

# Examination of online channel preference: Using the structure-conduct-outcome framework <sup>☆</sup>

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## Abstract

Electronic commerce and online shopping continue to grow as consumers' channel of choice for products and services. Yet, persistent issues of security, availability, and personalization inhibit its full potential. This paper examines the behavioral and economic aspects that contribute to online consumers' satisfaction and eventually lead to their preference of the online channel. Using a structure-conduct-outcome (SCO) framework, this study analyzes the economic aspects of consumer transaction through incurred costs and the social aspects through patterns of behavior.

The results from the structural equation modeling analysis indicate that asset specificity and uncertainty structure variables of the electronic marketplace are associated with the conduct constructs such as time responsiveness, personalization, website design and security and reliability of the online channel. Further, we find that time responsiveness, personalization, security, and reliability are also significantly related to the consumer satisfaction outcome with the channel. We do not find support for website design being related to online consumers' satisfaction. Finally, there is evidence that satisfaction derived from the above conduct variables is strongly related to the consumers' preference for the online channel.

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## 1. Introduction

More Internet users now turn to the online channel to perform work-related tasks and to make online transactions than ever before [35]. Still, many issues associated with business-to-consumer (B2C) online shopping such as slow website response and delay in deliveries remain

unresolved. Although there are various reports in the media of customer-friendly electronic commerce (EC) services, few academic research studies have examined the determinants of online consumers' satisfaction from a socio-economic perspective. The key determinants of the online channel success are still not well understood. Jarvenpaa and Todd [39] conducted one of the earlier studies to examine salient factors affecting consumers' attitude towards online shopping. They identified four factors that affect consumers' attitude toward online shopping channel — product perceptions, shopping experience, customer service, and consumer risk and their findings suggest that although online shopping has the potential for time-savings and reduced effort, poor cus-

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tomer service and limited online offerings continue to plague online retailing. These findings were corroborated by Limayem et al. [49] who found that consumers' attitude and belief regarding cost and time saving, convenience, level of customer service, and security concerns have significant effects on their intention to choose the online channel for their purchases.

Similar findings are reported by other studies in EC. For instance, Novak et al. [56] found that a compelling online experience is positively correlated with 'flow', a critical construct for describing online navigation in the Internet environment. Along these lines, Rose et al. [67] identified six impediments to EC: (1) download delays, (2) limitations in the Web interface, (3) search problems, (4) inadequate measurement of Web application success, (5) security weakness, and (6) a lack of Internet standards. With the steady growth of online shopping and lingering navigation and security issue, an important question is: What are determinants of consumer satisfaction in the new online channel?

In this study we examine consumers' satisfaction and choice of the online channel vis-a-vis the traditional brick-and-mortar channel. The purpose of this research is to examine the determinants of consumer online channel satisfaction and preference through economic and social constructs. Online channel is defined as the shopping channel that involves the use of the Internet as a means of reaching the customers [18]. We focus the study on channels instead of individual stores because, as a collective group, online stores possess certain unique structure and performance qualities that are different from the conventional or brick-and-mortar channel. Although consumers interact directly with specific stores within a channel, various channel-specific characteristics can be measured and studied, and inferences drawn would apply to the online channel in general as opposed to specific stores. In the marketing literature channel theory maintains that a channel remains viable only by performing duties that reduce customer transaction costs [18]. Thus, consistent with our previous research on channel preference [20], we study the critical structural and behavioral factors that affect consumers purchase decisions in the context of their choice of the online channels.

Transaction costs have attracted considerable attention in channel related studies in analyzing transaction efficiency and its effect on institutional structure [43,42]. As is the case in the conventional channel, transaction costs in the online environment will also affect consumer choice of channel structure [45,47,72,71]. However, the purely economic focus of transaction cost framework might limit the behavioral con-

text needed to understand consumer choice behavior. Coase [17] suggests that modern institutional economics should study humans as they are, acting with the constraints imposed by institutions. Therefore, we integrate transaction cost framework and social exchange theory [24,30,55] to examine transaction efficiency, online service provided by firms, and consumer reactions by using the *structure, conduct, and outcome* (SCO) framework (discussed below). We operationalize 'structure' measures based on transaction costs and analyze how the Internet transaction structure affects firms' online strategic actions (conduct) and, subsequently, consumer satisfaction and channel choice (outcomes).

The paper is organized as follows. We present our conceptual framework in the next section, followed by our research methodology. We then discuss the data analysis, results, and implications of this research. The final section addresses research limitations and future research issues.

## 2. Conceptual framework

Consumer satisfaction and preference toward different transaction channels is a topic of significant importance to businesses as well as researchers. Satisfaction is seen as related to past experience [3], performance, and issues of control and power [78]. Similarly, EC consumer satisfaction has also been studied in the context of support for consumers' decision making process while shopping online [44]. Based on prior experiences, consumers form differential preferences and demands for various products and services. Grouping together those demands based on physical or online channels will enable us to better design channel strategies to reach and serve customers [18].

The theoretical structure of transaction cost constructs has been applied in channel research to examine the effect of different institutional structures on transaction efficiency [30,43,42]. Few studies have examined the channel preference beyond the economic constructs. In one of the few studies that have done so, Heide and John [30] extended transaction cost model with social exchange theory to study inter-organizational dependence resulting from asset specificity in the traditional marketing channel. In a meta-analysis of the channel literature, Geyskens et al. [29] lamented the lack of non-economic drivers of satisfaction in channel research. Further, they utilize the structure-conduct-outcome (SCO) framework to examine antecedents of channel satisfaction by integrating economic and non-economic factors. As the reach of the Internet grows,

firm strategies will increasingly mirror those of the conventional channel [87]. In other words, as B2C online channel shopping increases, economic as well as non-economic factors will play a key role in determining consumer satisfaction, just as the case in conventional channels.

