

## Stage antecedents of consumer online buying behavior

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### **Abstract:**

Unlike previous research which adopts simultaneous measures to examine customers' satisfaction with the entire online shopping experience, this study examines two important stages of online buying behavior: ordering and fulfillment. The explicit consideration of the two stages acknowledges the fact that in an online environment, the two stages are distinct and there is a delay between the time a customer makes an order and the time he receives delivery of the merchandise. Examined are the antecedents and consequences of customer satisfaction in different stages of the online buying process based on the expectation–confirmation model (ECM). Results indicate that the customers' satisfaction with the ordering process and the fulfillment process, and the perceived usefulness of the website contribute significantly to their intention to continue using a business-to-consumer (B2C) website. It is also shown that the customers' perceived usefulness affects their satisfaction only with the ordering process but not with the fulfillment process. Implications and limitations are discussed.

**Keywords:** Expectancy disconfirmation theory | Expectation–confirmation model | Perceived usefulness | Satisfaction

### **Article:**

#### **Introduction**

Electronic commerce has been growing rapidly in recent years. Many businesses are turning towards the Internet to market their products. eMarketer (2009) estimates that US B2C e-commerce sales will reach \$224.3 billion in 2009, down 1.4% from 2008. However, as consumer spending recovers from the recession, online sales will begin to rebound in 2010 and be expected to grow 6.9%. In 2011, eMarketer expects a jump to 11.2% growth. The growth of the online retail industry results in tight competition and increases the difficulty of retaining customers (Swaid and Wigand 2009; Vatanasombut et al. 2004). Reduction in consumer search costs, lower barriers to entry and reduced distinctiveness of firms are three interrelated forces undermining customer retention in the e-commerce environment (Vatanasombut et al. 2004). Winning

customer loyalty is critical to online business success (Swaid and Wigand 2009). Therefore, understanding why customers are willing to return for additional purchases at a B2C website has become an increasingly important issue for management and practice.

Researchers have recognized that satisfaction is an important surrogate measure of information system (IS) success and use (DeLone and McLean 2003; Mckinney et al. 2002) and is the key to build and retain a loyal base of long-term customers (Bhattacharjee 2001b). Most of prior studies have used simultaneous measures of a customer's entire online shopping experience (Cao et al. 2003). They measure customer satisfaction as the overall level of satisfaction based on all experiences with the e-tailer (Garbarino and Johnson 1999). However, to account for the fact that a customer's online shopping experience is separated in time (i.e., ordering and fulfillment of the order), it is meaningful to separate the overall satisfaction into satisfaction with the ordering process and satisfaction with the fulfillment process, and to examine their impact on intention to continue using a B2C website.

In e-commerce, websites are the typical media of exchange. Website features, such as ease of use, diversity of product selection, availability of product information, and high performance can provide shopping convenience and contribute to customers' satisfaction with the ordering process, provided it meets their pre-consumption expectations (Szymanski and Hise 2000). The convenience of ordering is a major motivator for customers to shop online (Shim et al. 2002; Bridges and Florsheim 2008). However, customers' satisfaction with the fulfillment process is equally important to their continuance intention. Because of spatial and temporal separation, customers may have even more concerns about on-time delivery, customer support, order tracking, and so forth after the orders are placed (Posselt and Gerstner 2005; Reichheld and Scheffer 2000). Accordingly, different expectations need to be confirmed during customers' entire online shopping experience. Thus, the construct of "confirmation" is separated into "confirmation with the ordering process" and "confirmation with the fulfillment process" in this study. These two confirmations are expected to have an influence on satisfaction with the ordering process and satisfaction with the fulfillment process respectively. Furthermore, prior research has demonstrated that perceived usefulness is also an antecedent to satisfaction (Bhattacharjee 2001b; Hsieh and Wang 2007; Kang et al. 2009; Limayem and Cheung 2008; Limayem et al. 2007), and is expected to have an influence on satisfaction in different stages of the online buying process.

The primary objective of this study is to investigate the antecedents and consequences of customer satisfaction in different stages of the online buying process, and to offer useful insights into continued use in a consumer-based e-commerce context. The expectancy disconfirmation theory (EDT) (Oliver 1980) and the expectation–confirmation model (ECM) of IS continuance (Bhattacharjee 2001b) are used to explore consumers' satisfaction and continuance intentions.

## **Theoretical background**

### **Expectancy disconfirmation theory and expectation–confirmation model**

The expectation disconfirmation theory (EDT) originally developed by Oliver (1980) is a customer behavior model that is widely used in research to explain and predict customer

satisfaction and their behavioral continuance (e.g., repurchase of products, continuance of service use, reuse of information systems) (Anderson and Sullivan 1993; Bhattacharjee 2001a, b; Bhattacharjee and Premkumar 2004; Oliver 1980,1993; Patterson et al. 1997; Tse and Wilton 1988). EDT posits that customers' intention to repurchase products or continue service use is determined primarily by their satisfaction with prior use and expresses customer satisfaction as a function of expectation and expectancy disconfirmation. Expectations are thought to create a frame of reference about which one makes a comparative judgment (Oliver 1980) and disconfirmation is determined jointly by the combination of the expectation and performance manipulations (Churchill and Surprenant 1982). When outcomes (i.e., the perceptions of product performance) are poorer than expected (a negative disconfirmation), they are rated below this reference point, whereas those better than expected (a positive disconfirmation) are evaluated above (Oliver 1980).

