International Journal of Hospitality Management 29 (2010) 620–631

Contents lists available at ScienceDirect

International Journal of Hospitality Management

journal homepage: www.elsevier.com/locate/ijhosman

Applying loss aversion to assess the effect of customers' asymmetric responses to service quality on post-dining behavioral intentions: An empirical survey in the restaurant sector

Kuo-Chien Chang [a,*], Mu-Chen Chen [b], Chia-Lin Hsu [c]

[a] Department of Sports, Health and Leisure, Chihlee Institute of Technology, No. 313, Sec. 1, Wunhua Rd., Banciao City, Taipei County 220, Taiwan, ROC
[b] Institute of Traffic and Transportation, National Chiao Tung University, 4F, No. 118, Section 1, Chung Hsiao W. Road, Taipei 100, Taiwan, ROC
[c] Department of Business Administration, National Taiwan University of Science and Technology, No. 43, Sec. 4, Keelung Rd., Taipei 106, Taiwan, ROC

ARTICLE INFO

Keywords:
Loss aversion
DINESERV
Customers' post-behavioral intentions

ABSTRACT

Using the loss aversion concept, this paper attempts to investigate the relationship between service quality and customers' post-dining behavioral intentions in the restaurant sector. Incorporating the DINESERV instrument, the results gained from a Chinese chain restaurant indicate that a decrease in service quality from the reference point (customer's expectation) will decrease the perceived service value and customer satisfaction, but that an increase in service quality may not have significant effects on these two behavioral constructs. Moreover, the behavior-related causal relationships underlying service quality suggest that perceived service value and attitudinal loyalty succeed in acting as mediating variables within the model.

1. Introduction

Service quality has been recognized as an important topic in the restaurant industry (Kim et al., 2009). Identifying the effect of service quality on customers' post-dining events, such as customer satisfaction (Weiss et al., 2004) and customer loyalty (Ladhari et al., 2008), is crucial for informing managers and employees of how customers experience the level of service quality offered by restaurants (Fu and Parks, 2001). In other words, the more customers' responses to service quality levels can be clarified, the better management can respond to improving service quality so as to meet customers' expectations (Lee et al., 2005), which, in turn, can generate numerous benefits for restaurants, such as repeat purchasing (Gupta et al., 2007).

In the field of restaurant management research, most previous studies have assumed that customers' responses to service quality can be approximated using a smooth or differentiable function. Bojanic and Rosen (1994), for instance, investigated restaurant service quality gaps through surveys of guests' expectations and perceptions in relation to restaurant service offerings. The results regarding the slope of guests' service quality gain and loss could be interpreted as smooth or differentiable functions, such as a linear relationship. That is, a "sudden change" in the slopes for the functions representing the relationship between service quality and guest demand was not considered (Suzuki et al., 2001). Therefore, some studies (e.g., Suzuki and Tyworth, 1998; Suzuki et al., 2001; Lin et al., 2008) have proposed an alternative perspective, suggesting that a non-smooth (non-differentiable) response function called a *loss aversion*, developed by Tversky and Kahneman (1991), more accurately represents the effects of customer-perceived service quality (Suzuki et al., 2001). The loss aversion concept suggests that the effect of service quality is asymmetric with respect to a reference point (i.e., a customer's expectation), meaning that a customer's response to service quality would be steeper in the loss region than in the gain region (Suzuki et al., 2001). Therefore, although previous studies have unveiled nonlinear phenomena occurring in customer post-purchasing behaviors, such as the impact of customer satisfaction level on repeat purchase (Rust et al., 1995) or the effect of positive word-of-mouth versus negative word-of-mouth on communicating message (Woodside and Delozier, 1976; Ha, 2002), the loss aversion concept applied in the present study focuses on the understanding of how customers make assessments of restaurants' service quality after encountering restaurant service offerings, as well as how the perceived service quality translate into the behavior-related causal relationships in the restaurant sector. This issue is important because in the service quality-profit chain, also known as the "Return on Quality" framework proposed by Rust et al. (1995), service quality dominates customer behaviors. This would influence the revenues, market share, and profitability of a firm driven by the levels of customer retention or new customers' attraction.

* Corresponding author. Tel.: +886 2 22576167x2325; fax: +886 2 29660259.
E-mail addresses: kcchang@mail.chihlee.edu.tw (K.-C. Chang), ittchen@mail.nctu.edu.tw (M.-C. Chen), D9508109@mail.ntust.edu.tw (C.-L. Hsu).

0278-4319/$ – see front matter © 2009 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ijhm.2009.11.004

Although several behavior-related causal links involving the effect of service quality have been empirically examined, the structural interrelationships among the constructs need to be further clarified based on the loss aversion perspective. Therefore, the present study builds on such previous works with the goal of integrating previous important constructs, including service quality, perceived service value, customer satisfaction, customer complaints, attitudinal loyalty, and behavioral loyalty (e.g., Zeithaml et al., 1996; Fu and Parks, 2001; Lee et al., 2005; Reich et al., 2005; Ladhari et al., 2008; Kim et al., 2009), and best applying the knowledge of these relationships within the restaurant sector. In summary, this study addresses a causation structure for restaurant service quality, incorporating the loss aversion concept in order to explore the effects of service quality on customers' post-dining behaviors in the restaurant sector.

By understanding customers' asymmetric responses to restaurant service quality in a post-dining behavioral process, restaurant managers can gain a better understanding of how to improve their restaurant service offerings to satisfy customers. Accordingly, this investigation seeks to achieve the following research objectives. The first aim is to verify the restaurant service quality measurement scale, i.e., the DINESERV (Stevens et al., 1995), by using a Chinese chain restaurant as the case. The second is to identify a loss aversion-based service quality causation model that clarifies the important constructs that link with service quality in a restaurant context and simultaneously to empirically verify the loss aversion effect of service quality used in the behavioral decision examination.

2. Literature review

This section, with the purpose of creating a research framework, reviews the related literature on restaurant service quality, applying the loss aversion concept to restaurant service quality and constructing a loss aversion-based post-dining behavioral intentions model. From this, sixteen hypotheses are established.

2.1. Service quality in restaurants

The growing number of studies that discuss service quality issues mostly define service quality based on an overall customer judgment of service offerings (Parasuraman et al., 1988), and have viewed service quality as the gap between customers' expectations and their perceptions of actual services (Parasuraman et al., 1985). Thus, understanding which aspects the customer considers most important when evaluating a restaurant's service offerings has become a priority for restaurants (Oyewole, 1999).

Accordingly, determining the dominant dimensions of service quality in restaurants is the first aim of this study. Many previous scholars have presented outstanding methods for measuring restaurant service quality by hypothesizing about their own dimensions of restaurant service quality (e.g., Oyewole, 1999; Huang, 2003). SERVQUAL, which includes the five dimensions of tangibles, reliability, responsiveness, assurance, and empathy, proposed by Parasuraman et al. (1988), is one of the principal ways to measure service quality in restaurants (e.g., Bojanic and Rosen, 1994). Brady and Cronin (2001) have developed a three-dimensional service quality model (i.e., interaction quality, physical environment quality, and outcome quality) that is synthesized from the service quality models based on the Nordic (Grönroos, 1984) and American perspectives (Parasuraman et al., 1988). The three SERVQUAL dimensions (i.e., reliability, responsiveness, and empathy) are important elements that were utilized to conceptualize their service quality model. Accordingly, although the SERVQUAL approach has its limitations, as articulated by some scholars (Lee et al., 2005), such as the problem with measuring time (Babakus and Boller, 1992) and not being general enough for every service setting (Oyewole, 1999), the approach has been supported by sufficient research as a valid measure of service quality (Heung et al., 2000). Thus, some works inspired by SERVQUAL have developed models to measure service quality in the hospitality sector and have confirmed PZB's five dimensions. HOLSERV, a measuring scale for hotel service quality, developed by Mei et al. (1999), is one example. With respect to measuring restaurant service quality, Stevens et al. (1995) have proposed an instrument called DINESERV to assess customers' perceptions of a restaurant's quality. DINESERV is adapted and refined from SERVQUAL and LODGSERV (Knuston et al., 1990; Patton et al., 1994) and is a restaurant industry-specific quality measurement that is adopted by several restaurant service quality studies (e.g., Heung et al., 2000; Ladhari et al., 2008).

Nevertheless, as suggested by Kim et al. (2003), replication studies should be undertaken in different cultures using various restaurant segments to validate the DINESERV scale. Additionally, because the DINESERV instrument has been used in a number of restaurant studies, most (if not at all) of the studies have not explored loss aversion-based restaurant service quality in the restaurant context. Therefore, the following section discusses the necessity of applying the loss aversion concept to restaurant service quality; this is a fundamental consideration for further exploration of the causal relationships derived from restaurant service quality.

