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THE ROLES OF THE PHYSICAL ENVIRONMENT, PRICE PERCEPTION, AND CUSTOMER SATISFACTION IN DETERMINING CUSTOMER LOYALTY IN THE RESTAURANT INDUSTRY

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This research aims to examine the relationships among three components of the physical environment (i.e., décor and artifacts, spatial layout, and ambient conditions), price perception, customer satisfaction, and customer loyalty in the restaurant industry. A total of 279 cases from a survey were used to assess overall fit of the proposed model and test hypotheses using structural equation modeling. The three factors of the physical environment strongly influenced how customers perceived price, and this price perception, in turn, enhanced customer satisfaction level and directly/indirectly influenced customer loyalty. Décor and artifacts were the most significant predictors of price perception among the three components of the physical environment. Furthermore, both price perception and customer satisfaction played significant partial/complete mediating roles in the proposed model. The paper provides potential ways for restaurateurs to increase customer loyalty by improving their understanding of the roles of physical environment, price perception, and customer satisfaction.

KEYWORDS: *physical environment; price perception; customer satisfaction; customer loyalty; restaurant industry*

The benefits of creating and maintaining customer loyalty among existing customers have been investigated in many fields. Researchers agree that firms reduce marketing costs and increase profits by enhancing customer loyalty (Bowen & Chen, 2001). Loyal customers are more likely than nonloyal customers to engage in positive word-of-mouth (WOM) behaviors and spend extra money in a specific service operation (Ladhari, Brun, & Morales, 2008; Tepeci,

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1999; Yang & Peterson, 2004). In addition, loyal customers are less costly to serve because they know the product/service well and require less information (Reichheld & Sasser, 1990). Thus, in recent years, service providers have focused on achieving customer loyalty by delivering superior value and by identifying and enhancing the important factors that determine loyalty (McDougall & Levesque, 2000; Parasuraman & Grewal, 2000; Yang & Peterson, 2004). These efforts are all based on the desire to retain customers longer, thereby increasing overall sales and profits.

First and foremost, customer loyalty depends largely on customer satisfaction (Fornell, Johnston, Anderson, Cha, & Bryant, 1996; Ladhari et al., 2008; McDougall & Levesque, 2000). Thus, a large body of research in services marketing has focused on identifying the factors that enhance customer satisfaction level. Research suggests that ultimately, customer satisfaction is strongly influenced by physical surroundings and price perception (Dube, Johnson, & Renaghan , 1999; Knutson & Patton, 1995; Ryu, 2005; Varki & Colgate, 2001). Unlike buyers of tangible products, service customers are limited to a small number of cues to evaluate their overall experience because of the intangible nature of service (Nguyen & Leblanc, 2002; Reimer & Kuehn, 2005). In many cases, price and the physical environment (e.g., décor and artifacts, spatial layout, and ambient conditions) are the only tangible cues available (Bitner, 1992; Zeithaml, 1981). Thus, from the service provider's point of view, the physical environment and reasonable price are two essential elements that determine the level of customer satisfaction, and ultimately enhance customer loyalty (Bolton & Lemon, 1999; Nguyen & Leblanc, 2002; Reimer & Kuehn, 2005; Ryu & Jang, 2007; Varki & Colgate, 2001).

Despite indications that tangible physical environment, perceived price, and customer satisfaction are essential components in explaining the formation of customer loyalty, surprisingly little research in the service literature, particularly the restaurant sector, has examined the roles of these variables in forming customer loyalty. Additionally, to best of our knowledge, no empirical research has yet verified the relationships between multicomponents of the physical environment (i.e., décor and artifacts, spatial layout, and ambient conditions) and price perception, and the possible influence of such relationships on customer satisfaction and customer loyalty in the service sector. Furthermore, the role of price perception in increasing the level of satisfaction and in forming loyalty still remains unclear both empirically and theoretically. Thus, the combined effect of the elements that make up customer loyalty in the restaurant industry should be empirically tested to create an overall conceptual model.

The primary objective of this study, therefore, was to investigate the relationships among three components of the physical environment (décor and artifacts, spatial layout, and ambient conditions), price perception, customer satisfaction, and customer loyalty. For additional tests to better understand the mechanism behind the relationships between antecedents and outcome variables in the conceptual framework, this study also examined the mediating role of price perception in the relationships between customer satisfaction and the three dimensions

of the physical environment and assessed the mediating effect of customer satisfaction on the relationship between price perception and customer loyalty in the restaurant industry.

REVIEW OF THE LITERATURE

The Physical Environment

According to research in environmental psychology, human behavior is strongly associated with the physical environment (Mehrabian & Russel, 1974; Russel & Pratt, 1980). Specifically, Mehrabian and Russel's (1974) theory indicated that individuals generally react to the environment in two opposite ways: approach and avoidance. Whereas approach behaviors can be seen as positive responses to the environment of a place (e.g., desire to stay, work, and affiliate), avoidance behaviors can be described as negative responses (e.g., a desire not to stay, work, and affiliate). Firms apparently want to enhance individual approach behaviors and decrease avoidance behaviors (Bitner, 1992). In recent years, the importance of the physical environment in influencing behaviors has been verified in many consumer behavior studies (Reimer & Kuehn, 2005; Wakefield & Blodgett, 1996). Findings in these studies indicated that making the atmosphere more pleasant and innovative is essential for a firm's success.

The role of the physical environment in influencing customer behaviors and in creating a provider's image is especially pertinent in a service industry such as the restaurant industry (Booms & Bitner, 1982). Indeed, customers consciously (or unconsciously) sense the physical surroundings before, during, and after the meal when dining out in a restaurant. While the food and the service must be of acceptable quality, pleasing physical surroundings, such as décor, artifacts, layout, and music may determine, to a large extent, the degree of overall customer satisfaction and subsequent customer behavior. That is, customers may respond to more than just the quality of the food and service when evaluating their experience and building their attitudes toward a provider. Kotler (1973) indicated that, in some situations, the atmosphere of the place can be as much important as the product itself (e.g., foods and services) in purchasing decision making. Creative use of physical design in a restaurant operation would be essential in enhancing specific marketing objectives such as positive customer perception of quality, positive evaluation of experience, and positive attitudes.