In the IS literature, Bhattacharjee (2001b) applied EDT to develop an expectation–confirmation model of IS continuance, in which users' intentions to continue using an IS was modeled as a function of users' satisfaction with IS use and perceived usefulness of continued IS use. User satisfaction, in turn, is influenced by their confirmation of expectation from prior IS use and perceived usefulness. Post-acceptance perceived usefulness is influenced by the users' confirmation level. Bhattacharjee (2001b) argued that the EDT only examines the effect of pre-consumption expectation, but not post-consumption expectation. In proposing the expectation–confirmation model (ECM), he amended EDT to include post-consumption expectation since the post-consumption expectation is especially important for products or services where expectation may change with time. In ECM, the “perceived usefulness” construct is adopted to represent the post-consumption expectation. The conception of perceived usefulness comes from technology acceptance model (TAM) and is defined by Davis (1989, p. 320) as “the degree to which a person believes that using a particular system would enhance his or her job performance.” Perceived usefulness has been verified as an important predictor of initial intentions to use information systems (Davis 1989; Davis et al. 1989; Mathieson1991; Taylor and Todd 1995b) and of intentions to continued use (Bhattacharjee 2001a, b; Gefen 2003; Gefen et al. 2003; Liao et al. 2006; Lin et al. 2005). Although TAM posits that perceived ease of use is another determinant of system use, Karahanna et al. (1999) and Taylor and Todd (1995a) found that perceived ease of use has no significant effect on behavioral intentions to use for experienced information technology (IT) users. Perceived ease of use usually is shown as an important predictor for potential adopters of systems, but its effect decreases with experience (Venkatesh et al. 2003).

The online customers' decisions to continue using a website is similar to IS users' continuance decisions and off-line customers' repurchase decisions, since the typically online shopping behaviors involve the use of IT (a website) and purchase of merchandise. Therefore, the proposed model is based on EDT and ECM.

### **Decomposition of online buying process**

The customer–retailer exchange relationships typically involve several activities in the e-commerce environment. Pavlou (2003) indicated that customer online transaction process involves three steps: information retrieval, information transfer, and product purchase. His

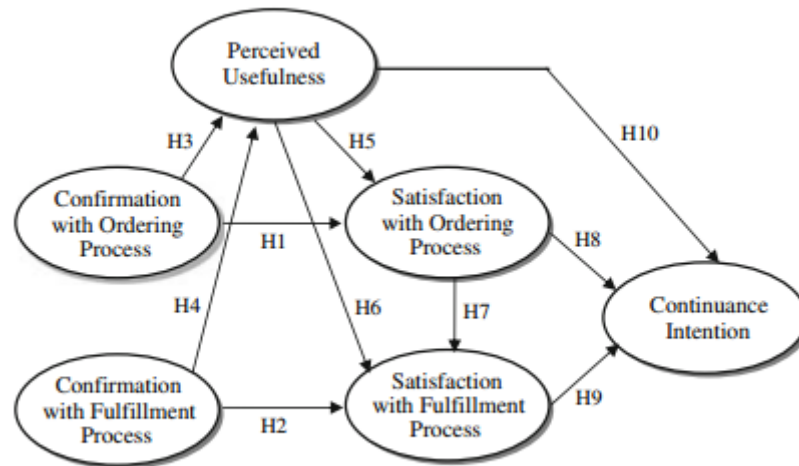
viewpoint focuses on the exchange of transaction information and only considers the process before orders are placed. Nevertheless, by accounting for the delay customers experience between the time they complete their on-line transaction and delivery of the ordered merchandise, the entire online buying process can be modeled as a two-step sequence (Cao et al. 2003). The first step involving searching for products, comparing various features, making a selection, and placing an order is described as the ordering process. The second step begins after the order is placed and includes online order tracking, asking questions, and keeping or returning the item. This step is referred to as the fulfillment process. For online transactions of physical goods, activities related to the ordering process, such as information seeking, evaluation of the product, and ordering can be completed through the website interface. However, after the order is placed, activities related to the fulfillment process, such as delivery and customer support are not immediately available since online transactions lack face-to-face contact, and are performed later. Since the two stages of ordering and fulfillment are distinct and handled separately, it is appropriate to treat them separately. The critical link between ordering and the delivery of the product is often referred to as the last mile of e-commerce (Esper et al. 2003). Late deliveries, broken promises and unmet expectations, especially during periods of high demand like holiday seasons, leave consumers dissatisfied and thus result in low intention to repurchase (Lee and Whang 2001; Madlberger and Sester 2005). Xu et al. (2008) indicated that the convenience and time saving benefits of online shopping may not be realized due to the inefficiency or failure of the last mile delivery. Therefore, an investigation that combines ordering and fulfillment processes into one will necessarily miss the nuances and differences of the two processes.

There are different expectations that need to be confirmed at different stages of the online buying process. In the ordering stage, customers' expectations include ease of use of the website, breadth/depth of products offered, quality of product information, and performance of the site. In the fulfillment stage, customers' expectations include effective order tracking, on-time delivery, product matching the description on the website, and adequate support of their questions and requests. Customers' satisfaction and perceived usefulness will increase if these pre-consumption expectations were confirmed (Bhattacharjee 2001a, b; Hong et al. 2006; Hsu et al. 2006; Thong et al. 2006). Cao et al. (2003) argued that overall satisfaction is determined by pre- and post-purchase processes and the determinants of customer satisfaction are different for the ordering and fulfillment stages. Customers' affect (e.g., satisfaction) reflecting the extent of their expectation to be confirmed may vary from ordering to fulfillment stage because of the time delay between the two processes and different expectations need to be confirmed. Thus, it is more appropriate to consider the satisfaction with the ordering process and the satisfaction with the fulfillment process separately and examine their antecedents and consequences in their own right.