2.2. Applying the loss aversion concept to service quality

The *loss aversion* concept is developed based on the theory of human choice behavior (Tversky and Kahneman, 1991; Suzuki et al., 2001), and represents a non-smooth (non-differentiable) response function of customers toward their evaluation of service offerings. Thus, as compared to a smooth or differentiable function from traditional economic theory, the biggest advantage of the loss aversion concept is the implication of an asymmetric effect of service quality, as perceived by customers, with respect to a reference point (Suzuki and Tyworth, 1998). The reference point used in this study is the customer's expectation of restaurant service quality, as derived from the concept of the PZB gap-based service quality model (Lin et al., 2008). In this model, the reaction to experienced service quality below expectations (treated as loss) is greater than the reaction to equivalent experienced service quality above expectations (treated as gain) (Suzuki et al., 2001). As shown in Fig. 1, restaurant service quality, in terms of service offerings, can be divided into loss (abbreviated as RSQLOSS) and gain regions (abbreviated as RSQGAIN), wherein the slope for loss is steeper than the slope for gain, representing a sudden change at

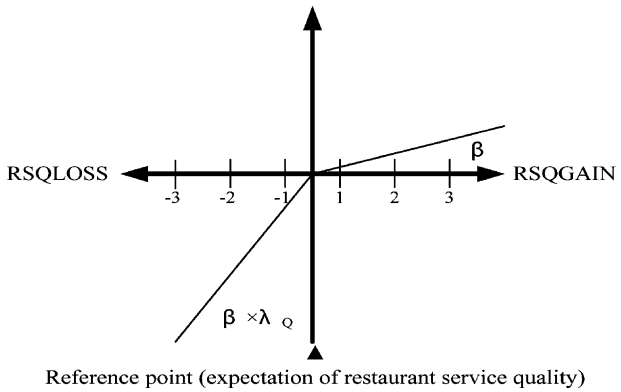


Fig. 1. Slopes reflecting loss aversion ($\lambda_Q > 1$). Modified from Suzuki and Tyworth (1998).

the reference point (i.e., customer's expectation of restaurant service quality); λ_Q measures how the customer weighs losses relative to gains.

Therefore, in order to verify the loss aversion effect, four main steps are conducted, as described by Lin et al. (2008, p. 131). The first step is to construct the aggregate reference point. The expectation of restaurant service quality acts as the reference point. In the second step, based on the relationship between restaurant service offerings and the reference point, each service quality item is recoded into both service loss and service gain variables. In the third step, parameters for both service loss and service gain are calibrated in a single equation. In the fourth step, statistical tests are performed to check whether the slope of service loss exceeds that of service gain. This analytical procedure can be used to verify the loss aversion effect of restaurant service quality. Along with the clarification of the loss aversion effect in restaurant service quality, the causal relationship among important constructs in the post-dining behavioral process is examined.

2.3. A loss aversion-based service quality causation model construction

In accordance with the concept of customers' post-dining behaviors, the service quality is assessed to determine how it affects related constructs, such as perceived service value, customer satisfaction, customer complaints, and behavioral intentions. Thus, based on previous works, a loss aversion-based restaurant service quality causation model is constructed by first exploring the relationships among loss aversion-based restaurant service quality (abbreviated as RSQ), perceived service value (abbreviated as PSV), and customer satisfaction (abbreviated as CS), and then exploring the effect of customer satisfaction on customer complaints (abbreviated as CC), attitudinal loyalty (abbreviated as AL), and behavioral loyalty (abbreviated as BL), discussed as follows.

2.3.1. The relationships among RSQ, PSV, and CS

Service quality is the premise that customer satisfaction produces a significant effect on customers' repurchasing intentions (Cronin et al., 2000). Thus, only when there is total customer satisfaction with service offerings will patrons return to consume again (Garbarino and Johnson, 1999). In particular, the acquisition of new customers usually increases costs more than retaining existing customers does, but it may not generate profits (Zeithaml et al., 1996). Along with the number of studies in which the direct effect of RSQ on CS has been stressed (e.g., Chow et al., 2007), an increasing number of studies have shed light on the mediating role of PSV between service quality and customer satisfaction (e.g., Lee et al., 2004; Turel and Serenko, 2006). This is because "customer-perceived value results from an evaluation of the relative rewards and sacrifices associated with the offering" (Chang et al., 2009, p. 428). The quote implies that service quality is viewed as the offering of a business and that perceived service value is an appropriate means of improving customer satisfaction and is expected to have a positive mediating effect on the relationship between service quality and customer satisfaction. Specifically, the customer's perception of the value regarding what is being received for what is given (Zeithaml, 1988; Nasution and Mavondo, 2008) drives various customer behaviors (Chan et al., 2007), including customer satisfaction (Heskett et al., 1994) and loyalty (Ladhari et al., 2008). This argument is verified by previous studies (e.g., Lee et al., 2005), in which the indirect effect of service quality on customer satisfaction (i.e., RSQ → PSV → CS) is so significant as to warrant treating PSV as a required mediating construct between RSQ and CS in the context of the restaurant industry. Therefore, this study assumes that PSV, with varying levels of the effect of loss aversion-based RSQ (divided into RSQLOSS and RSQGAIN), influences CS and subsequent behaviors.

Regarding the issue of loss aversion-based RSQ, as discussed by Stan et al. (2007), since most research in services posits linear relationships and symmetric effects of positive and negative service evaluations, some nonlinear effects of service quality have been identified to clarify customer's behaviors to a service provider (e.g., Rust et al., 1995; Zeithaml et al., 1996; White and Schneider, 2000). In their article, Stan et al. (2007) take an example to describe the phenomenon of customers' asymmetric responses to service quality evaluation. On a scale from 1 to 7, if service quality rating drops from 4 to 3, the impact on customer satisfaction is larger than if the service quality rating increases from 4 to 5. This means that a negative evaluation of service quality has a stronger effect on customer post-purchasing behaviors (e.g., customer satisfaction) than does a positive evaluation of the same magnitude. That is, that losses loom larger than gains occurs in terms of theoretical bases of the loss aversion concept proposed by Tversky and Kahneman (1991). Accordingly, this study attempts to investigate customers' asymmetric responses to loss aversion-based service quality on customer post-dining behaviors, such as perceived service value and customer satisfaction in the restaurant sector.

What deserves mention is that, as proposed by Suzuki et al. (2001) and Lin et al. (2008), due to the coding and scoring methods that affect the relationship of the hypothesis among constructs as being positive or negative, this study makes the RSQLOSS construct negative, while all other constructs are considered positive. Consequently, nine hypotheses are constructed as follows:

H1. Perceived RSQLOSS is positively and directly related to PSV.

H2. Perceived RSQGAIN is positively and directly related to PSV.

H3. The slope of perceived RSQLOSS to PSV is steeper than the slope of perceived RSQGAIN to PSV.

H4. Perceived RSQLOSS is positively and directly related to CS.

H5. Perceived RSQGAIN is positively and directly related to CS.

H6. The slope of perceived RSQLOSS to CS is steeper than the slope of perceived RSQGAIN to CS.

H7. PSV is positively and directly related to CS.

H8. PSV mediates the relationship between RSQLOSS and CS.

H9. PSV mediates the relationship between RSQGAIN and CS.

2.3.2. The relationships among CS, CC, AL, and BL

According to determination of the relationships among RSQLOSS, RSQGAIN, PSV, and CS, the consequence of customer satisfaction is an important strategic imperative for firms (Jones and Sasser, 1995). That is, as shown in many previous studies, service quality leads to customer satisfaction, and customer satisfaction leads to customer loyalty (Chow et al., 2007; Kim et al., 2009). Specifically, satisfaction experienced by customers directly and positively influences their loyalty toward a restaurant (Lee et al., 2005); furthermore, loyalty distinguishes the behavioral aspect from the attitude aspect, namely, attitudinal loyalty and behavioral loyalty (Reich et al., 2005). Therefore, attitudinal loyalty is defined as customers' willingness to build relationships with the service providers, while behavioral loyalty refers to customers' behaviors in relation to repeat purchases. Both kinds of loyalty in terms of relationship quality concept indicate that customer satisfaction with received products and services would be crucial to a customer's decision to maintain a buying

relationship with a business (Huang et al., 2009). Accordingly, in order to clarify the relationships among CS, AL, and BL, four hypotheses are constructed as follows:

H10. The satisfaction experienced by the customer (CS) directly and positively influences AL for the restaurant.

H11. The satisfaction experienced by the customer (CS) directly and positively influences BL for the restaurant.

H12. AL directly and positively influences BL for the restaurant.

H13. AL mediates the relationship between CS and BL.

