AN INTEGRATED MODEL FOR THE EFFECTS OF PERCEIVED PRODUCT, PERCEIVED SERVICE QUALITY, AND PERCEIVED PRICE FAIRNESS ON CONSUMER SATISFACTION AND LOYALTY

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ABSTRACT

The complete products provided by most service industries contain both tangible and intangible parts, just in different proportions. Previous empirical research in this field tended to emphasize service quality only. The purposes of this study are 1) to balance service quality and product quality into an integrated model, and 2) to explore the effects of three consumer perceptions (product quality, service quality, and price fairness) on satisfaction and loyal behavior. Automobile maintenance service is chosen as an examined object because both technicians' skills and parts' quality are essential to consumers. A survey of 495 customers is conducted in 15 repair centers of three major auto firms, Mitsubishi, Nissan, and Toyota. The results illustrate that (a) perceived service quality mainly affects consumer loyalty through satisfaction, while (b) perceived product quality and perceived price fairness have both direct and indirect (through satisfaction) effects on loyalty. Consumers' perceptions about service quality, product quality, and price fairness are almost equally important to build up their satisfaction. We suggest that managers consider product quality and price as the foundations to build up consumer satisfaction and loyalty and to improve service quality as an add-on value to consumers.

INTRODUCTION

Service industries are playing an increasingly important role in the economies of developed countries. As in most developed countries, services currently account for over 60% of the Taiwan's GDP. Service management has also become an important issue in Taiwan.

To date the studies of service quality and consumer satisfaction have dominated the service-related literature (Cronin, Brady, and Hult 2000), and the dimensions and measurements of service quality have been thoroughly examined. Parasuraman, Zeithaml, and Berry (1985) built up a well-accepted five-gap service quality model which has led the main stream of service quality research. In past decades, Taiwan's researchers have observed the measurement and management of service quality, but few studies focused on the determinants of consumer satisfaction other than the quality of service issue.

Besides abundant discussions regarding consumer satisfaction, Voss, Parasuraman, and Grewal (1998) suggested that the price decision has an impact on consumers' satisfaction in service industries. Parasuraman, Zeithaml, and Berry (1994) also indicated that the influences of product quality and consumers' perceived price were often ignored in prior consumer satisfaction studies. In addition, until now, the simultaneous investigation of the interrelationships between perceived product quality, perceived service quality, perceived price fairness, satisfaction, and loyalty has not yet been done.

Another critical issue is the dichotomy of classifying any product into a pure physical category or an intangible one. The intact product provided by most industries contains both tangible and intangible parts, just in different proportions (Rathmell 1966; Rushton and Carson 1989; Shostack 1977). Much attention has been paid to only the intangibility of service in prior related studies (Bebko 2000; Lovelock 1983; Rathmell 1966; Rushton and Carson 1989; Shostack 1977; Wakefield and Blodgett 1999). The tangible dimension of service quality was defined as the appearance of physical facilities, equipment, personnel, and communication materials, but not the physical product bought by consumers. Price,

another important factor on consumer satisfaction, was mentioned by Parasuraman, Zeithaml, and Berry (1994), but was rarely investigated in previous studies. Voss, Parasuraman, and Grewal (1998) also pointed out the lack of literature exploring the possible effect of a consumer's price decision on the degree of satisfaction. Thus, the motive of this study is to combine service quality, product quality, and price into one complete model.

It was commonly suggested that service quality is an antecedent of consumer satisfaction, and that consumer satisfaction leads to consumer loyalty (Cronin, Brady, and Hult 2000). However, unlike prior studies, Lee (1998) found that service quality and product quality directly led to favorable consumer loyalty while influencing satisfaction. Therefore our objective is to examine the effects of product quality, service quality, and perceived price on both consumer satisfaction and consumer loyalty. Though these relationships have been discussed theoretically (Anderson, Fornell, and Lehmann 1994; Bolton and Drew 1991; Oliver 1999; Parasuraman, Zeithaml, and Berry 1988; Zeithaml 1988), an empirical study shall provide more insight to this area.

CONCEPTUAL BACKGROUND

Early in the studies of service industries, many studies focused on the dimensions and measurement of service quality. More recently, Cronin, Brady, and Hult (2000) and other researchers were more concerned with the understanding of the relationship among related constructs as well as the effects of the constructs on consumer behavior. For the purpose of this study, literature regarding linkages between consumer satisfaction, consumer loyalty, service quality, product quality, and price will be reviewed in order to conduct hypotheses for the relationship.

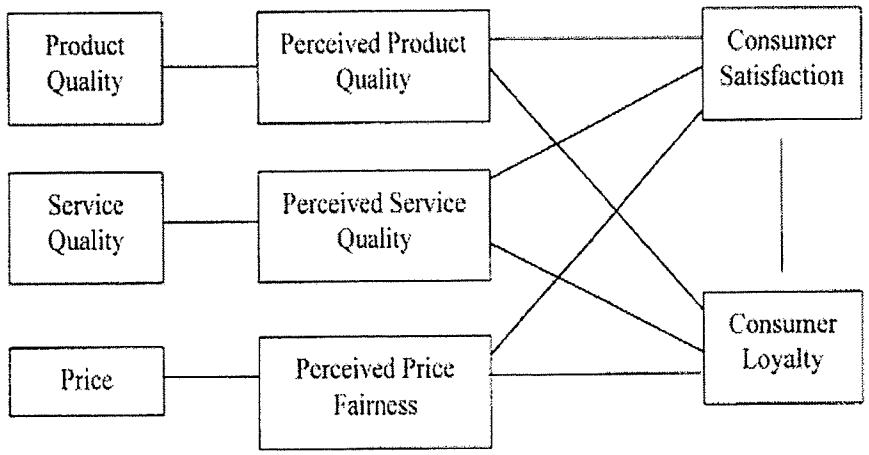
Consumer Satisfaction

The definition of consumer satisfaction has been divergent ever since Cardozo (1965) introduced this concept into the marketing field. Perceived service quality and satisfaction assessment depend on the function of the variation between consumer's perception and expectation of service levels. Therefore, these two terms were interchangeable in some previous studies until Parasuraman, Zeithaml, and Berry (1994) provided clear definitions for consumer satisfaction and service quality.