Similar to the traditional channel, previous studies in the online channel have also found that consumers' choice goes beyond economic factors into perceptions of risk, quality of service and convenience [38,49]. Yet, few studies have incorporated the social aspect of consumers' choice in examining the online channel choice. Therefore, we employ the SCO framework to explain consumer satisfaction and channel preference in the online retail environment (Fig. 1).

In the context of social exchange theory, channel *structure* refers to the patterned aspects of relationships between channel participants; action or *conduct* refers to strategies and patterns of behavior that emerge in a relationship; and *outcomes* refer to relational, qualitative outcomes, including economic and non-economic satisfaction, that result from the relationship. Traditional transaction costs framework focuses on structural analysis in channel relationship. Similar theoretical support is found in industrial organization economics through the paradigm referred to as the structure-action-performance (SAP) or the structure-conduct-performance (SCP). Although previous research utilized these frameworks to examine the structure of markets at the industry level, recent works have attempted to relate to the structure and conduct of markets on firm

performance [36,86]. Similar to the theme of our research reported here, the SCP framework is utilized to understand customer satisfaction in the consumer research arena [64].

By extending traditional transaction costs framework which places a focus on structural analysis, the SCO framework provides a unique perspective on the interrelationships among transaction structure, firm actions, and the outcomes at both a “macro” and “micro” level. The “macro” level is the transaction structure that provides the opportunities and constraints (primarily economic), within which the “micro” level firm strategic behavior and actions (primarily non-economic) operate [55]. An integrated analysis of the three constructs – structure, conduct, and outcomes – will help better understand the dynamics of the EC environment. Specifically, we examine the channel *structure* through the two dimensions of transaction cost economics: uncertainty and asset specificity. Drawing from previous research, we identify four *conduct* variables – time responsiveness, personalization, website design and security and reliability – that are critical to the success of online retailers. Finally, we examine the *outcome* of the channel relation-consumer satisfaction and channel preference (Fig. 1).

### 2.1. Structure

In the past two decades, transaction cost economics (TCE) has experienced significant development as the “New Institutional Economics” (NIE) [25,76]. Drawing

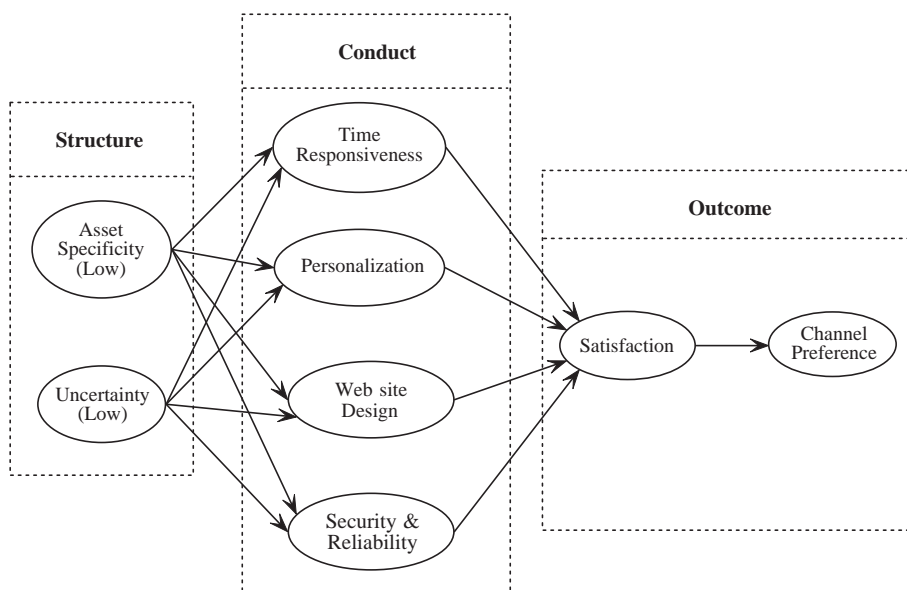


Fig. 1. Conceptual model of online consumer satisfaction and channel preference.

from its interdisciplinary foundations in law, economics, and organization theory, NIE-based TCE is now applied to study a variety of economic and social phenomena, ranging from marriage [79], corporate finance [77] and marketing [4,43], to business strategy [32] and the efficiency of political systems [54]. Information Systems researchers have applied TCE constructs in studies examining electronic markets [52,46,20,44], industrial cooperation and coordination [16], corporate procurement systems [69], computerized loan origination systems [33], environmental information acquisition strategies [15], and IT outsourcing in the banking industry [7]. The insights from these studies suggest that technology changes affect transaction costs, and subsequently, affect the way organizations organize their business activities.

The TCE framework builds on the three dimensions of transactions — *uncertainty*, *asset specificity*, and *frequency*. Uncertainty reflects the inability to predict relevant contingencies. When investments (e.g. capital, time, effort) are made to support a particular transaction, it leads to creation of specific assets reflected in the construct *asset specificity*. *Frequency* refers to the recurring nature of the transactions. Previous work indicates that frequency of transactions has received limited attention in empirical TCE literature [65] and several studies have failed to find positive association between transaction frequency and governance structure [4,6]. As a result, many researchers consider frequency as a dichotomous phenomena (one-time versus recurring transactions) and control for transaction frequency by examining only recurring exchanges (e.g. [43]). In this study, we follow [43] and assume transactions are recurring in nature. Thus, we restrict our analysis on channel structure based on only uncertainty and asset specificity. The TCE research framework is designed to evaluate transactions in various settings and is particularly relevant in this setting because online transactions also pose issues of uncertainty and asset specificity for channel participants.

