

Full Length Research Paper

The effect of atmosphere on customer perceptions and customer behavior responses in chain store supermarkets

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This study aims at exploring the theme of creating and managing store atmosphere of chain store supermarket from customer's point of view. The findings from the study indicate: (1) The customer-perceived factors of store atmosphere of supermarket include 6 factors in 3 categories, that is, design factors, ambient factors (including intangible factors and visual stimulus) and social factors (including image of service personnel, image of other customers and environmental crowding); (2) Store atmospheric factors have significant positive correlation with customer approach behaviors, design factors being the most significant impact among all factors. Store atmospheric factors will influence not only customer emotions but also customer cognitive valuations of commodities and services. Customer cognitive valuations and emotional responses will affect customer approach behaviors significantly; meanwhile, customers' cognitions and emotional responses will moderate the impact of store atmosphere on customer behaviors partially; (3) Customers with various characteristics (including different shopping planning, time urgency, environmental familiarity etc.) have significant differences in customer perceptions and behaviors in general. Finally, this study proposes specific suggestions and measures of how to create a pleasant store atmosphere in chain store supermarket according to results of empirical analyses.

Key words: Chain store supermarket, store atmosphere, customer perception, approach-avoidance behaviors.

INTRODUCTION

Along with the trends toward brand internationalization, retail industrialization, and diversification of consumption behaviors come changes in how people shop. One of the ways in which the shopping experience is changing is that more consumers are turning their attention to the question of whether shopping itself is a pleasant experience or just a chore. Baker et al. (1992) point out that, when retailers begin to find it extremely difficult to gain advantages in terms of product, price, promotion,

and place (channel), the store itself becomes an opportunity for market differentiation. It is no surprise that brand loyalty is important in the retail industry (Kau and Ehrenberg, 1984); retailers are working toward strengthening the environment in their stores in order to create a store atmosphere that can make consumers more loyal.

Sirgy et al. (2000) suggest that the overall atmosphere of a store can create a favorable consuming context and generate positive perceptive emotions about the store among consumers. Store environmental factors can influence the subjective feelings experienced by consumers in the store and influence the shopping intention, consumption amount, perceived quality, satisfaction, and shopping value (Babin and Attaway, 2000). A pleasant

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store atmosphere can prolong the time consumers spend in the store, increasing the likelihood that the consumer will find something he or she needs, as well as increasing impulse buying.

Mehrabian and Russell (1974) propose the stimulus-organism-response (S-O-R) model, which indicates that the external physical environment can influence an individual's internal state and behaviors (approach or avoidance). Donovan and Rossiter (1982) and Baker et al. (1992) were the first to employ the S-O-R model to study the impact of store atmosphere on customers' perceptions and patronage decision. Although many scholars have studied the relationship between store atmosphere and customer behaviors, most consider only the impact of specific environmental factors (e.g., background music, indoor temperature, odor) on customer shopping.

However, the purchase process involves a complete experience, so a particular environmental factor can hardly be separated from the overall environment as having an impact on consumer perceptions and behaviors independently. Moreover, the extant single-factor studies apply primarily the experimental method, which is easy to control but the limitations of the experiment itself, which may not accurately reflect the real customer purchase psychology, may result in loss of and misreading of information.

At present, the profit margins of chain store supermarkets are relatively low, so they are concerned about how to provide shopping experiences that make a positive impression on customers, increase the length of their time in the store, and increase their consumption amounts. To find the answer to these queries, it is necessary to determine the impact that the external shopping environment has on customer shopping behaviors and how the store atmosphere should be managed to satisfy consumer demands and stimulate their perceptions and behaviors. These are the objectives of this study.

In pursuing these objectives, this study first explores the influencing mechanism of store atmosphere in chain store supermarkets on customer's cognitive valuations (product value perceptions, service quality perceptions), emotional responses (positive emotions and negative emotions), and approach-avoidance behaviors. Second, the study discusses the impact of cognitive valuations and emotional responses on customer shopping behaviors.

Finally, the study examines the impact of store atmospheric factors on customer perceptions and behaviors as they relate to different customer characteristics (planning level, urgency, and environmental familiarity).

LITERATURE REVIEW

This study took chain store supermarket as the survey object of retail industry. Following is the description of theories and models relevant to the research topic and

structure.

Store atmosphere

Environmental psychology model

Mehrabian and Russell (1974) proposed the S-O-R environmental psychology model, providing three dimensions that could describe the emotional states: Pleasure, arousal and dominance (PAD). The combinations of these three different emotions result in different behavioral consequences, making a person to decide whether to remain in a specific environment, that is, to decide the behavior he adopts is approach or avoidance. Donovan and Rossiter (1982) utilized S-O-R model and took retail stores as testing objects to study the relationship between environmental stimulus and behavioral intention by two emotional dimensions- pleasure and arousal. The finding was the emotions of pleasure and arousal initiated by environment would increase customers' spending of extra time and money by 12% in average; meanwhile, their interactive intentions with on-site service personnel also increased.

According to the research of Engel et al. (1986), at least half of the shopping behaviors of supermarket consumers belong to impulse buying. Welles (1986) found that 9 out of 10 consumers going shopping would have impulse buying. Ahtola's (1985) study indicated that it was estimated that about 50% consumers bought without plans, so they were easy to carry out impulse buying. By exploring the causes, he discovered that the reason was consumers increased their perceptual perceived value due to the influence of store atmosphere. The study of Bellenger et al. (1978) on department stores found that 27 to 62% of all sales belonged to impulse buying. They also discovered that the more frequently a consumer visited a store, the more possible he would purchase. Therefore, how to make use of store atmosphere to initiate perceptual consumer emotion is very important. Singh (2006) introduced customer experience value on the basis of S-O-R and took it as the foundation of customer perceptions and valuations to explore how the environmental perceptions and valuations of customers with different shopping motives (utilitarian and hedonic motivation) affected their shopping behaviors. He found that same environment would bring about different impacts on customers with different shopping motives: Customers with hedonic motives focused on both the realization of shopping purpose and the pleasure of shopping experience while customers with utilitarian motives paid more attention to whether the environment could promote highly-efficient accomplishments of their tasks.

