	0.942	0.688	0.750	0.518
HAB3	0.340	0.257	0.953	0.661	0.709	0.462
PDQ1	0.346	0.247	0.678	0.923	0.773	0.646
PDQ2	0.365	0.224	0.675	0.934	0.798	0.598
PDQ3	0.344	0.158	0.615	0.910	0.733	0.518
SAT1	0.406	0.232	0.726	0.828	0.939	0.590
SAT2	0.350	0.239	0.722	0.778	0.955	0.559
SAT3	0.399	0.238	0.715	0.774	0.955	0.599
SAT4	0.393	0.245	0.726	0.788	0.955	0.585
SEGI1	0.538	0.202	0.498	0.627	0.586	0.975
SEGI2	0.545	0.180	0.493	0.619	0.610	0.974

Common method bias

The influence of common methods biases resulting from multiple sources such as social desirability has been a widely concern in the behavioral sciences (Podsakoff *et al.*, 2003; Liang *et al.*, 2007). It is suggested that obtaining data from different sources can help reduce common method variance (CMV) and Harman's single-factor test is arguably the most extensively applied approach for assessing CMV (Podsakoff *et al.*, 2003). The data in our study were collected from different sources, which is helpful for reducing CMV. Harman's single factor test was performed with the complete data set by conducting a principal components analysis (PCA) in SPSS. The factor solution resulted in 6 factors with eigenvalues greater than 1.0, accounting for 89.301% of variance. At the same time, the first factor accounted for 23.032% of the variance, indicating that this factor does not account for the majority of the variance.

Furthermore, following Podsakoff *et al.* (2003) and Liang *et al.* (2007), we included in the PLS model a common method factor whose indicators included all the

principal constructs' indicators. "For each single-indicator construct, we examined the coefficients of its two incoming paths from its substantive construct and the method factor" (Liang *et al.*, 2007, p.87). The results show most method path coefficients are not significant. Meanwhile, the path coefficients of substantive constructs are substantially greater than their method path coefficients, thus explaining substantially greater variance of items than method. So, we contend that common method bias is not a concern in this study.

Structural model with results

The structural model with results is presented in Figure 2 (p is based on two-tailed t value). Tests of significance were performed using the bootstrap resampling procedure with 1000 samples, following the recommendation that the sample size should be at least 500 (Wetzels *et al.*, 2009), so as to obtain the t values of the estimates. The explained variance of Perceived Decision Quality is 0.432, and the explained variance of Satisfaction with Online Shopping is 0.751, showing a good predictive validity of the model (Straub *et al.*, 2004).

