Post-Adoption Behaviors of E-Service Customers: The Interplay of Cognition and Emotion

Sophea Chea and Margaret Meiling Luo

ABSTRACT: The interplay between cognition and emotion has been explored in the consumer behavior literature, but the links between cognition-emotion interplay, satisfaction, and post-adoption behaviors have not been integrated in a single model of customer retention. The authors proposed a model that links these constructs and empirically tested it in e-service settings. The results showed that satisfaction is a significant predictor of all three post-adoption behaviors: continuance, complaint, and recommendation. Negative affective response to e-service use was found to directly predict complaint behavior, but positive affect and negative affect did not influence customer satisfaction. The implications of these findings for e-service customer retention theory and practice are delineated.

KEY WORDS AND PHRASES: Affective experience, complaint, customer retention, e-service, expectancy confirmation theory, post-adoption behaviors, recommendation, satisfaction.

E-services are pervasive in today’s market space [22, 53, 63]. They are offered by both traditional and on-line firms either for competitive advantage or from competitive necessity [30]. E-services range from the electronic provision of traditional services, such as banking (e.g., E*TRADE), investing (e.g., chase.com), and airline ticketing (e.g., expedia.com), to intelligent interactivity in post-sales product support (e.g., dell.com and Internet service providers) [18]. They also include hedonic e-services like on-line gaming and music downloading (e.g., blizzard.com and iTunes) and socially oriented services like virtual communities and social networking sites (e.g., Second Life, MySpace, and Facebook).

Wareham, Zheng, and Straub defined e-service as “the provision of some kinds of services that are substantially differentiated from traditional retailing, such as professional services, entertainment or education” [63, p. 3]. Traditional services are based on a “high-touch”/“low-tech” paradigm. E-service providers are trying to apply the high-touch paradigm to the on-line environment, which is high-tech by nature. E-services are information intensive and enabled by technology [7, 30]. One underlying fact of e-service is that switching costs are minimal because the competitor is just a mouse click away [10]. As a result, keeping customers loyal presents a major challenge for e-service providers.

In a survey of e-loyalty in various on-line industries, Reichheld and Schefter found that it normally took from 1.1 to more than 4 years for a company to achieve breakeven from a new customer, and that 15 percent to more than 60 percent of customers defected to competitors before the breakeven point [48]. To survive in the turbulent e-commerce environment, on-line companies need to have a long-term customer-relationship strategy. Long-term customer relationship plays an important role in business profitability not only because loyal customers use more of the complementary products and services, but also because they are less costly to be retained. According to past research, acquiring a new customer is about five to eight times more expensive than
retaining an existing one [47]. Such evidence underscores the relevancy and timeliness of studying customer loyalty and post-adoption behaviors in an on-line environment.

Previous information systems (IS) studies of customer retention focused mainly on one post-adoption behavior, namely, continuance intention [5, 6, 8, 10]. However, with the proliferation of social computing technologies, including blogs, social networking, and consumer review forums as media for users of e-services to spread word-of-mouth and complaints, an understanding of other post-adoption behaviors, such as word-of-mouth and complaint behaviors (in addition to continuance behavior), is becoming crucial for both researchers and practitioners. Furthermore, evidence from previous studies shows that loyal customers not only continue to use a product or service, but also help to recruit more customers through favorable word-of-mouth. In contrast, unsatisfied customers cease their use of a product or service and discourage others from using it [9, 55]. From the standpoint of a firm offering an e-service on-line, understanding word-of-mouth and complaint behaviors in addition to continuance intention is very helpful in dealing with on-line customers. Therefore, to further the understanding of customer-retention behaviors in e-service settings, the first objective of this study is to explain the determinants of the three post-adoption behaviors: recommendation intention, complaint intention, and continuance intention.

Economic value in our society has progressed to the point where staging an “experience” for customers is the key to winning the next competitive battle [46]. Some call the present economy an “experience economy.” To achieve customer loyalty in this environment, on-line and off-line companies must pay attention to customer experience, because each of their customers is a unique “emotive customer” and customer loyalty can be built through emotive connections [21]. In today’s e-service environment, where competitors are technologically capable of emulating one another’s service attributes and features, creating an emotive connection with customers is a more effective and less replicable differentiation strategy. It creates long-term trust and healthy relationships with customers. In an off-line environment, service providers rely on the skills and expertise of their front-line service representatives to convey emotive connections to their customers. How to do the same thing in an on-line service environment is not well understood. For example, the mainstream customer-retention model, expectancy confirmation theory (ECT), focuses only on attitudinal and cognitive aspects of customer loyalty [5, 8, 10]. To better understand and connect with customers emotionally, a customer-retention model must incorporate emotional aspects into customer-retention theory. That is the second objective of this study.

Theoretical Background

Customer satisfaction and post-adoption behaviors have been the subjects of research in both marketing and IS. The studies on post-adoption behaviors in IS have focused mainly on customer satisfaction and customer’s continuance intention (e.g., [5, 6, 10]). This is because IS researchers use the theory of
planned behavior [2]-based technology acceptance model (TAM) and ECT to explain post-adoption behavior. Both of these models have only one dependent variable: continuance intention. The marketing literature, however, has given ample attention to complaint and recommendation behaviors (e.g., [4, 9, 38, 55]). Since a great many of today’s e-service users use social computing technologies like blogs, social networking, and consumer review forums as media to spread word-of-mouth and complaints, it is necessary to incorporate all three post-adoption behaviors in a model of customer retention.