Classification of store atmosphere factors

The disadvantage of Mehrabian and Russell's (1974)

S-O-R model was it did not establish explicit classification system for environmental stimulus variables. Baker (1986) considered that the design of business environment could produce unique emotional impacts in customers' minds and could increase buying possibilities. He divided environmental factors into three categories: (1) Ambient cues, that is, the ambient conditions that could influence customers potentially, such as attributes of temperature, music, noise and lighting; (2) Design cues, referring to those aesthetic feelings that could be perceived by customers directly, including style, layout and architectural etc.; (3) Social cues, referring to factors related to people in the environment, including customers and store employees. The number, type and behavior of people are proposed to influence customers' perceptions of stores.

Bitner (1992) separated physical environment into three categories: (1) Ambient conditions, that is, the intangible background features in the environment, including background music, noise, temperature, lighting and odor etc., which would affect people's perceptions; (2) Spatial layout and functionality. Spatial arrangement means the layout of mechanical equipments, facilities, furnitures and furnishings etc. as well as their spatial correlations; (3) Signs, symbols and artifacts, that is, signboards used for communicating with customers directly or indirectly and the decorations/designs for store image.

Berman and Evans (2009) made revisions and supplements to Bitner's (1992) conclusions. They summarized environmental factors into four categories including the exterior of the store, the general interior, the layout and design variables, and the point-of-purchase and decoration variables. Turley and Milliman (2000) extended Berman and Evans' (2009) method of classification by adding Human variables, dividing the 58 kinds of environmental stimulus variables into 5 categories: (1) External variables, including exterior signs, entrance, exterior display window, architectural style and surrounding area; (2) General interior variables, including flooring and carpeting, lighting, scents, music, temperature, cleanliness, wall composition and color schemes; (3) Layout and design variables, including space design and allocation, placement of equipments, grouping of merchandise, waiting rooms, waiting ques and furniture; (4) Point-of-purchase and decoration variables, including products displays, point-of-purchase displays, signs and cards, artwork, and price displays; (5) Human variables, including employee characteristics, employee uniforms, crowding, customer characteristics and privacy.

Customer perception

Customer perceived value

Customer perceived value refers "value is the consumer's overall assessment of the utility of a product based on

perceptions of what is received and what is given" (Zeithaml, 1988). Monroe (2002) defined it as "Buyers' perceptions of value represent a tradeoff between the quality or benefits they perceive in the product relative to the sacrifice they perceive by paying the price". Woodruff (1997) interpreted it as "customers' evaluation of attributes and performance of products for achieving their goals". Mathwick et al. (2001) considered it was "a kind of cognitive status of consumers on product attribute and service performance, facilitating or hindering the realization of consumers' goals by interaction".

In the approach of measuring customer perceived value, Woodruff (1977) used three dimensions including "economic benefits", "cognitive benefits" and "emotional benefits" for the measurement; Grewal et al. (1998) considered that two cognitive dimensions could be divided, that is, "acquisition value" and "transaction value"; Holbrook (1996) measured by three dimensions: (1) Extrinsic value and intrinsic value; (2) Self-oriented value and other-oriented value; (3) Active value and passive value. Mathwick et al. (2001) took "economy" and "experience" as two measuring dimensions. Though the names used by the aforementioned scholars are different, their intentions all focus on "customer perception" and "customer benefit".

Shopping process will bring different experiences to customers; meanwhile, the values of products or services are different due to the positions customers locate in during the processes of shopping experience (Hirschman and Holbrook, 1982). In order to establish a long, stable and sound relationship with target customers, retail enterprises should provide customers with more complete experience values (Spiegelman, 2000). The shopping value under a retail context should include tangible shopping results and intangible value perceptions as well as customer emotions. Customers' shopping behaviors should be considered from the acquisition view of overall experience value. Babin and Darden (1995) thought that experience value provided two kinds of benefits for customers, that is, external and internal benefits. The former was to acquire concrete benefits from shopping, for example, the commodity purchased and the service enjoyed etc; the latter referred to the preference of the purchasing experience itself and the type of preference was related to no results of experience (Holbrook, 1994).

From the aforementioned, researches on customer perceived value mainly focus on cognitive value and emotional perception, as complies with the opinions of store atmosphere, that is, customers will perceive the impact of store atmosphere from cognitive and emotional dimensions and then make decisions in adopting what kind of shopping behaviors.

Customers' consumption emotion

In a shopping process, the consumption environment

customers locate in will affect him and he will develop different emotional responses by combining his demand and motives. Laros and Steenkamp (2005) sorted out the recent customer studies that took consumption emotion as a variable and concluded the emotion scales and consumption emotion structures applied by every research: Mehrabian and Russell's (1974) PAD (pleasure, arousal and dominance) emotion scale, Izard's (1997) differential emotions scale (DES) and Plutchik's (1980) eight primary emotion types. After employing these three kinds of representative emotion scales together in the measurement and comparison of consumption shopping, Machleit (2000) found that the performance of Izard's (1997) and Plutchik's (1980) emotion scales were better than Mehrabian and Russell's (1974) PAD scale, because the former two provided more emotional features and PAD scale could not measure the emotional responses caused by interpersonal interaction sufficiently, even worse to infer customers' specific emotions clearly. Moreover, Izard's (1997) and Plutchik's (1980) emotion scales were divided into positive emotions and negative emotions after factor analysis. Such divisions are same to the results of literature review of Laros and Steenkamp (2005), that is, most literatures studying emotions take positive and negative emotion as the classification standard.