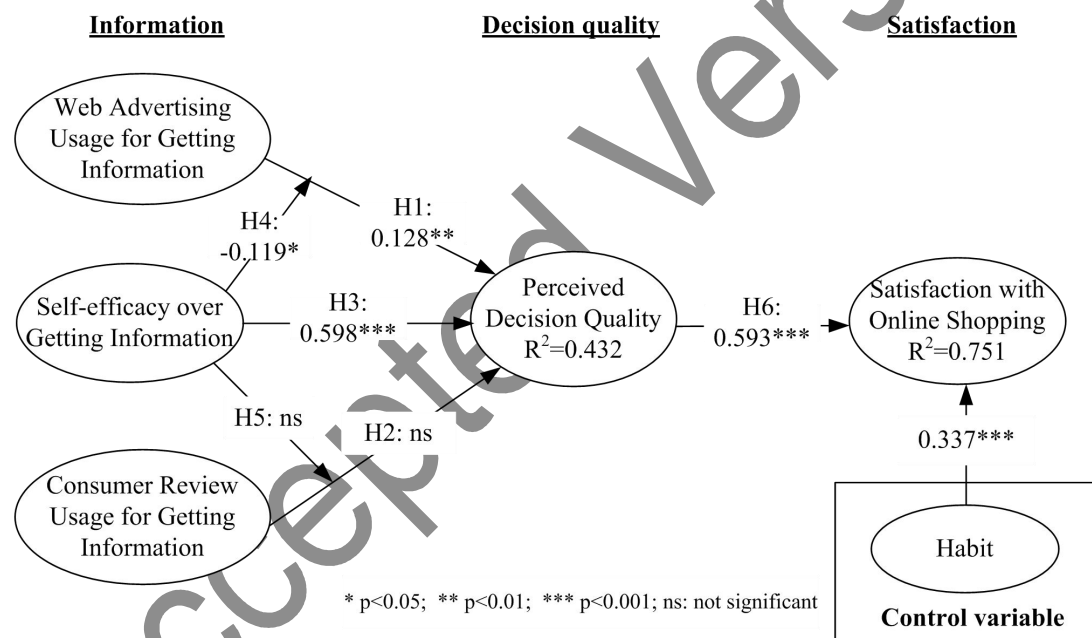


Figure 2. PLS structural model with results

As hypothesized, Perceived Decision Quality has a strong and significant impact on Satisfaction with Online Shopping given the consideration of control variable Habit. Meanwhile, Web Advertising Usage for Getting Information and Self-efficacy over Getting Information each has a significant influence on Perceived Decision Quality. For H4 and H5, their interaction effects are each created by standardizing indicator values before multiplication since it is suggested that this "allows an easier interpretation of the resulting regression beta for the predictor variable" (Chin *et al.*, 2003, p.199). We can see that H4 is supported.

From Table IV, we can see that the correlation between CRGI and PDQ is 0.382, with independent effect being significant. But, from Figure 2, we can see that H2 is not significant, implying that SEGI captures all the information in CRGI given the

correlation between them is 0.556, so that once SEGI is included in the model, there is no effect of CRGI on PDQ. Two regression models were used to further interpret this phenomenon. As shown in Table VI, for Model 1 where SEGI is excluded, CRGI has significant direct effect on PDQ (path coefficients= 0.345). For Model 2 where SEGI is included, the impact of CRGI on PDQ is no longer significant.

Table VI.

Results of two regression models

Independent variables	Dependent variable (PDQ)	
	Model 1 (Excluding SEGI)	Model 2 (Including SEGI)
CRGI	0.345***	0.008 (ns)
WAGI	0.138**	0.128**
CRGI×SEGI		0.081 (ns)
WAGI×SEGI		-0.119*
SEGI		0.598***

Note: *p<.05; **p<.01; ***P<.001; ns: not significant

We suggest that customers with higher self-efficacy over getting information tend to involve more cognitive efforts in order to reach an optimal purchase decision. As for Consumer Review Usage for Getting Information which includes both positive and negative evaluations from customers, it requires more confidence and deeper cognitive processing (Chen and Xie, 2008; Yayi and Bayrame, 2012). Consequently, self-efficacy over getting information which involves cognitive efforts is more likely to overpower Consumer Review Usage for Getting Information itself.

Discussion and Implications

Moderating effect of self-efficacy over getting information

From Figure 2, we can see that Self-efficacy over Getting Information moderates the impact of Web Advertising Usage for Getting Information on Perceived Decision Quality. To further interpret interactions and indicate the moderating effect, we conducted separate regression analyses for subgroups of the sample. Following Steward (2006) and Chang and Wang (2011), we employed at least one standard deviation below and above the mean as the criterion to split the sample and form low and high self-efficacy over getting information subgroups. We then regressed WAGI on PDQ for each subgroup and plotted the within-subgroup regression equations (see Figure 3).