The role of emotional experiences in traditional service encounters have been studied extensively in the customer-retention literature [32, 38, 40, 45, 57]. Research findings from some studies suggest that post-adoption affective experiences influence behavior through satisfaction [45, 57]. Other studies have found that affective experiences have a direct effect on satisfaction in addition to mediating between cognitive evaluations (i.e., perceived product performance or confirmation) and satisfaction [35, 38, 40]. Although the role of emotion has been studied in traditional service settings, knowledge about the role of emotion in on-line environments is limited. For instance, the many applications of the ECT model and its extensions in studies of on-line customer retention only include satisfaction as an emotional variable.

In sum, the discussion in this paper proposes and will explore the following two propositions:

1. A comprehensive model of on-line customer retention should consider customers’ emotional aspects in addition to their attitudinal and cognitive aspects.
2. The model should incorporate word-of-mouth and complaint behaviors in addition to the traditional continuance-intention behavior.

**Expectancy Confirmation Theory**

Expectancy confirmation theory (ECT) originated in the consumer behavior literature [44]. According to ECT, whether customers are satisfied is determined by their expectations before using a service and the (dis)confirmation of their expectations [44]. The term “(dis)confirmation” refers to a (mis)match between the customer’s level of expectation toward a product or a service and the perceived actual performance of the product or the service. Positive disconfirmation happens when the perceived service or product performance exceeds the expectation. Negative disconfirmation happens when the perceived performance is lower than the expectation. Confirmation happens when the perceived performance is exactly the same as the expectation. According to ECT, positive disconfirmation and confirmation both affect satisfaction. Satisfied customers form a repurchase intention, whereas dissatisfied customers discontinue subsequent use of the product or service. From this point on, to simplify the discussion, the term “confirmation” will refer to the continuum of the level of disconfirmation (negative disconfirmation → confirmation → positive disconfirmation).
Customer satisfaction has been the focus of studies by researchers in both marketing and information systems [5, 6, 24, 29, 30, 36, 44, 58]. The perspectives of researchers in these two fields differ, however. ECT, which originated in marketing, posits satisfaction as a process by which customers evaluate a product or a service through the path of expectation-confirmation-satisfaction. Most studies in IS regard satisfaction as the response of end-users toward systems attributes and service quality (e.g., [29, 30, 31]). The present study adopts the combined view of satisfaction as a process of cognitive evaluations (represented by confirmation and perceived usefulness) and as affective responses (consisting of positive affect and negative affect).

Investigators of customer satisfaction fall into two groups, those who believe that satisfaction and dissatisfaction are different constructs (e.g., [34]) and those who believe that satisfaction is a single construct representing the overall cognitive/affective response to product/service usage (e.g., [38, 40]). In the present paper, satisfaction is treated as a one-dimensional construct, following the practices of previous research in customer retention [5, 6, 29, 30, 38, 40, 67, 68].

ECT has also been used beyond satisfaction to explain repurchase intention [5, 6, 8]. A study of financial service customers found that the relevancy of confirmation is fairly apparent, whereas expectation may have only an indirect influence on satisfaction and thus dropped expectancy from the model [62]. This practice has been followed by subsequent researchers employing ECT to explain on-line customers’ continuance intention [5, 6, 10]. Perceived usefulness, a construct that originated in IS in the technology acceptance model (TAM), was introduced into ECT to explain the continuance intention of on-line banking customers [5, 6]. Figure 1 presents the retention model derived from ECT. It was as the starting point for the model proposed by the authors.

**The Importance of Emotion**

Affect has been defined variously in the literature. It is generally understood to comprise a class of mental phenomena characterized by a consciously experienced, subjective feeling state, commonly accompanying emotions and moods [67]. When affect is involved, a decision is likely to occur automatically. In contrast, when cognition is involved, the decision is more controlled and deliberate [54]. Two examples of cognitive constructs from the customer-retention literature are expectancy confirmation and perceived usefulness. Both involve deliberate objective judgment and belief. More precisely, perceived usefulness is a belief construct that originated from the theory of planned behavior. It is a post-adoption cognitive evaluation of the utility of a product/service by customers. Similarly, confirmation is a cognitive appraisal of post-adoption consumption of a product/service. Post-adoption emotional experiences are an example of an affective construct because they involve subjective feeling states. Note that in this study the terms “emotion” and “affect” are used interchangeably.

As can be seen in Figure 1, confirmation and perceived usefulness determine satisfaction and continuance intention. From earlier discussion, it can be seen
that both confirmation and perceived usefulness are cognitive constructs. Emotion, therefore, was not included in the model in Figure 1. While one might point out that satisfaction is an affective construct, some researchers argue that satisfaction is not an emotion but an evaluation of emotion (e.g., [5, 27]).

ECT-based retention models explain customer-retention behavior solely from the cognitive perspective, but many researchers believe that decision-making is driven by a combination of affect and cognition [3, 33, 70]. Zajonc in particular argued that affect and cognition are only “partially independent” from each other because they have complementary roles in human decision-making [70, p. 151]. Similarly, the risk-as-feelings hypothesis and Bagozzi’s extended volitional model posit that cognitive evaluation and affective experience (emotion) are more or less activated by the same mechanism—they diverge from each other in a parallel manner, and they act in concert to determine specific behaviors [3, 33].

The research findings on the role of affect in determining service satisfaction are mixed [32, 35, 38, 40, 45, 57, 67]. For example, Phillips and Baumgartner found that both positive and negative affective experiences related to the consumption of orange juice influenced satisfaction when the effects of confirmation, expectations, and performance were controlled [45]. On the other hand, a study of customer emotional responses in the context of service failures and recovery encounters found that emotional responses influenced satisfaction in some circumstances but with effects that varied across industry settings [57]. Other studies found that affect is a mediator between cognitive evaluations (e.g., perceived product performance or confirmation) and satisfaction in addition to its direct effect on satisfaction [35, 38, 40].