On the basis of positive and negative emotion classification, Shaver et al. (1987) suggested that consumption emotion could be combined and aggregated to form a hierarchal structure. He developed the classification system of consumption emotions, showing emotions should be classified in three levels: (1) Superordinate level: Positive and negative emotions; (2) Basic level: Fundamental and major emotions; (3) Subordinate level: Specific and secondary emotions. Laros and Steenkamp (2005) continued previous studies, trying to integrate a hierarchal consumption emotion model. They took the consumption emotion set (CES) developed by Richins (1997) as a basis, separating all consumption emotions into two kinds first: Positive and negative, below each were four basic level emotions, further below each basic levels were specific subordinate level emotions. Richins (1997) particularly emphasized three points when using emotion scales: (1) The measure should cover the range of emotions most frequently experienced in a wide range of consumption situations, and it should measure these emotions with an acceptable level of reliability; (2) The measure should be brief enough that it could be used in surveys or field studies; (3) The emotion descriptors in the measure should be words that are familiar to and readily understood by consumers.

Customer cognitive valuation

The store atmosphere that customers locate in during the process of shopping will stimulate them. They will witness

and perceive many environmental clues, collecting and obtaining all clues in their minds to form impressions unconsciously. Such a perception process is very important because customers will first acquire specific expectations on products and services from the perception process before they carry out actual shopping behaviors (Kotler, 1973). The stimulus in store atmosphere will provide important information to customers; customers will infer the information such as price, product, service quality etc. of the retail store according to this information (Baker et al., 2002). Most of the previous studies on store atmosphere ignored the importance of cognitive valuation, discussing the impact of environmental stimulus on individual emotional reactions and behaviors directly (Lin, 2004). However, more and more scholars consider consumption behavior as a decision-making process of perception. They think the variables of customer perception will also influence customer behaviors; some scholars have begun to utilize perception process in S-O-R model, with the intention of learning about the impact of perception in the studies of store atmosphere. The following is the discussion regarding literatures of cognitive valuation.

Patterns of customer cognitive valuation on store atmosphere: Bitner's (1992) service scapes model was the earliest theoretical model that involved the concept of perception in store atmosphere. It considered that in store atmosphere, customers would have perceptual, emotional and psychological reactions against the environment he was in; these three kinds of reactions would have effects on customer behaviors. To customers, store atmosphere could provide the clues of products and services and create real-time impression of perception in customer minds (Kotler, 1973); customers would establish beliefs on ambient store atmosphere and take the beliefs as the basis of determining commodity and service quality (Bitner, 1992).

Sweeney and Wyber (2002) considered that customers' emotional and perceptual reactions must be considered at the same time if exploring the impact of store atmosphere stimulus on customers. The findings showed that emotional condition and perceptual process could interfere with the impact of musical stimulus on approach-avoidance behaviors at the same time. The characteristics of the model were to add the impact of cognitive process onto traditional S-O-R model, taking commodity and service quality as the measurement of cognitive process.

The identification and measurement of customer cognitive valuation: Parasuraman (1997) pointed out that driven factors of customer cognitive value included product quality, service quality and price factor. This research achievement has received universal recognition from the academia. Among the aforementioned three factors, service quality is more difficult to be duplicated by

competitors than product quality and price. Therefore, how to present the optimal service quality becomes the source of sustainable competitive advantage of an enterprise. Other scholars made supplement to the aforementioned, for example, the maintenance of brand equity and customer relationship (Ravald and Grönroos, 1996) and so on.

Ulaga and Chacour (2001) divided the customer cognitive value drivers into three dimensions: (A) Product-related components, e.g., consistency of products, product characteristics, range of products and ease of use etc; (B) Service-related components, e.g., reliability and speed of supply, technical support/application and quick service/response etc.; (C) Promotion-related components, e.g., image, corporate identity, personal relations and reliability of supplier etc.

Sweeney and Soutar (2001) developed the PERVAL scale that can measure customer perceived value, consisting of 19 indicators in 4 categories. This scale aims at evaluating customer perception of value on long-term brand level. This kind of measuring method is to determine the consumption value that can result in transaction attitude and behaviors in the retail transaction environment. It forms four independent value dimensions, that is, emotional, social, quality/performance and price/value for money. Except for emotional, the other three are contents of customer perceived value.

Customer behavioral responses

In Mehrabian and Russell's (1974) S-O-R model, customer behavioral responses are customer's intentions of approaching or avoiding certain environment, which is called approach-avoidance behaviors. Customer's behavioral response to consumption environment can be sorted into two categories; one is approach while the other is avoidance. Approach behavior means to approach certain environment, stay, explore, interact and identify in it, having good impression on the environment and holding the intention to return to that environment again. Avoidance behavior is just the opposite: To express dissatisfaction, worry, boringness and irritableness to the environment, hoping to leave from the environment without any intention to return. Customers' responses depend on the extent initiated by environment and can be used to predict customer emotions and their responses to environment.

Regarding the relationships between approach-avoidance behaviors and other variables, early studies have shown that customer behaviors in store atmosphere are brought about by the feelings and emotions that customers develop in the environment (Donovan and Rossiter, 1982; Mehrabian and Russell, 1974). Therefore, customer behavioral responses to different environment are originated from different emotions. Mehrabian and Russell (1974) divided people's emotional responses to

environmental signals into three dimensions: Pleasure, arousal and dominance (PAD). Different combination of the three emotions leads to different behavioral results, which make a person to determine whether to remain in a certain specific environment, that is, to determine the behavior he adopts is approach or avoidance.

