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Service Quality, Customer Satisfaction and Customer Loyalty in Consumer Electronics E-Tailers: A Structural Equation Modeling Approach

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SERVICE QUALITY, CUSTOMER SATISFACTION, AND CUSTOMER LOYALTY

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EQUATION MODELING APPROACH

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SERVICE QUALITY, CUSTOMER SATISFACTION, AND CUSTOMER LOYALTY IN CONSUMER ELECTRONICS E-TAILERS: A STRUCTURAL EQUATION MODELING APPROACH

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SERVICE QUALITY, CUSTOMER SATISFACTION, AND CUSTOMER LOYALTY IN CONSUMER ELECTRONICS E-TAILERS: A STRUCTURAL EQUATION MODELING APPROACH

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Abstract

The *E-S-QUAL* and *E-RecS-QUAL* scales have been successfully tested in a study by Parasuraman, Zeithaml, and Malhotra (2005). However, *E-S-QUAL* and *E-RecS-QUAL* are newly developed and lack specific application to different types of e-business. This non-experimental, correlational study is the first to examine and explore the relationships among electronic service quality, customer satisfaction, and customer loyalty for consumer electronics e-tailers.

Using quota and snowball sampling, participants from the continental United States received e-mail invitations and voluntarily forwarded the e-mail invitations to their friends and family. A total of 276 participants completed the online survey. This study's demographic characteristics included most between the ages of 26 and 35 years (47%), mean age of 35.2, most with graduate degrees (40.6%), and with 40% earning a family income of $75,000 or more. Out of twenty hypotheses (including four sub-hypotheses for H_1 and three for H_2) in this study, 13 were supported, two were marginally supported, and five were not supported.

Findings indicated that electronic service quality was measured by online shoppers' perceptions of service quality of consumer electronic e-tailers through four dimensions of the 17-indicator modified *E-S-QUAL* (efficiency, system availability, fulfillment, and privacy). Electronic recovery service quality was measured by online

shoppers' perceptions of recovery service quality of consumer electronic e-tailers through two dimensions of modified *E-RecS-QUAL* (responsiveness and contact, and compensation). Findings also indicated that perceived value and customer satisfaction were two significant variables that mediated the relationships among customer expectations, electronic service quality, customer loyalty, and customer complaints. However, this study also found that electronic service quality and customer expectations had no direct effect on customer satisfaction, but had indirect positive effects on customer satisfaction for consumer electronics e-tailers.

Consumer electronics e-tailers' managers could formulate plans to improve service quality and recovery service quality through dimensions of *E-S-QUAL* and *E-RecS-QUAL*. They also could formulate a competitive strategy based on the modified Electronic Customer Satisfaction (e-CS) model to keep current customers and to enhance customer relation management. The limitations and recommendations for future research are also included in this study.

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CHAPTER I

Introduction and Background to the Problem

The customer is one of the vital "assets" for business. Businesses that lack this important asset may face the difficulty that operational income is less than operational cost; businesses losing customers may confront the problem of a profit decline. Several studies have shown that improving service quality and customer satisfaction results in better financial performance for businesses (Babakus, Bienstock, & Van Scotter, 2004; Fornell, 1992; Ittner & Larcker, 1998; Nelson, Rust, Zahorik, Rose, Batalden, & Siemanski, 1992). Without exception, retail store performance is influenced by service quality and customer satisfaction (Babakus et al., 2004). Therefore, maximizing customer satisfaction is one of the key factors for retailers to be successful and this may be true for e-tailers as well.

For over a decade, retailing has been a zero-sum game in which market share and earning gains can be made only at the expense of competitors. In other words, a retailer that gains market share means that other retailers lose their customers. In the past few decades, more and more scholars and managers have observed that service quality is as important as product quality in retaining customers. Several studies indicate that perceptions of high service quality and high service satisfaction result in a high level of purchase intentions (Boulding, Kalra, Staelin, & Zeithaml, 1993; Kuo, 2003; Taylor, 1997; Taylor & Baker, 1994; Wirtz, Kum, & Lee, 2000; Zeithaml, Berry, & Parasuraman, 1996). When service quality evaluations are high, customer behavioral intentions are favorable to the company. Therefore, a basic retailing strategy for creating competitive advantage is to deliver better service quality (Dabholkar, Thorpe, & Rentz, 1996).

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Unlike product quality, service quality cannot be detected by standards such as usage life or rate of defect. Service quality is more difficult to measure than product quality because of certain unique characteristics of services. Services are intangible, perishable, variable, and immediately produced and consumed (Parasuraman, Zeithaml, & Berry, 1988; Rosen, Karwan, & Scribner, 2003; Schiffman & Kanuk, 2000; Stamatis, 1996). Services are usually performances, concepts, or ideas, which are difficult to see or to touch, so they cannot be stored or saved as inventory. Services differ from day to day, from employee to employee, and from customer to customer. Customers are also simultaneously involved with the production of services when they evaluate the quality of services that they receive. In the online context, online stores may not provide direct human contact as much as physical stores do, but they provide services in different ways, such as Web design and package handling.

Online retail sales are growing, and growing fast. Online sales have explosively increased by nearly 400% from 2000 to 2004, rising from $28.3 billion in 2000 to $141.4 billion in 2004 (Millard, 2005; U. S. Census Bureau, 2004). Year after year, online sales were up 26% versus a 5.4% increase in overall retail sales (Standard & Poor's Co., 2004). Sales of consumer electronics continue to grow, even though the growth of the US economy lagged by some events, such as the terrorist attacks of September 11, 2001 and military involvement in Afghanistan in 2001 and 2002 and in Iraq in 2003 (Gale Group, 2004). Americans spent $100 billion on electronic products in 2003, a nearly four percent increase from the previous year (Reed Business Information, 2004). According to the Consumer Electronics Association, the promotion of big-screen televisions and portable MP3 players helped boost sales of consumer electronics to exceed $110 billion

in 2004 (as cited in Spooner, 2005). Although online consumer electronics sales account for only 6% of total online sales, the amount of sales can not be ignored because of the growth year after year (Miller, 2001).

Electronic commerce has emerged as an increasingly significant business phenomenon in recent years (Sexton, Johnson, & Hignite, 2002), and the experience of shopping in an online store is more technological than the non-electronic retail service experience. Using the Internet, customers browse Web sites to find merchandise, to search for merchandise information, and to compare prices. They are also able to determine when the items will be delivered and how to return merchandise. All of those experiences influence customers' expected and perceived e-tailer's service quality, and will ultimately influence their satisfaction and loyalty. However, almost 70% of customers who change their retail sales providers do not complain about price or product quality, but they have complained about the indifferent attitude of their former providers (Bennington & Cummane, 1998). The WebTrack data also has shown that while a greater percentage of online-only retailers (33%) responded to customer service e-mails within six hours than brick-and-mortar retailers (28%), the pure-plays were less responsive overall (as cited in Cox, 2002). Meanwhile, findings from the Jupiter Executive Survey revealed that a majority of consumers (57%) expressed that the speed of a retailer's response to customer service e-mail inquiries would affect their decision to make future purchases from a particular Web site (as cited in Cox, 2002). These consumers' responses indicate that service quality is one of the factors that influences customer satisfaction and retains customers in the competitive online market.

In the satisfaction literature, Fornell, Johnson, Anderson, Cha, and Bryant (1996)

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have developed the American Customer Satisfaction Index model, which comprehensively identifies causal relationships among customer satisfaction and antecedents and consequences of customer satisfaction. However, this model has difficulty in explaining how firms deal with service failure and how to turn dissatisfied customers into loyal customers. It is necessary to add service recovery into the model to help explain how a firm can improve customer satisfaction through service failure solution to turn dissatisfied customers into loyal customers.

Service quality and customer satisfaction have been selected as research topics for forty years. However, the development of the Internet inspired the emergence of e-commerce in the past ten years. This new type of business has led to rethinking about the definition of business. The developers of *SERVQUAL*, Parasuraman, Zeithaml, and Berry (1988), also developed two new scales to show their interests in the new era. Unlike the *SERVQUAL* that was examined and applied in several studies, the *E-S-QUAL* and *E-RecS-QUAL* (Parasuraman, Zeithaml, and Malhotra, 2005) are newly developed, and therefore need continued validation and application to different types of e-business.

Purpose of the Study

The expectations of this online survey research were to achieve the following broad purpose: to provide correlational knowledge of a customer satisfaction model in consumer electronics e-tailers using a structural equation modeling approach. The specific purposes of this non-experimental, correlational study using structural equation modeling, quota and snowball sampling, and an online survey were to:

    1. Validate the dimensions contained in the electronic service quality scale (*E-S-QUAL*), including electronic service recovery quality (*E-RecS-QUAL*) applied

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to consumer electronics e-tailers,

2. Validate the *American Customer Satisfaction Index* (*ACSI*) model applied to consumer electronics e-tailers, and

3. Link the construct of electronic recovery service quality to the *ACSI* model for consumer electronics e-tailers.

Definitions of Terms

In general, variables can be dependent or independent, according to their role in a research study. For example, heart rate is the dependent variable and room temperature is the independent variable in a study investigating the relationship between room temperature and heart rate. In this instance, measuring instruments can precisely measure room temperature and heart rate. However, in the behavioral sciences, researchers are often concerned with theoretical constructs that cannot be observed directly (Byrne, 2001). The theoretical phenomena that scales intend to measure are often called latent variables, while the measured scores are termed observed or manifest variables (Byrne, 2001). In this matter, variables are not termed dependent or independent variables, especially when structural equation modeling is used as the data analysis method. The terms of exogenous and endogenous latent variables are used in structural equation modeling. Exogenous latent variables are synonymous with independent variables, which influence the values of other latent variables in the model. Endogenous latent variables are synonymous with dependent variables, which are influenced by the exogenous variables in the model (Byrne, 2001). There were two exogenous latent variables in this study: customer expectations and electronic recovery service quality. There were nine endogenous latent variables in this study: the dimension of efficiency for

electronic service quality, the dimension of fulfillment for electronic service quality, the

dimension of system availability for electronic service quality, the dimension of privacy

for electronic service quality, the dimension of responsiveness for electronic recovery

service quality, the dimension of compensation for electronic recovery service quality,

the dimension of contact for electronic recovery service quality, customer complaints,

and customer loyalty. There were three endogenous and exogenous latent variables in

this study: electronic service quality, perceived value, and customer satisfaction.

Latent Variables

Customer Expectation

Theoretical definition. Customer expectation is defined as "anticipation of future

consequences based on prior experience, current circumstances, or other sources of

information" (Oliver, 1997, p. 68).

Operational definition. In this study, customer expectation refers to what online

shoppers believe consumer electronics e-tailers "should" offer. Customer expectation is

measured by the *Customer Expectation Scale*, which is a modification of the *E-S-QUAL*

scale, developed by Parasuraman, Zeithaml, and Malhotra (2005). Each statement was

modified to reflect what the consumer believes "should" be offered by e-tailers to online

shoppers. The *Customer Expectation Scale* consists of five items and is shown in

Appendix C.

Electronic Service Quality

Theoretical definition. Electronic service quality can be defined as "the extent to

which a Web site facilitates efficient and effective shopping, purchasing, and delivery"

(Zeithaml, Parasuraman, & Malhotra, 2000, p. 11).

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Operational definition. In this study, electronic service quality refers to customers' perceptions of service quality from their experiences in purchasing consumer electronics e-tailers. The *E-S-QUAL* scale developed by Parasuraman et al. (2005) was used to measure service quality. The *E-S-QUAL* scale consists of 22 items, measuring four dimensions of electronic service quality: efficiency, fulfillment, system availability, and privacy (see Appendix C).

Efficiency as a dimension of electronic service quality. Efficiency is defined as the extent of the ease of usage and quickness offered by a Web site (Parasuraman et al., 2005). In this study, efficiency is the extent of the ease of usage and quickness offered by consumer electronics e-tailers and is measured by eight items of the *E-S-QUAL* scale (see Appendix C).

Fulfillment as a dimension of electronic service quality. Fulfillment is defined as the extent of promise fulfillment provided by a Web site regarding order delivery and item availability (Parasuraman et al., 2005). In this study, fulfillment is the extent of promise fulfillment provided by consumer electronics e-tailers regarding item availability and order delivery and is measured by seven items of the *E-S-QUAL* scale (see Appendix C).

System availability as a dimension of electronic service quality. System availability is defined as the extent of proper function provided by the Web site (Parasuraman et al., 2005). In this study, system availability is the extent of proper function provided by consumer electronics e-tailers and is measured by four items of the *E-S-QUAL* scale (see Appendix C).

Privacy as a dimension of electronic service quality. Privacy is defined as the extent of safety and protection of customer information offered by a Web site

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(Parasuraman et al., 2005). In this study, privacy is the extent of safety and protection of customer information offered by consumer electronics e-tailers and is measured by three items of the *E-S-QUAL* scale (see Appendix C).

Electronic Recovery Service Quality

Theoretical definition. Electronic recovery service quality can be defined as the extent by which a Web site responds to a service failure (Zeithaml & Bitner, 2003). Three dimensions identify the electronic recovery service quality construct: responsiveness, compensation, and contact (Parasuraman et al., 2005).

Operational definition. In this study, electronic recovery service quality refers to customers' perceptions of recovery service quality from the recovery-service experiences in purchasing from consumer electronics e-tailers. The *E-RecS-QUAL* scale developed by Parasuraman et al. (2005) is used to measure electronic recovery service quality. The *E-RecS-QUAL* scale consists of eleven items measuring three dimensions of electronic recovery service quality: responsiveness, compensation, and contact (see Appendix C).

Responsiveness as a dimension of electronic recovery service quality. Responsiveness is defined as the Web site's ability to handle problems and to allow return of purchased items effectively (Parasuraman et al., 2005). In this study, responsiveness expresses consumer electronics e-tailers' ability to handle problems and to allow return of purchased items effectively and is measured by five items of the *E-RecS-QUAL* scale (see Appendix C).

Compensation as a dimension of electronic recovery service quality. Compensation is defined as the Web site's ability to compensate customers for problems (Parasuraman et al., 2005). In this study, compensation expresses consumer electronics

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e-tailers' ability to compensate customers for problems and is measured by three items of the *E-RecS-QUAL* scale (see Appendix C).

Contact as a dimension of electronic recovery service quality. Contact is defined as the Web site's ability to assist customers through telephone or online representatives (Parasuraman et al., 2005). In this study, contact expresses consumer electronics e-tailers' ability to assist customers through telephone or online representatives and is measured by three items of the *E-RecS-QUAL* scale (see Appendix C).

Perceived Value

Theoretical definition. Perceived value is defined as "the perceived level of product quality relative to the price paid" (Fornell, Johnson, Anderson, Cha, & Bryant, 1996, p. 9).

Operational definition. In this study, perceived value refers to customers' perceived level of service quality relative to the price paid for purchasing consumer electronics products on the Internet. Four items of the *Perceived Value Scale* developed by Parasuraman et al. (2005) are used to measure perceived value. The *Perceived Value Scale* is shown in Appendix C.

Customer Satisfaction

Theoretical definition. Customer satisfaction is defined as "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 overfulfillment" (Oliver, 1997, p. 13).

Operational definition. Customer satisfaction in this study is defined as the customer's overall feeling, which is generated from a process of evaluating prior

purchasing experiences at consumer electronics e-tailers, and is measured by three items from the customer satisfaction part of the *American Customer Satisfaction Index Scale* developed through a partnership of the University of Michigan Business School, American Society for Quality, and CFI Group in 1994 (American Society for Quality, 2001); (see Appendix C).

Customer Loyalty

Theoretical definition. Customer loyalty is defined as "a deeply held commitment to rebuy or repatronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1997, p. 392).

Operational definition. In this study, customer loyalty refers to customers' favorable behavioral intentions to consumer electronics e-tailers. Customer loyalty is measured by five items of the *Customer Loyalty Scale* (see Appendix C) developed by Parasuraman et al. (2005), which is a modification of the loyalty dimension of the *Behavioral-Intentions Battery* scale.

Customer Complaints

Theoretical definition. Customer complaint is defined as "a combination of negative responses that stem from dissatisfaction and predict or accompany defection" (Zeithaml, Berry, & Parasuraman, 1996, p. 34).

Operational definition. In this study, customer complaint refers to customers' negative responses that resulted from having a problem with consumer electronics e-tailers. Customer complaint is measured by three items of the external response dimension of the *Behavioral-Intentions Battery* scale, developed by Zeithaml et al. in 1996.

E-Tailer

New terminology, such as e-commerce, is created along with the emerging type of retailers. For example, "e-tailer" is a word that would be regarded as an abbreviation of "electronic retailer" (Schappell, 2000). An e-tailer can be a pure on-line business like Amazon.com or an online store set up by a conventional bricks-and-mortar retailer (Brown, 2003; Learnthat.com, 2004; Standard & Poor's Co., 1999), such as Walmart.com. Retailers that own both physical and virtual stores are also called clicks-and-mortar businesses (Gulati & Garina, 2000). E-tailing is an "organization or individual selling products or services through electronic media, [especially] the Internet" (Diamond, 2005, Definition, ¶ 1). Therefore, an e-tailer is a business-to-consumer business that sells products and services to the final consumer over the Internet (Brown, 2003).

Assumptions of the Study

This study is conducted based on the following assumptions which this study cannot verify:

1. The quality of Internet service providers of survey respondents does not influence the results of this study because this study cannot verify whether connecting speed influences the respondents' willingness to complete the online survey.

2. The performance of survey respondents' computers does not influence the results of this study. This study cannot verify whether the performance of computer influences the willingness respondents' to complete the online survey.

3. Online survey respondents are assumed to clearly remember their purchase experiences. This study cannot verify whether participants who complete the

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online survey remember every detail of prior shopping experiences.

4. Online survey respondents are assumed to have the ability to identify their friends who also purchase consumer electronics products on the Internet, and are assumed to be willing to forward the e-mail invitation to participate in the online survey to their friends.

5. Structural equation modeling is one of the data analysis methods used in this study. Like any statistical method, structural equation modeling features a number of assumptions, which should be met to ensure trustworthy results (Information Technology Services, 2002). The following assumptions are related to structural equation modeling:

   a. The sample size in this study is assumed to be a large enough sample to conduct the statistical analysis.

   b. The endogenous latent variables in this study are assumed to be continuously and normally distributed.

   c. The model tested in this study is assumed to meet the requirement of model identification.

   d. The incomplete data in this study are assumed to be randomly missing.

   e. Model specification in this study is assumed to be very explicit.

Justification of the Study

Consumer electronics is the second most popular product category sold on the Internet (King, Lee, & Viehland, 2004), but no study was found that examined service quality for the consumer electronics e-tailers. Since the business model of consumer electronics e-tailers may differ from that of other Internet-based businesses, it is essential

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to develop an appropriate service quality model for the consumer electronics e-tailers.

This study attempted to integrate various constructs into a conceptual model for the consumer electronics e-tailers. This study provided construct validation of this model by examining the relationships among service quality, customer satisfaction, and loyalty for consumer electronics e-tailers. The results of the study enabled the examination of the newly developed measures (*E-S-QUAL* and *E-RecS-QUAL*) by Parasuraman et al. (2005). The results of the study were able to contribute to theory development for future scholarly inquiry into the fields of services marketing and Internet marketing. Moreover, in the intensely competitive e-tailing industry, consumer electronics e-tailers need to discover factors affecting service quality in order to gain and retain customers. The results of the study may allow managers in the Internet consumer electronics retailing industry to identify consumer behaviors and may help them develop their Internet marketing strategies, such as market segmentation.

This study was researchable because the study contains scientific questions and all variables could be measured. This study was feasible because it could be implemented in a reasonable amount of time, subjects were available, and concepts in the theoretical frameworks could be measured.

Delimitations of the Study

This study was conducted based on the following delimitations which were the boundaries of this study:

1. The geographic setting was limited to the continental United States in order to promote a more homogeneous sample, and limited the influence of other extraneous variables such as national culture and diverse economies.

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2. Consumer electronics e-tailers were limited to U.S.-based businesses in order to prevent confusion from foreign country issue, such as language and international shipping.

3. E-tailers were limited to Internet retailers that carried consumer electronics products. However, the e-tailers were not limited to those that sold only consumer electronics products. In this study, any Internet retailer carrying consumer electronics products is a consumer electronics e-tailer.

4. The survey participants must be able to read and write English and must be 18 years old or older.

5. The survey participants must have at least one e-mail account and at least one credit or debit card because those are requirements for purchasing on the Internet.

6. The survey participants must have been living in the continental United States for at least six months in the past year.

7. The survey participants must have at least once purchased consumer electronics products on the Internet in the past year.

8. This study focused on the impact of service quality on customer satisfaction. Product quality was not accounted for in the scope of this study.

9. Consumer electronics products were limited to the nine major categories defined by the Consumer Electronics Association (2005): accessories, audio, electronic gaming, home networking, home theater, IT/Tech office, mobile electronics, video, and wireless communications.

Organization of the Study

Chapter I of the study provides an overview of the study. It includes a background to the study problem, the purposes of the study, the definitions of terms, the assumptions, justification, and the delimitations. This chapter offers an introduction to the correlational design of the study that uses a structural equations model.

Chapter II of the study provides an in-depth review of electronic service quality, customer satisfaction, and other constructs. This chapter provides a critical analysis of related theoretical and empirical literature about service quality and customer satisfaction. The formation of a hypothesized conceptual model is based on the foundations addressed in the literature review. Research hypotheses are also presented in this chapter.

Chapter III of the study presents the methodology for testing the proposed conceptual model. It includes the study design, population and sample, the survey instruments, procedures and ethical aspects, plans for data analysis, and evaluation of the research methodology. The instrument design section includes the discussion of the scales utilized to measure the service quality construct and the other constructs within the conceptual model. The data analysis section includes the justification for the use of structural equation modeling and the assessment of construct validity for all measures addressed in this study.

Chapter IV reports socio-demographic characteristics of the final data-producing sample and the results of hypothesis testing. Chapter V provides a discussion of the findings and interpretations of the statistical results. In addition, implications for theory and practice are discussed. The limitations and recommendations for future research are also included.

CHAPTER II

LITERATURE REVIEW, THEORETICAL FRAMEWORK,

AND RESEARCH QUESTIONS

Literature Review

Customer Satisfaction

Customer satisfaction has been a critical marketing research topic for more than

forty years. The first research involving the measurement of customer satisfaction

occurred in the mid-1960s. A seminal experimental study by Cardozo (1965) found that

customer satisfaction was not only influenced by perceived product quality but also by

the overall shopping experience and expectations. Since then, customer satisfaction has

been defined in various perspectives. From the perspective of antecedents, satisfaction is

the consumer's response to the evaluation of the perceived discrepancy between

expectations and perceived performance of the product or service after its consumption

(Tse & Wilton, 1988). From the perspective of consequence, customer satisfaction is the

generator of repeated buying behavior and the advantage of sustenance and development

to any business (Dubrovski, 2001). From the perspective of dissatisfaction, Kondo (2001)

asserted that customer satisfaction is reducing customer complaints, which could lead to

dissatisfaction. Oliver (1997) described satisfaction:

> Satisfaction is the consumer's fulfillment response. It is 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
>
> overfulfillment. (p. 13)

The diversity of customer satisfaction definitions represents the complexity of this

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construct. However, Oliver's definition used in his 1997 study seems to be more consistent with the theoretical and empirical evidence.

Antecedents of Customer Satisfaction

Research on customer satisfaction focused on finding determinants that influence customers' level of satisfaction: expectancy disconfirmation, performance, and equity (Oliver & DeSarbo, 1988; Szymanski & Henard, 2001). The discussions of these factors follow.

Expectancy disconfirmation. Expectancy disconfirmation theory consists of two components: the formation of expectations and the disconfirmation of those expectations through performance comparisons (Oliver & DeSarbo, 1988). Expectations reflect anticipated performance (Churchill & Surprenant, 1982). Oliver (1997) defined an expectation as "anticipation of future consequences based on prior experience, current circumstances, or other sources of information" (p. 68). Zeithaml, Berry, and Parasuraman (1993) developed a conceptual model of customer service expectations. They found that there are three different levels of customer expectations: desired service ("ideal"), adequate service ("should"), and predictive service ("will"). However, researchers argued that respondents were often confused when they attempted to distinguish among these three levels of expectations (Tse & Wilton, 1988).

The satisfaction literature suggests that customers' expectations have an impact on satisfaction levels. As presented by Oliver (1980), customers form expectations of anticipated performance prior to purchase. These expectations serve as the baseline for satisfaction assessments (Oliver, 1981, 1993). Interestingly, customers are believed to adapt satisfaction levels to expectation levels in order to avoid the discord that would

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happen when expectations deviate from satisfaction levels. This effect results in the

higher (lower) expectations and the higher (lower) the satisfaction judgment (Oliver,

1997; Oliver & DeSarbo, 1988). The majority of the empirical findings supported a

positive relationship between expectations and satisfaction (Bearden & Teel, 1983;

Swan & Trawick, 1981).

By the mid-1980s, satisfaction literature focused on the disconfirmation paradigm

(Bearden & Teel, 1983; Churchill & Surprenant, 1982; Oliver, 1980; Prakash &

Lounsbury, 1984). In one of their studies, Churchill and Surprenant (1982) linked related

concepts and formed a disconfirmation paradigm. The full disconfirmation paradigm

encompassed four constructs: expectations, performance, disconfirmation, and

satisfaction. According to their paradigm of satisfaction, disconfirmation resulted from

the discrepancy between expectations and performance, "occupied a central position as a

crucial intervening variable" (Churchill & Surprenant, 1982, p. 492), and eventually

influenced satisfaction. The performance-expectation comparison was labeled negative

disconfirmation if the product or service was worse than expected, positive

disconfirmation if better than expected, and zero or simple disconfirmation if as expected

(Oliver & DeSarbo, 1988). A more recent study also supported disconfirmation

emerging as a dominant predictor of satisfaction effects (Szymanski & Henard, 2001).

Performance. Performance is not only a component of disconfirmation, but also

has been found to have a strong direct relationship with satisfaction in a number of

studies (Anderson & Sullivan, 1993; Churchill & Surprenant, 1982; Halstead, Hartman,

& Schmidt, 1994; Oliver & DeSarbo, 1988; Tse & Wilton, 1988). Since the performance

of product or service may have many features, researchers usually use factor analysis to

reduce the dimensionality of the feature list (Oliver, 1997).

Parasuraman, Zeithaml, and Berry (1988) developed a multi-item *SERVQUAL*
scale to measure service quality composed of five dimensions: tangibles, reliability,
responsiveness, assurance, and empathy. They proposed that service quality is measured
by the disparity between performance and expectations. However, their perceptions-
minus-expectations approach was fiercely debated in the early 1990s. In 1993, Tease
proposed that research in service quality may have relied on the "perceptions" component
alone to avoid the confusion of expectations (as cited in Yang, 2001). Carman (1990)
also concluded that service quality expectations may not always be useful in service
quality research. Another famous argument against the perceptions-minus-expectations
approach was from Cronin and Taylor (1992, 1994). They modified the perceptions part
of the *SERVQUAL* scale, resulting in a 22-item *SERVPERF* scale. Their research results
showed that service quality could be exclusively measured by perceived service
performance because *SERVPERF* had better discriminant validity than the *SERVQUAL*
scale (Cronin & Taylor, 1992; Parasuraman, Zeithaml, & Berry, 1994b). A detailed
discussion about service quality is presented in a later section of this review and in
Chapter III.

Equity. An early pioneer in the study of equity, George Homans stated that the
essence of equity was contained in a "rule of justice" (as cited in Oliver, 1997). In
fundamental terms, equity is an evaluation of fairness, rightness, or deservingness that
customers make in reference to what others receive (Oliver, 1997). In the satisfaction
literature, equity theory considers the ratio of the customer's perceived outcome/input to
that of the service provider's outcome/input (Oliver & DeSarbo, 1988). Bolton and

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Lemon (1999) extended this concept of outcome/input to the perspective of perceived value. They declared that equity referred to customers' evaluation of the perceived sacrifice (input) of the offering (outcome). Perceived sacrifices include purchase price and other possible costs such as time consumption (Yang, 2001). A positive perception of value may bring customers back to make another transaction (Minocha, Dawson, Blandford, & Millard, 2005). When customers believe they are being treated fairly in an exchange, they will be satisfied with the transaction if their outcome-to-input ratio is in some sense adequate (Oliver & DeSarbo, 1988). Fredericks and Salter (1998) pointed out that quality, price, and company or brand image were three factors that comprise the customer value package. In other words, customers will make an explicit comparison between what they give and what they get. The positive relationship between equity and satisfaction was supported in the literature (Oliver, 1993; Oliver & Swan, 1989a, 1989b). However, customers expect prices to be lower in an online store than in a traditional sales channel (Karlsson, Kuttainen, Pitt, & Spyropoulou, 2005). They may expect to get more value from an online store than from a physical store.

Consequences of Customer Satisfaction

Although satisfying customers is not the ultimate goal for firms, the outcomes of customer satisfaction are the truly essential factors affecting firms' financial performance. These outcomes generally fall into two main categories: complaints and loyalty.

Customer loyalty. The beginning of a behavioral perspective on loyalty appeared in the 1970s (Oliver, 1997). A number of studies presented various perspectives of loyalty, but the essential elements remain unchanged since the publication of Jacoby and Chestnut's book in 1978 (as cited in Oliver, 1997). Corresponding to Jacoby and

Chestnut, customer loyalty was defined by Bloemer and Odekerken-Schröder (2003) as:

> The biased (i.e. non random) behavioral response, expressed over time, by some
> decision making unit, with respect to one financial service provider out of a set of
> financial service providers, which is a function of psychological (decision making
> and evaluative) processes resulting from commitment. (p. 35)

Oliver (1999) argued that none of the definitions of loyalty included all three components of cognition, affect, and behavioral intention. As a result, he defined customer loyalty as:

> A deeply held commitment to rebuy or repatronize a preferred product/service
> consistently in the future, thereby causing repetitive same-brand or same brand-
> set purchasing, despite situational influences and marketing efforts having the
> potential to cause switching behavior. (p.34)

The conceptualization and measurement of loyalty has often remained limited, ignoring the full range of conceivable loyalty actions that may follow the evaluation of service quality (Zeithaml, Berry, & Parasuraman, 1996). Cronin and Taylor (1992) focused solely on repurchase intentions, while Bolding, Kalra, Staelin, and Zeithaml, (1993) measured repurchase intentions and willingness to recommend. Zeithaml et al. (1996) argued that price sensitivity and price-increase tolerance were often excluded in previous research. The results of their 1996 study led to conclusions that dimensions of favorable behavior intentions were loyalty and willingness to pay more. The dimension of loyalty included items regarding word-of-mouth and repurchase intentions.

Customer complaints. Customer complaints are side effects of customer dissatisfaction. According to Singh (1988), dissatisfaction led to consumer-complaining behavior (CCB) that was expressed in voice responses (complain to seller), private

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responses (complain to friends), and third-party responses. The findings of Zeithaml et al. (1996) partially supported the three-dimension typology of complaining behavior. Unexpectedly, findings indicated that internal response (complain to seller) was not a dimension of unfavorable behavior intentions because it lacks validity.

The Relationships Among Service Quality, Customer Satisfaction, and Loyalty

Bloemer and Ruyter (1998) suggested that store loyalty resulted from a consumer committed to the store through an explicit and extensive decision-making process. Customer loyalty is frequently operated as a conscious evaluation of the price/quality ratio or the willingness to pay a premium price, or alternatively price indifference (Raju, Srinivasan, & Lal, 1990; Zeithaml, Berry, & Parasuraman, 1996). Supphellen and Nysveen (2001) suggested that corporate brand loyalty affected online shoppers' intentions to revisit the Web site.

Cronin and Taylor (1992) examined the causal relationships among service quality, customer satisfaction, and purchase intention. Each variable was measured by one item. There were 660 usable questionnaires randomly collected from customers of four types of businesses in the southeastern United States: banking, pest control, dry cleaning, and fast food. The results of correlation analysis have suggested that (1) service quality was an antecedent of consumer satisfaction, (2) service quality had less effect on purchase intentions than did consumer satisfaction, and (3) consumer satisfaction had a significant effect on purchase intentions.

Dabholkar, Shepherd, and Thorpe (2000) also found that customer satisfaction strongly mediated the effect of service quality on behavioral intentions. The data used in their study were systematically randomly collected from 397 churches. A test of

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discriminant validity revealed that the construct of service quality was different from the construct of customer satisfaction. The result of regression analysis in structural equations modeling supported their proposition that customer satisfaction had a stronger effect on behavioral intentions than service quality did (Dabholkar et al., 2000).

Service quality literature indicated that perceptions of high service quality and high service satisfaction resulted in a very high level of purchase intentions (Boulding, Kalra, Staelin, & Zeithaml, 1993; Cronin & Taylor, 1992; Taylor, 1997; Taylor & Baker, 1994; Zeithaml, Berry, & Parasuraman, 1996). Cöner and Güngör (2002) claimed that customer loyalty was affected by product quality, service quality, and retailer image. They also suggested "quality [of product and service] ... is directly related to customer satisfaction, and ... lead[s] to the loyalty of the customer" (Cöner & Güngör, 2002, p. 195). Customer satisfaction literature showed that the relationship between customer satisfaction and customer loyalty depended on the type of satisfaction. The positive impact of manifest satisfaction on customer loyalty was stronger than that of latent satisfaction on customer loyalty (Bloemer & Kasper, 1995; Bloemer & Ruyter, 1998). Based on empirical findings in service quality and satisfaction literature, service quality is one of the antecedents of satisfaction (Anderson & Sullivan, 1993; Cronin & Taylor, 1992, 1994; Reidenbach & Sandifer-Smallwood, 1990; Spreng & Mackoy, 1996; Woodside, Frey, & Daly, 1989), and loyalty is one of the consequences of satisfaction (Cöner & Güngör, 2002; Cronin & Taylor, 1992, 1994; Dabholkar, Shepherd, & Thorpe, 2000). Luarn and Lin (2003) tested their hypothesized customer loyalty model and found that customer satisfaction, perceived value, and customer loyalty were different constructs. Their findings indicated that customer satisfaction and perceived value not

only directly affected customer loyalty, but also indirectly affected customer loyalty through commitment.

American Customer Satisfaction Index (ACSI)

The American Customer Satisfaction Index (*ACSI*) is a standardized, national, cross-industry measure of satisfaction with the quality of goods and services available in the United States. The *ACSI* is a relatively new type of customer-based measurement system for assessing the performance of firms, industries, economic sectors, and national economies (Fornell, Johnson, Anderson, Cha, & Bryant, 1996). The *ACSI* was developed through a partnership of the National Quality Research Center (NQRC) at the University of Michigan Business School, American Society for Quality, and CFI Group in 1994 (American Society for Quality, 2001). Approximately 50,000 interviews (randomly selected from customers of 200 firms) were conducted from May to July of 1994. Interviews were from seven economic sectors: (1) manufacturing/durables, (2) manufacturing/nondurables, (3) transportation/ communications/utilities, (4) retail, (5) finance/insurance, (6) services, and (7) public administration/government (Fornell et al., 1996). NQRC produces quarterly updates of the national *ACSI*, with each sector, industry, company, and government agency measured annually since 1994 (American Society for Quality, 2001). The measured sectors were expanded: (1) e-commerce was included in 2000; (2) utilities were added in 2001; and (3) specialty retailers and telecommunications/cable and satellite television were added as industries (American Society for Quality, 2001). The *American Customer Satisfaction Index (ACSI)* model is presented in Figure 2-1.
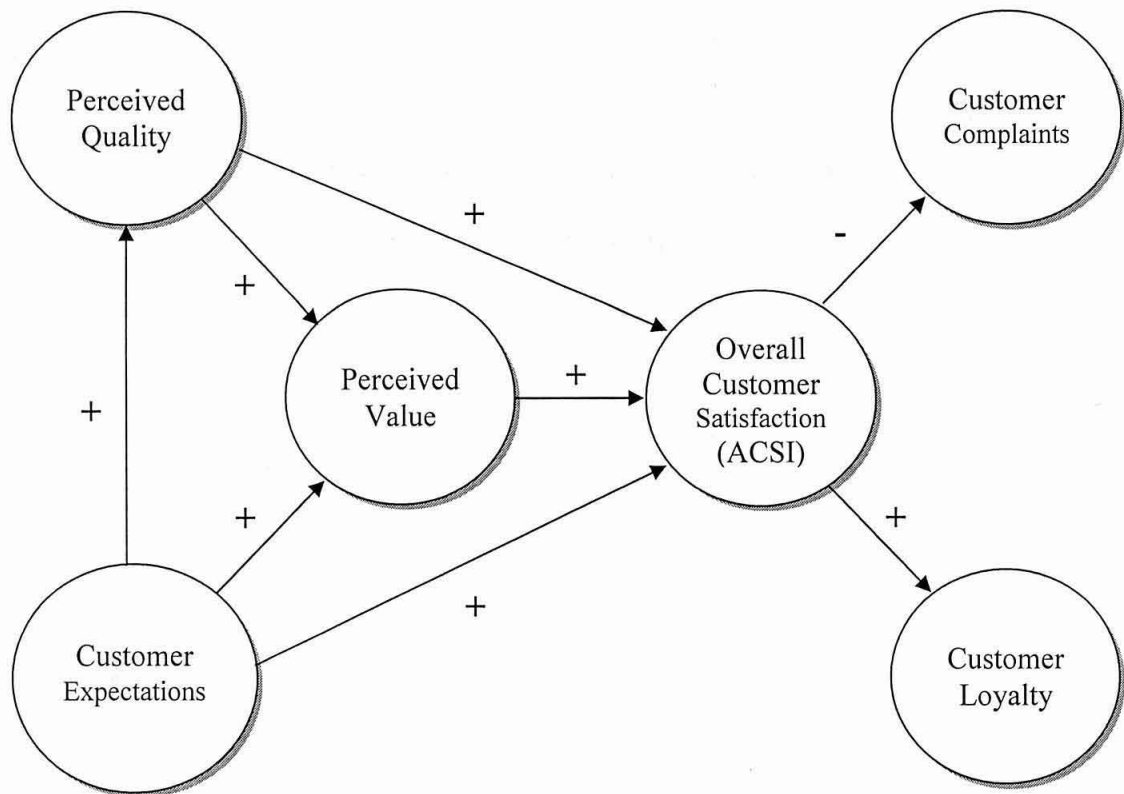
Figure 2-1. The American Customer Satisfaction Index (*ACSI*) model.[a]

The *ACSI* model used a multiple indicator approach to measure overall customer satisfaction as a latent variable as well as to measure other constructs as latent variables (Fornell et al., 1996). Overall customer satisfaction has three antecedents: perceived quality, perceived value, and customer expectations, and two consequences: complaints and loyalty. This figure represents that the *ACSI* model has the ability to explain important latent variables, such as overall customer satisfaction and loyalty. On average, the structural model accounts for 94% of the latent variable covariance structure

(American Society for Quality, 2001). For overall customer satisfaction, the average R^2 is .75; for customer loyalty, the average R^2 is .36 (Fornell et al., 1996). The results indicated that the three measures of cumulative satisfaction (overall satisfaction, expectancy disconfirmation, and comparison to an ideal) provided a reliable satisfaction index (Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2000).