Howard and Sheth (1969) first denoted consumer satisfaction as a related psychological state to appraise the reasonableness between what a consumer actually gets and gives. Churchill and Surprenant (1982) suggested consumer satisfaction resulted from purchasing and using a certain product, which was made by a consumer to compare the expected reward and the actual cost of the purchase. Oliver (1981) defined satisfaction as a total psychological state when there is an existed discrepancy between the emerging emotion and expectation, and such an expectation is a consumer's feeling anticipated and accumulated from his or her previous purchases. On the other hand, in a study of durable goods, the main factor for consumer satisfaction was not the gap between "the product performance" and "expectation," or the initial expectation (Churchill and Surprenant 1982). The major factor was the "production performance" that determined the consumer satisfaction. The understanding of satisfaction implies that satisfaction is particularly incurred towards a particular purchase. A consumer compares the actual benefit and cost level in the purchasing behavior with the expected level of benefit. After this appraisal process, positive or negative feelings and emotions occur.

Parasuraman, Zeithaml, and Berry (1994) suggested that, service quality, product quality, and price all influence satisfaction. Voss and colleagues (1998) indicated satisfaction results from the function of price, expectation, and

Figure 1
A Conceptual Framework for the Effects of Perceived Product Quality, Service Quality, and Price Fairness on Consumer Satisfaction and Consumer Loyalty



performance. The current study also regards consumer satisfaction as the function of perceived service quality, product quality, and price (as shown in the top left hand side of Figure 1), and it is measured by consumer's overall judgment.

Consumer Satisfaction and Loyalty

Consumer satisfaction leads to brand loyalty (Cronin, Brady, and Hult 2000; Cronin and Taylor 1992; Lee 1998; McDougall and Levesque 2000). In a modification of Oliver's definition (1997, p.392), loyalty is defined as a deeply held commitment to repeat purchases of a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior. This definition focuses on behavior. From the behavioral view, the definition and measurement of consumer loyalty are based upon a consumer's actual purchasing behavior. The typical measurement is the proportion of the purchases for certain brands among the consumer's total purchases during a certain phase, but Jacoby and Chestnut (1978) concluded that consistent purchasing as an indicator of loyalty could be invalid because of happenstance buying or a preference for convenience and that inconsistent purchasing could mask loyalty if consumers had brand loyalty to several brands in one product category. However, the behavioral measurement could not distinguish consumer loyalty from repeatedly habitual purchase behavior. Therefore, some researchers preferred to emphasize the attitudinal part of consumer loyalty and defined consumer loyalty on the basis of both behavior and attitude (Oliver 1997).

However, other concepts, such as perceived quality, perceived price, and satisfaction in this study, all reflect the attitudes of a consumer towards a target object. To distinguish consumer satisfaction and consumer loyalty, loyal repeat purchase behavior would be a better measurement to eliminate any possible confusion. Many related empirical studies (Cronin, Brady, and Hult, 2000; Cronin and Taylor 1992; Lee 1998; McDougall and Levesque 2000) reported that satisfied consumers demonstrate more loyal behavior. The first hypothesis is to repeat the test of this relationship:

H_1: Consumer satisfaction is positively related to consumer loyalty.

Perceived Quality

As stated by Parasuraman, Zeithaml, and Berry (1985), quality has been a complex but vague construct which demands further investigation for the industries to highlight product and service quality as satisfaction management. Zeithaml (1988) noted that quality could be defined broadly as superiority or excellence, and by extension, perceived quality could be defined as the consumer's judgment about a product's overall excellence or superiority. Perceived quality is (1) different from objective or actual quality, (2) a higher-level abstraction rather than a specific attribute of a product, (3) a global assessment that in some cases resembles attitude, and (4) a judgment usually made within a consumer's evoked set. "Objective quality" is the term used in the literature to describe the actual technical superiority or excellence of the products (Zeithaml 1988). Thus, the perceived quality perspective is different from product-based and manufacturing-based approaches. Most corporations adopt their quality definition from market-oriented viewpoints (Main 1994), rather than from objective quality measures manufacturers use.

In most service industry marketing literature, perceived service quality captures the spot light, while perceived product quality is absent. For most service industries providing intangible services and tangible goods, these two forms of products both play important roles in consumer satisfaction and loyalty. Hence, perceived quality is discussed in this study in two parts, service quality and product quality.

Perceived Service Quality. Parasuraman, Zeithaml, and Berry established the Five-Gap Model in 1985, which established the structure and measurement of service quality. They assumed that the methods to measure service quality and consumer satisfaction were basically the same, with both based on comparisons of expectation and performance. Oliver (1993) pointed out that some service contact for consumers was essential to decide if they were satisfied, but for service quality, the recognition could be done with or without actual consumption of the service.

