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Review on Atmospheric Effects of Commercial Environment

Noorliyana Ramlee*, Ismail Said

Faculty of Built Environment, Universiti Teknologi Malaysia, Skudai 81310, Malaysia

Abstract

Atmospheric effects have been studied widely in many settings to determine human behaviours towards the environment stimuli in enclosed buildings. The aim of this paper is to discuss a synthesis of 30 studies in the past 20 years on atmospheric effects towards human behaviours in the commercial environment. The synthesis includes variables used as environment stimuli that widely used in past studies and the effects. In summary, spatial layout, colour, scent, lighting and music are the most discussed variables in atmospheric studies and atmospheric stimuli affected human behaviours through emotion, satisfaction, and behavioural intentions.

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Keywords: Atmospherics effects; human behaviour; emotion; behavioural intentions

1. Introduction

Human interacts with their surrounding with certain behaviours. The behaviours are resulting depends on how environment stimulates them. Stimulation from the environment has generated many studies in various field of research. The importance of gaining knowledge on environment behaviour studies help to increase the value of one space. Therefore, most of the research regarding the impact of environment stimuli on human behaviour has started in the marketing field. Atmospheric effects are the facility based cues that explore the influence of environmental cues on consumer behaviour (Kotler, 1973). As people interact with its surrounding, atmospheric effects studies done by Kotler (1973) much concerned on how

* Corresponding author. Tel.: +6019-7895875
E-mail address: ariesbluefan@yahoo.com.my

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shopping behaviour of consumer can maximise their purchasing level with the influence of environmental stimuli. People who are satisfied with their surrounding have a higher level of pleasure and arousal. Therefore, they have the intention to come back to the places and spent more time in the places. However, through years, the variables used in atmospheric studies has widen to other fields such as environmental and behaviour studies, environmental studies, and building and environment studies which is also concerning about human behaviours in a different context of study (Knez & Kers, 2000; Ariffin et al. 2012; North & Hargreaves 1996; Yildirim et al. 2007). The purpose of this synthesis is to review and compare the effects of atmospheric effects on human behaviour based on 30 studies in the past 20 years from various fields to understand better on the topic. The aim of this paper is to investigate the variables used in atmospheric studies and to understand the effects of these variables towards human behaviours in the commercial environment especially their emotions and behavioural intentions. From this, the future research direction will be study on the relationship between environmental stimuli and human behaviours in particular those affecting visitors' shopping behaviours in commercial environment.

1.1. Theoretical development

In the study of environmental psychology, Mehrabian and Russell (1974) suggests a model of stimulus- organisms response (S-O-R) which explain that environmental stimuli (S) influence emotional response of organisms (O) which in turn, initiates consumers' behavioural response (R). In the model, consumers have three states of emotional response which consists of pleasure, arousal and dominance (Jang & Namkung, 2009). The influence of the three emotional responses will determine the behaviour of consumers whether approach behaviour or avoidance behaviour. Approach behaviour consists of intention to stay, explore and affiliate with others surrounding them, while avoidance behaviour is defined as escaping and ignoring the communication attempts from others within the environment (Mehrabian and Russell, 1974; Jang & Namkung, 2009). By using Mehrabian and Russell model, many studies were conducted and used environmental stimuli as the forecaster of emotional responses such as pleasure, arousal and dominance. The variables also used as the forecaster for behaviour of consumers such as revisit intention, purchasing intention, time at the store, and satisfaction (Fig 1).