The *ACSI* model was used to explain relationships between latent variables, but this model has three weaknesses. First, the *ACSI* model did not present the dimensions of perceived service quality, even though a number of studies showed that those dimensions were essential factors for improving service quality (Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1988, 1994a). Second, expectation measures used in the *ACSI* were concerned with quality rather than value. The logic behind the expectations to value linkage was unclear (Johnson et al., 2000). Third, there was no direct measure of a firm's customer complaint-handling systems. Although Fornell et al. (1996) argued that the implication was that the firm was successful in turning complaining customers into loyal customers when the relationship between customer satisfaction and customer loyalty was positive, this model did not explain the exact process of customer satisfaction recovery.

Service Quality

Conceptualization of Service Quality

The construct of service quality. Different scholars defined service quality in different ways. Zeithaml suggested that "perceived quality is the consumer's judgment about an entity's overall excellence or superiority" (as cited in Parasuraman, Zeithaml, & Berry, 1988, p. 15). Roest and Pieters (1997) also assumed that a service-quality

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construct should be focused on the post-purchase phase judgments of customers. Both statements imply that the evaluation of perceived service followed the completion of shopping experience. However, some scholars asserted that service quality and satisfaction were different constructs. Oliver (1997) indicated that service quality judgments were more cognitive reactions and evaluations of specific attributes, whereas satisfaction judgments were more comprehensive, affective, and emotional reactions. Bei and Chiao (2001) and Parasuraman et al. (1988) also suggested that perceived quality was a form of attitude, relevant but not equivalent to satisfaction, and caused by a comparison of expectations with perceived performance. Based on the concept from Parasuraman et al. about service quality, Brady and Cronin (2001) defined service quality with an overall, flexible perspective. They defined service quality as a customer's perception of at least one of the following circumstances: (1) an organization's technical and functional quality; (2) the service product, service delivery, and service environment; or (3) the reliability, responsiveness, empathy, assurances, and tangibles associated with a service experience.

Discussion of conceptualization of service quality. Most scholars agree that perceived service quality is a form of attitude associated with the experiences of encountered services (Bei & Chiao, 2001; Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1988, 1994a, 1994b; Zeithaml et al., 2002). Therefore, customers evaluate service quality by their own criteria, such as past experience or personal favoritism. This experience-judging phenomenon indicates that service quality is not an evaluation by service providers but depends on the judgment from each customer's perceived performance. It implies that service providers should be concerned with customers' feedback to improve service quality.

Some scholars defined service quality as the difference between customers' pre-determined expectations for service performance and their perception of received service (Asubonteng, McCleary, & Swan, 1996; Hung, Huang, & Chen, 2003; Parasuraman et al., 1988). However, there are some potential problems with this definition. As an example, people who have never ordered pizza by phone would have a different degree of expectation than those who have done so several times. People who lack experience with services use their imagination and assumptions to form their expectations. High expectations usually result in lower perceptions of service performance; however, low expectations may cause unexpectedly high perceptions of service performance. Therefore, the performance-based model is more appropriate for measuring service quality than the perceptions-minus-expectations model (Dabholkar et al., 2000).

Another potential problem is that the definition contributes to the confusion between service quality and customer satisfaction. Satisfaction should be treated as a superordinate construct to service quality (Dedeke, 2003; Ruyter, Bloemer, & Peeters, 1997). Generally, an increase in service quality results in an increase in service satisfaction. However, customers may not need to buy the highest quality service, but they need high service satisfaction. Therefore, customers may not need the best-perceived service performances, but need the perceived service performances to meet customer's expectations of service quality. Some empirical results indicate that low perceived service quality may also be associated with high service satisfaction (Dedeke, 2003; Ruyter et al., 1997). The results imply that service quality and customer satisfaction are different constructs (Wolfinbarger & Gilly, 2002).

Brady and Cronin (2001) used an integrated approach to define service quality.

Their definition included a customer's perception of five dimensions from the

SERVQUAL scale. However, the five dimensions (reliability, responsiveness, empathy, assurances, and tangibles) were retrieved from the responses to service quality for only five different types of service providers, and therefore cannot completely represent all kinds of service providers. For example, services provided by a long-distance telephone company are different from services provided by an appliance repair and maintenance firm. After a customer purchases a communication package, the long-distance communication service is always available whether the customer uses it or not. In other words, the service continues until the customer cancels it. On the other hand, the service provided by an appliance repair and maintenance firm is a one-time only service. The firm's customer receives a single-event service rather than a continuous service.

According to Parasuraman et al. (1991), five dimensions explained from 57% to 71% of the service quality variance, indicating that other factors affecting service quality need to be identified. This finding may result from the fact that their research is a cross-industry study. Different industries have different service features and settings. When conducting a cross-industry study, similarities and differences of the industries must be observed and populations identified to avoid a negative effect on the study's validity. However, Finn and Lamb (1991) found that the *SERVQUAL* scale did not have enough external validity to measure perceived quality in retailing (Finn & Lamb, 1991). Dabholkar et al. (1996) also modified the *SERVQUAL* scale and kept only one dimension of the scale (reliability) in order to measure retail service quality. The same problem also occurs in measuring service quality for Web sites and e-tailers. Service quality in different contexts may not always consist of the same five dimensions (Sachdev &

Verma, 2002). Some dimensions such as security and Web site design become critical issues as the number of online shoppers steadily increases (Kim, 2003; Parasuraman, Zeithaml, & Malhotra, 2005; Wolfinbarger & Gilly, 2002).

The Measurement of Service Quality

Both *SERVQUAL* and *SERVPERF* were based on the measurement of pure service providers that did not sell physical products. Finn and Lamb (1991) conducted a quantitative study, examining whether the *SERVQUAL* scale could be used in a retail setting. The population was female shoppers from four different types of stores: stores like K-Mart, stores like Sears, stores like Dillards, and stores like Neiman Marcus. There were 1,100 telephone numbers randomly selected and purchased from a commercial sampling company. A total of 258 valid responses were obtained. The internal consistency estimates of reliability ranged from 0.59 to 0.83 for five dimensions of the scale, but construct validity was not examined. Finn and Lamb (1991) found that the *SERVQUAL* scale could not be used to assess perceived service quality in retailing because perceived service quality in retailing was not completely identified by the original five dimensions. Therefore, the *SERVQUAL* scale could not adequately measure customers' perceptions of service quality for retail stores that provide a mix of merchandises and services.

Dabholkar et al. (1996) adopted a hierarchical approach to identify the dimensions of service quality in a retail environment. They modified the *SERVQUAL* scale to develop a valid scale to measure retail service quality, and named the new instrument the *Retail Service Quality Scale* (*RSQS*). The *RSQS* consisted of 28 items, 17 items from *SERVQUAL* and 11 items from literature review and focus groups. A sample of 227

respondents was obtained from customers of seven stores from two department store chains. Dabholkar et al. (1996) found that the hierarchical structure included five basic dimensions of retail service quality (physical aspects, reliability, personal interaction, problem solving, and policy) and that three of the five basic dimensions had two subdimensions. The internal consistency estimates of reliability of *RSQS* ranged from 0.83 to 0.89, which were very similar to the internal consistency estimates of the original *SERVQUAL* scale (0.87 to 0.90). Construct validity estimate of the overall scale computed from a confirmatory factor analysis was 0.74. The predictive validity of two dependent variables of the retail scale was also examined. These two dependent variables were intentions to shop at the store and intentions to recommend the store to others. The predictive validity with intentions to shop and the predictive validity with intentions to recommend were 0.65 and 0.70, respectively.

Wong and Sohal (2002) conducted a correlational study to examine the relationship between service quality and overall relationship quality on two levels of retail relationships (employee and company level). They measured retail service quality by using a modified *SERVQUAL* scale, which included seven more items than the original *SERVQUAL* scale, but they kept the five original dimensions. The responses from 1,261 shoppers were obtained at eight retail outlets. The results indicated that there is a positive and direct relationship between service quality and relationship quality, and that empathy is the most important factor to allow employees to maintain good relationship with customers. The internal consistency estimates of reliability of the modified *SERVQUAL* scale ranged from 0.83 to 0.89, which were also similar to the internal consistency reliabilities of original *SERVQUAL* scale (0.87 to 0.90). Construct

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validity of the modified scale computed from a confirmatory factor analysis ranged from 0.02 to 0.87 because the five original dimensions could not appropriately represent customers' perceived service quality in retail encounters.

Retailing service quality literature indicated that the *SERVQUAL* scale needed to be modified when used to measure service quality for retail stores because the service categories used in the development of the *SERVQUAL* scale were different from the retail setting (Finn & Lamb, 1991; Dabholkar et al., 1996; Mehta et al., 2000; Wong & Sohal, 2002). Few studies supported that the *RSQS* scale (a modified *SERVQUAL* scale) was more appropriate for use in the retailing context (Dabholkar et al., 1996; Mehta et al., 2000). However, future academic research could conduct replication studies for different types of retailers to investigate the appropriateness of hierarchical structures for the *RSQS* scale.

Electronic Service Quality

Self-service is an important concept to be applied to business-to-consumer e-commerce. Online shoppers look for items they want to purchase on the Internet, add items into an online basket, and click the submit button to send an order to online stores. The growing level of online sales every year is the evidence that consumers increasingly prefer to "help themselves" and demand to obtain instant information (Bonde & Cahill, 2005). Time saving is the biggest advantage of self-service according to 50% of 1,008 survey respondents, whereas lack of human contact is the biggest disadvantage of self-service by 43% of respondents (Howard & Worboys, 2003).

Like a shop window for a physical retail store, a Web page is an essential element for a virtual store. However, an online store not only needs a fancy, informative Web

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page, but also requires a reliable system to support the operation. A study conducted by the Boston Consulting Group indicates that 48% of respondents cite slow response time as the main reason for abandoned online transactions (as cited in Teeter & Schointuch, 2000).

Cao (2002) suggested that an e-tailer's services may be separated into two basic dimensions: pre-purchase services and post-purchase service quality. The pre-purchase services include ease of use (convenience and speed of ordering), product selection (breadth/depth of products offered), product information (information quantity, quality, and relevance), and Web site performance (layout, links, pictures, images, and speed). The post-purchase services include on-time delivery, product representation, customer support, and order tracking. Similar to the description of e-tailer's service by Cao (2002), e-service quality defined by Zeithaml, Parasuraman, and Malhotra (2000) is "the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery" (p. 11). This definition implies that customers evaluate a Web site's service quality from pre-purchase to post-purchase (Zeithaml, 2002).

An e-tailer may be a pure online store or a click-and-mortar store. Although both types of businesses may be called e-tailers, their operational and marketing strategies are not quite the same. A click-and-mortar business like JC Penney may regard its online store as one of its marketing channels (Rosenbloom, 1999). On the other hand, selling goods through the Internet is the only marketing channel for a purely online store like Amazon.com. Customers may form their expectations of a click-and-mortar store according to the reputation or image of its existing physical store, but they cannot do so based on the short history of purely online stores. The *SERVQUAL* model does not

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identify the differences in customer expectations between the two types of e-tailers. Customers who are not familiar with the reputation or image of a certain e-tailer may generate low expectations or low confidences, which affect the perceptions of service performance.

An e-tailer's services include two basic dimensions: pre-purchase services and post-purchase service quality (Cao, 2002). The pre-purchase services are very important factors in determining whether online shoppers abandon the shopping cart before they check out, especially with regard to product selection and Web site performance. An e-tailer cannot sell goods if they are out of stock or if customers cannot find what they want. A Web site that is slow in showing its Web pages could hinder the customers' purchase intentions. There are four factors of pre-purchase services that cover most issues of e-tailer services (Cao, 2002). These four factors are ease of use, product selection, product information, and Web site performance. Layouts, pictures, and links are factors of Web site design. The speed of ordering is a factor of Web site performance. Therefore, the four factors for the pre-purchase services should be revised to include Web site design, product selection, product information, and Web site performance.

There are four factors of post-purchase services (Cao, 2002). These four factors are on-time delivery, product representation, customer support, and order tracking. However, most e-tailers sign contracts with major cargo carriers, such as UPS and FedEx, to deliver the merchandise. Customers usually may select their preferred cargo carrier and preferred delivery method, so e-tailers do not have the responsibilities for estimated delivery time. Still, e-tailers must shorten processing time for orders to reduce the waiting time for customers. Moreover, most cargo carriers offer online tracking services.

E-tailers need only to send an e-mail to inform customers of the tracking number or to post a link to the tracking information on the e-tailers' Web pages. Another important factor for e-tailers' services is to protect customer information, including name, address, and credit card number. This factor is associated with the ability of the e-tailer's information system to block Internet hackers. Therefore, the factors for the post-purchase services could be revised to include order processing and handling, product accuracy, customer support, and information security.

The measurement of electronic service quality. The literature about Web site service quality provided the guideline for measuring e-tailing service quality. Scholars modified the *SERVQUAL* scale to measure service quality for Web sites (Li, Tan, & Xie, 2002; Lin & Wu, 2002; Van Riel, Semeijn, & Janssen, 2003). The research methods included quantitative, qualitative, and mixed research methods. The quantitative studies adopted the modified *SERVQUAL* scale and used factor analysis to retrieve dimensions (Li et al., 2002; Lin & Wu, 2002; Van Riel et al., 2003; Wolfinbarger & Gilly, 2002). A qualitative study analyzed the responses from focus groups and identified two groups of dimensions, which are incubative and active dimensions (Santos, 2003). The incubative dimension was defined as the extent of a Web site's design, helping customers easily access and browse the Web site, while the active dimension is defined as the extent of a Web site's ability to offer a reliable shopping platform (Santos, 2003). The mixed method is similar to the forming process of the *SERVQUAL* scale. For example, one study was conducted by a two-stage data collection research, combining the data from focus groups and quantitative questionnaires (Loiacono, Watson, & Goodhue, 2002).

According to the review of the Web site service quality literature, the number of

obtained service quality dimensions ranged from three to six. There were some common dimensions within those studies, such as responsiveness and customization (Li et al., 2002; Lin & Wu, 2002; Van Riel et al., 2003). The interpretation of the responsiveness dimension for Web site service quality is different from the interpretation of the dimension for service quality of traditional businesses. In the retailing context, responsiveness refers to a sales representative's responsibility for serving customers. In the Web-based context, an online response refers to the availability of e-mail responses and updated order status (Li et al., 2002).

Web site service quality is not determined by the Web site itself but is determined by its customers. Therefore, the population of survey participants should be customers of the Web site. According to the review of the literature, there are some common research limitations in the studies. First, most surveys collect responses from college students (Lin & Wu, 2002; Loiacono et al., 2002; Van Riel et al., 2003). The sampling method of those studies is convenience and non-probabilty sampling (Li et al., 2002; Lin & Wu, 2002; Van Riel et al., 2003). This sampling method indicates that the samples may not represent the target population, so those studies have weak external validity (Trochim, 2000a, 2000b). Second, the different features of online travel Web sites (pure-service) and online bookstores (physical-service) may need different scales to measure the Web site's dimensions of service quality. Online travel Web sites provide service related to information flows, such as airline seat booking and hotel booking, whereas online bookstores provide product flows, to include packing and delivery. The measurement of dimensions of online bookstores may not entirely apply to online traveling Web sites.

The measurement of Web site service quality needs further development. It is

necessary to continue modifying the scale for measuring Web site service quality to improve validity (Li et al., 2002). Researchers should conduct replication studies to measure service quality for different types of Web sites (Lin & Wu, 2002; Van Riel et al., 2003). Additional research could include conducting longitudinal studies. Customers may change their attitudes toward perceived service quality as they encounter additional e-service experiences. A longitudinal study, which monitors behaviors over time and identifies changes in attitudes or behaviors, would help to identify the experience factor (Van Riel et al., 2003).

The literature of e-tailing service quality is developed from the retail service quality literature and Web site service quality literature. The measurement of e-tailing service quality is similar to the measurement of Web site service quality. Scholars either modified the *SERVQUAL* scale or developed their own scale to measure e-tailing service quality (Barnes & Vidgen, 2002; Francis & White, 2001; Kim, 2003; Wolfinbarger & Gilly, 2002; Yang & Jun, 2002). The research methods included quantitative and mixed research methods. The quantitative studies also adopted the modified *SERVQUAL* scale and used factor analysis to retrieve dimensions (Francis & White, 2001; Yang & Jun, 2002). However, instead of conducting *SERVQUAL* replication studies, some researchers adopted mixed methods to develop new scales (Barnes & Vidgen, 2002; Kim, 2003; Wolfinbarger & Gilly, 2002).

According to the review of e-tailing service quality literature, the number of obtained dimensions of service quality ranges from four to thirteen. The dimensions obtained by each e-tailing service quality study are not quite the same. The possible explanation is that different scales, different populations, different sampling, and

different products result in different findings, since scholars develop their own scale for measuring e-tailing service quality. E-tailing service dimensions frequently identified in studies are reliability, responsiveness, and security, which are similar to the dimensions for Web site service quality (Francis & White, 2001; Kim, 2003; Wolfinbarger & Gilly, 2002; Yang & Jun, 2002). It is interesting that Web site design is not the most important factor for measuring e-tailing service quality. This implies that e-tailing customers are concerned with detailed product information, product availability, and system reliability instead of Web page layouts (Francis & White, 2001; Kim, 2003; Wolfinbarger & Gilly, 2002; Yang & Jun, 2002).

The dimension of security relates to the dimension of trust. Online shoppers trust that the Web sites have the technologies to protect their personal information, so they have confidence in placing orders (Barnes & Vidgen, 2002; Loiacono et al., 2002). The dimension of reliability includes the reliability of Web site (information system) and the reliability of customer service (Francis & White, 2001; Kim, 2003; Wolfinbarger & Gilly, 2002; Yang & Jun, 2002). The dimension of Web site design, including the layouts, pictures, and links in the Web pages, is relevant to the dimension of ease of use (Barnes & Vidgen, 2002; Loiacono et al., 2002).

The background of respondents for e-tailing service quality studies was more heterogeneous than that of respondents for retail and Web site service quality studies. However, there was a common limitation in the e-tailing service quality literature. In the e-tailing service quality literature, scholars chose the convenience sampling method, but the results may not be generalized beyond the sample (Barnes & Vidgen, 2002; Francis & White, 2001; Kim, 2003; Loiacono et al., 2002; Wolfinbarger & Gilly, 2002; Yang & Jun,

2002). Therefore, further research needs to be conducted by using random probability sampling methods (Kim, 2003). Another recommendation for future study was to conduct replication studies to measure service quality for different types of e-tailing business to further validate the new scales across industries (Barnes & Vidgen, 2002; Kim, 2003; Wolfinbarger & Gilly, 2002).

The existing framework to examine service quality is based on pure service providers (Parasuraman et al., 1988), but e-tailers may have different service attributes which result in different dimensions of service quality. The performance-based model developed by Cronin and Taylor (1992) is more appropriate for an e-tailing context than the perceptions-minus-expectations model developed by Parasuraman, Zeithaml, and Berry (1988). A hierarchical model was emerging from the contemporary service quality theory (Dabholkar et al., 1996, 2000). Still, little e-tailing literature about service quality adopts this approach. Moreover, Cao (2002) developed an embryonic concept for e-tailer's service. Scholars identify this as the gap within the contemporary service quality theory (Cronin & Taylor, 1992; Dabholkar et al., 2000; Parasuraman et al., 1988) and the existing e-tailing service quality literature (Barnes & Vidgen, 2002; Kim, 2003; Wolfinbarger & Gilly, 2002). Therefore, the theoretical framework of e-tailing service quality needs further development based on the hierarchical model and Cao's concept about e-tailers' service.

Most studies were based on the *SERVQUAL* scale to measure service quality, whether for retail, Web site, or e-tailing (Li et al., 2002; Lin & Wu, 2002; Van Riel et al., 2003; Wong & Sohal, 2002; Yang & Jun, 2002), but the results indicated that the validity of the dimensions was questionable when the *SERVQUAL* dimensions were used to

describe the Internet-based service. The major problems are the weak external validity from non-probability samples and untapped dimensions of electronic service quality. It is necessary to develop a scale for measuring electronic service quality. Alzola and Robaina (2005) conducted an analysis of service quality based on literature reviews. They concluded that *SERVQUAL* in the context of business-to-consumer e-commerce was organized by five dimensions: design, reliability, guarantee, security, and empathy. However, this proposed model had not tested by empirical data.

   E-core service quality scale (E-S-QUAL). Zeithaml, Parasuraman, and Malhotra (2000) developed 11 e-SQ dimensions for measuring perceived e-service quality through a three-stage process using exploratory focus groups and two phases of empirical data collection and analysis. Their purpose was to develop a conceptual framework to understand e-service quality. These scholars also suggested that the 11 e-SQ dimensions should be continually examined and improved (Zeithaml, Parasuraman, and Malhotra, 2002). Parasuraman, Zeithaml, and Malhotra (2005) refined the e-SQ scale and developed two sets of scales for measuring electronic service quality. One is called the *E-Core Service Quality Scale* (*E-S-QUAL*), consisting of 22 items to measure four dimensions: efficiency, system availability, fulfillment, and privacy. Another is called the *E-Recovery Service Quality Scale* (*E-RecS-QUAL*): consisting of 11 items to measure three dimensions: responsiveness, compensation, and contact. These scholars declared that the *E-Rec-QUAL* scale is a subset scale of the *E-S-QUAL* scale.

   The *E-S-QUAL* and *E-RecS-QUAL* scales were successfully tested in a study using a quota-sampling method. One-third of respondents were asked to evaluate their favorite sites, one-third were asked to evaluate their second-favorite sites, and one-third

were asked to evaluate their third-favorite sites (Parasuraman et al., 2005). There were 549 completed questionnaires from randomly selected Web users. However, Parasuraman et al. (2005) suggested that the reliability and validity of *E-RecS-QUAL* needed further examination in the context of Web sites having a higher incidence of problem encounters. These scholars also suggested that these two scales may be modified to measure service quality of pure-service sites because their research focused on Web sites that sold physical products. Table 2-1 presents a comparison of *E-S-QUAL* and other electronic service quality scales.

Table 2-1

Comparison of E-S-QUAL and Other Electronic Service Quality Scales

Author	Francis and White (2001)	Barnes and Vidgen (2002)	Li et al. (2002)	Lin and Wu (2002)
Instrument	*PIRQ* (Modified *SERVQUAL*)	*WebQual*	Modified *SERVQUAL*	*OSQ* (Modified *SERVQUAL*)
Number of items	23 items	22 items	28 items	Not addressed
Data collection study sample(s)	Internet shoppers	Customers of three on-line bookstores	Users of news groups	Undergraduate students of six Management Colleges
Sample size	302	376	202	433
Response scale	Five-point scale	Seven-point scale	Five-point scale	Not addressed
Questionnaire administration	Online survey	Online survey	Online survey	Field survey
Data analysis procedure for assessing factor-structure	Principal component analysis	Exploratory factor analysis (principal components method with varimax rotation)	Exploratory factor analysis	Principal components factor analysis with varimax rotation
Final dimensions	Six	Five	Six	Three
Reliability				
Internal Consistency (Cronbach's alphas)	.92	.70 to .90	.68 to .87	.73 to .89
Validity				
Construct Validity (Convergent or Discriminant Validity)	Not examined	Not examined	Not examined	Convergent −.31 for ease of use and .53 for usefulness

Table 2-1 (continued)

Comparison of E-S-QUAL and Other Electronic Service Quality Scales

Author	Loiacono et al. (2002)	Wolfinbarger and Gilly (2002)	Yang and Jun (2002)	Kim (2003)
Instrument	Modified *WebQual*	*.comQ*	Modified *SERVQUAL*	Self-developed scale
Number of items	36 items	25 items	41 and 43 items	59 items
Data collection study sample(s)	Undergraduate students	Members of the Harris Poll Online Panel	Subscribers of a regional Internet Service Provider	Students in golf management programs
Sample size	311	1,013	271	294
Response scale	Seven-point scale	Seven-point scale	Five-point scale	Five-point scale
Questionnaire administration	Not addressed	Online survey	Mail survey	Mail survey
Data analysis procedure for assessing factor-structure	Confirmatory factor analysis	LISREL confirmatory factor analysis of five and eight dimension models	Exploratory factor analysis	Exploratory factor analysis and confirmatory factor analysis
Final dimensions	12	Four	Six and seven	Three basic dimensions and 13 subdimensions
Reliability				
Internal Consistency (Cronbach's alphas)	.72 to .93	.79 to .88	.59 to .89 (Internet purchasers) and .68 to .89 (Internet non-purchaser group)	.75 to .91 for service quality, .64 to .85 for information quality, and .77 to .84 system quality
Validity				
Construct Validity (Convergent or Discriminant Validity)	Convergent – .78	Convergent – .61 to .79 Discriminant – .55 for satisfaction and .48 for loyalty	Convergent – .67 (Internet purchasers) and .70 (Internet non-purchaser group)	Convergent – service quality explain .85 of variance in integrated service quality, information quality explain .93 of variance in integrated service quality, and system quality explain .85 of variance in integrated service quality

Table 2-1 (continued)

Comparison of E-S-QUAL and Other Electronic Service Quality Scales

Author	Van Riel et al. (2003)	Wolfinbarger and Gilly (2003)	Yang and Fang (2004)	Parasuraman et al. (2005)
Instrument	Modified *SERVQUAL*	*eTailQ*	Qualitative method	*E-S-QUAL* and *E-RecS-QUAL*
Number of items	16 items	14 items	35 items	22 and 11 items
Data collection study sample(s)	College students and recent college graduates and their referred friends	E-mail invitation receivers	Secondary data from online customer reviews	Customers of Amazon.com and Walmart.com
Sample size	159	1,013	740	653 and 205
Response scale	Seven-point scale	Seven-point scale	Not applicable	Five-point scale
Questionnaire administration	Online survey	Online survey	Not applicable	Online survey
Data analysis procedure for assessing factor-structure	Confirmatory factor analysis	Exploratory factor analysis and confirmatory factor analysis	Analyzing qualitative data by using Ethnograph 5.0	Exploratory factor analysis
Final dimensions	Five	Four	Eight	Four for *E-S-QUAL* and three for *E-RecS-QUAL*
Reliability				
Internal Consistency (Cronbach's alphas)	.59 to .85 for adequate quality and .60 to .83 for desired quality	.79 to .88	Not examined	.83 to .93 for *E-S-QUAL*
Validity				
Construct Validity (Convergent or Discriminant Validity)	Not examined	Convergent – .70 to .91	Not examined	Convergent – .71 to .94 for *E-S-QUAL*

Service Recovery

Service recovery can be regarded as a passive strategy for the improvement of customer satisfaction. Service recovery refers to the actions taken by a firm in response to a service failure (Zeithaml & Bitner, 2003). Service failure often occurs when the customer's perceived service quality falls below customer expectations. For example, delivery and Web site design problems are two major types of service failure in online retailing (Holloway & Beatty, 2003). Such failures may cause significant costs to the firm, such as lost customers and negative word of mouth (Bitner, Brown, & Meuter, 2000).

Literature has addressed the importance of service recovery. According to Hart, Heskett, & Sasser (1990), firms learn from experiences of service recovery when they may not be able to prevent service failure. Berry and Parasuraman (1992) believed that firms should not regard service failure as a problem but as an opportunity to create satisfied customers. Hence, recovery strategies have a dramatic impact on a firm's revenue and profitability (Tax & Brown, 1998). Service recovery literature has shown that resolving customer problems has a strong impact on customer satisfaction and loyalty (Miller, Craighead, & Karwan, 2000; Smith & Bolton, 2002). Swanson and Kelley (2001) also found that customer behavioral intentions are more favorable when customers believe that firms consistently implement service recovery when failures occur. Furthermore, Robbins and Miller (2004) found that well-handled service recovery strongly affects customer loyalty.

Theoretical Framework

Based on the discussion and review of theoretical and empirical literature, two models for consumer electronics e-tailers are proposed for this study. These two models

are electronic service quality model and Electronic Customer Satisfaction (e-CS) model. The electronic service quality model can be regarded as a sub-model of the e-CS model, since the electronic service quality model focuses on the relationships among electronic service quality, electronic recovery service quality, and their respective dimensions. The formation of a proposed electronic service quality model is primarily from the research results in the study by Parasuraman et al. (2005). The hypothesized electronic service quality model is shown in Figure 2-2.
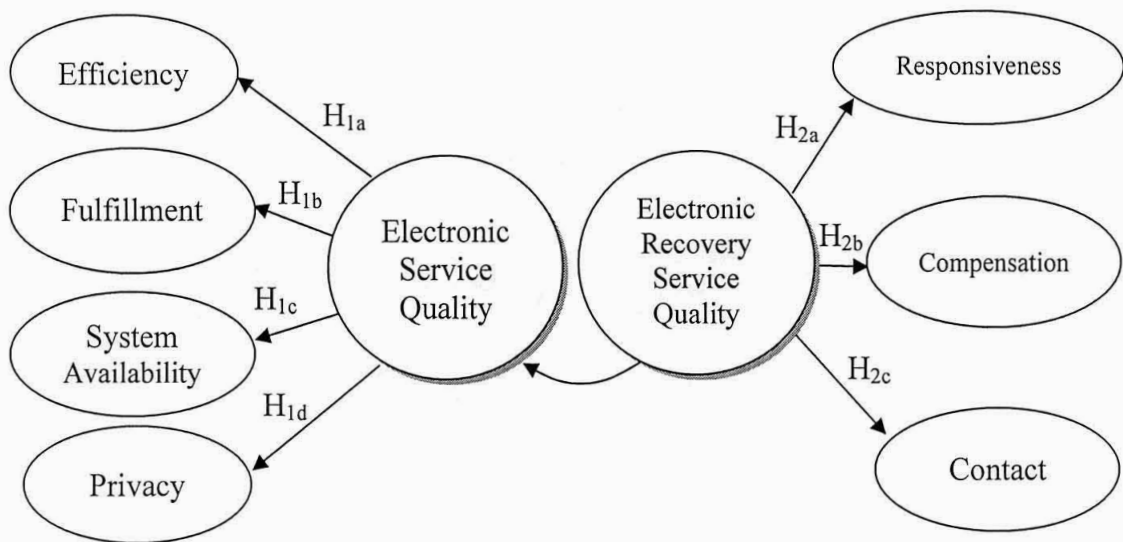
Figure 2-2. Hypothesized electronic service quality model for consumer electronics e-tailers.

The hypothesized Electronic Customer Satisfaction (e-CS) model is a modification of the American Customer Satisfaction Index (*ACSI*) model. The modifications include: (1) replacing perceived quality with electronic service quality; (2)

adding electronic recovery service quality as an essential variable. The first

recommended change is to replace perceived quality with electronic service quality.

Electronic service quality is a multidimensional construct, which is appropriately adopted

in the online context. The second recommended change is to add electronic recovery

service quality as an essential variable. Service recovery literature indicates that good

service recovery performance has a positive effect on customer satisfaction and loyalty

(Miller, Craighead, & Karwan, 2000; Smith & Bolton, 2002). Adding electronic

recovery service quality into the model may help explain how a firm improves customer

satisfaction through a service failure solution to turn dissatisfied customers to loyal

customers. As shown in Figure 2-3, customer satisfaction mediates the relationship

between electronic recovery service quality and customer loyalty.
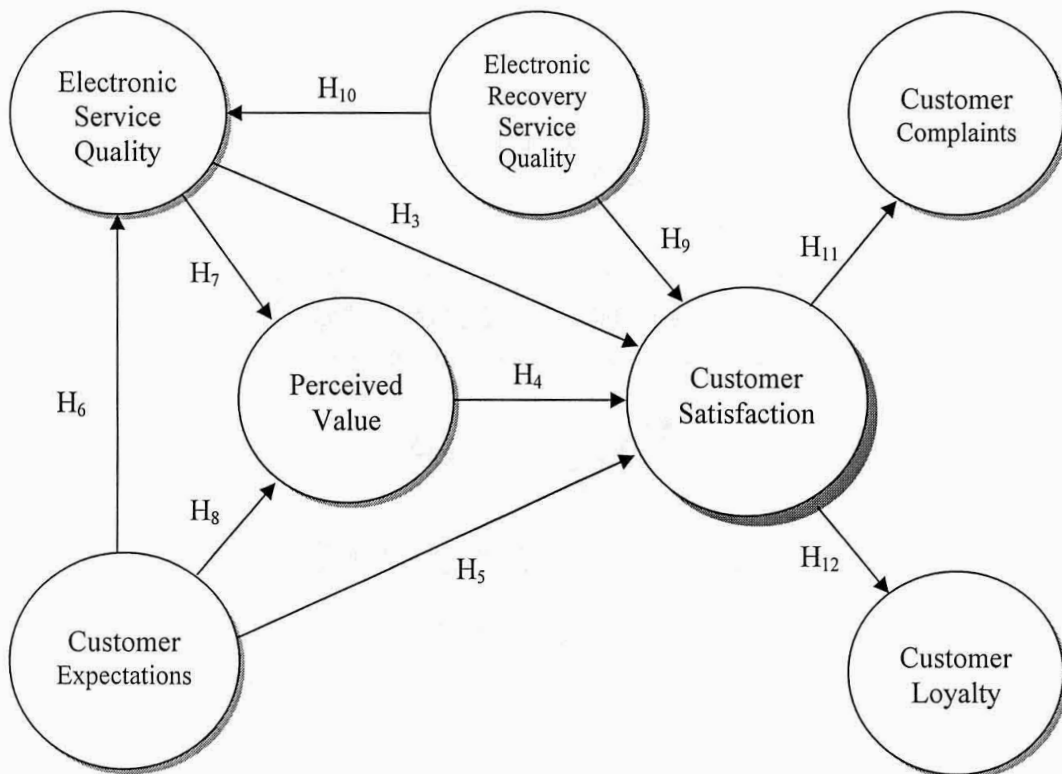
Figure 2-3. Hypothesized Electronic Customer Satisfaction (e-CS) model.

Research Hypotheses

The research hypotheses in the study based on the hypothesized electronic service quality model and the hypothesized electronic customer satisfaction (e-CS) model for consumer electronics e-tailers follow:

H_1: Each dimension of electronic service quality has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1a}: The efficiency dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1b}: The fulfillment dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1c}: The system availability dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1d}: The privacy dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_2: Each dimension of electronic recovery service quality has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H_{2a}: The responsiveness dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H_{2b}: The compensation dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H_{2c}: The contact dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H_3: Electronic service quality has a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_4: Perceived value has a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_5: Customer expectations have a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_6: Customer expectations have a direct positive effect on electronic service quality for consumer electronics e-tailers.

H_7: Electronic service quality has a direct positive effect on perceived value for consumer electronics e-tailers.

H_8: Customer expectations have a direct positive effect on perceived value for consumer electronics e-tailers.

H_9: Electronic recovery service quality has a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_{10}: Electronic recovery service quality has a direct positive effect on electronic service quality for consumer electronics e-tailers.

H_{11}: The level of customer satisfaction has a direct negative effect on customer complaints for consumer electronics e-tailers.

H_{12}: The level of customer satisfaction has a direct positive effect on customer loyalty for consumer electronics e-tailers.

H_{13}: Customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, and customer complaints and customer loyalty for consumer electronics e-tailers.

Chapter II provides an in-depth review of electronic service quality, customer satisfaction, and other constructs examined in this study. This chapter provides critical analyses of related theoretical and empirical literature about service quality and customer satisfaction. A hypothesized conceptual model and research hypotheses are also presented in this chapter. Chapter III includes a description of the research design, the sampling plan, instrumentation, ethical considerations, data collection procedures, methods of data analysis, and evaluation of research methods.

CHAPTER III

METHODOLOGY

This chapter addresses the methodology used in this study about the relationship between service quality, customer satisfaction, and loyalty for consumer electronics e-tailers. This chapter includes a discussion of the descriptive, correlational research design used in this study, the population and sampling plan, instrumentation, data collection procedures and ethical aspects, the methods of data analysis, and evaluation of the methodology. The instrument design section includes the scales utilized to measure electronic service quality, as well as discussion of the scales utilized to measure the other constructs within the conceptual model. Data collection procedures include all sequential steps of data collection in an ethical manner. The data analysis section includes the justification for the use of structural equation modeling, and plans to assess construct validity for all measures addressed in this study. Finally, the evaluation of the research methodology regarding internal and external validity is also represented.

Research Design

This quantitative, non-experimental study about the assessment of relationships among service quality, customer satisfaction, and loyalty for consumer electronics e-tailers was a descriptive, correlational study, conducted through an online survey to collect data. Due to its two advantages, a correlational research design is highly useful for studying problems in the social sciences (Gall, Gall, & Borg, 2003). One advantage of correlational design is that researchers can identify and analyze the relationships among a large number of variables in a single study. Another advantage is that the correlational design can measure the degree of relationship between variables.

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The purpose of this research design was to test 13 research hypotheses. There were seven latent variables in this study: customer expectations, electronic service quality, perceived value, customer satisfaction, customer complaints, customer loyalty, and electronic recovery service quality. There were also seven sub-latent variables in this study: efficiency, fulfillment, system availability, privacy, responsiveness, compensation, and contact.

In this study, customer expectations refer to what online shoppers believe consumer electronics e-tailers "should" offer. Electronic service quality refers to customers' perceptions of service quality from their experiences in purchasing consumer electronics e-tailers. Perceived value refers to customers' perceived level of service quality relative to the price paid for purchasing consumer electronics products on the Internet. Customer satisfaction in this study is defined as the customer's overall attitude, which was generated from a process of evaluating prior purchasing experiences at consumer electronics e-tailers and is measured by three items from the customer satisfaction part of the *American Customer Satisfaction Index Scale*. Customer loyalty refers to customers' favorable behavioral intentions to purchase from consumer electronics e-tailers. Customer complaint refers to customers' negative responses resulting from having had a problem with consumer electronics e-tailers.