Under a retail context, Donovan and Rossiter (1982) applied S-O-R model to study the impact of emotion on customers' presence behaviors. They considered: (1) In general conditions, appropriate arousal level can promote customer to accepting behaviors, but either excessively high or excessively low arousal level will make customers take avoidance behaviors; (2) In pleasant environment, arousal level and customers' accepting extent have positive correlation; (3) In unpleasant environment, arousal level and avoidance behavior have positive correlation. Wakefield and Blodgett (2002) discovered that customer's good emotional status had positive correlation with the duration of their stay, the quantity of their shopping commodity and the amount of their consumption. The dominance of environment can significantly affect customers' buying behaviors, which will not only impact the theories of retail enterprises, but also correlate closely with customer loyalty. Therefore, making use of physical environment to regulate customers' positive emotions and initiate their accepting behaviors becomes the issue concerned intensely by retail enterprises. Baker et al. (1986, 1992) studied the connection between physical environment and customer psychological status. Baker et al. (1992) considered that an individual's emotional response to environment revealed the ability the environment regulated emotions, that is, the extent that customer perceives pleasure and arousal in the environment. They examined the impacts of two kinds of environmental factors on customers' emotional assessments and found that surrounding environment factors (replaced by background music) affected the extent of customer pleasure along with social factors (replaced by store service staff); while the extent of arousal that social factors influenced customers complied with the opinions of S-O-R model in their findings, that is, customer emotions on store environment had important moderate effect on buying behaviors.

Bitner (1992) firstly introduced the opinion of cognitive valuation into S-O-R model, proposing that customers would make use of environmental information to infer and value the commodity and service quality as well as the behaviors they should perform. He thought that store atmosphere provided the non-language communication between retail stores and customers: Retail stores presented commodity and service information to customers through the design of store atmosphere while customers would sort the retail store into a certain type according to their perception on the environment and thus form an overall impression to apply as the standard of purchase decisions. In contrast to researches of emotions, the study of how environment has effect on customer's

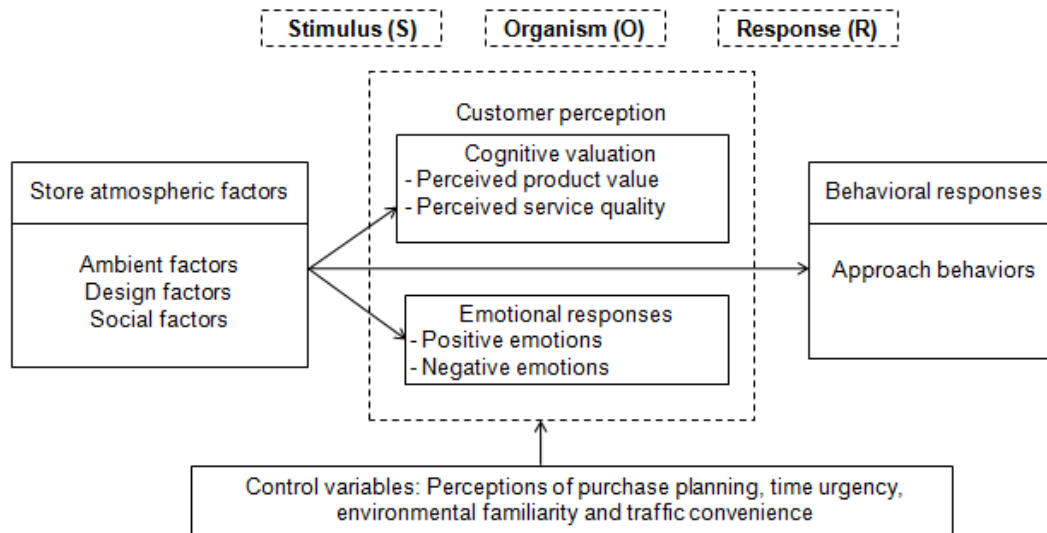


Figure 1. Research structure.

cognitive valuations and further influences customer buying behaviors has just begun. Therefore, taking cognitive valuation as a critical customer perception factor to study the impact of environment on customer behaviors becomes the emphasis of this study.

METHODS AND PROCEDURES

Research structure

Based on Mehrabian and Russell's (1974) S-O-R model, this study extended the model by blending cognitive valuation process, with the purpose of exploring how store atmosphere of domestic chain store supermarkets influences consumers' cognitive valuations and perceived emotions, and further affects their shopping behaviors. The research structure is shown in Figure 1.

Research hypotheses

From the foregoing discussions on literature review, inference and research structure, this study intends to explore the relationship among every variable in practical context, so as to acknowledge the relationship among shopping environment of chain store supermarket, customers cognitive valuation, customer emotional response and customer behavioral response. Research hypotheses are shown in Table 1.

Questionnaire design and sampling survey

In the questionnaire design, all parts except basic personal data applied Likert's five-point scale, with a closed form of structured questionnaire. The contents included five parts: The first part was basic personal data, including customer's gender, age, educational level, job category, monthly visits to supermarkets and monthly income etc.; the second part was the store atmosphere measurement of chain store supermarket, the measurement scale mainly adopting Baker's (1987) division of store atmosphere-design, ambient and social factors. Additional adjustments were performed