Furthermore, as proposed by Loudon and Della (1984), satisfied customers usually have better post-purchasing attitudes and higher brand loyalty, while unsatisfied customers have worse post-purchasing attitudes, showing brand switching, complaints and negative word-of-mouth activities. Therefore, in addition to the aforementioned relationships regarding CS, AL, and BL, this study discusses the customer complaints (CC) construct because of its negative association with the degrees of satisfaction and loyalty (Turel and Serenko, 2006). Specifically, customers make complaints to others through informal or formal channels when service problems occur (Zeithaml et al., 1996). Thus, if customer satisfaction increases, not only do customer complaints decrease, but customer loyalty also increases (Knuston et al., 2003). Therefore, customer complaints about poor service might be treated as an opportunity for the company to improve its image and its perceived quality by customers (Gil et al., 2006). Accordingly, the mediating role of CC between CS and AL is addressed to clarify the relationships among CS, CC, and AL. Consequently, three hypotheses are constructed as follows:

H14. CS directly and negatively influences CC for the restaurant.

H15. CC directly and negatively influences AL for the restaurant.

H16. CC mediates the relationship between CS and AL.

In summary, loss aversion-based service quality is proposed to reflect customers' asymmetric responses that link perceived service value, customer satisfaction, customer complaints, attitudinal loyalty, and behavioral loyalty. Accordingly, a loss aversion-based service quality causation framework is outlined in Fig. 2 to present these assumptions.

3. Research methodology

The research process started with a questionnaire design, including measurements and service quality coding for loss aversion, followed by analysis methods, research samples and data collection for examining the causal relationships among the constructs in the loss aversion-based restaurant service quality model.

3.1. Measurements and service quality coding for loss aversion

First, a survey instrument for restaurant service quality was adopted from the 29-item DINESERV (Stevens et al., 1995). The DINESERV measurements used in this study were followed by the methods proposed by Kim et al. (2003), which were (1) the authors suggest that customers' expectations be measured using "should" statements (e.g., employees at the restaurant *should* make you feel special) before customers' meals in terms of customers' normative expectations of what should happen; (2) the perception scale that measures a restaurant's service performance (e.g., employees at the restaurant make you feel special) was completed after the meal. Items in both expectation and perception instruments were rated based on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree); (3) the back-translation method proposed by Sinaiko and Brislin (1973) was recommended by the authors in order to ensure the quality of the translation of the DINESERV measure from English to Chinese. Thus, based on the evaluations of expectations and perceptions, the respondents are required to answer two questions related to *the degree of expectation* toward the service components in a restaurant and *the degree of perception* toward the service components in a restaurant. The methods of coding restaurant service quality loss (RSQLOSS) and restaurant service quality gain (RSQGAIN) are modified from the work of Lin et al. (2008), as illustrated below:

$$\text{If } RSQ_{percept} >= RSQ_{expect}, \text{ then } RSQGAIN = RSQ_{percept} - RSQ_{expect} \text{ and } RSQLOSS_i = 0$$

$$\text{Else if } RSQ_{percept} < RSQ_{expect}, \text{ then } RSQGAIN_i = 0 \text{ and } RSQLOSS_i = RSQ_{percept} - RSQ_{expect}$$

$RSQ_{percept}$ represents the customer's perception of the restaurant's performance, RSQ_{expect} is the expectation of the services offered by the restaurant (treated as a reference point), and i is the service item index. Thus, for the service quality item i, a "gain" occurs when the real experience (i.e., perception) of service quality exceeds the reference point, and a "loss" occurs when the real experience of service quality falls below the reference point. Therefore, the restaurant service quality construct is split into two constructs (RSQLOSS and RSQGAIN) in this study. By using the coding methods described above, the dimension score, after the procedure of factor analysis, is obtained by aggregating the score of items related to that dimension.

Second, the customer's perceived service value takes both cost and price perspectives into account, modified from past research

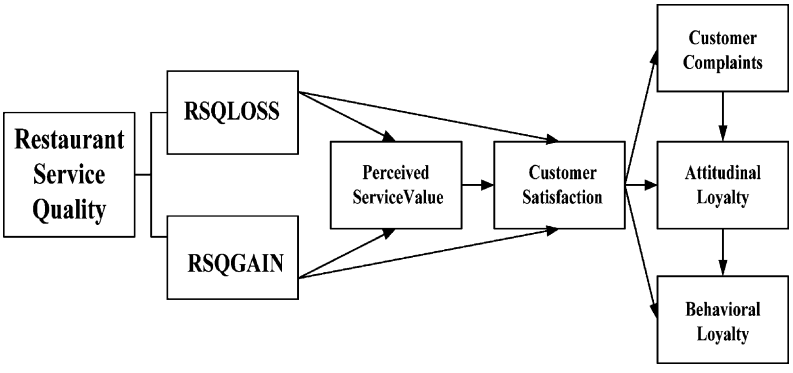


Fig. 2. The research framework.

(i.e., Lee et al., 2004; Lin et al., 2008), is composed of six items that are established and assessed on a 7-point Likert scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree". The three items for perceived cost are "The money spent in this restaurant is lower than expected", "The services offered by this restaurant are a very good value for the money spent", and "It is acceptable to spend money in this restaurant". The other three items for perceived price are "The price of this restaurant is not expensive for me", "The price of this restaurant is reasonable for this level of service", and "The price of this restaurant is acceptable".

Third, the construct of customer satisfaction draws on past research (i.e., Olorunniwo et al., 2006), and includes two items that are assessed on a 7-point Likert scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree". The two items are "I am satisfied with my decision to dine at this restaurant", and "My choice to dine at this restaurant was a wise one".

Fourth, the construct of the customer complaints, modified from past research (i.e., Zeithaml et al., 1996; Turel and Serenko, 2006) regarding how customers informally or formally complain about the service they have received includes two items assessed on a 7-point Likert scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree". The two items are "I would complain to other customers since experiencing a problem with this restaurant's service", and "I would complain to external agencies, such as the Consumers' Foundation, since experiencing a problem with this restaurant's service".

Fifth, another issue to consider is the understanding of customers' attitudinal loyalty to the restaurant. Thus, subjects are asked to respond to another three questions, which are designed to investigate how they will demonstrate their positive attitude toward the restaurant. The construct of customers' attitude to the restaurant is modified from past research (i.e., Reich et al., 2005) on the dimension of attitudinal loyalty. The three items are assessed on a 7-point Likert scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree". The three items are "I am very loyal to this restaurant", "I would highly recommend this restaurant to my family and friends", and "I would continue to dine at this restaurant even if the price were high". Subsequent to the customers' attitudinal loyalty to the restaurant, behavioral loyalty is measured with another two items, also assessed on a 7-point Likert scale, ranging from 1 for "very unlikely" to 7 for "very likely"; the items are "In the future, I intend to keep dining at this restaurant", and "The next time I go to a Chinese restaurant, how likely it is that it will be this restaurant". Along with the DINESERV measurement of expectation, the above questions, following the DINESERV measurement of perception, were included in the designed questionnaire. Last, the respondents' demographic information, with eight items including gender, age, educational level, occupation, monthly income, residency, family status, and dining purpose (via a categorical scale), were listed at the end of the questionnaire.

An instrument with multiple scaled items for the constructs was developed as described above. Although the questions in the questionnaire are based on a review of the literature, the questionnaire needed to be pre-tested through a pilot study in order to provide valid and reliable information on the questionnaire design (Kivela et al., 1999). Following Chen and Tsai (2007), first the survey instrument was revised and finalized based on the feedback from three hospitality experts. Then, a pilot sample of 60 diners who dined at the head chain store of the target chain restaurant was invited to join this study under permission from the chain restaurant founder. To increase the response rate, a small gift (eco-chopsticks) was offered to respondents who agreed to participate in this survey. Eight invalid questionnaires were eliminated and 52 questionnaires retained for analysis. The results of scale reliability for the pilot test are the questions of DINESERV expectation (Cronbach α = 0.980), DINESERV perception (Cronbach α = 0.979), perceived service value (Cronbach α = 0.874), customer satisfaction (Cronbach α = 0.892), customer complaints (Cronbach α = 0.882), attitudinal loyalty (Cronbach α = 0.869), and behavioral loyalty (Cronbach α = 0.927). Hence, the reliability of the survey instrument was deemed to be adequate.

3.2. Research samples and data collection

This study attempts to explore service quality in a chain restaurant based on an understanding of customer post-dining behaviors in a set of loss aversion-based causation relationships. One domestic-brand Chinese dining chain, which operates three chain-owned branches and seven franchised branches in Taiwan, was invited to participate in this study. The rationale for choosing a chain restaurant was based on the fact that restaurants in the chain operated with similar management styles, such as the menus, price, and decorations. In addition, this family-style Chinese chain restaurant is characterized by its nostalgia and health style, which reflects the trend that consumers are currently seen as seeking food that involves these features. Therefore, the chain restaurant not only focuses on providing traditional Chinese food (e.g., Fresh Bacon with Preserved Cabbage) that can provide people with nostalgic experiences (Holbrook and Schindler, 1994), but it also adheres to cooking food with a few oils, salts, and flavors to create health food. These features have allowed this chain restaurant to obtain a competitive advantage in the restaurant sector. In 2007, this chain restaurant was been awarded the prize of GSP (good service practice) from the Ministry of Economic Affairs of Taiwan, which indicates its benchmarking role within the restaurant industry. Thus, although a number of restaurants have been explored in previous studies, none of these studies has included this nostalgia- and health-oriented Chinese chain restaurant, which could increase our understanding of service quality issues in the restaurant sector. Thus, it is deserved to further explore whether service quality-related casual relationships occur in this type of chain restaurant.