In marketing literature, the awareness of designing space to produce definite emotional effects in buyers to maximise the probability of purchasing is defined as atmospheric (Kotler, 1973). The features of atmospheric consist of tangible and intangible environment such as lighting, music, scent, sound and furnishings (Liu & Jang, 2009). According to Liu and Jang (2009), there are three dimensions of atmospheric as outline by Bitner (1992). The first dimension is ambient conditions which refer to the characteristics of intangible environment such as lighting, music, temperature, sound, and scent that mainly affecting non-visual senses of consumers. The second dimension is spatial layout and functionality that explain how the machinery, facilities, and furniture are arranged within a setting and how these elements help in goal-attainment and performance of consumers. The last dimension of atmospheric is the signs, symbols and artifacts which give the information towards consumers by explicit or implicit signals that communicate with the consumers (Bitner, 1992). However, there are other variables added in the studies of atmospheric for example external variables (entrances, exterior wall, and parking), point-of-purchase and decoration variables (pictures, artwork, point-of-purchase displays, and usage instructions) and also human variables such as privacy, crowding and employee factors (Turley & Milliman, 2000).

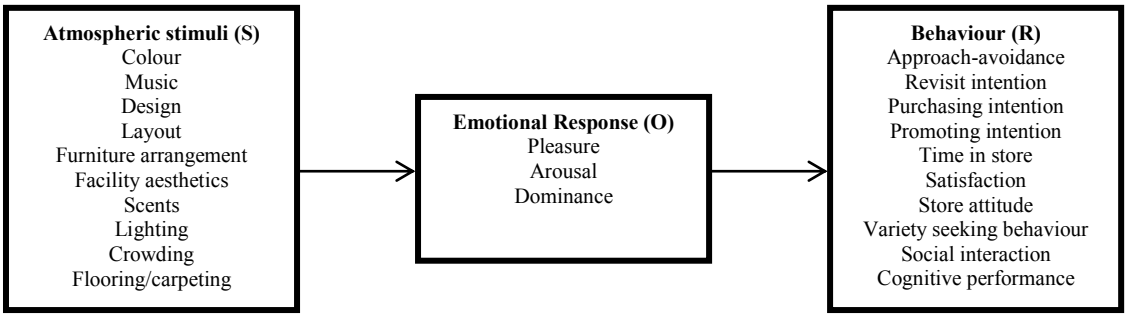

Fig. 1. Influence of atmospheric variables

According to environmental psychologist, atmospheric stimuli can affect human in several ways. In terms of emotion, atmospheric stimuli effect on human pleasure and arousal level. For example, warm colours which consist of orange and red can stimulate consumers and become stressful. While cool colours such as blue and purple create more relaxed environment and decrease the level of stress on consumers (Liu & Jang, 2009). Besides that, high volume of music attracts people to visit a store but create disturbing feelings in restaurants. In terms of the effects of atmospheric stimuli on consumer behaviours, colours can contribute towards customers' intention of visiting a store in the future, with appropriate layout of store; consumers are believed to spend more time and money on the store. In summary, with good atmospheric variables used, positive effects on human behaviours can be achieved.

2. Methodology

Literatures were selected based on different disciplines ranging from business research, marketing, environmental psychology, building and environment, hospitality management and other fields. Online databases were conducted to search articles from Science Direct, SAGE, Scopus and JSTOR. Papers are searched by using the combination of following key words that include atmospheric effects, human behaviour, environmental psychology, teenagers and shopping behaviour. Papers are selected based on 20 years back of timeframe which is from 1994 until 2013 based on empirical articles. Literatures were chosen to explain the knowledge about the behaviour of human during their inhabitancy in the environment based on how stimuli stimulate them. Literatures that addressed the relationship between atmospheric stimuli variables that influence social interaction behaviour was placed a greater consideration.

3. Result and Discussion

As shown in the Table 1, the study of atmospheric effects is not only focusing in the shopping mall context. The context of research has been widened into other types of settings such as laboratory (Knez & Kers, 2000; Lin 2009; Hui & Bateson, 2013; Sharma & Stafford 2000; Machleit et al., 2000; Zemke & Shoemaker, 2007; Igor 1995; Stone & English, 1998), restaurants (Ariffin et al., 2012; Kim & Moon, 2009; Yildirim & Akalin-baskaya, 2007; Guéguen & Petr, 2006; Liu & Jang, 2009; Heung & Gu, 2012; Yildirim, et al. 2007; North & Hargreaves, 1996), shopping malls (Babin et al., 2003; Massicotte et al. 2011; Michon et al., 2005; Morin et al., 2007; Dube & Morin, 2001; Chebat & Michon, 2003; Mohan et al., 2012; Singh & Prashar, 2013) and store (Spies et al., 1997; Yoo et al., 1994; Summers & Hebert,