One central issue in applying TCE is the operationalization of the key TCE concepts. Although TCE was initially developed to analyze the organization and governance structure [83], it has experienced significant development and has been applied to study a variety of economic and social issues as discussed earlier. Transaction structure in the online retail environment in effect reflects the bilateral interactions between online sellers and buyers. For online businesses, the online environment could mean highly volatile demand [81] and customers with heterogeneous switching costs [13]. In this study, we examine

transaction structure and define structure to have the underlying dimensions of uncertainty and asset specificity from the buyers' perspective. While, structural implications for online businesses can be important issues for future research, they are not the focus of this paper.

Uncertainty has two possible sources — randomness and behavior uncertainties [65]. In studying retail transactions, we focus on the behavior uncertainties. Given that online consumers cannot gather all possible sources of information i.e. they are assumed to behave under bounded rationality, it becomes a source of uncertainty for them. On the other hand the channel providers can take advantage of such asymmetric information and be opportunistic and, therefore, create further behavior uncertainties [65]. In the online channel, one effect of behavior uncertainty is that decision makers may choose not to disclose complete or accurate information. For example, some online stores may purposefully not disclose shipping and tax charges until customers have placed an order. Another effect of behavior uncertainty is a performance evaluation problem. For example, a buyer may have difficulty determining whether an online travel agent is making his or her full effort to find the best deal for the client.

Asset specificity is another structure dimension, which can create a safeguarding or lock-in problem because market competition no longer serves as a restraint for opportunism [65]. The online channel has some unique qualities in terms of reducing the safeguarding and lock-in issue by incorporating features such as online search and price comparison, greater product choice, and lower switching cost. In contrast, without the online channels, consumers are being “locked” in their geographical locations and forced to choose the conventional purchasing channel.

The assumptions of TCE, in terms of uncertainty and asset specificity, have been well supported in previous channel related studies. Anderson [4] applied TCE to study the factors that affect firms' decision in selecting in-house versus independent sales forces. Klein et al. [43] studied the channel structure in international markets, and found that both asset specificity and external uncertainty affect channel integration. Klein and Roth [42] found that uncertainty and the ability to change channels significantly affect a firm's satisfaction toward its existing channels.

In summary, the nature of uncertainty and asset specificity in any transaction channel provides opportunities as well as constraints for that channel. It affects channel members' behavior and encourages firms to take proactive actions in order to assure positive out-

comes. Given that the tenets of transaction costs (uncertainty and asset specificity) in online channel remain at least as important as those in traditional channels, we regard uncertainty and asset specificity as two key transaction cost dimensions through which we can study a range of online channel related issues.

## 2.2. Conduct

Consumer satisfaction is influenced by different behavior interactions with the companies they do business with [29]. Past studies have investigated the critical factors that lead to the success of online stores. Dutta and Segev [22] find that online businesses are built on two dimensions: technology and business. The key technological factors include ease of use, customization, and speed and response time. Costs and time saving, convenience, level of customer service, and security concerns have been found to affect consumer attitude toward online shopping [49]. Shanker et al. [75] find that service provided during and following the purchase is essential to consumer's repeat purchases in online environments. Factors such as download delays, Web interface, online searching, security weaknesses are identified as impediments to a greater use of e-commerce [67]. One objective of this research is to identify key behavioral dimensions from prior studies and empirically test those that affect consumer satisfaction toward the online channel.

First, security and reliability concerns are considered by many as the most important obstacles to online shopping [70,68,48]. For instance, consumers will hesitate to use their credit cards to shop online if there are lingering security concerns. It is found that online fraud rate is three to four times higher than traditional transactions, and around 80% of new online users are somewhat concerned about using their credit cards online [53]. Therefore, security and reliability will continue to be important factors influencing consumer attitudes and acceptance of the online channel.

In examining the implications of electronic shopping, Alba et al. [2] argued that response time is a key factor of interactive shopping. The response of electronic communication has to be immediate as in face-to-face communications in physical stores. Rose and Straub [66] also recognized download time as one of the most important technological impediments to EC. They suggest that increases in download time have a negative impact on consumer's attitude toward the consumer's intention to buy from the online retailer. Studies conducted by Lohse et al. [50] and Gehrke and Turban [27] support the claim that response time is a

critical success factor to consumer's satisfaction with online experience. Although online firms cannot totally control download delays, they can mitigate the delays by offering solutions such as providing powerful servers and offering multimedia files with a balance of content and file size.

In addition to responsiveness, website design is found to be an important factor. Ho and Wu [34] find that web page presentation is a factor in achieving customer satisfaction. Dholakia and Rego [21] examine the factors which make commercial web pages popular and find that more rapid updates positively affect hit-rate. They also find that the website design has to be informative and help consumers acquire the necessary information to make their purchasing decision. Online information includes product attribute information and alternative products, both of which influence customers' ability to predict consumption satisfaction in the pre-purchase stage and their quality of decisions [2]. Therefore, information conveyed through websites will affect the quality of consumers' decision and consumers' satisfaction toward online channel.

In comparing online and conventional channels, brick-and-mortar stores can provide buyers the opportunity to touch and feel merchandise and obtain information from sales representatives. On the other hand, online channel stores possess other types of benefits. One potential advantage of online channel is that it can provide a vast number of alternatives to consumers. Although advanced search tools are available online, consumers may still find it difficult to screen hundreds of products for consideration. In competing with conventional stores, online stores have to offer personalized tools that retain customer preferences from previous transactions as well as search tools to help consumers sort efficiently and focus on products that best match their preferences [2]. However, as the online channel begins to rapidly customize products to fit individual consumer's preferences and display them better (such as 3-D), consumers are more likely to find the online channel more personalized to their needs and thus be satisfied with online channel.