with reference to the comprehensive study of Turley and Milliman (2000) along with the conclusions from on-site observations and interviews in supermarkets; The third part was the measurement of customer cognitive valuation; this study took the two fundamental cognitive valuations proposed by Baker et al. (2002) as basis, mainly including the customer perceptions of commodity value and service quality; meanwhile adding the valuation items on commodity quality and price proposed by Dodds et al. (1991) and finally receiving eight total items; The fourth part was the measurement of customer emotional responses. This study adopted Laros and Steenkamp's (2005) hierarchical consumption emotion scale, separating all consumption emotions into positive and negative emotions. The reason of not applying PAD emotion scale in Mehrabian and Russell's (1974) model was mainly because in PAD emotion scale, customers could not identify the difference between pleasure and arousal; instead, they just identified emotions from the angle of "good" or "bad". It was clearer if interpreting the influencing effect of emotion by using positive and negative emotions; the fifth part was the measurement of customers' approach behaviors, Mehrabian and Russell (1974) thought that all behaviors could be categorized into approach behaviors or avoidance behaviors. This study made use of the revised scale proposed by Sweeney and Wyber (2002) on the basis of Donovan and Rossiter (1982), expressing the approach behaviors under retail context as seven items including customer intentions of visiting, prolonging of going-around time, impulse buying, satisfactory experience and WOM recommendation behaviors etc. This study adopted convenience sampling as the sampling method. This study takes consumers that have been shopped in the three major chain supermarkets in Taiwan as respondents, choosing three branches in Taipei, Taichung and Kaohsiung for questionnaire survey respectively. The execution time was from January to March of 2009, with a release of 400 questionnaires and 358 responses. By deducting incomplete and unanswered questionnaires, there remained 268 valid samples and the effective response rate was 67%.

EMPIRICAL ANALYSES

Demographic analysis

According to the results of questionnaire responses, in terms of

Table 1. Hypotheses and verification results.

Hypothesis	Description	Result	
The impact of store atmosphere of supermarkets on customer approach behaviors	H ₁	Store atmosphere affects customer shopping behaviors	Supported
	H _{1a}	Design factors of store atmosphere have positive correlation with customer approach behaviors	Supported
	H _{1b}	Ambient factors of store atmosphere have positive correlation with customer approach behaviors	Supported
	H _{1c}	Social factors of store atmosphere have positive correlation with customer approach behaviors	Supported
The impact of store atmosphere on customer perceptions	H _{2a}	Store atmosphere factors will affect customer cognitive valuations	Supported
	H _{2a1}	Design factors of store atmosphere have positive correlation with customer cognitive valuations	Partially supported
	H _{2a2}	Ambient factors of store atmosphere have positive correlation with customer cognitive valuations	Partially supported
	H _{2a3}	Social factors of store atmosphere have positive correlation with customer cognitive valuations	Partially supported
	H _{2b}	Store atmosphere factors will affect customer emotional responses	Supported
	H _{2b1}	Design factors of store atmosphere have positive correlation with customer emotional valuations	Supported
	H _{2b2}	Ambient factors of store atmosphere have positive correlation with customer emotional valuations	Supported
The impact of customer perceptions on customer shopping behaviors	H ₃	Customer perceptions will affect customer shopping behaviors	Supported
	H _{3a}	Perceived commodity value of customer cognitive valuation has positive correlation with customer approach behaviors	Supported
	H _{3b}	Perceived service quality of customer cognitive valuation has positive correlation with customer approach behaviors	Supported
	H _{3c}	Positive emotions of customer emotional responses have positive correlation with customer approach behaviors	Supported
	H _{3d}	Negative emotions of customer emotional reactions have negative correlation with customer approach behaviors	Supported
The moderate effect of customer perception	H ₄	Customer perceptions will moderate the impact of store atmosphere on customer shopping behaviors	Partially supported
	H _{4a}	Customer cognitive valuations will moderate the impact of store atmosphere on customer shopping behaviors	Partially supported
	H _{4b}	Customer emotional responses will moderate the impact of store atmosphere on customer purchase behaviors	Partially supported
The impact of customer characteristics on customer perceptions and behaviors	H ₅	Under different strength of customer characteristics, customer perceptions and behaviors will have significant differences	Partially supported
	H _{5a}	Shopping planning has negative correlation with customer perceptions and behaviors	Partially supported
	H _{5b}	Time urgency has negative correlation with customer perceptions and behaviors	Not supported
	H _{5c}	Environmental familiarity has positive correlation with customer perceptions and behaviors	Supported
	H _{5d}	Transportation convenience has positive correlation with customer perceptions and behaviors	Supported

gender, the proportion of females (58.4%) was a little bit higher than that of males (41.6%); the distribution of age mainly fell between 31 and 40 (32.7%), then was 21 and 30 (28.5%); the educational level concentrated in university (college) (46.6%); the monthly income were mainly NT\$

20,001 to 40,000 (38.2%)(1US\$=NT\$33); job categories fell in service industries in a great amount (30.4%); presenting times of most subjects were more than once weekly (once to twice weekly occupying 44.8%, over thrice weekly occupying 41.4%), with a total of over 85%,

showing that shopping in supermarkets have become necessary daily activities of most people. Though regional factors determine that customers will only visit nearby supermarkets, because of customers' necessity and habituation of visiting supermarkets, retail operators can

enhance and promote customers' shopping behaviors by creating pleasant shopping experiences for them. The design and improvement of shopping environment will determine whether customers can perceive satisfactory shopping experiences and will have impact on their buying behavior intentions.

Factor analysis

This study made use of the sampling adequacy of Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity to measure and examine whether constructs of this study were fit for factor analysis. If KMO sampling adequacy value is bigger than 0.7 and the p-value of Bartlett test of sphericity is close to 0, factor analysis can be performed. The KMO values of constructs including store atmospheric factors, customers' emotional response and cognitive valuation factors, customers' shopping behavior factors in this study were 0.821, 0.849 and 0.783 respectively; meanwhile Bartlett's test of sphericity value achieved significant level, reflecting there were same factors which existed in the relevant matrix of parent population and fit for factor analysis.