2001; Mattila & Wirtz, 2001; Morrison et al., 2011). Findings showed that the elements of atmospheric studies have been manipulated by other field of research to be discussed in wider perspectives. This review discovered that eight studies were conducted in a laboratory setting while the other 22 studies conducted in the actual settings such as restaurants, shopping malls and stores. Most of the studies conducted through laboratory setting have the same result as the studies conducted in an actual setting. There is only one study which the results differed from the actual settings (Zemke & Shoemaker, 2007). Therefore, results from research conducted in laboratories can be accepted in certain conditions. However, in an actual setting of research, there are also some limitations that influenced the results. For example, the sampling method used in the studies limit the generalization of the research findings (Liu & Jang, 2009). The limitation on controlling other variables such as the number of respondents affected the results especially in the store setting (Dube & Morin, 2001). Therefore, the limitations of research can be influenced the findings of the research but with a good control on these variables, the research still can be conducted whether in laboratories or actual settings. The independent variables used to test in the five contexts of research are quite similar between one another. The variables used for atmospheric effects do not merely different through years. For example, in the research done by Ariffin et. al, (2012) on the influence of colour towards emotions has been studied by Knez and Kers (2000) which having the same results that are colour has a significant influence towards emotion of consumers. Music is the popular variable that often discussed by researchers and has been studied across research context (Morrison et al., 2011; North & Hargreaves, 1996; Mattila & Wirtz, 2001). However, there are also some literatures that used moderating variables such as age (Yildirim et al. 2007), gender (Knez & Kers, 2000) and culture (Morin et al., 2007). The used of these variables create a better understanding on human behaviors between its groups. From the findings, it is suggested that the independent variables still generating interest among researchers in order to understand the impact of atmosphere stimuli towards human behaviours.

Table 1. Summary table of atmospheric research

Author	Research context	Independent variables	Dependent Variables
(Knez & Kers, 2000) (Lin, 2009) (Hui & Bateson, 2013) (Sharma & Stafford, 2000) (Machleit et al., 2000) (Zemke & Shoemaker, 2007) (Igor, 1995) (Stone & English, 1998)	Laboratory	Lighting Age Gender Servicescape Colour Music Consumer density Consumer choice Layout Discrete sign Ceiling Fixtures Wall coverings Carpeting Perceived retail crowding Ambient scent Posters	Cognitive task Perceived room light estimation Satisfaction Perceived crowding Perceived control Approach-avoidance Salesperson credibility Salesperson persuasion Expectation Disconfirmation Emotion Personal tolerance Affiliation behaviour Social interaction behaviour Long-term recall and recognition Problem-solving Free recall Performance appraisal Performance
(North & Hargreaves, 1996) (Ariffin et al., 2012) (Kim & Moon, 2009) (Yildirim et al., 2007) (Guéguen & Petr, 2006) (Liu & Jang, 2009)	Restaurant	Colour Lighting Facility aesthetics Electric equipment Seating comfort Ambient conditions	Attitude Promoting intention Revisit intention Pleasure-feeling Perceived service quality Cognitive performance