From the above discussion, we hypothesize that security, responsiveness, website design, and personalization as key service dimensions that affect customer satisfaction. These are also actionable variables that online stores can control and position their business strategically in order to retain customers. These variables have parallels in the service quality (SERVQUAL) scale used in the marketing and service operations management literature [61].



### 2.3. Relationship between structure and conduct

As discussed in Section 1, the channel *structure* refers to the relationships between channel participants and *conduct* refers to strategies and patterns of behavior that emerge in this relationship. We characterize *structure* through transaction cost constructs – uncertainty and asset specificity – as the two dimensions through which the online channel transaction structure affects the channel providers' strategic actions. Uncertainties exist because circumstances surrounding an exchange cannot be specified *ex ante* and performance cannot be verified. Due to information asymmetry, customers will have difficulties in selecting and screening vendors as well as products.

Prior research has shown that behavioral uncertainty is positively related to vertical integration [4,6]. Extending TCE, Dahlstrom and Nygaard [19] find that formalization in channels alleviates opportunism and reduces transaction cost as it helps clarify how tasks are to be done and who is responsible for doing them. As the retail online channel matures, formalized and standard business processes such as the use of cookies and online shopping carts are increasingly being adopted in the online industry. Similarly, in electronic bookstores, customer reviews, expert recommendations, search tools, and delivery time have also become standard customer information [74]. This increasing level of predictability and formalization of online business processes e.g. product and purchase information provided for the customers alleviates opportunistic behavior and brings out a higher quality of service from vendors. Our measure captures uncertainty in the online shopping process which included uncertainties about price, taxes, and information about the product. Therefore, our hypothesized relationship is that reduction of behavioral opportunism and increasing predictability in the online channel foster a higher level of service including security, responsiveness, personalization, and site design.

We employ asset specificity to examine the structural impact of transaction costs on firm strategies. Asset specificity arises when certain investments by way of costs, time, and effort are specialized for a particular transaction. High asset specificity and its related switching costs create dependency between members in the channel [30]. Conversely, with a lower level of asset specificity, switching costs are drastically reduced in a highly competitive environment. In the electronic channel, consumers have a wide choice in selecting online sellers due to which they can easily switch to other sellers, thereby reducing the asset specificity to-

ward any single seller. Therefore, security and interactive responsiveness are necessary steps for online firms in order to retain customers in a competitive online market. Further, with a wide choice of products, consumers will depend on the online channel to provide customized screen and navigation tools to find the right choice. The measure for asset specificity assesses whether there were many ways to fulfill the purchase. In the event that there are multiple ways the shoppers' switching costs are low – that is – asset specificity is also low. Therefore, our hypothesized relationship is that lower asset specificity fosters (a) greater use of security and quick response measures, (b) greater adoption of personalization tools and good site design practices, and (c) reliable and secure service provided by the online business.

### 2.4. Outcomes

As shown in Fig. 1, 'outcomes' in the SCO framework are represented by online consumers' satisfaction and consequent channel preference. Satisfaction is seen by researchers as an *ex post* psychological evaluation of consumers' experience with the service [3,82]. Satisfaction has been regarded as evaluating an experience while stepping away from it [42]. While Anderson [3] believes that satisfaction can be captured as a positive feeling, indifference, or negative feeling, Hunt and Nevin [37] argues that satisfaction is not simply the pleasurable of an experience; it is the evaluation rendered that the experience was at least as good as it was supposed to be. Although the satisfaction construct is generally considered in reference to customers' satisfaction with a product or vendor, it remains a valuable construct to study the channel via which the product is acquired [20,62]. We recognize that a vendor and a product is the object of the purchase in an online transaction, however, it is important to reiterate that our use of 'satisfaction' is targeted toward that of the channel through which that product was acquired, not the product or the vendor or the website. To this effect, we ensured that this distinction was clear to the research participants (see Research design and data collection below).

Prior channel research has focused on the effects of satisfaction on participants' motivation to stay with the channel [29,62], and on the performance and issues of power and control of the channel relationship [78]. Satisfaction is found to facilitate improved morale and cooperation among channel members, and make them less prone to exit the channel [29]. Today's consumers have many alternatives to purchase products and ser-

vices [85]. In order for consumers to continue to use the online channel, they must believe that a particular channel offers better choices than the alternatives. In relating to consumer overall channel experience, satisfaction should capture both economic and behavioral effects [28,29]. When the online channel enables consumers to shop efficiently, they will be satisfied with the general effectiveness and efficiency of the channel. Consumers will also find the purchase experience satisfying if online vendors are responsive during the shopping process and subsequent after-sale interactions [41,60]. Therefore, we examine the antecedents of channel satisfaction based on constructs that measure the quality of service of online firms including security and time responsiveness to personalization and ease of navigation.

Satisfaction is an attitude construct that affects consumers' behavioral intention toward the purchase of the product, channel preference is a result of a consumer's habitual behavior choice resulting from satisfaction from prior experiences [18], and is considered a consequence of consumers' satisfying experience [29]. In studying consumer brand preferences, it is found that consumer preferences vary with their purchasing experiences [31]. In a classic work on consumer choice, Aaker and Jones [1] suggest that as consumers enter a new market they generally show little evidence of product preference. As they gather more information on a product and with increased purchasing experience, their probability of choosing a particular product increases. Similarly, consumers' store choice behavior is largely affected by their recent purchase experience [1,63]. In the online environment, a consumer's decision to continue to use the channel depends on the experience in online stores. As the overall satisfaction

with the online channel increases, it is likely that consumers will continue to use the online channel [10].

