Customer Value, Satisfaction, Loyalty, and Switching Costs: An Illustration From a Business-to-Business Service Context

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Although researchers and managers pay increasing attention to customer value, satisfaction, loyalty, and switching costs, not much is known about their interrelationships. Prior research has examined the relationships within subsets of these constructs, mainly in the business-to-consumer (B2C) environment. The authors extend prior research by developing a conceptual framework linking all of these constructs in a business-to-business (B2B) service setting. On the basis of the cognition-affect-behavior model, the authors hypothesize that customer satisfaction mediates the relationship between customer value and customer loyalty, and that customer satisfaction and loyalty have significant reciprocal effects on each other. Furthermore, the potential interaction effect of satisfaction and switching costs, and the quadratic effect of satisfaction, on loyalty are explored. The authors test the hypotheses on data obtained from a courier service provider in a B2B context. The results support most of the hypotheses and, in particular, confirm the mediating role of customer satisfaction.

Keywords: *customer value; satisfaction; loyalty*

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Customer loyalty has a powerful impact on firms' performance and is considered by many companies an important source of competitive advantage (Heskett, Sasser, and Schlesinger 1997; Rust, Zeithaml, and Lemon 2000; Woodruff 1997). The consequences of enhanced customer loyalty in service firms are increased revenue, reduced customer acquisition costs, and lower costs of serving repeat purchasers, leading to greater profitability (Reichheld 1993; Reichheld and Sasser 1990). Customer loyalty has also been shown to be important in the online environment (Shankar, Smith, and Rangaswamy 2003). Indeed, customer loyalty constitutes an underlying objective for strategic market planning (Kotler 1997).

While much research has focused on customer loyalty in business-to-consumer (B2C) contexts, customer loyalty is important in business-to-business (B2B) contexts as well. In organizational buyer-seller relationships, loyal buyers are more likely to focus on long-term benefits and engage in cooperative actions beneficial to both partners in a relationship than disloyal buyers, thus enhancing the competitiveness of both partners and reducing transaction costs (Doney and Cannon 1997; Ganesan 1994; Morgan and Hunt 1994).

To date, however, limited attempts have been made to conceptualize customer loyalty and investigate its antecedents, in particular, in the B2B context (e.g., Bolton 1998; Oliver 1999; Sirdeshmukh, Singh, and Sabol 2002).

Potential antecedents include customer satisfaction, switching costs, and customer value. Considerable attention has been given to customer satisfaction as a potential determinant of customer loyalty during the past two decades (Fornell 1992; Oliver 1999). Aside from improving customer satisfaction, increasing switching costs is a common strategy advocated to increase customer loyalty as the costs of switching to alternative suppliers can deter customers from using these suppliers (Gronhaug and Gilly 1991; Heide and Weiss 1995). Customers may also stay loyal to a company if they feel that they are receiving greater value than they would from the competitors (Bitner and Hubbert 1994; Bolton and Drew 1991; Sirdeshmukh et al. 2002). Although researchers acknowledge the importance of the customer loyalty concept in marketing theory and practice and have made attempts to investigate some of the relationships between customer loyalty, satisfaction, switching costs, and customer value in B2C settings, the complex interrelationships between these constructs are still not well understood, particularly in the B2B environment (Jones and Sasser 1995; Oliver 1996; Reichheld and Sasser 1990). Moreover, no research has empirically investigated these constructs in a single framework.

The objective of this study is to propose and empirically analyze a conceptual framework that considers customer perceived value, customer satisfaction, and switching costs as antecedents of customer loyalty in a B2B context. We incorporate the complex interrelationships of all these constructs into the framework and test them in a B2B setting. In particular, we examine the mediating role of customer satisfaction in the impact of customer value on customer loyalty and explore reciprocal effects of customer satisfaction and loyalty on each other. Understanding how various factors relate to customer loyalty can help managers monitor and enhance customer loyalty effectively through initiatives involving those factors that directly affect customer loyalty. Likewise, if customer loyalty has a positive effect on customer satisfaction, then managers can focus directly on loyalty-building initiatives.

We also compare the strengths of the different relationships in our model. In particular, we examine whether customer loyalty is more strongly affected by customer satisfaction than it is by switching costs. From a managerial perspective, if customer satisfaction exerts a stronger effect, managing customer satisfaction will be more important than influencing switching costs. In addition, we extend the current conceptualization of customer loyalty as a one-dimensional construct (Zeithaml, Berry, and Parasuraman 1996) to a two-dimensional construct. Tsiros and Mittal (2000) showed the differential impact of satisfaction and regret on different types of behavioral intentions, which can be considered correlates of customer loyalty. Consistent with their result, we conceptualize customer loyalty as a construct embodying two distinct dimensions, namely, recommending the service provider to other buyers and an intention to repeat purchase or patronage.

Furthermore, we examine several nonlinear relationships in our study. We explore whether there is any interaction effect of satisfaction and switching costs on loyalty. Such variation may imply, for example, that customer satisfaction has a stronger effect on customer loyalty for customers with low switching costs than it has for customers with high switching costs. If that is the case, customer satisfaction would particularly matter for customers with low switching costs, and so a seller may want to pay particular attention to satisfying these customers' needs. Moreover, we examine whether the effect of customer satisfaction on loyalty is quadratic. This is important because the managerial implications resulting from increasing returns to scale of customer satisfaction are different from those arising from constant or decreasing returns to scale.

We test the hypotheses using structural equation modeling on data obtained from a courier service provider in a B2B context. The data were collected from corporate clients who use or have used the service of the courier service provider. We select the B2B service context for illustration because B2B services, including accounting, banking, logistics, legal work, and advertising, constitute an important sector of economy in many countries, but there is a dearth of research on customer loyalty in this context. Our results support most of our hypotheses and offer important implications for managers to enhance customer loyalty.

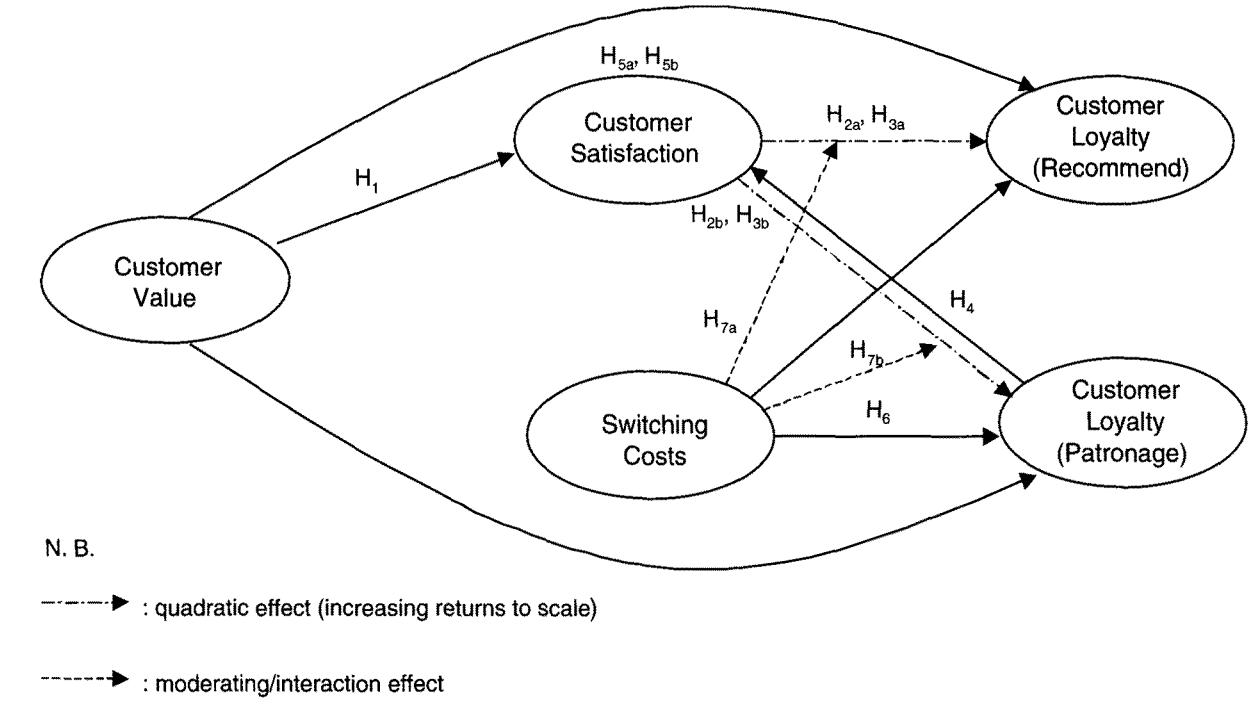
CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

In developing our conceptual framework (shown in Figure 1), we review literature on relationship marketing, services marketing, and customer satisfaction that is relevant to our research focus. On the basis of this review, we define the key constructs of our framework and describe the theoretical grounds and existing evidence supporting the relationships contained in this framework.