Previous studies of emotion in consumer behavior used two different measures of affective experience: Izard’s scales and Watson, Clark, and Tellegen’s scales [28, 65]. Both measures include two dimensions of affect, namely, positive affect and negative affect. Izard’s scales were developed and used in the summed rating environment of research in the 1970s, whereas those of Watson et al. were developed and widely used in research of the structural equation
modeling type. According to the operational definition of affect and its applications in previous research, an individual can experience both positive and negative affect simultaneously due to the complexity of human emotion. For instance, previous research by Westbrook [67], Mano and Oliver [35], Oliver [40], Wirtz, Mattila, and Tan [69], and Smith and Bolton [57] suggested that satisfaction is a partly cognitive, partly affective evaluation of a consumption experience, and that separating cognitive antecedents from emotional antecedents is both valuable and necessary for modeling consumer behavior in service settings. In light of the foregoing, the authors’ model uses the two-dimensional affect consisting of positive affect and negative affect.

**Recommendation and Complaint Behaviors**

The interplay between cognition and emotion has been explored in the consumer behavior literature [3, 38, 54], but the links between cognition-emotion interplay, satisfaction, and post-adopter behaviors were not integrated in a single model of on-line customer retention. Responding to this need, the authors proposed a model that links these constructs (see Figure 2) and tested it empirically in e-service settings.

Why are recommendation and complaint behaviors important in today’s e-service settings? The answer lies in the widespread use of social computing technologies, such as blogs, consumer forums, price comparisons and reviews, and RSS (really simple syndication), resulting from recent technological advances. Using these tools, e-customers generate enormous amounts of content every day. If e-service providers are to manage all this user-generated con-

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**Figure 2. The Proposed Model with Hypotheses**

Note: “+” indicates positive relationship; “–” indicates negative relationship.
tent, they have to understand what determines the post-adoption behaviors of e-service customers. This need is compounded by the fact that customers are more likely to be frustrated and experience greater negative affect in the on-line environment, where there is no presence of front-line staff, than in physical service settings, where they can talk face-to-face with a real human. Thus, paying attention to complaint behaviors and recommendation behaviors and understanding how they are formed is crucial for on-line service provider in dealing with the problems that induce the negative affect that can lead to customer dissatisfaction with an e-service. Complaint behaviors stem from negative emotional experiences, but not all complaints are bad for e-service providers. They can help e-service providers to take appropriate steps to correct the service failures that caused the complaint in the first place [11].

Complaint and recommendation are affect-driven behaviors. The work-motivation literature has made the connection between affective response and affect-driven behaviors. In particular, affective events theory (AET) posits that affective reactions in the workplace determine affect-driven behaviors [66]. In AET, positive affect fostered helping behavior by coworkers [66]. Recommendation behavior is similar to helping behavior in that both produce selfless acts in which individuals assist others. Thus it can be reasonably argued that recommendation is also determined by positive affect. Similarly, complaint was found to be determined by negative affect [9]. Citing prior research, Chebat, Davidow, and Codjovi maintained that emotions play a key mediating role between the incident of service failure and the customer’s behavioral response, particularly complaint behaviors [11]. Thus, negative affect exerts both direct and indirect (mediated by satisfaction) effects on complaint behavior. Likewise, positive affect exerts direct and indirect influences (mediated by satisfaction) on recommendation behavior.

Numerous studies have investigated the impact of emotion on consumer behaviors in traditional store/service settings [9, 11, 38, 57]. How does the impact differ in e-service settings? Studies of customer negative affect on complaint behavior suggest that some customers fail to complain even when they have experienced negative affect, whereas others do, and if the complaint gets a satisfactory response, they continue their patronage with the service provider [9, 11, 57]. Filing complaints is easier in e-service settings than in traditional service settings because one does not have to go to a particular place to fill out the complaint forms or talk face-to-face with a customer service representative. All of this can be done from the comfort of one’s home. Recommendation behavior also seems to be easier in e-service settings than in traditional ones. These facts suggest that emotion may play a more important role in determining the behaviors of e-service customers than of traditional service customers due in part to the ease of complaining and recommending in e-service settings.

Research Model and Hypotheses

There are several different ways of defining satisfaction. According to Oliver, it is “the consumer’s fulfillment response . . . a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable
level of consumption-related fulfillment, including levels of under or over fulfillment” [40, p. 13]. Empirical evidence supports the ECT hypothesis that satisfaction is a major determinant of continuance intentions (or repurchase intention) [5, 6, 36, 43, 60]. The results of a study of on-line banking customers confirmed that satisfaction with system use was the strongest predictor of their continuance intention ($R^2 = 0.32$) [6]. Thus, the following hypothesis:

**H1a:** Customers’ e-service continuance intention is positively associated with their satisfaction with e-service use.

Numerous studies of customer loyalty have focused on continuance behavior, word-of-mouth, and complaint behaviors [9, 38, 49, 55, 56]. However, research on the ECT paradigm rarely includes all three aspects of post-purchase behavior in a single model. In an e-service environment, where customers do not interact face-to-face with service representatives, understanding the three post-purchase behaviors and their determinants is crucial to customer retention. The results of previous studies suggest that the behavioral responses of unsatisfied customers to service failures consist of negative word-of-mouth, complaints, and switching behaviors [9, 38, 49, 50, 55]. In contrast, the behavioral responses of satisfied customers consist of favorable word-of-mouth and recommendation of the service to others [38]. Based on this findings, one may hypothesize that:

**H1b:** Customers’ e-service complaint intention is negatively associated with their satisfaction with e-service use.

**H1c:** Customers’ e-service recommendation intention is positively associated with their satisfaction with e-service use.