The survey contained 11 sections, including filter questions part A, general questions, customer expectations, electronic service quality, perceived value, customer satisfaction, customer loyalty, customer complaints, filter questions part B, electronic recovery service quality, and demographic questions. This study expected to validate the dimensions contained in electronic service quality (including electronic service recovery

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quality) applied to consumer electronics e-tailers, and validate the American Customer

Satisfaction Index (*ACSI*) model applied to consumer electronics e-tailers. Furthermore,

it was hypothesized that electronic recovery service quality positively influences

customer satisfaction. Hypotheses were tested by structural equation modeling.

Population and Sampling Plan

Target Population

The target population includes a set of people or events to which researchers wish

to generalize the results of their study (Romano, 2004). In this study, the target

population included all American online shoppers who had ever purchased consumer

electronics products on the Internet. It is difficult to calculate an exact number of the

target population because the size of the consumer electronics market is presented by the

amount of dollar sales. In this study, the number of the target population was estimated

by dividing the number of annual online consumer electronics sales by the number of

average online spending per year per online shopper. Online sales reached $141.4 billion

in 2004 (Millard, 2005), and online consumer electronics sales accounted for 6% of total

online sales (Miller, 2001). The average online spending per person in the first half of

2004 was nearly $580 (Kerner, 2004). The average online shopping frequency was 1.34

times per month (Turow, Feldman, & Meltzer, 2005) or nearly 16 times per year, per

online shopper. Therefore, the estimated number of target population is 177,500 online

shoppers of consumer electronics.

Accessible Population

The accessible population is a subset of the target population that is accessible to

a researcher because of geographic, temporal, or cultural characteristics (Romano, 2004).

In this study, the accessible population was limited to online consumer electronics shoppers who could be reached by e-mail, but its number was unknown.

Quota and Snowball Sampling Plan

Two non-random sampling techniques were used for this study. The sampling method is one of the factors affecting sampling error. The greater the sampling error, the less accurate the estimation of the population values (Grossnickle & Raskin, 2001). As a result, random samples are always preferable to nonrandom samples. However, random samples are not always available, affordable, or efficient. Online shoppers are more difficult to identify compared to traditional shoppers; therefore, non-random snowball sampling was used to access the population. Furthermore, in order to enhance the representativeness of the sample, quota sampling was used. Quota sampling is another non-random sampling technique closely paralleling stratified sampling (random sampling) (StatPat Inc., 2005).

The sample of this study was selected from online consumer electronics shoppers who received the e-mail invitations to do an online survey. A snowball sampling method was used for this study to access the initial sample. "Snowball or referral sampling is used when the population being researched is difficult to reach" (Grossnickle & Raskin, 2001, p. 126). The method relies on finding initial respondents who fit the profile for the study, contacting them, asking them to participate in the study, and asking them to refer other qualified potential respondents.

The initial group of respondents of the snowball was a non-random "quota" sample, selected to represent the population. The strengths of the snowball sampling are cost-efficiency and time-saving. Snowball sampling allows researchers to reach the

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potential qualified respondents by the distribution of interpersonal relationships. The

weakness of snowball sampling is the increased risk of obtaining biased data resulting

from the selection of the initial sample. The analyzed results may be difficult to

generalize to the target population and thus affects external validity. By initially starting

with a quota sample, to represent various subpopulations in the target population, it may

be possible that the final data-producing sample closely represents the target population,

thereby strengthening the external validity of study findings.

The demographic profile of the initial quota sample was determined based on the

characteristics of U.S. adult Internet users presented in the research by Turow, Feldman,

and Meltzer in 2005. From their research, the characteristics of U.S. adult Internet users

are 48% male, 59% under 45 years old, 61% some college or more, and 55% family

income less than $75,000. The demographics of the online consumers in the United

States from a study by InsightExpress were similar to the characteristics of U.S. adult

Internet users (as cited in Girard, Korgaonkar, & Silverblatt, 2003). In this present study,

the initial quota sample was distributed according to the following characteristics: 50%

male, 60% under 45 years old, 60% with some college or more, and 55% with family

income less than $75,000.

Eligibility Criteria and Exclusion Criteria

The nature of the study requires collecting responses from a sample of online

shoppers after completing the process of purchasing consumer electronics products on the

Internet, from browsing the Web sites to receiving the packages. Although the focus of

this study was more concerned with online shoppers with experience in purchasing

consumer electronics products on the Internet, some criteria were used to enhance

internal validity. The eligibility criteria of the sample were:

1. Online shoppers who were 18 years old or older,

2. Online shoppers who were able to read and write English,

3. Online shoppers who had at least one e-mail account and at least one credit or debit card because those were requirements for purchasing on the Internet,

4. Online shoppers who had been living in the continental United States for the past six months,

5. Online shoppers who had purchased at a U.S.-based consumer electronics e-tailer, and

6. Online shoppers who had purchased consumer electronics products at least once at a consumer electronics e-tailer in the past year.

The exclusion criteria of the sample were:

1. Online shoppers who were under 18 years old,

2. Online shoppers who were not able to read and write English,

3. Online shoppers who were not able to be reached by e-mail,

4. Online shoppers who had not been living in the continental United States for the past six months,

5. Online shoppers who purchased at a non-U.S.-based consumer electronics e-tailer, and

6. Online shoppers who did not purchase consumer electronics products at a consumer electronics e-tailer in the past year.

Sample Size

Generally speaking, the larger the sample size, the smaller the sampling error, and the more likely the sample is representative of the target population (Grossnickle & Raskin, 2001). Structural equation modeling requires a large sample size because the estimation procedure and the estimation for the model fit are based on the assumption of a large sample size (Hair, Anderson, Tatham, & Black, 1998). Kline (1998) argued that "sample sizes that exceed 200 cases could be considered [large]" (p. 12). Hoelter (1983) asserted that a sample size of 200 was a critical sample size. Kelloway (1998) suggested that a sample size of at least 200 observations would be an appropriate minimum for structural equation modeling. Hair et al. (1998) also recommended that a size ranging from 100 to 200 is an appropriate size for model estimation. On the other hand, the *minimum sample size is at least five times as many as the observed variables for factor analysis (Hair et al., 1998). There are a total of 53 observed variables for the study (five items for customer expectations, 22 items for electronic service quality, four items for perceived value, three items for customer satisfaction, five items for customer loyalty, three items for customer complaints, and eleven items for electronic recovery service quality). Therefore, the minimum sample size for the study is 265 to meet the requirement.

The percentage of responses may be as low as 20% to 30% in mailed questionnaire studies (Best & Kahn, 2003). Because the nature of online survey studies is very similar to that of mailed questionnaire studies, the percentage of responses may also be as low as 20% to 30% in online surveys. Therefore, a large number of the initial e-mail invitations are required to ensure getting a large enough number of online survey responses.

In this study, the initial quota sample of 320 people selected by the researcher was based on the quota characteristics. Table 3-1 represents the quota characteristics of the initial sample. The first order quota, snowball sample consisted of people who received e-mail invitations from the initial sample. The second order snowball sample consisted of people who received e-mail invitations from the first order snowball samples.

Table 3-1

The Quota Characteristics and Size of the Initial Sample

		Some college or more		Less than college		Total
		Male	Female	Male	Female	
Family income less than $75K	Under 45 years old	32	32	21	21	106
	45 years old or more	20	20	15	15	70
$75K or more	Under 45 years old	26	26	17	17	86
	45 years old or more	18	18	11	11	58
	Total	96	96	64	64	320

Note. The initial quota sample was distributed according to the following characteristics: 50% male, 60% under 45 years old, 60% with some college or more, and 55% with family income less than $75,000.

The anticipated number of responses was calculated based on the following assumptions:

1. The action of forwarding e-mail invitations would be stopped at the second-order respondents.

2. The percentage of response for initial respondents, first-order respondents, or

  second-order respondents would be 20%.

3. The number of respondents for each order finishing the online survey would be

  equal to the number of those forwarding the e-mail invitations.

4. Each initial respondent would forward ten e-mail invitations; each first-order

  respondent would forward five e-mail invitations.

The projected number of respondents for data collection is presented in Table 3-2.

This projection suggested that there would be 320 respondents completing the online

survey (data-producing sample). This number meets the requirement of the minimum

sample size of 265.

Table 3-2

The Projected Number of Sample Size

	Initial	First-Order	Second-Order	Total
Receives e-mail invitation	320	640	640	1600
Forwards invitation	64	128	0	192
Takes online survey (data-producing sample)	64	128	128	320

Instrumentation

Some constructs cannot be observed directly in the social science field, and so the

researcher has to use scales to measure the theoretical constructs. The theoretical

phenomena that scales intend to measure are often called latent variables, while the

measured behavior scores are termed observed or manifest variables (Byrne, 2001). The instruments used to measure latent variables are usually in a form of self-reporting questionnaires. This study required measures of seven latent variables: electronic service quality, electronic recovery service quality, customer expectations, perceived value, customer satisfaction, customer loyalty, and customer complaints. The majority of instruments were adapted from existing scales, except the customer expectations scale, which was developed by the researcher based on the electronic service quality scale. The questionnaire consisted of a total of 70 questions in 11 sections: filter questions part A, socio-demographic questions, general questions, customer expectations, electronic service quality, perceived value, customer satisfaction, customer loyalty, customer complaints, filter questions part B, and electronic recovery service quality. The survey instruments included the *Customer Expectations Scale, Electronic Service Quality Scale, Perceived Value Scale, Customer Satisfaction Scale, Behavioral-Intentions Battery*, and *Electronic Recovery Service Quality Scale*. It took approximately 10 minutes to complete the online survey.

Filter Questions

There were two locations of filter questions in the questionnaire: three filter questions in the first section and one filter question in the tenth section (see Appendix C). All four filter questions required yes/no responses. The purpose of the first three filter questions was to make sure that the respondents fit three basic restrictions: being 18 years old or more, having been living in the continental United States in the past six months, and having had experience in purchasing consumer electronics on the Internet. The last filter question was to ensure that the respondents were eligible to answer the last section of the questionnaire regarding the experience of recovery services.

Socio-Demographic Profile

The second section of the questionnaire included a socio-demographic profile consisting of eight demographic questions. The purpose of the demographic questions was to identify the respondents' demographic characteristics. These parameters included age, gender, education, marital status, current employment status, occupation, and income. All questions in this section were multiple-choice questions. The education and occupational categories were derived from Hollingshead's 2-factor index, which are reliable and valid measures and can produce an index of social status (as cited in Miller & Salkind, 2002).

General Questions

The third section of the questionnaire consisted of five general questions. The purpose of the general questions was to identify the respondents' experiences in purchasing consumer electronics on the Internet. Three of the five questions were multiple-choice questions, whereas the remaining two questions were open-ended questions.

Customer Expectation Scale (Modified E-S-QUAL)

Description

The fourth section of the questionnaire consisted of five items for measuring customer expectations to consumer electronics e-tailers. The *Customer Expectation Scale* is a modification of *Electronic Service Quality Scale* (*E-S-QUAL*) developed by Parasuraman, Zeithaml, and Malhotra (2005). For the purposes of this study, each statement of the *E-S-QUAL* was modified to reflect what the consumer believes "should" be offered by e-tailers to online shoppers. A five-point semantic differential scale, with

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strongly disagree (1) and strongly agree (5) as anchors, was used to measure customer

expectations. The items of the *Customer Expectation Scale* are presented in Table 3-3.

Table 3-3

Items of the Customer Expectation Scale

Indicators	Items
EXPECT1	This site should be used easily and quickly.
EXPECT2	This site should fulfill its promises about order delivery and item availability.
EXPECT3	This site should function properly.
EXPECT4	This site should be safe and protect customer information.
EXPECT5	The overall expectation of service quality to the site is very high.

There was no reliability and validity for the *Customer Expectation Scale*

(*Modified E-S-QUAL*) because it was constructed for this study based on another scale.

However, reliability estimates and validity are presented in the discussion of the *E-S-QUAL*. Coefficient alphas and factor loadings were obtained for this study's data (see

Chapter IV).

Electronic Service Quality Scale (E-S-QUAL)

Description

The fifth section of the survey instrument used in this study is the *Electronic

Service Quality Scale (E-S-QUAL)*. *E-S-QUAL*, developed by Parasuraman et al. (2005),

consisting of 22 items for measuring electronic service quality on four dimensions:

efficiency (eight items), fulfillment (seven items), system availability (four items), and

privacy (three items). A five-point semantic differential scale, strongly disagree (1) and

strongly agree (5) as anchors, was used to measure electronic service quality. The items

of the *E-S-QUAL* are presented in Table 3-4.

Table 3-4

Items of the E-S-QUAL

Indicators	Items
ESQ01	This site makes it easy to find what I need.
ESQ02	This site makes it easy to get anywhere on the site.
ESQ03	This site enables me to complete a transaction quickly.
ESQ04	Information at this site is well-organized.
ESQ05	This site loads its pages fast.
ESQ06	This site is simple to use.
ESQ07	This site enables me to get on to it quickly.
ESQ08	This site is well-organized.
ESQ09	This site is always available for business.
ESQ10	This site launches and runs right away.
ESQ11	This site does not crash.
ESQ12	Pages at this site do not freeze after I enter my order information.
ESQ13	This site delivers orders when promised.
ESQ14	This site makes items available for delivery within a suitable time frame.
ESQ15	This site quickly delivers what I order.
ESQ16	This site sends out the items ordered.
ESQ17	This site has in stock the items the company claims to have.
ESQ18	This site is truthful about its offerings.
ESQ19	This site makes accurate promises about delivery of products.
ESQ20	This site protects information about my Web-shopping behavior.
ESQ21	This site does not share my personal information with other sites.
ESQ22	This site protects information about my credit card.

Reliability

Reliability is the extent of consistency that the instrument presents (Best & Kahn, 2003; Gall et al., 2003). Internal consistency as an estimate of reliability is one of four types of reliability, and is the most popular standard to measure instrument reliability. An internal consistency estimate is used to assess the consistency of results across items within a test and thus avoids the problem associated with repeated tests (Allen & Yen, 2002; Trochim, 2000c). Parasuraman et al. (2005) assessed internal consistency as an estimate of reliability when they developed *E-S-QUAL*. Coefficient alpha values ranged from .83 to .94 for the four dimensions of electronic service quality. These coefficient alpha values exceeded the minimum standard of .7 (Nunnally & Bernstein, 1994), providing good estimates of reliability.

Validity

Factorial validity is a form of construct validity that is established through factor analysis (Allen& Yen, 2002). The factor loadings in the confirmatory factor analysis reported by Parasuraman et al. (2005) ranged from .74 to .88 for the dimension of efficiency, from .64 to .81 for the dimension of system availability, from .77 to .88 for the dimension of fulfillment, and from .78 to .79 for the dimension of privacy. Factor loadings are considered practical significance if they are .50 or greater (Hair, Anderson, Tatham, & Black, 1998). Because each factor loading on each dimension was more than .50, the scale established construct validity for each dimension.

Moreover, the four dimensions of electronic service quality have consistently strong and positive correlations with perceived value (.52 to .72 and .48 to .73 for two groups of samples, respectively) and customer loyalty (.48 to .65 and .48 to .69 for two

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groups of samples, respectively). These results represent that the *E-S-QUAL* scale has established predictive validity (Parasuraman et al., 2005).

Perceived Value Scale

Description

The sixth section of the questionnaire consisted of four items to measure perceived value. Parasuraman, Zeithaml, and Malhotra (2005) developed the *Perceived Value Scale*. A ten-point semantic differential scale, with poor (1) and excellent (10) as anchors, was used for measuring perceived value. The items of the *Perceived Value Scale* are presented in Table 3-5.

Table 3-5

Items of the Perceived Value Scale

Indicators	Items
VALUE1	The price of the products and services available at this site
VALUE2	The overall convenience of using this site
VALUE3	The extent to which the site gives you a feeling of being in control
VALUE4	The overall value you get from this site for your money and effort

Reliability

The coefficient alpha values of two samples were .89 and .92 for the *Perceived Value Scale* (Parasuraman et al., 2005). The results suggested that the scale had high internal consistency, and provided good estimates of reliability.

Validity

The factor loadings reported by Parasuraman et al. (2005) in the confirmatory

factor analysis ranged from .71 to .88 and .83 to .94 for two groups of samples,

respectively. Because each factor loading on each dimension was more than .50, the

scale established construct validity (Hair et al., 1998).

Customer Satisfaction Scale

Description

The seventh section of the questionnaire consisted of three items for measuring

customer satisfaction with consumer electronics e-tailers. The *Customer Satisfaction*

Scale was adopted from the *American Customer Satisfaction Index (ACSI)* scale. The

earliest *ACSI* scale was developed through a partnership of the University of Michigan

Business School, the American Society for Quality, and the CFI Group in 1994

(American Society for Quality, 2001). This present study adopted the latest version of

the *ACSI* scale developed in 2001. This part of the questionnaire consisted of three

measures: (a) overall satisfaction, rated by respondents on a ten-point semantic

differential scale, with very dissatisfied (1) and very satisfied (10) as anchors; (b)

expectancy disconfirmation, rated by respondents on a ten-point semantic differential

scale, with falls short of expectations (1) and exceeds expectations (10); and (c)

performance versus ideal service quality, rated by respondents on a ten-point semantic

differential scale, with not very close to the ideal (1) and very close to the ideal (10). The

items of the *Customer Satisfaction Scale* are presented in Table 3-6.

Table 3-6

Items of the Customer Satisfaction Scale

Indicators	Items
CS1	Overall satisfaction
CS2	Expectancy disconfirmation
CS3	Performance versus ideal service quality

Reliability

The reliability of the *ACSI* model is determined by the scale's signal-to-noise ratio. Reliability is the ratio of the variability of the true score to the variability of the total score (ratio of signal to signal-plus-noise) (Pasta & Suhr, 2003). Signal-to-noise in the items was about 4 to 1 (American Society for Quality, 2001). The 4:1 ratio may be regarded as .80 (Pasta & Suhr, 2003), providing good estimates of reliability.

Validity

Nomological validity of the *ACSI* model was examined by the latent variable covariance, which accounted for and explained variance (R^2). On average, the structural model accounted for 94% of the latent variable covariance structure. The average R^2 of the customer satisfaction equation in the model was .75, establishing construct validity (American Society for Quality, 2001).

Customer Loyalty of the Behavioral-Intentions Battery

Description

The eighth section of the questionnaire consisted of five items for measuring customer loyalty of consumer electronics e-tailers. The customer loyalty scale was

adopted from the modified *Behavioral-Intentions Battery* scale, developed by
Parasuraman et al. in 2005, while Zeithaml, Berry, and Parasuraman developed the
original scale in 1996. A five-point semantic differential scale, very unlikely (1) and very
likely (5) as anchors, was used for measuring customer loyalty. The items of the
Customer Loyalty Scale are presented in Table 3-7.

Table 3-7

Items of the Customer Loyalty Scale

Indicators	Items
LOYALTY1	Say positive things about this site to other people.
LOYALTY2	Recommend this site to someone who seeks your advice.
LOYALTY3	Encourage friends and others to do business with this site.
LOYALTY4	Consider this site to be your first choice for future transactions.
LOYALTY5	Do more business with this site in the coming months.

Reliability

The coefficient alpha values of two samples were .93 and .96 for customer loyalty
(Parasuraman et al., 2005). These results suggested that the scale had high internal
consistency, and provided good estimates of reliability.

Validity

The factor loadings in the confirmatory factor analysis ranged from .73 to .95
and .84 to .95 for two groups of samples, respectively (Parasuraman et al., 2005).
Because each factor loading on each dimension was more than .50, the scale established
construct validity (Hair et al., 1998).

Customer Complaints of the Behavioral-Intentions Battery

Description

The ninth section of the questionnaire consisted of three items measuring

customer complaints of consumer electronics e-tailers. The *Customer Complaints Scale*

was adopted from the Behavioral-Intentions Battery scale, developed by Zeithaml, Berry,

and Parasuraman in 1996. This part of the questionnaire for the present study excluded

the dimension of internal response because this dimension lacked validity (Zeithaml et al.,

1996). The dimension of external response consisted of three items, measured on a

seven-point semantic differential scale with not at all likely (1) and extremely likely (7)

as anchors. The items of the *Customer Complaints Scale* are presented in Table 3-8.

Table 3-8

Items of the Customer Complaints of the Behavioral-Intentions Battery

Indicators	Items
COMPLAI1	Switch to a competitor if you experience a problem with the web site.
COMPLAI2	Complain to other customers if you experience a problem with the web site.
COMPLAI3	Complain to external agencies, such as the Better Business Bureau, if you experience a problem with the web site.

Reliability

The coefficient alpha value of the external response dimension was .70 (Zeithaml

et al., 1996). The value barely matches the minimum standard of .7 (Nunnally &

Bernstein, 1994), suggesting acceptable internal consistency as an estimate of reliability.

Validity

The factor loadings in the confirmatory factor analysis ranged from .74 to .79 for the dimension of external response (Zeithaml et al., 1996). Because each factor loading on this dimension was more than .50, the scale established construct validity (Hair et al., 1998).

Electronic Recovery Service Quality Scale (E-RecS-Qual)

Description

The last section of the survey instrument used in this study was the *Electronic Recovery Service Quality Scale (E-RecS-Qual)*. *E-RecS-QUAL*, also developed by Parasuraman, Zeithaml, and Malhotra (2005), which consisted of 11 items for measuring electronic recovery service quality on three dimensions: responsiveness (five items), compensation (three items), and contact (three items). These items were measured on a five-point semantic differential scale, with strongly disagree (1) and strongly agree (5) as anchors. The items of the *E-RecS-QUAL* are presented in Table 3-9.

Table 3-9

Items of the E-RecS-QUAL

Indicators	Items
ERecSQ01	This site provides me with convenient options for returning items.
ERecSQ02	This site handles product returns well.
ERecSQ03	This site offers a meaningful guarantee.
ERecSQ04	This site tells me what to do if my transaction is not processed.
ERecSQ05	This site takes care of problems promptly.
ERecSQ06	This site compensates me for problems it creates.
ERecSQ07	This site compensates me when what I ordered doesn't arrive on time.
ERecSQ08	This site picks up items I want to return from my home or business.
ERecSQ09	This site provides a telephone number to reach the company.
ERecSQ10	This site has customer service representatives available online.
ERecSQ11	This site offers the ability to speak to a live person if there is a problem.

Reliability

The coefficient alpha values ranged from .77 to .88 for *E-RecS-QUAL* (Parasuraman et al., 2005). These results suggested that the scale had high internal consistency, and provided good estimates of reliability.

Validity

The factor loadings in the confirmatory factor analysis ranged from .63 to .84 for the dimension of responsiveness, from .54 to .89 for the dimension of compensation, and from .62 to .87 for the dimension of contact (Parasuraman et al., 2005). Because each factor loading on each dimension was more than .50, the scale established high construct validity (Hair et al., 1998).

Procedures: Ethical Considerations and Data Collection Methods

1. Obtaining permission to use scales adopted in this study was the first required action before collecting data (see Appendixes F to I).

2. An online survey was created and posted on a Web site (see Appendix D). The Web site contained consent information, purpose, procedure, possible risks, possible benefits, assurance of anonymity, access to consent form, instructions, and survey instrument. The Web site was not accessible until the study was approved by the Lynn University Institutional Review Board (IRB). The date of accessibility was August 4, 2005.

3. The third required action was receiving approval from the Institutional Review Board of Lynn University (see Appendix A).

4. The following process was used to send an e-mail to the initial quota sample.

   a. The content of the e-mail included the invitation to do the online survey, the link to the online survey, and a request for forwarding the survey-inviting e-mail to respondents' friends.

   b. The invitation e-mail was sent by using the Blind Carbon Copy (Bcc) feature (see Appendix E). When an e-mail is sent by the Bcc feature, the Bcc recipients are unable to know who receives the message as well. In other words, the mailing list is not known to any of the recipients (Brevard User's Group Computer Club, 2002).

   c. The e-mail included a message that strongly suggested recipients use the Bcc feature when forwarding the e-mail.

   d. The action of forwarding the e-mail was a voluntary behavior. The

researcher did not know who forwarded the e-mail or who did not.

e. The e-mail was sent in a plain text format, not as an e-mail attachment, to prevent recipients' mail server from affecting any viruses or blocking e-mails.

f. If the subject agreed to participate in the online survey, the subject would click the link of the online survey provided in the e-mail invitation and then would click the "Yes, I agree to participate in this study" to start filling in the online survey in the consent form page.

g. The online survey page would show up only if the respondent clicked the "Yes, I agree to participate in this study" option in the consent form page (see Appendix B).

h. The estimated time for respondents to complete the online survey was approximately 10 minutes.

i. Participation in this study was voluntary and all the responses were reported as a group. Once again, the researcher did not know who completed the survey or who did not. Participants were anonymous to the researcher.

j. The respondents submitted the survey by clicking a submit button after completing the survey.

5. The Web site did not track respondents' IP address or any personal identification information.

6. The data collection process was conducted for two months.

7. The start date was the date after this study was approved by IRB (August 4,

2005) and completion date was two months after the date for starting data collection (October 3, 2005).

8. The online questionnaires were removed at 11:59 pm eastern time on the last day of data collection (October 3, 2005).

9. At the completion of data collection, the principal investigator submitted the Lynn University IRB Report of Termination of Project.

10. Data were analyzed by using AMOS 5.0 and SPSS 11.5.

11. The data were kept confidential and stored electronically on "password protected" computers.

12. The data will be destroyed after five years.

Method of Data Analysis

The data collected from the online survey were analyzed using the statistical software of SPSS 11.5 and AMOS 5.0. The methods of data analysis included descriptive statistics, exploratory factor analysis, and structural equation modeling (SEM) analysis.

Descriptive Statistics

Descriptive statistics were used to examine the demographic characteristics and the sample's experiences in purchasing consumer electronics products on the Internet. Frequency distributions and measures of central tendency were reported.

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is a statistical method to determine the relationships between the observed (manifest) variables and the constructs, which are also called latent variables (Byrne, 2001). Since the survey instrument consisted of items

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from existing scales, confirmatory factor analysis may reduce data dimensionality and create appropriate dimensions for the hypothesized model.

Factor loading was used as the criteria for item reduction. Factor loading is the correlation of each variable and the factor. Factor loadings greater than ± .30 are considered to meet the minimal level of practical significance (Hair, Anderson, Tatham, & Black, 1998). However, the assessment of statistical significance is influenced by the sample size. For a sample size of 250 or greater, a factor loading of .35 is required for statistical significance based on a .05 significance level (α), a power level of 80 percent, and standard errors assumed to be twice those of conventional correlation coefficients (c) (Hair et al., 1998). Because the sample size for the study was greater than 250, items with a factor loading less than .35 were deleted from the item pool.

Structural Equation Modeling (SEM)

Structural equation modeling (SEM) is a statistical methodology with a confirmatory approach to analyze multivariate data (Byrne, 2001; Chiou, 2004). The general SEM model is composed of two sub-models: a measurement model and a structural model. The measurement model identifies relations between the observed and latent variables. By means of confirmatory factor analysis, the measurement model provides the link between scores on an instrument and the constructs that they are designed to measure. The structural model identifies causal relations among the latent variables. It specifies that particular latent variables directly or indirectly influence certain other latent variables in the model (Byrne, 2001).

Hair et al. (1998) suggested a seven-stage process for the application of structural equation modeling. The seven stages are (1) developing a theoretically based model, (2)

construction of a path diagram of causal relationships, (3) converting the path diagram into a set of structural and measurement models, (4) choosing the input matrix type and estimating the proposed model, (5) assessing the identification of the structural model, (6) evaluating goodness-of-fit criteria, and (7) interpreting and modifying the model, if theoretically justified. These stages were the guidelines for testing the hypothesized model in this study.

Stages One through Three: Developing a Theoretically Based Model, Constructing a Path Diagram, and Converting the Path Diagram

Stages one through three have been addressed in the preceding sections. The development of a theoretically based model for stage one is presented in "Theoretical Framework" in Chapter II. The construction of a path diagram of causal relationships for stage two is presented in Figure 2-3 in Chapter II. The determination of the number of indicators for stage three is presented in Chapter III. Stages four through seven are used for measurement model and structure model assessments.

Stage Four: Choosing the Input Matrix Type and Estimating the Proposed Model

Stage four involves choosing the input matrix type and estimating the proposed model. The input matrix type for SEM can be either variance-covariance or correlation matrix. The correlation matrix can be used when the research aim is to understand the pattern of relations between constructs (Hair et al., 1998). However, the correlation matrix may not be able to perform an accurate significance test when standardized variables are analyzed (Kline, 1998). The covariance matrix is more appropriate when the research intends to test theory (Schumacker & Lomax, 2004). Because this study is concerned with the test of theoretical relationships between constructs, the covariance matrix is appropriate.

Maximum likelihood (ML) estimation, the most common estimation procedure, is the default model estimation method in AMOS 5.0. The maximum likelihood estimation is efficient and unbiased when the assumption of multivariate normality is met (Hair et al., 1998). If a large sample is obtained but multivariate normality is not assumed, generalized least squares (GLS) estimation is the appropriate method of choice. This study was conducted under the assumption of multivariate normality; therefore, ML estimation was the model estimation method used in this study.

Stage Five: Assessing the Identification of the Structural Model

During the estimation process, a problem in the identification of the structural model may cause the computer program, such as AMOS, to produce meaningless results. "An identification problem ... is the inability of the proposed model to generate unique estimates" (Hair et al., 1998, p. 608). Hair et al. (1998) suggested that the possible symptoms of an identification problem include:

(1) Very large standard errors for one or more coefficients, (2) the inability of the program to invert the information matrix, (3) wildly unreasonable estimates or impossible estimates such as negative error variances, or (4) high correlations (.90 or greater) among the estimated coefficients. (p. 609)

Hair et al. (1998) also suggested that the only solution for an identification problem is the elimination of some of the estimated coefficients so that the process should gradually delete paths from the path diagram until the problem is remedied.

Stage Six: Evaluating Goodness-of-Fit Criteria

It is not easy to use a single statistical test to fully describe the intensity of a model's prediction. Researchers have developed several goodness-of-fit measures from

three perspectives: overall fit (absolute fit measures), comparative fit to a base model

(incremental fit measures), and model parsimony (parsimonious fit measures) (Hair et al.,

1998). An absolute fit measure is used to determine the degree to which the overall

model (structural and measurement models) fits the sample data. An incremental fit

measure is used to compare the proposed model to a baseline model. A parsimonious fit

measure is used to diagnose whether model fit has been achieved by over-fitting the data

with too many coefficients (Hair et al., 1998).

Absolute fit measures. The most commonly used absolute fit measures are chi-

square test (χ^2), χ^2 / degrees of freedom (χ^2 / df) ratio, the goodness-of-fit index (GFI), and

root mean square error of approximation (RMSEA). The chi-square statistic is the most

fundamental measure of overall fit. A large value of chi-square relative to the degree of

freedom indicates that there is a significant difference between the observed and

estimated covariance matrices. Low chi-square values indicate that the proposed model

fit the sample data. However, the chi-square measure is heavily influenced by sample

size (Byrne, 2001). A chi-square value cannot be the sole determinant in model fit.

An alternative index that avoids the problem from the chi-square measure is χ^2 /

degrees of freedom ratio. The χ^2 / df ratios that are between 2 and 5 indicate a good fit to

the data (Kelloway, 1998). The goodness-of-fit index (GFI) presents the overall degree

of fit. The GFI ranges from 0 to 1, with values exceeding 0.9 indicating a good fit to the

sample data. Based on the analysis of residuals, the RMSEA is the discrepancy per

degree of freedom (Byrne, 2001; Hair et al., 1998; Kelloway, 1998). The RMSEA values

with ranges from 0.05 to 0.08 are considered acceptable.

Incremental fit measures. The second group of measures includes adjusted good-of-fit index (AGFI), the Tucker-Lewis index (TLI), normed fit index (NFI), and comparative fit index (CFI). The incremental fit measures are used to compare the proposed model to the baseline model. The AGFI is a modification of the GFI, adjusted by the number of degrees of freedom in the specified model. The AGFI also ranges from 0 to 1, with values above 0.9 indicating a good fit to the data. The NFI, one of the most popular measures, is a measure ranging from 0 (no fit at all) to 1.0 (perfect fit). A commonly recommended NFI value is 0.90 or greater. The TLI, also known as the nonnormed fit index (NNFI), adjusts the NFI for the number of degrees of freedom in the model. As with the NFI, a recommended TLI value is 0.90 or greater. The CFI represents comparisons between the estimated model and an independence model. The CFI values also range from 0 to 1.0, with values exceeding 0.90 indicating a good fit to the data. The CFI has been found to be more appropriate in a model development strategy or when a smaller sample is available (Rigdon, 1996).

Parsimonious fit measures. The third group of measures includes parsimonious normed fit index (PNFI) and parsimonious goodness-of-fit index (PGFI). The PNFI adjusts the NFI for model parsimony. Similarly, The PGFI adjusts the GFI for the degrees of freedom in the model. Both the PNFI and the PGFI range from 0 to 1.0, with larger values indicating a more parsimonious fit.

Stage Seven: Interpreting and Modifying the Model

Once the model is assessed by goodness-of-fit measures, the next step is to examine the results for their correspondence to the theory. Furthermore, model respecification is used for improving model fit. The researcher should classify all

relationships in the model into one of two categories: theoretical or empirical. Model respecification is not applicable for theoretical relationships but for empirical relationships. Modification indices (MIs) usually help the researcher access the fit of a model when model respecification is needed. "The modification index value corresponds approximately to the reduction in chi-square that would occur if the coefficient were estimated" (Hair et al., 1998, p. 615). However, the researcher should never modify the model based solely on the MIs. A theoretical justification must be taken into account prior to any model modification (Hair et al., 1998).

Evaluation of Research Methods

The evaluation of research methods for this study is as follows:

1. The strengths of the snowball sampling are cost-efficiency and time-saving.

2. Snowball sampling allows researchers to reach the potential qualified respondents by the distribution of interpersonal relationships.

3. Quota sampling strengthens the chances the sample is more representative of the population.

4. The weaknesses of quota and snowball sampling are that they are non-random, and can introduce sampling bias, threatening external validity.

5. The analyzed results may be difficult to generalize to the target population, thus affecting external validity.

6. Generalizing findings to the target population is dependent upon how closely the final data producing sample represents the "quota."

7. The instruments used in this study have evidence of good estimates of reliability and validity, contributing to the study's internal validity.

8. The statistical procedures used in data analysis (structural equations modeling) are rigorous, and thus strengthen internal validity of the study findings.

Chapter III presented the research methodology that addressed the research hypotheses about relationships among customer expectations, electronic service quality, customer satisfaction, perceived value, customer loyalty, customer complaints, and electronic recovery service quality for consumer electronics e-tailers. This chapter included a description of the research design, the sampling plan, instrumentation, ethical considerations, data collection procedures, methods of data analysis, and evaluation of research methods. Chapter IV presents the results of this study.

CHAPTER IV

RESULTS

In this study about the relationships among service quality, customer satisfaction, and loyalty for consumer electronics e-tailers, the results are presented. Chapter IV presents tests of hypotheses and other findings from this study. Methods of data analysis include descriptive statistics and structural equation modeling. The reliability and validity of the measurement scales are also examined and reported.

Socio-Demographic Characteristics of the Final Data-Producing Sample

Among the 359 respondents who participated in the online survey, 20 respondents had not lived in the continental United States for at least six months in the past year, 52 respondents had not purchased online electronic products within the past year, nine respondents did not finish the online survey, and two respondents had made their last purchase more than one year ago. This resulted in a total of 276 valid responses used in the data analysis procedures. Table 4-1 presents the frequency and percentage of valid and invalid responses.

Table 4-1

Summary of Responses to the Online Survey

Responses	Frequency	Percentage
Valid	276	76.9%
Invalid		
Did not live in the U.S.	20	5.6%
Did not purchase online electronic products	52	14.5%
Incomplete responses	9	2.5%
Made last purchase more than one year ago	2	0.5%
Total	359	100.0%

The respondents consisted of 60.2% males and 39.8% female, with an age range from 18 to 75. The average of the respondents' age was 35.23, with a standard deviation of 10.9 years. The largest age group of respondents was between 26 and 35 years old (47.0%) and the smallest age group was 66 years old or more (1.5%). The majority of respondents were married (51.8%), while the second largest group of marital status was single (41.3%). Table 4-2 presents the frequency distribution of the respondents' gender, age, and marital status.

Table 4-2

Socio-Demographic Characteristics of the Sample by Gender, Age, and Marital Status

Demographic variables	Frequency	Valid percentage
Gender (n = 274)		
Male	165	60.2%
Female	109	39.8%
Age[a] (n = 268)		
18-25	45	16.8%
26-35	126	47.0%
36-45	52	19.4%
46-55	30	11.2%
56-65	11	4.1%
66 or more	4	1.5%
Marital Status (n = 276)		
Single/Never Married	114	41.3%
Married	143	51.8%
Separated	5	1.8%
Divorced	13	4.7%
Widowed	1	0.4%

[a]The average age was 35.23 years old, and the standard deviation is 10.9.

Most of the respondents were employed full-time (79.7%). The largest occupational group was "business managers" (26.3%), and the second largest group was "administrative personnel" (23.0%). Of all respondents, more than 90% completed some higher education. The largest educational group was "professional/graduate" (40.6%), whereas the second largest educational group, which was slightly fewer than the largest group, was "four-year college graduate" (40.2%). Social status was measured by Hollingshead's Index of Social Position (ISP), which is composed of weighted scores from the education and occupation scales. "Upper-middle class" (50.2%) was the largest group, and the second largest group was "middle class" (24.1%). Table 4-3 presents the frequency distribution of the respondents' employment status, occupation, education, and Index of Social Position using Hollingshead's Two-Factor Index.

Table 4-3

Socio-Demographic Characteristics of the Sample by Employment Status, Occupation, Education, and Social Status

Demographic variables	Frequency	Valid percentage
Employment Status (n = 276)		
Full-time	220	79.7%
Part-time	33	12.0%
Unemployed (Seeking employment)	7	2.5%
Unemployed (Not seeking employment)	16	5.8%
Hollingshead's Occupation Scale (n = 274) (Scales score 1-7)		
1. Higher executives	56	20.4%
2. Business managers	72	26.3%
3. Administrative personnel	63	23.0%
4. Clerical and sales workers	28	10.2%
5. Skilled manual employees	29	10.6%
6. Machine operators	1	0.4%
7. Unskilled employees	4	1.5%
Other[a]	21	7.7%
Hollingshead's Education Scale (n = 276) (Scale score 1-7)		
1. Professional/Graduate	112	40.6%
2. Four-year college graduate	111	40.2%
3. One to three years college	40	14.5%
4. High school graduate	13	4.7%
5-7 Categories with less than high school	0	0.0%
Hollingshead Index of Social Position (ISP) (n = 253) (Occupational Scale * 7) + (Educational Scale * 4)		
1. Upper (11-17)	55	21.7%
2. Upper-middle (18-31)	127	50.2%
3. Middle (32-47)	61	24.1%
4. Lower-middle (48-63)	10	4.0%
5. Lower (64-77)	0	0.0%

[a]There were 20 students and one retired senior citizen in this category.