### **Research model and hypotheses**

Figure 1 shows the research model in which the customers' overall confirmation is separated into confirmation with the ordering process and confirmation with the fulfillment process, and the overall satisfaction is separated into satisfaction with the ordering process and satisfaction with the fulfillment process. Confirmation with the ordering process and confirmation with the fulfillment process separately have a positive influence on satisfaction with ordering and satisfaction with fulfillment respectively; the two in turn positively influence continuance

intention. Both confirmation with ordering and confirmation with fulfillment lead to perceived usefulness, which in turn has a positive influence on satisfaction with ordering, satisfaction with fulfillment, and continuance intention. It is further postulated that satisfaction with ordering leads to satisfaction with fulfillment because of the time dependency.



**Fig. 1** The research model

EDT posits that customer satisfaction is determined by expectation confirmation/disconfirmation (Oliver 1980). Confirmation implies realization of expected benefits, while disconfirmation denotes failure to achieve expectations. Customers' cognitive belief can influence their affect (Ajzen 1991; Davis et al. 1989; Mathieson 1991; Taylor and Todd 1995b). The confirmation belief, therefore, is expected to influence satisfaction. The confirmation–satisfaction association is well established in the marketing literature and also verified empirically in the contexts of e-commerce service continuance (Bhattacharjee 2001a, b; Hong et al. 2006; Hsu et al. 2006; Thong et al. 2006) and web portal continuance (Lin et al. 2005). As described before, different expectations need to be confirmed during the ordering process and the fulfillment process, and these in turn have an influence on satisfaction at their respective stages. Thus,

**H1.** Customers' extent of confirmation with the ordering process is positively associated with their satisfaction with the ordering process.

**H2.** Customers' extent of confirmation with the fulfillment process is positively associated with their satisfaction with the fulfillment process

Drawing from cognitive dissonance theory (Festinger 1957), when there is inconsistency, or when there is conflict with the past experience to make us uncomfortable, we take the simplest way out to get consistency again. The tension of dissonance motivates us to change either our behavior or our belief in an effort to avoid a distressing feeling. The online customers may experience cognitive dissonance or psychological tension if their pre-consumption usefulness perceptions are disconfirmed during actual use. Rational customers may try to remedy this dissonance by distorting or modifying their usefulness perceptions in order to be more consistent

with reality (Bhattacharjee 2001b). The initial usefulness perception may be adjusted higher when the pre-consumption expectation is confirmed and lower when there is disconfirmation both in the ordering and the fulfillment processes. Thus,

**H3.** Customers' extent of confirmation with the ordering process is positively associated with their perceived usefulness of a B2C website.

**H4.** Customers' extent of confirmation with the fulfillment process is positively associated with their perceived usefulness of a B2C website.

To account for customers' changes in expectations following consumption experience and the impact of these changes on subsequent cognitive processes, Bhattacharjee (2001b) regards post-consumption perceived usefulness as post-consumption expectation and demonstrates that the users' perceived usefulness of IS use is positively associated with their satisfaction. Post-consumption expectation (or perceived usefulness) serves to provide the foundation for post-consumption attitude formation and thus satisfaction (Oliver 1980). The usefulness of a website depends on the extent of benefits obtained from using it (Gefen et al. 2003). The immediate benefits obtained from using a website are convenience of shopping, such as gathering information, making product and price comparisons, and placing an order. The ultimate benefits are realized when the ordered items are filled correctly and the items perform the same way or better than expected. Satisfaction with the ordering process increases when immediate benefits are obtained and the satisfaction with the fulfillment process increases when ultimate benefits are obtained. Therefore,

**H5.** Customers' perceived usefulness of a B2C website is positively associated with satisfaction with the ordering process.

**H6.** Customers' perceived usefulness of a B2C website is positively associated with satisfaction with the fulfillment process.

Prior studies of customers' satisfaction with services of auto retailing and restaurants (Hoyer et al. 2002; Lemmink et al. 1998), Cao et al. (2003) have found that there is generally a significant degree of carry-over of satisfaction from one experience to the subsequent experience. These studies have verified the carry-over effect of satisfaction with the order on to the fulfillment process and have indicated that the halo effect is one possible source of the carry-over effect. Indeed, when judging the value of something, the initial impression usually influences one's subsequent impression and even the overall perception of the entire experience. Therefore, customers who are more satisfied with the ordering process would also be more satisfied with the subsequent fulfillment process.

**H7.** Customers' level of satisfaction with the ordering process is positively associated with their satisfaction with the fulfillment process.

The role of satisfaction in predicting behavioral intentions is well established in the marketing literature (Anderson et al. 1994; Cronin and Taylor 1992; Oliver 1980; Patterson et al. 1997; Zeithaml et al. 1996). Recent studies demonstrated that satisfaction can also be considered a key

predictor of intention to continue IT usage (Bhattacharjee 2001b; Hong et al. 2006; Lin et al. 2005; Thong et al. 2006). Satisfaction is an affect, captured as positive (satisfied), indifferent, or negative (dissatisfied) feelings (Bhattacharjee2001b). When customers finish placing an order, their immediate affect response (e.g. satisfaction) to the ordering process is was formed. After acquiring the items, customers form another affect response to the fulfillment process. Both responses lead to an overall evaluation of their experience with the website. As DeLone and McLean (2003) have argued, “user satisfaction” remains an important means of measuring opinions about an e-commerce system and should cover the entire customer experience cycle from information retrieval through purchase, payment, receipt, and service. Therefore, both satisfaction with the ordering process and satisfaction with the fulfillment process will form customers’ continuance intention.