### 3. Research methodology

#### 3.1. Research design and data collection

The process employed in collecting data is summarized in Fig. 2. First, each participant was asked to 'register' by filling out a brief demographics survey. Next, we asked each subject to shop online as well as at conventional physical stores for a similar product. In this way, we made sure that when consumers state their preference for online shopping, they have conventional channel as a reference. Finally, we captured their experiences in shopping via both channels using online questionnaire surveys. The questionnaire was pre-tested and questions were revised for clarity and format. While filling out the demographic information, participants were also introduced to the study requirements and then directed to a website created for the purpose of supporting this study. The website listed frequently asked questions (FAQ), links to online comparison-shopping websites, and researchers' contact information. Since our focus was on the channels and not specific stores, participants were allowed to shop at any online store and conventional store of their convenience. Statements to this effect were also posted at the beginning of the surveys. Though we did not control the sites and stores that they visited we asked them to indicate this information in the survey.

From a total of approximately 200 individuals approached, 171 participated in the survey. Our final sample consists of 134 respondents who completed all three surveys giving us a usable response rate of 67%.

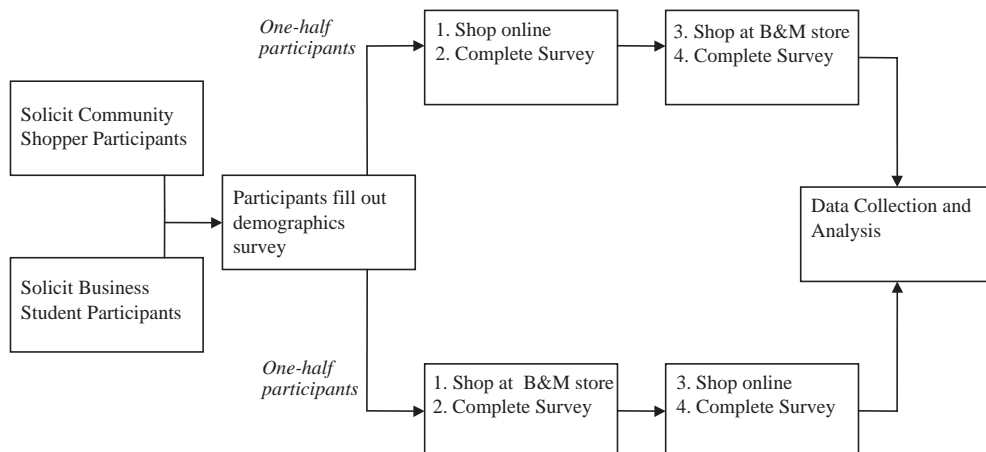


Fig. 2. Overview of the survey process.

Respondents to our survey included students of business administration as well as members from the community. The community shoppers were contacted through a membership list of a social and cultural organization. The solicitation was primarily through phone and email, followed by in-person contacts once the individual agreed to participate in the study. Students were solicited in-person by one of the researchers, following a request to the instructor of each course. All participants who completed all the requirements of the survey were provided with a \$20 gift certificate as an incentive to provide complete and accurate information. The gift certificate was redeemable at any store in a local shopping mall and the university bookstore.

The age of respondents varied from 19 years to 49 years with an average of 24 years. Of these, 41% were female and 59% male. In terms of work experience, the range was from those with no work experience (students) to respondents with 22 years work experience, and the average years of work experience being 4 years. 86.6% of the respondents had prior experience purchasing products online. Demographic information about the sample is shown in Table 1. We also compared the profile of the respondents with the profile of the general population for the zip codes with information obtained from the local Chamber of Commerce. The objective was to check if there was a self-selection bias in our sample. Our *t*-tests indicated that the age and gender of the sample were not significantly (*p*-value greater than 0.10) different than the population from which we sampled.

### 3.2. Measures

Except for demographic questions such as age and years of working experience, questions in the survey used a seven-point Likert-scale, ranging from strongly agree to strongly disagree. Most of the measures employed in this study were extracted from prior literature on transaction costs, channel satisfaction, and e-commerce marketing. Appendix A provides the survey questions and scale items. The uncertainty measure was adapted from Anderson and Schmittlein [6] and captures the uncertainty in online shopping due to prices,

taxes, and information about the product. Two dimensions of asset specificity — site specificity and product specificity were adapted from Anderson [4] and Klein et al. [43]. The measures for asset specificity assess if there are store choices available for the consumer in which case the asset specificity and switching costs will be low. As can be observed from the items in Appendix A, the wording of items imply that a higher value on the scale indicate a lower uncertainty and asset specificity. The four online conduct constructs were based upon studies on the online channel [67] discussed earlier and SERVQUAL measures [61]. All measures on structure and conduct are customer assessments of the environment under which online shopping operates. In contrast, the satisfaction construct is a measure of consumer reaction and attitude toward online shopping. The satisfaction scale consisted of three items adapted from Oliver [58] and Bhattacharjee [10]. Consumer preference was operationalized by capturing intention to repeat use [11,85].

## 4. Data analysis and results

### 4.1. The measurement model — confirmatory factor analysis

The correlation matrix of variables is presented in Table 2. We assessed the measurement model by conducting a confirmatory factor analysis (CFA). CFA allows for tests to be conducted for unidimensionality, convergent validity, and divergent validity of the constructs used in the study. Unidimensionality is the degree to which empirical measures (indicators) of a construct are strongly associated with each other and represent a single concept. Convergent validity is the extent to which varying construct measurement approaches yield the same results, and discriminant validity assesses how much a concept and its indicators differ from another concept and its indicators.