Accordingly, in order to clarify customer demands and responses to restaurants, three chain-owned restaurants, located in Taipei City (namely, *R1*), Taoyuan County (namely, *R2*), and Hsinchu County (namely, *R3*), were selected, not only for increasing "sample representativeness" (Kerlinger and Lee, 2000) but also because the geographic location of restaurants is an important concern that should be considered, as proposed by Huang (2003). This setup included the branches located at three different areas, all owned by the chain restaurant, and could allow more confident conclusions regarding the service quality issues investigated in this study.

For the formal survey, the agreement of managers of the three branches was obtained prior to the distribution of questionnaires to restaurant guests dining at the restaurants. As suggested by Kim et al. (2003), one questionnaire regarding customers' expectations about the restaurant was distributed before customers' meals, while another questionnaire regarding customers' perceptions, with related post-dining behavioral intentions and customers' demographics, was completed by customers after their meals. This was done to ensure responses that were as accurate as possible.

Before starting the investigation, nine postgraduate students were trained as interviewers to fully understand the content of the questionnaire in order to answer questions from respondents. Since three restaurants in the chain participated in this study, three groups composed of three interviewers were given ID badges and each assigned to one restaurant, allowing the study of all three restaurants to be conducted simultaneously. Data collection was conducted in the selected three restaurants over a 1-month period (from March 15 to April 15, 2009) at different time intervals (e.g., weekdays or weekends from 11:00 a.m. to 3:00 p.m. and 5:00 p.m. to 9:00 p.m.) because there were more restaurant customers at these two peak times. The purpose of this study was explained to

restaurant guests, and, if they were willing to participate in the survey and complete the questionnaire, they were thanked for their participation with a small gift (eco-chopsticks). To make the sample as representative as possible of the target population, the chosen respondents were guests (18 years of age and older) who were dining at the restaurant and an intercept approach was used, as suggested by Weiss et al. (2004). The restaurant guests would complete the questionnaire anonymously, put it into an envelope and leave it on the restaurant table or return it to restaurant employees. Last, 300 questionnaires were distributed to each selected restaurant (i.e., R1, R2, and R3), and a total of 900 respondents participated in this study.

4. Empirical analysis and results

Statistical analyses of the collected questionnaires were computed based on the 713 usable responses obtained from the branches of R1 ($n = 237$), R2 ($n = 244$), and R3 ($n = 232$). The total response rate was 79% (713/900). SPSS 10.0 and AMOS 6.0 statistical software was used to conduct the following empirical analyses.

4.1. Demographic profile

For the data collected from R1, R2, and R3, the test of homogeneity of proportions was first employed to examine the backgrounds of respondents from the three branches, including gender, age, education level, occupation, monthly income, residency, and family status. The results based on the chi-square value show that only respondent's ages and incomes were different at the 5% significance level. Nevertheless, the age and income demonstrate a similar distribution trend among the three branches, for which the age between 25 and 44 and the income between NT$ 20,000 to NT$40,000 were the two most represented groups. Therefore, given the minimization of the heterogeneity of sample sources, the three sets of data from the branches were aggregated to conduct the related analyses to unveil the research questions concerned in this study.

Of these 713 questionnaires, 40.4% of the responses were from male respondents, while 59.6% were from females. The great majority of respondents were aged below 55 but over 25 (77.9%). The largest group was service workers (32%), and 91.7% of the respondents were from northern Taiwan, followed by the middle and southern areas. Finally, the majority (74.1%) had at least a university degree (bachelor's or equivalent), and many respondents had an income of between NT$ 20,000 and NT$50,000[1] per month (38.5%). Finally, 47.5% of the respondents were married with children, while 42.5% of respondents were single. In addition, regarding the guests' dining purposes, the results indicated that dining with family members (431/1028 = 41.9%) was the most popular dining purpose, followed by dining with friends (303/1028 = 29.5%), and with colleagues (114/1028 = 11.1%). As a whole, the samples appeared to be generally representative of the northern population (because the diners were mostly from the north of Taiwan) based on the gender, education, occupation, and income profile of the northern residents (Taiwan Census Bureau, 2008). The detailed demographic profile is shown in Table 1.

Table 1
Profile of respondents ($n = 731$).

Variables		Frequency (s)	Percentage of total (%)
Gender	Male	288	40.4
	Female	425	59.6
Age	18–24	121	17
	25–34	225	31.6
	35–44	208	29.2
	45–54	122	17.1
	55 and over	37	5.2
Education level	Primary	30	4.2
	High school	155	21.7
	University	447	62.7
	Postgraduate	81	11.4
Occupation	Civil servant	85	11.9
	Service worker	228	32
	Self-employed	53	7.4
	Student	61	8.6
	Skilled worker	115	16.1
	Housework	49	6.9
	Retired	14	2
	Other	108	15.1
Monthly income (NT$)	Under 20,000	73	10.2
	20,001–30,000	138	19.4
	30,001–40,000	136	19.1
	40,001–50,000	78	10.9
	50,001–60,000	72	10.1
	60,001–70,000	53	7.4
	Over 70,001	81	11.4
	Other (unemployed)	82	11.5
Residency	North	654	91.7
	Middle	24	3.4
	South	18	2.5
	East	9	1.3
	Other (overseas)	8	1.1
Family status	Single	303	42.5
	Married without children	60	8.4
	Married with children	339	47.5
	Other	11	1.5
Dining purpose (multiple-choice)	Dinning with family	431	41.9
	Dinning with friends	303	29.5
	Dinning with colleagues	114	11.1
	Celebrating special events	58	5.6
	Tasting	95	9.2
	Other	27	2.6

4.2. DINESERV factors

Using principal axis factoring (PAF) with oblique rotation was recommended for the purpose of identifying sub-dimensions in the DINESERV measurement (Kim et al., 2003). Before conducting the factor analysis, as provided by Kim et al. (2003), the 29 DINESERV items in relation to their gap scores (perception questions minus expectation questions) were calculated. Accordingly, based on the collected data ($n = 731$), all items with a factor loading value below 0.5 or cross-loaded on two factors with factor loadings greater than 0.4 were excluded (i.e., items 10, 16, 17, 19, 20, and 21), and factors with eigenvalues equal to or greater than 1.0 were extracted. The remaining items were factor-analyzed again to ensure that the factors were extracted appropriately. After this, three factors were extracted (KMO = 0.942, $p < 0.001$), explaining 61.95% of the variance. Additionally, the Scree Plot is a way of determining how many factors to extract. The curve begins to tail off after three factors, which could justify retaining three factors extracted from the DINESERV measurement. Consequently, based on the patterns of the factor loadings, the factors encompassed by the DINESERV items are shown in Table 2.

As for the factor analysis results, three factors were extracted. The first factor is recognized as the tangibles dimension. The second factor could be recognized as the empathy dimension, composed of five empathy items, except for items D22, D23, and D24 (originally belonging to the assurance dimension), which are

[1] 1 NT$ ≒ 0.33 US$ at the time of study.

Table 2
Factor analysis results of DINESERV measurement.

Dimension	Items	Factor loading		
		1	2	3
Tangibles	D01: ...has visually attractive areas and building exteriors.	0.680		
	D02: ...has a visually attractive dining area.	0.745		
	D03: ...has staff members who are clean, neat, and appropriately dressed.	0.705		
	D04: ...has a décor in keeping with its image and price range.	0.747		
	D05: ...has a menu that is easily readable.	0.674		
	D06: ...has a visually attractive menu that reflects the restaurant's image.	0.780		
	D07: ...has a dining area that is comfortable and easy to move around in.	0.778		
	D08: ...has rest rooms that are thoroughly clean.	0.654		
	D09: ...has dining areas that are thoroughly clean.	0.603		
Empathy	D22: ...makes you feel personally safe.		0.695	
	D23: ...has personnel who seem well-trained, competent, and experienced.		0.662	
	D24: ...seems to give employees support so that they can do their jobs well.		0.739	
	D25: ...has employees who are sensitive to your individual needs and wants.		0.875	
	D26: ...makes you feel special.		0.830	
	D27: ...anticipates your individual needs and wants.		0.907	
	D28: ...has employees who are sympathetic and reassuring if something is wrong.		0.924	
	D29: ...seems to have the customers' best interests at heart.		0.868	
Reliability	D11: ...serves you in the time promised.			0.638
	D12: ...quickly corrects anything that is wrong.			0.680
	D13: ...is dependable and consistent.			0.704
	D14: ...provides an accurate quest check.			0.748
	D15: ...serves your food exactly as you ordered it.			0.805
	Eigenvalues	9.886	3.441	1.424
	% of Variance	43.239	14.080	4.626
	Cumulative %	43.239	57.319	61.945
	Cronbach's α	0.913	0.948	0.879
	Kaiser–Meyer–Olkin	0.942		

Notes: D's (D01–D29) are the difference between perception scores and expectation scores.

loaded in this factor. The third factor could be recognized as the reliability dimension. This is the only DINESERV dimension that is completely the same as the DINESERV used in the principal axis factoring. In summary, the results did not completely succeed in identifying Stevens et al.'s (1995) five service quality dimensions (i.e., DINESERV). A similar situation also happened in previous studies, as argued by Fu and Parks (2001) and Kim et al. (2003), who find a strong interrelationship among the dimensions of DINESERV (e.g., responsiveness, assurance, and empathy). This study also shows similar results. As mentioned earlier, cultural differences might be another possible interpretation (Kim et al., 2003). Nevertheless, in this study, these three retained dimensions could be used as the basis underlying restaurant service quality in accordance with our goal of investigating related issues of service quality for further examination.