(Heung & Gu, 2012) (Yildirim & Akalin-baskaya, 2007)		Age Gender Odour Interior design Ambience Spatial layout Human elements Employee factor View from window Seating densities Music	Time spent Money spent Emotion Perceived value Behavioural intention Satisfaction Behavioural intention Pay more willingness Gender Cognitive performance Music likeness
(Babin et al., 2003) (Massicotte et al., 2011) (Michon et al., 2005) (Chebat & Morrin, 2007) (Dube & Morin, 2001) (Dennis, Newman, Michon, Brakus, & Tiu, 2010) (Chebat & Michon, 2003) (Mohan et al., 2012) (Singh & Prashar, 2013)	Shopping mall	Colour Lighting Price Age Ambient scent Digital signage Music Employee Layout Assortment Shoppers' convenience Safety and security Physical infrastructure	Price fairness perception Excitement Patronage intentions Purchase intention Functional congruity Self-congruity Mall evaluation Product quality perception Culture Attitude towards servicescape Attitude towards sale personnel Approach behaviour Emotion Cognition Positive effect Variety seeking behaviour Shopping experience
(Spies et al., 1997) (Yoo et al., 1994) (Summers & Hebert, 2001) (Mattila & Wirtz, 2001) (Morrison et al., 2011)	Store	Condition Layout Information rate Product assortment Value Salesperson's service After sale service Location Facilities Atmosphere Display lighting Scent Music Aroma	Goal-attainment Purchasing behaviour Age Time at display No. of item touched No. of item picked up Approach Store environment Impulse buying Satisfaction Emotion Approach behaviours Time spent in store Money spent in store

3.1. Atmospheric variables that strongly influence human behaviour

There are five atmospheric stimuli that strongly influenced on human emotion and behaviours through the literature analysis. The stimuli are spatial layout, colour, scent, lighting and music as shown in Table 2 that synthesized from the literature analysis from the 30 past studies of atmospheric effects.

Table 2. Atmospheric variables influences on human behaviour

Atmospheric variable	**Authors**	**Findings**	
		Positively affect	**Negatively affect**
Spatial layout	Ariffin et al. (2012); Kim & Moon (2009); Liu & Jang (2009); Sharma & Stafford (2000); Mohan et al. (2012)	• Revisit intention • Emotion • Perceived value • Repeat purchase • Recommendation	

		• Customers' persuasion • Perception of salespeople • Variety seeking behaviour	
Lighting	Ariffin et al. (2012); Knez & Kers (2000); Summers & Hebert (2001); Sharma & Stafford (2000); Mohan et al. (2012)	• Revisit intention • Mood • Attitude • Problem solving • Long and short term recall • Perceived room light estimation • Approach behaviour • Customers' persuasion • Perception of salespeople • Variety seeking behaviour	
Colour	Ariffin et al. (2012); Yildirim et al. (2007); Chebat & Morrin (2007); Babin et al. (2003); Sharma & Stafford (2000)	• Perceive from young and male • Perceive quality by different culture • Price fairness perception • Customers' persuasion • Perception of salespeople	• Behaviour • Mood
Scent	Morrison et al. (2011); Michon et al. (2005); Guéguen & Petr (2006); Chebat & Michon (2003); Mattila & Wirtz (2001); Mohan et al. (2012); Zemke & Shoemaker (2007)	• Mood and environment perception at medium retail density level • Spending behaviours • Variety seeking behaviour • Number of social interaction behaviours	• Affiliation behaviours
		• Varied result gained from the influence of scent on satisfaction, approach behaviour, time and money spent	
Music	North & Hargreaves (1996); Morrison et al. (2011); Dube & Morin (2001); Mattila & Wirtz (2001); Sharma & Stafford (2000); Mohan et al. (2012)	• Emotion • Overall satisfaction • Atmosphere liking • Customers' persuasion • Perception of salespeople • Variety seeking behaviour	• Money spent • Time spent • Store evaluation
		• Varied result gained from the influence of approach behaviours	