In her investigation of the impact of physical surroundings on customers and employees, Bitner (1992) used the term *servicescape* to describe "the built environment" or, more specifically, "the man-made, physical surroundings as opposed to the natural or social environment" (p. 58). In her study, physical surroundings included all of the objective physical factors that can be controlled by service firms to enhance customer (or employee) internal (e.g., cognition, emotion, and satisfaction) and external responses (e.g., staying, repatronage, and approach). Similarly, in our study, the physical environment refers to the man-made physical setting/conditions, which can be controlled by restaurateurs, as opposed to the natural environment.

In many theoretical and empirical studies, researchers have identified the essential factors of the physical environment, such as décor and artifacts, spatial layout, and ambient conditions that are particularly pertinent to the service industry (e.g., Nguyen & Leblanc, 2002; Raajpoot, 2002; Wakefield & Blodgett, 1999). These three factors have been frequently included in most research related to the physical environment and are the most adequate dimensions of the physical environment for customer behavior study in service settings (Nguyen & Leblanc, 2002; Raajpoot, 2002; Wakefield & Blodgett, 1999).

Décor and artifacts. Décor and artifacts contribute to the attractiveness of the physical environment (Wakefield & Blodgett, 1994). While customers remain inside a restaurant, they are likely to evaluate consciously and subconsciously the pleasant appearance of the interior designs of a restaurant as well as the quality of the materials used in construction, artwork, and decoration. Their evaluations of the attractiveness and overall aesthetic impression are influenced by various aspects of interior schemes as well as artifacts (Bitner, 1992). In a restaurant, the color schemes of the dining area's walls, ceiling/wall decorations, pictures/ paintings, plants/flowers, tableware (e.g., glass and silverware), linens (e.g., table cloths and napkin), floor coverings, and quality furniture (e.g., dining table and chair) can all play an important part in delivering an image and in creating an overall aesthetic impression. In addition, from a customer's viewpoint, these can be important environmental cues to evaluate their overall experience in an operation.

Spatial layout. The physical environment in service settings is the purposeful environment that exists to fulfill customers' specific needs and wants, so effective spatial layout of the physical surroundings is particularly important (Bitner, 1992). Spatial layout refers to the arrangement of objects, such as furniture and equipment, according to the needs of the service delivery process (Nguyen & Leblanc, 2002). Efficiency of layout in service settings facilitates the fulfillment of functional needs and affects the comfort of the customer (Wakefield & Blodgett, 1994). Spatial layout of the environment (e.g., table and seating arrangements) would be highly salient to customers in a restaurant where ample space is essential for moving around and sitting in comfort. An effective layout of the physical environment keeps restaurant customers from feeling crowded.

Ambient conditions. Ambient conditions are intangible background characteristics that generally have a subconscious effect on customer perceptions and responses to the environment (Baker, 1987; Nguyen & Leblanc, 2002). These conditions include elements (e.g., lighting, noise, music, scent, air quality, and temperature) that are considered background characteristics of the environment (Baker, 1987; Bitner, 1992). The ambient conditions of the physical environment in service settings encourage customers to pursue the service consumptions and consequently affect their attitudes and behaviors toward the provider (Hui, Dube, & Chebat, 1997; Nguyen & Leblanc, 2002). Pleasant scent, pleasing music,

comfortable temperature, low noise level, and adequate lighting, all harmonizing with other elements in a restaurant, may result in customers having more favorable perceptions of an operation and evaluating their experiences more positively.

Price Perception

Many studies in marketing suggest that the variability in product/service performance across different consumption experiences increases customer uncertainty. This uncertainty leads to decreased reliance on prior expectations of the product/service. In this situation, from the customer's point of view, price is often used as a cue in their expectations of the product/service performance (Dodds, Monroe, & Grewal, 1991; Mattila & O'Neill, 2003). Furthermore, customers tend to use price as a cue in evaluating their experiences with a product/service and in shaping their attitude toward a provider (Bolton & Lemon, 1999; Varki & Colgate, 2001). The role of the price in influencing customer behaviors would be more salient to the restaurant industry because customer experiences will not be identical; high human involvement while delivering services ensures differences in experience. This variability in restaurant services may foster the use of price as a cue of expectation, evaluation, and decision making.

Zeithaml (1988) defined price as "what is given up or sacrificed to obtain a product" (p. 10). Price is distinguished as objective price and perceived price (Jacoby & Olson, 1977). While objective price is the actual price of a product/service, perceived price indicates the price as encoded by the customer (Jacoby & Olson, 1977). It is important to note that the objective price of a product/service becomes meaningful to the customer after the customer's subjective interpretation (Oh, 2000). A firm in a particular type of restaurant industry offers a wide variety of products/services, and the prices of these products vary widely. The complexity of such a pricing environment makes it inappropriate to use the objective price of a product in determining the role of price (Chen, Gupta, & Rom, 1994). Customers do not know/remember the actual price of a specific product/service, but they encode the price in ways that are meaningful to them (Zeithaml, 1983). Customer price perception rather than actual price, therefore, was used in this study.

Customer Satisfaction

Customer satisfaction is a central concept in marketing because it is crucial to meeting the needs and wants of customers (Spreng, Mackenzie, & Olshavsky, 1996; Yi, 1990). Firms deliver a product as well as satisfaction to customers, and obtain profits in return (Yi, 1990). While customer satisfaction has been defined in many ways, researchers generally agree that an evaluation process is an essential element underlying customer satisfaction (Yi, 1990). Hunt (1977) defined satisfaction as "an evaluation rendered that the consumption experience was at least as good as it was supposed to be" (p. 459). Based on previous theoretical and empirical evidence, Engel and Blackwell (1982) conceptualized

satisfaction as "an evaluation that the chosen alternative is consistent with prior beliefs with respect to that alternative" (p. 501). These conceptualizations all suggest that customer satisfaction is an overall judgment process of the perceived discrepancy between prior expectation and actual consumption.

Customer Loyalty

Some researchers suggest that customer loyalty comprises both a behavioral dimension and an attitudinal dimension (Julander, Magi, Jonsson, & Lindqvist, 1997; Kandampully & Suhartanto, 2000). While the behavioral dimension considers consistent repeat patronage or repeat purchase frequency, the attitudinal dimension considers psychological (decision-making or evaluative) commitment toward the store/brand (Julander et al., 1997; Kandampully & Suhartanto, 2000). That is, loyalty is a consequence of consistent repeat patronage/repeat purchase frequency of a single store/brand as well as favorable attitude.