4.3. Confirmatory factor analysis of purified DINESERV

The purified scale obtained from the factor analysis was used to test the solution by using confirmatory factor analysis, a procedure recommended and conducted by several studies (e.g., Hinkin, 1998; Chen and Tsai, 2007; Wilkins et al., 2007; Matzler et al., 2008). Therefore, the method of first-order confirmatory factor analysis was employed to verify the obtained three-dimensional restaurant service quality model by using a Structural Equation Modeling (SEM) package through Analysis of Moment Structure (AMOS) version 6.0. Even though the χ^2 statistic is too high due to the large sample size (Baggozzi and Yi, 1988), the results (listed in Table 3) indicate that the SEM statistics, such as AGFI, NFI, RFI, CFI, RMSEA, and CMIN/DF sampled from three restaurant guests match the suggested requirement on the model's goodness-of-fit.

Table 3
CFA results of DINESERV measurement.

Dimension: Tangibles	Standardized regression weight	Dimension: Reliability	Standardized regression weight	Dimension: Empathy	Standardized regression weight
D01	0.689***			D22	0.806***
D02	0.754***			D23	0.776***
D03	0.793***	D11	0.748***	D24	0.798***
D04	0.774***	D12	0.776***	D25	0.871***
D05	0.710***	D13	0.806***	D26	0.847***
D06	0.675***	D14	0.742***	D27	0.864***
D07	0.707***	D15	0.736***	D28	0.856***
D08	0.720***			D29	0.821***
D09	0.727***				

Overall composite reliability = 0.940; $\chi^2 = 884.212$ (<0.001); df = 200; GFI = 0.895; AGFI = 0.868; NFI = 0.925; RFI = 0.913; CFI = 0.941; RMSEA = 0.069; discriminant validity = correlation ± (S.E. × 2).
Tangibles and reliability: 0.651 ± 0.029 = 0.593–0.709 (supported).
Tangibles and empathy: 0.413 ± 0.045 = 0.323–0.503 (supported).
Reliability and empathy: 0.492 ± 0.042 = 0.408–0.576 (supported).
*** $p < 0.001$.

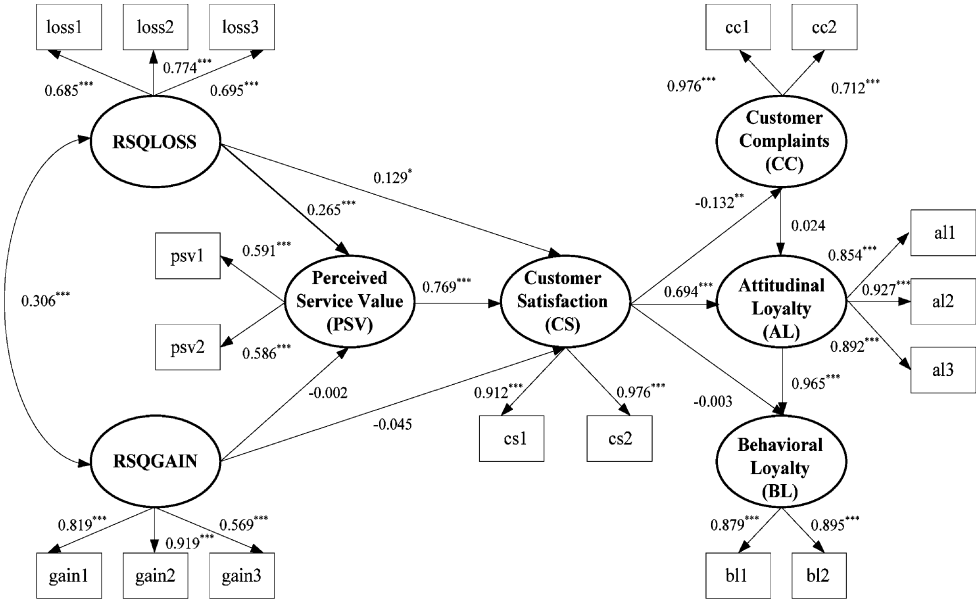
Although some statistics (such as GFI) do not fully match the suggested requirement, as proposed by Cheung and Rensvold (2002), they do suggest that when a model is composed of more than three factors, with each factor including more than three items, the RMSEA is an appropriate way to explain the model's goodness-of-fit. Additionally, Hinkin (1998) recommends CFI to determine the quality of fit. Therefore, the results indicate that the three-dimensional restaurant service quality model is a suitable model for this study. In addition, for convergent validity, the results show that most of the standardized factor loadings are higher than the suggested value of 0.40 in a confirmatory factor analysis (Anderson and Gerbing, 1988), while each of the items contributes to the formation of only a single factor (loadings of less than 0.50 on all other dimensions). Furthermore, the results show that the confidence interval of the correlation do not include the value one (Hatcher, 1994), which means that the three constructs present good discriminant validity.

Moreover, according to the multi-dimensional concept proposed by Law et al. (1998), service quality could be defined as the higher-level multi-dimensional construct that underlies its certain dimensions through a second-order model. This model suggests that a higher-order construct links the correlated first-order factors, namely, restaurant service quality. Accordingly, this study also makes comparisons between the first-order model and the second-order model to clarify their differences in terms of goodness-of-fit (Lee et al., 2005). The findings indicate that there is no difference between the first-order service quality model and the second-order model ($\chi^2 = 884.212$; df = 200). Nevertheless, Wilkins et al. (2007) also have made efforts to clarify the dimensions and structure of service quality in the hotel industry by examining the four types of service quality models. However, their results conclude that the second-order model is better than others (e.g., the single-factor model, the first-order model of uncorrelated factors, and the first-order model of correlated factors), and they claim that service quality should be a higher-order dimension that provides a holistic experience rather than having separate dimensions for customers' experiences. Therefore, in this study, the restaurant service quality in terms of the second-order model was considered to verify the overall loss aversion effect of the service quality on examining customers' post-dining behaviors.

4.4. Coding of restaurant service quality for loss aversion

Based on the obtained three-dimensional restaurant service quality model of this study, regarding the issue of asymmetric effects, in order to test for these effects, a procedure described and used by Lin et al. (2008) was employed. That is, a "gain" occurs when the real experience (i.e., perception) of service quality exceeds the reference point, while a "loss" occurs when the real experience of service quality falls below the reference point. For example, on the DINESERV scale from 1 to 7, if a service quality item is given a 4 in the expectation aspect and is given a 6 in the perception aspect by the respondents, this service quality item then has a value coded as "2" (please refer to the equation in subsection 3.1), representing the gain, and another value, "0", representing the loss. Similarly, if a service quality item is given a 6 in the expectation aspect but is given a 3 in the perception aspect by the respondents, this service quality item then has a value coded as "−3", representing the loss, and another value, "0", representing the gain. Following this coding method, accordingly, three new sets of variables (i.e., loss1 versus gain1; loss2 versus gain2; loss3 versus gain3, as shown in Fig. 3) were created based on the arithmetic means of the service quality items attributed to the three DINESERV dimensions (i.e., tangibles, reliability, and empathy) obtained in this study. Therefore, these variables could be recognized as continuous variables analyzed with related constructs in the established model of this study.

Furthermore, after using the coding method to split the raw data into Loss and Gain constructs, for initially observing the variability of data in the RSQLOSS and RSQGIAN samples, the data has been checked by calculating the frequency of "0" and the "non-zero value" in the three gain and loss regions, respectively. The results show that in the complete dataset ($n = 3 \times 713 = 2139$), the frequency of the non-zero in the gain regions is ($n = 1078$), which is a bit less than that in the loss regions ($n = 1108$), while the frequency of "0" in the gain regions is ($n = 1061$), which is only a bit more than that in the loss regions ($n = 1031$). This indicates that the



Notes: ***(p<0.001); **(p<0.01); *(p<0.05).
χ^2: 470.504; df: 108; GFI: 0.928; AGFI: 0.898; CFI: 0.948; NFI: 0.934; RMSEA: 0.069.