The largest group of annual household income was between $60,000 and $74,999 (19.4%), with 60% of respondents' annual household income being less than $75,000 and 40% of that being more than $75,000. The majority of respondents earned between $30,000 and $44,999 per year (22.4%), and the second largest group of annual personal income was between $45,000 and $59,999 (21.7%). Table 4-4 presents the frequency distribution of the respondents' annual household and personal income.

Table 4-4

Socio-Demographic Characteristics of the Sample by Annual Household and Personal Income

Demographic variables	Frequency	Valid percentage
Annual Household Income (n = 273)		
Less than $15,000	11	4.0%
$ 15,000-$ 29,999	18	6.6%
$ 30,000-$ 44,999	38	13.9%
$ 45,000-$ 59,999	44	16.1%
$ 60,000-$ 74,999	53	19.4%
$ 75,000-$ 89,999	39	14.3%
$ 90,000-$104,999	13	4.8%
$105,000-$119,999	18	6.6%
$120,000-$134,999	7	2.6%
$135,000 or more	32	11.7%
Annual Personal Income (n = 272)		
Less than $ 15,000	33	12.1%
$ 15,000-$ 29,999	40	14.7%
$ 30,000-$ 44,999	61	22.4%
$ 45,000-$ 59,999	59	21.7%
$ 60,000-$ 74,999	37	13.6%
$ 75,000-$ 89,999	14	5.1%
$ 90,000-$104,999	6	2.2%
$105,000-$119,999	5	1.8%
$120,000-$134,999	4	1.5%
$135,000 or more	13	4.8%

The initial quota sample was distributed according to the following characteristics: 50% male, 60% under 45 years old, 60% some college or more, and 55% family (household) income less than $75,000 (see Table 3-1 in Chapter III). The socio-demographic characteristics of the final data-producing sample were 60% male, 83% under 45 years old, 95% some college or more, and 60% family income less than $75,000. To assess the representativeness of the final data-producing sample with the target population, and implications for external validity, the percentage difference in four demographic characteristics between the data-producing sample and the initial quota sample were analyzed. For the characteristic of gender, the percentage difference was 10%. For the characteristic of age, the percentage difference was 23% (under-representing those 45 and over). For the characteristic of education, the percentage difference was 35% (under-representing those with less than some college). For the characteristic of family income, the percentage difference was 5%. The results indicated that the characteristics of the final data-producing sample in gender and family income had good representativeness with the initial quota sample, but not with the characteristics of age and education. Table 4-5 presents the comparison of characteristics of the initial quota sample with the final data-producing sample.

Table 4-5

Comparison of Characteristics of Initial Quota Sample with Final Data-Producing Sample

Variable	Quota sample (N = 320)	Quota sample (%)	Final data-producing sample (N = 268-276)	Final data-producing sample (%)	Percentage difference (data-producing sample – quota sample)
Age			n = 268		
Under 45	192	60%	223	83%	+23%
45 and older	128	40%	45	17%	- 23%
Gender			n = 274		
Male	160	50%	165	60%	+10%
Female	160	50%	109	40%	- 10%
Education			n = 276		
No college	128	40%	13	5%	- 35%
Some college or more	192	60%	263	95%	+35%
Family Income			n = 273		
Less than $75K	176	55%	164	60%	+5%
$75K or more	144	45%	109	40%	- 5%

Online-Purchasing Characteristics of the Sample

The online-purchasing behaviors of the sample, by electronic product category of purchases, are presented in Table 4-6. Of the 276 respondents, 149 (54%) purchased IT products within the past year, and nearly half (49.6%) purchased accessories for electronic products. Home networking was the third most popular product category with 104 (37.7%) respondents having purchased home networking products within the past year. The least purchased product category was mobile electronics, with 27 (9.8%) respondents.

Table 4-6

Online-Purchasing Behaviors of the Sample by Electronic Product Category (N = 276)

Online-purchasing behaviors	Frequency	Valid percentage
Purchased Accessories		
Yes	137	49.6%
No	139	50.4%
Purchased Audio Components		
Yes	72	26.1%
No	204	73.9%
Purchased Electronic Gaming		
Yes	52	18.8%
No	224	81.2%
Purchased Home Networking		
Yes	104	37.7%
No	172	62.3%
Purchased Home Theater		
Yes	49	17.8%
No	227	82.2%
Purchased IT/Tech Office Product		
Yes	149	54.0%
No	127	46.0%
Purchased Mobile Electronics		
Yes	27	9.8%
No	249	90.2%
Purchased Video Components		
Yes	78	28.3%
No	198	71.7%
Purchased Wireless Communications		
Yes	87	31.5%
No	189	68.5%

The online-purchasing behaviors of the sample by purchasing frequency, last purchase, annual spending, and negative experiences are presented in Table 4-7. The

majority of respondents purchased electronics products online less than once a month (71.8%). The largest group of last purchases made was "six months to one year ago" (25.6%). The largest group of annual spending for consumer electronics online purchases was $100-$300 (26.5%), and the second largest group was $300-$500 (22.1%). Few respondents spent more than two thousand dollars in purchasing electronics products on the Internet within the last year. Less than a half of respondents (43.8%) had negative experiences while online shopping for consumer electronics products.

Table 4-7

Online-Purchasing Behaviors of the Sample by Purchasing Frequency, Last Purchase, Annual Spending, and Negative Experiences

Online-purchasing behaviors	Frequency	Valid percentage
Purchasing Frequency (n = 273)		
4 or more times per month	12	4.4%
1-3 times a month	65	23.8%
Less than once a month	196	71.8%
Last Purchase (n = 273)		
Less than one week ago	32	11.7%
One week to one month ago	66	24.2%
One month to three months ago	63	23.1%
Three months to six months ago	42	15.4%
Six months to one year ago	70	25.6%
Annual Spending (n = 272)		
Less than $100	23	8.5%
$ 101-$ 300	72	26.5%
$ 301-$ 500	60	22.1%
$ 501-$ 750	38	14.0%
$ 751-$1,000	38	14.0%
$1,001-$1,500	15	5.5%
$1,501-$2,000	17	6.3%
$2,001 or more	9	3.3%
Negative experiences (n = 276)		
Yes	121	43.8%
No	155	56.2%

Descriptive Analysis of Measurement Scales

Descriptive Analysis of Customer Expectations

The *Customer Expectation Scale* consisted of five items, modified from the E-S-QUAL developed by Parasuraman, Zeithaml, and Malhotra (2005). Respondents were asked to provide answers to each item, which was measured by a five-point semantic differential scale, ranging from 1 being "strongly disagree" to 5 being "strongly agree." Higher mean scores indicate higher expectations to consumer electronic e-tailers.

The average *Customer Expectation Scale* total score was 21.81, with a possible range of 5 to 25. The average item score for *Customer Expectation Scale* was 4.36. The item with the highest average score was "the site should be safe and protect customer information" ($M = 4.43$, $SD = 1.08$). The item with the lowest average score was "the overall expectation of service quality to the site is very high" ($M = 4.28$, $SD = 1.05$). Table 4-8 presents the results of analysis of descriptive statistics for the customer expectation items.

Table 4-8

Descriptive Analysis of Customer Expectation Items (N = 276)

Indicators	Items	Mean	Standard deviation
EXPECT1	This site should be used easily and quickly.	4.37	1.04
EXPECT2	This site should fulfill its promises about order delivery and item availability.	4.37	1.08
EXPECT3	This site should function properly.	4.36	1.08
EXPECT4	This site should be safe and protect customer information.	4.43	1.08
EXPECT5	The overall expectation of service quality to the site is very high.	4.28	1.05
Average item score for *Customer Expectation Scale*		4.36	
Total score (possible range 5-25)		21.81	

Note. Customer expectations was measured by a five-point semantic differential scale, with strongly disagree (1) and strongly agree (5) as anchors.

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Descriptive Analysis of Electronic Service Quality

The *Electronic Service Quality Scale (E-S-QUAL)* developed by Parasuraman, Zeithaml, and Malhotra (2005), contained 22 items explaining four subscale dimensions: efficiency, fulfillment, system availability, and privacy. Respondents were asked to indicate their answers to each item measured by a five-point semantic differential scale, ranging from 1 being "strongly disagree" to 5 being "strongly agree." Higher mean scores indicate higher perceived service quality.

The average *E-S-QUAL* total score was 93.07, with a possible range of 22 to 110, and the average item score for the *E-S-QUAL* scale was 4.23. The dimension with the highest mean score was system availability and the dimension with the lowest mean score was efficiency. The score of the efficiency dimension was 33.61, with a possible range of 8 to 40, and the average item score for the efficiency dimension was 4.20. The score of the system availability dimension was 17.09, with a possible range of 4 to 20, and the average item score for the system availability dimension was 4.27. The score of the fulfillment dimension was 29.64, with a possible range of 7 to 35, and the average item score for the fulfillment dimension was 4.23. The score of the privacy dimension was 12.74, with a possible range of 3 to 15, and the average item score for the privacy dimension was 4.25.

The item with the highest mean score was "pages at this site do not freeze after I enter my order information" (M = 4.35, SD = 0.98), followed by "making accurate promises about delivery of products" (M = 4.31, SD = 1.02). The item with the lowest mean score was "being well-organized" (M = 4.15, SD = 1.03). The results of analysis of descriptive statistics for the electronic service quality items are presented in Table 4-9.

Table 4-9

Descriptive Analysis of Electronic Service Quality Items (N = 276)

Indicators	Items	Mean	Standard deviation
Efficiency		4.20	
ESQ01	This site makes it easy to find what I need.	4.25	0.98
ESQ02	This site makes it easy to get anywhere on the site.	4.19	1.00
ESQ03	This site enables me to complete a transaction quickly.	4.26	1.03
ESQ04	Information at this site is well-organized.	4.20	1.00
ESQ05	This site loads its pages fast.	4.18	1.03
ESQ06	This site is simple to use.	4.19	0.99
ESQ07	This site enables me to get on to it quickly.	4.19	1.03
ESQ08	This site is well-organized.	4.15	1.03
Efficiency Dimension score (possible range 8-40)		33.61	
System Availability		4.27	
ESQ09	This site is always available for business.	4.25	1.02
ESQ10	This site launches and runs right away.	4.18	1.08
ESQ11	This site does not crash.	4.30	1.01
ESQ12	Pages at this site do not freeze after I enter my order information.	4.35	0.98
System Availability Dimension score (possible range 4-20)		17.09	
Fulfillment		4.23	
ESQ13	This site delivers orders when promised.	4.28	1.02
ESQ14	This site makes items available for delivery within a suitable time frame.	4.26	1.04
ESQ15	This site quickly delivers what I order.	4.16	1.09
ESQ16	This site sends out the items ordered.	4.24	1.10
ESQ17	This site has in stock the items the company claims to have.	4.16	1.04
ESQ18	This site is truthful about its offerings.	4.22	1.08
ESQ19	This site makes accurate promises about delivery of products.	4.31	1.02
Fulfillment Dimension score (possible range 7-35)		29.64	
Privacy		4.25	
ESQ20	This site protects information about my Web-shopping behavior.	4.21	1.01
ESQ21	This site does not share my personal information with other sites.	4.23	1.07
ESQ22	This site protects information about my credit card.	4.30	1.05
Privacy Dimension score (possible range 3-15)		12.74	
Average item score for the *E-S-QUAL* scale		4.23	
Total score (possible range 22-110)		93.07	

Note. Electronic service quality was measured by a five-point semantic differential scale, with strongly disagree (1) and strongly agree (5) as anchors.

Descriptive Analysis of Perceived Value

The *Perceived Value Scale*, developed by Parasuraman, Zeithaml, and Malhotra (2005), consisted of four items reflecting a trade-off between price and service quality. A total of four items was measured by a ten-point semantic differential scale, ranging from 1 being "poor" to 10 being "excellent". Higher mean scores indicate higher perceived value.

The average *Perceived Value Scale* total score was 30.10, with a possible range of 4 to 40. The average item score for *Perceived Value Scale* was 7.53. The item with the highest average score was "the overall value getting from this site for money and effort" ($M = 7.60$, $SD = 2.04$). The item with the lowest average score was "the extent to which the site gives you a feeling of being in control" ($M = 7.41$, $SD = 2.01$). The results of analysis of descriptive statistics for perceived value are presented in Table 4-10.

Table 4-10

Descriptive Analysis of Perceived Value Items (N = 276)

Indicators	Items	Mean	Standard deviation
VALUE1	The price of the products and services available at this site	7.52	1.99
VALUE2	The overall convenience of using this site	7.57	1.89
VALUE3	The extent to which the site gives you a feeling of being in control	7.41	2.01
VALUE4	The overall value you get from this site for your money and effort	7.60	2.04
Average item score for the *Perceived Value Scale*		7.53	
Total score (possible range 4-40)		30.10	

Note. Perceived value was measured by a ten-point semantic differential scale, with poor (1) and excellent (10) as anchors.

Descriptive Analysis of Customer Satisfaction

The *Customer Satisfaction Scale* consisted of three items reflecting a trade-off between price and service quality. The scale was developed through a partnership of the University of Michigan Business School, American Society for Quality, and CFI Group in 2001 (American Society for Quality, 2001). A total of three items was measured by a ten-point semantic differential scale, ranging from 1 to 10. The higher mean scores indicate higher customer satisfaction.

The average *Customer Satisfaction Scale* total score was 21.96, with a possible range of 3 to 30. The average item score for *Customer Satisfaction Scale* was 7.32. The item with the highest average score was "overall satisfaction" (M = 7.51, SD = 1.65). The item with the lowest average score was "expectancy disconfirmation" (M = 7.16, SD = 1.70). Table 4-11 presents the results of analysis of descriptive statistics for customer satisfaction.

Table 4-11

Descriptive Analysis of Customer Satisfaction Items (N = 276)

Indicators	Items	Mean	Standard deviation
CS1	Overall satisfaction[a]	7.51	1.65
CS2	Expectancy disconfirmation[b]	7.16	1.70
CS3	Performance versus ideal service quality[c]	7.29	1.67
Average item score for the *Customer Satisfaction Scale*		7.32	
Total score (possible range 3-30)		21.96	

Note. Customer satisfaction was measured by a ten-point semantic differential scale.
[a]Overall satisfaction was rated with very dissatisfied (1) and very satisfied (10) as anchors.
[b]Expectancy disconfirmation was rated with falls short of expectations (1) and exceeds expectations (10) as anchors.
[c]Performance versus ideal service quality was rated with not very close to the ideal (1) and very close to the ideal (10) as anchors.

Descriptive Analysis of Customer Loyalty

The *Customer Loyalty Scale* consisted of five items, developed by Parasuraman, Zeithaml, and Malhotra (2005). Respondents were asked to provide answers to each item that was measured by a five-point semantic differential scale ranging from 1 being "very unlikely" to 5 being "very likely." Higher mean scores are interpreted as respondents' favorable repurchase intention toward consumer electronics e-tailers.

The average *Customer Loyalty Scale* total score was 19.20, with a possible range of 5 to 25. The average item score for *Customer Loyalty Scale* was 3.84. The item with the highest average score was "recommend this site to someone who seeks your advice" (M = 3.93, SD = 0.97). The item with the lowest average score was "do more business with this site in the coming months" (M = 3.75, SD = 1.09). Table 4-12 presents the results of analysis of descriptive statistics for the customer loyalty.

Table 4-12

Descriptive Analysis of Customer Loyalty Items (N = 276)

Indicators	Items	Mean	Standard deviation
LOYALTY1	Say positive things about this site to other people.	3.80	1.05
LOYALTY2	Recommend this site to someone who seeks your advice.	3.93	0.97
LOYALTY3	Encourage friends and others to do business with this site.	3.82	1.03
LOYALTY4	Consider this site to be your first choice for future transactions.	3.89	1.06
LOYALTY5	Do more business with this site in the coming months.	3.75	1.09
Average item score for the *Customer Loyalty Scale*		3.84	
Total score (possible range 5-25)		19.20	

Note. Customer loyalty was measured by a five-point semantic differential scale, with very unlikely (1) and very likely (5) as anchors.

Descriptive Analysis of Customer Complaints

The *Customer Complaints Scale* which was developed by Zeithaml, Berry, and Parasuraman in 1996, contained three items: switching to a competitor, complaining to other customers, and complaining to external agencies. Respondents were asked to indicate their answers to each item on a seven-point semantic differential scale, ranging from 1 being "not at all likely" to 7 being "extremely likely." All three items on this measurement scale were reverse-scored. Consequently, lower mean scores were interpreted as respondents' unfavorable repurchase intention toward consumer electronics e-tailers, and higher mean scores were seen as favorable intentions to repurchase.

The average *Customer Complaint Scale* total score was 8.97, with a possible range of 3 to 21. The average item score for *Customer Complaint Scale* was 2.99. The item with the highest average score was "complain to external agencies" (M = 3.58, SD = 1.83). The item with the lowest average score was "switch to a competitor" (M = 2.61, SD = 1.47). Table 4-13 presents the results of analysis of descriptive statistics for customer complaints.

Table 4-13

Descriptive Analysis of Customer Complaint Items (N = 276)

Indicators	Items	Mean	Standard deviation
COMPLAI1	Switch to a competitor if you experience a problem with the web site.	2.61	1.47
COMPLAI2	Complain to other customers if you experience a problem with the web site.	2.79	1.41
COMPLAI3	Complain to external agencies, such as the Better Business Bureau, if you experience a problem with the web site.	3.58	1.83
Average item score for the *Customer Complaint Scale*		2.99	
Total score (possible range 3-21)		8.97	

Note. Customer complaint was measured by a seven-point semantic differential scale with item responses reverse-scored, resulting in extremely likely to switch or complain (1) and not at all likely (7) as anchors.

Descriptive Analysis of Electronic Recovery Service Quality

The *Electronic Recovery Service Quality Scale (E-RecS-Qual)*, developed by

Parasuraman, Zeithaml, and Malhotra (2005), contained 11 items explaining three

subscale dimensions: responsiveness, compensation, and contact. Respondents were

asked to respond to each item measured by a five-point semantic differential scale,

ranging from 1 being "strongly disagree" to 5 being "strongly agree." The eligible

respondents for this section were limited to those who answered "yes" for the "filter"

question about whether they had had negative experiences with consumer electronic e-

tailers. A total of 121 respondents indicated that they had negative experiences, and

completed this part of survey.

The average *E-RecS-QUAL* total score was 42.18, with a possible range of 11 to

55, and the average item score for the *E-RecS-QUAL* scale was 3.83. The dimension with

the highest mean score was responsiveness and the dimension with the lowest mean score

was compensation. The score of the responsiveness dimension was 19.64, with a

possible range of 5 to 25, and the average item score for the efficiency dimension was

3.93. The score of the compensation dimension was 10.78, with a possible range of 3 to

15, and the average item score for the system availability dimension was 3.59. The score

of the contact dimension was 11.75, with a possible range of 3 to 15, and the average

item score for the fulfillment dimension was 3.92.

As shown in Table 4-14, only two items had mean scores that were higher than 4.

The item with the highest mean score was "providing a telephone number to reach the

company" (M = 4.07, SD = 1.11), followed by "providing convenient options for

returning items" (M = 4.02, SD = 1.03). The item with the lowest mean score was

"compensating for problems the e-tailer creates" (M = 3.51, SD = 1.36), followed by

"compensating when ordered items don't arrive on time" (M = 3.57, SD = 1.41). Table

4-14 presents the results of analysis of descriptive statistics for the electronic recovery

service quality.

Table 4-14

Descriptive Analysis of Electronic Recovery Service Quality Items (N = 121)

Indicators	Items	Mean	Standard deviation
Responsiveness		3.93	
ERecSQ01	This site provides me with convenient options for returning items.	4.02	1.03
ERecSQ02	This site handles product returns well.	3.87	1.20
ERecSQ03	This site offers a meaningful guarantee.	3.97	1.06
ERecSQ04	This site tells me what to do if my transaction is not processed.	3.91	1.10
ERecSQ05	This site takes care of problems promptly.	3.88	1.20
Responsiveness Dimension score (possible range 5-25)		19.64	
Compensation		3.59	
ERecSQ06	This site compensates me for problems it creates.	3.51	1.36
ERecSQ07	This site compensates me when what I ordered doesn't arrive on time.	3.57	1.41
ERecSQ08	This site picks up items I want to return from my home or business.	3.70	1.34
Compensation Dimension score (possible range 3-15)		10.78	
Contact		3.92	
ERecSQ09	This site provides a telephone number to reach the company.	4.07	1.11
ERecSQ10	This site has customer service representatives available online.	3.83	1.18
ERecSQ11	This site offers the ability to speak to a live person if there is a problem.	3.85	1.19
Contact Dimension score (possible range 3-15)		11.75	
Average item score for the *E-RecS-QUAL* scale		3.83	
Total score (possible range 11-55)		42.18	

Note. Electronic recovery service quality was measured by a five-point semantic differential scale, with strongly disagree (1) and strongly agree (5) as anchors.

Research Hypothesis 1

H_1: Each dimension of electronic service quality has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1a}: The efficiency dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1b}: The fulfillment dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1c}: The system availability dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

H_{1d}: The privacy dimension has a positive relationship with electronic service quality for consumer electronics e-tailers.

Confirmatory Factor Analysis (CFA) of Electronic Service Quality

First-Order CFA Model of Electronic Service Quality

The initially hypothesized first-order CFA model of electronic service quality using the *E-S-QUAL* was designed to test the relationships among four dimensions of electronic service quality (efficiency, system availability, fulfillment, and privacy) and their observed indicators. This initially hypothesized model is shown in Figure 4-1. Twenty-two indicators were utilized to measure electronic service quality (see Table 3-4 in Chapter III).

Figure 4-1. Hypothesized first-order 22-indicator CFA model of electronic service quality.

Note. Errors of measurement associated with each indicator are presented as err01 to err22. ESQ01 to ESQ22 are indicators of the E-S-QUAL.

The results of the initial estimation of the CFA model of electronic service quality indicated a poor model fit to the sample data ($\chi^2_{[203]}$ = 894.95; GFI = .75; RMSEA = .11; AGFI = .69). Table 4-15 presents goodness-of-fit results of the initial estimation of the first-order 22-item CFA model of electronic service quality.

Table 4-15

Goodness-of-Fit Results of Initial Estimation of the First-Order 22-Indicator CFA Model of Electronic Service Quality (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	894.95 ($p < .001$)	$p > .05$
Degrees of freedom	df	203	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	4.41	2 to 5
Goodness of fit index	GFI	.75	> .90
Root mean square error of approximation	RMSEA	.11	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.69	> .90
Tucker-Lewis index	TLI	.91	> .90
Normed fit index	NFI	.90	> .90
Comparative fit index	CFI	.92	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.79	> .50
Parsimonious goodness-of-fit index	PGFI	.60	> .50

Although the CFI and TLI values met the threshold of .90, and PNFI and PGFI met the threshold of .50, other fit measures, such as GFI, RMSEA, and AGFI indicated a poor fit, and some modifications in the initial model were needed to improve the model fit. Evidence of misfit is captured by the modification indices (MI), which were examined to find error-correlated indicators. The value of an MI represents the expected drop in overall χ^2 value if the parameter were to be freely estimated (Byrne, 2001). The MIs and accompanying expected parameter change statistics related to the hypothesized first-order CFA model of electronic service quality are presented in Appendix K.

There was clear evidence of misspecification associated with the pairing of items from the covariance table in Appendix K: ESQ01 and ESQ09 (MI = 40.73), ESQ01 and ESQ10 (MI = 42.47), ESQ02 and ESQ22 (MI = 22.40), ESQ04 and ESQ05 (MI = 20.39), ESQ06 and ESQ09 (MI = 24.52), ESQ08 and ESQ22 (MI = 27.34), and ESQ12 and ESQ22 (MI = 32.63). These five pairs of misspecified error variances were comparatively larger than those remaining pairs of misspecified error variances. These measurement error covariances could represent a high degree of overlap in item content (Byrne, 2001). For example, the content of the item of ESQ05, "this site loads its pages fast," was highly correlated with the content of the item of ESQ10, "this site launches and runs right away." Parasuraman, Zeithaml, and Malhotra (2005), the developers of *E-S-QUAL*, agreed that the items in the measurement scale could be modified or eliminated. As a result, five items were deleted from the initial model (ESQ01, ESQ05, ESQ09, ESQ12, and ESQ22) based on the error variances and item content overlapping. A total of 17 observed indicators remained to estimate the modified model. The modified first-order 17-indicator CFA model of electronic service quality is shown as Figure 4-2.
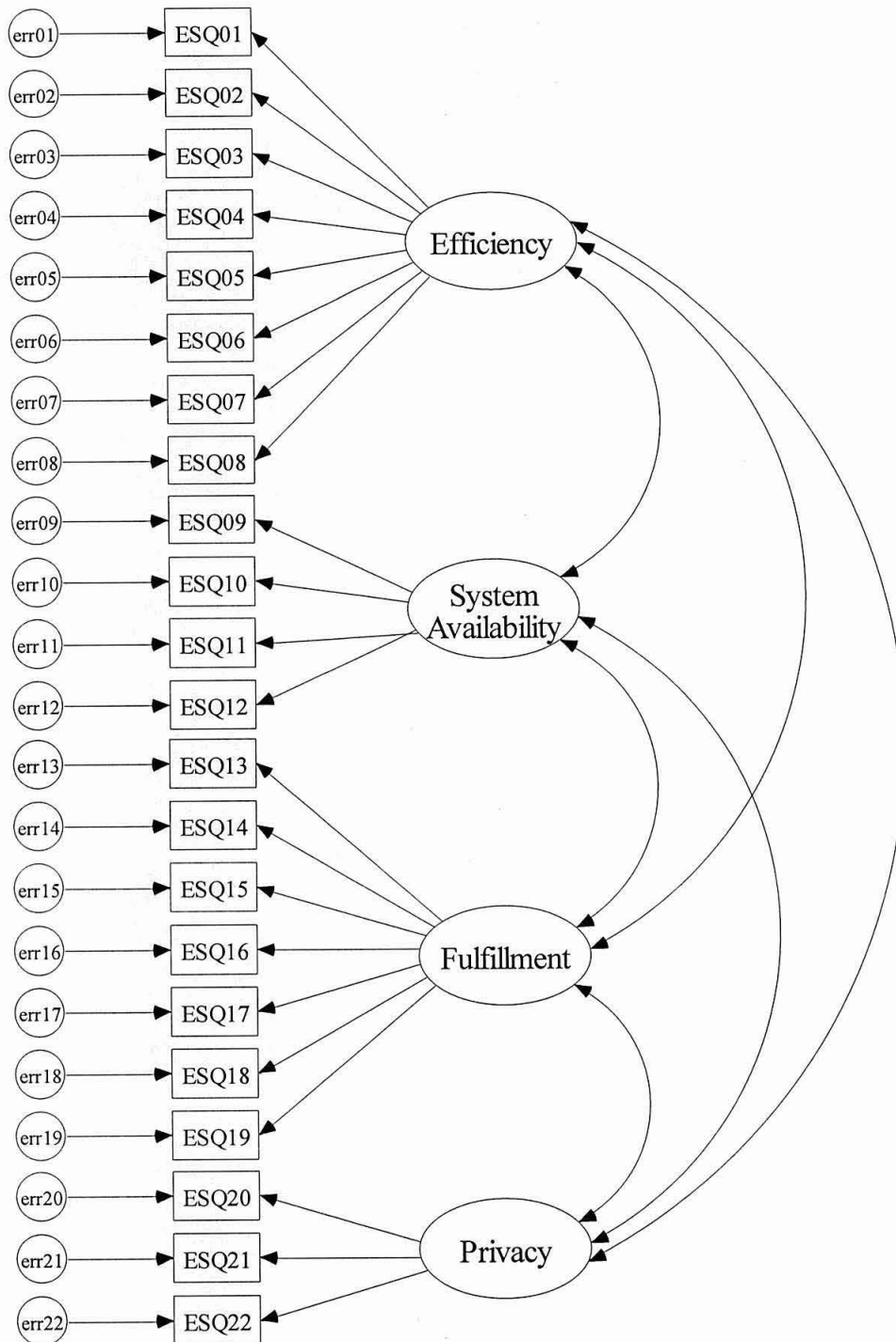
103
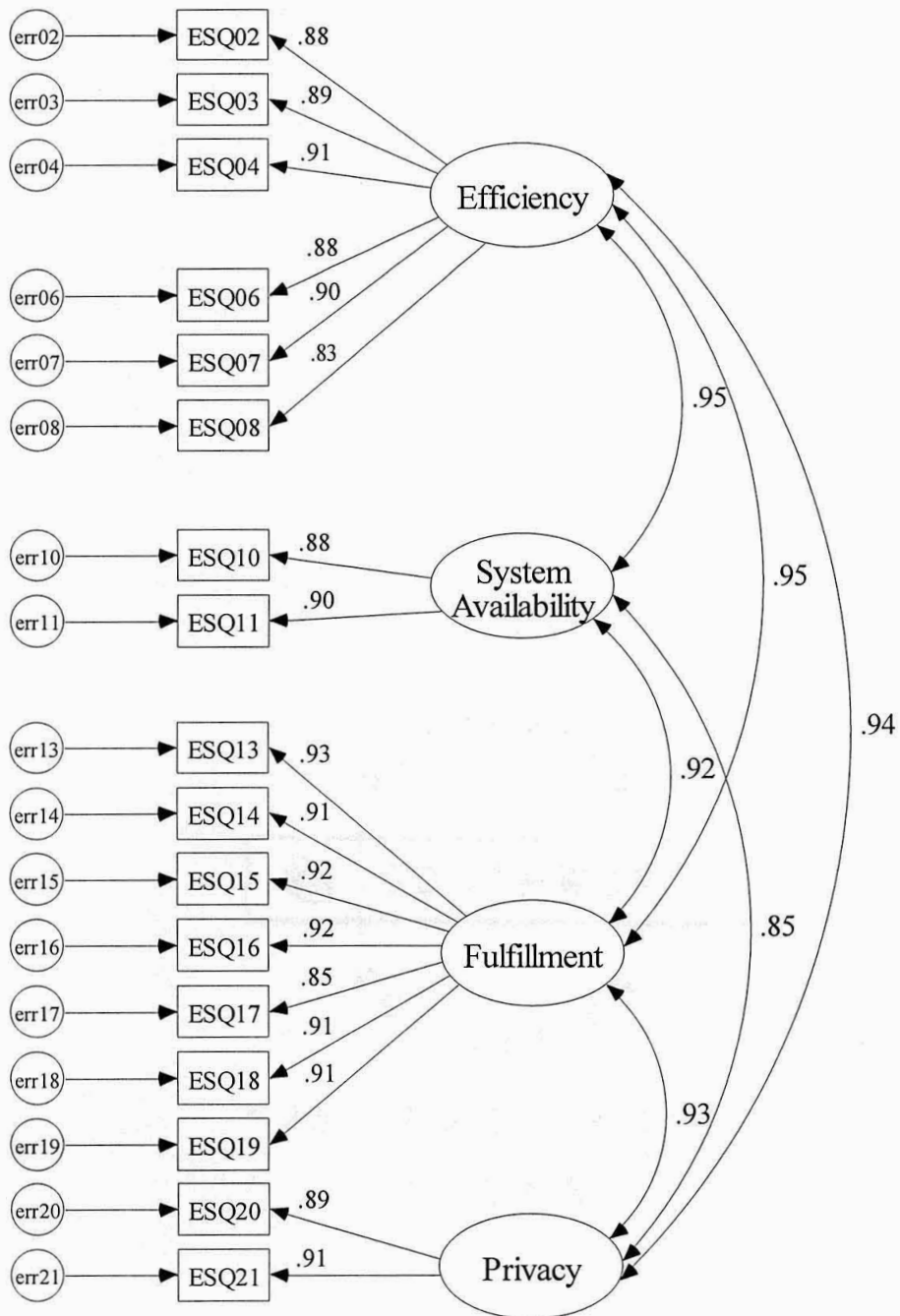
Figure 4-2. Modified first-order 17-indicator CFA model of electronic service quality.

Note. Errors of measurement associated with each indicator are presented as err and followed by the indicator numbers of the modified 17-indicator *E-S-QUAL*.

As shown in Table 4-16, most of the goodness-of-fit indices using the 17 indicators of the *E-S-QUAL* were satisfied with their relative recommended thresholds (χ^2 / df = 2.95; RMSEA = .08; TLI = .96; NFI = .95; CFI = .96; PNFI = .79; and PGFI = .64). Although the GFI value of .87 and the AGFI value of .82 did not meet the threshold of .90, their values were very close to the threshold and their values were remarkably improved from the initial values of .75 and .69, respectively. The RMSEA value also decreased to .08 from .11 to meet the threshold of .08. The results of model fit indicated that the modified first-order 17-indicator CFA model of electronic service quality fit the sample data. Table 4-16 presents goodness-of-fit results of the modified first-order 17-indicator CFA model of electronic service quality.

Table 4-16

Goodness-of-Fit Results of the Modified First-Order 17-Indicator CFA Model of Electronic Service Quality (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	333.00 ($p < .001$)	$p > .05$
Degrees of freedom	df	113	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	2.95	2 to 5
Goodness of fit index	GFI	.87	> .90
Root mean square error of approximation	RMSEA	.08	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.82	> .90
Tucker-Lewis index	TLI	.96	> .90
Normed fit index	NFI	.96	> .90
Comparative fit index	CFI	.96	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.79	> .50
Parsimonious goodness-of-fit index	PGFI	.64	> .50

Second-Order CFA Model of Electronic Service Quality

Based on the theoretical framework for this study and the results of first-order confirmatory factor analysis of electronic service quality, the second-order confirmatory factor analysis model of electronic service quality was initially specified. In this model, there were four first-order factors (efficiency, system availability, fulfillment, and privacy) and one second-order factor (electronic service quality). The dimension of efficiency was measured by six indicators. The dimension of system availability was measured by two indicators. The dimension of fulfillment was measured by seven indicators. The dimension of privacy was measured by two indicators. The second-order CFA model of electronic service quality was designed to test the hypothesis that electronic service quality is a multidimensional construct composed of four sub-dimensional factors and each dimension has a positive relationship with electronic service quality. The second-order CFA model of electronic service quality is shown as Figure 4-3.
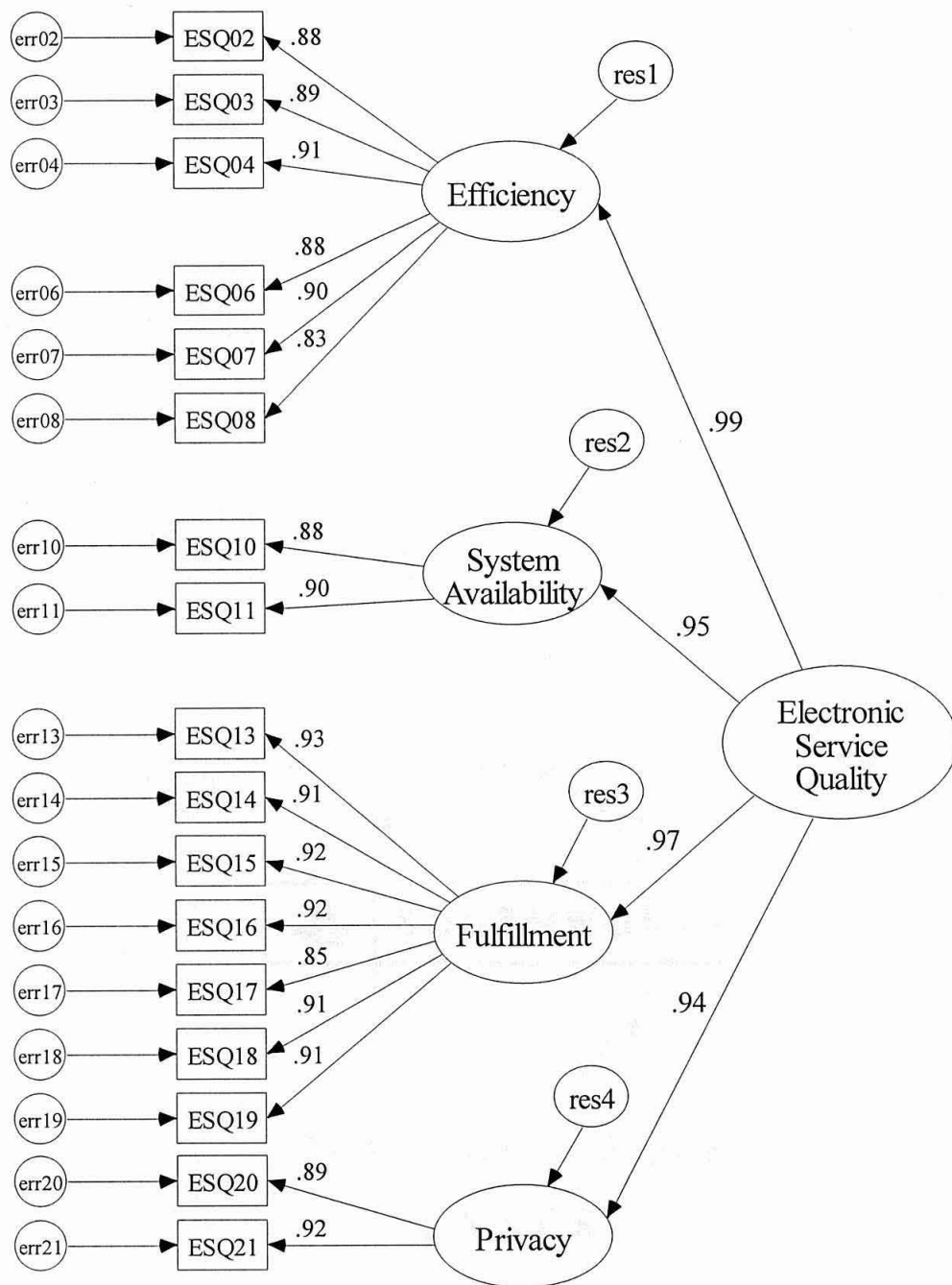
Figure 4-3. Second-order CFA model of modified 17-indicator E-S-QUAL.