However, in recent years, many researchers have emphasized the overall disadvantage of including the behavioral dimension in assessing the level of customer loyalty (Back, 2005; Dick & Basu, 1994; Getty & Thompson, 1994; Tepeci, 1999). The behavioral dimension disregards decision-making processes, which do not differentiate brand loyalty from simple repeat purchasing behavior (Dick & Basu, 1994). That is, repeat purchases are not always the outcome of a psychological (decision-making or evaluative) commitment to the brand/store (Tepeci, 1999). Furthermore, measuring customer loyalty with the behavioral dimension included frequently involves improper multiplication of attitudinal and behavioral attributes (Back, 2005).

Especially in the hospitality industry, the attitudinal approach to assessing the level of customer loyalty should be more focused (Back, 2005; Schall, 2003). Unlike the manufactured (or consumer good) industry, repeat purchase frequency would not be an adequate indicator of customer loyalty because loyalty in the hospitality field involves attitudinal and emotional commitment to a provider/brand (Schall, 2003). Many customers have multiple memberships in various branded restaurants or hotels (Mattila, 2001). Repeat purchases may not always indicate that the customer keeps on recommending or maintaining a favorable attitude toward the provider (Bowen & Chen, 2001). Accordingly, in this study, the attitudinal approach was used to assess restaurant customer loyalty by specifically gauging a particular range of potential behaviors triggered by overall experiences in a specific restaurant. Once a customer is deeply committed or has strong intentions to repurchase, recommend, and spend more, he/she is likely to remain loyal to a company (Getty & Thompson, 1994).

Research Hypotheses

Although the specific link between the physical environment and price perception has not been clearly verified in the service sector, some empirical findings, related to perceived value and quality, and theoretical schemes support the relationship. Environmental psychology literature notes that customers of a service firm tend to respond to dimensions of their physical surroundings

emotionally/physiologically as well as cognitively (Bitner, 1992). In particular, a firm's physical surroundings elicit emotional/physical responses as well as cognitive responses such as customer beliefs/perceptions (Bitner, 1992; Golledge, 1987). In a cognitive viewpoint, the physical environment is described as a form of nonverbal communication, which is also called object language (Rapoport, 1982). As an example, many environmental clues (e.g., type of office furniture, décor, artifacts, appearance of assistants and lawyer) in a lawyer's office can deliver messages to clients (Bitner, 1992). That is, these environmental clues affect a potential client's beliefs or perceptions about whether a lawyer's service is reliable or unreliable, the price for the lawyer's service is reasonable or unreasonable, and the lawyer is successful or unsuccessful (Bitner, 1992). It would be similar in the restaurant industry. Because customers in the restaurant industry pursue an entertaining or pleasurable atmosphere to enhance their dining experience and their expectations about physical environments are high (Raajpoot, 2002; Ryu, 2005), various environmental cues in a restaurant could also affect customer cognitive beliefs. Thus, in a competitive market environment, restaurant operators strive to create innovative and exciting designs that set them apart from the competition (Hamaker, 2000; Raajpoot, 2002). Indeed, the physical setting of a restaurant may enable customers to cognitively evaluate, categorize, and distinguish among similar types of restaurants (Bitner, 1992).

The logic underlying the relationship between the physical environment and perceived value also supports the link between physical environment and price perception. Various nonverbal cues in the physical environment (e.g., décor, furniture, layout, and ambience) communicate to a customer that the service offering's nature and value, including service prices, are reasonable during an initial visit (Nguyen & Leblanc, 2002). In investigating business traveler behaviors in luxury hotel settings, Mattila (1999) found that a hotel's physical environment, including the guest room, is important to a customer's value perception. This value is comparison/tradeoff between perceived quality/benefits in the product/service and the price paid (sacrifice) (Monroe, 1990). Accordingly, the significant relationship between physical surroundings and price perception can be inferred in that this value perception is highly associated with the perceived reasonableness of the price a customer pays to get the benefits (Oh, 2000).

Another research track supporting the relationship between physical environment and price perception is derived from the link between perceived quality and price. Chen et al.'s (1994) findings in three service sectors (a fast food restaurant, an airline, and a long-distance phone company) claimed that perceived quality affects value perception, and the perception of good value for the money leads to the perception of a reasonable price. Oh (2000) indicated that customer perception of reasonable price is likely to be combined with positive functions of brand awareness and perceived quality, such as the overall excellence or superiority of service/product. In these studies, the tangible physical environment was the important dimension of perceived quality. Thus, it can be posited that physical environments in a restaurant are positively associated with price perception.

Hypothesis 1: Décor and artifacts have a positive effect on price perception.
Hypothesis 2: Spatial layout has a positive effect on price perception.
Hypothesis 3: Ambient conditions have a positive effect on price perception.

Many previous empirical studies have shown how the physical environment influences customer satisfaction and predicts postpurchase behaviors (Hui et al., 1997; Knutson & Patton, 1995; Mattila & Wirtz, 2001; Wakefield & Blodgett, 1994). In examining customer behaviors in the restaurant industry, Knutson and Patton (1995) found five essential components of service quality and stressed the importance of physical surroundings, such as décor and artifacts, in influencing customer satisfaction and postpurchase behavior. Dube et al. (1999) found that quality of service involving physical surroundings such as guest room design/cleanliness correlated highly with guest satisfaction in the hotel industry. Wakefield and Blodgett's (1994) findings suggested that service/ retail facilities, specifically designed to add some level of excitement or arousal to the service experience, as in an upscale/family restaurant, should provide ample space to facilitate exploration and stimulation within physical surroundings. This effective layout induces a positive customer evaluation of overall consumption experiences. Hui et al. (1997) noted that creating favorable ambience such as playing music in the (service) environment is like adding a favorable feature to a product (or service), and the likely outcome is a more positive evaluation of the environment. Mattila and Wirtz (2001) investigated the main effect of matching ambient stimuli on consumer behaviors in retail settings. Their findings indicated that the matching ambient stimuli, specifically when ambient scent and music are congruent in quality, led to high evaluations of the store environment, high satisfaction level, and favorable behavioral responses.

Services often deliver benefits that are intangible and difficult to predict/ assess before actual purchase/consumption. For example, some restaurant services (e.g., food quality) cannot be anticipated and judged until those elements have been experienced. Thus, restaurant customers try to overcome their uncertainty by seeking and selecting one or more indicators (cues/stimuli) to help them predict and evaluate the overall dining experience. Innovative and exciting physical designs may provide important clues for predicting and positively evaluating their dining experiences in a restaurant.