According to ECT, confirmation or positive disconfirmation positively influences customer satisfaction, while negative disconfirmation leads to customer dissatisfaction. In the original ECT, confirmation is inversely related to expectation and directly related to perceived performance. However, the results of a study of financial service customers suggested that the relevancy of disconfirmation is fairly apparent and that expectation may have only an indirect influence on satisfaction [62]. This finding was supported by Bhattacharjee’s extended ECT model [5, 6] and another model of customer retention [38] that did not take expectation prior to use into account. Following the above findings, expectation and performance are also excluded from the model. Previous studies of ECT in an on-line environment confirmed the positive relationship between confirmation and satisfaction [5, 6, 44]. Based on ECT and previous studies, one may hypothesize that:

**H2:** E-service customers’ extent of confirmation is positively associated with their satisfaction with e-service use.

The continuance decisions of e-service users are similar to the consumers’ repurchase decisions of ECT because both types of decisions (1) follow an
initial (acceptance or purchase) decision, (2) are influenced by the initial use of e-service experience, and (3) can lead to ex-post reversal of the initial decision [5, 6]. Thus, continuance intention was used in lieu of repurchase intention in Bhattacherjee’s extended ECT model [5, 6]. However, ECT can only be adapted to a different context by extending the theory, in part because of its limitations and also to fit the e-service context.

Previous studies integrated perceived usefulness into ECT and hypothesized that it is a predictor of continuance intention [5, 6]. One study found that perceived usefulness explains nearly 19 percent of continuance intention’s variance [6]. This finding was supported by another study that applied the model to an e-service environment [10]. Thus:

**H3:** Customers’ perceived usefulness of e-service is positively associated with their e-service continuance intention.

Perceived usefulness as drawn from TAM is considered to be post-consumption expectation [5, 6]. In consumer behavior, ECT’s ex-ante expectation predictability to satisfaction has been supported by numerous studies (e.g., [40, 44]). Similarly, previous studies hypothesized that ex-post expectation (perceived usefulness) predicts satisfaction [5, 6, 10]. Based on the above evidence, one may also hypothesize that:

**H4:** Customers’ perceived usefulness of e-service is positively associated with their satisfaction with e-service use.

According to TAM, perceived ease of use is positively related to perceived usefulness [9]. Previous studies argued that perceived ease of use and confirmation are similar in the sense that both are cognitive constructs stemming from a person’s ex-post belief after performing an action (initial use of e-service) [5, 6, 10]. Based on Festinger’s theory of cognitive dissonance, people experience cognitive dissonance when their pre-acceptance expectation is higher than the perceived performance after acceptance, and they tend to adjust their perceptions according to the reality [19]. Previous research suggested that a higher level of confirmation elevates the level of perceived usefulness, while a lower one degrades the perceived usefulness of the e-service [5, 6, 10]. Thus, one may also hypothesize that:

**H5:** Customers’ extent of confirmation is positively associated with their perceived usefulness of e-service.

To date, a large body of literature on affective experience has suggested that affect tends to be two-dimensional and has a “circumplex” structure [52, 64]. Russell proposed a circumplex model of affect around two dimensions: pleasantness and activation [52]. Alternatively, Watson and Tellegen proposed a second perspective by rotating the axes of the pleasantness/activation space by 45 degree to form another two-dimensional affect, namely, positive affect and negative affect [64]. The second perspective has been tested and validated by numerous studies in consumer behavior [35, 38, 40]. Thus, the second perspective is adopted in the current study.
Researchers in consumer behavior have recognized affective influence in consumer post-adoption behaviors [35, 38, 42, 45, 67]. Like their counterparts in psychology [33, 70], researchers in consumer behavior have found that affect (emotion) coexists with cognition (i.e., confirmation) in the formation of satisfaction [3, 35, 38, 45, 67]. More specifically, previous research linking emotion and satisfaction has found that product satisfaction is decreased by negative affect and increased by positive affect [35, 38, 43]. Therefore, one may also hypothesize that:

**H6a:** Customers’ level of positive affective response to e-service is positively associated with their satisfaction with e-service use.

**H6b:** Customers’ level of negative affective response to e-service is negatively associated with their satisfaction with e-service use.

Roseman’s appraisal theory of emotion suggested that people encountering a situational state (event) that is either motive-consistent (confirmation or positive disconfirmation) or motive-inconsistent (negative disconfirmation) experience certain specific emotional states (positive emotion and negative emotion, respectively) [51]. Previous research on affect in the consumer behavior literature also recognized the dual experience of negative and positive affect in consumption [35, 38, 40]. In the case of e-service, users experience multiple aspects (features) of e-service simultaneously, so those aspects are being appraised (confirmed) to elicit multiple emotional states, either positive affect or negative affect. On the other hand, confirmation is a cognitive evaluation of an e-service after several uses. It is a post-adoption appraisal of the e-service. Therefore, confirmation determines both positive affect and negative affect [38]. Accordingly:

**H7a:** Customers’ extent of confirmation is positively associated with the level of positive affective response to e-service use.

**H7b:** Customers’ extent of confirmation is negatively associated with the level of negative affective response to e-service use.