Definitions of Customer Loyalty, Customer Value, Customer Satisfaction, and Switching Costs

Customer loyalty is a buyer's overall attachment or deep commitment to a product, service, brand, or organization (Oliver 1999). The loyalty concept is similar in meaning to relationship commitment, which is described by the relationship marketing literature as an enduring desire to be in a valued relationship (Anderson and Weitz 1992; Moorman, Zaltman, and Deshpande 1992; Morgan and Hunt 1994). Customer loyalty manifests itself in a

FIGURE 1
Conceptual Framework



variety of behaviors, the more common ones being recommending a service provider to other customers and repeatedly patronizing the provider (Dwyer, Schurr, and Oh 1987; Fornell 1992). A number of studies have treated these two behaviors as loyalty indicators (Sirdeshmukh et al. 2002; Zeithaml et al. 1996). Therefore, we consider them two key manifestations of customer loyalty.

Customer value can be conceptualized as a comparison of weighted "get" attributes to "give" attributes (Heskett et al. 1994). Customer value is operationalized as a ratio or trade-off between total benefit received to total sacrifices, taking into consideration the available suppliers' offerings and prices (Buzzell and Gale 1987). Service consists of a wide variety of dimensions, and two of the most commonly examined service attributes are reliability and customization (Zeithaml 2000). The sacrifice or price that a customer pays typically consists of transaction costs, life cycle costs, and some degree of risk (Naumann 1995).

Customer satisfaction in the B2B context is often defined as a positive affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm (Geyskens, Steenkamp, and Kumar 1999). Two general conceptualizations of customer satisfaction exist in the literature: service encounter or transaction-specific satisfaction and overall or cumulative satisfaction (Bolton and Drew 1991; Cronin and Taylor 1994; Shankar et al. 2003). While transaction-specific satisfaction may provide specific diagnostic information about a particular product or service encounter, cumulative satisfaction (i.e., satisfaction that accumulates across a series of transactions or service encounters) is a more fundamental indicator of the firm's past, current, and future performance (Bitner and Hubbert 1994; Oliver 1996; Rust and Oliver 1994). Therefore, we focus on cumulative satisfaction in our investigation and, for simplicity, refer to cumulative satisfaction as customer satisfaction in this study.

Switching costs can be defined as the costs involved in changing from one supplier to another (Heide and Weiss 1995). The domain of switching costs encompasses both monetary expenses and nonmonetary costs (e.g., time spent and psychological effort) (Dick and Basu 1994). Furthermore, the domain could include the loss of loyalty benefits as a result of ending the current relationship. For example, a customer may make transaction-specific investments on a relationship with a supplier, and over time, the customer may have developed routines and procedures for dealing with the supplier (Heide and Weiss 1995; Jap and Ganesan 2000). These investments and familiarity with procedures constitute one type of switching costs because they will become useless if the customer terminates the relationship. Conceptually, switching costs may

also reflect a buyer's dependence on a vendor, which refers to a buyer's need to maintain his or her relationship with a supplier to achieve desired goals (Frazier 1983).

The Relationship Between Customer Value and Customer Satisfaction

Existing models of customer satisfaction that are based on the disconfirmation-of-expectations paradigm (e.g., Cadotte, Woodruff, and Jenkins 1987) have rarely addressed the role of customer perceived value as an antecedent of customer satisfaction. Some studies have examined service quality as an antecedent of satisfaction (e.g., Rust and Oliver 1994; Spreng and MacKoy 1996). While most of these models incorporate benefits (via a measure of performance), they ignore any sacrifice component. Shortcomings in benefits (such as service failure) may be offset by perceived reduction in sacrifices (e.g., price), making a customer still satisfied. Thus, sacrifices made by customers need to be taken into account when the antecedents of customer satisfaction are investigated.

The service management literature argues that customer satisfaction is the result of a customer's perception of the value received in a transaction or relationship (Heskett et al. 1997). Using the examples of Southwest Airlines and AmEx Travel Services, Heskett et al. discuss how companies can deliver high-value services (quality services at a reasonable price) to their customers, thereby satisfying their customers' needs well. Theoretically, customer value can be considered a cognition-based construct capturing any benefit-sacrifice discrepancy, whereas customer satisfaction is primarily an affective and evaluative response (Oliver 1993). The social science literature indicates that cognitive thought processes trigger affective responses (Weiner 1986), suggesting that customer value judgments affect perceptions of satisfaction. Although neuroscience suggests that in the processing of sensory information, cognitive functions of the brain and feeling (or emotions) can affect each other, evidence on this reciprocal relationship has not been garnered in marketing research (Vakratsas and Ambler 1999). Therefore, we put forward the following hypothesis:

Hypothesis 1: Customer value has a positive effect on customer satisfaction.

The Relationship Between Customer Satisfaction and Customer Loyalty

Customer satisfaction is considered a key driver of the long-term relationship between suppliers and buyers (Geyskens, Steenkamp, and Kumar 1999). Many studies have shown that customer satisfaction affects variables that are indicators of customer loyalty or orientation toward a long-term relationship (e.g., Ganesan 1994; Mittal and Kamakura 2001; Mittal, Ross, and Baldasare 1998). A satisfied customer's affect toward a service provider could motivate the customer to patronize the provider again and recommend the provider to other customers. Therefore, we expect that customer satisfaction has a positive effect on these two loyalty dimensions.

The form of relationship between customer satisfaction and repeat patronage could be nonlinear. Kumar (2002) posited that change in the probability of choosing a supplier may bear a nonlinear relationship with disconfirmation of expectations of quality levels. This is because customers may sometimes prefer brands with a lower average quality level if the variance associated with its quality is lower than that of a brand with a higher average quality but greater variance. Previous research has found support for both increasing and decreasing returns to scale in the effect of customer satisfaction on repurchase intention (Anderson and Sullivan 1990; Mittal and Kamakura 2001). Heskett et al. (1997) suggested that customer loyalty should increase rapidly after customer satisfaction passes a certain threshold—that is, there are increasing returns to scale in the relationship between customer satisfaction and customer loyalty. Consistent with this "threshold" argument, research on the concept of customer delight has found that "tremendously satisfied" or "delighted" customers are much more likely to remain customers of an organization than those who are merely "satisfied" (Oliver, Rust, and Varki 1997). We expect this argument also applies to word-of-mouth recommendation. Therefore, we posit the following hypotheses:

Hypothesis 2a: Customer satisfaction has a positive effect on customer loyalty (recommend).

Hypothesis 2b: Customer satisfaction has a positive effect on customer loyalty (patronage).

Hypothesis 3a: The effect of customer satisfaction on customer loyalty (recommend) follows an increasing returns-to-scale relationship.

Hypothesis 3b: The effect of customer satisfaction on customer loyalty (patronage) follows an increasing returns-to-scale relationship.

The Reciprocal Effect of Customer Loyalty on Customer Satisfaction

Customer loyalty can drive customer satisfaction, and there could be a reciprocal effect between the two constructs. In both B2C and B2B contexts, loyal customers could derive important personal, noneconomic satisfactions from repeated social exchange with a seller and consequently find the overall experience with a service provider more satisfying than disloyal customers (Dwyer et al. 1987; Shankar et al. 2003). Furthermore, loyal customers are much less susceptible to negative information

about a service than are disloyal customers (Ahluwalia, Unnava, and Burnkrant 1999). Therefore, there is a reciprocal effect of customer loyalty on customer satisfaction. While this effect is relevant for the patronage component of loyalty, there is no strong rationale to suggest that it applies to the recommend component of loyalty. The foregoing discussion leads to our next hypothesis:

Hypothesis 4: Customer loyalty (patronage) has a positive effect on customer satisfaction.