Hypothesis 4: Décor and artifacts have a positive effect on customer satisfaction.
Hypothesis 5: Spatial layout has a positive effect on customer satisfaction.
Hypothesis 6: Ambient conditions have a positive effect on customer satisfaction.

Although empirical support for the price perception–satisfaction and price perception–loyalty links is scant in the restaurant industry literature, much recent research has attempted to verify the specific role of price perception in explaining consumer behaviors in marketing (Bolton & Lemon, 1999; Ranaweera & Neely, 2003; Varki & Colgate, 2001). Bolton and Lemon (1999) examined the impact of price perception on customer use of cellular phone and entertainment

services. Price perceptions were evaluated as fair or unfair. Their findings indicated that customer perceptions of price fairness/unfairness (payment equity) significantly affected their overall satisfaction and behavioral intentions in both industries. Using empirical data from the banking industry in New Zealand and the United States, Varki and Colgate (2001) tested the role of price perception in explaining customer postpurchase behaviors. Their findings indicated that whereas price perception measured on an absolute scale was not a significant predictor of satisfaction and behavioral intentions for the U.S. sample, price perception assessed on a comparative basis was significantly associated with customer satisfaction, likelihood of doing more business, and recommending the bank for the New Zealand sample. Customer feelings about the reasonableness of price may capture evaluated price perception (Martins & Monroe, 1994). According to Sirohi, McLaughlin, & Wittink (1998), this affects customer loyalty. Moreover, price perception may be a way to enhance a firm's profit level as well as a customer's level of satisfaction, and increasing the perception that price is reasonable is also highly associated with both customer retention and firm success (Ranaweera & Neely, 2003). Hence, based on these theoretical and empirical supports, it can be inferred that price perception is a significant driver of customer satisfaction and loyalty in the restaurant industry.

> *Hypothesis 7:* Price perception has a positive effect on customer satisfaction.
> *Hypothesis 8:* Price perception has a positive effect on customer loyalty.

Many researchers have provided empirical evidence of a positive relationship between customer satisfaction and loyalty (Cronin & Taylor, 1992; Fornell et al., 1996). Fornell et al.'s (1996) findings indicated that enhancing satisfaction level contributed to building customer loyalty in terms of repurchase likelihood and price tolerance given repurchase. Cronin and Taylor's (1992) findings revealed that satisfaction is a critical determinant of positive behavioral intentions in various service sectors (e.g., fast food, banking, and dry cleaning). Whereas the possible outcomes, when dissatisfied consumers have the ability (or motivation) to act, are to complain to the provider, to switch to another provider, and to spread negative WOM, satisfied customers are likely to remain loyal to the provider by engaging in positive WOM behaviors, by repatronizing the service/product, by spreading positive WOM, and by spending more (Fornell et al., 1996; McDougall & Levesque, 2000). Although using satisfaction is not the only strategy, a fundamental way to improve customer loyalty is to enhance customer satisfaction levels. Thus, a major component in any customer loyalty program in the restaurant industry is satisfaction.

> *Hypothesis 9:* Customer satisfaction has a positive effect on customer loyalty.

Figure 1 shows the conceptual model of the relationships among three components of the physical environment, price perception, customer satisfaction, and customer loyalty.

Figure 1
Conceptual Model
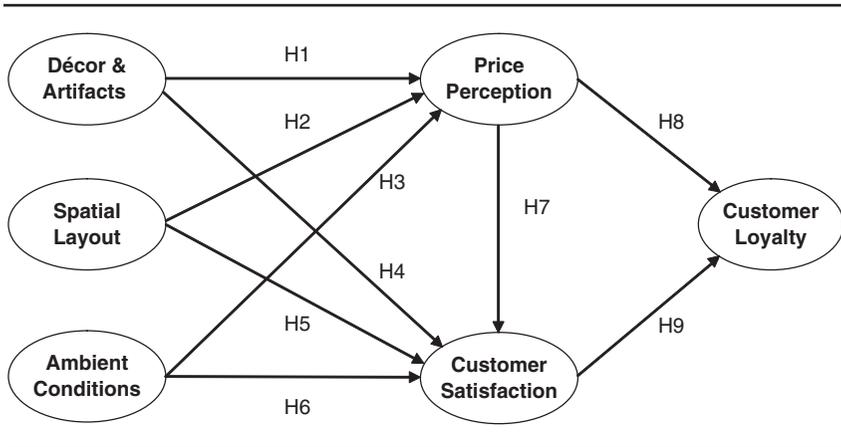
METHOD

Measurements

The study constructs were all measured with multiple items closely following previous studies (Bitner, 1992; Garbarino & Johnson, 1999; Mehrabian & Russel, 1974; Nguyen & Leblanc, 2002; Oh, 2000; Wakefield & Blodgett, 1996; Zeithaml, Berry, & Parasuraman, 1996). Three components of the physical environment were measured with 17 items using a 7-point Likert-type scale. Specifically, décor and artifacts were assessed using 8 items (i.e., paintings/ pictures, plants/flowers, ceiling décor, wall décor, colors, quality of furniture, quality of floor, and the linens/tableware), spatial layout was assessed using 3 items (i.e., overall layout, table/seating arrangements, and seating comfort), and ambient conditions were assessed using 6 items (i.e., lighting, background music, air quality, temperature, aroma, noise level). Price perception was measured with two items using a 7-point Likert-type scale (e.g., "The price at this restaurant is reasonable"). A 7-point Likert-type scale with three items was used to measure customer satisfaction (e.g., "Overall, I am satisfied with this restaurant"). Finally, customer loyalty was assessed using a 7-point Likert-type scale with three items (e.g., "I would like to come back to this restaurant in the future").

Data Collection

A field survey approach was used in this study. The data were collected from customers at three full-service restaurants, which offer acceptable ambience in northwestern and southeastern states in the United States. A convenience sampling approach was used. A total of 475 questionnaires were distributed to restaurant customers. After deleting incomplete responses, 279 cases were coded for data analysis, representing an effective response rate of 58.74%. Among 279

responses, male customers represented 40.6%; female respondents represented 59.4%. Approximately 39.8% were younger than 30 years of age, 34.6% were between the ages of 31 and 50 years, and 25.6% were older than 51 years. Their average age was 38.61 years.