While the appraisal theory of emotion explains how affective experiences are formed, AET explains how affective experiences influence behavior. According to AET, affective experiences in the workplace determine the affect-driven behaviors, like helping behavior (for positive affect) or job-incompatible behaviors (for negative affect) [66]. In the case of e-service patronage, affective responses toward the use of e-service can either be positive affect or negative affect. Complaint behavior and recommendation behaviors are both affect-driven. If positive affect leads to helping behavior (AET) and helping behavior is similar to recommendation behavior (because both involve assisting others), a positive affective response in an e-service setting might also relate to recommendation behavior. Similarly, if negative affect leads to job-incompatible behaviors (AET) and job-incompatible behaviors are similar to complaint behavior (because both are not desirable and use the firm’s resources), a nega-
tive affective response in an e-service setting might also relate to complaint behavior. In the consumer behavior literature, the relationship between negative affect and complaint behavior is supported by numerous studies [11, 38, 55]. The relationship between positive affect and recommendation behavior is also supported by a previous study [38]. Therefore:

**H8a:** Customers’ level of positive affective response to e-service use is positively associated with their e-service recommendation intention.

**H8b:** Customers’ level of negative affective response to e-service use is positively associated with their e-service complaint intention.

**Measures**

The constructs were measured using multiple-item scales drawn from previous research by Bhattacherjee [6], Watson, Clark, and Tellegen [65], Davis [16], and Bougie, Pieters, and Zeelenberg [9]. The reliability and validity of the constructs were evident in previous studies. Specifically, the reliability (Cronbach’s alpha) of continuance intention, confirmation, satisfaction, and perceived usefulness exceeds 0.80 [6]. The validity of these four constructs was tested by the three-condition convergent validity test proposed by Fornell and Larcker [20]. All three conditions were met [6]. The conditions were (1) all factor loadings to be significant and higher than 0.70, (2) internal composite reliability (which is analogous to Cronbach’s alpha) to exceed 0.80, and (3) average variance extracted (AVE) to exceed 0.50. The reliability of perceived usefulness has been tested repeatedly by Davis [16] and by IS researchers (e.g., [5, 6]). The constructs were measured on a seven-point Likert-type scale ranging from “strongly disagree” to “strongly agree.”

Watson, Clark, and Tellegen developed the instruments for negative and positive affect [65]. They reported alpha reliability of 0.84 to 0.87 across multiple studies. In the present study, participants were asked to recall and rate their levels of affective response to e-service use on a five-point Likert-type scale ranging from “very slightly or not at all” to “extremely so.”

Recommendation intention and complaint intention were adapted from the scales used in the study by Bougie, Pieters, and Zeelenberg [9]. The reliabilities reported in this study ranged from 0.69 for recommendation to 0.90 for complaint behavior. Table 1 summarizes the constructs, the definition, and the source of instrument for each construct, appropriately reworded to fit the e-service context. Appendix A presents all the questionnaire items.

**Research Method**

The study employed an on-line survey. Data were collected from a sample of undergraduate students in three sections of an introductory statistics class in the college of business administration of a U.S. university. The survey was conducted in a lab session. The participants were rewarded with extra credit for
participating in the survey. They were given the option to decline to participate in the survey and could elect to withdraw from the survey at any time. They could also choose an alternative way to get the same amount of extra credit. They were assigned randomly to a computer that was already logged on to the survey Web page. The random assignment of seats was meant to systematically prevent participants from seating next to someone they knew because it might have led to cross-talking. They were asked to recall and name a real e-service they had been using in their everyday lives and to report the URL of the Web site. Then they were instructed to fill out the questionnaire based on their past experiences with the e-service. The nature of the research model and the detailed research topic was neither mentioned nor alluded to. They were told that the research was a scientific study of e-service use. E-service was defined in the survey as a provision of services that is delivered on-line.

Ninety-seven participants completed the survey: 49 males (50.5%) and 48 females (49.5%). The participants were between 19 and 54 years old. The majority (87.6%) were between 19 and 30. Ninety-six percent were in their junior or senior year of college. Sixty-nine percent reported using the e-service free of charge, and 91.8 percent were using the service voluntarily. The e-services under investigation included search engines (20), on-line banking (19), Internet service providers (10), e-mail (10), e-portal sites (8), and on-line auctions (6); the rest were e-shopping, course management, sports news, social networking, on-line games, on-line trading, on-line music, and credit card services. Note that the findings of this study may only be applicable to an e-service population that fits these characteristics.

A structural equation modeling technique called partial least squares (PLSGraph, Version 03.00) was used to analyze the data and test the model. We

<table>
<thead>
<tr>
<th>Construct and definition</th>
<th>Instrument</th>
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<tbody>
<tr>
<td>Continuance intention: User’s intention to continue using service</td>
<td>4-item scale adapted from Bhattacherjee [6]</td>
</tr>
<tr>
<td>Confirmation: User’s perception of congruence between expectation of e-service use and actual performance</td>
<td>3-item scale adapted from Bhattacherjee [6]</td>
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<tr>
<td>Satisfaction: Consumer’s fulfillment response—a judgment that a feature of a product or service, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment [40, p. 13]</td>
<td>6-item scale adapted from Oliver [41]</td>
</tr>
<tr>
<td>Perceived usefulness: User’s perception of expected benefits of e-service use</td>
<td>4-item scale adapted from Davis [16]</td>
</tr>
<tr>
<td>Positive affect and negative affect</td>
<td>20-item PANAS scales by Watson, Clark, and Tellegen [65]</td>
</tr>
<tr>
<td>Recommendation: Positive word-of-mouth</td>
<td>3-item scale adapted from Bougie, Pieters, and Zeelenberg [9]</td>
</tr>
<tr>
<td>Complaint: Intention to complain to service provider and to a third-party</td>
<td>6-item scale adapted from Bougie, Pieters, and Zeelenberg [9]</td>
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</tbody>
</table>

Table 1. Measurements.
PANAS = Positive and Negative Affect Schedule.
chose PLS because it is suitable for theory-building research that emphasizes the predictive power of a model [13, 22].