Spatial layout positively affected on human emotion, cognition and behaviours. With a good planning of spatial layout, customers will intent to visit the place in the future. For example, teenage customers have the intention to visit the same restaurant when the restaurant offering accommodating layout for comfortable movement (Ariffin et al., 2012). A good spatial layout positively affected the emotion of customers thus increased opportunity to repeat purchase and recommend to others (Liu & Jang, 2009). Besides that, spatial layout also encourages variety seeking behaviour among customers (Mohan et al., 2012). Spatial layout is also one of atmospheric stimuli that significantly affected perception of salespeople and customers persuasion besides colour, lighting, and music (Sharma & Stafford, 2000). Spatial layout is another important variable that stimulate customers' emotion, cognition and behaviours. A good planning of spatial layout increased the potential behaviours of customers in one setting. Lighting is another atmospheric stimulus stimulate human. This variable influenced in all the studies that used lighting as their variables. Lighting was found encourage positive effects on emotion (Knez & Kers, 2000) as young females and older males preserved positive mood better than the other groups. Lighting also influenced humans' cognitive task in terms of problem solving, short and long term recall (Knez & Kers, 2000). Gender and age can be used as variables to determine the effect of lighting towards human behaviours as the results obtained is significantly different between groups. Besides that, lighting encourages variety seeking behaviour and approach behaviour among customers (Summers & Hebert, 2001; Mohan et al., 2012). Lighting is believed to be another influential stimulus towards human and encourage positive affect towards customers especially in the shopping mall. Most studies that used colour to determine the influence towards customers' cognitive task found to be significant towards its

variables. Different colours influenced customers on perceived quality by the different culture where environmental and product quality perceived better by French-Canadians through warm colours but Anglo-Canadians perceived better in cool colours (Chebat & Michon, 2003). This finding showed that colours are also had significant different between cultures. In other marketing studies, colours influenced positively on price fairness perception, customers' persuasion and perception of salespeople (Babin et al., 2003; Yalch & Spangenberg, 2000; Sharma & Stafford, 2000) which encourage more positive effects on customers' behavioural intention. However, in terms of behaviours and emotion, colours are found to be not significant (Ariffin et al., 2012; Chebat & Morrin, 2007). These findings showed that colours are not the important stimuli that can stimulate human behaviours and emotions. Scent gives positive affect on most studies. In terms of emotion and mood, scents affected positively towards these variables (Morrison et al. 2011; Michon et al., 2005; Chebat & Michon, 2003; Mattila & Wirtz, 2001). Scent also positively affected on customers' behaviours such as spending behaviours, variety seeking behaviour and social interaction behaviours (Chebat & Michon, 2003; Mohan et al., 2012; Zemke & Shoemaker, 2007). Different result gained on the influence of scent towards satisfaction, approach behaviour, time and money spent. Morrison et. Al (2011) in his study on shopping mall found that scent did not affect approach behaviours, time and money spent. This finding contradicts with findings suggested by Guéguen and Petr (2006) in research conducted in restaurants and Mattila & Wirtz (2001) conducted in store which believed that scent influenced these variables. The differences between the findings may be varied due to the setting specific where shopping mall covers larger scale and different types of settings while others focus in smaller scale settings. Based on these findings, scent is suggested to be another strong influence on human behaviours as this atmospheric stimulus affected on emotion and behaviours of customers. The last variable that believed to influence human behaviours is music. Music mostly discussed in many studies regarding its effects on customers' behaviours. In this review, music was identified to influence the emotion of the human. Music influenced the pleasure level of customers in stores (Mattila & Wirtz 2001) however, in the shopping mall music affected arousal level significantly but partially affected pleasure level of customers (Morrison et al., 2011). In the larger context of study, music seems to be a non-significant stimulus towards human compared to smaller context such as store. Music also influences overall satisfaction of consumers (Mattila & Wirtz, 2001). However, high volume of music found to be not significant to influence time and money spent of consumers in the shopping mall (Morrison et al., 2011). This finding explained that customers do not attract to visit the shopping mall with the presence of high volume of music. However, customers intend to visit the cafeteria in future under the moderate complexity new-age music (North & Hargreaves, 1996). In sum, music can influence human behaviours under certain condition especially under pleasant music. In conclusion, atmospheric effects in the commercial environment can influence customers positively or negatively. Based on the findings, there are several different results gained from every settings which can be influenced by other factors such as the purpose of visitors coming to the spaces, personal traits and function of the spaces. Customers with different age, cultures and gender perceived these stimuli differently. Accommodating layout, pleasant scents, manipulation of bright and soft lighting, pleasant music and use of warm and cool colours can affect the emotion, perception and behaviours of customers. Therefore, the used of right stimuli are important elements in identify the successful condition of one space.