**H8.** Customers’ level of satisfaction with the ordering process is positively associated with their continuance intention.

**H9.** Customers’ level of satisfaction with the fulfillment process is positively associated with their continuance intention.

Bhattacharjee (2001b) indicated that the usefulness-intention association originally derived in an acceptance context still holds true in continuance contexts, because human tendencies for subconsciously pursuing instrumental behaviors are independent of the timing or stage of such behaviors. A website interface that is perceived as facilitating the traction process is more likely to be accepted by customers (Pavlou 2003). The more useful the website is in enabling the customers to accomplish their tasks, the more it will be used. This is the customers’ rational reaction when they choose to use a website (Gefen 2003).

**H10.** Customers’ perceived usefulness of a B2C website is positively associated with their continuance intention.

## **Research methodology**

### **Instrument development**

Scales measuring the principal constructs were developed based on existing measures when possible or were based on similar scales. The operational definitions and sources for these constructs are presented in Table 1, and the list of the items is displayed in Appendix. Scales for confirmation with ordering and fulfillment processes were based on Cao et al. (2003) and Oliver (1980). Scales for perceived usefulness were adapted from existing studies on the technology acceptance model (Bhattacharjee 2001b; Davis 1989). Measures for satisfaction with ordering and fulfillment processes were adapted from Bhattacharjee (2001b). Pavlou (2003) argued that customers view the transaction process in its entirety, both as intention to use (information exchange) and intention to transact (product purchase). Following Pavlou’s work, the dependent variable measuring continuance intention was captured with three items, two measuring intention to use (information exchange) and one measuring intention to transact (product purchase). All items were measured on a 7-point Likert scale with anchors of strongly disagree (1) to strongly

agree (7), except for satisfaction with ordering and fulfillment processes, which were measured by a 7-point semantic differential scale.

**Table 1** Operationalization of constructs

Construct	Operational definition	Source/reference
Confirmation with ordering process	Consumers' perception of the congruence between expectation of website use and its actual performance in the ordering stage of buying process.	(Cao et al. 2003; Oliver 1980)
Confirmation with fulfillment process	Consumers' perception of the congruence between expectation of website use and its actual performance in the fulfillment stage of buying process.	(Cao et al. 2003; Oliver 1980)
Perceived usefulness	Consumers' perception of the expected benefits of website use.	(Bhattacharjee 2001b; Davis 1989)
Satisfaction with ordering process	Consumers' affect with (feelings about) prior website use in the ordering stage of buying process.	(Bhattacharjee 2001b)
Satisfaction with fulfillment process	Consumers' affect with (feelings about) prior website use in the fulfillment stage of buying process.	(Bhattacharjee 2001b)
Continuance intention	Consumers' intention to continue using a website.	(Pavlou 2003)

In addition to items for the constructs, the questionnaire included questions about the demographics of the respondents. The beginning of the questionnaire provided definitions of ordering and fulfillment processes. The subjects were to provide responses about websites based on their memory. In order to minimize potential memory bias, the respondent was asked to choose his or her favorite website, state the name of the e-tailer, and then provide answers in the context of the selected website. Choosing a favorite website or retailer reduces memory bias since it provides a contextual and natural scenario, as proposed in earlier studies (e.g., Pavlou 2003).

The preliminary instrument was reviewed by five customers having more than 6 years of online shopping experience, three doctoral students, and one researcher for precision and clarity. Pre-testing to check the psychometric properties of the scales was undertaken by 52 MBA students experienced in online shopping. Of the 52 questionnaires, five were discarded due to missing values. The Cronbach's alpha ( $\alpha$ ) coefficients of all constructs were above 0.85 and thus acceptable (Nunnally 1978).

## Subjects

A mail survey was conducted in October 2007 in Taiwan to test the research model. Although an online survey was considered, it was not chosen due to known problems of lower response rates, spam filters, people with multiple e-mail addresses, slow modem speeds, connect-time costs, and low-end browsers (Couper 2000; Pavlou 2003). The study focused on experienced online shoppers who have bought products/services online. According to a survey by Yam.com, a popular portal site in Taiwan, college students and salaried employees are major Internet users in Taiwan. Therefore, subjects were selected from undergraduate students, graduate students and company employees. Students from three universities were also asked to complete the survey. Additionally, we chose 42 companies in which MBA students work, and asked the students to distribute and collect the questionnaires. To reduce possible bias, we chose different kinds of companies and distributed 10–20 questionnaires in accordance with company size. As in the pre-test, participants were asked to name their favorite e-tailer, and answer questions in that context. Efforts were made to target shoppers who have purchased physical (i.e., non-digital) products or



tangible services on their target websites. This requirement was stated at the beginning of the questionnaire. In addition, those who assisted in distributing the questionnaires were asked to emphasize this requirement to the subjects.

A total of 781 questionnaires were distributed. One hundred and fifty six were distributed to students and 142 were collected. Six hundred and twenty five were distributed to company employees and 359 were collected. After discarding incomplete responses, 418 usable questionnaires (128 students and 290 employees) were received and used for analysis, resulting in a response rate of 53.5%. Data were pooled from these two samples. Pooling was justified as there were no significant differences between the two samples in the answers to items measuring key dependent and independent variables (Wilks' lambda = 0.975,  $p$ -value = 0.109). Non-response bias was assessed by comparing the early company respondents (65%) with late respondents (35%) (Armstrong and Overton 1977). Multivariate analysis of variance on key constructs showed no significant differences (Wilks' lambda = 0.992,  $p$ -value = 0.887). Thus, the risk of non-response bias is limited.