Most researchers suggested that high service quality resulted in high customer satisfaction (Parasuraman, Zeithaml, and Berry 1985, 1988). After service quality and perceived service are distinguished, Bitner (1990) suggested that good service quality led to satisfaction, and consumer satisfaction increased the evaluation of service quality again. The results of path analysis supported that service quality affected satisfaction, and then influenced perceived service quality significantly (Bitner 1990). Teas (1993) also mentioned that perceived service quality was the accumulation of consumer satisfaction.

However, it is difficult to separate true service quality and perceived service quality from a customer's viewpoint. Therefore, most researchers only measured perceived service quality and proposed that higher perceived service quality created more satisfaction to consumers. Cronin and Taylor (1992) asserted that service quality was the antecedent of consumer satisfaction when they examined four service industries of banking, pest control, dry-cleaning, and fast food to investigate the relation of service quality to consumer satisfaction. The same conclusion also appeared in other studies in this area (e.g., Anderson and Sullivan 1993; Anderson, Fornell, and Lehmann, 1994; Athanassopoulos 2000; Cronin, Brady, and Hult, 2000; Fornell 1992; Fornell, Johnson, Anderson, Cha, and Bryant 1996; Oliver and Desarbo 1988). This study then proposes the impact of perceived service quality on consumer satisfaction:

H_2: Perceived service quality is positively related to consumer satisfaction.

Perceived Product Quality. Most previous

service marketing research emphasized the construct and dimension of service quality, or its relation with consumer satisfaction and loyalty. In fact, most service industries provide both intangible and tangible products. In Shostack's (1977) categorization, salt and soft drinks are products nearly pure tangible; whereas consulting companies and teaching institutions provide nearly pure intangible service. Therefore, Rathmell (1966) rendered a concept of goods-service continuum with pure goods at one extreme and pure services at the other, but with most industries falling between these two extremes. Nevertheless, few researchers touched upon the issues of tangible products in service industries. In Lehtinen and Lehtinen's (1991) service quality dimension, physical quality of service included physical support—physical environment and equipment, as well as physical products. The "physical environment and equipment" was similar to the tangible dimension proposed by Parasuraman, Zeithaml, and Berry (1988). Physical product was considered, but treated as only part of the overall physical quality of service (Lehtinen and Lehtinen 1991).

After reviewing 32 studies about service industries, Cronin, Brady, and Hult (2000) suggested the tangible quality of service products should be included in the satisfaction model in the future study. They also indicated the importance of product quality on consumer decision-making. In Brucks, Zeithaml, and Naylor's (2000) study of the perceived quality construct of consumers' durable goods, perceived product quality played a crucial role affecting the purchasing choices. In the satisfaction model proposed by Parasuraman, Zeithaml, and Berry (1994), product quality was of same importance to affect consumer satisfaction as service quality. As a consequence, this study considers product quality as an independent factor and investigates its influence on consumer satisfaction.

H_3: Product quality is positively related to consumer satisfaction.

Perceived Price Fairness. As for the relation of price to satisfaction, Zeithaml and Bitner (1996) indicated that the extent of satisfaction was broader than that of service quality assessment and was subject to the factors of service quality, product quality, price, situation, and personal factors. Anderson, Fornell and Lehmann (1994) also emphasized price as an important factor of consumer satisfaction, because whenever consumers evaluate the value of an acquired service, they usually think of the price (e.g., Anderson and Sullivan 1993; Athanassopoulos 2000; Cronin, Brady, and Hult, 2000; Fornell 1992; Zeithaml 1988). However, price was not fully investigated in previous empirical studies (Spreng, Dixon, and Olshavsky 1993). Zeithaml and Bitner (1996) believed that the reason why the price variable was not properly discussed in the measurement of service quality was the lack of consumers' exact reference of price.

Abundant empirical surveys reported in the marketing area indicated that both objective price and perceived price are crucial factors for consumers to evaluate quality (Zeithaml 1988). From consumer's cognitive conception, price is something that must be given up or sacrificed to obtain certain kinds of products or services (Zeithaml 1988). Thus, price had been recognized as a kind of sacrifice in previous research (Anderson, Fornell and Lehmann, 1994; Athanassopoulos 2000; Chang and Wildt 1994; Sirohi, McLaughlin, and Wittink 1998). Zeithaml (1988) suggested that objective monetary price was not equal to the target price in consumers' mind. The definition of price based upon the consumer's viewpoint was the price that consumers perceived, that is, the perceived price. To consumers, perceived price is more meaningful than monetary price.

Usually, the lower the perceived price is, the lower perceived sacrifice is (Zeithaml 1988). Then, more satisfaction with the perceived price and overall transaction are created. On the other hand, it is also possible that consumers use the price as a clue. It implies that lower monetary

price or perceived price does not guarantee higher satisfaction. Consumers usually judge price and service quality by the concept of "equity," then generate their satisfaction or dissatisfaction level (Oliver, 1997). However, rationally low perceived price does ensure higher satisfaction. This study then proposes the following:

H_4: Perceived price fairness is positively related to consumer satisfaction.