Note. Errors of measurement associated with each indicator are presented as err and followed by the indicator numbers of the modified 17-indicator *E-S-QUAL*. Residuals associated with each dimension are presented as res1 to res4.

The model fit results of second-order CFA model of electronic service quality indicated that the model sufficiently fit the sample. Similar to the results of modified first-order CFA model of electronic service quality, most of the goodness-of-fit indices were satisfied with their relative recommended thresholds (χ^2 / df = 3.10; RMSEA = .08; TLI = .95; NFI = .94; CFI = .96; PNFI = .80; and PGFI = .65). Although the GFI value of .86 and the AGFI value of .82 did not meet the threshold of .90, their values were close to the threshold and thus they represented an acceptable model fit. Therefore, the goodness-of fit results supported H_1 (including H_{1a} to H_{1d}) and indicated that each dimension of electronic service quality had a positive relationship with electronic service quality, using a modified 17-indicator *E-S-QUAL*. A summary of the goodness-of-fit results is presented in Table 4-17.

Table 4-17

Goodness-of-Fit Results of the Second-Order CFA Model of Modified 17-Indicator E-S-QUAL

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	356.05	$p > .05$
		($p < .001$)	
Degrees of freedom	df	115	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.10	2 to 5
Goodness of fit index	GFI	.86	$> .90$
Root mean square error of approximation	RMSEA	.08	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.82	$> .90$
Tucker-Lewis index	TLI	.95	$> .90$
Normed fit index	NFI	.94	$> .90$
Comparative fit index	CFI	.96	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.80	$> .50$
Parsimonious goodness-of-fit index	PGFI	.65	$> .50$

Reliability and Validity of Electronic Service Quality Scale

The reliability of the modified 17-indicator *Electronic Service Quality Scale* (*E-S-QUAL*) was calculated by Cronbach's coefficient alpha. The coefficient alpha values exceeded the minimum standard of .7 (Nunnally & Bernstein, 1994), providing good estimates of internal consistency reliability. As shown in Table 4-18, coefficient alpha values ranged from .89 to .97 for the four dimensions of electronic service quality. All four dimensions obtained an acceptable level of a coefficient alpha above .70, indicating that the modified 17-indicator *E-S-QUAL* was reliable.

Table 4-18

Standardized Solutions of the Second-Order CFA Model of Modified 17-Indicator E–S-QUAL (N = 276)

Factor / Item	Factor loading	R^2
Efficiency (Cronbach's alpha = .95)	.99	.98
ESQ02	.88	.77
ESQ03	.89	.79
ESQ04	.91	.83
ESQ06	.88	.77
ESQ07	.90	.81
ESQ08	.83	.69
System Availability (Cronbach's alpha = .89)	.95	.90
ESQ10	.88	.78
ESQ11	.90	.81
Fulfillment (Cronbach's alpha = .97)	.97	.93
ESQ13	.93	.87
ESQ14	.91	.83
ESQ15	.92	.84
ESQ16	.92	.84
ESQ17	.85	.73
ESQ18	.91	.82
ESQ19	.91	.83
Privacy (Cronbach's alpha = .90)	.94	.89
ESQ20	.89	.79
ESQ21	.92	.84

Note. ESQ01, ESQ05, ESQ09, ESQ12, and ESQ22 were deleted from the original *E-S-QUAL*.

The estimates of standardized factor loadings were used to determine the convergent validity of the modified 17-indicator *E-S-QUAL*. The factor loadings in the confirmatory factor analysis ranged from .83 to .91 for the dimension of efficiency, from .88 to .90 for the dimension of system availability, from .85 to .93 for the dimension of fulfillment, and from .89 to .92 for the dimension of privacy (see Table 4-18). Because each factor loading on each dimension was more than .50, the convergent validity for each dimension of the scale was established (Hair et al., 1998).

Research Hypothesis 2

H$_2$: Each dimension of electronic recovery service quality has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H$_{2a}$: The responsiveness dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H$_{2b}$: The compensation dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

H$_{2c}$: The contact dimension has a positive relationship with electronic recovery service quality for consumer electronics e-tailers.

Confirmatory Factor Analysis (CFA) of Electronic Recovery Service Quality

First-Order CFA Model of Electronic Recovery Service Quality

The initially hypothesized first-order CFA model of electronic recovery service quality (*E-RecS-QUAL*) was designed to test the relationships among three dimensions of electronic recovery service quality (responsiveness, compensation, and contact) and their observed indicators. This initially hypothesized model is shown in Figure 4-4. Eleven

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indicators were utilized to measure the electronic recovery service quality (see Table 3-9 in Chapter III).
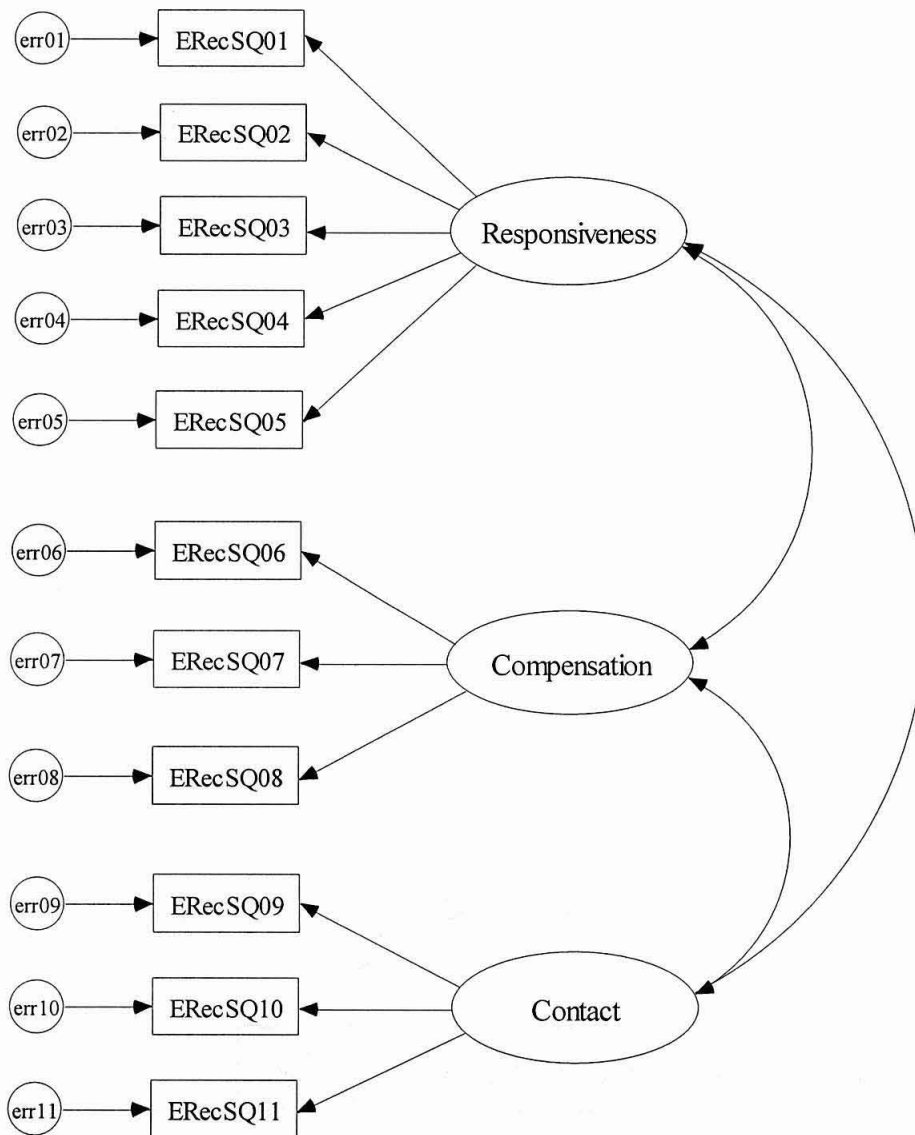
Figure 4-4. Hypothesized first-order CFA model of electronic recovery service quality.

Note. Errors of measurement associated with each indicator are presented as err01 to err11 of the *E-RecS-QUAL*.

The results of the initial estimation of the CFA model of electronic service recovery quality indicated a somewhat poor model fit to the sample data ($\chi^2_{[41]}$ = 119.98; GFI = .85; RMSEA = .13; and AGFI = 75). Table 4-19 presents goodness-of-fit results of initial estimation of the first-order CFA model of electronic recovery service quality using the 11-indicator *E-RecS-QUAL*.

Table 4-19

Goodness-of-Fit Results of Initial Estimation of the First-Order CFA Model of the E-RecS-QUAL (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	119.98 ($p < .001$)	$p > .05$
Degrees of freedom	df	41	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	2.93	2 to 5
Goodness of fit index	GFI	.85	> .90
Root mean square error of approximation	RMSEA	.13	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.75	> .90
Tucker-Lewis index	TLI	.93	> .90
Normed fit index	NFI	.92	> .90
Comparative fit index	CFI	.95	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.69	> .50
Parsimonious goodness-of-fit index	PGFI	.53	> .50

Although the TLI, NFI and CFI values met the threshold of .90, and PNFI and PGFI met the threshold of .50, other fit measures, such as GFI, RMSEA, and AGFI indicated a poor fit, and some modifications in the initial model needed to improve the model fit. The results of the initial estimation of the CFA model of electronic service recovery quality indicated that the dimension of responsiveness and the dimension of contact had a very strong positive relationship ($r = .99$). The correlation estimates for three dimensions of electronic recovery service quality are presented in Table 4-20.

Table 4-20

Correlation Estimates for Three Dimensions of E-RecS-QUAL

Correlations			Estimate
Compensation	↔	Responsiveness	.872
Compensation	↔	Contact	.892
Responsiveness	↔	Contact	.993

This strong positive relationship between the dimensions of responsiveness and contact demonstrated that these two dimensions should merge into one new dimension, which was called "responsiveness and contact." The two-factor first-order CFA model of electronic recovery service quality is shown in Figure 4-5.
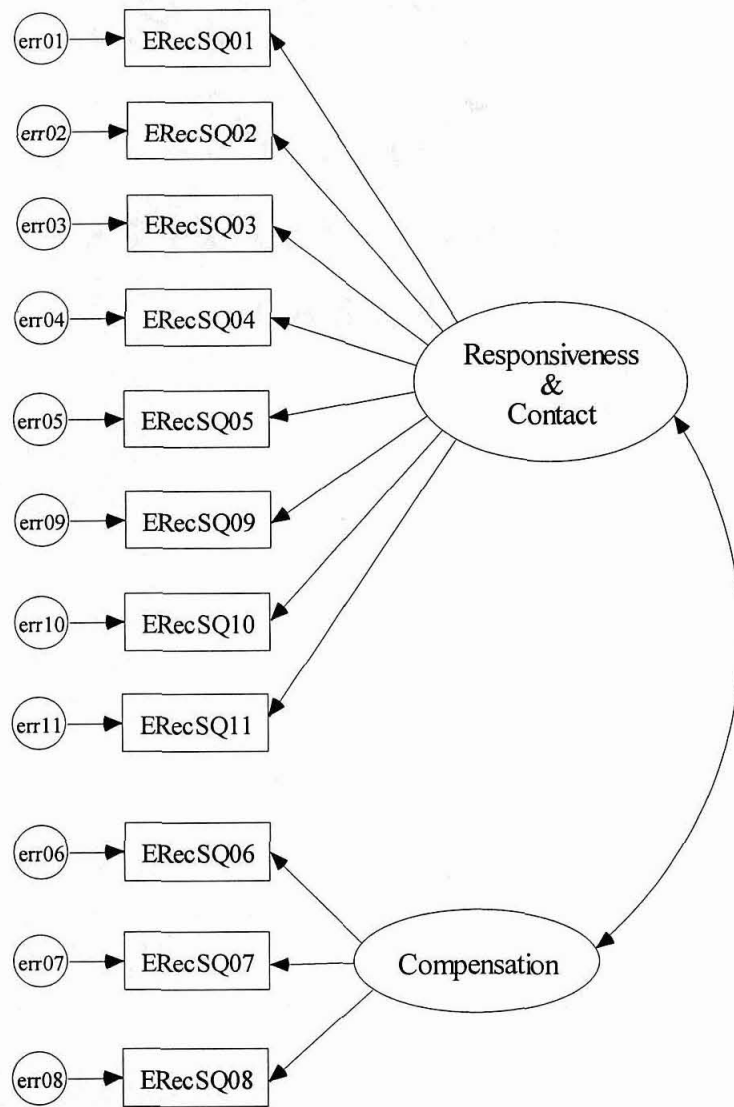
Figure 4-5. Two-factor first-order CFA model of electronic recovery service quality.

Note. Errors of measurement associated with each indicator are presented as err01 to err11 of the *E-RecS-QUAL*.

Although some fit measures were slightly improved compared to the fit measures for the initially hypothesized three-factor model, the results of the two-factor first-order CFA model of electronic service recovery quality also indicated a poor model fit to the sample data ($\chi^2_{[43]} = 121.13$; GFI = .85; RMSEA = .12; and AGFI = 76). Table 4-21 presents goodness-of-fit results of first-order CFA model of modified two-factor *E-RecS-QUAL*.

Table 4-21

Goodness-of-Fit Results of First-Order CFA Model of Modified Two-Factor E-RecS-QUAL (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	121.13 ($p < .001$)	$p > .05$
Degrees of freedom	df	43	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	2.82	2 to 5
Goodness of fit index	GFI	.85	> .90
Root mean square error of approximation	RMSEA	.12	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.76	> .90
Tucker-Lewis index	TLI	.93	> .90
Normed fit index	NFI	.92	> .90
Comparative fit index	CFI	.95	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.72	> .50
Parsimonious goodness-of-fit index	PGFI	.55	> .50

Modification indices (MIs) were examined to find error-correlated indicators. The MIs and accompanying expected parameter change statistics related to the first-order CFA model of modified two-factor *E-RecS-QUAL* are presented in Table 4-22.

Table 4-22

Modification Indices and Parameter Change Statistics for First-Order CFA Model of Modified Two-Factor E-RecS-QUAL

Covariances	Modification Index	Parameter Change
err11 ↔ err09	9.039	.115
err01 ↔ err11	9.369	.089
err02 ↔ err09	7.075	-.093
err03 ↔ err11	12.139	-.116
err03 ↔ err01	4.777	-.053
err04 ↔ Responsiveness & Contact	5.398	.067
err04 ↔ Compensation	7.217	-.102
err04 ↔ err11	5.014	-.083
err04 ↔ err02	7.788	.095
err06 ↔ err11	4.965	-.096
err06 ↔ err03	7.288	.097
err07 ↔ Responsiveness & Contact	7.113	-.074
err07 ↔ Compensation	5.391	.083
err07 ↔ err04	4.314	-.072
err08 ↔ err11	4.059	.080
err08 ↔ err03	5.107	-.075
err08 ↔ err05	4.673	.064
err08 ↔ err06	8.761	-.122

There were four pairs of items with comparatively high modification indices: ERecSQ01 and ERecSQ11 (MI = 9.37), ERecSQ03 and ERecSQ11 (MI = 12.14), ERecSQ06 and ERecSQ08 (MI = 8.76), and ERecSQ09 and ERecSQ11 (MI = 9.04). These misspecified error variances are comparatively larger than those remaining pairs of misspecified error variances. As a result, the modified two-factor first-order CFA model of electronic recovery service quality included four correlated errors between ERecSQ01

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and ERecSQ11, ERecSQ03 and ERecSQ11, ERecSQ06 and ERecSQ08, and ERecSQ09

and ERecSQ11. The modified two-factor first-order CFA model of electronic recovery

service quality is presented in Figure 4-6.
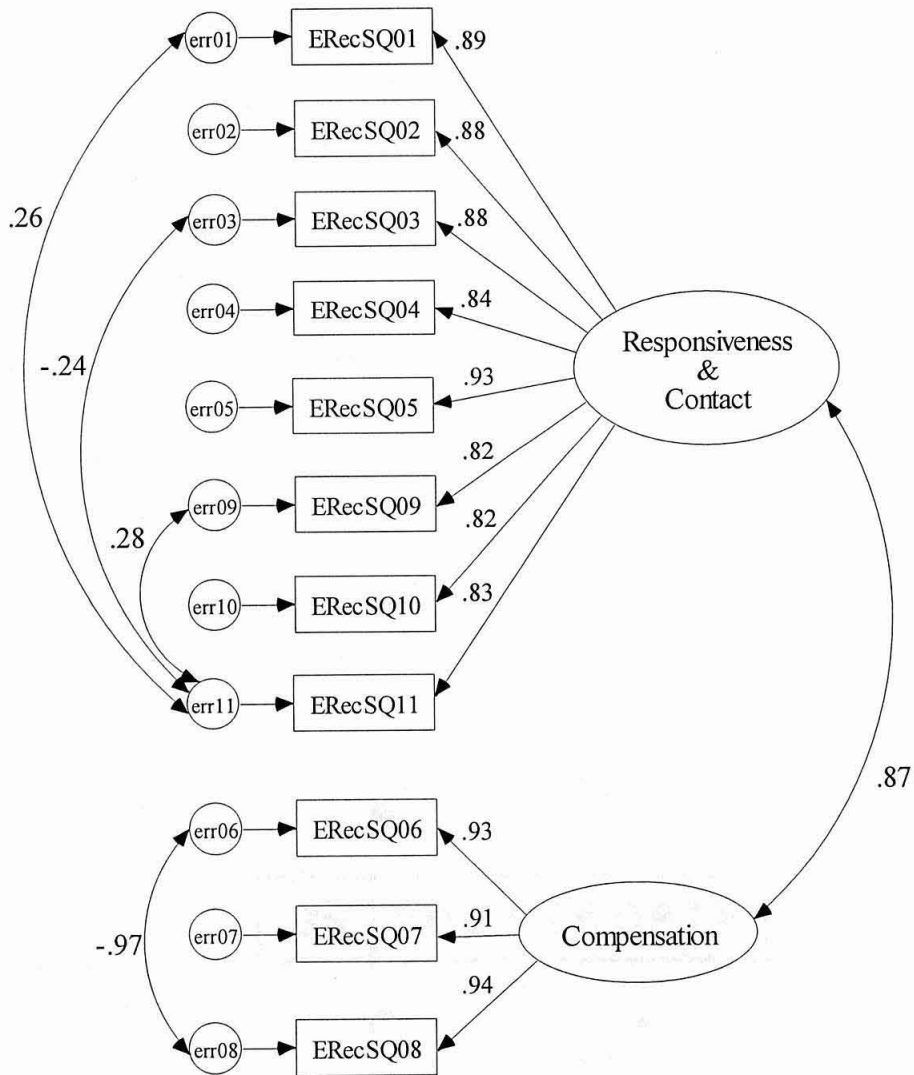
Figure 4-6. First-order CFA model of modified two-factor *E-RecS-QUAL*.

Note. Errors of measurement associated with each indicator are presented as err01 to err11 of the
modified two-factor *E-RecS-QUAL*.

The results of model fit for the modified first-order CFA model of two-factor

modified *E-RecS-QUAL,* adding correlations between four errors, indicated that the

model fits the sample data (see Table 4-23). All of the goodness-of-fit indices, except

AGFI, were satisfied with their relative recommended thresholds. Although the AGFI

value of .83 did not meet the threshold of .90, its value was very close to the threshold,

and the value was remarkably improved from the initial value of .75. The RMSEA value

also decreased to .08 from .13 to meet the threshold of .08. The results of model fit

indicated that the modified first-order CFA model of two-factor modified *E-RecS-QUAL*

fit the sample data. Table 4-23 presents goodness-of-fit results of the modified first-order

CFA model of two-factor modified *E-RecS-QUAL.*

Table 4-23

Goodness-of-Fit Results of the Modified First-Order CFA Model of Two-Factor Modified
E-RecS-QUAL (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	73.64 ($p < .005$)	$p > .05$
Degrees of freedom	df	39	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	1.89	2 to 5
Goodness of fit index	GFI	.90	$> .90$
Root mean square error of approximation	RMSEA	.08	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.83	$> .90$
Tucker-Lewis index	TLI	.97	$> .90$
Normed fit index	NFI	.95	$> .90$
Comparative fit index	CFI	.98	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.68	$> .50$
Parsimonious goodness-of-fit index	PGFI	.53	$> .50$

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Second-Order CFA Model of Electronic Recovery Service Quality

Based on the theoretical framework for this study and the results of first-order confirmatory factor analysis of electronic recovery service quality, the second-order confirmatory factor analysis model of electronic recovery service quality was initially specified. In this model there were two first-order factors (1) responsiveness and contact, and (2) compensation, and one second-order factor (electronic recovery service quality). The dimension of responsiveness and contact was measured by eight observed variables. The dimension of compensation was measured by three items. The second-order CFA model of electronic recovery service quality was designed to test the hypothesis that electronic recovery service quality is a multidimensional construct composed of three-dimensional factors, and each dimension has a positive relationship with electronic recovery service quality. The second-order CFA model of electronic recovery service quality is shown as Figure 4-7.
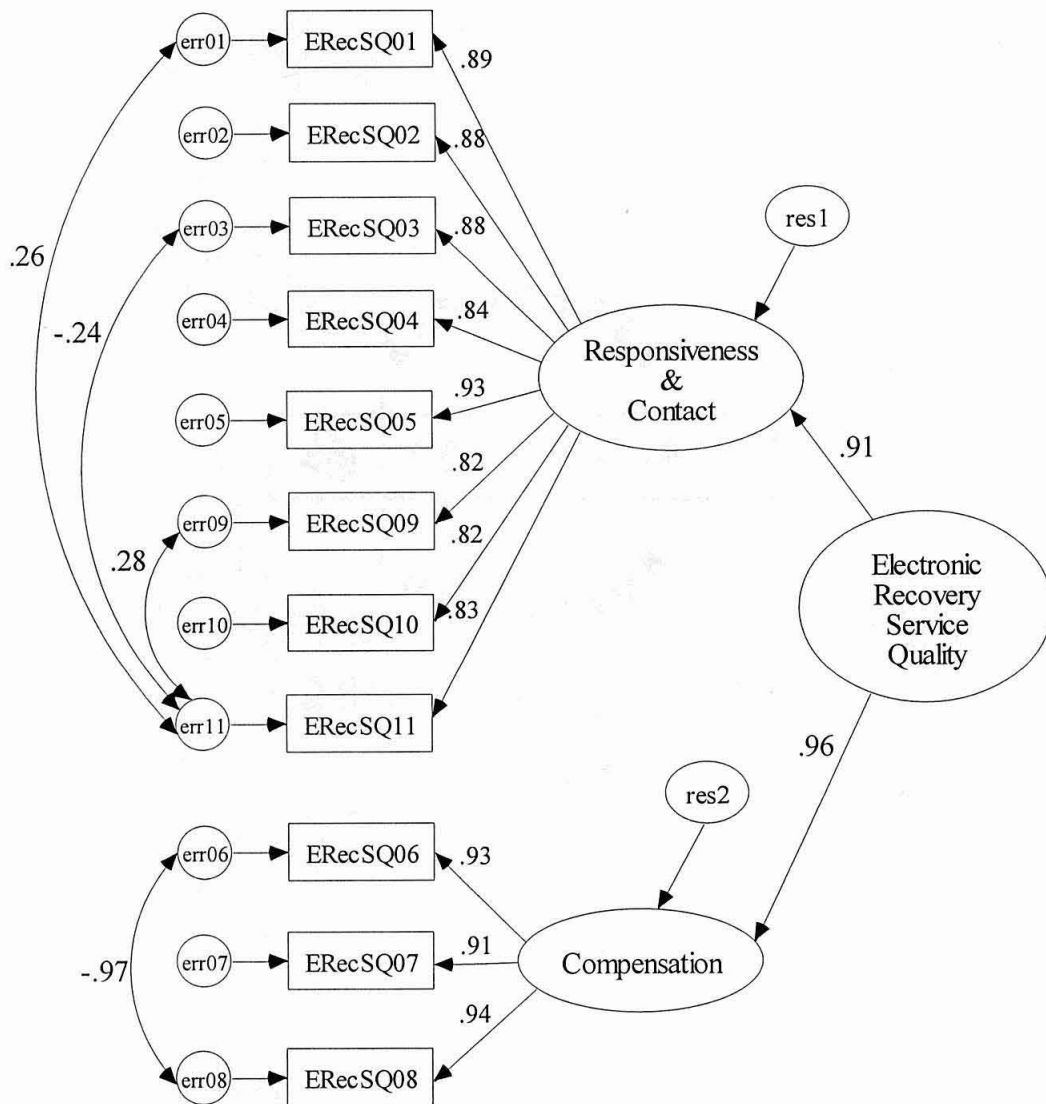
Figure 4-7. Second-order CFA model of electronic recovery service quality.

Note. Errors of measurement associated with each indicator are presented as err and followed by the indicator numbers of the two-factor modified E-RecS-QUAL. Residuals associated with each dimension are presented as res1 and res2.

The model fit results of second-order CFA model of electronic recovery service quality indicated that the model sufficiently fits the sample. Similar to the results of modified two-factor first-order CFA model of electronic recovery service quality, all of the goodness-of-fit indices, except AGFI, were satisfied with their relative recommended thresholds (RMSEA = .08; TLI = .97; NFI = .95; CFI = .98; PNFI = .68; and PGFI = .53). Although the AGFI value of .83 did not meet the threshold of .90, its value was close to the threshold. The results of goodness-of fit results partially supported H_2. Only the dimension of compensation remained, and the other two dimensions merged into one new dimension. Therefore, the results supported H_{2b}, but did not support H_{2a} and H_{2c}. A summary of the goodness-of-fit results is presented in Table 4-24.

Table 4-24

Goodness-of-Fit Results of the Second-Order CFA Model of Two-Factor Modified E-RecS-QUAL (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	73.64 ($p < .005$)	$p > .05$
Degrees of freedom	df	39	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	1.89	2 to 5
Goodness of fit index	GFI	.90	$> .90$
Root mean square error of approximation	RMSEA	.08	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.83	$> .90$
Tucker-Lewis index	TLI	.97	$> .90$
Normed fit index	NFI	.95	$> .90$
Comparative fit index	CFI	.98	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.68	$> .50$
Parsimonious goodness-of-fit index	PGFI	.53	$> .50$

Reliability and Validity of Electronic Recovery Service Quality Scale

The reliability of the *Electronic Recovery Service Quality Scale* was expressed by Cronbach's coefficient alpha. The coefficient alpha values exceeded the minimum standard of .7 (Nunnally & Bernstein, 1994), providing good estimates of internal consistency reliability. As shown in Table 4-25, coefficient alpha values ranged from .93 to .96 for the modified two-factor *E-RecS-QUAL*. Both dimensions obtained an acceptable level of a coefficient alpha above .70, indicating that the modified two-factor *E-RecS-QUAL* was reliable.

Table 4-25

Standardized Solutions of Second-Order CFA Model of Modified Two-Factor E-RecS-QUAL (N = 121)

Factor / Item	Factor loading	R^2
Responsiveness (Cronbach's alpha = .96)	.91	.83
ERecSQ01	.89	.79
ERecSQ02	.87	.76
ERecSQ03	.88	.77
ERecSQ04	.84	.71
ERecSQ05	.93	.87
ERecSQ09	.84	.70
ERecSQ10	.82	.67
ERecSQ11	.84	.71
Compensation (Cronbach's alpha = .93)	.96	.91
ERecSQ06	.93	.86
ERecSQ07	.91	.83
ERecSQ08	.94	.89

The estimates of standardized factor loadings were used to determine the convergent validity of *E-RecS-QUAL*. The factor loadings in the confirmatory factor analysis ranged from .82 to .93 for the dimension of responsiveness and contact and from .91 to .94 for the dimension of compensation (see Table 4-25). Because each factor loading on each dimension is more than .50 (Hair et al., 1998), the convergent validity for each dimension of the modified two-factor *E-RecS-QUAL* scale was established, providing evidence of construct validity.

Research Hypotheses 3 Through 8

H_3: Electronic service quality has a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_4: Perceived value has a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_5: Customer expectations have a direct positive effect on the level of customer satisfaction for consumer electronics e-tailers.

H_6: Customer expectations have a direct positive effect on electronic service quality for consumer electronics e-tailers.

H_7: Electronic service quality has a direct positive effect on perceived value for consumer electronics e-tailers.

H_8: Customer expectations have a direct positive effect on perceived value for consumer electronics e-tailers.

Confirmatory Factor Analysis (CFA) of Antecedents of Customer Satisfaction

Before making any attempt to evaluate the causal structure model, the CFA model of antecedents of customer satisfaction was examined for the construct validity of

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measurement model. The CFA model was specified to examine the relationships among four constructs (customer expectations, electronic service quality, perceived value, and customer satisfaction) and their observed indicators. The initially hypothesized model is shown in Figure 4-8.

Figure 4-8. Hypothesized CFA model of antecedents of customer satisfaction.

Note. Errors of measurement associated with each indicator are presented as err and followed by the consecutive numbers of the *Customer Expectations Scale*, the four-factor *E-S-QUAL*, the *Perceived Value Scale*, and the *Customer Satisfaction Scale*.

Compared to the modified 17-indicator *E-S-QUAL*, a four-indicator *E-S-QUAL* was created, based on the results shown in Figure 4-2. The indicator of ESQ_D1 referred to the dimension of efficiency of electronic service quality, and consisted of ESQ02, ESQ03, ESQ04, ESQ06, ESQ07, and ESQ08. The indicator of ESQ_D2 referred to the dimension of system availability of electronic service quality, and consisted of ESQ10 and ESQ11. The indicator of ESQ_D3 referred to the dimension of fulfillment of electronic service quality, and consisted of ESQ13, ESQ14, ESQ15, ESQ16, ESQ17, ESQ18, and ESQ19. The indicator of ESQ_D4 referred to the dimension of efficiency of electronic service quality, and consisted of ESQ20 and ESQ21.

The results of the initial estimation of the CFA model of antecedents of customer satisfaction indicated that model fit was marginally adequate (TLI = .94; NFI = .94; CFI = .95; PNFI = .76; and PGFI = .62). Although the GFI value of .86 and the AGFI value of .81 did not meet the threshold of .90, their values were close to the threshold and thus the model was an acceptable fit. Compared to the study of Parasuraman, Zeithaml, and Malhotra (2005), this study had the same RMSEA value of .10 as they reported. Therefore, no further modification was needed. Table 4-26 presents goodness-of-fit results of initial estimation of the first-order CFA model of antecedents of customer satisfaction.

Table 4-26

Goodness-of-Fit Results of Initial Estimation of the First-Order CFA Model of
Antecedents of Customer Satisfaction (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	379.36 ($p < .001$)	$p > .05$
Degrees of freedom	df	98	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.87	2 to 5
Goodness of fit index	GFI	.86	> .90
Root mean square error of approximation	RMSEA	.10	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.81	> .90
Tucker-Lewis index	TLI	.94	> .90
Normed fit index	NFI	.94	> .90
Comparative fit index	CFI	.95	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.76	> .50
Parsimonious goodness-of-fit index	PGFI	.62	> .50

Causal Structure Model of Antecedents of Customer Satisfaction

The initially hypothesized causal structure model represented in Figure 2-3 in
Chapter II was designed to test the relationships among customer expectations, electronic
service quality, perceived value, and customer satisfaction. The causal structure model of
antecedents of customer satisfaction was designed to test the hypothesis that customer
satisfaction was influenced by customer expectations, electronic service quality, and
perceived value. The causal structure model of antecedents of customer satisfaction is
shown as Figure 4-9.

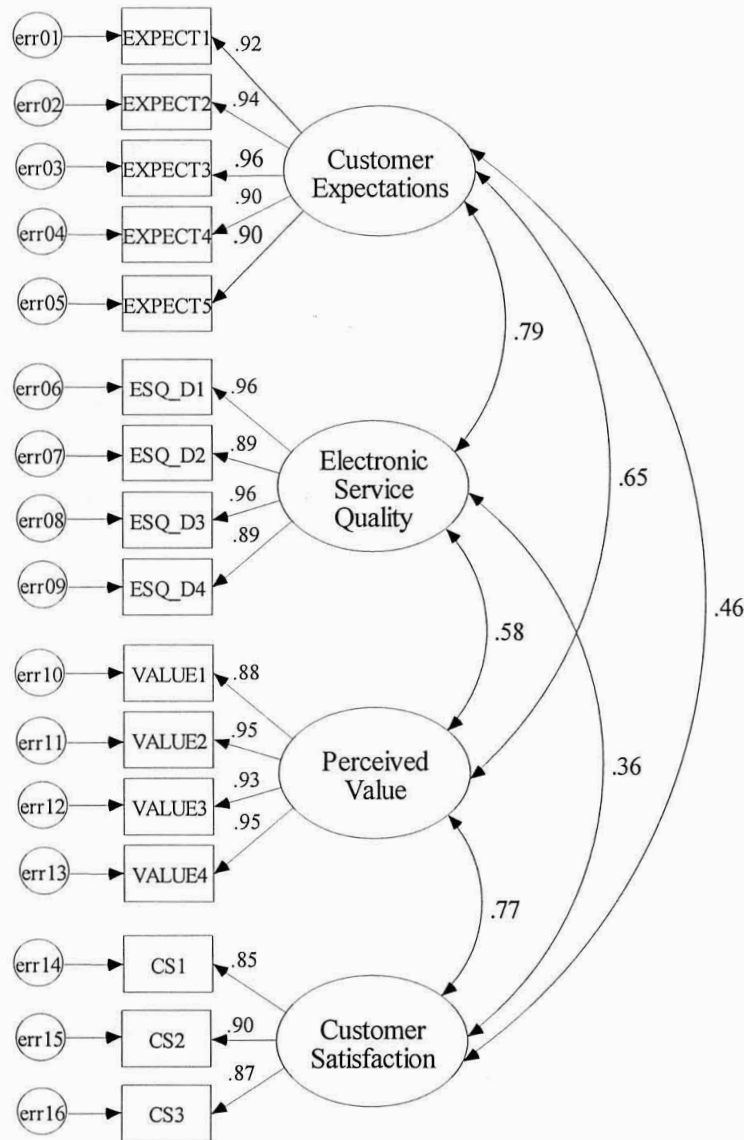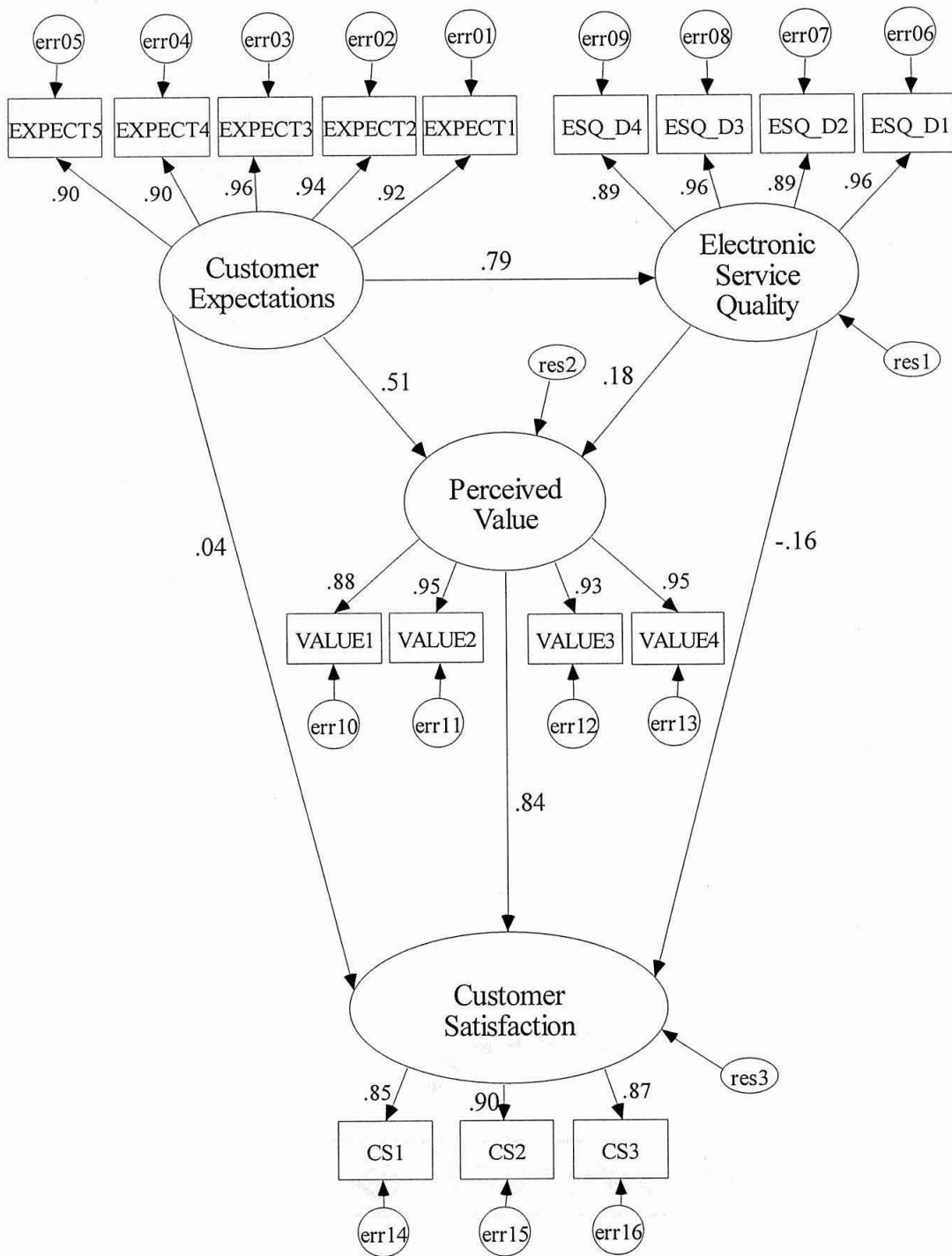*Figure 4-9.* Causal structure model of antecedents of customer satisfaction.

Note. Errors of measurement associated with each indicator are presented as err and followed by the corresponding numbers of the *Customer Expectations Scale*, the four-factor *E-S-QUAL*, the *Perceived Value Scale*, and the *Customer Satisfaction Scale*. Residuals associated with each endogenous latent variable are presented as res1 to res3.

The model fit results of causal structure model of antecedents of customer satisfaction indicated that the model well fit the sample. Similar to the results of hypothesized first-order CFA model of antecedents of customer satisfaction, the majority of the goodness-of-fit indices were satisfied with their relative recommended thresholds, with the exceptions of GFI, RMSEA, and AGFI. A summary of the goodness-of-fit results is presented in Table 4-27.