Reliability analysis

There were totally twenty-two questions in the dimensions of store atmospheric factors of chain store supermarket and six factor dimensions were extracted after factor analysis. The attribute values of every factor dimension were all bigger than 1, with a cumulative total variance explained ratio of 70.707%. We also conducted Cronbach's α reliability analysis on three factor dimensions and found the values were all bigger than 0.7, showing that they had good reliability. The dimensions of factor analysis were named "design factors", "intangible factors", "visual stimulus", "image of service personnel", "image of other customers" and "environmental crowding" respectively.

There were totally fifteen questions in the dimensions of customer emotional response and cognitive valuation factors and four factor dimensions were extracted after factor analysis. The attribute values of every factor dimension were all bigger than 1, with a cumulative total variance explained ratio of 72.252%. We also conducted Cronbach's α reliability analysis on the four factor dimensions and found the values were all bigger than 0.7, showing that they had good reliability. The dimensions of factor analysis were named "perception of commodity value", "perception of service quality", "negative emotion" and "positive emotion", respectively.

There were totally seven questions in the dimensions of customer shopping behavior factors; one factor dimension was extracted after factor analysis and was named "approach behavior", indicating that either customers' shopping enjoyment, intention of presence, WOM recommendation or satisfactory experience reflected that customers' overall positive appraisal would form his active attitude/opinion of the supermarket and lead to behaviors favorable for the supermarket. These approach behaviors are actually results of customer recognition of the supermarket in nature.

Validity analysis

In terms of validity analysis, it is usually explored in two aspects: Content validity and construct validity. In content validity, the scale of this study was formulated by archiving literature contents and research results of many experts and scholars. Therefore, the scale could cover the requirements of the research theme adequately, that is, to have corresponding adequacy to the representativeness of scale content or to the process of the content formation. In

construct validity, this study adopted Kerlinger's (1986) measurement on construct validity, by examining the coefficient value of item to total. So long as the coefficient value is above 0.5, composite reliability (0.9 to 0.95) > 0.7, extraction variance (0.74 to 0.82) > 0.5, it can be a high validity. Therefore after factor analyses, this study showed that all items had high construct validity in general.

RESEARCH RESULTS

The evaluation system of store atmospheric factors of chain store supermarkets

The measurement scale of store atmosphere of chain store supermarket in this study mainly adopts Baker's (1986) classification of store atmosphere, including design factors, ambient factors and social factors. By referring to the comprehensive study of Turley and Milliman (2000) and combining with the conclusions of on-site observations as well as interviews in supermarket, this study makes adjustments to contents and extracts six factor dimensions after factor analyses. The attribute values of every factor dimension are all bigger than 1, with a cumulative total variance explained ratio of 70.707%. We also conduct Cronbach's α reliability analysis on three factor dimensions and find that the values are all bigger than 0.7, revealing good reliabilities. The factor analysis dimensions are named "design factors", "intangible factors", "visual stimulus", "image of service personnel", "image of other customers" and "environmental crowding" respectively.

The relationship among store atmosphere, customer perception and customer approach behaviors

The impact of store atmospheric factors on customer approach behaviors

It can be seen from Table 2 that all store atmospheric factors except environmental crowding have significant impact on customer approach behaviors, verifying hypothesis 1 of this study. Viewing from the extent of impact and the sequence of entering into regression equation, the factors are orderly design factors, intangible factors, image of service personnel, visual arousal and image of other customers. It explains that the design factor of store is the biggest environment factor that influences customer approach behaviors; its impact and interpretation strength is significantly higher than other factors, verifying hypothesis 1a. Intangible factors and image of service personnel, that is, music, noise, room temperature, clothing and attitude of service personnel are also regarded as important influencing factors by customers, verifying hypotheses 1b and 1c. The only environment factor that doesn't enter into stepwise regression equation is crowding perception.

Table 2. Regression analysis results of store atmosphere to customer approach behaviors.

Order of importance	Impact factor	Approach behavior	
		Regression coefficient	Adjusted coefficient of determination R ²
1	Design	0.483***	0.416
2	Intangible	0.277***	
3	Image of service personnel	0.245***	
4	Visual arousal	0.163***	
5	Image of other customers	0.161***	

* p< 0.1; **p<0.05; ***p< 0.01.

The impact of store atmospheric factors on customer perceptions

The impact of store atmospheric factors on emotions can be seen from Table 3. Empirical results show that store atmosphere can definitely impact customers' positive emotions significantly, verifying hypothesis 2b of this study. Among the factors, the most influential kind is ambient factors, including intangible factors and visual arousal, that is, music, noise, temperature, lighting and colors etc., which can imperceptibly influence customer emotions, enable customers to retain active and positive emotions as well as acquire pleasant experiences. This verifies the opinions of Bitner (1992), who thinks customer will always choose to avoid from unpleasant environment and approach to the environment that can makes him happy. By controlling factors such as lighting, music and flavor etc, retail operators can create a pleasant environmental atmosphere and make customers' shopping more relaxed and enjoying. Additionally, another factor that has great impact on customers' positive emotions is design factor, the decoration function of which can bring customers the enjoyment of aesthetics and happy moods. Aubert-Gamet (1999) also thinks retail operators can develop an attractive, delightful shopping environment for the store by displaying beautiful commodities, applying color match and furnishing delicately. The image of service personnel and their friendly attitude will also arouse customers' positive emotions, as it complies with the opinion of Wakefield and Blodgett (2002), who thinks if the service personnel is competent enough and has friendly attitude, they will make customers have pleasant feelings, thus have favorable impressions on the retail store. Among control variables, purchase planning and environmental familiarity will also influence customers' positive emotions significantly. Besides, what influence customer perceived service quality are mainly the image of service personnel, visual stimulus and environmental crowding, verifying hypothesis 2a of this study.