The Mediating Role of Customer Satisfaction in the Relationship Between Customer Value and Customer Loyalty

Our discussion so far suggests that customer value affects customer satisfaction and customer satisfaction affects customer loyalty. Customer value is also positively related to customer loyalty (Bolton and Drew 1991; Sirdeshmukh et al. 2002). Cronin, Brady, and Hult (2000) provided evidence for some of these links but did not formally test the mediating role of customer satisfaction in the relationship between customer value and customer loyalty. Theoretical justification for the mediating role can be attributed to a well-investigated framework in attitudinal literature (Ajzen and Fishbein 1980). The framework is depicted as follows:

Cognition → Affect → Behavioral intent or behavior

Applying this framework to the service management context, we can identify a mediating effect for customer satisfaction. Customer value reflects customers' rational trade-off between the costs and benefits of using a product and service and thus is regarded as a cognition variable.[1] Customer satisfaction is an affect variable. Customer loyalty concerns behavior or a disposition to behave positively toward a service provider. Thus, the framework provides a basis for hypothesizing that customer satisfaction mediates the effect of customer value on customer loyalty. However, consumer and advertising research also suggests that cognition about a product may affect purchase behavior directly for some product categories (Vakratsas and Ambler 1999). For example, according to the research conducted by the Foote, Cone & Belding (FCB) advertising agency, product categories can be classified into "thinking" products and "feeling" products (Batra, Myers, and Aaker 1995). For "thinking" products, such as paper towels and life insurance, the purchase decision of these products is directly affected by information that consumers have about these products. Thus, the mediation performed by customer satisfaction on the relationship between customer value and customer loyalty may be total or partial. Furthermore, the partial mediation is consistent with the study by Cronin et al. (2000) that reported both a direct effect of service value on behavioral intention and an indirect effect of service value on behavioral intention through customer satisfaction. This reasoning and the associated evidence lead to the following hypotheses:

Hypothesis 5a: Customer satisfaction mediates totally or partially the relationship between customer value and customer loyalty (recommend) in such a way that the greater the customer value, the greater the customer satisfaction and the greater the customer loyalty.

Hypothesis 5b: Customer satisfaction mediates totally or partially the relationship between customer value and customer loyalty (patronage) in such a way that the greater the customer value, the greater the customer satisfaction and the greater the customer loyalty.

The Relationship Between Switching Costs and Customer Loyalty

Part of switching costs may involve loyalty benefits that have to be given up by a customer when his or her relationship with the service provider ends. The enjoyment of these benefits may lead the customer to recommend the provider to other customers. As a result, a positive relationship between switching costs and the recommend dimension of loyalty may exist. However, it is also plausible that switching costs and this dimension are negatively related in some situations. Compared with dissatisfied consumers who could switch in a situation of low switching costs, dissatisfied consumers in a situation of high switching costs would unwillingly stick with the service provider and thus be less inclined to recommend the provider (or may even bad-mouth the provider). In view of the uncertainty about the direction of the relationship between switching costs and this dimension, we do not advance a formal hypothesis regarding the relationship. Instead, we treat this as an empirical issue to be addressed by the results of our analysis.

According to Dwyer et al. (1987) and Heide and Weiss (1995), all else being equal, a customer will be motivated to stay in existing relationships to economize on switching costs, such as the transaction-specific investments that he or she has made on the relationships. The establishment of a new relationship represents some sort of investment of effort, time, and money, which constitutes a significant barrier to moving to other service providers when the customer is dissatisfied with the services of a provider. Consistent with these arguments, Heide and Weiss (1995) found that for the purchase of computer workstations, organizational buyers are less likely in both the consideration and choice stages to consider or select new suppliers

than current suppliers. On the basis of the foregoing arguments and evidence, we advance the following hypothesis:

Hypothesis 6: Switching costs have a positive effect on customer loyalty (patronage).

Interaction Effect Between Customer Satisfaction and Switching Costs on Customer Loyalty

There may exist an interaction effect between customer satisfaction and switching costs on customer loyalty. In general, dissatisfaction reduces customers' tendency to recommend a service provider to other customers. Furthermore, as mentioned in the previous section, "The Relationship Between Switching Costs and Customer Loyalty," in a situation of high switching costs, dissatisfied customers are forced to stay with a service provider. Being unable to switch at will may further reduce these customers' tendency to recommend the provider to other customers or increase their tendency to bad-mouth the provider. In other words, the gap between satisfied and dissatisfied customers in their recommendation disposition is widened in the situation of high switching costs. Therefore, we expect that higher switching costs may enhance the relationship between customer satisfaction and the recommend dimension of loyalty. This leads us to advance the following hypothesis:

Hypothesis 7a: Customer satisfaction has a stronger positive effect on customer loyalty (recommendation) when switching costs are high than when switching costs are low.

As customers stay with a service provider under high switching costs regardless of their satisfaction level, we expect that the relationship between customer satisfaction and the patronage dimension of customer loyalty is small or negligible under high switching costs. In contrast, under low switching costs, dissatisfied customers can switch to other service providers at will. Therefore, we expect a positive relationship between customer satisfaction and the patronage dimension under low switching costs. Jones, Mothersbaugh, and Beatty (2000) provided evidence that in B2C settings, the influence of customer satisfaction on repurchase intentions decreases under conditions of high switching barriers. This leads us to posit the following hypothesis:

Hypothesis 7b: Customer satisfaction has a stronger positive effect on customer loyalty (patronage) when switching costs are low than when switching costs are high.

MEASUREMENT AND DATA

The Industry and Company

To test the hypotheses, we chose the courier service industry for empirical analysis because it embodies some common characteristics considered important for B2B services, such as reliability and customization. Such an approach is consistent with prior research in customer satisfaction and loyalty that has investigated one particular industry (e.g., Shankar et al. 2003). Focusing on a particular industry allows us to customize items in our questionnaire to suit the characteristics of the studied industry and elicit more accurate responses. For example, we can capture all the service attributes deemed important for a particular industry. Single industry focus also helps to improve internal validity and could reduce the error variance and hence increase the power of our hypothesis testing.

We collected data from this industry through a global logistics and international mail group. This group, disguised by us as DPS for confidentiality, is a major player in the international courier industry. We obtained data from a heterogeneous sample of corporate customers of courier services, including small and large customers with different spending levels on courier service.

Measurement

We designed the questionnaire with measures of the relevant constructs primarily based on scales taken from previous research. We made some enhancements, consistent with the specific characteristics of the industry surveyed and our research setting. To establish the face validity of the constructs, we consulted a number of marketing professors and specialists in the courier service industry before deciding on the measures. The items used in the questionnaire are shown in Table 1.

Following recent research in services marketing and customer satisfaction (e.g., Zeithaml et al. 1996), we collected self-reported measures of all the constructs. Situational factors such as nonavailability of services may affect the accuracy of measuring behavioral consequences based on panel data (Bass 1974). Self-reported measures are less affected by these factors and thus have an advantage over the measures based on the panel data.

Customer Loyalty

We adopt the scale of customer loyalty developed by Zeithaml et al. (1996). The construct validity and nomological validity of this scale have been demonstrated by Zeithaml et al. (1996) and Sirdeshmukh et al. (2002). This scale contains three items relating to recommendation and two items involving repurchase intention. We adopt the former three items as measures for the recommend dimension of loyalty and the latter two items as measures for the

TABLE 1
Measurement Item Description

Item	*Description*
Service quality attributes[a]	
Q1	Understanding of my business and shipping needs by the staff
Q2	Timeliness of pickup of consignments as promised
Q3	Reliability in delivering shipments (accurately, on time, etc.)
Q4	Ease of booking a shipment with a company
Q5	Promptness in advising about any problems with my shipments
Price attributes[b]	
P1	Shipment costs incurred by your company (i.e., rates charged for actual services by the courier firms)
P2	Shipment preparation costs incurred by your company (i.e., printing, packing, labeling, filling shipping forms, etc.)
P3	Delay costs incurred by your company (i.e., costs related to fixing shipment delays, etc.)
P4	Communication costs incurred by your company (i.e., costs of telephone, fax, etc., in dealing with the courier firms)
P5	Costs incurred by your company in fixing problems with the courier firms' invoices and so on.
Customer satisfaction[c]	
SA1	In general, my company is very satisfied with the services offered by DPS.
SA2	Overall, my company is very satisfied with its relationship with DPS.
SA3	Overall, DPS is a good company to do business with.
SA4	Overall, DPS treats my company very fairly.
SA5	Overall, the service of DPS comes up to my expectations.
Switching costs[c]	
SW1	It would cost my company a lot of money to switch from DPS to another courier firm.
SW2	It would take my company a lot of effort to switch from DPS to another courier firm.
SW3	It would take my company a lot of time to switch from DPS to another courier firm.
SW4	If my company changed from DPS to another company, some new technological problems would arise.
SW5	My company would feel uncertain if we have to choose a new courier firm.
Customer loyalty (recommend)[c]	
RE1	I have said positive things about DPS to other professional colleagues.
RE2	I have recommended DPS to professional colleagues who seek my advice.
RE3	I have encouraged other companies to do business with DPS.
Customer loyalty (patronage)[c]	
PA1	My company considers DPS as its first choice for courier services.
PA2	My company will do more business with DPS in the next few years.