### **Sample characteristics and descriptive statistics**

Table 2 summarizes the demographics of the respondents. The characteristics are consistent with surveys of typical Internet users in Taiwan. Forty-three percent of the respondents were male, and 63% have more than 1 year of online shopping experience. The most frequented sites for purchase were: books.com.tw (12%), shopping.pchome.com.tw (10%), and kingstone.com.tw (4%). Product categories most often purchased online were: books (52%), 3C (Computer, Communication & Consumer electronics) products (37%), audio/video products (24%), and beauty/cosmetic products (24%).

**Table 2** Respondent demographic profile

Variable	Frequency	Percentage
Gender		
Male	180	43.1
Female	238	56.9
Age		
Under 20	81	19.4
20–29	193	46.2
30–39	115	27.5
40–49	24	5.7
Over 50	5	1.2
Degree of online shopping experiences		
<1 year	156	37.3
1–3 years	201	48.1
3–5 years	35	8.4
>5 years	26	6.2
Industries and affiliation		
Manufacturing	109	26.1
Service	88	21.1
Culture and education	42	10.0
Financial sector	29	6.9
Student	128	30.6
Others	22	5.3
Selected websites		
books.com.tw	52	12.4
shopping.pchome.com.tw	43	10.3
kingstone.com.tw	18	4.3
buy.yahoo.com.tw	16	3.8
www.payeasy.com.tw	15	3.6
www.etmall.com.tw	15	3.6
store.pchome.com.tw <sup>a</sup>	62	14.8
tw.shopping.yahoo.com <sup>b</sup>	37	8.9
Others	160	38.3

<sup>a</sup> store.pchome.com.tw is a shopping mall portal with a lot of e-tailers who rent e-stores from pchome.com.tw

<sup>b</sup> tw.shopping.yahoo.com is a shopping mall portal with a lot of e-tailers who rent e-stores from tw.yahoo.com

## Analysis and results

Structural equation modeling (SEM) was used to validate the research model. Following Anderson and Gerbing's (1988) guidelines, data analysis was carried out in accordance with a two-stage methodology. First, confirmatory factor analysis (CFA) was performed to evaluate the convergent and discriminant validity of the constructs. Next, the causal structure of the model was tested using structural equation analysis. LISREL 8.50 was used to perform these analyses.

### Measurement model

CFAs were employed to test the measurement model with all the constructs. Table 3 shows the overall model fit indices for CFA. It also shows the recommended value of each index. As shown, all measures satisfied the recommended values, except for the Chi-square. However, the Chi-square is quite sensitive to large sample sizes, especially for cases in which the sample size exceeds 200 respondents (Hair et al. 1998). Because the analysis was based on a large sample, it is necessary to complement the chi-square with other goodness-of-fit measures (Hair et al. 1998). Using the other measures, there is a reasonable overall fit between the model and the observed data.

**Table 3** Fit measures for the measurement model

Fit indicators	Recommendation criteria	Results
Chi-square ( $\chi^2$ )	$p > 0.05$ (Hair et al. 1998)	488.6 ( $p = 0.0$ )
Chi-square/degrees freedom ( $\chi^2/df$ )	$< 5.00$ (Hair et al. 1998)	2.27 (df=215)
Root Mean Square Error of Approximation (RMSEA)	$< 0.08$ (Hair et al. 1998)	0.056
Root Mean square Residual (RMR)	$< 0.05$ (Gefen et al. 2000)	0.028
Goodness-of-fit Index (GFI)	$> 0.90$ (Gefen et al. 2000)	0.91
Adjusted Goodness-of-Fit Index (AGFI)	$> 0.80$ (Gefen et al. 2000)	0.88
Normed Fit Index (NFI)	$> 0.90$ (Hair et al. 1998)	0.95
Non-Normed Fit Index (NNFI)	$> 0.90$ (Hair et al. 1998)	0.97
Comparative Fit Index (CFI)	$> 0.90$ (Gefen et al. 2000)	0.97

After the overall model was accepted, each construct was evaluated separately by examining the item loadings for statistical significance and assessing the construct reliability, and the variance extracted. Results are shown in Table 4, which also shows the recommended values of the measures (Hair et al. 1998). All measures satisfied the recommended values. Thus convergent validity of the measurement items is established. Additionally, discriminant validity is shown when the square root of each construct's average variance extracted (AVE) is larger than its correlations with other constructs. As seen in Table 5, the square root of the AVE is much larger than its correlations with the other constructs.

**Table 4** Measurement model fit indices for convergent validity

Construct	Indicator loading <sup>a</sup>	Item reliability	Composite reliability	Variance extracted
Recommended value		>0.50	>0.70	>0.50
Confirmation with order process (CWOP)			0.90	0.70
CWOP1	0.84	0.70		
CWOP2	0.84	0.70		
CWOP3	0.86	0.74		
CWOP4	0.81	0.65		
Confirmation with fulfillment process (CWFP)			0.89	0.66
CWFP1	0.81	0.66		
CWFP2	0.86	0.73		
CWFP3	0.80	0.64		
CWFP4	0.78	0.61		
Satisfaction with order process (SWOP)			0.95	0.83
SWOP1	0.91	0.83		
SWOP2	0.93	0.86		
SWOP3	0.92	0.85		
SWOP4	0.89	0.79		
Satisfaction with fulfillment process (SWFP)			0.95	0.84
SWFP1	0.89	0.79		
SWFP2	0.92	0.85		
SWFP3	0.92	0.85		
SWFP4	0.93	0.86		
Perceived usefulness (PU)			0.89	0.67
PU1	0.80	0.65		
PU2	0.79	0.63		
PU3	0.85	0.72		
PU4	0.83	0.69		
Continuance Intention (CI)			0.92	0.79
CI1	0.92	0.85		
CI2	0.91	0.83		
CI3	0.83	0.70		