Analysis

The collected data were analyzed using SPSS for Window 11.0 and AMOS 5. Following the procedure suggested by Anderson and Gerbing (1988), a measurement model was estimated before the structural model. A confirmatory factor analysis (CFA) was used to assess the measurement model and to test data quality, including reliability and construct validity checks. structural equation modeling (SEM) was conducted to assess overall fit of the proposed model and test hypotheses. The partial/full mediating roles of price perception and customer satisfaction were investigated through modeling comparisons following the procedure suggested by Baron and Kenny (1986).

RESULTS

Item Purification and Measurement Model

Prior to analysis, the data were screened to ascertain if there were any violations of the assumptions underlying the general linear model. Results of evaluation of assumptions using univariate tests of normality led to transformation of the variables to reduce skewness. Because all variables showed significant negative skewness, a square root transformation was used on these variables. Tests for multivariate outliers revealed four significant cases, Mahalanobis's $D(25) > 52.62$, $p < .001$. These cases were excluded from further analyses, leaving a final sample of 275 cases. Examination of residual scatterplots and normal-probability plots did not reveal any further violations of normality, linearity, or homoskedasticity.

To refine all measures for the structural model, a measurement model was estimated using the maximum likelihood estimation method. The initial 25 items developed for measurement were subjected to a CFA. Based on the results of the CFA, four items were deleted because of low factor loadings and low squared multiple correlations. Specifically, a total of 2 items of décor and artifacts (i.e., "Flooring is of high quality" and "The linens and tableware are attractive") and 2 items of ambient conditions (i.e., "Air quality is good" and "Noise level is unpleasant") were removed. The results of CFA on the remaining 21 items showed an excellent fit to the data ($\chi^2 = 360.88$, $df = 174$, $p < .001$, $\chi^2/df = 2.074$, root mean square error of approximation [RMSEA] = 0.063, comparative fit index [CFI] = 0.991, normed fit index [NFI] = 0.982), and the measurement model fit was significantly improved ($\Delta\chi^2 = 311.42$, $\Delta df = 86$, $p < .001$). Consequently, this measurement model was used for all further analyses.

A reliability test was conducted to assess internal consistency of multiple indicators for each construct. As shown in Table 1, because all values of

Table 1
Standardized Confirmatory Factor Loadings

Factors	Cronbach's α	Standardized Factor Loadings
Décor and artifacts	.89	
Paintings/pictures are attractive		.76
Plants/flowers make me feel happy		.74
Ceiling décor is attractive		.66
Wall décor is visually appealing		.82
Colors used create a warm atmosphere		.85
Furniture (e.g., dining table, chair) is of high quality		.74
Spatial layout	.83	
Overall, layout makes it easy for me to move around		.79
Table/seating arrangement gives me enough space		.88
Seating arrangement makes me feel comfortable		.72
Ambient conditions	.87	
Lighting creates a warm atmosphere		.87
Background music is pleasing		.96
Temperature is comfortable		.78
Aroma is enticing		.57
Price perception	.71	
The price at this restaurant is reasonable		.78
The price charged by this restaurant is appropriate		.71
Customer satisfaction	.92	
Overall, I am satisfied with this restaurant		.84
I have really enjoyed myself at this restaurant		.91
Overall feeling I get from this restaurant puts me in a good mood		.92
Customer loyalty	.88	
I would like to come back to this restaurant in the future		.94
I would recommend this restaurant to my friends or others		.96
I am willing to spend more than I planned at this restaurant		.68

Cronbach's alpha estimates were between .71 and .92, multiple measures in this study are reliable for assessing each construct (Nunnally, 1978). A construct validity test was conducted using the factor loadings within the constructs, average variance extracted (AVE), and the correlation between constructs. As shown in Table 1, all standardized factor loadings emerged fairly high, ranging from .57 to .96. This showed that the measurement had convergent validity (Anderson & Gerbing, 1988). As shown in Table 2, convergent validity was also indicated because all AVE values exceeded Hair, Anderson, Tatham, and Black's (1998) suggested cutoff of .50. Fornell and Larcker (1981) indicated that discriminant validity exists when the proportion of variance extracted in each construct exceeds the square of the coefficient representing its correlation with other constructs. All AVE values were greater than the squared correlations between constructs, indicating adequate discriminant validity.

**Table 2
Measure Correlations, the Squared Correlations,
and Average Variance Extracted (AVE)**

| Measure | Correlations Between Latent Constructs (Squared)[a] | | | | | | AVE |
	Décor and Artifacts	Spatial Layout	Ambient Conditions	Price Perception	Customer Satisfaction	Customer Loyalty	
Décor and Artifacts	1.00						.58
Spatial layout	.47 (.22)	1.00					.64
Ambient conditions	.41 (.17)	.45 (.20)	1.00				.65
Price perception	.68 (.46)	.57 (.32)	.50 (.25)	1.00			.57
Customer satisfaction	.75 (.56)	.57 (.32)	.49 (.24)	.83 (.69)	1.00		.79
Customer loyalty	.55 (.30)	.47 (.22)	.45 (.20)	.74 (.55)	.80 (.64)	1.00	.76
Mean	5.27	5.68	5.54	5.61	5.98	5.96	
SD	0.97	0.99	0.88	0.99	0.94	1.10	

a. Correlation coefficients are estimates from AMOS 5. All were significant at .01 level. Model measurement fit: $\chi^2 = 360.88$ ($df = 174$, $p < .001$), root mean square error of approximation [RMSEA] = 0.063, comparative fit index [CFI] = 0.991, normed fit index [NFI] = 0.982.