In the assessment of the measurement model, no one statistic is viewed as the single best indicator of fit; rather, researchers examine various fit indices in order to obtain a broad understanding of the measurement model. Accordingly, we examined several fit indices for the measurement model. Because the Chi-square statistic is dependent upon sample size, we used the ratio of Chi-square to degrees-of-freedom. We obtained a value of 1.86, which falls within the suggested value of 3 or below [12].

Unidimensionality is a necessary condition for construct validation and reliability [5]. CFA offers the

Table 1  
Number of respondents classified by demographic category

	Age			
	19–20 years	21–25 years	26–30 years	Above 30 years
Female	26	9	15	5
Male	33	18	10	18



Table 2  
Correlations among study variables

	1	2	3	4	5	6	7	8
1. Channel preference	1							
2. Asset specificity	0.45	1						
3. Uncertainty	0.362	0.551	1					
4. Satisfaction	0.714	0.555	0.596	1				
5. Time responsiveness	0.528	0.524	0.648	0.685	1			
6. Personalization	0.433	0.586	0.647	0.632	0.715	1		
7. Website design	0.407	0.508	0.651	0.574	0.709	0.605	1	
8. Security and reliability	0.599	0.521	0.538	0.738	0.687	0.613	0.573	1

capability to test for the statistical significance for every factor loading (as opposed to an exploratory approach such as principal component factor analysis). Convergent validity of a scale, in CFA, can be checked using the Bentler–Bonett coefficient ( $\Delta$ ) [9]. The Bentler–Bonett coefficient ( $\Delta$ ) is the ratio of the difference between the chi-square value of the null measurement model and the specified measurement model. Values of  $\Delta$  between 0.80 and 0.90 are acceptable, though a value of 0.90 or above demonstrates strong convergent validity [9]. The measurement model yielded a Bentler–Bonett coefficient equal to 0.95. Further, CFA provides tests for the statistical significance of the factor loadings. The loadings of each item are statistically significant at the 0.01 level.

Finally, we used CFA to assess discriminant validity [51]. For every pair of constructs, two CFA models are compared: one where the correlation between them is constrained to be equal to one and the other where it is allowed to vary. Further, the chi-square difference test was used to examine the statistical significance of the difference between the two models at  $p < 0.01$  [80].

An examination of such chi-square difference tests for all possible pairs of constructs indicated that the constructs were statistically distinct at 0.01 significance level.

Scale reliabilities were estimated using Cronbach alpha. The values of alpha for each scale are shown in Appendix A. As can be seen, all scales demonstrate sufficient reliability with alpha values being above 0.70 [57]. Some scales, such as *satisfaction*, *security and reliability*, and *website design*, have alpha values exceeding 0.80.

#### 4.2. Structural model results

The research model presented earlier was tested within a structural equation modeling (SEM) framework using LISREL [40]. Much recent empirical re-

search in IS has also utilized the power of this technique. SEM is a second-generation estimation technique and enables researchers to address a set of inter-related research questions in a single, systematic, and comprehensive analysis [26] by modeling relationships between multiple independent and dependent variables simultaneously.

In Fig. 3 we present the results of the structural equation modeling (SEM) analyses implemented using LISREL 8.30. The structure variables, asset specificity and uncertainty, are both statistically significant at the 0.01 level to all four of the conduct or action variables, namely, time responsiveness, personalization, website design, and security and reliability. Specifically, the lack of uncertainty and asset specificity in the channel structure is associated with better responsiveness, personalization, website design, and security and reliability as part of the actions of the online retailers. The percent of variance explained (R-squares) in each of these constructs is 46%, 49%, 46%, and 36%, respectively. In turn, time responsiveness, personalization, and security and reliability are each significantly related to satisfaction at the 0.01 level. However, the relationship between website design and satisfaction is not statistically significant. The percent of variation explained in satisfaction by the conduct variables is 62%. We discuss this finding in the next section. The link between satisfaction and channel preference is strong and statistically significant at the 0.01 level of significance, with 51% of the variation in channel preference explained by satisfaction. As can be seen, all hypothesized relationships with the exception of the relationship between Website Design and Satisfaction are statistically significant at the 0.01 level of significance. These results offer strong support for the hypothesized research model presented in Fig. 1.

It is a standard practice in the SEM literature to compare the hypothesized or proposed model (M1) with competing or alternative models. The first benchmark model is typically the Null Model or the Inde-

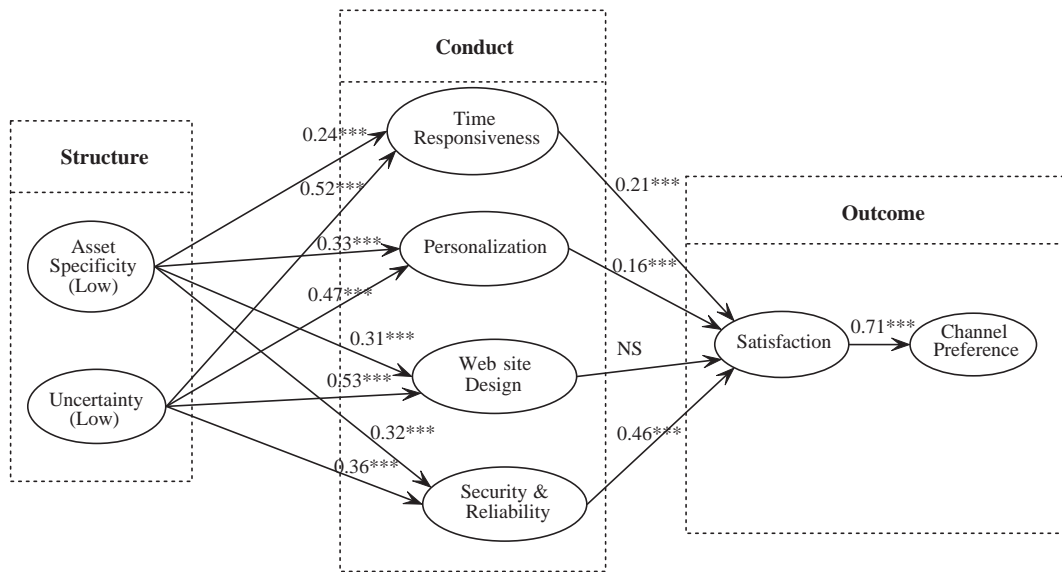


Fig. 3. Structural equation model results.