The Relationship Among Perceived Service Quality, Product Quality, Price Fairness, and Consumer Loyalty

Previous research has confirmed a positive relationship between service quality and consumer satisfaction. However, the majority of studies indicated that service quality influences behavioral intention only through satisfaction (e.g., Anderson and Sullivan 1993; Gotlieb, Grewal, and Brown 1994), while others argued for a direct effect (e.g., Boulding, Zeithaml, Kalra, Staelin, and Zeithaml 1993; Parasuraman, Zeithaml and Berry 1988; 1991). In Cronin and Taylor's (1992) empirical study, it was proposed that perceived service quality has a significant impact on purchase intentions. However, the results showed a significant impact of perceived service quality on consumer satisfaction, then influenced the purchase intention indirectly. Recently, Cronin, Brady, and Hult (2000) suggested that service quality would directly and indirectly lead to favorable behavioral intentions simultaneously. They found that service quality had a direct effect on consumers' behavioral intentions in four of the six tested industries, and an indirect effect through satisfaction on loyalty in all six industries. Thus, the following hypothesis is proposed:

H_5: Perceived service quality has positive effects both directly and indirectly (through consumer satisfaction) on consumer loyalty.

Recently, Lee (1998) applied the satisfaction model presented in Parasuraman, Zeithaml, and Berry (1994) and Zeithaml and Bitner (1996) to explore how perceived quality of gasoline affected consumer satisfaction and loyalty toward gas stations in Taiwan. Although all gasoline from those gas stations was supposed to be the same in quality because it was provided by one company, Chinese Petroleum Corporation, Lee's empirical results demonstrated that drivers' evaluations of gasoline qualities from different gas stations varied. Drivers did not trust the qualities of gasoline offered by some privately owned gas stations. Perceived product quality not only had effects on consumer satisfaction, but also placed influence directly on consumer loyalty as shown in Lee's study (1998). In addition, perceived product quality had a stronger impact on consumer loyalty than did satisfaction. The most interesting finding was that the respondents in Lee's study would repeatedly pay their visits to a gas station for which they were "not satisfied," but the station had reliable product quality. The explanation provided was that consumers cared more about the quality of gasoline than of service. This was because gasoline rather than service was the core product that consumers purchased in a gas station; consumers would go to a gas station with perceived superior gasoline and inferior service. It also implied that consumer behavior, for example, repeat purchase, was closely related to physical products, whereas consumer satisfaction was mostly associated with service quality (Lee 1998).

Based upon the unique findings of Lee (1998), the current study proposes to investigate the relationship between perceived product quality, perceived price fairness, and loyalty. If perceived product quality has strong effects on loyalty behavior, a similar direct effect of perceived price fairness on loyalty may also be found. From a consumer's perspective, price is what is given up or sacrificed to obtain a product. When consumers perceive that the price of a service or product is reasonable, it is possible for them to display the intention of repeat purchase behavior. On the other hand, if consumers do not

feel that their sacrifices are worthwhile, they may not make the purchase again, even when they are satisfied with the quality of a product or service. We suggest that both consumers' perceived product quality and price fairness may place direct influences on purchase behavior: as hypotheses six and seven propose here.

H_6: Perceived product quality has positive effects both directly and indirectly (through consumer satisfaction) on consumer loyalty.

H_7: Perceived price fairness has positive effects both directly and indirectly (through consumer satisfaction) on consumer loyalty.

According to the satisfaction model proposed by Parasuraman, Zeithaml, and Berry (1994), Zeithaml's means-end model (1988), sets up an integrated conceptual framework. Perceived service quality, perceived product quality, and perceived price fairness are three abstract concepts of higher hierarchy, which serve as the basis to form consumer satisfaction, an even higher hierarchy of attitudes. In addition to the impact of consumer satisfaction upon loyal purchase behavior, perceived service quality, perceived product quality, and perceived price fairness may directly influence consumer loyalty (refer to Figure 1). The objective measures of service quality, product quality and price are not part of this study.

METHODOLOGY

All industry can be located on a goods-service continuum, with pure goods on one extreme and pure services on the other, but most industries are between the two extremes (Rathmell 1966; Shostack 1977). According to Rathmell's (1966) and Shostack's (1977) concept, three industries, (1) gas station service, (2) auto repair and maintenance service, and (3) banking service were chosen to test their proportions of tangible and intangible parts. After a small pretest of 87 subjects, auto repair and maintenance service is selected because it was perceived as half-tangible and half-intangible. To respondents of this study, both skills and services, as well as parts and oil have almost equal importance. This study then investigates how consumers' perceptions of product quality, service quality, and price fairness influence their satisfaction and loyalty.

Sampling and Data Collection

Taiwan's car market is dominated by three major automobile companies: Nissan, Toyota, and Mitsubishi. Five maintenance service centers selected for each of these three companies, a total of fifteen, located in the Greater Taipei Metropolitan Area were chosen for the study. Trained interviewers through March 17 to March 25 in the year 2000, 40 to 90 copies in each center depending on its business volume, distributed the total of 650 sets. Each customer received a copy of the questionnaire while checking out in the waiting room. The questionnaire was collected before the customer left. The response rate was 97.69%.

Nearly all the respondents (95.76%) had their cars fixed at only one or a few maintenance service centers, and 95.35% of the respondents had previously been at this service center. Therefore, responses to the survey are based upon the customers' current experiences or on a combination of previous experiences and current experiences with the surveyed service center.

Questionnaire Design and Measurements

The questionnaire contains three sections. The first section is about the experience and overall evaluation of purchasing car maintenance services, relating to frequency, quality judgment and satisfaction toward the services, parts, and price in the current center, and loyalty. The second section is about the perception of service quality. The last part is concerned with personal background information. The definition and measurement of each variable are described in the following.