Table 4-27

Goodness-of-Fit Results of Causal Structure Model of Antecedents of Customer Satisfaction (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	379.36 ($p < .001$)	$p > .05$
Degrees of freedom	df	98	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.87	2 to 5
Goodness of fit index	GFI	.86	$> .90$
Root mean square error of approximation	RMSEA	.10	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.81	$> .90$
Tucker-Lewis index	TLI	.94	$> .90$
Normed fit index	NFI	.94	$> .90$
Comparative fit index	CFI	.95	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.76	$> .50$
Parsimonious goodness-of-fit index	PGFI	.62	$> .50$

As shown in Figure 4-9, however, two standardized regression weights were unusual: the standardized regression weight of customer expectations to customer satisfaction was as low as .04 (unstandardized regression weight = .059) and not significant, and the standardized regression weight of electronics service quality to customer satisfaction was -.16, $p \leq .05$ (unstandardized regression weight = .044), indicating that the results did not support H3. Further evaluations were needed. Table 4-28 presents regression weights of the causal structure model of antecedents of customer satisfaction performed by AMOS.

Table 4-28

Regression Weights of Causal Structure Model of Antecedents of Customer Satisfaction

		Unstandardized B coefficient	SE	Standardized β coefficient	t-value
Electronic service quality ←	Customer expectations	4.323	.252	.79	17.160**
Perceived value ←	Customer expectations	.931	.153	.51	6.064**
Perceived value ←	Electronic service quality	.061	.027	.18	2.230*
Customer satisfaction ←	Perceived value	.670	.057	.84	11.781**
Customer satisfaction ←	Electronic service quality	-.044	.020	-.16	-2.189*
Customer satisfaction ←	Customer expectations	.059	.118	.04	.502

*$p \leq .05$; ** $p \leq .01$

Only the regression weight of customer expectations to customer satisfaction was not significant ($t = .502$; $p > .05$). Moreover, service quality literature indicated that service quality and customer satisfaction have a positive relationship (Boulding, Kalra,

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Staelin, & Zeithaml, 1993; Cronin & Taylor, 1992; Taylor, 1997; Taylor & Baker, 1994;

Zeithaml, Berry, & Parasuraman, 1996); however, the regression weight of electronic

service quality to customer satisfaction was negative ($t = -2.19$). Therefore, H_3 and H_5

were not adequately tested by the causal structure model of antecedents of customer

satisfaction. However, the unstandardized data were difficult to use when making

comparisons with each effect. Using standardized data allows this study to compare the

relative effect of each exogenous latent variable on the endogenous latent variable (Hair

et al., 1998). The analyses of direct, indirect, and total effects, as presented in Table 4-29,

may help to explain how exogenous variables influenced endogenous variables.

Table 4-29

*Standardized Direct Effects, Indirect Effects, and Total Effects of Causal Structure Model
of Antecedents of Customer Satisfaction (N = 276)*

	Customer expectations	Electronic service quality	Perceived value
Direct effects			
Electronic service quality	.786**		
Perceived value	.507**	.182*	
Customer satisfaction	.041	-.165*	.843**
Indirect effects			
Perceived value	.143*		
Customer satisfaction	.418**	.153*	
Total effects[a]			
Electronic service quality	.786**		
Perceived value	.649**	.182*	
Customer satisfaction	.458**	-.012	.843**

* $p \leq .05$; ** $p \leq .01$

[a]Total effects = Direct effects + Indirect effects.

In Table 4-29, only one direct effect was not significant: customer expectations to customer satisfaction (.041). However, customer expectations had an indirect positive effect on customer satisfaction via perceived value (.418). Although electronic service quality had a direct negative effect on customer satisfaction, it had an indirect positive effect on customer satisfaction via perceived value (.153). The results indicated that perceived value mediated the relationships among electronic service quality, customer expectations, and customer satisfaction. Based on the goodness-of fit results and the results of analysis of direct, indirect, and total effects, H_4, H_6, H_7, and H_8 were supported and H_3 and H_5 were not supported.

Reliability and Validity of Customer Expectation Scale, Perceived Value Scale, and Customer Satisfaction Scale

The reliability of the *Customer Expectation Scale*, the *Perceived Value Scale*, and the *Customer Satisfaction Scale* was calculated by Cronbach's coefficient alpha. The coefficient alpha values exceeded the minimum standard of .7 (Nunnally & Bernstein, 1994), providing good estimates of internal consistency reliability. As presented in Table 4-30, coefficient alpha values were .97 for the *Customer Expectation Scale*, .96 for the *Perceived Value Scale*, and .90 for the *Customer Satisfaction Scale*. All of these three scales obtained an acceptable level of a coefficient alpha above .70, indicating that these three scales are reliable.

Table 4-30

Standardized Solutions of First-Order CFA Model of Antecedents of Customer

Satisfaction (N = 276)

Factor / Item	Factor loading	R^2
Customer expectations (Cronbach's alpha = .97)		
EXPECT1	.92	.84
EXPECT2	.94	.88
EXPECT3	.96	.92
EXPECT4	.90	.81
EXPECT5	.90	.80
Perceived value (Cronbach's alpha = .96)		
VALUE1	.88	.78
VALUE2	.95	.90
VALUE3	.93	.86
VALUE4	.95	.90
Customer satisfaction (Cronbach's alpha = .90)		
CS1	.85	.72
CS2	.90	.82
CS3	.87	.76

The estimates of standardized factor loadings were used to determine the

convergent validity of the *Customer Expectation Scale*, the *Perceived Value Scale*, and

the *Customer Satisfaction Scale*. The factor loadings in the confirmatory factor analysis

ranged from .90 to .96 for customer expectation, from .88 to .95 for perceived value, and

from .85 to .90 for customer satisfaction (see Table 4-30). Because each factor loading

on each construct was more than .50, the convergent validity for each scale was

established (Hair et al., 1998).

Research Hypothesis 9

H$_9$: Electronic recovery service quality has a direct positive effect on the level of

customer satisfaction for consumer electronics e-tailers.

The causal structure model of electronic recovery service quality and customer

satisfaction was designed to test the hypothesis that electronic recovery service quality

has a positive effect on customer satisfaction. The causal structure model of electronic

recovery service quality and customer satisfaction is shown as Figure 4-10.
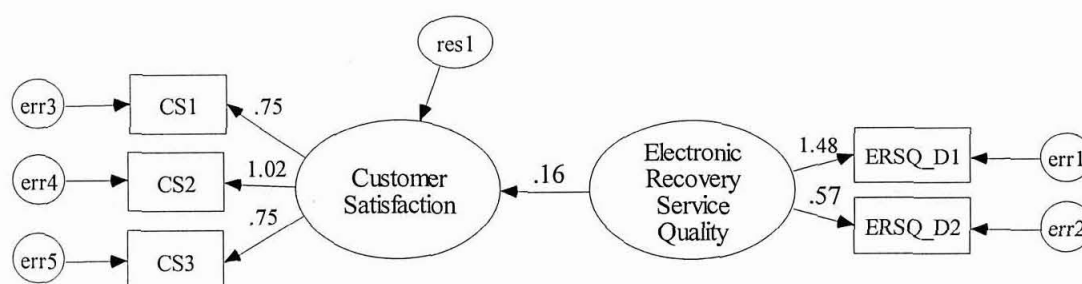
Figure 4-10. Causal structure model of electronic recovery service quality and customer
satisfaction.

Note. Errors of measurement associated with each indicator are presented as err and followed by
the corresponding numbers of the *Customer Satisfaction Scale* and the two-factor modified *E-RecS-QUAL*. The residual associated with the endogenous latent variable is presented as res1.

There were two new observed indicators for electronic recovery service quality,

which were created based on the results shown in Figure 4-5. The observed indicator of

ERSQ_D1 referred to the dimension of responsiveness and contact of electronic recovery

service quality, and consisted of ERSQ01 to ERSQ05 and ERSQ09 to ERSQ11. The

observed indicator of ESQ_D2 referred to the dimension of compensation of electronic

recovery service quality, and consisted of ERSQ06 to ERSQ08.

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The model fit results of the causal structure model of electronic recovery service quality and customer satisfaction indicated that the model marginally fit the sample. A summary of the goodness-of-fit results is presented in Table 4-31.

Table 4-31

Goodness-of-Fit Results of Causal Structure Model of Electronic Recovery Service Quality and Customer Satisfaction (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	12.39 ($p < .05$)	$p > .05$
Degrees of freedom	df	4	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.10	2 to 5
Goodness of fit index	GFI	.96	$> .90$
Root mean square error of approximation	RMSEA	.13	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.85	$> .90$
Tucker-Lewis index	TLI	.94	$> .90$
Normed fit index	NFI	.97	$> .90$
Comparative fit index	CFI	.98	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.39	$> .50$
Parsimonious goodness-of-fit index	PGFI	.26	$> .50$

As shown in Table 4-31, some goodness-of-fit indices were satisfied with their relative recommended thresholds (GFI = .96; TLI = .94; NFI = .97; and CFI = .98). Although the AGFI value of .85 did not meet the threshold of .90, its value was close to the threshold. The use of parsimonious fit measures was limited to comparisons between

models (Hair et al., 1998). There were only two latent variables involved in this causal

structure model, so it could not change the path to develop a simpler model. Although

both the PNFI value of .39 and the PGFI value of .26 did not meet the threshold of .50,

parsimonious fit measures were not applicable for testing of this model. Rigdon (1996)

suggested that RMSEA was best suited to use in a confirmatory model with larger

samples. The sample size for this model was 121, and thus RMSEA was not suited to

test the model. However, as shown in Figure 4-12, the standardized regression weight of

electronic recovery service quality to customer satisfaction was as low as .16 ($t = 1.0$; p

> .05). The regression weight of electronic recovery service quality to customer

satisfaction was not significant at p < .05. Therefore, the goodness-of fit results

marginally supported H_9, but the regression weight did not support H_9 and indicated that

electronic recovery service quality did not have a positive effect on customer satisfaction.

Research Hypothesis 10

H_{10}: Electronic recovery service quality has a direct positive effect on electronic

service quality for consumer electronics e-tailers.

The causal structure model of electronic service quality and electronic recovery

service quality was designed to test the hypothesis that electronic recovery service quality

has a positive effect on electronic service quality. The causal structure model of

electronic service quality and electronic recovery service quality is shown as Figure 4-11.
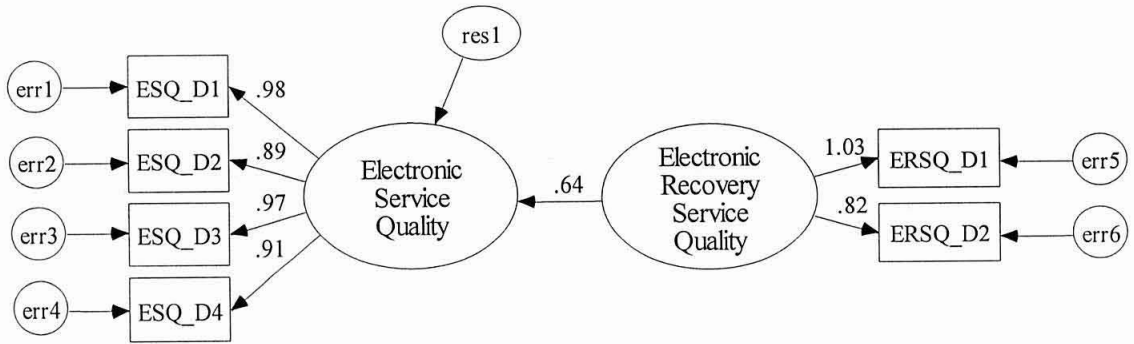
Figure 4-11. Causal structure model of electronic service quality and electronic recovery service quality.

Note. Errors of measurement associated with each indicator are presented as err and followed by the corresponding numbers of the 17-indicator modified E-S-QUAL and the two-factor modified E-RecS-QUAL. The residual associated with the endogenous latent variable is presented as res1.

The model fit results of causal structure model of electronic service quality and electronic recovery service quality indicated that the model marginally fit the sample. A summary of the goodness-of-fit results is presented in Table 4-32.

Table 4-32

Goodness-of-Fit Results of Causal Structure Model of Electronic Service Quality and
Electronic Recovery Service Quality (N = 121)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	27.24 ($p < .005$)	$p > .05$
Degrees of freedom	df	8	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.41	2 to 5
Goodness of fit index	GFI	.93	$> .90$
Root mean square error of approximation	RMSEA	.14	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.82	$> .90$
Tucker-Lewis index	TLI	.96	$> .90$
Normed fit index	NFI	.97	$> .90$
Comparative fit index	CFI	.98	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.52	$> .50$
Parsimonious goodness-of-fit index	PGFI	.36	$> .50$

As shown in Table 4-32, some goodness-of-fit indices were satisfied with their relative recommended thresholds (GFI = .93; TLI = .96; NFI = .97; CFI = .98; and PNFI = .52). Rigdon (1996) suggested that RMSEA was best suited to use in a confirmatory model with larger samples. The sample size for this model was 121, and thus RMSEA was not suited to test the model. Therefore, the goodness-of fit results supported H_{10} and indicated that electronic recovery service quality has a positive effect on electronic service quality.

Research Hypotheses 11 and 12

H_{11}: The level of customer satisfaction has a direct negative effect on customer

complaints for consumer electronics e-tailers.

H_{12}: The level of customer satisfaction has a direct positive effect on customer

loyalty for consumer electronics e-tailers.

Confirmatory Factor Analysis (CFA) of Consequences of Customer Satisfaction

Before making any attempt to evaluate the causal structure model, the CFA model

of consequences of customer satisfaction was examined for the validity of measurement

model. The CFA model was specified to examine the relationships among three

constructs (customer satisfaction, customer loyalty and customer complaint) and their

observed indicators. The initially hypothesized model is shown in Figure 4-12.

Figure 4-12. Hypothesized CFA model of consequences of customer satisfaction.

Note. Errors of measurement associated with each indicator are presented as err and followed by the consecutive numbers.

The results of the initial estimation of the CFA model of consequences of customer satisfaction indicated that model fit was adequate (GFI = .93; RMSEA = .08; TLI = .95; NFI = .95; CFI = .96; PNFI = .70; and PGFI = .58). Although the AGFI value of .89 did not meet the threshold of .90, its value was very close to the threshold and thus it represented an acceptable model fit. Therefore, no further modification was needed. Table 4-33 presents goodness-of-fit results of initial estimation of the first-order CFA model of consequences of customer satisfaction.

Table 4-33

Goodness-of-Fit Results of Initial Estimation of the First-Order CFA Model of Consequences of Customer Satisfaction (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	120.89 ($p < .001$)	$p > .05$
Degrees of freedom	df	41	≥ 0
Chi-square / degrees of freedom ratio	χ^2/df	2.95	2 to 5
Goodness of fit index	GFI	.93	> .90
Root mean square error of approximation	RMSEA	.08	< .08
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.89	> .90
Tucker-Lewis index	TLI	.95	> .90
Normed fit index	NFI	.95	> .90
Comparative fit index	CFI	.96	> .95
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.70	> .50
Parsimonious goodness-of-fit index	PGFI	.58	> .50

Causal Structure Model of Consequences of Customer Satisfaction

The initially hypothesized causal structure model represented in Figure 2-3 in Chapter II was designed to test the relationships among customer satisfaction, customer loyalty, and customer complaint. The causal structure model of consequences of customer satisfaction was designed to test the hypothesis that customer satisfaction has a positive effect on customer loyalty and has a negative effect on customer complaint. The causal structure model of consequences of customer satisfaction is shown as Figure 4-13.
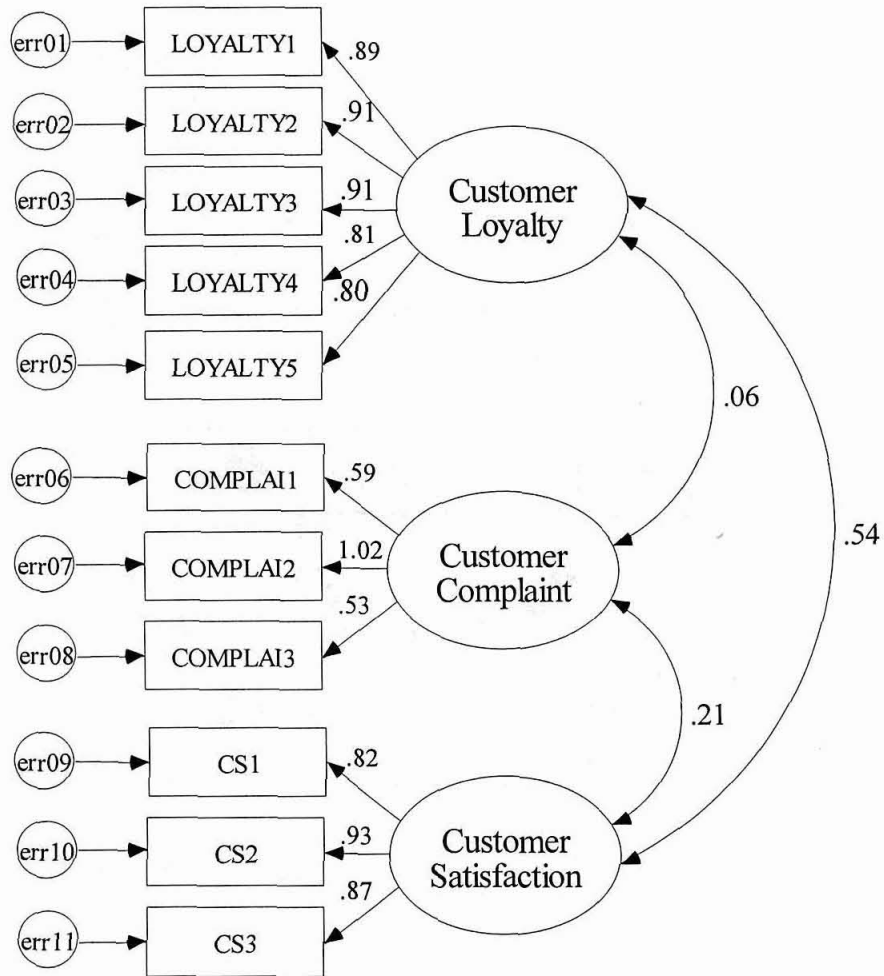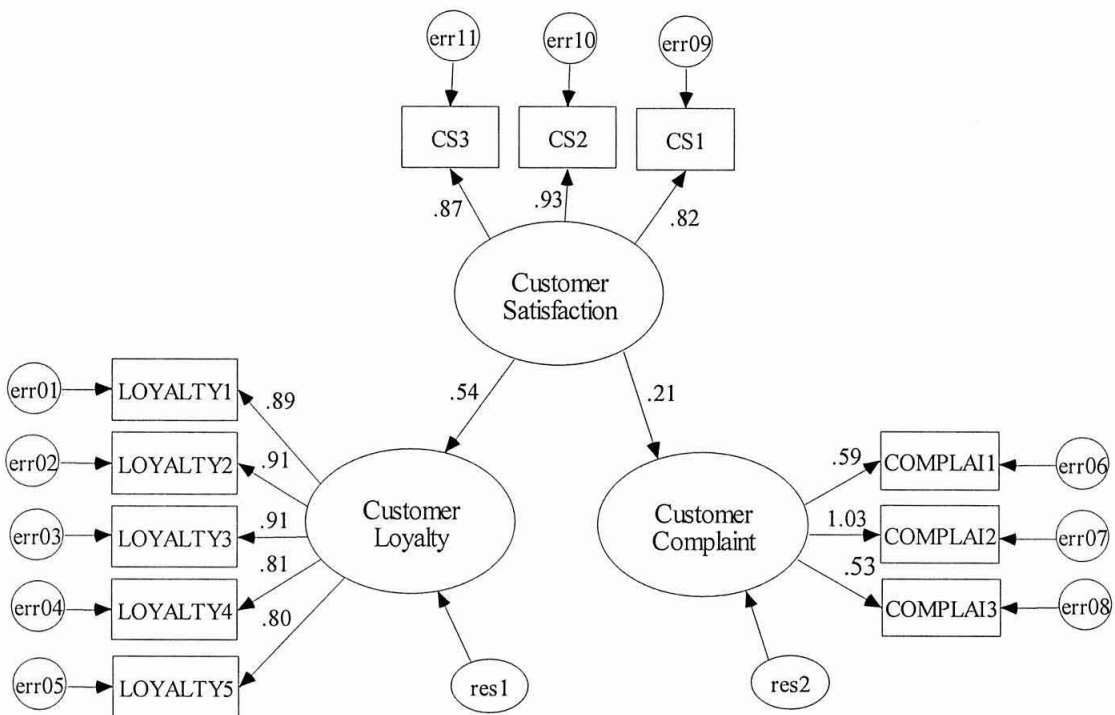

Figure 4-13. Causal structure model of consequences of customer satisfaction.

Note. Errors of measurement associated with each indicator are presented as err and followed by the corresponding numbers. Residuals associated with each endogenous latent variable are presented as res1 and res2.

The model fit results of causal structure model of consequences of customer satisfaction indicated that the model well fit the sample. Similar to the results of hypothesized first-order CFA model of consequences of customer satisfaction, the majority of the goodness-of-fit indices were satisfied with their relative recommended thresholds. Therefore, the goodness-of fit results supported H_{11} and H_{12} and indicated that customer satisfaction has a positive effect on customer loyalty and had a negative effect on customer complaints. A summary of the goodness-of-fit results is presented in Table 4-34.

Table 4-34

Goodness-of-Fit Results of Causal Structure Model of Consequences of Customer Satisfaction (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	122.01 ($p < .001$)	$p > .05$
Degrees of freedom	df	42	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	2.91	2 to 5
Goodness of fit index	GFI	.93	$> .90$
Root mean square error of approximation	RMSEA	.08	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.90	$> .90$
Tucker-Lewis index	TLI	.95	$> .90$
Normed fit index	NFI	.94	$> .90$
Comparative fit index	CFI	.96	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.72	$> .50$
Parsimonious goodness-of-fit index	PGFI	.59	$> .50$

Reliability and Validity of Customer Loyalty Scale and Customer Complaint Scale

The reliability of the *Customer Loyalty Scale* and the *Customer Complaint Scale* was calculated by Cronbach's coefficient alpha. The coefficient alpha values exceeded the minimum standard of .7 (Nunnally & Bernstein, 1994), providing good estimates of internal consistency reliability. As shown in Table 4-35, coefficient alpha values were .94 for the *Customer Loyalty Scale* and .74 for the *Customer Complaint Scale*. Both scales obtained an acceptable level of a coefficient alpha above .70, indicating that both scales were reliable.

Table 4-35

Standardized Solutions of First-Order CFA Model for Consequences of Customer Satisfaction

Factor / Item	Factor loading	R^2
Customer loyalty (Cronbach's alpha = .94)		
LOYALTY1	.89	.79
LOYALTY2	.91	.83
LOYALTY3	.92	.84
LOYALTY4	.82	.67
LOYALTY5	.80	.65
Customer complaint (Cronbach's alpha = .74)		
COMPLAI1	.62	.39
COMPLAI2	.97	.95
COMPLAI3	.56	.32

Estimates of standardized factor loadings were used to determine the convergent validity of the *Customer Loyalty Scale* and the *Customer Complaint Scale*. The factor loadings in the confirmatory factor analysis ranged from .80 to .92 for customer loyalty and from .56 to .97 for customer complaint (see Table 4-35). Because each factor loading on both constructs was more than .50, the convergent validity for these two scales was established (Hair et al., 1998).

Research Hypothesis 13

H_{13}: Customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, and customer complaints and customer loyalty for consumer electronics e-tailers.

The initially hypothesized causal structure model represented in Figure 2-3 in Chapter II was designed to test the relationships among customer expectations, electronic service quality, perceived value, customer satisfaction, customer loyalty, and customer complaint. The causal structure model of Electronic Customer Satisfaction (e-CS) was designed to test the hypothesis that customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, and customer complaints and customer loyalty. The causal structure model of e-CS is shown as Figure 4-14.

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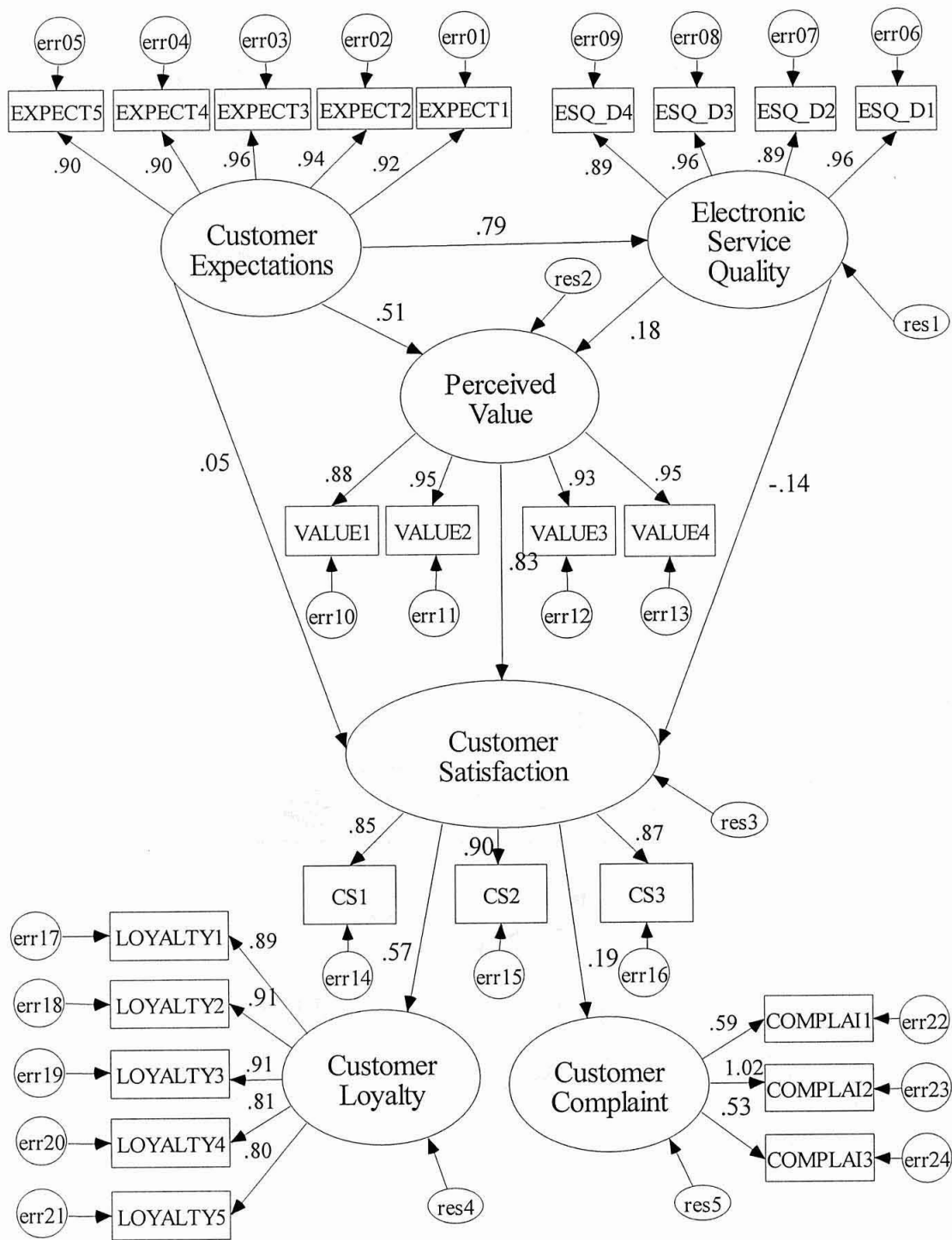
Figure 4-14. Causal structure model of Electronic Customer Satisfaction (e-CS).

Note. Errors of measurement associated with each indicator are presented as err and followed by the corresponding numbers. Residuals associated with each endogenous latent variable are presented as res1 to res5.

The results of the initial estimation of the CFA model of antecedents of customer satisfaction indicated that model fit was marginally adequate (TLI = .92; NFI = .90; CFI = .93; PNFI = .80; and PGFI = .66). Although the GFI value of .82 did not meet the threshold of .90, its value was very close to the threshold and thus it represented an acceptable model fit. Compared to the study of Parasuraman, Zeithaml, and Malhotra (2005), this study had a lower RMSEA value of .09 than that reported by Parasuraman et al. (2005). Therefore, no further modification was needed. A summary of the goodness-of-fit results is presented in Table 4-36.

Table 4-36

Goodness-of-Fit Results of Causal Structure Model of Electronic Customer Satisfaction (N = 276)

Goodness-of-fit statistics		Values	Desired range of values for a good fit
Absolute fit measures			
Chi-square test	χ^2	788.49 $(p < .001)$	$p > .05$
Degrees of freedom	df	244	≥ 0
Chi-square / degrees of freedom ratio	χ^2 / df	3.23	2 to 5
Goodness of fit index	GFI	.82	$> .90$
Root mean square error of approximation	RMSEA	.09	$< .08$
Incremental fit measures			
Adjusted good-of-fit index	AGFI	.77	$> .90$
Tucker-Lewis index	TLI	.92	$> .90$
Normed fit index	NFI	.90	$> .90$
Comparative fit index	CFI	.93	$> .95$
Parsimonious fit measures			
Parsimonious normed fit index	PNFI	.80	$> .50$
Parsimonious goodness-of-fit index	PGFI	.66	$> .50$

Similar to the results of the tests of H_3 through H_8, two standardized regression weights were unusual as shown in Figure 4-14. The standardized regression weight of customer expectations to customer satisfaction was as low as .05, and the standardized regression weight of electronic service quality to customer satisfaction was -.14. Table 4-37 presents regression weights of causal structure model of electronic customer satisfaction.

Table 4-37

Regression Weights of Causal Structure Model of Electronic Customer Satisfaction (e-CS)

		Unstandardized B coefficient	SE	Standardized β coefficient	t-value
Electronic service quality ←	Customer expectations	4.323	.252	.79	17.159**
Perceived value ←	Customer expectations	.931	.154	.51	6.064**
Perceived value ←	Electronic service quality	.061	.027	.18	2.230*
Customer satisfaction ←	Perceived value	.664	.056	.83	11.848**
Customer satisfaction ←	Electronic service quality	-.038	.020	-.14	-1.918*
Customer satisfaction ←	Customer expectations	.074	.117	.05	.631
Customer loyalty ←	Customer satisfaction	.377	.040	.57	9.324**
Customer complaint ←	Customer satisfaction	.120	.042	.19	2.869**

Note. * $p \leq .05$; ** $p \leq .01$

As shown in Table 4-37, only the regression weight of customer expectations to customer satisfaction was not significant ($t = .63$; $p > .05$). This indicated that customer expectations had no significant direct effect on customer satisfaction. However, the unstandardized data were difficult to make comparisons with each effect. Using

standardized data allows this study to compare the relative effect of each exogenous latent variable on the endogenous latent variable (Hair et al., 1998). The analyses of direct, indirect, and total effects, as presented in Table 4-38, may help understand how exogenous variables influenced endogenous variables.

Table 4-38

Standardized Direct Effects, Indirect Effects, and Total Effects of Causal Structure Model of Electronic Customer Satisfaction (e-CS) (N = 276)

	Customer expectations	Electronic service quality	Perceived value	Customer satisfaction
Direct effects				
Electronic service quality	.786**			
Perceived value	.507**	.182*		
Customer satisfaction	.050	-.142*	.834**	
Customer loyalty				.568**
Customer complaint				.192**
Indirect effects				
Perceived value	.143*			
Customer satisfaction	.430**	.151*		
Customer loyalty	.273**	.005	.473**	
Customer complaint	.092	.002	.161*	
Total effects[a]				
Electronic service quality	.786**			
Perceived value	.649**	.182*		
Customer satisfaction	.480**	.009	.834**	
Customer loyalty	.273**	.005	.473**	.568**
Customer complaint	.092	.002	.161*	.192**

Note. $*p \leq .05$; $**p \leq .01$

[a]Total effects = Direct effects + Indirect effects.

In Table 4-38, only one direct effect was not significant: customer expectations to customer satisfaction (.050). Six of nine indirect effects were significant: customer expectations to perceived value (.143), customer expectations to customer loyalty (.273), electronic service quality to customer satisfaction (.151), perceived value to customer loyalty (.473), and perceived value to customer complaint (.161). Three of the indirect effects were not significant: customer expectations to customer complaint (.092), electronic service quality to customer loyalty (.005), and electronic service quality to customer complaint (.002). The results indicated that perceived value and customer satisfaction mediate the relationships among electronic service quality, customer expectations, customer complaints, and customer loyalty. Based on the goodness-of fit results and the results of analysis of direct, indirect, and total effects, H_{13} was supported, thereby indicating that customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, customer complaints, and customer loyalty.

With the exception of two hypothesized relationships (H_3 and H_5), the structural equation model indicated good support for the proposed electronic satisfaction model. Chapter V provides a discussion of the findings and interpretations of the statistical results. In addition, implications for theory and practice are discussed. The limitations and recommendations for future research are also included.

CHAPTER V

DISCUSSION

The *E-S-QUAL* and *E-RecS-QUAL* scales have been successfully tested in a study by Parasuraman, Zeithaml, and Malhotra (2005). However, *E-S-QUAL* and *E-RecS-QUAL* are newly developed and lack specific application to different types of e-business. This study is the first to examine and explore the relationships among electronic service quality, customer satisfaction, and customer loyalty for consumer electronic e-tailers. The specific purposes of this non-experimental, correlational study using structural equation modeling and quota and snowball sampling were to validate the dimensions contained in electronic service quality (including electronic service recovery quality) applied to consumer electronics e-tailers, to validate the customer satisfaction model applied to consumer electronics e-tailers, and to link the construct of electronic recovery service quality to the customer satisfaction model for consumer electronics e-tailers. A total of 13 hypotheses were tested.

In this study, electronic service quality was measured by online shoppers' perceptions of electronic service quality of consumer electronic e-tailers through four dimensions of 17-indicator modified *E-S-QUAL* (efficiency, system availability, fulfillment, and privacy). Electronic recovery service quality was measured by online shoppers' perceptions of electronic recovery service quality of consumer electronic e-tailers through two dimensions of modified *E-RecS-QUAL* (responsiveness and contact, and compensation). Customer expectations were measured by online shoppers' expectations of consumer electronic e-tailers, using the five-item modified *E-S-QUAL*. Customer satisfaction was measured by the level of online shoppers' satisfaction with

consumer electronic e-tailers, using a three-item *Customer Satisfaction Scale* which was adopted from the *American Customer Satisfaction Index (ACSI)* scale. Perceived value was measured by online shoppers' trade-off between price and service quality, using the four-item *Perceived Value Scale* developed by Parasuraman et al. (2005). Customer loyalty was measured by online shoppers' favorable intentions to repurchase consumer electronics at a certain e-tailer, using the five-item modified *Behavioral-Intentions Battery* scale developed by Parasuraman et al. (2005). Customer complaint was measured by online shoppers' unfavorable intentions to consumer electronics e-tailers, using the three-item *Customer Complaints Scale*, which was adopted from the *Behavioral-Intentions Battery* scale developed by Zeithaml, Berry, and Parasuraman (1996).

Using quota and snowball sampling, participants received e-mail invitations and voluntarily completed the online survey. A total of 276 participants completed the online survey. Findings indicated that perceived value and customer satisfaction were two significant variables that mediated the relationships among customer expectations, electronic service quality, customer loyalty, and customer complaint. However, this study also found that electronic service quality and customer expectations had no direct effects on customer satisfaction, but had indirect positive effects on customer satisfaction for consumer electronics e-tailers. Chapter V presents a discussion of the interpretations, limitations, implications, recommendations, and conclusions in this study of relationships among customer expectations, electronic service quality, perceived value, customer satisfaction, customer loyalty, and customer complaint.

Interpretations

Socio-Demographic Characteristics of Online Consumer Electronics Shoppers

Based on the data analyzed in the *Socio-Demographic Characteristics* in Chapter

IV, the major online consumer electronics shoppers of this study were male. The

majority of online consumer electronics shoppers were between the ages of 26 and 35

years (47%). This was a relatively young group of people, born between 1970 and 1979.

Depending upon the demographer, they can represent characteristics of generation X or

generation Y (Mitchell, McLean, & Turner, 2005). Both generations X and Y are

identified as "computer savvy" (Practice Development Counsel, 2005), used computers at

young ages, and may be frequent computer users today.

For marital status, more than half of online consumer electronics shoppers were

married. The majority of online consumer electronics shoppers were full-time employees,

with many working as business managers or administrative personnel. Most online

consumer electronics shoppers earned between $30,000 and $44,999 per year, and their

annual family income was between $60,000 and $74,999. In terms of education, the

majority of online consumer electronics shoppers earned professional or graduate degrees.

Combining educational and occupational status, this resulted in a sample of online

consumer electronics shoppers who were mostly upper-middle class, according to

Hollingshead's Index of Social Position (ISP) categories (as cited in Miller & Salkind,

2002).

Characteristics of the final data-producing sample in gender and family income

were partially consistent with characteristics of the initial quota sample. Unlike

characteristics of the initial quota sample, however, characteristics of the final data-

producing sample were dominated by respondents who were under 45 years old and with some college level education. This may indicate that younger and educated people were more willing to forward the survey invitation and to complete the online survey. The result may also indicate that generations X and Y are more willing to purchase consumer electronics over the Internet compared to other age groups.

According to an online survey of 1,200 U.S. Internet users by Ernst & Young, an international accounting and consulting firm, men more than women bought consumer electronics online (44% of men versus 26% of women) (as cited in Pastore, 2000). Szymanski and Hise (2000) obtained similar demographic results, where the number of male online shoppers was more than that of female online shoppers. In their study, 73% of a total of 1,007 respondents who finished an online survey about customer satisfaction were male. Demographic findings about gender in the present study were consistent with those studies' findings. However, demographic findings about gender in the present study were not consistent with the study by Parasuraman, Zeithaml, and Malhotra (2005), who surveyed customers of Amazon.com and Walmart.com for electronic service quality and electronic recovery service quality as well as for demographic information. However, in their study, there were three times as many female respondents as male.

Findings about the ages of online shoppers of consumer electronics in this study (47% were between the ages of 26 - 35 years), were somewhat consistent with the study by Parasuraman et al. (2005). In their study, online shoppers in the age group between 25 and 40 accounted for 40% of all respondents. However, the mean age of 35.2 years in this study was inconsistent with the mean age of 44 years reported by Szymanski and Hise (2000).