Fig. 3. Results of structural modeling analysis.

Table 4
DINESERV scores.

Dimension	Expectation mean	Standard deviation	Perception mean	Standard deviation	Difference ($P-E$) mean	Standard deviation
Tangibles	5.601	0.956	5.563	0.858	−0.038	0.708
Reliability	5.764	0.991	5.776	0.859	0.012	0.672
Empathy	5.361	1.113	5.440	0.982	0.079	0.862
Total	5.575	0.916	5.593	0.825	0.018	0.767

variability of a list of non-zero values in both RSQLOSS and RSQGIAN samples would provide certain variance in the constructed model of this study. In other words, the variance of the RSQLOSS and RSQGIAN samples in the model would not be mostly derived from the equivalence situation (i.e., the perception minus expectation is equal to 0).

4.5. Expectation and perception of restaurant service dimensions

The mean scores of service quality dimensions are presented in Table 4. From this table, we find that customers' overall perceptions regarding the service quality items are a bit better than that of their expectations, which might indicate that customers are more satisfied with the restaurant's service offerings, namely, positive disconfirmation (Molinari et al., 2008). However, for the three service quality dimensions, compared with tangibles, customers seemed to be more satisfied with the restaurant's reliability and empathy. For this, two conditions exist for restaurant managers to consider. On the one hand, since the service quality of tangibles was lower than customers' expectations, restaurant managers were easily alerted to improving the deficiency in order to meet customers' requirements. On the other hand, even though the service quality of reliability and empathy seemed to meet customers' expectations, this might mean that restaurant managers should not indulge in temporary success but should instead pay attention to understanding customers' needs. That is, understanding customers' responses to service quality urges restaurant managers to continually provide better service to customers. Therefore, this study applies the concept of loss aversion to clarify whether customers' responses would be steeper in the loss region than in the gain region, from a psychological perspective.

4.6. The reliability of the measurements for each construct

The reliability (measured by coefficient alpha) of each construct exceeds 0.7 (Nunnally, 1978), which is an acceptable level across all constructs. All of the Cronbach alpha values for RSQGAIN, RSQLOSS, perceived service value, customer satisfaction, customer complaints, attitudinal loyalty, and behavioral loyalty range between 0.749 and 0.917. This result indicates that the constructs for these scales have high reliability.

4.7. Path analysis with latent variables

Structural model testing was conducted with path analysis by using AMOS 6.0. All constructs with their latent variables described above were included in the model, as shown in Fig. 3. Regarding the goodness-of-fit indices for the theoretical model, e.g., GFI, AGFI, CFI, NFI, and RMSEA, an excess to the required statistics indicates an acceptable fit for the data from the three restaurants.

According to the path analysis from Amos, Table 5 lists information on the direct effects among the constructs. The results of direct effects among constructs indicate that hypotheses 1, 4, 7, 10, 12, and 14 are supported ($p < 0.05$) and that hypotheses 2, 5, 11, and 15 are rejected ($p > 0.05$). Regarding the indirect effects, the results indicate support for H8, in which PSV works as a mediator between RSQLOSS and PSV, while H9 is rejected, since only PSV demonstrated significant direct effects on customer satisfaction. H13, in which AL works as a mediator between customer satisfaction and behavioral loyalty, is supported. H16 is rejected because only customer satisfaction demonstrated significant direct effects on attitudinal loyalty. In addition, based on the aforementioned statistically significant results from the path analysis, the hierarchical loss effect of RSQLOSS on post-dining behaviors was investigated, i.e., the indirect effect of RSQLOSS on behavioral loyalty (RSQLOSS → PSV → CS → AL → BL versus RSQLOSS → CS → AL → BL) is examined. The results show that the indirect effect of RSQLOSS through PSV, CS and AL on BL has a larger effect (0.136) than the indirect effect of RSQLOSS through CS and AL on BL (0.086). Therefore, the role of perceived service value is critical, as it especially links and dominates the relationship between service quality and customer satisfaction to the decision-making construct (i.e., behavioral loyalty) for customers.

Furthermore, as can be seen in Table 5 (i.e., both hypotheses 8 and 13 are supported), two conditions have been employed to test the extent to which the mediating effect works between the variables. In other words, after adding the mediator to the prediction of the dependent variable from the independent variable in the second regression, the effect of the independent variable decreasing or falling close to zero is of concern. That is, a partial or complete mediation effect can be clarified through the method (Baron and Kenny, 1986). Table 6 lists the information on the partial mediating effects of PSV and AL among endogenous and exogenous constructs.

The results of H3 and H6 used to verify the loss aversion effect are the focus of this study. Based on the results of the path analysis in Table 5 (i.e., both hypotheses H1 and H4 are supported), the numerical values of their slopes indicate that the restaurant service quality is positive and significant only in the loss region, whereas its effect is not significant in the gain region. This condition indicates that a decrease in service quality from the reference point will decrease PSV and CS but that an increase in service quality may not have any effect on PSV and CS. The χ^2 difference test rejected both of the null hypotheses of $\lambda_Q = 1$ (loss neutrality hypothesis)

Table 5
Results of the direct effect, indirect effect and testing results.

Hypothesis and path		Direct effect	Indirect effect	Testing result
H1	RSQLOSS → PSV	0.265***	–	Supported
H2	RSQGAIN → PSV	−0.002	–	Not supported
H4	RSQLOSS → CS	0.129*	–	Supported
H5	RSQGAIN → CS	−0.045	–	Not supported
H7	PSV → CS	0.769***	–	Supported
H10	CS → AL	0.694***	–	Supported
H11	CS → BL	−0.003	–	Not supported
H12	AL → BL	0.965***	–	Supported
H14	CS → CC	−0.132**	–	Supported
H15	CC → AL	0.024	–	Not supported
H8	RSQLOSS → PSV → CS	–	0.204**	Supported
H9	RSQGAIN → PSV → CS	–	−0.001	Not supported
H13	CS → AL → BL	–	0.670**	Supported
H16	CS → CC → AL	–	−0.003	Not supported

*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.

Table 6
Regression results for the mediating effect.

R1: Mediating effect	Regression 1	β	S.E.	Sig.	Regression 2	β	S.E.	Sig.
RSQLOSS → PSV → CS	Constant	5.636	0.044	0.000	Constant	2.935	0.178	0.000
	RSQLOSS (CS as the DV)	0.580	0.082	0.000	RSQLOSS	0.411	0.072	0.000
					PSV (CS as the DV)	0.531	0.034	0.000
CS → AL → BL	Constant	1.611	0.196	0.000	Constant	0.097	0.389	0.000
	CS (BL as the DV)	0.660	0.035	0.000	CS	0.071	0.027	0.007
					AL (BL as the DV)	0.893	0.025	0.000

Notes: DV = depend variable; S.E. = standard error; sig. = significance; β and S.E. are unstandardized coefficients.

with significant *p*-values. The results (χ^2 difference value = 9.543, df = 1, $p < 0.001$) for H3 and the results (χ^2 difference value = 3.396, df = 1, $p < 0.05$) for H6 indicate that the two hypotheses are supported. Therefore, the results provide evidence supporting hypotheses H3 and H6 ($\lambda_Q > 1$). That is, that the loss aversion phenomenon exists in our post-dining behavioral model.

5. Conclusions

Service quality is one of the primary issues in restaurant management, since it influences customers' behavioral intentions. However, the literature mainly focuses on treating customers' responses toward service quality from a "smooth" perspective. Based on this, from an academic point of view, this study establishes a loss aversion-based conceptual framework that permits continued advances in the development of service quality in the restaurant sector. Along these lines, this study attempts to clarify customers' asymmetric responses to service quality in which important service quality post-behavioral constructs are involved. From a practical standpoint, this study adds to existing knowledge by providing empirical evidence from the case of a Chinese chain restaurant to demonstrate customers' loss-averse tendencies, which occur even when there is no significant service quality gap for the restaurant. An understanding of the loss aversion effect and the relationship between the factors influencing customers' behavioral intentions urges restaurant managers to continually provide good service quality in order to succeed in meeting customers' requirements.