<sup>a</sup> All indicator loadings are significant at  $p=0.01$

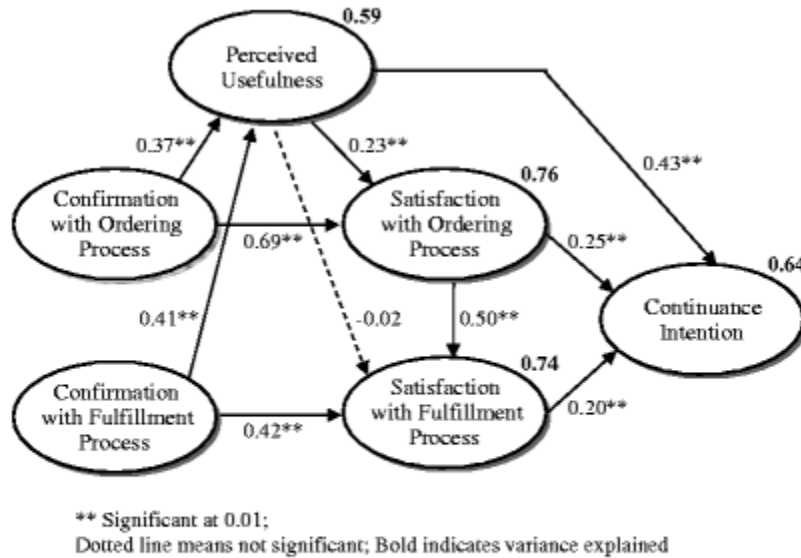
**Table 5** Inter-construct correlations

Construct	CWOP	CWFP	SWOP	SWFP	PU	CI
CWOP	<b>0.837</b>					
CWFP	0.797	<b>0.812</b>				
SWOP	0.773	0.782	<b>0.911</b>			
SWFP	0.729	0.760	0.798	<b>0.917</b>		
PU	0.665	0.661	0.677	0.613	<b>0.819</b>	
CI	0.636	0.655	0.688	0.642	0.671	<b>0.889</b>

Diagonals represent the square root of the AVE

## Structural model

Having satisfied the measurement requirements, structural equation analysis was performed to test the structural relationships. The result showed that the chi-square statistic is significant ( $\chi^2 = 511.707, p = 0.0$ ) and the other fit indices are within accepted thresholds:  $\chi^2/df$  at 2.34 ( $df = 219$ ), RMSEA at 0.0574, RMR at 0.0311, GFI at 0.902, AGFI at 0.877, NFI at 0.948, NNFI at 0.965, CFI at 0.969. Figure 2 shows the standardized LISREL path coefficients. All paths are significant except the path between perceived usefulness and satisfaction with fulfillment process ( $\gamma = -0.02, t = -0.38$ ). The extent of explained variance of continuance intention was 64%, of satisfaction with ordering process 76%, of satisfaction with fulfillment process 74%, and of perceived usefulness 59%.



**Fig. 2**  
Standardized LISREL solution

## Results

As shown in Fig. 2, confirmation with the ordering process was found to affect satisfaction with the ordering process ( $\gamma = 0.69, p < 0.01$ ) and perceived usefulness ( $\gamma = 0.37, p < 0.01$ ) positively, validating H1 and H3. Confirmation with the fulfillment process was found to affect satisfaction with the fulfillment process ( $\gamma = 0.42, p < 0.01$ ) and perceived usefulness ( $\gamma = 0.41, p < 0.01$ ) positively, thus validating H2 and H4. The effect of perceived usefulness on satisfaction with the ordering process ( $\gamma = 0.23, p < 0.01$ ) was significant, lending support for H5. However, perceived usefulness has a non-significant effect on satisfaction with fulfillment process ( $\gamma = -0.02$ ), thus H6 was rejected. The effect of satisfaction with the ordering process on satisfaction with the fulfillment process ( $\gamma = 0.50, p < 0.01$ ) was significant, validating H7. Satisfaction with the ordering process ( $\gamma = 0.25, p < 0.01$ ), satisfaction with the fulfillment process ( $\gamma = 0.20, p < 0.01$ ), and perceived usefulness ( $\gamma = 0.43, p < 0.01$ ) are all strong predictors of continuance intention. Therefore, H8, H9 and H10 are supported. Besides, the variance explained for all dependent and mediating variables was substantial, indicating strong predictive power of the proposed model.

Although perceived usefulness has the strongest effect on continuance intention (relative to satisfaction with ordering process and satisfaction with fulfillment process), Bhattacharjee (2001b) argued that overall satisfaction is the stronger predictor of IS continuance intention relative to perceived usefulness. Therefore, the model was run without including perceived usefulness in order to examine how much of the variance in intention is explained by the two satisfactions alone. The results showed an adequate fit:  $\chi^2$  at 415.933 ( $p = 0.0$ ),  $\chi^2/df$  at 2.85 ( $df = 146$ ), RMSEA at 0.0673, RMR at 0.0387, GFI at 0.904, AGFI at 0.875, NFI at 0.951, NNFI at 0.962, and CFI at 0.967. Satisfaction with the ordering process and satisfaction with the fulfillment process jointly explained 56% of the intention variance. Therefore, satisfaction alone predicts a substantial amount of variance in continuance intention, which is consistent with Bhattacharjee's finding.