pendence Model. This model (M2) assumes that there are no relationships between the constructs of interest to the study. The second competing model (M3) we examined is one where satisfaction does not mediate the effect of the Conduct or Action variables on Channel Preference. In other words, we allow the conduct variables to load directly onto channel preference. We report the summary of the various goodness-of-fit criteria in Table 3. The GFI, CFI, and NNFI are above 0.90 for the hypothesized model. The AGFI is above the recommended threshold of 0.80 [14,73]. The other two statistics, Chi-square divided by the degrees of freedom and the Root Mean Square Error of Approximation (RMSEA), are also in the desired range for the hypothesized model [14,73]. These results indicate that the hypothesized model (M1) is significantly better than both the null model as well as the un-mediated model along all dimensions of goodness-of-fit.

## 5. Discussion and implications

This study examined the determinants of consumer satisfaction and preference of the online channel using the SCO framework. We analyzed two possible relationships: transaction structure affects firm conduct and

actions, and firm actions affect consumer acceptance of online channel directly. The findings of this study confirm that transaction costs-based *structure* variables are significantly associated with *conduct* variables of time responsiveness, personalization, website design, and security and reliability. Both transaction cost-based constructs – asset specificity and uncertainty – are found to be significantly related to the conduct variables.

Our results indicate that asset specificity is strongly related to the conduct variables — time responsiveness, personalization, website design, and security and reliability. These results suggest that given the online shopping environment's low asset specificity, consumers may find it easier to switch to another store. The association with time responsiveness is indicative that due to the low consumer asset specificity, online businesses respond by being more time responsive. For instance, by recording preferences and purchase history, online channel businesses can provide personalized service, thus empathizing with the consumer. Part of dealing with the lower asset specificity in the online channel structure is to keep the consumer interface (website design) user-friendly and perhaps most importantly secure and reliable. As in past studies [67,23] our

Table 3  
Goodness of fit tests

Model	$\chi^2/df$	GFI	AGFI	CFI	NNFI	RMSEA
M1: Hypothesized model	1.885	0.97	0.87	0.99	0.96	0.081
M2: Null (independence) model	16.993	0.59	0.29	0.49	0.32	0.35
M3: Unmediated model	18.835	0.84	0.36	0.76	0.24	0.28

findings demonstrate the significance of security and reliability of online transactions. For the online channel *conduct*, security of transactions and purchase history is even more important because of the potential loss or theft of online data. Online channel providers are cautioned that if security issues are not addressed, consumers may switch to another, more secure, channel for their purchases.

Similar to asset specificity, uncertainty of online channel is strongly associated with the *conduct* variables. In our study, consumers indicated that the online channel offers less uncertainty than alternative channels. However, since asset specificity is the ‘...big locomotive to which transaction cost economics owes much ...’ [84], uncertainty manifests in a supplementary role in transactions. Nevertheless, uncertainty provides a critical context for understanding transaction costs. Our findings indicate that given the low asset specificity and low switching cost, channel providers are less likely to resort to opportunism, thus reducing the behavioral uncertainty in the channel. In other words, uncertainty is of lesser consequence when transactions are nonspecific and new trading relationships can be easily established [83]. Increasing predictability in the channel relationship fosters channel providers’ conduct of responsiveness, personalization of transactions, website design and secure nature of the transactions. Thus, our findings indicate that the electronic channel provides opportunity for both consumer and retailer to carry out a smoother transaction with lower costs: economic as well as behavioral.

Examining the relationships between the *conduct* and *outcome* variables, our results suggest that time responsiveness, personalization, and security and reliability are significantly associated with satisfaction. Satisfaction is largely influenced by post-purchase performance against pre-purchase expectations [59]. These results are both intuitive and consistent with previous findings. Our findings indicate that channel satisfaction, and eventual preference, is influenced by the timely response of the channel and the extent to which the channel identifies with the consumer’s needs. In addition, as expected, the security and reliability of the channel also determine the satisfaction with the channel.

The website’s design was found not significantly related to satisfaction. One explanation for this finding is that although well-designed websites are preferred, consumers may soon get past the site appearance or navigation issues to more germane issues that affect transactions. This finding should be viewed in the context of the above stated findings of responsiveness,

reliability and personalization i.e. consumers may get past the website design, provided the absence of good design does not hinder the ease, responsiveness or reliability of the online transaction. Similar behavioral preferences can be seen in other channels where consumers transition to economically favorable shopping even if the appearances are less than preferable. This study also confirms that satisfaction is an antecedent of channel preference. We find evidence that post-purchase satisfaction positively influences the decision of the customer to choose and continue to use the channel.

Our findings have several important implications for research as well as practice. From a theoretical perspective this paper demonstrates the suitability of transaction cost framework as instrumental in our understanding of the behavioral aspects of the online channel including satisfaction. Until recently, transaction cost framework was primarily applied in the economic context. Via the SCO framework, this study also validates an empirical relationship between the transaction costs constructs, consumer satisfaction and eventual channel preference in a social exchange theory perspective. From a theoretical standpoint, this study establishes the viability of the *structure-conduct-outcome* framework to understand complex consumer behavior. This is particularly true of online buying behavior that can be affected by a variety of non-economic factors such as personalization, perception of risk and reliability of the channel.