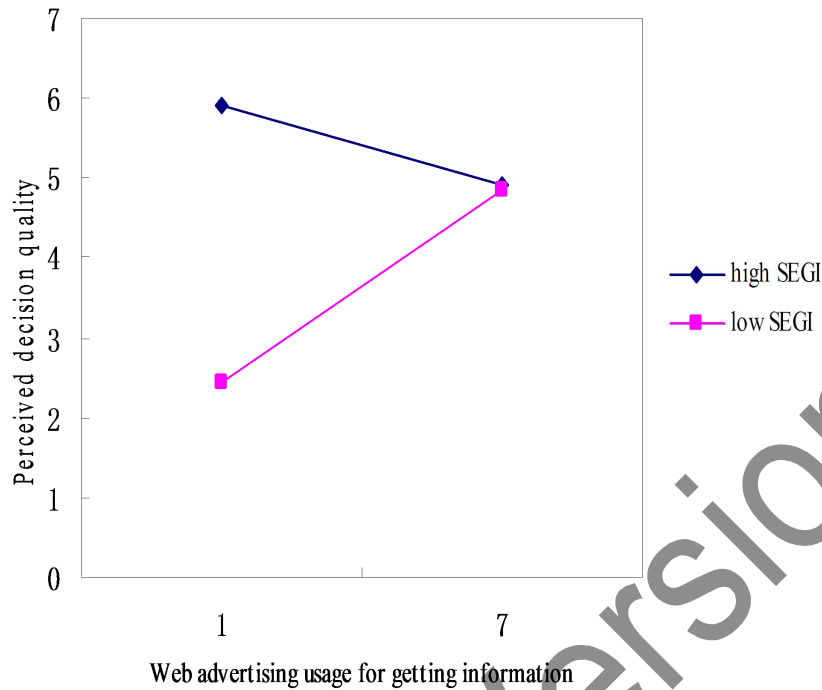


Figure 3. Moderating effect of SEGI on the path from WAGI to PDQ

From Figure 3, we can see that for customers with higher level of self-efficacy over getting information, the impact of WAGI on PDQ becomes weak with a negative slope than without the moderating effect. For customers with lower level of self-efficacy over getting information, this impact becomes stronger with a steeper positive slope than without the moderating effect. This suggests that customers with higher level of self-efficacy over getting information are less likely to depend on Web advertising given the decreasing effect of WAGI on PDQ, meanwhile, customers with lower level of self-efficacy over getting information are more likely to depend on Web advertising given the increasing effect of WAGI on PDQ.

Implications for theory

Previous literature has extensively explored antecedents of online customer satisfaction (Devaraj *et al.*, 2002; Khalifa and Liu, 2007), yet ignoring information self-efficacy and information acquisition behavior. This study integrates information self-efficacy and information acquisition behavior into satisfaction theory which contributes to the theoretical extension of satisfaction model. Second, previous literature has explored the moderating effects of customer self-efficacy in the customer's online behaviors (Lee *et al.*, 2009; Yang *et al.*, 2011); however, as far as we know, few researches have explored the moderating effect of information self-efficacy in the context of online shopping. This study explores the moderating effect of self-efficacy of getting information on two main online channels: Web advertising and consumer review. We believe that the current research usefully contributes to the theoretical development of the structural model exploring the effect of information self-efficacy and information behavior on decision quality and further satisfaction with online shopping in the specific context of China and beyond more

generally.

Implications for practice

Getting product information is generally the initial step of online purchasing by customers (Pavlou and Fygenson, 2006). The proliferation of Web 2.0 technology has been providing opportunities for online firms to better serve their customers. In particular, consumer reviews are becoming increasingly available on websites to provide customers with abundant product information directly coming from customers so as to improve consumers' decision quality. Consumer review is a kind of information source dynamically maintained by customers themselves with both positive and negative comments, concordant with the trend that information selection, organization and handling have become the concern and ability of everyone (Yan and Davison, 2011). Customers are motivated to use consumer reviews for the purpose of finding unique customer experiences, which are written by non-expert like them and are not available anywhere else (Khammash and Griffiths, 2011). Consequently, getting useful information from consumer review involves more customers' own judgments (Dichter, 1966). Nevertheless, from Table VI, we can see that CRGI has the effect of 0.345 on PDQ while WAGI has the effect of 0.138, suggesting that product information coming from customers has larger effect. In addition to Web advertising, we thus recommend that the application of consumer reviewer should be much encouraged in EC websites since the application of consumer review provides a platform through which customers can freely comment on products or services, which are more likely to usefully result in accumulation of knowledge and experience contributed by these customers.

From Figure 3, we can see that customers with lower level of self-efficacy over getting information are more likely to heavily depend on Web advertising given the increasing effect of Web Advertising Usage for Getting Information on decision quality. We thus recommend that EC websites should pay attention to the development of online advertisements to guarantee their informativeness, entertainment and credibility so as to bolster the self-confidence for making purchase by customers (Beuninger *et al.*, 2009), especially the customers with lower level of self-efficacy over getting information.