## **Discussion and implications**

As expected, perceived usefulness and satisfaction (both with ordering and fulfillment processes) were significant antecedents of continuance intention, which is consistent with ECM and related studies (Hong et al. 2006; Liao et al. 2007; Lin et al. 2005; Thong et al. 2006). To retain customers, an e-tailer should strive to enhance customers' perceptions of usefulness and their satisfaction. The customers' limited prior experience or poor computer literacy may reduce perceived usefulness of the website (Bhattacharjee 2001b). Therefore, e-tailers should simplify the shopping procedure as much as possible, offer guidance about the complete shopping procedure, and educate the customer on the benefits of the website. Such features would enhance the perceived usefulness of the website. Note that the customers' satisfaction (reflecting their post-consumption affect), by itself, also has a strong impact on continuance intention.

Both customer satisfaction with the ordering process and satisfaction with the fulfillment process affect continuance intention. It is notable that not only the customers' satisfaction with the ordering process has a stronger direct impact on continuance intention than their satisfaction with the fulfillment process, but it also has an indirect effect on continuance intention through satisfaction with the fulfillment process. These results have important implications for practice. For individual practitioners or small organizations with limited resources and inadequate ability to meet customers' every demand in their initial undertaking of e-commerce, it may be an effective strategy to utilize the carry-over effects of ordering satisfaction and to allocate more resources to improve their satisfaction at the ordering stage of the buying process. In spite of this proposition, customers' satisfaction with the fulfillment process should not be ignored since it does have a significant impact on their continuous intention. Prior research has demonstrated that customers whose orders are filled correctly are more likely to purchase again in the future (Reichheld and Scheffer 2000).

Satisfaction with the ordering process was predicted primarily by customers' confirmation with ordering process and secondarily by their perceived usefulness of the website. These determinants jointly explain 76% of the variance. Satisfaction with the fulfillment process was predicted primarily by customers' confirmation with the fulfillment process, but it is not significantly associated with perceived usefulness. A possible explanation is that the customers' cognitive belief about the usefulness of the website stems primarily from their ability to assess the website's convenience in purchase and ordering vis-à-vis a face-to-face transaction and sales

clerk service. In other words, ordering is more associated with website features while fulfillment is regarded as a more behind the scene activity. Some prior ECM-based studies have shown that the association between perceived usefulness and overall satisfaction is non-significant (Hong et al. 2006; Liao et al. 2007; Lin et al. 2005; Thong et al. 2006) or relatively weak (Thong et al. 2006) than the original ECM. These inconclusive results can now be explained more clearly with our model. We have found that perceived usefulness of the website is related to satisfaction with ordering, but not to satisfaction with fulfillment.

The extent of confirmation with ordering and fulfillment processes is separately assessed by customers, which in turn determines their satisfaction with the two stages of the buying process. As expected from ECM, confirmation is a stronger predictor of satisfaction than perceived usefulness in every stage of the buying process. This finding is consistent with ECM-based studies (Hong et al. 2006; Liao et al. 2007; Lin et al. 2005; Thong et al. 2006), although they have been applied to the entire buying experience. The confirmation of expectation implies that customers can obtain their expected benefit from the website use, which is a more direct and salient motivator than the website's general usefulness. This is consistent with Thong et al.'s (2006) argument that IT users place more emphasis on the confirmation of their expectations, rather than on individual post-adoption beliefs, in forming their levels of satisfaction. Therefore, in addition to strengthening the customers' perception of usefulness through improving efficiency and effectiveness of website use, e-tailers should periodically investigate the needs and expectations of customers, constantly examine the extent of customers' expectations that need to be confirmed at every stage of the buying process, and adopt appropriate actions to decrease the gap between expectation and perceived performance. This is a more focused and effective strategy to retain customers.

From a strategic point of view, satisfaction with the fulfillment process can be a critical factor for customers' "repatronage" decisions (Reichheld and Scheffer 2000; Lee and Whang 2001). There are a lot of e-tailers who find themselves unable to make timely, cost-effective deliveries (Lee and Whang 2001). This is because order fulfillment in electronic B2C transactions is a complex, multi-faceted process (Peters 2000), which "involves all of the activities from the point of a customer's purchase decision until the product is delivered to the customer and he or she is fully satisfied with its quality and functionality" (Pyke et al. 2001, p. 27). Good fulfillment, which means taking the right product, putting it in the right box, shipping it, and gaining the customer's approval on arrival, is a demanding task (Ricker and Kalakota 1999). The fulfillment logistics often need to coordinate and collaborate with channel partners, which can be suppliers, intermediaries, and third party service providers. Furthermore, given the greater similarity in front-end features of online stores, e-tailers with a superior ordering process are unlikely to differentiate themselves as it becomes a minimum requirement for doing business. The fulfillment stages therefore become much more important for differentiation. However, compared to the ordering process, the fulfillment stage has not gained enough attention from researchers and practitioners, and deserves deeper scrutiny.

It is noteworthy that many e-tailers have developed a fulfillment system by which their customers are able to track order and delivery status. However, it is not always easy to deliver goods in the right quantities, to the right locations, and at the right time with minimum costs while satisfying service level requirements, because it requires effective supply chain

management. In fact, more and more e-tailers in Taiwan are striving to improve their service and performance of the fulfillment process so as to differentiate themselves from their competitors. The shopping.pchome.com.tw, a famous e-tailer and a forerunner of online 24-h shopping mall in Taiwan, has benefited greatly from its new services which guarantee that the ordered items will be delivered in 24 h. For ensuring on-time delivery, a compensation policy for delivery service delays is announced on the site. The fact that the online 24-h shopping mall strategy is being imitated by competitors emphasizes the point that enhancing customer satisfaction with the fulfillment process is an effective strategy to differentiate e-tails from their competitors.