Consumer Satisfaction. A direct performance appraisal is chosen to measure the consumers' overall satisfaction with the maintenance center, as suggested by Finn and Kayande (1997). This study uses a single-item, asking respondents "How satisfied are you with the maintenance center?" A consumer's satisfaction level toward the center is coded from 1 to 5 representing very dissatisfied, dissatisfied, common, satisfied, and very satisfied, respectively.

Consumer Loyalty. Consumer loyalty expresses an intended behavior related to the product or service. Two items are formed to measure a consumer's loyalty toward a center: (1) remain loyal to it through repurchase (i.e., I will come to this maintenance center again when I need auto-repair service next time,) and (2) recommend it to other consumers (i.e., I will recommend this maintenance center to friends and relatives when they need one.) These two items are similar to the measurement used in previous research (Cronin, Brady, and Hult, 2000; Cronin and Taylor 1992; McDougall and Levesque 2000; Selnes 1993). A five-point scale ranges from "very unlikely" to "very likely" to assess the consumer loyalty. Internal consistency, i.e. Cronbach's alpha, of these two items is equal to 0.76.

Perceived Service Quality. An empirical study by Cronin and Taylor (1992) has proved that SERVPERF (performance perceptions in measures of service quality) is a more effective measure in terms of considerations of reliability, validity or explanatory power. They suggested that performance perceptions could be applied to measure service quality in order to explain the variation in the construct (Zeithaml and Bitner 1996). As a result, the concept of post-perception is adopted here to measure perceived service quality.

The measurement of service quality, SERVQUAL, formulated by Parasuraman, Zeithaml, and Berry is the most frequently applied measure of the construct of service quality, with various versions proposed by researchers for different service industries. This study includes a set of 23 items based upon SERVQUAL. All items are modified for auto maintenance service industry and confirmed by several marketing professors and senior managers in the three firms to secure the content validity. An overall service quality item is then listed at the bottom of the 23 questions. All of the statements are formed positively in a five-point Likert-type scale ranged form "strongly disagree" to "strongly agree."

Three factors with eigenvalues greater than 1 are extracted by the principal component analysis. Promax rotation is then employed to produce an orthogonal matrix. Two items are deleted because their factor loadings are greater than 0.4 in more than one factor. The three final factors are named reliability, tangibility, and convenience, with internal reliability 0.92, 0.89, and 0.81, respectively. Our reliability includes the original SERVQUAL scale's reliability and assurance; convenience covers both empathy and responsiveness; and tangibility is kept the same. The inconsistent dimensions are acceptable, as Carman (1990) has found heterogeneous dimensions in four different service sectors. Because the purpose of this study is not about the dimensions of service quality, the results of the factor analysis are only for confirming the validity and reliability of the scale.

The result of the 23-item service quality scale is highly correlated with the single-item overall quality measurement. The single-item is used to test the hypotheses in this study similar to the operational definition of service quality in Cronin and Taylor (1992) and Oliver (1997).

Perceived Product Quality. Perceived product quality in this survey is defined as consumers' judgment of the quality of parts and oil offered by the automobile maintenance center. For example, "The quality of parts provided in this maintenance center is good," ranked from "strongly disagree" to "strongly agree." The internal consistency of these two five-point

Likert-type items assessed by Cronbach's alpha is 0.55.

Perceived Price Fairness. Perceived price is defined as what is given up or sacrificed to acquire a service or product (Athanassopoulos 2000; Cronin, Brady, and Hult, 2000; Voss, Parasuraman and Grewal, 1998). It represents consumers' perceptions of the monetary and the non-monetary price associated with the acquisition and use of a service or product. In this study, respondents are asked to directly evaluate if the wages and the cost of auto parts charged by the maintenance center are reasonable. Two five-point items are ranging from "very unreasonable" to "very reasonable" for wages and parts separately. Internal consistency of these two questions is Cronbach's alpha 0.84. (It should be mentioned that the term "reasonable price" in Mandarin implies "good deal" and "acceptable price.")

Data Analysis

Confirmatory Factor Analysis and Path Analysis are first employed through use of the LISREL model. However, only GFI=0.91 reaches the acceptable level; other measures (e.g., RMSEA, Chi-square statistic, CFI, AGFI) do not reach the criteria. The suggestion of Baron and Kenny (1986) regarding mediational test is taken (cf. Jap and Ganesan's 2000 methodology). The similar findings are found as LISREL's results. Although Linear Structure Relation (LISREL) is allowed to analyze our conceptual model, Path Analysis provides more insights about the amount of influences (i.e. coefficients) and comparisons among variables.

Path Analysis is suitable to examine the relationships between perceived service quality, perceived product quality, perceived price fairness, consumer satisfaction, and consumer loyalty. Consumer satisfaction is treated as a mediator from perceived service quality, product quality, and price fairness to consumer loyalty. Baron and Kenny (1986) stated that three regression equations must be estimated to establish a mediation model and the following effects must hold: (1) a significant effect of regressing the mediator on the independent variable, (2) a significant effect of regressing the dependent variable on the independent variable, and (3) when regressing the dependent variable on both the mediator and the independent variable, the effect of the independent variable must be weaker than in Equation 2. If all three of these conditions hold, the mediation model is supported. Baron and Kenny noted that "the strongest demonstration of mediation" occurs when the independent variable "drops out" (which is reduced to insignificant) in Equation 3.