Self-efficacy over getting information is a kind of information literacy which is concerned with judgments of how well one can execute courses of action of getting information required to deal with online shopping (Bandura, 1982). People who have more confidence in their abilities tend to exert more effort to perform a particular behavior, persist longer in order to overcome obstacles, and set more challenging goals (McKee *et al.*, 2006). Customers with high self-efficacy are proactive information seekers (Brown *et al.*, 2001) and prefer more interactive and personalized product information. They are more likely to choose to perform more challenging tasks and to achieve the desired outcome (Monzuwé *et al.*, 2004), i.e. after making a purchase decision, a shopper would be less likely to change his/her mind and switch to another alternative when given an opportunity to do so, with a higher degree of confidence in a purchase decision (Xiao and Benbasat, 2007; Fasolo *et al.*, 2005; Hostler *et al.*, 2005; Haubl and Trifts, 2000). From Figure 2, we can see that SEGI has

an effect of 0.598 on PDQ, which is larger than the effect of the usage behavior of information channels to get information, suggesting that high level of self-efficacy over getting information is more important than the time spent on or frequency involved in getting information. Online firms should spend more time on their core and “right” kind of customers (Villanueva *et al.*, 2008). However, it is not reasonable to expect that each of such customers would naturally attain a high level of information self-efficacy in the context of online shopping where s/he cannot consult with salespeople as s/he can in offline shopping environments (Wang and Benbasat, 2009). We thus recommend that EC websites should pay more attention to ease of use perceived by users and improve it in designing accordingly given the broad acceptance of this construct as a key factor to determine users’ usage behavior (Venkatesh *et al.*, 2003). We suggest that ease of use can make users feel comfortable with Web advertising usage and consumer review usage for getting information, thus usefully lubricate and facilitate the formation of information self-efficacy, and further high quality decision and satisfaction.

Limitations

This study has its limitations. First, only two specific information channels were considered in the study, namely, Web advertising and consumer review. Second, a sample from China was used and respondents are all Chinese, which implies that replication of this research in cross-national settings should be further demonstrated.

Conclusion

Building on customer satisfaction theory, information and decision theory and self-efficacy theory, we developed a research model. Data analysis indicates that Self-efficacy over Getting Information (SEGI) has large effect on decision quality and further on satisfaction with online shopping. Meanwhile, SEGI negatively moderates the impact of WAGI on PDQ, and overpowers the effect of CRGI on PDQ. We believe that the current research usefully integrates information self-efficacy into customer satisfaction theory, providing guidance and assistance for the design of the website of online firms and EC. Furthermore, RAs are reported to be able to reduce information overload, thus improving the quality of purchase decisions and further the overall satisfaction by customers (Xiao and Benbasat, 2007; Hostler *et al.*, 2005). We thus suggest that further study is needed to include RAs to explore its effect on decision quality as well as the moderating effect of information self-efficacy on this effect. We believe this further study would lead to more interesting findings which would usefully complement the current study.

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Appendix 1. Constructs and items.

Web Advertising Usage for Getting Information (adapted from Kankanhalli *et al.*, 2005; Venkatesh *et al.*, 2003; Pavlou and Fygenson, 2006)

I often use Web advertising to get information about the product I intend to buy online (WAGI1)

I spend a lot of time using Web advertising to get information about the product I intend to buy online (WAGI2)

Consumer Review Usage for Getting Information (adapted from Kankanhalli *et al.*, 2005; Venkatesh *et al.*, 2003; Pavlou and Fygenson, 2006)

I often use consumer review to get information about the product I intend to buy online (CRGI1)

I spend a lot of time using consumer review to get information about the product I intend to buy online (CRGI2)

Self-efficacy over Getting Information (adapted from Pavlou and Fygenson, 2006)

If I want to, I would be able to get useful information about the product I intend to purchase online (SEGI1)

If I want to, I am confident I could get useful information about the product I intend to purchase online (SEGI2)

Perceived Decision Quality (adapted from Xiao and Benbasat, 2007; Fasolo *et al.*, 2005; Hostler *et al.*, 2005)

I am confident in my online purchase decisions (PDQ1)

I am satisfaction with the choices I made in online purchase (PDQ2)

I would make the same purchase decision again when given an opportunity to do so (PDQ3)

Satisfaction with Online Shopping (adapted from Bhattacharjee, 2001)

My online shopping experience is satisfied (SAT1)

My online shopping is excited (SAT2)

My online shopping is contended (SAT3)

My online shopping is delighted (SAT4)

Habit (adapted from He and Wei, 2009)

I purchase online as a matter of habit (HAB1)

Online shopping is natural to me (HAB2)

Online shopping has become a habit to me (HAB3)

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