a. Respondents were asked to rate each of the courier service firms on a scale of 1 to 10 on each service quality attribute (1 = *most inferior*, 10 = *most superior*).
b. Respondents were asked to rate each of the courier service firms on a scale of 1 to 10 based on their satisfaction with each of them on the various price attributes (1 = *most dissatisfied*, 10 = *most satisfied*).
c. Respondents were asked to indicate their agreement/disagreement with each of the statements (1 = *strongly disagree*, 5 = *strongly agree*).

patronage dimension. Consistent with the recommendation of Zeithaml et al. (1996) on extending existing research, we measure customers' self-reported recommendation behavior rather than their recommendation intention.

Customer Satisfaction

Andreassen and Lindestad (1998) suggest that the customer satisfaction indicators should tap into the construct by addressing overall satisfaction and congruence with expectations. Ping (1993) proposed that the relationship between buyers and sellers reflects overall satisfaction. Thus, we developed two items relating to customers' expectations and the relationship between customer and service provider. In addition, we adopted three items commonly used in customer satisfaction research as indicators of the customer satisfaction construct (Oliver and Swan 1989). We thus measure the satisfaction construct by five items.

Switching Costs

We developed measures reflecting various aspects of this construct, including time, money, effort, and risk associated with change of technology. These measures are based on measures developed by Ping (1993) and conceptual insights gleaned from Liljander and Strandvik (1995).

Customer Value

A method for measuring customer value is provided by Gale (1994). Gale's method, which has been used in the PIMS (Profit Impact of Marketing Strategies) study by Buzzell and Gale (1987), enables empirical testing of the relationship between customer value and such variables as customer satisfaction and loyalty. This method also has an advantage in that it provides a profile of a company relative to its competitors on various service/product attributes and costs. According to Gale, customer value is represented mathematically by a weighted sum of relative over-

TABLE 2
Customer Perceived Value Calculation[a]

Dimension	*Importance Weights*	*Performance Scores (1-10)*			*Weighted Scores*
Quality Attributes (1)	*QW (2)*[b]	*Company (3)*	*Competitor (4)*[c]	*Ratio (3/4)*	*Weighted Ratio (2 × 3/4)*
					Subtotal (relative overall quality score)
Price Attributes (1)	*PW (2)*[d]	*Company (3)*	*Competitor (4)*[c]	*Ratio (3/4)*	*Weighted Ratio (2 × 3/4)*
					Subtotal (relative price competitiveness score)
Customer value = (Relative Overall Quality Score × Quality Weight) + (Relative Price Competitiveness Score × Price Weight)[e]					

a. Adapted from Gale (1994).
b. Quality attribute weights.
c. An average is taken when there is more than one competitor.
d. Price attribute weights.
e. The quality weight and the price weight are given by the respondents. The sum of the quality and price weights is fixed to be one.

all perceived quality score and price competitiveness scores. The derivation of customer value is illustrated in Table 2. To estimate the importance of service quality attributes, we asked respondents to indicate the importance of these attributes by dividing 100 percentage points among these attributes. We did the same for the importance of price attributes. The use of self-reported weights addresses the variation of attribute importance across respondents, thus enabling us to gauge customer value more precisely.[2] The relative overall perceived quality score is found by adding several weighted quality ratios together. Each weighted quality ratio is a weighted ratio of the customer perceived quality score of the company on a particular service quality attribute to that of its competitor on the same attribute. Relative price competitiveness score is calculated similarly by using the price ratios and the price weights.

We determined the service quality attributes as follows. On the basis of previous customer satisfaction surveys conducted by DPS, consultation with DPS' management, and literature on service quality measurement (e.g., Parasuraman, Zeithaml, and Berry 1988), we selected eight service quality attributes, which were considered most important by customers and experts in the courier service industry. In a pretest of the questionnaire on 14 DPS' customers, most of the respondents found the eight attributes too many to assign a suitable percentage of importance to each attribute. Consequently, we reduced the eight attributes to five by choosing those with the highest mean in the importance rating. As Table 1 shows, the attribute Q1 shares the meaning of customization, whereas the attributes Q2 and Q3 reflect service reliability. We developed the price attributes in consultation with DPS' management. Also, based on the pretest, we modified the attribute measures, replacing words that respondents considered difficult to understand with familiar ones.

In our full survey, some of our respondents could not rate all the competing service providers that we listed because they had not used and were not familiar with their service. For these cases, we took the mean of those providers that they rated in calculating the relative overall quality and price competitiveness scores. In addition, there are 24 cases in which respondents only used DPS and could not rate any of the competing providers. We excluded these cases from our analysis since we could not derive a meaningful comparison standard for them on the basis of our data.

Data Collection

The targeted sample includes companies that had used the courier services offered by DPS before the survey commenced. With the help of DPS' marketing department, a package containing a cover letter, the survey questionnaire, and a self-addressed prepaid envelope was sent to each respondent. To encourage high response, the cover letter explained the nature and importance of the study and promised a small amount of donation to a charity organization for each duly completed questionnaire on behalf of this responding company. A total of 2,986 questionnaires

TABLE 3
Observed Frequency and Percentage of Responses by Average Shipping Cost per Month and Activity Status: Respondents Versus Nonrespondents

	Average Shipping Cost per Month			
	Respondents		*Nonrespondents*	
Size of the participating company	*Observed Frequency*	*Percentage of Responses*	*Observed Frequency*	*Percentage of Responses*
Large ($2,261 and above per month)	8	3.0	50	1.8
Medium ($451-$2,260 per month)	52	19.4	269	9.9
Small ($450 and below per month)	208	77.6	2,399	88.3
Total	268		2,718	

	Activity Status			
	Respondents		*Nonrespondents*	
Current customers versus ex-customers	*Observed Frequency*	*Percentage of Responses*	*Observed Frequency*	*Percentage of Responses*
Current customers	234	87.3	2,169	79.8
Inactive customers[a]	34	12.7	549	20.2
Total	268		2,718	

a. These include the companies that became inactive (i.e., did not use the service of DPS) in the 2-year period before the survey was conducted.

were mailed. We made follow-up telephone calls to the nonresponding companies to ensure that they received the questionnaires. The data collection process lasted 4 weeks.

Sample

We received a total of 268 responses at a response rate of about 9 percent. We conducted a chi-square test of independence to test the nonresponse bias. The test showed that the respondents and the nonrespondents differ on the dimensions of company size ($\chi^2(2) = 70.3, p < .001$), and activity status ($\chi^2(1) = 8.71, p < .001$). In particular, the sample appears to be overrepresented by medium-sized companies and current customers (see Table 3). To some extent, this nonresponse bias limits the generalizability of the research findings to the population, which consists of all customers of DPS. Respondents belonged to a variety of industries, including manufacturing, merchandising/wholesale/retail, and transportation/distribution industries, which together constituted 48 percent of the sample.

We deleted 10 cases in which the respondents did not rate all the attributes of DPS or provided erroneous rating (e.g., values that do not exist in our scales). A MANOVA that compared these 10 cases with the other cases showed no significant difference between them in terms of switching costs, satisfaction, and loyalty, Wilks's $\Lambda = .22$, $F(15, 250) = 59, p > .05$. Also, as mentioned in the previous section, we removed from our sample 24 cases in which the respondents did not rate any of the competing service providers. After making all these changes, we retained 234 cases in our sample. We also examined the existence of influential cases in our sample based on the Cook's distance (Tabachnick and Fidell 1996). We found that our sample does not contain such cases.[3]

MODELS AND ANALYSIS

We estimate our models through structural equation modeling using LISREL 8.30 and based on the principle of full information maximum likelihood. This method controls for measurement errors and jointly estimates the entire system of equations that constitute the models.