RESULTS AND DISCUSSIONS

After eliminating those responses, which are incomplete with too many missing answers, 495 respondents are valid for analysis. Within them, 85.86% are male, which reflects the actual car owners' gender ratio that male owners account for more than 80%. Ninety-five percent of the respondents have a high school education or higher. More than 65% of the respondents' monthly family income is between 30000 to 90000 NT dollars (34 NT dollars equal 1 US dollar). There is no significant difference among the respondents of the three companies, Nissan, Mitsubishi, and Toyota.

Table 1 presents the descriptive statistics and correlation coefficients of variables involved in this study before the hypothesis tests. Due to some high correlation coefficients, the variance inflationary factor (VIF) is further used to examine the degree of multicollinearity among independent variables. The results indicate that there is virtually no multicollinearity problem in these variables since the VIF values of all independent variables are below 1.89. This VIF value is slightly bigger than 1, which indicates that there is no correlation among all the independent variables, but far smaller than 10 which implies a serious multicollinearity problem (Hair, Anderson, Tatham, and Black 1995).

Table 1
Descriptive Statistics and Correlation Coefficients

Variable	Mean	S.D.	Service quality	Product quality	Price fairness	Consumer satisfaction
Service quality	4.07	0.51				
Product quality	3.74	0.64	0.68 **			
Price fairness	4.43	0.74	0.42 **	0.49 **		
Consumer satisfaction	3.99	0.56	0.48 **	0.54 **	0.52 **	
Consumer loyalty	3.88	0.75	0.44 **	0.50 **	0.55 **	0.56 **

Note: ** denotes $p<0.01$, sample size = 495.

Table 2
The Regression Analysis of Consumer Satisfaction on Consumer Loyalty

Dependent Variable	Independent Variables	Estimated Coefficient
Consumer Loyalty	Constant	1.869 **
	Consumer Satisfaction	0.482 **
	Model's F-Value	227.857 **
	Adjusted R^2	0.315

Note: ** denotes $p<0.01$, sample size = 495.

The Impact of Consumer Satisfaction on Consumer Loyalty

The results of the effect of consumer satisfaction on consumer loyalty are shown in Table 2. The empirical result in this model confirms that consumer satisfaction is positively related to consumer loyalty ($F = 227.857$, significant at the $\alpha = 0.01$ level). One more unit on consumer satisfaction increases 0.315 unit of consumer loyalty. Hypothesis 1 is supported and the result is consistent with previous studies (Cronin, Brady, and Hult, 2000; Lee 1998; McDougall and Levesque 2000). The adjusted R^2 is 0.315, which is adequate, but also implies the existence of other factors.

The Relationship among Perceived Service Quality, Consumer Satisfaction, and Loyalty

Path Analysis is adopted to test the "antecedent, mediating, and consequent" relationships among perceived service quality, product quality, price fairness, consumer satisfaction, and consumer loyalty (Baron and Kenny 1986). Table 3 presents the regression results of three models. The first model regresses consumer satisfaction on perceived service quality, product quality, and fairness. The second model regresses loyalty on the three variables. The final model regresses loyalty on satisfaction and three independent variables. The F-values for the three model are 106.49, 99.16, and 92.42, which are all significant at the $\alpha = 0.01$ level. The explained variances measured by the adjusted R^2 are 0.39, 0.37, and 0.43, respectively.

Hypothesis 2 proposes that a consumer's perceived service quality is positively related to satisfaction. From the results of the regression Model 1, service quality is significant at the $\alpha = 0.01$ level with t value 3.09. Consumer satisfaction is increased by 0.22 units when perceived service quality is raised one unit. The positive relationship between service quality and

Table 3
The Regression Analysis of Perceived Service Quality, Product Quality, Price Fairness, and Consumer Satisfaction on Consumer Loyalty

Dependent Variable	Independent Variables	t value	Estimated Coefficient	95% Confidence Interval	
				Lower Bound	Upper Bound
Model 1 Consumer Satisfaction	Constant	1.60	0.355	-0.081	0.790
	Service Quality	3.09 **	0.220	0.080	0.360
	Product Quality	5.65 **	0.379	0.247	0.511
	Price Fairness	7.91 **	0.326	0.245	0.407
	Model's F Value	106.49 **			
	Adjusted R^2	0.39			
Model 2 Consumer Loyalty	Constant	4.73 **	0.912	0.533	1.291
	Service Quality	2.63 **	0.162	0.041	0.284
	Product Quality	4.42 **	0.258	0.144	0.373
	Price Fairness	9.23 **	0.331	0.260	0.401
	Model's F Value	99.16 **			
	Adjusted R^2	0.37			
Model 3 Consumer Loyalty	Constant	4.44 **	0.882	0.458	1.186
	Service Quality	1.78	0.107	-0.011	0.224
	Product Quality	2.81 **	0.162	0.049	0.276
	Price Fairness	6.81 **	0.248	0.177	0.320
	Consumer Satisfaction	6.74 **	0.253	0.179	0.327
	Model's F Value	92.42 **			
	Adjusted R^2	0.43			

Note: ** denotes $p<0.01$, sample size = 495.

consumer satisfaction is supported.