The impact of customer perception on customer approach behaviors

It can be told from Table 4 that among customer

perceptions, both cognitive valuations (including perceived service quality, perceived commodity value) and emotional responses (including positive and negative emotions) enter into regression equation; the adjusted coefficient of determination R² is 0.453, indicating that customer perception has significant impact on customer approach behaviors, verifying hypothesis 3. The order of importance is indicated in Table 4. Among the factors, positive emotion has the biggest impact on customer approach behaviors, confirming the opinions of former scholars, e.g., Donovan et al. (1982; 1994) considers pleasant emotions have significant positive correlation with customer approach behaviors; Stayman and Deshpande (1989) finds that customer's good emotional status has positive correlation with their time retaining in a store, the quantity of commodities they purchase and their consumption amounts; the negative correlation between negative emotions and customer approach behaviors is weaker than that between positive emotions and customer approach behaviors.

It can be concluded from the aforementioned analyses that the results received from efforts on store atmosphere management and promotion of positive emotions are much better than reducing the effects of negative emotions. Meanwhile, customer perceived commodity value and service quality both have significant positive correlation with customer approach behaviors, indicating commodity and service perception will influence their sense of satisfaction, impulse consumption behaviors, WOM recommendation and intention of repeated presence.

The moderate effect of customer perception

The study finds that under the moderate effect of customer cognitive valuation, the significance standard of the image of other customers and visual stimulus among store atmosphere factors reduce, showing that customer's cognitive valuation brings about moderate effect on the image of other customers and visual stimulus, verifying hypothesis 4a of this study partially. Moreover, this study discovers that, among store atmosphere factors, only the significance standard of visual stimulus declines while that of other factors have no apparent changes,

Table 3. Regression analysis results of store atmosphere to customer perceptions.

Order of importance	Positive emotion		Perceived service quality		Perceived commodity value	
	Impact factor	Regression coefficient	Impact factor	Regression coefficient	Impact factor	Regression coefficient
1	Intangible	0.294***	Image of service staff	0.490***	Design	0.262***
2	Design	0.274***	Visual stimulus	0.166***	Image of service staff	0.218***
3	Visual stimulus	0.261***	Environmental crowding	0.150***	Intangible	0.136**
4	Image of service staff	0.188***			Image of other customers	0.130**
5					Environmental crowding	0.119**
Control variable	Shopping planning	0.206***	Environmental familiarity	0.136***	Shopping planning	0.278***
	Environmental familiarity	0.142***				

* p< 0.1; **p<0.05; ***p< 0.01.

Table 4. Regression analysis results of customer perception to customer approach behaviors.

Order of importance	Approach behavior		
	Impact factor	Regression coefficient	Adjusted coefficient of determination R ²
1	Positive emotion	0.417***	0.453
2	Perceived service quality	0.355***	
3	Perceived commodity value	0.335***	
4	Negative emotion	-0.221***	

* p< 0.1; **p<0.05; ***p< 0.01.

showing that customer emotional responses bring about moderate effect on visual stimulus, verifying hypothesis 4b partially.

Comparative analysis of customer characteristics

This study discovers by ANOVA that there will be significant differences of customer perceptions and shopping behaviors when the strength of customer characteristics differs, verifying hypothesis 5 of this study.

This study sorts out the verification results as indicated in Table 1.

DISCUSSION

Store atmosphere factors will impact customer approach behaviors significantly (S-R)

All store atmospheric factors, except for environmental crowding, have significant impact on customer approach behaviors. Ordering from high to low according to the extent of impact, the factors

are design factors, intangible factors, image of service personnel, visual stimulus and image of other customers. This reveals that the design factor of a store is the biggest environment factor that impacts customer approach behaviors; its power of influence and interpretation are significantly higher than other factors. Customers pay special attention to the designing in a supermarket, including whether the layout and overall structure is reasonable, how is the interior decoration, whether the signs and marks are clear, whether the display of commodities in corridor space, commodity information and classification is

complete and convenient. All the aforementioned factors have significantly positive correlation with customer approach behaviors, indicating that customer behaviors in supermarkets are mainly affected by the environment factors that have biggest relevance with commodity. Intangible factors and image of service personnel, that is, music, noise, room temperature, clothing and attitude of service personnel etc. are also considered by customers as critical factors that will influence their behaviors. The only environment factor that does not enter into stepwise regression equation is crowding perception. The major reason why crowding perception would not influence customer approach behaviors may be because crowdedness is a common phenomenon in Taiwan and people have already got used to it. Therefore, Taiwan consumers' tolerance on crowding perception is higher than overseas consumers; crowdedness will not significantly influence customer approach behaviors.

Store atmospheric factors will impact customer perceptions (S-O)

This study adds cognitive valuation as an important driven factor of customer perceived environment on the basis of S-O-R model to explore how cognitive valuation and emotional response influence customers' environment perception and their shopping behaviors. Therefore, the effective management of design factors will significantly promote customer perceptions of commodity value; secondly, the factors that influence perceived commodity value are image of service personnel, image of other customers and perception of environmental crowding among social factors.

Customer perceptions will affect customer approach behaviors significantly (O-R)

It can be concluded from the aforementioned analyses that the results received from efforts on store atmosphere management and promotion of positive emotions are much better than reducing the effects of negative emotions. Meanwhile, customer perceived commodity value and service quality both have significant positive correlation with customer approach behaviors, indicating commodity and service perception will influence customers' sense of satisfaction, impulse consumption behaviors, WOM recommendation and intention of repeated presence.

Customer perceptions will partially interfere with the relationship between store atmosphere and customer approach behaviors

Customer cognitive valuation has interference effect on

image of other customers and visual stimulus; customer emotional responses have interference effect on visual stimulus. The interference effect is not very obvious, indicating that store atmospheric factors will influence customer behaviors through other channels.