6. Discussion and managerial implications

6.1. Customers' asymmetric responses to restaurant service quality

This study explored customers' asymmetric responses to restaurant service quality, with the PZB service quality gap concept acting as a reference point for the evaluation process. In line with the findings of Fogel et al. (2004), customers are loss averse for quality in choice. Although in Lin et al.'s (2008) study on passengers' responses to inter-city bus service quality, the gain and loss region showed both significant and positive effects on passengers' post-behavioral intentions, the results of this study show that only the service quality in the loss region has a significant and positive effect on restaurant customers' post-dining behaviors (i.e., perceived service value and customer satisfaction). These results are in line with Suzuki et al.'s (2001) findings, which imply that service quality may influence customers' behaviors when it falls below the reference point, but that it may not have a significant effect on customers' post-behavioral intentions when it exceeds the reference point. As stated by Stan et al. (2007), if losses outweigh gains, there is a negative asymmetry to which a drop in service reliability lowers a customer's perception of service offerings and satisfaction; however, an equivalent increase in service reliability would produce insignificant effects on customer's behaviors. Specifically, this study demonstrates that even though customers' perceptions about the service quality of a restaurant may exceed their expectations to some extent, the phenomenon of loss aversion still occurs among customers. Therefore, this points to the critical issue that customer expectations and perceptions of service offerings might be ways for service providers to *overtly* understand how customers are satisfied with service quality. However, the loss aversion effect, which is *covertly* performed from a customer's psychological perspective, should not be ignored. This applies to restaurant managers, even those who show high service quality performance, who should continue to satisfy customers' demands as much as they can and to work to eliminate possible loss aversion toward the service offerings. Once this is done, it is easier to retain customers and reduce their tendency to switch to other restaurants.

6.2. The effects of service quality on customers' post-dining behaviors in the restaurant sector

Although chain restaurants, in terms of the brand concept, receive various benefits, such as simplifying customers' pre-decision-making process (Kotler et al., 2003), the post-behavioral intentions within the service-profit chain (Heskett et al., 1994) also provide useful information that helps a restaurant build and promote its distinguishable brand as a "Virtuous Circle". Therefore, this study clarifies the customers' post-behavioral intentions by collecting data from three Chinese restaurants in the chain. This provides more evidence that, aside from the aforementioned loss aversion effect, the service quality-related post-behavioral constructs link together to offer restaurant managers important information about managing and improving service quality in their restaurants.

First, regarding PSV, the empirical results are in accordance with previous studies (e.g., Lee et al., 2004) in which the perceived service value works as a mediating variable in the relationship between RSQLOSS and customer satisfaction. That is, service quality in the loss region will positively influence customer satisfaction, and the perceived service value would strengthen this relationship. Therefore, this may imply that the restaurant value that customers receive for the price that they pay truly reflects a successful give-and-receive exchange (Zeithaml, 1988; Lee et al., 2004). This phenomenon should be especially considered by chain restaurant management because the chain's brand identity is established based on the consistent value received by customers from each branch.

Second, the positive relationship between perceived service value and customer satisfaction indicates that perceived service value is pivotal in establishing long-term client relationships and winning repeat business (Lee et al., 2004). Following this pattern, another important finding is that the effect of customer satisfaction directly influences customers' attitudinal loyalty toward the restaurant but has no direct effect on customers' behavioral loyalty. That is, customers' attitudinal loyalty works as a mediating variable in the relationship between customer satisfaction and behavioral loyalty. As concluded by Kim et al. (2007), attitudinal and behavioral aspects should be considered in measuring the "true" concept of

loyalty. Specifically, customer satisfaction does not guarantee customers' repeat purchasing behaviors, which should pass through the phase of attitudinal conformity toward the restaurant.

Third, another interesting finding was that customer satisfaction significantly directly and negatively influences customer complaints regarding the restaurant (H14). However, the rejection of H15 and H16 indicates that informal and formal customer complaints have no direct effect on customers' attitudinal loyalty and have no mediating effect on the relationship between customer satisfaction and customers' attitudinal loyalty. With regard to this, it is reasonable to believe that customers' complaining behavior may be explained by other factors that were not examined in the suggested model. That is, customer complaints may have a significant effect on other customer behaviors, such as new brand trial tendencies (Tarn, 2005). However, these behaviors were not examined in this study. Overall, as suggested by Turel and Serenko (2006), service providers cannot fully control customers' complaints because complaints are affected by various external uncontrollable factors. Nevertheless, they have recommended that service providers adequately and professionally address and evaluate complaints whenever they arise.

In summary, loss aversion is a common psychological trait that has implications for various facets of our daily life. This phenomenon is well established and has been studied extensively in different domains (Kahneman and Tversky, 2000). When customers' knowledge of, and involvement in, provided services is high, loss aversion is more likely to occur because customers feel more conscious of the benefits of the services provided (Fogel et al., 2004). In addition, we believe that the level of loss aversion can vary across contexts and levels of customers' experiences. Hence, for restaurants, it is critical to frequently manage and supervise the quality of service offerings and the process of service delivery in order to avoid service failure as much as possible.

7. Limitations and directions for further research

The limitations of this research, addressed as follows, provide direction for future research. First, this study mainly focuses on exploring *common* guests' behavioral intentions toward target restaurants. Therefore, as discussed by Kim et al. (2007), since loyal customers and frequent visitors are significantly different, future researchers should notice and distinguish their decision-making processes and behavioral intentions. Second, future research should collect data by carrying out a longitudinal study, instead of a transversal study, to track customers' post-behavioral intentions in terms of improvement in the service quality of a restaurant. These considerations should provide another perspective for understanding the issue of service quality. For example, since many cases indicate that patrons "forgive" a previous bad experience and return to a favorite business, a longitudinal study helps both to identify current customers' level of loss aversion toward a business and to track whether their forgiving behavior occurs toward the business. Finally, some socioeconomic variable could shed some light on how customers react to restaurant service offerings. For example, Kim et al. (2003) find that gender, average spending, and dining occasions impact the perceptions of service quality. Therefore, future research should consider how restaurant service quality, as perceived by customers in the loss and gain areas, might significantly differ in terms of certain demographic characteristics such as education, income, and profession.

References

Anderson, J.C., Gerbing, D.W., 1988. Structural equation modelling in practice: a review and recommended two-step approach. Psychological Bulletin 103, 411–423.

Babakus, E., Boller, G.W., 1992. An empirical assessment of the SERVQUAL scale. Journal of Business Research 24, 253–268.

Baggozzi, R.P., Yi, Y., 1988. On the evaluation of structure equation models. Journal of Academy of Marketing Science 16, 76–94.

Baron, R.M., Kenny, D.A., 1986. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology 51 (6), 1173–1182.

Bojanic, D.C, Rosen, L.D., 1994. Measuring service quality in restaurants: an application of the SERVQUAL instrument. Hospitality Research Journal 18 (1), 3–14.

Brady, M.K., Cronin, J.J., 2001. Some new thoughts on conceptualizing perceived service quality. Journal of Marketing 65 (3), 34–49.

Chan, H., Wan, L.C., Sin, L.Y.M., 2007. Hospitality service failures: who will be more dissatisfied. International Journal of Hospitality Management 26 (3), 531–545.

Chang, H.H., Wang, Y.H., Yang, W.Y., 2009. The impact of e-service quality, customer satisfaction and loyalty on e-marketing: moderating effect of perceived value. Total Quality Management 20 (4), 423–443.

Chen, C.F., Tsai, D.C., 2007. How destination image and evaluative factors affect behavioral intentions? Tourism Management 28, 1115–1122.

Cheung, G.W., Rensvold, R.B., 2002. Evaluating goodness-of-fit indices for testing measurement invariance. Structural Equation Modelling 9 (2), 233–255.

Chow, I.H.S., Lau, V.P., Lo, T.W.C., Sha, Z., Yun, H., 2007. Service quality in restaurant operations in China: decision and experiential-oriented perspectives. International Journal of Hospitality Management 26 (3), 698–710.

Cronin Jr., J.J., Brady, M.K., Hult, G.T.M., 2000. Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. Journal of Retailing 76 (2), 193–218.

Fogel, S, Lovallo, D., Caringal, C., 2004. Loss aversion for quality in consumer choice. Australian Journal of Management 29 (1), 45–64.

Fu, Y.Y., Parks, S.C., 2001. The relationship between restaurant service quality and consumer loyalty among the elderly. Journal of Hospitality & Tourism Research 25 (3), 320–336.

Garbarino, E., Johnson, M.S., 1999. The different roles of satisfaction, trust, and commitment in consumer relationships. Journal of Marketing 63 (2), 70–87.

Gil, S.M, Hudson, S., Quintana, T.A., 2006. The influence of service recovery and loyalty on perceived service quality: a study of hotel customers in Spain. Journal of Hospitality & Leisure Marketing 14 (2), 47–68.

Grönroos, C., 1984. A service quality model and its marketing implications. Journal of Marketing 18 (4), 36–44.

Gupta, S., McLaughlin, E., Gomez, M., 2007. Guest satisfaction and restaurant performance. Cornell Hotel and Restaurant Administration Quarterly 48 (3), 284–298.

Ha, H.Y., 2002. The effects of consumer risk perception on pre-purchase information in online auctions: brand, word-of-mouth, and customized information. Journal of Computer-Mediated Communication 8 (1) Retrieved August 18, 2009 from http://jcmc.indiana.edu/vol8/issue1/ha.html.

Hatcher, L., 1994. A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling. SAS Institute, Cary, NC.