In Model 2, service quality has a significant effect on consumer loyalty ($t = 2.63$, $p < 0.01$), while service quality is not significant in Model 3 ($t = 1.78$, $p = 0.08$). Combining the results of the three models, the mediating effect of perceived service quality is confirmed. Perceived service quality has a positive effect on satisfaction (significant in Model 1), and through satisfaction influences loyalty (significant in Model 2, but not in Model 3). The results imply that perceived service quality has only indirect positive effect on consumer loyalty, and nearly no direct effect on loyalty. Hypothesis 5, which proposes that perceived service quality has both direct and indirect effects on loyalty, is partially supported.

The Relationship among Perceived Product Quality, Consumer Satisfaction, and Loyalty

The same process is used to explain the relationship between perceived product quality, satisfaction, and loyalty. The perceived product quality in service marketing studies was often ignored. However, in our empirical results, perceived product quality does demonstrate an important role on consumer satisfaction. As expected, perceived product quality and consumer

satisfaction have a significant positive relationship ($t = 5.65$, $p < 0.01$). Consumer satisfaction was increased by 0.379 units while product quality was raised by one unit. This positive relationship supports Hypothesis 3.

Furthermore, we discuss the effects of perceived product quality directly and indirectly on consumer loyalty as proposed in Hypothesis 6. It is found that perceived product quality has significant effects on consumer loyalty in both Model 2 ($t = 4.42$, $p < 0.01$) and Model 3 ($t = 2.81$, $p < 0.01$). However, the estimated coefficient is 0.258 in Model 2, but drops to 0.162 in Model 3 when satisfaction is included. Since perceived product quality is significant in three models and a weaker effect in Model 2 than Model 3, the mediating effect of satisfaction is accepted. Perceived product quality has an indirect effect on loyalty. Due to the significant result of product quality in Model 3, it also has a direct effect on loyalty while satisfaction is included. Thus, Hypothesis 6 is supported that perceived product quality has both direct and indirect positive effects on loyalty.

The Relationship among Perceived Price Fairness, Consumer Satisfaction, and Loyalty

Perceived price fairness is positively and significantly related to consumer satisfaction at the 0.01 level in Model 1 ($t = 7.91$). Consumer satisfaction is increased by 0.326 units when perceived price fairness is raised by one unit. This result is consistent with Yieh and Chiao's (2001) study, and with our expectation in Hypothesis 4 that there is a positive relationship between perceived price fairness and satisfaction.

Perceived price fairness also has significant effects on consumer loyalty in Model 2 ($t = 9.23$, $p < 0.01$) and Model 3 ($t = 6.81$, $p < 0.01$). Meanwhile, the estimated coefficient is from 0.334 lower to 0.248. Considering the significant results and changing in these three models, perceived price fairness is positively related to loyalty through satisfaction. The mediating effect of satisfaction for the relationship between perceived price fairness and loyalty is found. The strong effect of perceived price fairness in Model 3 (coefficient = 0.248, $p < 0.01$) also suggests a direct effect on loyalty. Hypothesis 7 that proposes the perceived price fairness has positive effects on consumer loyalty both directly and indirectly is accepted.

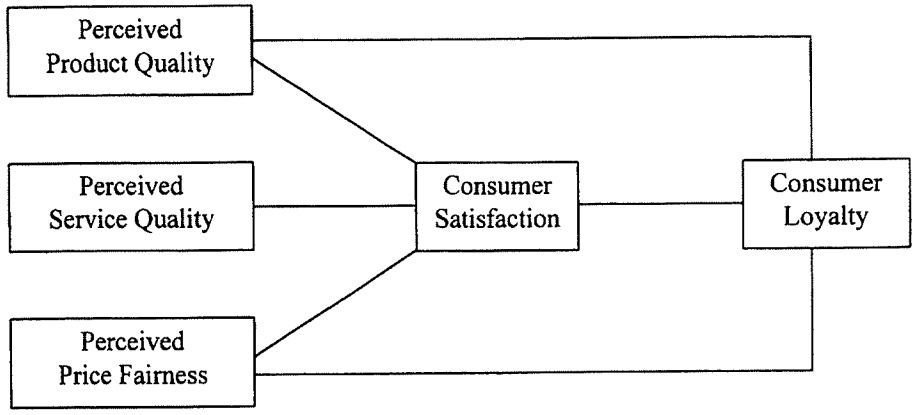
In order to understand the statistically significant differences among the three independent variables on consumer satisfaction, the confidence intervals are examined. The lower and upper bound of 95% confidence interval is from 0.080 to 0.360 for perceived service quality, from 0.247 to 0.511 for perceived product quality, and between 0.245 and 0.407 for perceived price fairness. The overlapped intervals imply that the effects of service quality, product quality, and perceived price on satisfaction are not significantly different. This result suggests these three variables have almost equal importance to build up consumer satisfaction.

CONCLUSIONS AND SUGGESTIONS

The main objectives of this study are to explore the effect of perceived service quality, perceived product quality, perceived and price fairness on consumer satisfaction and loyalty, and to establish an integrated model. The results of this study have verified the previous findings (Cronin, Brady, and Hult 2000; Cronin and Taylor 1992; Lee 1998; McDougall and Levesque 2000; Selnes 1993) that consumers establish higher loyalty toward a service when they are more satisfied. This is also consistent with prior studies (Athanassopoulos 2000; Cronin, Brady, and Hult, 2000; Cronin and Taylor 1992; Lee 1998; McDougall and Levesque 2000; Parasuraman, Zeithaml, and Berry, 1985; 1988; Yieh and Chiao 2001) that perceived service quality is an important determinant of consumer satisfaction.