Structural Model Comparisons

Structural equation modeling to assess the proposed conceptual model was conducted using the maximum likelihood estimation method. Chi-square value of the model ($\chi^2 = 486.62$, $df = 180$, $p < .001$) and other goodness of fit indices (RMSEA = 0.079; CFI = 0.985; NFI = 0.976) revealed that the model fit the data reasonably well. This proposed structural model was then compared with the alternative model. Recent research in several fields supports the direct relationship between the physical environment and customer postpurchase behavior (Knutson & Patton, 1995; Wakefield & Blodgett, 1994, 1996). Thus, in the comparison model, the direct effects of three components of the physical environment on customer loyalty were considered by adding the three paths from décor and artifacts, spatial layout, and ambient conditions on customer loyalty. The results showed that the chi-square value was 480.91 ($df = 177$, $p < .001$), the CFI was .985, NFI was .976, and RMSEA was .079. In comparing this model with the hypothesized structural model, no significant differences appeared ($\Delta\chi^2 = 5.71$, $\Delta df = 3$, $p > .05$). That is, adding the direct paths from the three components of physical environments to customer loyalty did not significantly improve the model fit. In addition, whereas the indirect effects of décor and artifacts ($\beta_{DA-PP/CS-CL} = .49$, $t = 9.10$, $p < .01$), spatial layout ($\beta_{SL-PP/CS-CL} = .23$, $t = 5.41$, $p < .01$), and ambient conditions ($\beta_{AC-PP/CS-CL} = .19$, $t = 4.71$, $p < .01$) on customer loyalty in the proposed model were all significant, the added paths in the comparison model were all insignificant at the level of .05. Thus, the original model was kept for further analyses.

Table 3
Structural Parameter Estimates

Hypothesized Path	Coefficient	t Value	Result
Hypothesis 1:	.54	6.40**	Supported
Décor and artifacts → Price perception			
Hypothesis 2:	.29	3.69**	Supported
Spatial layout → Price perception			
Hypothesis 3:	.27	3.60**	Supported
Ambient conditions → price perception			
Hypothesis 4:	.33	4.06**	Supported
Décor and artifacts → Customer satisfaction			
Hypothesis 5:	.12	1.78	Not supported
Spatial layout → Customer satisfaction			
Hypothesis 6:	.06	1.03	Not supported
Ambient conditions → Customer satisfaction			
Hypothesis 7:	.56	5.11**	Supported
Price perception → Customer satisfaction			
Hypothesis 8:	.24	2.08*	Supported
Price perception → Customer loyalty			
Hypothesis 9:	.56	5.06**	Supported
Customer satisfaction → Customer loyalty			
R^2			
Price perception	.45		
Customer satisfaction	.70		
Customer loyalty	.59		
Goodness-of-fit statistics			
$\chi^2(180)$	486.62, $p < .001$		
χ^2/df	2.703		
RMSEA	0.079		
CFI	0.985		
NFI	0.976		

Note: RMSEA = root mean square error of approximation; CFI = comparative fit index; NFI = normed fit index.
*$p < .05$. **$p < .01$.

Empirical Testing of Hypothesized Paths

Hypotheses were tested based on the proposed structural model. The fit of the model indicated that the conceptual model is parsimonious and fits well (see Table 3), so it provides a good basis for testing the hypothesized paths. The parameter estimates were assessed using the maximum likelihood estimation. Figure 2 presents standardized path coefficients and t values for the proposed conceptual model.

Hypotheses 1, 2, and 3 were supported, indicating customer price perception was a positive function of the physical environment. The relationships between each component of the physical environment and price perception were all significant (Hypothesis 1, $\gamma_{11} = .54$, $t = 6.40$, $p < .01$; Hypothesis 2, $\gamma_{12} = .29$, $t = 3.69$, $p < .01$; Hypothesis 3, $\gamma_{13} = .27$, $t = 3.60$, $p < .01$). The three components of the

Figure 2
Results of Structural Equation Model
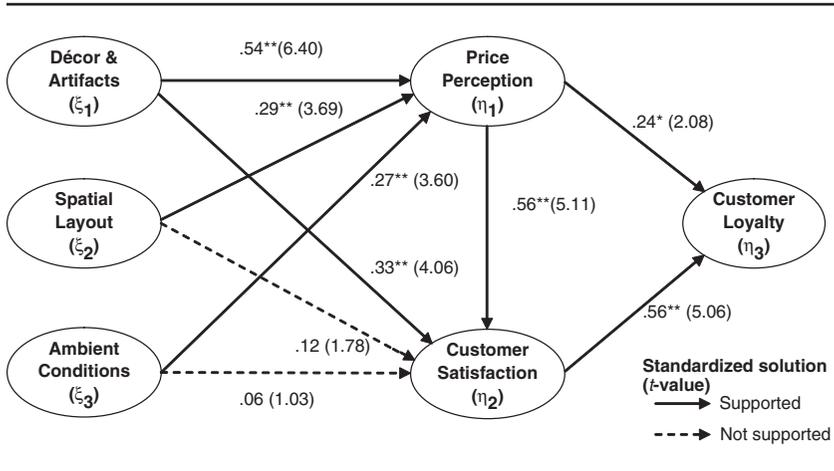
$*p < .05. **p < .01.$

physical environments accounted for 45% of variance in price perception. The findings suggest that a restaurant firm should carefully design the physical environment to improve the customer's perceived reasonableness of the price.

Simply comparing the standardized correlation coefficients and t values is not enough to verify statistical difference between strengths of paths. Thus, the Fisher test was conducted to decide whether standardized coefficients (γ_{11}, γ_{12}, and γ_{13}) have statistically different strengths. This test is an intensive way to compare paths in terms of strength. Two standardized correlation coefficients among three were compared using Fisher's Z transformation in sequence. The results indicated that the path from décor and artifacts to price perception had a significantly different strength from the other two paths ($p < .001$). Moreover, the correlation coefficient and t value of this variable ($\gamma_{11} = .54$, $t = 6.40$) were greater than the others ($\gamma_{12} = .29$, $t = 3.69$; $\gamma_{13} = .27$, $t = 3.60$). Thus, we can conclude that décor and artifacts was the most significant predictor of price perception among the three components of the physical environment. Two correlation coefficients (spatial layout → price perception vs. ambient condition → price perception) showed no significant differences in strength ($p > .05$).

Décor and artifacts had a significant positive effect on customer satisfaction (Hypothesis 4, $\gamma_{21} = .33$, $t = 4.06$, $p < .01$), supporting Hypothesis 4. However, spatial layout and ambient conditions had no significant direct effects on customer satisfaction (Hypothesis 5, $\gamma_{22} = .12$, $t = 1.78$, $p > .05$; Hypothesis 6 $\gamma_{23} = .06$, $t = 1.03$, $p > .05$). These results showed the significant mediating role of price perception in the relationships between spatial layout/ambient conditions and customer satisfaction. Thus, Hypotheses 5 and 6 were not supported. Moreover, the results also show that price perception had a positive effect on customer satisfaction (Hypothesis 7, $\beta_{21} = .56$, $t = 5.11$, $p < .01$), supporting Hypothesis 7. This finding

indicated that customer satisfaction level increases when price is considered reasonable. The three components of physical environments and price perception explained 70% of the variance in customer satisfaction.