Heskett, J.L., Jones, T.O., Loveman, G.W., Sasser, W.E., Schlesinger, L.A., 1994. Putting the service-profit chain to work. Harvard Business Review 72 (2), 164–174.

Heung, V.C.S., Wong, M.Y., Qu, H., 2000. Airport-restaurant service quality in Hong Kong: an application of SERVQUAL. Cornell Hotel and Restaurant Administration Quarterly 41 (3), 86–96.

Hinkin, T.R., 1998. A brief tutorial on the development of measures for use in survey questionnaires. Organizational Research Methods 1 (1), 104–121.

Holbrook, M.B., Schindler, R.M., 1994. Age, sex, and attitude toward the past as predicators of consumers' aesthetic tastes for cultural products. Journal of Marketing Research 31, 412–422.

Huang, C.H, 2003. A comparison of the service quality perspectives between restaurant customers and restaurateurs in Taiwan. Journal of Foodservice Business Research 6 (2), 87–104.

Huang, Y., Huang, F., Hsu, M.K., Chang, F., 2009. Determinants and outcomes of relationship quality: an empirical investigation on the Chinese travel industry. Asia Pacific Journal of Tourism Research 14 (1), 59–75.

Jones, T.O., Sasser, W.E., 1995. Why satisfied customers defect. Harvard Business Review 73 (6), 88–99.

Kahneman, D., Tversky, A., 2000. Choices, Values, and Frames. Cambridge University Press, New York.

Kerlinger, F.N., Lee, H.B., 2000. Foundations of Behavioral Research. Harcourt Brace, New York.

Kim, H.J., McCahon, C., Miller, J., 2003. Assessing service quality in Korean casual-dining restaurants using DINESERV. Journal of Foodservice Business Research 6 (1), 67–86.

Kim, W.G., Lee, S., Lee, H.Y., 2007. Cobranding and brandy loyalty. Journal of Quality Assurance in Hospitality & Tourism 8 (2), 1–23.

Kim, W.G., Ng, C.Y.N., Kim, Y.S., 2009. Influence of institutional DINESERV on customer satisfaction, return intention, and word-of-mouth. International Journal of Hospitality Management 28 (1), 10–17.

Kivela, J., Inbakaran, R., Reece, J., 1999. Consumer research in the restaurant environment, part 2: research design and analytical methods. International Journal of Contemporary Hospitality Management 11 (6), 269–286.

Knuston, B.J., Singh, A.J., Yen, H.H., Bryant, B.E., 2003. Guest satisfaction in the U.S. lodging industry using the ACSI model as a service quality scoreboard. Current Issues and Development in Hospitality and Tourism Satisfaction 4 (3/4), 97–118.

Knuston, B.J., Stevens, P., Wullaert, C., Patton, M., Yokoyama, F., 1990. LODGSERV: a service quality index for the lodging industry. Hospitality Research Journal 14 (2), 277–284.

Kotler, P., Bowen, J., Makens, J., 2003. Marketing for Hospitality and Tourism. Pearson Education. Upper Saddle River, New Jersey.
Ladhari, R., Brun, I., Morales, M., 2008. Determinants of dining satisfaction and post-dining behavioral intentions. International Journal of Hospitality Management 27 (2), 563–573.
Law, K.S., Wong, C.S., Mobley, W.H., 1998. Toward a taxonomy of multidimensional constructs. The Academy of Management Review 23 (4), 741–755.
Lee, Y.K., Lee, Y., Lee, K.A., Park, D.H., Moon, H., 2004. Exploring the role of service value in the relationship between service quality and customer satisfaction. International Journal of Hospitality & Tourism Administration 5 (1), 67–85.
Lee, Y.K., Park, K.H., Park, D.H., Lee, K.A., Kwon, Y.J., 2005. The relative impact of service quality on service value, customer satisfaction, and customer loyalty in Korean family restaurant context. International Journal of Hospitality & Tourism Administration 6 (1), 27–51.
Lin, J.H., Lee, T.R., Jen, W., 2008. Assessing asymmetric response effect of behavioral intention to service quality in an integrated psychological decision-making process model of intercity bus passengers: a case of Taiwan. Transportation 35 (1), 129–144.
Loudon, D.L., Della, B.A.J., 1984. Consumer Behavior-Concepts and Applications. McGraw-Hill, New York.
Matzler, K., Renzl, B., Rothenberger, S., 2008. Measuring the relative importance of service dimensions in the formation of price satisfaction and service satisfaction: a case study in the hotel industry. Scandinavian Journal of Hospitality and Tourism 6 (3), 179–196.
Mei, A.W.O., Dean, A.M., White, C.J., 1999. Analyzing service quality in the hospitality industry. Managing Service Quality 9 (2), 13–143.
Molinari, L.K., Abratt, R., Dion, P., 2008. Satisfaction, quality and value and effects on repurchase and positive word-of-mouth behavioral intentions in a B2B services context. Journal of Service Marketing 22 (5), 363–373.
Nasution, H.N, Mavondo, F.T., 2008. Customer value in the hotel industry: what managers believe they deliver and what customer experience. International Journal of Hospitality Management 27 (2), 204–213.
Nunnally, J.C., 1978. Psychometric Theory. McGraw-Hill, New York.
Olorunniwo, F., Hsu, M.K., Udo, G.F., 2006. Service quality, customer satisfaction, and behavioral intentions in the service factory. The Journal of Services Marketing 20 (1), 59–72.
Oyewole, P., 1999. Multi-attribute dimensions of service quality in the fast food restaurant industry. Journal of Restaurant & Foodservice Marketing 3 (3/4), 65–91.
Parasuraman, A., Zeithaml, V.A., Berry, L.L., 1985. A conceptual model of service quality and its implications for future research. Journal of Marketing 49 (4), 41–50.
Parasuraman, A., Zeithaml, V.A., Berry, L.L., 1988. SERVQUAL: a multiple-item scale for measuring customer perceptions of service quality. Journal of Retailing 64 (1), 12–40.
Patton, M., Stevens, P., Knuston, B.J., 1994. Internationalizing LODGSERV as a measurement tool: a pilot study. Journal of Hospitality & Leisure Marketing 2 (2), 39–55.
Reich, A.Z., McCleary, K.W., Tepanon, Y., Weaver, P.A., 2005. The impact and service quality on brand loyalty: an exploratory investigation of quick-service restaurants. Journal of Foodservice Business Research 8 (3), 35–53.
Rust, R.T., Zahorik, A.J., Keiningham, T.L., 1995. Return on quality (ROQ): making service quality financially accountable. Journal of Marketing 59 (2), 58–70.
Sinaiko, H.W., Brislin, R.W., 1973. Evaluating language translations: experiments on three assessment methods. Journal of Applied Psychology 57 (3), 328–334.
Stevens, P., Knuston, B., Patton, M., 1995. DINESERV: a tool for measuring service quality in restaurant. Cornell Hotel and Restaurant Administration Quarterly 36 (2), 56–60.
Stan, S., Evans, K.R., Wood, C.M., Stinson, J.J., 2007. Segment differences in the asymmetric effects of service quality on business customer relationships. Journal of Service Marketing 21 (5), 358–369.
Suzuki, Y., Tyworth, J.E., 1998. A theoretical framework for modeling sales–service relationships in the transportation industry. Transportation Research E 34 (2), 87–100.
Suzuki, Y., Tyworth, J.E., Novack, R.A., 2001. Airline market share and customer service quality: a reference-dependent model. Transportation Research Part A 35 (9), 773–788.
Taiwan Census Bureau, 2008. Annual Report on Population Statistics. Government Printing Office, Taipei, Taiwan.
Tarn, D.C., 2005. Marketing-based tangibilization for services. The Service Industries Journal 25 (6), 747–772.
Turel, O., Serenko, A., 2006. Satisfaction with mobile services in Canada: an empirical investigation. Telecommunications Policy 30, 314–331.
Tversky, A., Kahneman, D., 1991. Loss aversion in riskless choice: a reference-dependent model. Quarterly Journal of Economics 106, 1039–1061.
Weiss, R., Feinstein, A.H., Dalbor, M., 2004. Customer satisfaction of theme restaurant attributes and their influence on return intent. Journal of Foodservice Business Research 7 (1), 23–41.
White, S.S., Schneider, B., 2000. Climbing the commitment ladder: the role of expectations disconfirmation on customers' behavioral intentions 2 (3) 240–253.
Wilkins, H., Merrilees, B., Herington, C., 2007. Towards an understanding of total service quality in hotels. International Journal of Hospitality Management 26 (4), 840–853.
Woodside, A.G., Delozier, M.W., 1976. Effects of word of mouth advertising on consumer risk taking. Journal of Advertising 5 (4), 12–19.
Zeithaml, V.A., 1988. Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. Journal of Marketing 52 (3), 2–22.
Zeithaml, V.A, Berry, L.L., Parasuraman, A., 1996. The behavioral consequences of service quality. Journal of Marketing 60 (2), 31–46.