Assessing Construct Validity

Our data analysis begins with a confirmatory factor analysis (CFA) on the multi-item measures of customer satisfaction, switching costs, and customer loyalty to assess the convergent validity and discriminant validity of these measures. Note that we do not include customer value in the CFA. In our study, customer value is determined by a linear combination of independent variables (involving several service and price attributes). As such, these variables are formative (causal) indicators, rather than reflective indicators (Diamantopoulos and Winklhofer 2001). Unlike reflective indicators, which are

TABLE 4
Unstandardized Coefficient Estimates and Fit Indices

Construct	*Model 1*[a]		*Model 2*[a]		*Model 3*[a]	
Customer Satisfaction (R^2)[b]	.48		.48		—	
Customer value	2.4***	(.46)	2.4***	(.46)	—	
Customer loyalty (patronage)	.19	(.12)	.18	(.12)	—	
Customer Loyalty (Recommend) (R^2)	.39		.39		.27	
Customer value	.83	(.44)	.62	(.43)	1.8***	(.32)
Customer satisfaction	.39***	(.10)	.40***	(.10)	—	
Switching costs	.30***	(.054)	.30***	(.054)	.33***	(.058)
Customer satisfaction × Switching costs	−.089	(.055)	—		—	
Customer satisfaction × Customer satisfaction	.061	(.052)	—		—	
Customer Loyalty (Patronage) (R^2)	.57		.57		.45	
Customer value	2.0***	(.58)	1.9***	(.57)	3.0***	(.34)
Customer satisfaction	.36*	(1.6)	.37*	(.17)	—	
Switching costs	.35***	(.055)	.35***	(.055)	.38***	(.060)
Customer satisfaction × Switching costs	−.049	(.055)	—		—	
Customer satisfaction × Customer satisfaction	.039	(.052)	—		—	
Fit Indices						
Root mean square error of approximation (RMSEA)	.068		.078		.075	
Root mean square residual (RMR)	.045		.044		.043	
Goodness-of-Fit Index (GFI)	.90		.90		.94	
Comparative Fit Index (CFI)	.96		.96		.98	
χ^2 (*df*)	224.2***	(103)[c]	203.9***	(81)	67.5***	(30)

NOTE: The numbers in parentheses are standard errors.
a. Model 1: full model; Model 2: reduced model (with linear-effect terms only); Model 3: comparison model (without the satisfaction construct).
b. Variance explained.
c. The number in parentheses is the degree of freedom.
*$p < .05$. ***$p < .001$.

commonly used for measuring marketing concepts, formative indicators are exogenously determined and do not necessarily correlate among themselves. Therefore, conventional procedures used to assess the validity (convergent and discriminant validity) and reliability of scales composed of reflective indicators is not appropriate for composite variables (i.e., indexes) with formative indicators (Diamantopoulos and Winklhofer 2001). Despite these problems, one can investigate the validity of formative indicators to a certain extent by examining the content validity and nomological validity of the construct (Nunnally and Bernstein 1994; Diamantopoulos and Winklhofer 2001). In our study, the indicators of customer value were developed on the basis of the opinions of industry experts and customers, and the literature on service quality. The indicators appear to cover various service and price attributes in the courier industry (see Table 1). Also, nomological validity for the customer value construct is demonstrated as we found that customer value is significantly related to customer satisfaction (see the Results section).

Structural Equation Models and Hypothesis Testing

We formulate the relationships embodied in our conceptual framework by developing a full model, Model 1 (see Table 4 for its specification). Consistent with some previous studies involving single-indicant constructs (e.g., Cadotte et al. 1987), we fixed the indicator loading of the customer value measure to be one and its error variance to be zero. We also allowed the disturbance terms of the two loyalty dimensions to correlate with each other, as the dimensions could be related to other common causes (e.g., some personality traits) not captured in our model. Except for these two disturbance terms, we assume that the disturbance terms of all the endogenous variables are uncorrelated, as we have no special reason to believe they are. This assumption is commonly made by structural equation modeling researchers (Rigdon 1995).

In addition to linear effects, Model 1 includes nonlinear effects: the quadratic effect of customer satisfaction and the interaction effect between customer satisfaction and switching costs on the loyalty dimensions. In structural equation modeling, one approach of testing nonlinear effects is subgroup analysis. Subgroup analysis involves dividing the study cases into subgroups based on a suspected interaction or quadratic variable, and then testing for significant coefficient differences between the subgroups. This approach is appropriate when on theoretical grounds, the research model could be posited to be different for different subject subgroups. However, for other situations, particularly when all the variables involved are continuous, this approach could lead to a reduction of sta-

tistical power and the resultant likelihood of false disconfirmation (Jaccard, Turrisi, and Wan 1990). Another approach, indicant product analysis, uses products of indicants to specify interaction and quadratic variables (Kenny and Judd 1984). This approach overcomes the limitations of subgroup analysis but can be tedious to use for a number of reasons, such as convergence problems caused by the addition of many variables. To overcome these problems, Ping (1995) introduced a simplified variant of this approach. Ping proposes using the product of summed indicants to measure an interaction or quadratic latent variable and fixing the loading and error variance of the measure to be certain constants. Ping shows that his technique performs adequately using synthetic data sets. Therefore, we adopted Ping's method for its ease of implementation and efficacy.

Following the method of Ping (1995), we tested the nonlinear effects in Model 1 by including a quadratic latent variable, Customer Satisfaction × Customer Satisfaction, and an interaction latent variable, Satisfaction × Switching Costs, as explanatory variables of the loyalty dimensions. The paths linking the quadratic variable to the loyalty dimensions denote the quadratic effect, whereas the paths linking the interaction variable to these constructs denote the interaction effect. Following Ping, we measured the quadratic variable by the square of the sum of customers' rating on the five satisfaction items in our questionnaire. Similarly, we measured the interaction variable by a product of the sum of customers' response on the satisfaction items and the sum of their response on the switching costs items. All the scores on the satisfaction and switching costs items were mean-centered to reduce the correlations between the nonlinear and linear effect constructs pertaining to satisfaction and switching costs. In addition, we fixed the factor loading and the error variance of the interaction and quadratic measures to particular values, based on the formulas provided by Ping (1995) and using parameter estimates from a linear-terms-only model (Model 2 shown in Table 4 and Figure 2) as input into these formulas.

As our analysis shows that the nonlinear latent variables do not have a significant effect on the loyalty dimensions, and the evidence provided by previous studies for these nonlinear effects is mixed, we removed these variables from Model 1 and based our hypothesis testing on the reduced model, Model 2. To test the mediating role of satisfaction in the relationship between customer satisfaction and the loyalty dimensions, we developed a third model, Model 3, which does not contain the satisfaction construct (see Table 4 and Figure 2). According to Baron and Kenny (1986), to establish mediation in the relationship between customer value and a loyalty dimension, the following conditions must hold: (a) customer value must have a positive effect on the loyalty dimension in Model 3, (b) customer value must have a positive effect on customer satisfaction in Model 2, (c) customer satisfaction must have a positive effect on the loyalty dimension in Model 2, and (d) the effect of customer value on the loyalty dimension must be less in Model 2 than in Model 3. We test whether these conditions are complied with in this study. Perfect mediation holds if the direct effect of customer value on the loyalty dimension is not significant in Model 2.