This study's finding that 90% of the sample of online shoppers of consumer electronics had some college level education was consistent with the findings of Szymanski and Hise (2000), where 88% of online shoppers of books, CDs, computers, and travel had some college, and with the findings of Parasuraman et al. (2005), where 86% of customers of Amazon.com and Walmart.com had some college. However, findings about education were inconsistent with the research by Turow, Feldman, and Meltzer (2005). These researchers surveyed 1,500 Internet users and found that only 61% of respondents had some college. This indicated that online consumer electronics shoppers may be more educated than general Internet users versus the more specific category of Internet users who are online buyers.

In this study, 60% of online shoppers of consumer electronics products reported a family income of less than $75,000. These findings about family income in this study were consistent with the findings of Turow et al. (2005), where 55 % of Internet users had annual family income less than $75,000, but inconsistent with the findings of Parasuraman et al. (2005), where, 76% of customers of Amazon.com and 83% of customers of Walmart.com had annual family income less than $75,000. This suggests that the average annual family income of online consumer electronics shoppers may be higher than that of other types of online shoppers because the unit price of consumer electronics is higher than unit price of other kinds of product, such as apparel or books commonly sold through Amazon.com and Walmart.com.

Characteristics of the final data-producing sample were partially consistent with characteristics of the initial quota sample. Most online consumer electronics shoppers were in generation X, who grew up with the computer technology. Findings about the

age of online shoppers of consumer electronics in this study were somewhat consistent with the study by Parasuraman et al. (2005). Findings about the education of online shoppers of consumer electronics in this study were consistent with the findings of Szymanski and Hise (2000) and Parasuraman et al. (2005). Findings about family income in this study were consistent with the findings of Turow et al. (2005). This study was the first study that examined the relationships among electronic service quality, customer satisfaction, and customer loyalty using a sample of online purchasers of consumer electronics. This study's demographic characteristics included a majority between the ages of 26 and 35 years (47%), mean age of 35.2, a majority with professional or graduate degrees (40.6%), and with 40% earning a family income of $75,000 or more. These characteristics of online consumer electronics shoppers were new, and contribute to the body of knowledge about customer characteristics for consumer electronics e-tailers.

Online-Purchasing Characteristics of Online Consumer Electronics Shoppers

Based on the data analyzed in the *Online-Purchasing Characteristics* in Chapter IV, the most popular product category was IT/Tech Office product (54%). The majority of online shoppers (71.8%) purchased consumer electronics less than once a month, and nearly one-half (48.6%) of online shoppers annually spent between $101 and $500 in shopping at consumer electronics e-tailers. Less than half (43.8%) of online consumer electronics shoppers had negative experiences with consumer electronics e-tailers.

According to the Consumer Electronics Association (CEA), digital cameras and cordless telephones are included in the top five consumer electronics gifts in 2005 (as cited in Smith, 2005). This organization also reported that the unit sales of digital

cameras increased to $18,852,000 in 2004, from $14,786,000 in 2003, and that unit sales

of cordless telephones slightly increased to $37,605,000 in 2004, from $37,534,000 in

2003 (as cited in Gerson, 2005). Digital cameras and cordless telephones are included in

the IT/Tech Office category for this study. Online-purchasing behavior findings about

popular product categories of consumer electronics in this study were consistent with

actual sales data obtained from Consumer Electronics Association.

According to Turow et al. (2005), the average monthly online shopping frequency

was 1.34 times per online shopper. This indicated that the purchase frequency of most

online consumer electronics shoppers (71.8% shop at consumer electronics e-tailers less

than once a month) may be less frequent than that of online shopping for general products.

The possible explanation is that most consumer electronics products are more durable

than other kinds of products. People typically do not purchase a new digital camera or

cordless telephone every month, even though some manufacturers launch new models of

products quarterly and try to make product life cycles shorter.

Kerner (2004) reported that the average online spending per person in the first

half of 2004 was nearly $580. In other words, the average online spending per person in

2004 was estimated to be nearly $1,200. Miller (2001) reported that online consumer

electronics sales accounted for 6% of total online sales. Because online spending per

year in the consumer electronics area was not found in the literature, it was estimated to

be around $70 per customer per year based on Miller's report of 6% of $1200 (total

online spending reported by Kerner). Findings in this study indicated most online

shoppers spent between $101 and $500 per year in purchasing consumer electronics on

the Internet. This indicated that the actual spending per year for online consumer

electronics shoppers may be more than the estimated spending, or that spending for consumer electronics purchased online may be increasing, as this study occurred during the second half of 2005.

In the research by Parasuraman et al. (2005), only about 8% of the Amazon.com sample of 653 and 16% of the Walmart.com sample of 205 had experienced problems or sought assistance from the Web sites. This resulted in small sample sizes for electronic recovery service quality in their study: 51 for Amazon.com and 34 for Walmart.com. Compared with their research, this study found that nearly 44% (n = 121) of the sample of 276 had negative experiences with consumer electronics e-tailers. A possible explanation is that Amazon.com and Walmart.com are e-tailers with a positive image and reputation and a better customer service system, and thus the sites have fewer customers having experienced problems with them. A second explanation is that the Web sites that consumers responded to in this study were more heterogeneous, and were not limited to customers shopping at a specific consumer electronics e-tailer. A third explanation is that a diversity of e-tailers does not have the quality of service as Amazon.com or Walmart.com. A fourth explanation is that type of product typically sold (apparel, books) at Amazon.com and at Walmart.com may have few product problems as might be experienced with consumer electronic products.

Hypotheses Testing

In this study, goodness-of-fit measures are major criteria to test the hypothesized model. Regression weights were used for hypothesis testing when it was necessary to examine the extent of effects of exogenous latent variables on endogenous latent variables. An absolute fit measure was used to determine the degree to which the overall

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model (structural and measurement models) fits the sample data. An incremental fit measure was used to compare the proposed model to a baseline model. A parsimonious fit measure was used to diagnose whether model fit has been achieved by over-fitting the data with too many coefficients (Hair et al., 1998). The results of absolute fit measures and incremental fit measures were varied in this study. Parsimonious fit measures were consistently acceptable for all hypotheses tests in this study.

Out of twenty hypotheses (including four sub-hypotheses for H_1 and three for H_2) in this study, 13 were supported, two were partially supported, and five were not supported. Table 5-1 summarizes the research purposes, corresponding hypotheses, and whether or not the hypothesis was supported based on the results in Chapter IV.

Table 5-1

Research Purposes, Hypotheses, and Results

Research Purposes	Hypotheses	Results
To validate the dimensions contained in electronic service quality (including electronic service recovery quality) applied to consumer electronics e-tailers	1. Each dimension of electronic service quality has a positive relationship with electronic service quality.	Supported
	1a. *The efficiency dimension has a positive relationship with electronic service quality.*	Supported
	1b. The fulfillment dimension has a positive relationship with electronic service quality.	Supported
	1c. The system availability dimension has a positive relationship with electronic service quality.	Supported
	1d. The privacy dimension has a positive relationship with electronic service quality.	Supported
	2. Each dimension of electronic recovery service quality has a positive relationship with electronic recovery service quality.	Partially Supported
	2a. The responsiveness dimension has a positive relationship with electronic recovery service quality.	Not Supported
	2b. The compensation dimension has a positive relationship with electronic recovery service quality.	Supported
	2c. The contact dimension has a positive relationship with electronic recovery service quality.	Not Supported
To validate the *ACSI* model applied to consumer electronics e-tailers	3. Electronic service quality has a direct positive effect on the level of customer satisfaction.	Not Supported
	4. Perceived value has a direct positive effect on the level of customer satisfaction.	Supported
	5. Customer expectations have a direct positive effect on the level of customer satisfaction.	Not Supported
	6. Customer expectations have a direct positive effect on electronic service quality.	Supported
	7. Electronic service quality has a direct positive effect on perceived value.	Supported
	8. Customer expectations have a direct positive effect on perceived value.	Supported
To link the construct of electronic recovery service quality to the *ACSI* model.	9. Electronic recovery service quality has a direct positive effect on the level of customer satisfaction.	Not Supported
	10. Electronic recovery service quality has a direct positive effect on electronic service quality.	Supported
To validate the *ACSI* model applied to consumer electronics e-tailers	11. The level of customer satisfaction has a direct negative effect on customer complaints.	Supported
	12. The level of customer satisfaction has a direct positive effect on customer loyalty.	Supported
	13. Customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, and customer complaints and customer loyalty.	Partially Supported

The Dimensions of Electronic Service Quality

This study hypothesized that four dimensions (efficiency, system availability, fulfillment, and privacy) of electronic service quality have a positive relationship with electronic service quality for consumer electronics e-tailers (H_1 and H_{1a} through H_{1d}). The results indicated that electronic service quality consisted of four dimensions and each dimension had a positive relationship with electronic service quality for consumer electronics e-tailers. These findings support the assessment of electronic service quality by Parasuraman, Zeithaml, and Malhotra (2005), using Amazon.com and Walmart.com Web sites.

Parasuraman et al. (2005) found that 22 items of *E-S-QUAL* were organized by four dimensions. The results for Amazon.com and Walmart.com also supported their findings. However, this study found that the four dimensions consisted of 17 items, not the original 22 items of *E-S-QUAL*. There are several possible explanations for the elimination of five items. First of all, for the dimension of efficiency, the item ESQ01 "this site makes it easy to find what I need" and the item ESQ04 "information at this site is well-organized" may be a situation of collinearity or redundancy between these variables. Usually, it is easy to find a certain product when the site is well-organized. Second, the Internet connecting speed to the Internet when customers shop at consumer electronics e-tailers may influence their evaluations of the item ESQ05 "this site loads its pages fast." Third, in the late 90s, many e-businesses did suffer from the unstable servers which had difficulty to deal with large numbers of data transactions at one time. Nowadays, the speed of the CPU has been tripled compared to the speed of five years ago, and the capacity of data storage devices has been increased tremendously. Therefore,

items ESQ09 "this site is always available for business" and ESQ12 "pages at this site do not freeze after I enter my order information" may have become basic requirements for consumer electronic e-tailers. Finally, the item ESQ22 "this site protects information about my credit card" also may be a basic requirement for consumer electronics e-tailers. Compared with ESQ22, two other items (ESQ20 and ESQ21) in the same dimension of privacy of the original *E-S-QUAL* may also relate to security, such as the unauthorized installation of spyware and adware. The results of a survey of 1,005 consumers showed that the concern for data privacy, online fraud, and identity theft made consumers avoid online shopping (Vijayan, 2005). According to these possible explanations, *E-S-QUAL* seems to need further modification to fit the context of consumer electronics e-tailers today because Internet security and identity theft recently have become major concerns of online consumer shoppers.

The Dimensions of Electronic Recovery Service Quality

This study hypothesized that three dimensions (responsiveness, compensation, and contact) of electronic recovery service quality have a positive relationship with electronic service quality for consumer electronics e-tailers (H_2 and H_{2a} through H_{2c}). The results indicated that electronic recovery service quality consisted of two dimensions (responsiveness and contact, and compensation), and each dimension had a positive relationship with electronic recovery service quality for consumer electronics e-tailers. These findings do not support the assessment of electronic recovery service quality by Parasuraman et al. (2005).

Parasuraman et al. (2005) found that 11 items of *E-RecS-QUAL* were organized by three dimensions (responsiveness, compensation, and contact) when they conducted

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an exploratory factor analysis during the development of the scale. Nevertheless, the restricted sample sizes from Amazon.com (51) and Walmart.com (34) were too small to adequately assess the scale's validity. This study obtained a somewhat larger sample size of 121 completed responses for the assessment of electronic recovery service quality, and met the recommended minimum observation-to-variables ratio of five (Hair et al., 1998). However, the results of the modified CFA model indicated that 11 items were organized by two dimensions, not by three dimensions.

A possible explanation for these unpredicted findings may due to the high correlation between items on the dimension of contact and items on the dimension of responsiveness. For example, for the dimension of responsiveness, the item of ERSQ05 "this site takes care of problems promptly" may imply customer service representatives are responsible and deal with problems seriously. The point is that people solve problems, not the Web site. Customers may make efforts to contact the Web site either by phone or by e-mail when problems occur. They may think the Web site is responsible when they successfully communicate with the site. Therefore, items organized by the dimension of contact are highly correlated with items organized by the dimension of responsiveness, and thus these two dimensions could merge into one dimension, which may result from a situation of collinearity.

Relationships Among the Antecedents of Customer Satisfaction

This study hypothesized that electronic service quality has a direct positive effect on the level of customer satisfaction (H_3), that perceived value has a direct positive effect on the level of customer satisfaction (H_4), that customer expectations have a direct positive effect on the level of customer satisfaction (H_5), that customer expectations have

a direct positive effect on electronic service quality (H_6), that electronic service quality has a direct positive effect on perceived value (H_7), and that customer expectations have a direct positive effect on perceived value (H_8). The results indicated that high perceived value may result in high customer satisfaction with shopping experiences. The positive relationship between perceived value and customer satisfaction supported the research findings of Oliver (1993) and of Oliver and Swan (1989a) about equity and satisfaction.

In this study, the results also indicated that customer expectations and electronic service quality did not directly influence customer satisfaction. Instead, customer expectations and electronic service quality influenced customer satisfaction via perceived value. These unpredicted findings do not support empirical findings of a positive relationship between expectations and satisfaction found by Bearden and Teel (1983) and Swan and Trawick (1981), and do not support empirical findings that service quality is one of the antecedents of satisfaction (Anderson & Sullivan, 1993; Cronin & Taylor, 1992, 1994; Reidenbach & Sandifer-Smallwood, 1990; Spreng & Mackoy, 1996; Woodside, Frey, & Daly, 1989). A possible explanation for these unexpected findings may be that online shoppers primarily evaluate their satisfaction according to their perceived value. The process of online shopping is a kind of self-service procedure. Online shoppers on their own decide what kind of consumer electronics product they want to purchase, read the online product description, compare prices and those providing coupon codes on the Internet, and submit an electronic order to the e-tailer of their choice. No wonder saving time is the biggest advantage of self-service (Howard & Worboys, 2003). Due to lack of human contact, online shoppers may easily misunderstand that e-tailers start to serve customers only from order handling to delivery, and forget that

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service includes the development and design of the Web site, reliable computer servers, and so on. Therefore, online shoppers may simply use the price and the delivery as the standards for the evaluation of satisfaction.

Relationships Among Electronic Recovery Service Quality, Electronic Service Quality, and Customer Satisfaction

This study hypothesized that electronic recovery service quality has a direct positive effect on the level of customer satisfaction (H_9), and that electronic recovery service quality has a direct positive effect on electronic service quality (H_{10}). The results indicated that electronic recovery service quality does not directly influence customer satisfaction, but directly influences electronic service quality. These findings do not support the empirical findings of Miller, Craighead, and Karwan (2000) and of Smith and Bolton (2002) that resolving customer problems has a strong impact on customer satisfaction.

A possible explanation for the unpredicted findings may be that the *E-RecS-QUAL* is a sub-scale of the *E-S-QUAL* (Parasuraman et al., 2005). In other words, electronic recovery service quality may be a dimension of electronic service quality. Unfortunately, in this study, the sample size of 121 is too small to test the causal structure model of electronic recovery service quality, electronic service quality, and customer satisfaction. This study was not able to test whether electronic recovery service quality has an indirect effect on customer satisfaction.

Relationships Among the Consequences of Customer Satisfaction

This study hypothesized that customer satisfaction has a direct negative effect on customer complaints (H_{11}), and that customer satisfaction has a direct positive effect on

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customer loyalty (H_{12}). The results indicated that customer satisfaction did influence behavioral intentions. Online shoppers who were satisfied with shopping experiences with consumer electronics e-tailers may have favorable intentions toward the sites such as repurchase intentions; online shoppers who were not satisfied with consumer electronic e-tailers may have unfavorable intentions toward the sites, which may lead them to complain to other customers. These findings confirm the definition of loyalty by Oliver (1999), and support the results of the empirical research by Luarn and Lin (2003) and Singh (1988).

This study found that online shoppers who were satisfied with consumer electronics e-tailers were likely to have favorable behavioral intentions toward the sites, such as recommending the consumer electronics e-tailers they shopped to someone and considering the e-tailer to be their first choice for future transactions. On the contrary, online shoppers who were not satisfied with consumer electronics e-tailers were likely to have unfavorable behavioral intentions toward the sites, and to switch to competitors if they experienced a problem with the consumer electronics e-tailer or to complain to other customers.

Electronic Customer Satisfaction (e-CS) Model

This study hypothesized that customer satisfaction mediates the relationships among electronic service quality, customer expectations, perceived value, and customer complaints, and customer loyalty (H_{13}). The results indicated that not only did customer satisfaction mediate the relationships among other latent variables, but also perceived value played a very important mediation role. In other words, electronic service quality and customer expectations influence behavioral intentions via perceived value and

satisfaction. These findings in this study support empirical findings of Cronin and Taylor (1992, 1994) and Dabholkar, Shepherd, and Thorpe (2000).

In the *American Customer Satisfaction Index (ACSI)* model, customer satisfaction has three antecedents which have a direct, positive effect on satisfaction: perceived value, perceived service quality, and customer expectations (American Society for Quality, 2001). However, this study found that only one antecedent (perceived value) has a direct positive effect on customer satisfaction. Customer expectations were found to have no effect on satisfaction; moreover, electronic service quality was found to have a weak direct negative effect on satisfaction. These findings marginally support the findings of the American Society for Quality (2001).

A possible explanation may be that online shoppers are willing to endure low electronic service quality in exchange for low price of consumer electronics products. Low electronic service quality may result in low levels of satisfaction, but low prices may bring customers back to the e-tailers. Online shopping does have the advantage of price competition. Most consumer electronics e-tailers ship an order for free when the order reaches a certain amount of money. If the e-tailers do not have any store in the state where the customer lives, the customer can enjoy the benefit of no sales tax. Online shoppers may not care about electronic service quality as much as the price when their online shopping motivation is saving money. A recent *Consumer Reports* reader survey (18,700 respondents) also suggested that online shoppers were satisfied with shopping online for consumer electronics due to price (Wong, 2005).

According to the prior discussion, the hypothesized Electronic Customer Satisfaction (e-CS) model presented in Figure 2-3 of Chapter II was modified to the

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model presented in Figure 5-1. The modified e-CS model removed the arrow

representing the relationship between customer expectations and customer satisfaction,

and changed the relationship between electronic service quality and customer satisfaction

from positive to negative. The modified e-CS model also removed a latent variable

(electronic recovery service quality) because the small sample size of 121 cannot be used
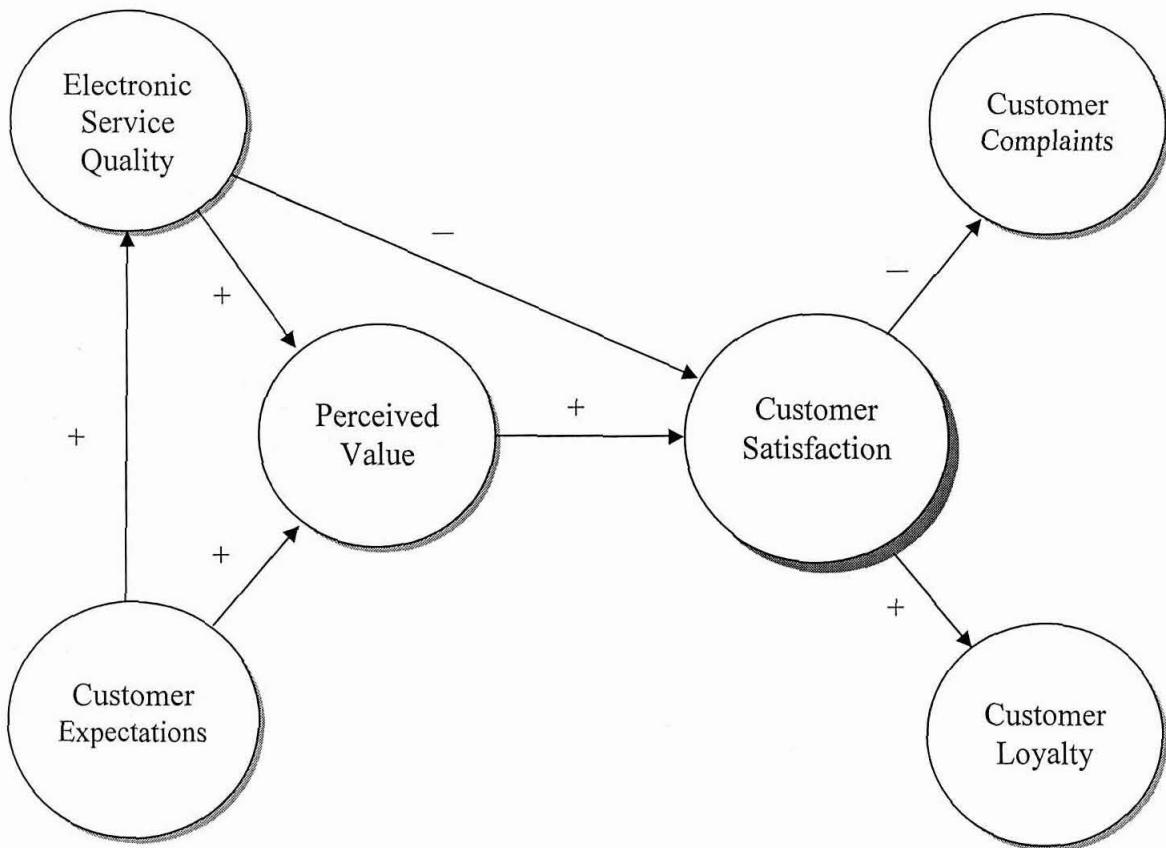
to test the full causal structural model.

Figure 5-1. Modified Electronic Customer Satisfaction (e-CS) model.

Practical Implications

1. Consumer electronics e-tailers could improve service quality through four dimensions: efficiency, system availability, fulfillment, and privacy. Although some items of *E-S-QUAL* were removed as a result of findings in this study, those could not be ignored and may be fundamental requirements for online shoppers.

2. Consumer electronics e-tailers could improve recovery service quality through two dimensions: responsiveness and contact, and compensation. Although electronic recovery service quality may not directly influence customer satisfaction, it may have an indirect effect on customer satisfaction via electronic service quality. Consumer electronics e-tailing managers should be attentive to recovery service quality as much as they are to service quality and should therefore enhance complaint management.

3. The major motivator of customer purchases of consumer electronics on the Internet may be price and saving money. Consumer electronics e-tailers could reduce costs and offer better prices to increase sales.

4. People who are male, under 45 years old, with some college education, and mostly upper-middle class may be the target market for consumer electronics e-tailers. In terms of age, online shoppers who are in generations X and Y may be the target market segment for consumer electronics e-tailers. Managers could develop marketing plans that focus on the target market to increase sales.

5. Customer satisfaction has a direct effect on customers' behavioral intentions. Consumer electronics e-tailers' managers could develop a training program for

customer service representatives to make a concerted effort to increase

customer loyalty and reduce customer complaints.

6. Consumer electronics e-tailing managers could formulate a competitive

    strategy based on the modified Electronic Customer Satisfaction (e-CS) model

    to keep current customers and to enhance customer relation management.

7. Consumer electronics e-tailers could improve their Web sites to serve

    customers better. For example, a better Web site design and check out system

    may allow customers to enjoy self-service and increase satisfaction.

8. Consumer electronics e-tailers could improve Web site security to protect

    customers' privacy because this is a fundamental requirement for e-commerce.

Conclusions

1. Four dimensions of electronic service quality have a positive relationship with

    electronic service quality for consumer electronics e-tailers. These results

    support the empirical findings reported by Parasuraman et al. (2005). However,

    this study found that a modified 17-indicator *E-S-QUAL* was more appropriate

    for measuring electronic service quality for consumer electronics e-tailers than

    the original 22-indicator *E-S-QUAL*.

2. Two dimensions of electronic recovery service quality have a positive

    relationship with electronic service quality for consumer electronics e-tailers.

    These results marginally support the empirical findings reported by

    Parasuraman et al. (2005). The dimensions of responsiveness and contact may

    merge into one dimension.

3. For consumer electronics e-tailers, the greater the perceived value, the greater the customer satisfaction. The greater the customer satisfaction, the greater the chance that customers have favorable intentions toward consumer electronics e-tailers. Findings in this study support satisfaction literature (Cöner & Güngör, 2002; Cronin & Taylor, 1992, 1994; Dabholkar, Shepherd, & Thorpe, 2000).

4. The combined effects of self-service and price may influence the process of online shoppers' evaluation of satisfaction.

5. Perceived value mediates the relationship between customer expectations and customer satisfaction, and is as important a mediator as customer satisfaction in the modified Electronic Customer Satisfaction (e-CS) model.

6. Findings in this study may contribute to the field of online market segmentation, customer relation management, and complaint management.

7. Privacy as a dimension of service quality rarely appears in dimensions of service quality for physical stores, but it is one of four dimensions of electronic service quality in this study. The issue of Internet security becomes important for online shopping.

8. Goodness-of-fit measures may not be always consistently acceptable. The sample size and model complexity could influence the value of fit measures.

Limitations

1. The sample size was too small to add electronic recovery service quality in the e-CS model.

2. The quota and snowball sampling methods are non-random, and may introduce sampling bias, threatening external validity. The results obtained by the quota

and snowball sampling method were difficult to generalize to the population because a quota and snowball sampling method was a type of non-probability sampling and the socio-demographic characteristics of data-producing samples partially matched those of quota samples.

3. This study was primarily a "one-time survey" study due to the constraints of cost and time, although a longitudinal approach is very important for a study of consumer behavior.

4. The findings of this study cannot be generalized to other categories of e-tailers, such as e-tailers selling apparel, due to the difference in the nature of each industry.

5. The survey invitation may not have reached a representative sample of the whole target population.

6. The sample size of 121 for the *E-RecS-QUAL* was too small to conduct all analyses.

7. Single group threats may affect the internal validity of this study (Trochim, 2005). The participants in this study may be active online survey respondents, and they may have completed a similar survey prior to participating in this study.

Recommendations for Future Study

1. This study was limited to examining the causal relationships among customer expectations, electronic service quality, perceived value, customer satisfaction, customer loyalty, customer complaint, and electronic recovery service quality. In any future study, other significant variables, such as store image and

profitability of the consumer electronics e-tailers, may be added into the hypothesized causal structural model.

2. In any future study, the *E-S-QUAL* and *E-RecS-QUAL* need further examination of the reliability and validity in other types of e-businesses.

3. The sample of 121 for the *E-RecS-QUAL* in this study accounted for approximately 44% of the total sample of 276. The sample size was too small to add electronic recovery service quality in the e-CS model. In any future study, the total sample should be doubled in order to obtain a subsample for the *E-RecS-QUAL* to at least 550 participants so that there are at least 200 to test the effects of electronic recovery service quality on other latent variables.

4. Future studies may test whether electronic recovery service quality is a dimension of electronic service quality and whether it indirectly affects customer satisfaction through electronic service quality for consumer electronics e-tailers.

5. The modified Electronic Customer Satisfaction (e-CS) model may be tested, modified, or applied to other contexts in any future study.

6. Future studies may add other variables, such as price and product quality, into the e-CS model and make the model more complete.

7. Future studies may use a different sampling method to collect data; for example, randomly selecting respondents from a list of customers of a specific e-tailer.

8. Future studies may examine the relationships among socio-demographic characteristics, electronic service quality, customer satisfaction, and customer loyalty.

9. Future studies may examine the effect of involvement of self-service on the evaluation of customer satisfaction.

Chapter V provides a discussion of the findings and interpretations of the statistical results. In addition, implications for theory and practice are discussed. The limitations and recommendations for future research are also included.

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APPENDIX A

Authorization for Informed Consent

Lynn University

Principal Investigator: Kuang-Wen Wu
Project Title: Service Quality, Customer Satisfaction, and Customer Loyalty in Consumer Electronics E-Tailers: A Structural Equation Modeling Approach

IRB Project Number___2005-037___ REQUEST FOR IRB EXEMPTION of Application and Research Protocol for a New Project

IRB ACTION by the IRB Chair or Another Member or Members Designed by the Chair

Review of Application and Research Protocol and Request for Exemption Status:
Approved __X__; Approved w/provision(s) _____

COMMENTS
Consent Required: No ___ Yes _X_ Not Applicable ___Written __X___Signed _____
Consent forms must bear the research protocol expiration date of __08/03/06_____
Application to Continue/Renew is due:
(1)   For review of research with exempt status, by a College or School Annual Review of Research Committee __X___. If the academic unit ("The Colleges and Schools") where the researcher is assigned does not have a committee in place, the application to Continue/Renew is submitted to the IRB, for an Expedited IRB Review no later than one month prior to the due date.

Name of IRB Chair (Print) _____Farideh Farazmand_____

Signature of IRB Chair_____ ████████████████ ___Date: _08/03/05_

C.c.: Dr Scialli

Institutional Review Board for the Protection of Human Subjects
Lynn University
3601 N. Military Trail Boca Raton, Florida 33431

Institutional Review Board for the Protection of Human Subjects
Lynn University
3601 N. Military Trail Boca Raton, Florida 33431

AUTHORIZATION FOR VOLUNTARY CONSENT

PROJECT TITLE: Service Quality, Customer Satisfaction, and Customer Loyalty in Consumer Electronics E-Tailers: A Structural Equation Modeling Approach
Project IRB Number: _____ Lynn University 3601 N. Military Trail Boca Raton, Florida 33431
2005-037

I Kuang-Wen Wu, am a doctoral student at Lynn University. I am studying Global Leadership, with a specialization in Corporate and Organizational Management. Part of my education is to conduct a research study.

DIRECTIONS FOR THE PARTICIPANT:

You are being asked to participate in my research study. <u>Please read this carefully</u>. This form provides you with information about the study. The Principal Investigator (Kuang-Wen Wu) will answer all of your questions. Ask questions about anything you don't understand before deciding whether to participate or not. You are free to ask questions at any time before or after your participation in this study. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

PURPOSE OF THIS RESEARCH STUDY: The study is about service quality, customer satisfaction, and customer loyalty in online consumer electronics retailers. There will be approximately 300 people participating in this study. Participants are at least 18 years and older. Participants must be able to fluently read, speak, and write in English. They are online shoppers who have purchased consumer electronics online within the past year.

PROCEDURES: An invitation e-mail sent to participants uses the blind carbon copy (Bcc) feature so that the names and e-mail addresses of recipients does not appear in the header and are unknown to others. The survey is completed electronically and begins by clicking the link below. You are prompted to answer questions based on your online purchasing experiences. It takes about 10 minutes to complete. The data will be kept confidential and stored electronically on "password protected" computers. The data will be destroyed after five years. Recipients of the e-mail are also asked to forward the e-mail to family or friends who may be online consumer electronic buyers. When forwarding the e-mail, you are asked to put e-mail addresses in the "blind carbon copy" feature (Bcc) so that the names and e-mail addresses of recipients does not appear in the header and are unknown to others.

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. You may find that some of the questions are sensitive in nature. In addition, participation in this study requires a minimal amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research. But knowledge may be gained which may help in the continuous improvement of consumer electronics e-tailing.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

ANONYMITY: Anonymity will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. The researcher will not identify you and data will be reported as "group" responses. Participation in this survey is voluntary and proceeding with completing the survey will constitute your informed consent to participate. Your e-mail address, IP address, and individual responses will not be identified nor tracked as part of data collection.

The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study.

RIGHT TO WITHDRAW: You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Kuang-Wen Wu who may be reached at: ▇▇▇▇▇▇ and Dr. Joan Scialli, faculty advisor who may be reached at: (▇▇▇▇▇▇ . For any questions regarding your rights as a research subject, you may call Dr. Farideh Farazmand, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at ▇▇▇▇▇▇ If any problems arise as a result of your participation in this study, please call the Principal Investigator (Kuang-Wen Wu) and the faculty advisor (Dr. Scialli) immediately. You may print off a copy of this consent form.

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INVESTIGATOR'S AFFIDAVIT: I have carefully explained to the subject the nature of the above project. The person participating has represented to me that he/she is at least 18 years of age, and that he/she does not have a medical problem or language or educational barrier that precludes his/her understanding of my explanation. I hereby certify that to the best of my knowledge the person participating in this project understands clearly the nature, demands, benefits, and risks involved in his/her participation.
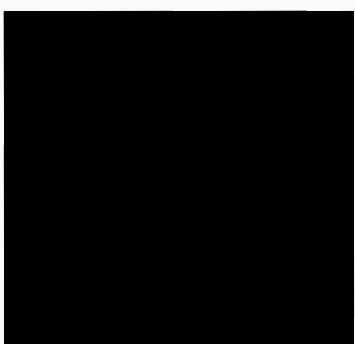
███████████

_____
Signature of Investigator

Date of IRB Approval by Lynn University's Institutional Review Board: _08/03/05 7.7._

Date of IRB Expiration: _08/03/06_

YES, I agree to participate in this study.

NO, I am not interested in this study.

████████████

Seal should not be
Posted on the Web.

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APPENDIX B

Print Outs of Online Authorization for Informed Consent

AUTHORIZATION FOR VOLUNTARY CONSENT

PROJECT TITLE: Service Quality, Customer Satisfaction, and Customer Loyalty in Consumer Electronics E-Tailers: A Structural Equation Modeling Approach

Project IRB Number: 2005-037 Lynn University 3601 N. Military Trail Boca Raton, Florida 33431

I Kuang-Wen Wu, am a doctoral student at Lynn University. I am studying Global Leadership, with a specialization in Corporate and Organizational Management. Part of my education is to conduct a research study.

DIRECTIONS FOR THE PARTICIPANT:

You are being asked to participate in my research study. <u>Please read this carefully.</u> This form provides you with information about the study. The Principal Investigator (Kuang-Wen Wu) will answer all of your questions. Ask questions about anything you don't understand before deciding whether to participate or not. You are free to ask questions at any time before or after your participation in this study. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

PURPOSE OF THIS RESEARCH STUDY: The study is about service quality, customer satisfaction, and customer loyalty in online consumer electronics retailers. There will be approximately 300 people participating in this study. Participants are at least 18 years and older. Participants must be able to fluently read, speak, and write in English. They are online shoppers who have purchased consumer electronics online within the past year.

PROCEDURES: An invitation e-mail sent to participants uses the blind carbon copy (Bcc) feature so that the names and e-mail addresses of recipients does not appear in the header and are unknown to others. The survey is completed electronically and begins by clicking the link below. You are prompted to answer questions based on your online purchasing experiences. It takes about 10 minutes to complete. The data will be kept confidential and stored electronically on "password protected" computers. The data will be destroyed after five years. Recipients of the e-mail are also asked to forward the e-mail to family or friends who may be online consumer electronic buyers. When forwarding the e-mail, you are asked to put e-mail addresses in the "blind carbon copy" feature (Bcc) so that the names and e-mail addresses of recipients does not appear in the header and are unknown to others.

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. You may find that some of the questions are sensitive in nature. In addition, participation in this study requires a minimal amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research. But knowledge may be gained which may help in the continuous improvement of consumer electronics e-tailing.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

ANONYMITY: Anonymity will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. The researcher will not identify you and data will be reported as "group" responses. Participation in this survey is voluntary and proceeding with completing the survey will constitute your informed consent to participate. Your e-mail address, IP address, and individual responses will not be identified nor tracked as part of data collection.

The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study.

RIGHT TO WITHDRAW: You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Kuang-Wen Wu who may be reached at: ▮▮▮▮▮▮ or ▮▮▮▮▮▮, and Dr. Joan Scialli, faculty advisor who may be reached at: ▮▮▮▮▮. For any questions regarding your rights as a research subject, you may call Dr. Farideh Farazmand, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at ▮▮▮▮▮. If any problems arise as a result of your participation in this study, please call the Principal Investigator (Kuang-Wen Wu) and the faculty advisor (Dr. Scialli) immediately. You may print off a copy of this consent form.

INVESTIGATOR'S AFFIDAVIT: I have carefully explained to the subject the nature of the above project. The person participating has represented to me that he/she is at least 18 years of age, and that he/she does not have a medical problem or language or educational barrier that precludes his/her understanding of my explanation. I hereby certify that to the best of my knowledge the person participating in this project understands clearly the nature, demands, benefits, and risks involved in his/her participation.

<div style="background:#000; color:#000; width:250px; height:90px;"> </div>

Signature of Investigator

Date of IRB Approval by Lynn University's Institutional Review Board: August 3, 2005

Date of IRB Expiration: August 3, 2006

YES, I agree to participate in this study.

NO, I am not interested in this study.

APPENDIX C

Survey Instrument

I. Filter Question Part A

1. Are you 18 years old or more?

_____ Yes _____ No

2. Have you been living in the continental United States for at least six months in the past year?

_____ Yes _____ No

3. Which of the following consumer electronic products have you purchased online within the past year (Check all apply)?
   - ☐ **Accessories:** Cables, batteries, chargers, headsets, etc.
   - ☐ **Audio Components**: Receivers, Full-Size Systems, Mini Systems, Portable Audio, etc.
   - ☐ **Electronic Gaming**: PS2, GameCube, Xbox, etc.
   - ☐ **Home Networking**: Access point, router, network card, etc.
   - ☐ **Home Theater**: Home theater system, etc.
   - ☐ **IT/Tech Office**: Digital cameras, camcorders, fax machine, etc.
   - ☐ **Mobile Electronics:** Car Navigation Systems, Car Audio Components, Radar Detectors, etc.
   - ☐ **Video Components**: DVD Players, Televisions, Projectors, AV Equipment, etc.
   - ☐ **Wireless Communications**: Cellphone, etc.
   - ☐ I did **NOT** purchase the above products online within the past year.
   - ☐ Other (Please specify)

II. Socio-Demographic Profile

INSTRUCTIONS: Please choose the category for each question that best describes you.