All in all, consumers' perception of usefulness depends on the extent to which the expectations of customers are met by the e-vendors. While perceived usefulness reflects the post-consumption expectation (Bhattacharjee 2001b), an e-tailer can raise the post-consumption expectation by improving the efficiency of both the ordering and the fulfillment processes. Many e-tailers have been successful in improving the efficiency of various aspects of the ordering process. Many convenience elements of online shopping are realized in the ordering process itself (e.g., wide selection, continuous shopping hours, instant access, etc.) (Cao et al. 2003), suggesting an overemphasis on the ordering process and its influence on usefulness and continuance intention, over and above the role of the fulfillment process. Our research suggests otherwise and underscores the importance of the fulfillment process in par with the ordering process. While much attention has been given to the ordering process, e-tailers should strive to enhance their order-fulfillment ability.

In summary, the current research contributes to the existing body of knowledge by modeling and measuring the ordering and fulfillment stages of the online shopping experience independently. The two stage decomposition of the buying process allows e-tailers a finer lens to examine their e-commerce strategy, and provides them more options and greater precision in developing specific plans.

### **Limitations**

The study has certain limitations, many common to survey-based studies. First, the subjects came from two sources and were not sampled randomly. To reduce possible bias, we chose different types and sizes of companies. Moreover, the characteristics of the sample are similar to the profile of online customers in Taiwan. Second, in spite of careful design and pretest, the retrospective nature of this survey may introduce potential response bias (e.g., memory recall errors). Third, a large number of studies based on TRA (Theory of Reasoned Action) (Fishbein and Ajzen 1975), TPB (Theory of Planned Behavior) (Ajzen 1991), or TAM generally accept the perspective that the proximal determinant of behavior is intention, and the strong intention-behavior association has been validated in prior online consumer behavior research (e.g., Chen et al. 2002; Pavlou 2003; Pavlou and Fygenson 2006). However, it cannot be ignored that respondents' actual behavior may not replicate intention. Fourth, the model may not be applicable to the purchase of digital goods. For digital goods delivered online, the time delay between order and fulfillment stages might be too short to explicitly distinguish between the order process and the fulfillment process. Therefore, some scale items measuring confirmation with the fulfillment process may have to be modified for purchasing digital goods. In spite of



these issues, the contribution of this study lies in the decomposition of the buying process and a better understanding of the antecedents of online shopping behavior.

## **Conclusions**

This study advocates the necessity to separate the online buying process into ordering and fulfillment processes, when modeling online consumer behavior. Interrelationships among the key variables related to the two processes were developed and examined for their comparative effect on key dependent variables: satisfaction and continuance intention. The results of the empirical analysis provide a number of interesting insights and enrich our current understanding of B2C e-commerce. We suggest that modeling and measuring the ordering and fulfillment stages of the online shopping experience independently would help provide a more complete picture of online consumer behavior. Given the high explanatory power of the resulting baseline model, the findings have theoretical implications for future work in predicting consumer behavior. There are a number of practical implications for online vendors as they continue to explore opportunities for optimization of the electronic media for improved sales.

## **Appendix**

List of items by construct

Confirmation with ordering process (CWOP)

**CWOP1:** The ease of use of the website (e.g. convenience and speed of ordering) was better than what I expected.

**CWOP2:** The breadth/depth of products offered by the website was better than what I expected.

**CWOP3:** The product information quality (e.g. information quantity, quality, and relevance) offered by the website was better than what I expected.

**CWOP4:** The website performance (e.g. layout, links, pictures, images, and speed) was better than what I expected.

Confirmation with fulfillment process (CWFP)

**CWFP1:** The on-time delivery (expected vs. actual delivery date) of products was better than what I expected.

**CWFP2:** The product representation (product description/depiction vs. what you received) was better than what I expected.

**CWFP3:** The customer support (e.g. status updates and complaint/question handling) offered by the website was better than what I expected.

**CWFP4:** The ability to effectively track orders was better than what I expected.

Perceived usefulness (PU)

**PU1:** Using the website improves my performance in information seeking and purchasing

**PU2:** Using the website enables me to seek and purchase faster

**PU3:** Using the website enhances my effectiveness in information seeking and purchasing

**PU4:** Using the website increases my productivity in information seeking and purchasing

Satisfaction with ordering process (SWOP)

How do you feel about your experience of using the website in the ordering stage of online buying process:

**SWOP1:** Very dissatisfied/Very satisfied

**SWOP2:** Very displeased/Very pleased

**SWOP3:** Very frustrated/Very contented

**SWOP4:** Absolutely terrible/Absolutely delighted

Satisfaction with fulfillment process (SWFP)

How do you feel about your experience of using the website in the fulfillment stage of online buying process:

**SWFP1:** Very dissatisfied/Very satisfied

**SWFP2:** Very displeased/Very pleased

**SWFP3:** Very frustrated/Very contented

**SWFP4:** Absolutely terrible/Absolutely delighted

Continuance intention (CI)

**CI1:** I intend to continue using the website in the future

**CI2:** I expect my use of the website to continue in the future

**CI3:** It is likely that I will continue to transact with the e-tailer in the near future

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