RESULTS

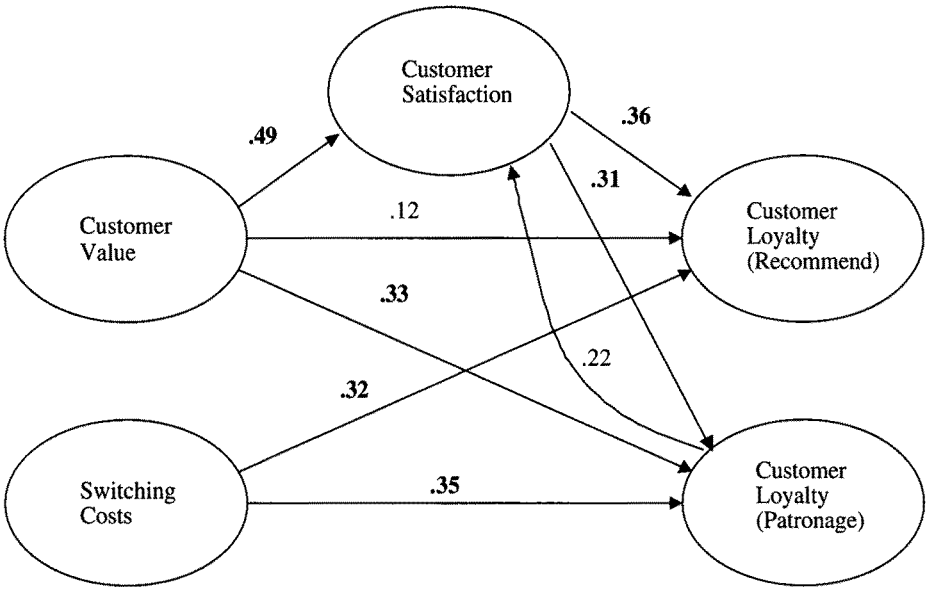
Confirmatory Factor Analysis

We performed CFA on a four-factor model consisting of customer satisfaction, switching costs, and the two loyalty dimensions. Altogether, the fit indices for this model are not acceptable. Although the reported value of the Comparative Fit Index (CFI), .95, is above the benchmark of .9 recommended by the structural equation modeling literature, other indices, including the Goodness-of-Fit Index (GFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (RMR), do not meet the respective benchmarks (Bagozzi and Yi 1988). Specifically, the reported GFI, .88, is below .9, and the reported RMR, .056, is above .05, suggesting a poor fit between the model and the data. Similarly, the reported RMSEA, .088, is between .08 and .10, indicating a mediocre fit. The chi-square fit statistic also suggests a poor fit ($\chi^2(84) = 242.2, p < .001$), although this statistic is sensitive to sample size (Bagozzi and Yi 1988). We conclude that some of the measures in our model may be problematic. The modification indices of the LISREL output reveal problems with a switching costs item, SW5 ("My company would feel uncertain if we have to choose a new courier firm"). The indices suggest that the chi-square statistic can be significantly reduced by linking the satisfaction and the loyalty dimensions to this item. Indeed, this item is different from the other items in meaning, as the former talks about uncertainty rather than specific switching costs. Therefore, on the basis of both empirical and theoretical grounds, we dropped this item.

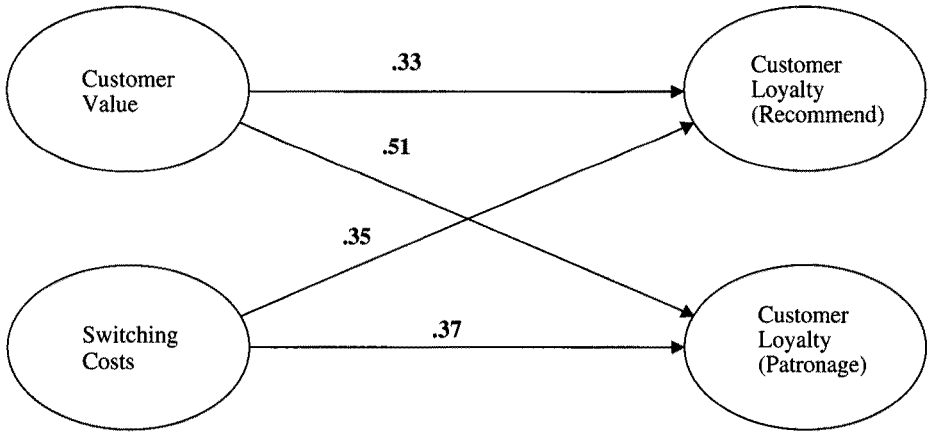
Subsequently, we repeated the CFA with the SW5 item removed. The fit indices so generated suggest a good model fit (GFI = .90, CFI = .96, RMSEA = .080, RMR = .045, $\chi^2(71) = 183.1, p < .001$). Therefore, the model without the SW5 items appears to be acceptable. Furthermore, we also assessed the convergent validity (reliability) and discriminant validity of the measures based on this model. We calculated the average variance extracted by the constructs and the variance shared between the constructs. The results are shown in Table 5. As Table 5 indicates, the average variance extracted for each construct is greater than .5, thus providing support for the convergent validity of the measure for each construct. The discriminant validity of the measures for the constructs is also demonstrated,

FIGURE 2
Standardized Coefficient Estimates

Model 2 (Includes Linear Effects Only)



Model 3 (Excludes the Satisfaction Construct)



NOTE: Coefficient estimates that are significant at the .05 or lower level are in bold.

TABLE 5
Test Results on Convergent Validity and Discriminant Validity

	Satisfaction	*Switching Costs*	*Customer Loyalty (Recommend)*	*Customer Loyalty (Patronage)*
Satisfaction	*.76*[a]			
Switching Costs	.028[b]	*.73*		
Customer Loyalty (Recommend)	.29	.16	*.75*	
Customer Loyalty (Patronage)	.44	.19	.44	*.75*

a. The diagonal entries (in italics) represent the average variance extracted by the construct.
b. The off-diagonal entries represent the variance shared (squared correlation) between constructs.

as the variance shared between the constructs is smaller than the average variance extracted by the constructs. Having confirmed the validity of these measures, we used them in our subsequent analysis that includes the causal relationships under examination.

Structural Models

We conducted LISREL analysis on the full model (Model 1), the reduced model (Model 2), and the comparison model (Model 3), respectively. The correlation and covariance matrices of the manifest variables used as input to the analysis are shown in Table 6, and the model estimation results are shown in Table 4. As Table 4 indicates, the three models exhibit good fit with the data. The reported fit indices of RMSEA, RMR, GFI, and CFI fulfil the respective benchmarks (Bagozzi and Yi 1988). Specifically, the reported values are lower than .08 for RMSEA and .05 for RMR, and greater than .9 for GFI and CFI. Although the chi-square values are significant at the .01 or lower level, the large chi-square values could be related to the size of our sample (234 cases).

As Table 4 shows, the results of Model 1 do not support the nonlinear effects under examination. The coefficient estimates of the quadratic and interaction constructs are not significant at the .05 level. Therefore, Hypotheses 3a, 3b, 7a, and 7b, which describe the nonlinear effects, are not supported. Consequently, we based our hypothesis testing on the reduced model (Model 2). We also noted that the parameter estimates are very similar across Models 1 and 2.

The Model 2 results support most of our hypotheses. The coefficient estimates relating to Hypotheses 1, 2a, 2b, and 6 are significant at the .05 or lower level and in line with the hypothesized direction. Specifically, the results indicate that customer value has a positive effect on customer satisfaction (Hypothesis 1), customer satisfaction has a positive effect on the two loyalty dimensions (Hypotheses 2a and 2b), and switching costs have a positive effect on the patronage dimension (Hypothesis 6). However, the reciprocal effect of the patronage dimension on customer satisfaction is not significant at the .05 level. Therefore, Hypothesis 4 is not supported. We also found that the effect of switching costs on the recommend dimension, which we have not formally hypothesized, is positive and significant at the .001 level.

To test the mediating role of customer satisfaction in the relationship between customer value and customer loyalty, we examined and compared the results of Model 2 and Model 3. Referring to Table 4 for the path coefficient estimates of Models 2 and 3, we found that all the mediating conditions set by Baron and Kenny (1986) are satisfied for both the recommend and repurchase loyalty dimensions. Specifically, we found that (a) customer value has a positive effect on the loyalty dimensions in the absence of customer satisfaction (Model 3), (b) customer value has a positive effect on customer satisfaction (Model 2), (c) customer satisfaction has a positive effect on the loyalty dimensions (Model 2), and (d) the effect of customer value on the loyalty dimensions is reduced in the presence of customer satisfaction (Model 2). Furthermore, we noted that in Model 3, the estimate for the path from customer value to the recommend dimension is not significant at the .05 level, whereas the estimate for the path from customer value to the patronage dimension is significant at the .05 level. Therefore, we conclude that the relationship between customer value and the recommend dimension is totally mediated by customer satisfaction (Hypothesis 5a), whereas the relationship between customer value and the patronage dimension is partially mediated by customer satisfaction (Hypothesis 5b).