3.2. Effects of atmospheric stimuli

From the analysis, there are three (3) categories of dependent variables featured by earlier research studies; (1) Mood and Emotion, (2) Satisfaction, and (3) Behavioural intentions.

3.2.1. Mood and emotion

Most of the previous literatures used emotions as their dependent variables. Emotions are believed to be the moderating effects towards human behaviours (Ariffin et al., 2012; Kim & Moon, 2009; Liu & Jang, 2009; Morrison et al., 2011). Cool colours such as blue and violet are found to be relaxing towards customers (Yildirim et al., 2007; Babin et al., 2003). However, colours are not significant on customers' emotion (Chebat & Morrin, 2007; Ariffin et al., 2012) . Besides colours, lighting can change customers' mood and emotions.

3.2.2. Satisfaction

There are four studies examined atmospheric on customers' satisfaction (Heung & Gu, 2012; Michon et al., 2005; Lin 2009; Stone & English, 1998). In dining places, people appreciate their meals when the surrounding environment stimulates them. Atmospheric of the restaurants is significantly influenced customers' dining satisfaction (Heung & Gu, 2012). High volume of music and the presence of aroma affected overall satisfaction of customers in the shopping mall (Michon et al., 2005). In the experiment done in the laboratory with hotel bar setting, Lin (2009) indicated individual arousal level moderating ambience towards satisfaction. However, in Stone and English (1998), the result indicated that satisfaction and performance were not significantly affected by posters or workspace colour. From these findings, it is suggested that wall décor are not significantly affected customer's satisfaction. Therefore, the findings from the previous literatures suggested that atmospheric effects are positively influenced customers' satisfaction whether in the shopping mall or restaurants except colours.

3.2.3. Behavioural intentions

Behavioural intentions are the behaviours that intent to do by customers in the future. Behavioural intentions includes revisit intention (Kim & Moon, 2009; Ariffin et al., 2012; Heung & Gu, 2012), promoting intention (Ariffin et al. 2012; Heung & Gu 2012; Morrison et al. 2011; North & Hargreaves 1996; Babin et al., 2003), purchasing intention (Babin et al., 2003; Mattila & Wirtz, 2001). According to Ariffin et.al (2012),` with appropriate lighting refined style and accommodating layout, teenage customers are intent to revisit the restaurants in the future. Heung and Gu (2012) believed that restaurant atmospheric such as ambience and view from window encouraged customer to come again.

4. Conclusion

Atmospheric effects in the commercial spaces have become researchers' attention to study the effects on customers' behaviours. These atmospheric stimuli determined what types of condition preferred by customers while they are in the spaces and how these stimuli do affected their behaviours. There are various variables that have been used for atmospheric studies. The most influential atmospheric stimuli in this review consist of spatial layout, colours, scent, lighting and music. These variables mostly discussed in many literatures and some of the variables positively affected on their emotion, cognitive and behaviours. Emotion influenced by atmospheric stimuli includes arousal and pleasure level of customers. In terms of cognitive task, atmospheric stimuli affected mostly on perception of salespersons, perceived quality of environment and products. Customers' behaviours affected by atmospheric stimuli include time and money spent in store, social interaction behaviours and variety seeking behaviours. Atmospheric effects in this review influenced on the mood, satisfaction and behavioural intentions. Most of the findings suggested that with appropriate spatial layout, the manipulation of bright and soft lighting, pleasant scent and music and the right use of warm and cool colours positively affecting on the mood and emotion although there are some literatures supporting differently in the findings. However, these atmospheric stimuli can be further discussed in the future by focusing on the different group of studies

such as age, culture and gender in order to gain more specific result. By studying the effects of atmospheric effects in built environment field, human behaviours in commercial environment can be predict and improve time to time. The future research in these studies will increase the knowledge of managers in the business by improving their environment in order to increase interest of visitors to visit their places.

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