Finally, the direct effect of price perception and customer satisfaction on customer loyalty was statistically significant (Hypothesis 8, $\beta_{31} = .24$, $t = 2.08$, $p < .05$; Hypothesis 9, $\beta_{32} = .56$, $t = 5.06$, $p < .01$), supporting Hypotheses 8 and 9. This result was consistent with previous findings that price perception and satisfaction are significant predictors of customer loyalty (Bolton & Lemon, 1999; Ranaweera & Neely, 2003; Varki & Colgate, 2001). Both price perception and satisfaction accounted for 59% of the total variance of customer loyalty.

Mediation Analysis

Further analysis tested the mediating role of price perception between customer satisfaction and the three components of physical environment. The proposed model was reestimated by constraining the direct effect of price perception on customer satisfaction (set to zero). In comparing this constrained model ($\chi^2 = 529.84$, $df = 181$, $p < .001$) to the original model ($\chi^2 = 486.62$, $df = 180$, $p < .001$), chi-square differed significantly ($\Delta\chi^2 = 43.22$, $\Delta df = 1$, $p < .001$), thus indicating the proposed model (mediating model) fit was significantly better. In particular, the mediating role of price perception between décor and artifacts and customer satisfaction was investigated. In the mediating model, γ_{11}, β_{21}, and γ_{21} were significant; thus the proposed model met Baron and Kenny's (1986) first three conditions for testing mediation. Their next condition would be satisfied if the parameter estimate between décor and artifacts and customer satisfaction in the mediating model is less strong (partial mediation) or insignificant (full mediation) compared with the parameter estimate in the constrained model. Because the direct path from décor and artifacts to satisfaction in the mediating model is less strong ($\gamma_{21} = .33$, $t = 4.06$, $p < .01$) than the path in the constrained model ($\gamma_{21} = .65$, $t = 8.96$, $p < .01$), price perception was a partial mediator. Furthermore, the mediating role of price perception between spatial layout/ambient conditions and satisfaction was tested. The direct paths from spatial layout/ ambient conditions to satisfaction were not significant ($\gamma_{22} = .12$, $t = 1.78$, $p > .05$; $\gamma_{23} = .06$, $t = 1.03$, $p > .05$; Hypotheses 5 and 6), and the other two essential conditions were met in the mediating model (Baron & Kenny, 1986). Because the paths from spatial layout/ambient conditions to satisfaction were significant in the constrained model ($\gamma_{22} = .29$, $t = 4.75$, $p < .01$; $\gamma_{23} = .21$, $t = 3.76$, $p < .01$), price perception can be regarded as a full mediator in the relationships between spatial layout/ambient conditions and customer satisfaction.

In the same way, when testing the mediating role of customer satisfaction, the mediating model was re-estimated by setting the direct effect of price perception on customer loyalty to zero ($\chi^2 = 496.67$, $df = 181$, $p < .001$). Because β_{21}, β_{32}, and β_{31} were significant, Baron and Kenny's (1986) first three conditions were met. The direct path in the constrained model was stronger ($\beta_{31} = .80$, $t = 12.30$, $p < .01$) than the path in the mediating model ($\beta_{31} = .24$, $t = 2.08$, $p < .05$). In addition, the mediating model fit was significantly better than the constrained

model ($\Delta\chi^2 = 10.05$, $\Delta df = 1$, $p < .01$). Thus customer satisfaction did indeed act as a partial mediator in the relationship between price perception and loyalty. This finding implies that price perception has both direct and indirect effects on customer loyalty.

DISCUSSION AND IMPLICATIONS

Our research has provided empirical evidence of the development of customer loyalty in the restaurant industry through the physical environment, price perception, and customer satisfaction. A total of nine hypotheses were developed and tested using structural equation modeling. Of the nine hypotheses, seven were upheld (Hypotheses 1, 2, 3, 4, 7, 8, and 9). However, two of them were not supported because price perception completely mediated the effects of spatial layout and ambient conditions on customer satisfaction (Hypotheses 5 and 6). In particular, décor and artifacts, spatial layout, and ambient conditions had a significant effect on price perception. Whereas décor and artifacts significantly influenced customer satisfaction itself, spatial layout and ambient conditions did not have a direct effect on satisfaction. Price perception proved to be an important predictor of satisfaction, directly/indirectly influencing customer loyalty.

This study extends and moves beyond the previous research in several ways. First, the current study examined the formation of customer loyalty by adopting a multidimensional view of the physical environment and by integrating price perception. Although a number of studies have examined the role of the physical environment and price perception in explaining consumer behaviors (Hamaker, 2000; Kim, Lee, & Yoo, 2006; Oh, 2000; Varki & Colgate, 2001; Wakefield & Blodgett, 1996), consumer research has neither verified the physical environment–price perception relationship nor explored the possible influence of such relationship on subsequent consumer behaviors. The findings emphasize the importance of the physical environment, price perception, and customer satisfaction in understanding how customer loyalty develops. For researchers, the demonstrated relationships between such variables offer insight into how customers develop their intentions to revisit, recommend, and spend more than they planned. Thus, researchers in the restaurant industry should incorporate such constructs into loyalty studies (e.g., loyalty theory building).

Second, unlike much prior research, this study tested the effects of mediating variables using structural model comparisons, following Baron and Kenny's (1986) suggested steps. Little research has considered price perception and customer satisfaction together as mediators. As the results of structural model comparisons indicated, this study empirically supported the proposed full-mediating loyalty model, which contradicts the findings in prior research (e.g., Knutson & Patton, 1995; Wakefield & Blodgett, 1994, 1996). Although many researchers have attempted to verify the influence of the physical environment on customer postpurchase behavior (e.g., Hui et al., 1997; Knutson & Patton, 1995; Wakefield & Blodgett, 1999), an unresolved issue in consumer behavior research was

whether the physical environment influences outcome variables directly or indirectly. According to Bitner's (1992) conceptual framework, customers in a specific service firm cognitively, emotionally, and physiologically respond to their physical surroundings. That is, the perceived quality of the physical surroundings indirectly causes customers to behave in certain ways because of their internal responses. Consistent with Bitner's (1992) theoretical framework, our results revealed that all components of the physical environment indirectly influenced customer approach behavior, which is congruent with aspects of customer loyalty in this study, through customer cognitive response (i.e., price perception) and satisfaction. Thus, in this study, the indirect effect of the physical environment on outcome variables was evident in a restaurant setting. This result goes beyond the previous research that has mainly focused on the direct influence of the physical environment on outcome variables.