The R^2 estimates also reveal another difference between the two loyalty dimensions in the effect of their antecedents. The R^2 statistics in Table 4 show that the proportion of variation of the patronage dimension explained by the antecedents, customer value, customer satisfaction, and switching costs, is much greater than the proportion of variation of the recommend dimension explained by the same antecedents. This suggests that there are other major factors or antecedents affecting the recommendation behavior.

Our analysis also enables us to compare the strengths of the different relationships. As Table 4 shows, customer satisfaction seems to have a larger effect on the loyalty dimensions than do switching costs. We used a chi-square test to examine the significance of this difference. The test results show that the effect of customer satisfaction on the recommend dimension is not different from the effect of switching costs on this dimension ($\chi^2(1) = .7$, $p > .05$). Similarly, there is no significant difference between the effect of customer satisfaction and the effect of switching costs on the patronage dimension ($\chi^2(1) = .01$, $p > .05$).

We also assessed the relative importance of explanatory variables in Model 2 based on their standardized coefficient estimates. As Figure 2 shows, customer satisfaction is the most important variable explaining the variation of the recommend dimension, whereas switching costs is the most important variable explaining the variation of the patronage dimension. Taking the reciprocal effect of the patronage dimension on customer satisfaction into account, we found that the total effect of customer satisfaction on this dimension is slightly lower than the effect of switching costs on this dimension by .02.

Summary

Our CFA demonstrates our measures' validity. In particular, it indicates that the customer loyalty measure used in previous research consists of two dimensions rather than one. Except for the nonlinear effect hypotheses,

TABLE 6
Covariance and Correlation Matrices of the Manifest Variables

	SA1	*SA2*	*SA3*	*SA4*	*SA5*	*RE1*	*RE2*	*RE3*	*PA1*	*PA2*	*VA*	*SW1*	*SW2*	*SW3*	*SW4*	*SASQ*	*SASW*
SA1	*.812*	.871	.760	.713	.741	.396	.418	.417	.537	.567	.568	.210	.116	.098	.142	-.215	.001
SA2	.691	*.775*	.796	.743	.714	.448	.465	.480	.493	.537	.545	.214	.137	.130	.147	–.257	–.026
SA3	.550	.562	*.644*	.815	.698	.383	.408	.458	.493	.458	.534	.243	.159	.151	.200	–.194	–.005
SA4	.508	.517	.517	*.626*	.747	.419	.395	.405	.464	.468	.473	.230	.113	.137	.165	–.191	–.007
SA5	.583	.549	.489	.517	*.764*	.351	.383	.388	.514	.493	.562	.160	.092	.104	.090	–.246	–.022
RE1	.317	.350	.273	.294	.272	*.787*	.814	.666	.432	.487	.373	.290	.324	.299	.293	–.082	.004
RE2	.359	.391	.312	.298	.319	.688	*.909*	.745	.504	.536	.334	.293	.351	.347	.309	–.055	–.081
RE3	.351	.395	.343	.300	.317	.553	.664	*.875*	.578	.536	.331	.294	.305	.317	.309	–.115	–.047
PA1	.533	.479	.436	.405	.496	.423	.530	.596	*1.215*	.752	.509	.450	.380	.372	.346	–.089	.006
PA2	.505	.468	.364	.366	.426	.427	.506	.496	.820	*.978*	.464	.385	.319	.310	.308	–.155	.015
VA	.085	.080	.071	.062	.082	.055	.053	.051	.093	.076	*.028*	.233	.152	.103	.113	–.291	.137
SW1	.196	.195	.202	.189	.145	.267	.290	.286	.515	.396	.040	*1.079*	.714	.698	.564	–.011	.035
SW2	.108	.124	.132	.092	.083	.297	.345	.294	.433	.325	.026	.766	*1.065*	.888	.694	.003	.003
SW3	.089	.116	.123	.110	.092	.269	.335	.300	.414	.310	.017	.733	.926	*1.022*	.748	.014	–.009
SW4	.117	.118	.147	.120	.072	.238	.269	.265	.349	.278	.017	.536	.655	.691	*.836*	–.037	–.018
SASQ	–4.629	–5.397	–3.724	–3.612	–5.141	–1.747	–1.250	–2.559	–2.355	–3.657	–1.154	–.272	.068	.329	–.798	*569.765*	.188
SASW	.017	–.392	–.062	–.088	–.318	.062	–1.301	–.735	.104	.245	.385	.613	.045	–.146	–.272	75.428	*283.681*

NOTE: The covariance matrix is shown in the lower triangle of the table, whereas the correlation matrix is shown in the upper triangle. The variances of the manifest variables are shown in the diagonal and are italicized. SA1-SA5 = customer satisfaction items; RE1-RE3 = customer loyalty (recommend) items; PA1-PA2 = customer loyalty (patronage) items; VA = customer value; SW1-SW4 = switching costs items; SASQ = square of the sum of the satisfaction items; SASW = product of the sum of the satisfaction items and the sum of the switching costs items. All these items are described in detail in Tables 1 and 2.

TABLE 7
Summary of Hypotheses and Results

Hypothesis	*Relationship*	*Results*
Hypothesis 1	Customer value has a positive effect on customer satisfaction.	Supported
Hypothesis 2a	Customer satisfaction has a positive effect on customer loyalty (recommend)	Supported
Hypothesis 2b	Customer satisfaction has a positive effect on customer loyalty (patronage).	Supported
Hypothesis 3a	The effect of customer satisfaction on customer loyalty (recommend) follows an increasing return to scale relationship.	Not supported
Hypothesis 3b	The effect of customer satisfaction on customer loyalty (patronage) follows an increasing return-to-scale relationship.	Not supported
Hypothesis 4	Customer loyalty (patronage) has a positive effect on customer satisfaction.	Not supported
Hypothesis 5a	Customer satisfaction mediates totally or partially the relationship between customer value and customer loyalty (recommend) in such a way that the greater the customer value, the greater the customer satisfaction and the greater the customer loyalty.	Supported (totally mediated)
Hypothesis 5b	Customer satisfaction mediates totally or partially the relationship between customer value and customer loyalty (patronage) in such a way that the greater the customer value, the greater the customer satisfaction and the greater the customer loyalty.	Supported (partially mediated)
Hypothesis 6	Switching costs have a positive effect on customer loyalty (patronage).	Supported
Hypothesis 7a	Customer satisfaction has a stronger positive effect on customer loyalty (recommend) when switching costs are high than when switching costs are low.	Not supported
Hypothesis 7b	Customer satisfaction has a stronger positive effect on customer loyalty (patronage) when switching costs are low than when switching costs are high.	Not supported

nearly all our hypotheses on the interrelationships between customer value, satisfaction, switching costs, and customer loyalty are supported by our results. The results on the hypotheses are summarized in Table 7.

DISCUSSION AND MANAGERIAL IMPLICATIONS

Discussion

Our findings provide insights into the complex interrelationships between customer value, customer satisfaction, switching costs, and customer loyalty constructs. In contrast to previous empirical research in which customer value, customer satisfaction, and switching costs are separately analyzed as antecedents of customer loyalty in the B2C context, this study examines their combined impact on customer loyalty and the reciprocal effect of customer loyalty on customer satisfaction in a single model in the B2B context.

The CFA results reveal that customer loyalty has two dimensions, namely, recommendation and patronage. This finding extends previous studies that treat customer loyalty as a one-dimensional construct (e.g., Zeithaml et al. 1996) and the study that showed that satisfaction affects different types of customer intentions (Tsiros and Mittal 2000). Our structural analysis also indicates that the two loyalty dimensions behave differently with regard to their linkage with their antecedents, thus providing support for the nomological validity of treating customer loyalty as a two-dimensional construct. The decomposition of customer loyalty into two dimensions is intuitively sound. Furthermore, the decomposition relates to different managerial objectives: repeat patronage pertains to customer retention and recommendation to customer attraction.

Our results show that the two dimensions of customer loyalty are positively related to customer satisfaction and switching costs. Satisfied customers appear to be willing to repeat patronizing the service provider and also to recommend the provider to other customers, supporting Reichheld and Sasser (1990) and Oliver (1999). Similar to customer satisfaction, switching costs, which can be in the form of monetary expenses, time, and psychological effort, help the service provider retain its customers, consistent with Gronhaug and Gilly (1991). In addition, switching costs seem to encourage customers to recommend the provider to other customers, possibly because of the link between switching costs and the benefits specific to the relationship between the service provider and its customers. While some of the foregoing relationships have been examined by researchers in B2C settings, our study shows these findings in a B2B setting.