1. Your gender: _____ Male _____ Female

2. Your age:

3. Your marital status:
   ____Single/Never Married
   ____Married
   ____Separated
   ____Divorced
   ____Widowed

4. Your current employment status:
   ____Full-time
   ____Part-time
   ____Unemployed (Seeking employment)
   ____Unemployed (NOT seeking employment)

5. Your education category:
____Professional (MA, MS, ME, MD, PhD, LLD, and the like)
____Four-year college graduate (BA, BS, BM)
____One to three years college (also business schools)
____High school graduate
____Ten to 11 years of school (part high school)
____Seven to nine years of school
____Less than seven years of school

6. Your occupation category:
____Higher executives of large concerns, proprietors, or major professionals
____Business managers or proprietors of medium-sized businesses
____Administrative personnel or owners of small businesses
____Clerical and sales workers or technicians
____Skilled manual employees
____Machine operators and semiskilled employees
____Unskilled employees

7. What is your annual **household** income category?

____Less than $15,000	____$15,000-$29,999	____$30,000-$44,999
____$45,000-$59,999	____$60,000-$74,999	____$75,000-$89,999
____$90,000-$104,999	____$105,000-$119,999	____$120,000-$134,999
____$135,000-$149,999	____$150,000 or more	

8. What is your annual **personal** income category?

____Less than $15,000	____$15,000-$29,999	____$30,000-$44,999
____$45,000-$59,999	____$60,000-$74,999	____$75,000-$89,999
____$90,000-$104,999	____$105,000-$119,999	____$120,000-$134,999
____$135,000-$149,999	____$150,000 or more	

III. General Question

1. How often do you purchase consumer electronics products on the Internet?
_____ 4 or more times per month
_____ 1-3 times a month
_____ Less than once a month

2. When did you make your last purchase of a consumer electronic product on the Internet?
_____ Less than one week ago
_____ Between one week and less than one month ago
_____ Between one month and less than 3 months ago
_____ Between 3 months and less than 6 months ago
_____ Between 6 months and less than 1 year ago
_____ More than 1 year ago

3. What is the average amount of money you spend in purchasing consumer electronics products on the Internet per year?

____Less than $100   ____$101-$300   ____$301-$500   ____$501-$750

____$751-$1,000   ____$1,001-$1,500   ____$1,501-$2,000   ____$2,001 or more

4. Please list the kind of consumer electronics product you most recently purchased on the Internet?

(_____)

5. Please indicate the Web site name or address at which you made your most recent purchase of consumer electronics products on the Internet.

(_____)

IV. Customer Expectations

INSTRUCTIONS: In this survey, a consumer electronics e-tailer refers to any Internet retailer carrying consumer electronics products whatever a pure player like Amazon.com or a bricks-and-mortar like Walmart.com. Please do NOT consider Ebay.com as a consumer electronics e-tailer. Please answer the following questions based on your most recent shopping experience with a US based consumer electronics e-tailer.

Please show the extent to which you think consumer electronics e-tailers offering services should possess the features described by each statement. Choosing a **5** means that you **strongly agree** that these consumer electronics e-tailers should possess a feature, and choosing **1** means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

1. This site should be used easily and quickly.	1	2	3	4	5
2. This site should fulfill its promises about order delivery and item availability.	1	2	3	4	5
3. This site should function properly.	1	2	3	4	5
4. This site should be safe and protect customer information.	1	2	3	4	5
5. The overall expectation of service quality to the site is very high.	1	2	3	4	5

V. Electronic Service Quality

INSTRUCTIONS: The following statements relate to your beliefs about consumer electronics e-tailers that you shopped most recently. For each statement, please show the extent to which you believe the consumer electronics e-tailers has the feature described by the statement. Choosing a **5** means that you **strongly agree** that the consumer electronic e-tailer has that feature, and choosing **1** means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

1. This site makes it easy to find what I need.	1	2	3	4	5
2. This site makes it easy to get anywhere on the site.	1	2	3	4	5
3. This site enables me to complete a transaction quickly.	1	2	3	4	5
4. Information at this site is well-organized.	1	2	3	4	5
5. This site loads its pages fast.	1	2	3	4	5
6. This site is simple to use.	1	2	3	4	5
7. This site enables me to get on to it quickly.	1	2	3	4	5
8. This site is well-organized.	1	2	3	4	5
9. This site is always available for business.	1	2	3	4	5
10. This site launches and runs right away.	1	2	3	4	5
11. This site does not crash.	1	2	3	4	5
12. Pages at this site do not freeze after I enter my order information.	1	2	3	4	5
13. This site delivers orders when promised.	1	2	3	4	5
14. This site makes items available for delivery within a suitable time frame.	1	2	3	4	5
15. This site quickly delivers what I order.	1	2	3	4	5
16. This site sends out the items ordered.	1	2	3	4	5
17. This site has in stock the items the company claims to have.	1	2	3	4	5
18. This site is truthful about its offerings.	1	2	3	4	5
19. This site makes accurate promises about delivery of products.	1	2	3	4	5
20. This site protects information about my Web-shopping behavior.	1	2	3	4	5
21. This site does not share my personal information with other sites.	1	2	3	4	5
22. This site protects information about my credit card.	1	2	3	4	5

VI. Perceived Value

INSTRUCTIONS: The following statements relate to your beliefs about perceived value relating to your most recent shopping experience with consumer electronics e-tailers. Choosing a **10** means "**excellent**", and choosing **1** means "**poor**". You may choose any number between 1 and 10 that shows how strong your belief is. There is no right or wrong answer. Please choose the number that best shows your perceived value about consumer electronics e-tailers offering services.

1. The price of the products and services available at this site	1	2	3	4	5	6	7	8	9	10
2. The overall convenience of using this site	1	2	3	4	5	6	7	8	9	10
3. The extent to which the site gives you a feeling of being in control	1	2	3	4	5	6	7	8	9	10
4. The overall value you get from this site for your money and effort	1	2	3	4	5	6	7	8	9	10

VII. Customer Satisfaction

1. Please consider your most recent experience with this consumer electronics e-tailer. Using a 10-point scale on which **10** means **very satisfied** and **1** means **very dissatisfied**, how satisfied are you with this site? You may choose any number between 1 and 10 that shows how strong your belief is.

    1   2   3   4   5   6   7   8   9   10

2. Considering all of the expectations in the site, to what extent has the consumer electronics e-tailer that you shopped fallen short of your expectations or exceeded your expectations? Using a 10-point scale on which **10** means **exceeds your expectations** and **1** means **falls short of your expectations**. You may choose any number between 1 and 10 that shows how strong your belief is.

    1   2   3   4   5   6   7   8   9   10

3. Please imagine an ideal consumer electronic e-tailer. How well do you think the consumer electronic e-tailer that you shopped compares with that ideal consumer electronic e-tailer? Please use a 10-point scale on which **10** means **very close to the ideal** and **1** means **not very close to the ideal**. You may choose any number between 1 and 10 that shows how strong your belief is.

    1   2   3   4   5   6   7   8   9   10

VIII. Customer Loyalty

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe you will conduct behaviors described by the statement. Choosing a **5** means that you will be **very likely** to conduct the behavior, and choosing **1** means that you will be **very unlikely** to conduct the behavior. You may choose any number between 1 and 5 that shows how strong your feeling is.

1. Say positive things about this site to other people.	1	2	3	4	5
2. Recommend this site to someone who seeks your advice.	1	2	3	4	5
3. Encourage friends and others to do business with this site.	1	2	3	4	5
4. Consider this site to be your first choice for future transactions.	1	2	3	4	5
5. Do more business with this site in the coming months.	1	2	3	4	5

IX. Customer Complaints

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe you will conduct behaviors described by the statement. Choosing a **7** means that you will be **extremely likely** to conduct the behavior, and choosing **1** means that you will be **not at all likely** to conduct the behavior. You may choose any number between 1 and 7 that shows how strong your feeling is.

1. Switch to a competitor if you experience a problem with the web site.   1   2   3   4   5   6   7
2. Complain to other customers if you experience a problem with the web site.   1   2   3   4   5   6   7
3. Complain to external agencies, such as the Better Business Bureau, if you experience a problem with the web site.   1   2   3   4   5   6   7

X. Filter Question Part B

1. Have you experienced any problem or needed help with the consumer electronics e-tailer that you most recently shopped? For example, returning products or delivery delay.

     _____ Yes   _____ No

XI. Electronic Recovery Service Quality

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe the consumer electronics e-tailers has the feature described by the statement. Choosing a **5** means that you **strongly agree** that the consumer electronic e-tailer has that feature, and choosing **1** means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

1. This site provides me with convenient options for returning items.   1   2   3   4   5
2. This site handles product returns well.   1   2   3   4   5
3. This site offers a meaningful guarantee.   1   2   3   4   5
4. This site tells me what to do if my transaction is not processed.   1   2   3   4   5
5. This site takes care of problems promptly.   1   2   3   4   5
6. This site compensates me for problems it creates.   1   2   3   4   5
7. This site compensates me when what I ordered doesn't arrive on time.   1   2   3   4   5
8. This site picks up items I want to return from my home or business.   1   2   3   4   5
9. This site provides a telephone number to reach the company.   1   2   3   4   5
10. This site has customer service representatives available online.   1   2   3   4   5
11. This site offers the ability to speak to a live person if there is a problem.   1   2   3   4   5

APPENDIX D

Print Outs of Online Survey
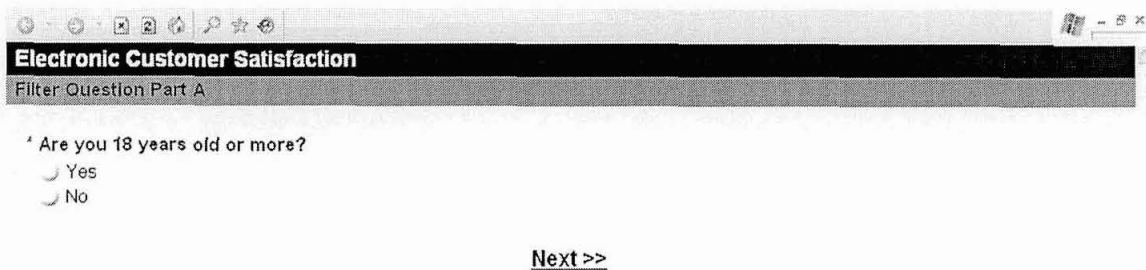
* Are you 18 years old or more?
  ◯ Yes
  ◯ No

Next >>

Figure C1. Print out of the first filter question of online survey.

* Have you been living in the continental United States for at least six months in the past year?
  ◯ Yes
  ◯ No

<< Prev   Next >>
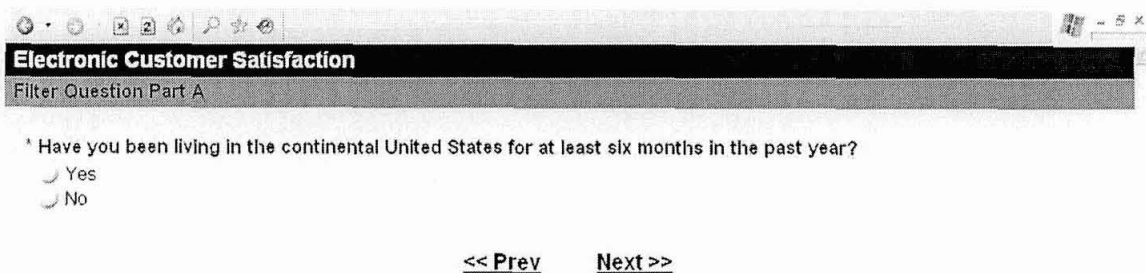
Figure C2. Print out of the second filter question of online survey.

* Which of the following consumer electronic products have you purchased online within the past year (Check all apply)
  ☐ *Accessories:* Cables, batteries, chargers, headsets, etc.
  ☐ *Audio Components:* Receivers, Full-Size Systems, Mini Systems, Portable Audio, etc.
  ☐ *Electronic Gaming:* PS2, GameCube, Xbox, etc.
  ☐ *Home Networking:* Access point, router, network card, etc.
  ☐ *Home Theater:* Home theater system, etc.
  ☐ *IT/Tech Office:* Digital cameras, camcorders, fax machine, etc.
  ☐ *Mobile Electronics:* Car Navigation Systems, Car Audio Components, Radar Detectors, etc.
  ☐ *Video Components:* DVD Players, Televisions, Projectors, AV Equipment, etc.
  ☐ *Wireless Communications:* Cellphone, etc.
  ☐ I did **NOT** purchase the above products online within the past year.
  ☐ Other (please specify)
    [_____]

<< Prev   Next >>

Figure C3. Print out of the third filter question of online survey.

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INSTRUCTIONS: Please choose the category for each question that best describes you.

Your gender:

   Male   Female

Your age (please fill in the blank):

Your marital status:
- Single/Never Married
- Married
- Separated
- Divorced
- Widowed

Your current employment status:
- Full-time
- Part-time
- Unemployed (Seeking employment)
- Unemployed (Not seeking employment)

Your education category:
- Professional (MA, MS, ME, MD, PhD, LLD, and the like)
- Four-year college graduate (BA, BS, BM)
- One to three years college (also business schools)
- High school graduate
- Ten to 11 years of school (part high school)
- Seven to nine years of school
- Less than seven years of school

Your occupation category:
- Higher executives of large concerns, proprietors, or major professionals
- Business managers or proprietors of medium-sized businesses
- Administrative personnel or owners of small businesses
- Clerical and sales workers or technicians
- Skilled manual employees
- Machine operators and semiskilled employees
- Unskilled employees
- Other (please specify)

What is your annual HOUSEHOLD income category?
- Less than $15,000
- $15,000-$29,999
- $30,000-$44,999
- $45,000-$59,999
- $60,000-$74,999
- $75,000-$89,999
- $90,000-$104,999
- $105,000-$119,999
- $120,000-$134,999
- $135,000-$149,999
- $150,000 or more

What is your annual PERSONAL income category?
- Less than $15,000
- $15,000-$29,999
- $30,000-$44,999
- $45,000-$59,999
- $60,000-$74,999
- $75,000-$89,999
- $90,000-$104,999
- $105,000-$119,999
- $120,000-$134,999
- $135,000-$149,999
- $150,000 or more

<< Prev   Next >>

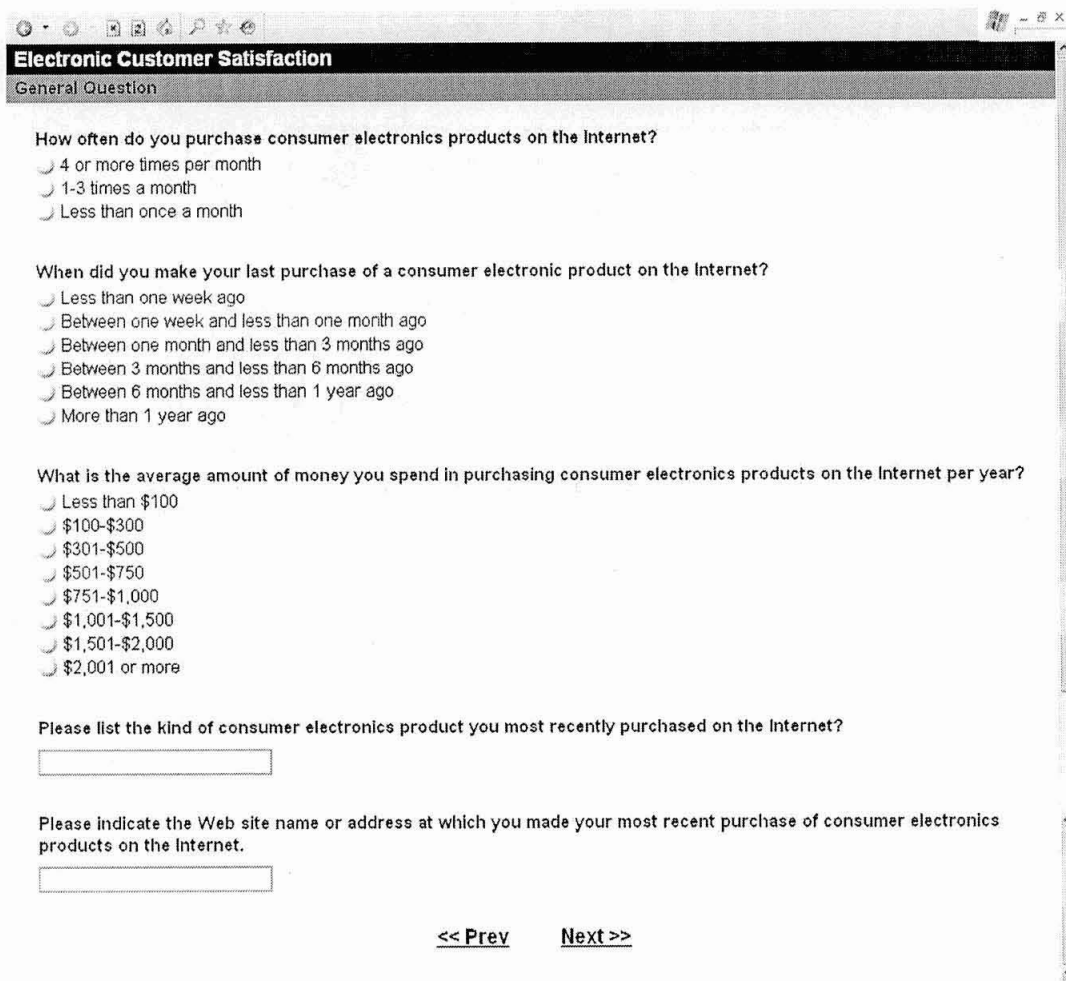*Figure C4.* Print out of demographic questions of online survey.

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Electronic Customer Satisfaction
General Question

How often do you purchase consumer electronics products on the Internet?
- 4 or more times per month
- 1-3 times a month
- Less than once a month

When did you make your last purchase of a consumer electronic product on the Internet?
- Less than one week ago
- Between one week and less than one month ago
- Between one month and less than 3 months ago
- Between 3 months and less than 6 months ago
- Between 6 months and less than 1 year ago
- More than 1 year ago

What is the average amount of money you spend in purchasing consumer electronics products on the Internet per year?
- Less than $100
- $100-$300
- $301-$500
- $501-$750
- $751-$1,000
- $1,001-$1,500
- $1,501-$2,000
- $2,001 or more

Please list the kind of consumer electronics product you most recently purchased on the Internet?

Please indicate the Web site name or address at which you made your most recent purchase of consumer electronics products on the Internet.

<< Prev   Next >>

Figure C5. Print out of general questions of online survey.

Electronic Customer Satisfaction
Customer Expectations

INSTRUCTIONS: In this survey, a consumer electronics e-tailer refers to any Internet retailer carrying consumer electronics products whatever a pure player like Amazon.com or a bricks-and-mortar like Walmart.com. Please do NOT consider Ebay.com as a consumer electronics e-tailer. Please answer the following questions based on your most recent shopping experience with a US based consumer electronics e-tailer.

Please show the extent to which you think consumer electronics e-tailers offering services should possess the features described by each statement. Choosing a 5 means that you **strongly agree** that these consumer electronics e-tailers should possess a feature, and choosing 1 means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

	1	2	3	4	5
This site should be used easily and quickly.					
This site should fulfill its promises about order delivery and item availability.					
This site should function properly.					
This site should be safe and protect customer information.					
The overall expectation of service quality to the site is very high.					

<< Prev   Next >>

Figure C6. Print out of the *Customer Expectation Scale.*

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INSTRUCTIONS: The following statements relate to your beliefs about consumer electronics e-tailers that you shopped most recently. For each statement, please show the extent to which you believe the consumer electronics e-tailers has the feature described by the statement. Choosing a **5** means that you **strongly agree** that the consumer electronic e-tailer has that feature, and choosing **1** means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

Note. The scale is from "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," by A. Parasuraman, V. A. Zeithaml, and A. Malhotra, 2005, *Journal of Service Research*, 7(10), pp. 18-19. Copyright 2005 by Journal of Service Research. Adapted with permission of the first author.

	1	2	3	4	5
This site makes it easy to get anywhere on the site.	○	○	○	○	○
This site makes it easy to find what I need.	○	○	○	○	○
This site is truthful about its offerings.	○	○	○	○	○
This site is simple to use.	○	○	○	○	○
This site loads its pages fast.	○	○	○	○	○
This site does not crash.	○	○	○	○	○
This site has in stock the items the company claims to have.	○	○	○	○	○
Pages at this site do not freeze after I enter my order information.	○	○	○	○	○
This site makes items available for delivery within a suitable time frame.	○	○	○	○	○
This site is well organized.	○	○	○	○	○
This site makes accurate promises about delivery of products.	○	○	○	○	○
This site quickly delivers what I order.	○	○	○	○	○
This site is always available for business.	○	○	○	○	○
This site enables me to get on to it quickly.	○	○	○	○	○
This site sends out the items ordered.	○	○	○	○	○
Information at this site is well organized.	○	○	○	○	○
This site protects information about my Web-shopping behavior.	○	○	○	○	○
This site launches and runs right away.	○	○	○	○	○
This site does not share my personal information with other sites.	○	○	○	○	○
This site enables me to complete a transaction quickly.	○	○	○	○	○
This site protects information about my credit card.	○	○	○	○	○
This site delivers orders when promised.	○	○	○	○	○

<< Prev   Next >>

Figure C7. Print out of the *Electronic Service Quality Scale*.

Note. The items appeared in random order on the online survey

INSTRUCTIONS: The following questions relate to your beliefs about perceived value relating to your most recent shopping experience with consumer electronics e-tailers. Choosing a **10** means **"excellent"**, and choosing **1** means **"poor"**. You may choose any number between 1 and 10 that shows how strong your belief is. There is no right or wrong answer. Please choose the number that best shows your perceived value about consumer electronics e-tailers offering services.

Note. The scale is from "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," by A. Parasuraman, V. A. Zeithaml, and A. Malhotra, 2005, *Journal of Service Research*, 7(10), p. 19. Copyright 2005 by Journal of Service Research. Adapted with permission of the first author.

The price of the products and services available at this site

1	2	3	4	5	6	7	8	9	10

The overall convenience of using this site

1	2	3	4	5	6	7	8	9	10

The extent to which the site gives you a feeling of being in control

1	2	3	4	5	6	7	8	9	10

The overall value you get from this site for your money and effort

1	2	3	4	5	6	7	8	9	10

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Figure C8. Print out of the *Perceived Value Scale*.

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Note. The scale is from *American Customer Satisfaction Index: Methodology Report* (p. 112), by American Society for Quality, 2001, Milwaukee, WI: Author. Copyright 2001 by The Regents of the University of Michigan. Adapted with permission of the author.

1. Please consider all your experiences to date with consumer electronics e-tailers. Using a 10-point scale on which "10" means "very satisfied" and "1" means "very dissatisfied", how satisfied are you with this site? You may choose any number between 1 and 10 that shows how strong your belief is.

1	2	3	4	5	6	7	8	9	10

2. Considering all of the expectations in the site, to what extent has the consumer electronics e-tailer that you shopped fallen short of your expectations or exceeded your expectations? Using a 10-point scale on which "10" means "exceeds your expectations" and "1" means "falls short of your expectations". You may choose any number between 1 and 10 that shows how strong your belief is.

1	2	3	4	5	6	7	8	9	10

3. Please imagine an ideal consumer electronic e-tailer. How well do you think the consumer electronic e-tailer that you shopped compares with that ideal consumer electronic e-tailer? Please use a 10-point scale on which "10" means "very close to the ideal" and "1" means "not very close to the ideal". You may choose any number between 1 and 10 that shows how strong your belief is.

1	2	3	4	5	6	7	8	9	10

<< Prev   Next >>

Figure C9. Print out of the *Customer Satisfaction Scale.*

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe you will conduct behaviors described by the statement. Choosing a 5 means that you will be **very likely** to conduct the behavior, and choosing 1 means that you will be **very unlikely** to conduct the behavior. You may choose any number between 1 and 5 that shows how strong your feeling is.

Note. The scale is from "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," by A. Parasuraman, V. A. Zeithaml, and A. Malhotra, 2005, *Journal of Service Research*, 7(10), p. 19. Copyright 2005 by Journal of Service Research. Adapted with permission of the first author.

	1	2	3	4	5
Say positive things about this site to other people.					
Encourage friends and others to do business with this site.					
Consider this site to be your first choice for future transactions.					
Recommend this site to someone who seeks your advice.					
Do more business with this site in the coming months.					

<< Prev   Next >>

Figure C10. Print out of the *Customer Loyalty Scale.*

Electronic Customer Satisfaction

Customer Complaints

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe you will conduct behaviors described by the statement. Choosing a 7 means that you will be **extremely likely** to conduct the behavior, and choosing 1 means that you will be **not at all likely** to conduct the behavior. You may choose any number between 1 and 7 that shows how strong your feeling is.

Note. The scale is from "The Behavioral Consequences of Service Quality," by V. A. Zeithaml, L. L. Berry, and A. Parasuraman, 1996, *Journal of Marketing*, 60(2), p. 38. Copyright 1996 by Journal of Marketing. Adapted with permission of the first author.

Switch to a competitor if you experience a problem with the web site.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Complain to other customers if you experience a problem with the web site.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Complain to external agencies, such as the Better Business Bureau, if you experience a problem with the web site.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

<< Prev   Next >>

Figure C11. Print out of the *Customer Complaint Scale.*

Electronic Customer Satisfaction

Filter Question Part B

* Have you experienced any problem or needed help with the consumer electronics e-tailer that you most recently shopped? For example, returning products or delivery delay.
◡ Yes
◡ No

<< Prev   Next >>

Figure C12. Print out of the fourth filter question of online survey.

INSTRUCTIONS: Please consider your most recent experience with this consumer electronics e-tailer. For each statement, please show the extent to which you believe the consumer electronics e-tailers has the feature described by the statement. Choosing a 5 means that you **strongly agree** that the consumer electronic e-tailer has that feature, and choosing 1 means that you **strongly disagree**. You may choose any number between 1 and 5 that shows how strong your belief is.

Note. The scale is from "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," by A. Parasuraman, V. A. Zeithaml, and A. Malhotra, 2005, *Journal of Service Research*, 7(10), p. 19. Copyright 2005 by Journal of Service Research. Adapted with permission of the first author.

	1	2	3	4	5
This site picks up items I want to return from my home or business.	○	○	○	○	○
This site takes care of problems promptly.	○	○	○	○	○
This site tells me what to do if my transaction is not processed.	○	○	○	○	○
This site compensates me for problems it creates.	○	○	○	○	○
This site compensates me when what I ordered doesn't arrive on time.	○	○	○	○	○
This site has customer service representatives available online.	○	○	○	○	○
This site provides a telephone number to reach the company.	○	○	○	○	○
This site offers a meaningful guarantee.	○	○	○	○	○
This site handles product returns well.	○	○	○	○	○
This site offers the ability to speak to a live person if there is a problem.	○	○	○	○	○
This site provides me with convenient options for returning items.	○	○	○	○	○

<< Prev   Next >>

Figure C13. Print out of the *Electronic Recovery Service Quality Scale.*

Note. The items appeared in random order on the online survey

APPENDIX E

Sample of E-Mail Invitation

Hello:

My name is Kuang-Wen Wu. Your e-mail address was given to me by _____ (Name of e-mail list provider). I am a current Lynn University student who is seeking a PhD in Global Leadership, with a specialization in Corporate and Organizational Management.

This e-mail invites you to participate in an online survey about service quality and your satisfaction, if you have purchased consumer electronics products online this year. You must be at least 18 years or older.

Please click the following link to enter a web page, which further describes the survey and provides information about your consent to participate. This is followed by a link to the online survey.

http://www.geocities.com/kuang_wen_wu/ConsentForm.htm

Whether or not you participate, I would appreciate if you would forward this e-mail to your friends or family who may have purchased consumer electronics online, and ask if they would participate. When you forward this e-mail, please put their email addresses as a blind carbon copy (Bcc). Thank you for your cooperation.

Thank you for your assistance with my dissertation.

Kuang-Wen Wu

Phone:
E-mail:

APPENDIX F

Permission to Use the *E-S-QUAL* and *E-RecS-QUAL* Scales

From: Parasuraman, A [████████████████████████]
Sent: Thu 1/20/2005 10:32 PM
To: Kuang-Wen Wu
Subject: RE: Requesting permission to use the E-S-QUAL scale

Dear Kuang-Wen:

Thanks for your inquiry. I am hereby pleased to grant you permission to use the E-S-QUAL and E-RecS-QUAL scales in your dissertation research. Best wishes for success in your research.

Sincerely,
Parasuraman

****
A. "Parsu" Parasuraman
Professor & Marketing Department Chair
University of Miami
█████████
****

APPENDIX G

Permission to Reprint the *ACSI* Model

From: Fornell, Claes █████████████████████
Sent: Monday, March 21, 2005 3:22 PM
To: Kuang-Wen Wu
Subject: RE: Requesting permission to reprint the ACSI model

Dear Mr. Wu,

I am delighted to give you permission to reprint the ACSI model for your dissertation. I would be interested in seeing a copy of your work when it is completed.

Best of luck.

Claes Fornell

APPENDIX H

Permission to Use the *ACSI* Scale

From: Hauswirth, Kim A. [REDACTED]
Sent: Thursday, May 12, 2005 10:09 AM
To: Kuang-Wen Wu
Subject: RE: Requesting the permission to use the ACSI scales

Dear Mr. Wu,

First, I apologize for taking so long to respond to your request. We had a change in responsibilities recently and it took a while for this request to get to me.

I would like to first point you to the ACSI methodology report that you can find for sale on ASQ's Quality Press website (http://qualitypress.asq.org/perl/catalog.cgi?item=T517). A new, updated, version will be coming out within the next week or so.

Please note, anyone has a right to use information contained in the methodology report without permission, including the questions and scales. What you must NOT do, however, is call it ACSI. You must indicate that you are using your own modified version. The engine used for the modeling of results and the name is proprietary and copyrighted; the questions/scales are not.

If you have any other questions, please let me know.

Kim Hauswirth
Program Leader
[REDACTED]

American Society for Quality
[REDACTED], extension [REDACTED]

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APPENDIX I

Permission to Use the Behavioral-Intentions Battery Scale

From: Zeithaml, Valarie █████████████
Sent: Tuesday, March 22, 2005 4:01 PM
To: Kuang-Wen Wu
Cc: Malhotra, Arvind; █████████████
Subject: RE: Requesting permission to use the Behavioral-Intentions Battery

Dear Mr. Wu,

Our material is copyrighted by the Journal of Marketing, where the paper was published. Published material is considered in the public domain and usable by other researchers as long as the original authors are cited in any publications and presentations that use the material.

If you need formal permission, you will need to seek that from the Journal of Marketing, but I do not think you need that.

Incidentally, you may want to look at the attached paper which we have just published on e-service quality.

Best regards, and good luck in your research.

Valarie A. Zeithaml
Associate Dean for the MBA Program
Roy and Alice H. Richards Bicentennial Professor of Marketing
Kenan-Flagler Business School
McColl Building, CB #3490
University of North Carolina, Chapel Hill
Chapel Hill, NC 27599-3490
████████████████ (phone/fax)
████████████████

APPENDIX J

Response from Survey Monkey

From: "SurveyMonkey Support" <surveymonkey@mailca.custhelp.com>
Reply-To: "SurveyMonkey Support" <surveymonkey@mailca.custhelp.com>
To: ████████████████ ████████████████
Subject: Survey respondent IP addresses [Incident: 050626-000005]
Date: Sun, 26 Jun 2005 13:36:22 -0700 (PDT)

Recently you requested personal assistance from our on-line support
center. Below is a summary of your request and our response.

If this issue is not resolved to your satisfaction, you may update it
within the next 7 days.

Thank you for allowing us to be of service to you.

To update your question from our support site, click the following
link or paste it into your web browser.
http://www.surveymonkey.com/help/AskLogin.asp?p_userid=████████████████
&p_next_page=myq_upd.php&p_iid=15550&p_created=1119816495

Subject

Survey respondent IP addresses
Discussion Thread

Response (Grant Pauls) - 06/26/2005 01:36 PM
Kuang,

You can use the IP address to find out what network they were on, but it will not tell you
who that person was. The IP address is only unique for the network not the individual
computer.

Customer (KUANG-WEN WU) - 06/26/2005 01:08 PM
Can you confirm whether respondent IP addresses are non-traceable? I need to know
whether respondents can be traced or not.
Thanks

Auto-Response - 06/26/2005 01:08 PM
We are currently reviewing your question and will get back to you shortly.

[---001:001058:33912---]

Thanks,

    Grant

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APPENDIX K

AMOS Text Output for Hypothesized First-Order CFA Model for Electronic

Service Quality: Modification Indices and Parameter Change Statistics

Covariances:	M.I.	Par Change
err09 <--> Privacy	7.728	.034
err09 <--> Efficiency	10.974	-.026
err10 <--> Privacy	19.079	-.063
err10 <--> Efficiency	11.649	.032
err10 <--> err09	4.377	-.034
err11 <--> Privacy	30.799	-.073
err11 <--> Fulfillment	5.707	.026
err11 <--> err10	9.277	.054
err12 <--> Privacy	49.551	.093
err12 <--> Fulfillment	14.108	-.041
err12 <--> err09	13.952	.056
err12 <--> err11	7.804	-.046
err20 <--> Fulfillment	4.814	-.021
err20 <--> err11	19.576	-.066
err20 <--> err12	11.267	.051
err21 <--> System_Availability	5.569	-.025
err21 <--> Privacy	4.228	-.025
err21 <--> Fulfillment	4.608	.023
err21 <--> err09	4.467	-.031
err22 <--> System_Availability	5.808	.024
err22 <--> Efficiency	7.868	-.022
err22 <--> err09	17.901	.059
err22 <--> err10	10.960	-.055
err22 <--> err11	9.681	-.047
err22 <--> err12	32.628	.087
err22 <--> err20	4.817	.029
err13 <--> err20	4.608	-.024
err14 <--> Efficiency	4.475	.016
err14 <--> err10	4.522	-.034
err14 <--> err11	9.735	.045
err14 <--> err12	8.103	-.041
err14 <--> err21	6.023	.035
err14 <--> err13	8.554	-.032
err15 <--> err11	9.035	-.043
err15 <--> err12	4.437	.030
err15 <--> err21	11.658	-.048
err15 <--> err22	14.021	.049
err16 <--> System_Availability	17.231	.040
err16 <--> Privacy	5.107	-.027
err16 <--> err11	6.550	.038
err16 <--> err20	4.769	-.029

Covariances:	M.I.	Par Change
err16 <--> err13	4.365	.023
err17 <--> err09	9.240	.049
err17 <--> err14	4.445	.032
err18 <--> Privacy	15.832	.048
err18 <--> err17	4.234	-.033
err19 <--> err12	11.027	-.048
err19 <--> err21	5.619	.033
err19 <--> err22	8.829	-.039
err19 <--> err13	11.491	.036
err01 <--> err09	40.733	-.091
err01 <--> err10	42.472	.111
err01 <--> err11	13.041	.056
err01 <--> err21	7.481	.042
err01 <--> err22	9.022	-.043
err02 <--> System_Availability	10.710	-.033
err02 <--> Privacy	4.135	-.025
err02 <--> Efficiency	16.379	.032
err02 <--> err09	19.636	-.063
err02 <--> err11	10.264	.049
err02 <--> err12	16.155	-.062
err02 <--> err21	14.342	.057
err02 <--> err22	22.397	-.067
err02 <--> err15	8.347	-.039
err02 <--> err01	16.720	.059
err03 <--> Fulfillment	12.825	.037
err03 <--> err15	6.112	.034
err04 <--> err10	5.886	.038
err04 <--> err11	5.778	-.034
err04 <--> err20	6.998	.034
err04 <--> err21	4.928	.031
err04 <--> err22	7.734	-.036
err04 <--> err14	4.567	-.027
err04 <--> err19	15.859	.049
err04 <--> err01	5.269	.031
err05 <--> System_Availability	8.398	.032
err05 <--> err10	13.357	.069
err05 <--> err21	8.851	-.050
err05 <--> err15	6.854	.039
err05 <--> err16	13.016	-.056
err05 <--> err02	6.043	.040
err05 <--> err04	20.390	-.067

Covariances:	M.I.	Par Change
err06 <--> Privacy	17.081	.050
err06 <--> Efficiency	10.534	-.026
err06 <--> err09	24.523	.069
err06 <--> err10	13.453	-.061
err06 <--> err11	9.603	-.047
err06 <--> err12	15.873	.061
err06 <--> err20	12.211	.048
err06 <--> err21	6.372	-.038
err06 <--> err22	12.164	.049
err06 <--> err01	6.907	-.038
err06 <--> err03	5.777	-.035
err07 <--> Privacy	7.357	-.033
err07 <--> Fulfillment	7.536	.027
err07 <--> err11	8.995	.045
err07 <--> err20	7.219	-.037
err07 <--> err21	6.044	.037
err07 <--> err22	7.061	-.037
err07 <--> err14	19.835	.059
err07 <--> err03	14.504	.055
err07 <--> err06	4.079	-.028
err08 <--> Privacy	7.002	.038
err08 <--> Fulfillment	12.435	-.042
err08 <--> err09	7.291	.045
err08 <--> err11	14.922	-.069
err08 <--> err12	17.245	.075
err08 <--> err21	9.436	-.054
err08 <--> err22	27.336	.086
err08 <--> err13	5.543	-.032
err08 <--> err03	9.505	-.053
err08 <--> err04	5.550	.036
err08 <--> err06	4.296	.034

Regression Weights:	M.I.	Par Change
ESQ09 <--- ESQ22	5.121	.062
ESQ09 <--- ESQ01	10.580	-.097
ESQ09 <--- ESQ02	5.198	-.067
ESQ10 <--- ESQ22	5.295	-.075
ESQ10 <--- ESQ01	11.082	.118
ESQ10 <--- ESQ05	4.380	.070
ESQ11 <--- ESQ20	8.400	-.090
ESQ11 <--- ESQ22	5.524	-.070
ESQ12 <--- ESQ20	7.858	.088
ESQ12 <--- ESQ22	12.540	.107
ESQ12 <--- ESQ02	4.007	-.064
ESQ12 <--- ESQ08	4.058	.062
ESQ20 <--- ESQ11	4.878	-.063
ESQ21 <--- ESQ02	5.328	.072
ESQ22 <--- ESQ12	7.269	.080
ESQ22 <--- ESQ02	6.628	-.075
ESQ22 <--- ESQ08	5.474	.066
ESQ14 <--- ESQ07	4.840	.060
ESQ01 <--- ESQ09	6.893	-.077
ESQ01 <--- ESQ10	9.564	.086
ESQ02 <--- ESQ09	5.253	-.067
ESQ02 <--- ESQ12	5.929	-.074
ESQ02 <--- ESQ22	6.122	-.070
ESQ04 <--- ESQ05	5.085	-.059
ESQ06 <--- ESQ09	5.622	.068
ESQ06 <--- ESQ12	5.253	.069
ESQ06 <--- ESQ20	6.584	.074
ESQ06 <--- ESQ22	6.194	.069
ESQ07 <--- ESQ14	4.828	.062
ESQ08 <--- ESQ12	4.714	.077
ESQ08 <--- ESQ22	5.183	.074