In addition, perceived product quality and perceived price fairness played important roles on satisfaction. Although numerous researchers (Rathmell 1966; Rushton and Carson 1989; Shostack 1977) mentioned that most service

Figure 2
A Practical Model for the Effects of Perceived Product Quality, Perceived Service Quality, and Perceived Price Fairness on Consumer Satisfaction and Consumer Loyalty



industries provide both tangible products and intangible service, there was no empirical study focusing simultaneously on perceived service quality, perceived product quality, and perceived price. Since perceived product quality and perceived price were often not included in previous service marketing studies regarding consumer satisfaction, this study endeavors to establish the links among these elements.

As expected, the results provide concrete empirical evidences that perceived product quality and perceived price fairness are both positively related to consumer satisfaction, which are as equally important as perceived service quality. Thus, from a managerial standpoint, managers should not emphasize only service quality in a total consumer satisfaction program. Both product quality and price fairness are fundamental and also very important to build up consumer satisfaction. None of them can be ignored or partially accented.

In the revised integrated model (see Figure 2) based upon the results of this study, consumer satisfaction is a mediator for all perceived service quality, product quality, and price fairness. Perceived service quality has only indirect effect on loyalty through satisfaction. However, perceived product quality and price fairness both have direct and indirect effects on loyalty. Because service is considered intangible, consumers can only form their attitudes toward service quality through perception. This attitudinal inherence may limit the influences of perceived service quality only on satisfaction, but not directly on loyalty. On the other hand, product is more tangible and is usually the core part that consumers purchase for, such as the parts and oil in auto maintenance service, and hamburgers in fast food restaurants. Price is the necessary sacrifice that a consumer gives to exchange for the product and service. Perceived product quality and perceived price fairness certainly are the sources of consumer satisfaction. However, the fundamental natures of product and price may contribute to a consumer's loyally repetitive purchase behavior directly.

It is a suggestion to managers in service industries that price fairness and product quality can be viewed as threshold factors, while service quality is regarded similar to a motivator leading to consumer loyalty. No matter how hard a manager attempts to improve the service quality, product quality and price are the essential concerns to consumers. However, if consumers

are only satisfied with the product and price provided by a firm, they may only repeat purchase habitually, but without true loyalty, as found in Lee (1998). Thus, the best strategy for a marketing manager in service industries is to ensure the basic quality of tangible products sold at a fair price, then emphasize service quality to provide added values in order to maintain customers.

Perceived service quality was found influencing loyalty only through satisfaction in some previous studies (e.g., Boulding, Zeithaml and Berry, 1993; Parasuraman, Zeithmal, and Berry, 1988; 1991; Taylor and Baker 1994), but directly affecting loyalty in others (e.g., Anderson and Sullivan 1993; Gotlieb, Grewal, and Brown, 1994). The findings of this study indicate that service quality is an antecedent of consumer satisfaction, and consequently consumer satisfaction influences consumer loyalty. This finding should not and does not intend to end or solve the conflict results in all these studies, but only provides documentation for further research.

Zeithaml (1988) pointed out that approximately 90 research studies in the past 30 years have been designed to test the general knowledge that price and quality are positively related. This study has also found that perceived price, perceived product quality, and perceived service quality are positively correlated (refer to Table 1). It implies the possibility that perceived quality influences satisfaction through perceived price.

Previous studies have suggested that good service quality led to satisfaction, and consumers' satisfaction increased the evaluation of service quality (Bitner, 1990; Bolton & Drew, 1991; Teas, 1993). It is also possible that a consumer's satisfaction from previous transactions can affect his/her judgments toward current service quality as suggested by this study. However, it cannot be verified due to the nature of cross-sectional data. A longitudinal study to investigate the feedback effect of satisfaction and loyalty on consumer perceptions would be recommended for further research.

Although we have tested linear relations among all the variables, consumer loyalty has been considered as a nonlinear function of satisfaction or service quality by some researchers (Oliva, Oliver, and MacMillan, 1992; Taylor, 1997). Taylor (1997) examined three service industries; fast food, grocery stores, and department stores, to explore any possible high-order relation. He found that the relation between perceived quality and purchase intention was not linear. Both quality and quality square were positively related to purchase intention. However, the nonlinear relation between satisfaction and purchase intention was only found in department stores. Taylor (1997) indicated that the unobserved potential higher-order factors (and their interactions) in such efforts could lead to problems associated with interpreting regression coefficients as weights of importance. Following Taylor's suggestions, the nonlinear relations among service quality, satisfaction, and loyalty have also been tested in this study as a Post Hoc study. However, none of the higher-order factors was significant. The linear or nonlinear relationship would be an important issue that requires future researchers to clarify.

Whether the tangible product and the tangible dimension of service quality should be combined or separated is an interesting issue. In Lehtinen and Lehtinen's (1991) study, their tangible dimension of service quality included both physical service supports (i.e., environment and equipment), as well as physical products. In the current study, these two tangibles are defined differently and divided into different variables.

Different effects on loyalty are also found. Service quality, including tangible dimensions, mainly contribute to satisfaction, whereas the perceived quality of tangible goods not only indirectly influences loyalty through the mediator of satisfaction, but also produces direct effect at the same time. It seems reasonable to separate these two tangible parts in service industries. However, how consumers truly evaluate these tangible components, either combined or separated, is not examined in this study. Are they

accounted differently in other service industries by various proportions of services and products? Some model comparisons among several industries are necessary before a conclusion can be made. These induce an open field for further research.

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