According to Chin, the minimum required sample size is determined by the larger of two possibilities: (1) the bloc with the largest number of formative indicators and (2) the dependent latent variable with the largest number of independent latent variables influencing it [12]. By applying the regression heuristic of ten cases per predictor, the sample size requirement would be ten times either (1) or (2), whichever is greater [12]. The model has no formative indicator. According to (2) the dependent latent variable that has the largest number of independent latent variables is satisfaction, which has four independent latent variables. Applying the regression heuristic rule, the required minimum sample size is 40. A recent study challenged the “ten times” rule and suggested that Cohen’s power analysis for regression was a better way to determine the sample size of a PLS study [15, 25]. Cohen’s table [15, pp. 448–455] suggests that the sample size required for a multiple regression with four predicting variables with a power of 0.80 (at alpha = 0.05) to detect a medium effect size is 84 [15]. Thus, the sample size of 97 in the present study is sufficient for structural equation modeling with PLS according to both Cohen’s power and the “ten times” rule. Note that Cohen also argued that most studies in behavioral science aim at detecting the medium effect size [15], as is also the case for the present study.

**Limitations**

Before the results and implications are considered, it is necessary to point out that the study has certain limitations. Since it uses a cross-sectional survey method of data collection, the results presented here comprise a snapshot of the post-adoption behaviors of e-service users, neglecting possible time-lag effects of affective response. The fact that the participants were all current users may be another limitation of the study. Nonusers (or quitters) might be in different emotional states from current users. Replications of the study in different states of e-service use and cultural contexts with both users and quitters would help in identifying the boundary conditions for generalization of the model.

Most of the e-services under investigation were free of charge and were used on a voluntary basis. The results may not be applicable to paid e-services or e-services where customers have no volitional control in their adoption. Also, most of the e-services reported were business-to-customer e-services. The results might not be applicable to other forms of e-services, such as customer-to-customer and business-to-business. Finally, some degree of caution is required because the study is “recall” based and some covariates/factors may have affected the results.

**Results and Discussion**

Appendix B presents the loadings of questionnaire items from the sample of 97 subjects. All the items loaded on their assigned constructs with relatively
smaller cross-loadings [23]. Most loadings were above 0.70, and all of them were above the acceptable level of 0.60 [26, 39, 59]. All loadings were significant at the $p < 0.001$ level.

Construct reliability is acceptable in PLS when the internal composite reliability (ICR) of each construct is above 0.70 [61] and the AVE for each construct is above 0.50. ICR is analogous to the Cronbach’s alpha, which is a measure of construct reliability [22]. Table 2 reports the ICR, square root of AVE (diagonal elements), and interconstruct correlations. In PLS, the convergent and discriminant validities are achieved when the square roots of AVE are larger than the correlations of each construct with other constructs. Another criterion of discriminant validity is that each item has a higher loading on its assigned construct than on other constructs, acceptably 0.60 and preferably above 0.70 [22]. Note that the AVE values of all the constructs were above 0.50, their square roots were higher than the inter-construct correlations, and all the item loadings (Appendix B) were higher than 0.60. Thus, in this study both criteria of construct validity were met. Furthermore, the ICR of all the constructs was larger than the acceptable level of 0.80. This was consistent with the reliability levels reported by previous studies that used the constructs (as mentioned earlier in the discussion of measures).

PLS estimates item loadings and tests their significance with the $t$-value. Figure 3 reports the results of the proposed model. All hypotheses were tested collectively using the structural equation modeling approach. A bootstrapping technique (200 iterations) was used to obtain the corresponding $t$-value for each hypothesized path coefficient. All the proposed relationships represented by solid lines were significant at $p < 0.05$. Those represented by dotted lines were not significant.

The results show that satisfaction was a significant predictor of all three post-adoption behaviors. The findings were consistent with previous studies [6, 9, 38, 44]. For instance, a past study of e-banking customers suggested that satisfaction with system use was the strongest predictor of users’ continuance intention ($R^2 = 0.32$) [6]. The findings indicated that when e-service customers are satisfied with their use of e-service, they tend to continue to use the service, file fewer complaints, and spread positive word-of-mouth.

As hypothesized, confirmation was significantly associated with both positive affect and negative affect, supporting both the theory of cognitive appraisal of emotion and a previous study [38, 51]. Confirmation was also significantly associated with satisfaction and perceived usefulness, as hypothesized. The findings were consistent with the results of previous studies that applied ECT [5, 6, 41].

Perceived usefulness was found to be a determinant of satisfaction. This is consistent with the findings of previous studies [5, 6, 10]. Regarding the role of perceived usefulness in predicting continuance intention, the results of this study were somewhat different from those of previous studies. According to a previous study, perceived usefulness was the strongest predictor of continuance intention, accounting for 50 percent of variance explained ($R^2 = 0.50$) [10]. The results of the current study suggested that perceived usefulness was not a predictor of continuance intention. A possible explanation of the nonsignificance of the relationship between perceived usefulness and continuance intention
Table 2. Correlation of Constructs, AVE, and Internal Composite Reliability.

Note: ICR = Internal Composite Reliability; PA = positive affect; NA = negative affect; diagonal elements (in bold) are the square root of average variance extracted; off-diagonal elements are correlations between constructs.
may lie in the high correlation between perceived usefulness and satisfaction (0.69). Since satisfaction and perceived usefulness were hypothesized to predict continuance intention, a high correlation between the two constructs means that they partly share the explained variance for continuance intention. When satisfaction is dropped from the model, the relationship between perceived usefulness and continuance intention becomes significant.