Customer perceptions and behaviors under different customer characteristics have significant differences

Findings show: (A) Customers' different shopping planning presents significant difference on perceived commodity value and customer emotions: Customers with strong planning are significantly higher on the perception of commodity price and quality than those with weak planning; on the contrary, customers with weak planning have stronger positive emotions and weaker negative emotions; (B) Different time urgency will influence customer perceptions of commodity: Customers with strong urgency is higher on perceived commodity value than customers with weak urgency; (C) Environmental familiarity mainly influences customers' positive emotions and approach behaviors: Customers familiar with the environment have significantly higher positive emotions and approach behavioral intentions; (D) Customers with transportation convenience are significantly higher on commodity perception, service perception, positive emotions and approach behaviors than customers with less transportation convenience.

Managerial implications

According to analytical conclusions, this study proposes the following suggestions that can be taken as references when enterprises in the industry make market strategies.

Management of retail environment's design factors

Empirical studies show chain supermarket's design factors are significantly correlated with its impact on customer perception and approaching behaviors. According to such conclusion that design factors significantly affect customer perceived value of commodity, chain supermarkets should pay attention to highlight the functional value of design factors and promote customer's perception of commodity value by reasonable display and information presentation of commodities. Other than common application of promotional commodities in decorated carts and large-size promotion signs, other alternatives of comparing same kind of commodities such as putting main commodities with high profits and those with high price side by side to increase customer's choice of them. All these methods can promote customer's perception of commodity value effectively.

Secondly, based on the conclusion that design factors

have significant impact on customer's positive emotion, supermarkets should design the overall layout of supermarket environment from a shopping customer's mood when managing design factors: To make customers feel relaxed and at ease without any anxiety so as to keep their positive emotion. Besides, clear and explicit navigation signs should be installed, such as the distribution and classification signs of commodities, the guidance of way-finding and the locations of other functional facilities, so that customers can see them clearly when entering the supermarket. Moreover, based on the conclusion that design factors significantly affect commodities in supermarket is easy to make customers have the feeling that the information is too complicated, carefully selected commodities and effective layout should be made to provide customers with limited commodities as main attractive products and to control the information within the extent that customers are pleasant to accept. In addition, special atmosphere created for customers to promote their enjoyment in shopping can increase their frequency to visit and their duration of each visit, both are quite effective to increase sales volume.

Management of retail environment's social factors

Retail environment's social factors mainly affect customer's perception evaluation and approaching behaviors. Social factors are factors that are difficult to be controlled by retail enterprises. But they can influence social environmental factors through appropriate management measures and marketing strategies. For example, enterprises can improve service staff's clothing and behavioral management through the regulation of services. They can also reduce the crowdedness in supermarkets through reasonable route design in the shopping environment so as to enable it with a favorable social interaction atmosphere. Research outcomes of many scholars have shown that the service behaviors and emotional expressions of service staff are key factors that influence customer's consuming emotion, satisfaction and desire of repurchase. If service staff concern about customer's benefits, know their demands and provide them with prompt services to enable customers not only experience the perfect shopping environment but also perceive the amicability, honesty and concerns of service staff, they will definitely leave nice and unforgettable consuming impression to customers, thus promote customer trust and satisfaction in the supermarket.

Research contribution

Although Bitner (1992) first proposes that cognition evaluation is an important aspect of customer's internal perception and will affect the relationship between retail environment and customer behaviors, former studies add the impact of customer cognition only when discussing

the environmental stimulation of a single factor (e.g. rhythm and variety of music), cognition evaluation is not applied in the study of multi-retail environmental theory. This study is the first one to apply cognition evaluation to the study of retail environment in supermarkets to explore the impact of retail environmental factor system in chain supermarkets on customer's cognition evaluation of emotion. Research outcomes show that, cognition evaluation is really a very important factor in S-O-R model, many environmental factors (e.g. design factors, image of service staff and visual stimulation etc.) will determine customer's shopping behaviors by affecting customer's cognition evaluation, different from the opinion of former researches that customer's shopping behaviors will be influenced by emotion, verifying the importance of cognition evaluation on customer perception and assessment of retail environment.

SUGGESTIONS FOR FUTURE STUDIES

Though the research on retail environment has almost 40 years of history, there are still many aspects worth further studies in this field. The following are detailed explanations:

1. On the basis of S-O-R, this study adds perception assessment as the influential path of customer perceived environment. However, the study shows that perception and emotion can only explain the impact of part of the environment on customer behaviors. Environment can also influence customer behaviors through other paths, for instance, effective value, functional value, aesthetic feeling value etc., and then become factors that influence customer's shopping experience. Therefore, how to integrate retail environment and customer experience value deserves further and deeper study by other scholars in the future.
2. This paper analyzes that design factor is the biggest factor influencing customer perception and shopping behaviors, but how to propose operable management connotations still needs exploration. This also explains why, in previous studies, scholars prefer to study a particular factor such as music, smell and crowdedness which are easy to operate, few scholars study the impact of design factors on customer perception and behavior. The reason is design factors lack the concrete operation of quantization. This paper puts forward the conclusion that the impact of design factors on customer perception and shopping behaviors goes far beyond the impact of other factors for the first time, thus, it is of great value for future studies on how to evaluate and strengthen its impact effect by quantization.
3. This study considers the impact mechanism of retail environment from customer's point of view, instead of dividing them into different markets according to their characteristics. However, customers with different backgrounds and shopping motivations might have different

perception and evaluation on the environment which will further influence their shopping behaviors. Thus applying different management strategies to various target markets can result in unexpected effects. For example, setting up express check-out will reduce customer perceived crowdedness and anxiety by those customer's approaching behaviors, because the plenty of with less time and thus help them create good feelings for the supermarket and then enhance their approaching behaviors.

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