Our conceptual model highlights the mediating role of satisfaction in the impact of customer value on customer loyalty. Prior studies have highlighted the linkage between customer value and customer satisfaction (Heskett et al. 1997), the relationship between service quality and customer satisfaction (e.g., Rust and Oliver 1994; Spreng and MacKoy 1996), and the linkage between customer satisfaction and customer loyalty (e.g., Oliver 1999; Reichheld and Sasser 1990). Previous studies, however, have either ignored or not formally tested this mediating role, or they have not explained this role thoroughly. By invoking the well-investigated attitudinal framework, cognition → affect → behavioral intent or behavior, we provide a theo-

retical justification for this role by regarding customer value as cognition, customer satisfaction as affect, and customer loyalty as behavior (or a disposition to behave favorably toward a service provider). We extend prior research by testing this role. Interestingly, we found difference in this role between the two loyalty dimensions. While customer satisfaction *totally* mediates the impact of customer satisfaction on the recommend dimension, the mediation is only *partial* for the patronage dimension. It appears that customers are mainly driven by their affective state (satisfaction) in recommending a service to other customers but are influenced by both their satisfaction and perceived value of a service when considering whether to use this service again.

We do not find support for a reciprocal relationship between customer satisfaction and the patronage dimension. This relationship is based on the assumption that sustained usage of a service by loyal customers can provide them with additional noneconomic value, thus enhancing their satisfaction with the service. We used repurchase intention as a proxy for sustained usage in investigating this relationship, as we did not have a more direct measure of sustained usage. Therefore, the nonsignificant finding for this relationship could be due to either the invalidity of the assumption or the measure used.

We also do not find evidence for the interaction effect of customer satisfaction and switching costs and the quadratic effect of customer satisfaction on customer loyalty. Previous research provides mixed evidence on these nonlinear effects on customer loyalty or behavioral intention (e.g., Heskett et al. 1997; Mittal and Kamakura 2001). One possible reason is the sample size used in different studies. Previous studies that report significant interaction or nonlinear effects use larger samples compared to ours. For example, the study by Jones, Mothersbaugh, and Beatty (2000), which found the interaction effect, uses a sample of 434 cases, and the study by Mittal and Kamakura (2001), which found the nonlinear effect, uses a sample of about 100,000 cases. In contrast, our usable data contain 234 responses. As the power of hypothesis testing is positively related to sample size, our nonsignificant findings may be due to the relatively small sample that we used. In addition, there has been mixed evidence on the functional form of the satisfaction-loyalty relationship. For example, Mittal and Kamakura (2001) found that the functional form exhibits decreasing returns in the case of repurchase intent but increasing returns in the case of repurchase behavior. Finally, the quadratic relationship could be stronger in B2C settings than in B2B settings.

Managerial Implications

The result on the value-satisfaction link suggests that to enhance customer satisfaction, a service provider can spend its effort on improving the value perceived by customers. Our methodology allows a service provider to identify its strengths and weaknesses on the value components relative to its competitors. The relative service quality ratios and the relative price ratios that appear in the customer value calculation tell a provider where their strengths and weaknesses lie. By focusing on attributes with high importance rating, a service provider can tackle those critical weaknesses that severely hamper its effort to enhance customer value. By working on those weaknesses, a service provider could improve customer value and hence customer satisfaction. However, the variance in customer satisfaction explained by customer value is not large—about 38 percent when the link from the patronage dimension to customer satisfaction is excluded. Therefore, a service provider should also pay attention to other factors that may affect customer satisfaction, for example, the fairness or equitableness of its policies (Oliver and Swan 1989).

The confirmation of the mediating role of customer satisfaction has an important implication to management. It suggests that for the sake of customer acquisition, it is more essential for management to monitor changes in customer satisfaction scores than customer value scores, since customer satisfaction rather than customer value directly affects the recommend dimension. In contrast, for the concern of customer retention, it is important for management to track changes in both the satisfaction and value scores, because customer satisfaction does not totally mediate the impact of customer value on the patronage dimension. Our results also indicate that the effects of customer satisfaction on the two loyalty dimensions are not significantly stronger than the effects of switching costs on these constructs. Thus, both enhancing customer satisfaction and increasing switching costs can be seen as important strategies that promote customer loyalty.

Interestingly, the variance of customer loyalty (patronage) explained by customer value, customer satisfaction, and switching costs is 57 percent, whereas the variance of customer loyalty (recommend) explained by the same antecedents is much smaller at 39 percent. Apparently, while a service provider could retain customers effectively through enhancing customer satisfaction and switching costs, such a strategy would be less effective for promoting recommendation. This is not surprising since customers need to be sufficiently motivated before they can recommend the service provider, and customer satisfaction with a product or service is just one of the motivations for customers to recommend. Other motivations include enhancing one's self-concept and impression management (Chung 2000). Previous studies on word-of-mouth behavior have also found that consumers with positive attitude toward a product do not always recommend the product to friends and relatives (Swan and Oliver 1989).

LIMITATIONS AND FUTURE RESEARCH

Our study has some limitations that offer opportunities for future research. First, our data are from the courier industry that embodies many general characteristics of service industries. On one hand, our research focus on one industry and one company helps keep unexplained variance ("noise") small in our model estimation and hence increases the power of hypothesis testing. On the other hand, such narrow focus may limit the generalizability of our results. Future research may replicate our study in other industries and companies.

Second, variables such as the rate of technological change in an industry and the stage of the product life cycle that we did not examine in this study may also moderate the relationship between customer satisfaction and customer loyalty. When technological change is rapid or when an industry is in the growth stage, customers may be constantly looking for changes in offering and hence previous satisfaction with a company's product or service may not guarantee continued patronage. In contrast, when technological change is slow or when an industry is in the mature stage, the relationship between customer satisfaction and customer loyalty could be stronger. These issues merit further investigation.

Third, the interaction effect of customer satisfaction and switching costs and the quadratic effect of customer satisfaction on customer loyalty were not significant in our data. There may be cross-category variation in these relationships, and our sample size can be increased to further investigate this variation.

Fourth, the reciprocal effect of customer loyalty (patronage) on customer satisfaction is worth further investigation. An empirical examination of this effect could help answer whether loyalty-building initiatives (such as reward programs) can enhance customer satisfaction. Future research may use a more direct measure of sustained usage (e.g., the length of usage experience) for this examination. Similarly, as loyal customers could be distinguished from nonloyal customers by the type of exchange (relational vs. transactional), and the type of exchange may be related to the type of contractual obligations in a B2B context (Dwyer et al. 1987), future research may compare the relationship between loyalty and customer satisfaction among customers with different contractual obligations.

Finally, we have not formally examined trust in our framework. Future research may attempt to more rigorously examine the relationships of trust with customer satisfaction, loyalty, and value.

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NOTES

1. Although the costs and benefits may also include social or emotional elements, customer value is considered a cognition variable as we view customer value as involving a process that is well thought out and carefully considered.

2. Self-reported weights have been used by researchers in calculating belief-based attitudes based on the theory of reasoned action (Ajzen and Fishbein 1980). This theory assumes that individuals are assumed to evaluate outcomes caused by a behavior when they form their attitude toward the behavior. Individuals' report on these evaluations constitutes the weights in estimating their belief-based attitude toward the behavior. Researchers in a wide variety of domains have found that belief-based attitudes are significantly correlated with overall attitudes reported by individuals and predict their behavioral intention well, thus supporting the use of self-reported weights in calculating summary evaluation (Fazio 1990).

3. Cases with the Cook's distance above one are considered influential cases (Tabachnick and Fidell 1996). LISREL cannot provide the Cook's distance as the former uses the covariance or correlation matrix rather than individual cases as input. In contrast, the regression procedure of SPSS can generate the Cook's distance (Tabachnick and Fidell 1996). We obtained the Cook's distance for each case in our sample by treating our full model (Model 1) as a series of regression equations and running the regression procedure on each equation. We found that for all cases, the Cook's distance is less than .3 and therefore conclude that no influential cases exist.

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