A standard path of at least 0.2 ($\beta = 0.2$) can be considered as indicating that the added construct has a meaningful place in the model beyond variation by chance alone [37]. In the current study, the strength of the path between negative affect and complaint was $\beta = 0.25$ and it was significant at $p < 0.05$, so it was a meaningful relationship.

The findings of a past study suggested that negative emotions have a stronger effect on satisfaction than positive emotions [32]. The relative importance of negative affect over positive affect in determining satisfaction cannot be interpreted in this study because neither was significant. The reason for the nonsignificant relationships might result from the methodology employed. The participants were not exposed to their respective e-services before they were asked to fill out the survey. As a result, all the reported affective experiences were drawn from memories recalled from past experiences. Memories of past experiences may not be as vivid as present experiences, and thus the effects of emotional experience may have been less pronounced. In addition, the participants were in an environment detached from their everyday e-service uses. Another possible explanation is the free and voluntary nature of the e-service.
use that made up the sample (69% free and 91.8% voluntary, respectively). The use of e-service may be less emotional when it is free and voluntary.

Negative affect was found to significantly influence complaint behavior, whereas positive affect did not influence recommendation behavior. The results also confirmed that negative affect mediates the effect of confirmation on complaint intention. Negative affective experiences were more salient than positive affective experiences, were perceived with greater intensity, and were expressed with greater variety [17, 32]. Probably this is the reason why positive affect did not influence recommendation but negative affect did influence complaint.

In sum, negative affect is directly associated with complaint intention in e-service settings. Negative affect also mediates the effect of confirmation on complaint intention. Perceived usefulness and confirmation influence the level of satisfaction with an e-service use. The latter in turn predicts continuance, recommendation, and complaint behaviors.

**Post-Hoc Analyses**

Prior research linking emotion and satisfaction found that product satisfaction was decreased by negative emotion and increased by positive emotion (e.g., [35, 38, 43]). Since the results of the present study were not consistent with those of previous studies, further analyses were conducted to explore the possible presence of “complex hypotheses” that might include interaction effects [1]. The interaction effect between perceived usefulness and positive affect on satisfaction was found to not be significant. Likewise, the interaction effect between perceived usefulness and negative affect on satisfaction was not significant. The standardized and multiplicative approach was used to calculate interaction terms, as suggested in a previous study [14].

An effort was also made to find out why the path between positive affect and recommendation was not significant. To this end, the analysis of moderating effect of customers’ experience was conducted on that path. This is because one might reasonably believe that customers/users with higher levels of experience with e-service might be more willing to recommend than those with lower levels of experience. The number of months using the e-service was used as the measure of experience. The results of the test were not significant. Similarly, the moderating effect of level of use was tested, because one might reasonably believe that heavy users would have more to recommend than nonfrequent users. The results were not significant. Level of uses was measured using the number of times the e-service was used per week.

In general, using a paid service might involve a heavier emotional load than using a free service when things go wrong. Therefore it was necessary to find out whether the group that used free e-service differed from the group that used paid e-service. In PLS the test of difference of path coefficients between free vs. paid groups could be conducted to answer this question. Only 30 participants reported using paid e-services, while 67 of them used e-services free of charge. Since the minimum sample size to run the model was 40, it was not possible to test the model with the paid e-service group. However,
it was run with the sample of 67 participants who reported using e-services free of charge. The results are reported in Table 3. While the path between satisfaction and complaint intention remained significant, the path between negative affect and complaint intention became not significant. The $R^2$ level of complaint intention dropped from 0.493 (for the full sample) to 0.373 (for the free sample). While the path between satisfaction and complaint intention dropped from $-0.55^{***}$ to $-0.52^{***}$ (a decrease of 0.03), the path between negative affect and complaint intention dropped from $0.25^{**}$ to 0.16 (a decrease of 0.09). Although there was not enough evidence to conclude that these changes were caused by the exclusion of the paid service group from the sample, it was an indication that the free e-service sample behaved differently from the whole sample. Future research would make a contribution by comparing the free e-service and paid e-service groups of customers. A possible theoretical explanation for the difference in the roles of affective response among different e-service settings comes from target arousal theory [69]. It posits that different service settings require different levels of arousal to be satisfied because users expect to be treated differently (in terms of affective experiences) in different service settings.

**Implications**

In practice, e-service providers must take into account all three aspects of customer retention: continuance intention, recommendation, and complaint. The best way for e-service providers to address all three post-adoption behaviors is to maintain customers’ satisfaction with e-service use because satisfaction leads to higher continuance intention, lower complaint, and higher customer recommendations. To achieve customer satisfaction, e-service providers should maintain customers’ positive affective experiences, minimize their negative affective experiences, make the e-service useful, and know the customers’ expectations of the e-service use.

According to the results of this study and of a previous one, minimizing customers’ negative affective experiences with e-service is very important, since negatively emotionally charged customers spread complaints to both the e-service provider and third parties, thus discouraging others from using the e-service. In today’s on-line environment, where social computing and networking on-line are in fashion, negative word-of-mouth can very quickly damage an e-service company. In contrast, constructive complaints should be encouraged and rewarded.