Third, only a few research studies have considered the different levels of importance among the components of the physical environment in predicting outcome variables. In addition, unlike much prior research that has tended to use standardized coefficients or t values to compare the strengths of regression paths, the current study employed the Fisher test to identify the difference in terms of strengths of paths. The importance of the décor and artifacts was statistically verified through this intensive way. The results from the current study suggest that research in other segments of the restaurant industry should also examine the different level of importance among the dimensions of the physical environment. For example, spatial layout would be more important than other components in the quick-service/quick-casual restaurant segments because customers in such segments tend to value convenience.

Managerial Implications

The results of the current study also have implications for restaurant marketers and managers. First, price perception simultaneously influenced customer satisfaction and customer loyalty. Therefore, restaurateurs must provide customers with reasonableness of perceived price. One management approach is to offer high or, at least, appropriate quality of physical environment to customers, as indicated by the findings in this study. In addition, restaurateurs might control the perception of price by successful menu pricing. Consumer perception of price reasonableness in a restaurant primarily depends on menu price. Customers are not willing to revisit a restaurant when they believe that the prices on the menu are unreasonably high (Kim et al., 2006). Thus, providing pleasing and innovative atmosphere and high quality of service/food to restaurant customers is necessary to improve price perception.

Second, décor and artifacts, spatial layout, and ambient conditions had a significant independent role in forming customer loyalty. Particularly, décor and artifacts proved to be a stronger predictor of price perception than the other two components. Elements of décor and artifacts (e.g., ceiling/wall décor, furniture/floor, plants/flowers, and painting/pictures) are likely to differentiate a specific restaurant firm from its competitors (Menon & Kahn, 2002). Restaurateurs,

therefore, should allocate resources primarily for fascinating décor and artifacts of the physical dining environment. For ambience and spatial layout, management can control the physical elements representing ambience (e.g., background music, light, aroma, temperature) and spatial layout (e.g., seating arrangement) with little expense. For example, restaurateurs can easily control background music, varying its volume (loud to soft), genre (classical or jazz), and tempo (fast to slow) based on customer preferences. Restaurateurs should carefully consider such physical elements related to ambience as a marketing and operational tool to induce positive cognitive reactions and to improve customer experiences with their restaurants.

Finally, as previously discussed, both price perception and customer satisfaction were important mediating variables in the conceptual model, and both price perception and customer satisfaction showed high effect on customer loyalty. In particular, price perception was a mediating variable between customer satisfaction and the three components of physical environment. Price perception fully mediated the effect of spatial layout and ambient conditions and partially mediated the effect of décor and artifacts on customer satisfaction judgment. This indicated that the effect of physical environment on customers' evaluation of their experiences is maximized when they perceive the price paid for services is appropriate. Little research has been done on the verification of the mediating role of price perception. This finding suggested that price perception could be a useful concept to both researchers and restaurant marketers whose primary strategies focus on creating pleasant or exciting physical surroundings and thus increasing customer satisfaction to build customer loyalty. Furthermore, customer satisfaction appears to be a partial mediator in the relationship between price perception and customer loyalty. This finding supports the results of the previous study that customer satisfaction is an important summary of customer decision-making processes (Mooradian & Olver, 1997). Customers may perceive that the price is reasonable at a specific restaurant, and they may positively evaluate their experience with the restaurant. However, they may still not hold strong behavioral intentions unless they are satisfied with their experience at the restaurant. Overall, to maximize the positive impact of price perception on customer loyalty, restaurateurs should enhance customer satisfaction levels.

Limitations and Future Research

This study has several limitations. Data from this study were collected from customers in only two states, using a convenience sampling approach. Thus, caution is needed in generalizing our results to other restaurants in different geographic locations. Higher external validity of the study results can be achieved by sampling a wider range of customers at different geographical locations. Thus, for future study, developing a systematic design that better represents the population is strongly recommended. In addition, the variables can be more accurately measured when the participants are manipulated under a research control. Thus, instead of the field survey approach, an experimental study can be

also conducted as another research approach to examine the effect of multicomponents of the physical environment in the future study.

The total number of samples used for the data analysis in the present study (275 cases) was greater than the absolute minimum sample size, which exceeds the number of correlations/covariances in the input data matrix, and greater than Hair et al.'s (1998) recommended size ranging from 200 to 400 when using SEM with the maximum likelihood estimation method. However, Hair et al. (1998) argued that a minimum ratio of five cases for each estimated parameter is more typically considered to be adequate. Considering the number of estimated parameter in this study (72), the sample size was relatively small. Thus, increasing sample size is recommended for future study to more appropriately estimate the study model.

This study focuses only on the relationships between physical environment, price, customer satisfaction, and loyalty. The proposed model can be extended to include social interaction theory and various customer internal responses. Research indicates that all social interactions such as customer and employee interactions and relationship formation in interpersonal services are highly affected by environmental conditions (Bennett & Bennett, 1970; Bitner, 1992). In addition, customers' perceived physical environment elicits emotional and physiological responses, and a cognitive response to physical surroundings may also influence emotional and physiological responses (Wakefield & Blodgett, 1994). For example, according to a stimulus–organism–response paradigm (Mehrabian & Russel, 1974), the environment creates an emotional response in individuals, which in turn elicits either approach or avoidance behavior. Thus, for future study, including the social interaction theory and various internal responses in the proposed model may enrich a marketer's understanding of how customer loyalty develops in the restaurant industry.

The moderating roles of personal and situational factors in forming customer loyalty were not considered in the present study. Many researchers of consumer behavior have indicated that, in all behavioral relationships, the strength of the relationship between variables is influenced by personal characteristics (e.g., individual personality traits, gender, ethnic background, income, and education) and situational characteristics (e.g., an individual's plan or purpose for being in the environment; Evanschitzky & Wunderlich, 2006; Mehrabian & Russel, 1974). Hence, for future study, examining the potential effects of personal and situational factors would provide additional insight into the relationships among study constructs and would make an interesting extension of this study.

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