Our findings have several implications for practice. The importance of time responsiveness of the online transaction indicates that channel providers should invest in hardware and telecommunications to provide faster search and display of product information and transaction execution. Although time responsiveness issues are in part determined by the technology at consumers’ end, often the online channel response time is less than acceptable [67]. Our findings also suggest that channel providers should exploit technological capabilities to personalize transactions that meet the specific needs of the consumers. By virtue of recording and maintaining the history of customer preferences, the online channel has the opportunity to go beyond the traditional channels’ ability to provide personalized service. Further, as the channel response time increases, such as through broadband technologies, consumers are more likely to consider purchasing digital products such as software, music and full-motion video through the online channel.

Notwithstanding the above mentioned opportunities, our findings reinforce the persistent consumer issues of online security and reliability. Online channel

providers must constantly strive to stay ahead of computer hackers, viruses, and denial of service attacks. The online channel providers might consider providing virus protection and security software to its subscribers. Channel providers can engage web authentication and guaranteeing services such as *VeriFone E-Payment Services* and *VeriSign Digital Trust Services* to provide transaction security and assurance to online consumers. In addition, online shopping channel providers may be well served if the sites have fault tolerance capabilities such as mirrored sites and network rerouting so that the online sites have high availability (service reliability).

Although, similar risks exist in other channels, online channels are particularly prone to security and availability issues due to the complexity of the technology, resulting in potentially unresolved consumer concerns. Combined with our earlier finding of low asset specificity of the online channel structure, this result suggests that consumers will switch to the channel that offers more transaction security and reliability.

From our findings of the conduct variables, it appears that less than attractive website design is not a determinant of consumer satisfaction as long as the consumers' ability to conduct the transaction is not hindered. The capability of the channel to be responsive, provide personalization and a secure environment supersedes web design and navigation features. In other words, we suggest that the channel providers should address other issues of conduct before devoting resources to significant improvements in website design and navigation.

## 6. Limitations and future research

This study also has some limitations. First, while the sample included actual online consumers, it was not a random sample. Although the sample chosen appears to reflect typical online consumers, there can be differences of comfort-level with the online channel among the general population. Also, since the population is from one community we should exercise caution in generalizing the results to the general population. Nevertheless, the literature suggests that when people engage in a meaningful task, an accurate description of judgments is more likely [8]. We believe that since our research design engaged participants in a meaningful task of online purchase, this is not as severe a limitation.

Second, our research model is global in nature and involves several relationships. As such it did not study the direct effect of structure on outcome. It is possible

that there may be a direct relationship between transaction structure variables and consumer satisfaction and preference. However, as specified by the SCO framework, we tested the relationship of conduct variables on satisfaction, given the structure of online channel.

Since the online purchase decision can be affected by the characteristics of the product and store, another limitation of the study is that we do not explicitly incorporate these variables. We hope that future studies will examine the impact of the nature of the product and store on the relationships tested in this study. However, it should be noted that our results point to significant effects on 'average' and they do seem to hold across a number of products and stores.

Future studies may test the direct causal relationships between transaction structure and outcome variables. Future studies can also utilize this framework to examine online channel satisfaction differences between products and services; digital products and physical products; and consumer products and upscale luxury products. This research can be expanded to examine the antecedents of channel satisfaction among B2B (Business-to-Business) users such as electronic intermediaries and exchanges. Finally, other constructs, such as trust, that can play a useful role in explaining satisfaction might be examined in future research.

## Appendix A. Scale items and reliabilities (and percent variance explained)

Uncertainty ( $\alpha=0.735$ , PVE=56.58%)

- It was easy for me to get relevant quantitative (price, taxes etc.) information needed to make the purchase.
- I believe that it was possible for me to evaluate the various alternatives.
- The store's website provided adequate information.
- The online site provided sufficient information for the product.

Asset specificity ( $\alpha=0.710$ , PVE=50.48%)

- There are many sites where this product is available.
- I was satisfied with the number of sites where I could buy this product.
- Online shopping gives me a wider choice of different stores compared to conventional stores.
- Online shopping gives me a wider range of product choices compared to shopping at conventional stores.

Channel choice ( $\alpha=0.742$ , PVE=62.75 %)

- I plan to use online shopping again
- For products I can buy online, I intend to completely switch over to online shopping
- I intend to increase my use of shopping online in the future

Satisfaction ( $\alpha=0.828$ , PVE=75.69%)

- Overall, I was satisfied with this online experience.
- I like shopping online.
- I strongly recommend shopping online to others.

Time responsiveness of online stores ( $\alpha=0.753$ , PVE=51.32%)

- The store's website had a fast loading time
- Shopping online helps me accomplish tasks more quickly
- I did not have to spend too much time to complete the transaction
- I trust the online store to deliver the product on time
- In the case of any problem, I think the online store will give me prompt service

Personalization and empathy tools ( $\alpha=0.701$ , PVE=43.93%)

- The online store remembers/recognizes me as a repeat customer (after the first time)
- I think online shopping can address the specific needs of each customer
- Online shopping allowed me to search for the best price and features
- I was satisfied with the payment options (e.g. different credit cards) at the store I shopped

Website design ( $\alpha=0.869$ , PVE=71.95%)

- The store's website was visually appealing
- The online site was user-friendly
- The online site was easy to navigate
- The online site provided me with timely information

Security and reliability ( $\alpha=0.815$ , PVE=73.35%)

- I feel safe in my transactions with the online store
- I believe that online shopping is reliable
- I believe that what I ask for is what I get in online shopping

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