Practitioners can use the results of the study to maintain customers’ positive emotional experiences and minimize negative emotional experiences. As stated earlier, it may be easier to perform recommendation and complaint behaviors in e-service settings than in traditional ones. Therefore, affective responses may play a more important role in determining the behaviors of e-service customers than of traditional customers. Positive affective experience can be maintained by following good Web site design practices and thorough system testing and maintenance, but negative experience is harder to correct. Notably, the lack of the presence of front-line staff in an e-service environment is likely to frustrate
customers when things go wrong, whereas this is less like in physical settings. Thus, paying attention to complaint behavior and correcting the problems that cause customers’ negative experiences is a good start. Better yet, an e-service provider must be able to detect problems as they unfold and provide assistance if needed. For instance, when a customer seems to have trouble performing a task, as indicated by spending more time at it than necessary, assistance can be provided through live chat or a free telephone call.

The present study contributes to the body of knowledge pertaining to e-service retention by integrating cognition, emotion, satisfaction, and three post-adoption behaviors in a single model of customer retention. Although the results of the study do not support previous studies that conceptualized customer satisfaction with cognitive and affective antecedents, there is strong reason for including affect in the model of e-service customer retention. Affective constructs (especially negative affect) make for a better explanation of post-adoption behavior. Furthermore, introducing the two post-adoption behaviors that are determined by satisfaction into the model gives the retention theory more explanatory power in current e-commerce settings.

**Suggestions for Future Study**

Future research is needed to validate the model with different populations of customers/users of specific types of e-services. Customers’ post-adoption behaviors/emotions may differ when they use different types of e-services (e.g., hedonic vs. utilitarian). Applying the model with different types of e-services and comparing the results is a way to detect such differences. The contribution of such studies would be to identify the boundary conditions for generalization of the model.

**Table 3. Results of Total Sample in Comparison with Free E-Service Group.**
Most e-services under investigation were adopted on a voluntary basis. Future studies might consider voluntariness of use as a moderating variable. Considering the moderating effects of customer traits and characteristics that are specific to each type of e-service is an alternative way to augment the model. Future studies should measure the constructs close to actual e-service use to capture customers’ emotions and their perceptions of the e-services as realistically as possible. Finally, a broader sample of e-service users needs to be identified to participate in future studies to achieve power at small effect sizes.

REFERENCES

31. Khalifa, M., and Liu, V. The state of research on information system
37. Meehl, P.E. Why summaries of research on psychological theories are often uninterpretable. *Psychological Reports*, 66, 1 (1990), 195–244.
69. Wirtz, J.; Mattila, A.S.; and Tan, R.L. The moderating role of target arous-

### Appendix A. Questionnaire Items

All questionnaire items are measured on a seven-point Likert-type scale ranging from “strongly disagree” to “strongly agree.”

**Confirmation**

CONF1. My experience with using my online service was better than what I expected.
CONF2. The service level provided by my online service provider was better than what I expected.
CONF3. Overall, most of my expectations from using my online service were confirmed.

**Perceived Usefulness**

PU1. Using my online service improves my performance.
PU2. Using my online service increases my productivity.
PU3. Using my online service enhances my effectiveness.
PU4. Overall, my online service is useful.

**Satisfaction**

sat1. I am satisfied with my decision to use my online service.
sat2. My choice to use my online service was a wise one.
sat3. I am not happy with my earlier decision to use my online service.
sat4. My experience with using my chosen online service was very unsatisfactory.
sat5. I think, I did the right thing by deciding to use my online service.
sat6. If I were to do it again, I would feel differently about using my online service.

**Continuance Intention**

CI1. I intend to continue using my online service.
CI2. I plan to continue using my online service.
CI3. I expect to continue using my online service.
CI4. If I could, I would like to discontinue the use of my online service.
Complaint

COMP1. I intend to complain to the service provider about the online service quality.
COMP2. I plan to complain to the service provider about the way that I was treated.
COMP3. I plan to contact the service provider to discuss about the problem regarding the online service.
COMP4. I intend to complain to a consumer agency about the service provider.
COMP5. I plan to take legal action against the service provider.
COMP6. I intend to complain about my online service provider in an online forum.

Recommendation

RECM1. I intend to say negative things about the service provider to other people.
RECM2. I plan to recommend the online service to other people.
RECM3. I intend to discourage friends and relatives to use the online service.
### Appendix B. Cross-Loadings of Questionnaire Items on Latent Constructs

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<tr>
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<th>NA</th>
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<td>0.525</td>
<td>0.518</td>
<td>0.099</td>
<td>0.511</td>
<td>0.603</td>
<td>0.857</td>
<td>0.634</td>
</tr>
<tr>
<td>COMP6</td>
<td>0.503</td>
<td>0.599</td>
<td>0.495</td>
<td>0.177</td>
<td>0.450</td>
<td>0.637</td>
<td>0.902</td>
<td>0.726</td>
</tr>
<tr>
<td>RECM1</td>
<td>0.451</td>
<td>0.678</td>
<td>0.422</td>
<td>0.139</td>
<td>0.364</td>
<td>0.692</td>
<td>0.659</td>
<td>0.831</td>
</tr>
<tr>
<td>RECM2</td>
<td>0.515</td>
<td>0.513</td>
<td>0.438</td>
<td>0.319</td>
<td>0.303</td>
<td>0.531</td>
<td>0.512</td>
<td>0.756</td>
</tr>
<tr>
<td>RECM3</td>
<td>0.507</td>
<td>0.545</td>
<td>0.459</td>
<td>0.081</td>
<td>0.324</td>
<td>0.603</td>
<td>0.720</td>
<td>0.800</td>
</tr>
</tbody>
</table>

Notes: All items load on their assigned constructs significantly at \( p < 0.001 \). Boldface figures are the loadings of items on their respective constructs. PAS = Positive Affect Scale; NAS = Negative Affect Scale.
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