Lighting Impact on Consumer's Shopping Behaviour in Retail Cloth Stores

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Abstract: *Lighting should fulfill aesthetic, emotional and functional requirements in interior spaces, especially in commercial building. Lighting design in commercial establishments should be oriented towards product sales and satisfying the consumers taking into consideration the health, well-being and purchasing behaviour of consumers. A major challenge in recent times in the illumination field has been to define how light affects health, not only in aspects related to purchasing behaviour but also related to shopping attitude and mood. The objectives of the study mainly to explore the influence of lighting in retail cloth stores on consumer purchasing behaviour. For the study, ten retail cloth stores were selected in Hyderabad and Secunderabad, the twin cities of Andhra Pradesh. The study was conducted on 100 consumers who visit in these retail cloth stores. The data was collected by using an interview schedule and the results showed that the lighting condition in the retail cloth stores was not a factor that can influence the consumer shopping behavior. Planned purchase, impulse buying, time and money spent towards shopping under lighting was found to be moderate.*

Keywords: Lighting factors, consumers, planned purchase, impulse buying, time spent and money spent

1. Introduction

A consumer is the one who can make the decision whether or not to purchase an item at the store, and someone who can be influenced by shop image and advertisements. "Consumer Behaviour is the study of individuals, groups or organizations and the processes they use to select, secure, use, and dispose of products, services, experiences or ideas to satisfy needs and the impacts that these processes have on the consumer and society (**Hawkins et al., 1990**).

Consumer buying behaviour involves a long process where the buyer has to identify the product, study well its features, the pros and the cons and lastly deciding on whether to purchase it or not (**Schiffman and Kanuk, 2000**).

A consumers' attitude was considered as an important concept for the business practices since it is clearly shown in behavioural studies that it played an important role in consumers' buying behaviour (**Peter and Bowler, 2001, Hopes, 1995 and Dubois, 2000**).

Consumer behaviour research is the scientific study of the processes consumers use to select, secure, use and dispose of products and services that satisfy their needs. Knowledge of consumer behaviour directly affects marketing strategy (**Anderson et al, 2005**).

This is because of the marketing concept, i.e., the idea that firms exist to satisfy customer needs (**Winer, 2000**). Firms can satisfy those needs only to the extent that they understand their customers. For this reason, marketing strategies must incorporate knowledge of consumer behaviour into every facet of a strategic marketing plan (**Solomon, 2002**).

The understanding of consumer behaviour appeals to a set of different areas of knowledge/factors: psychological, cultural social psychological, physio-psychological, genetics anthropology. One of them is the psychology since consumer behaviour deals with emotions, beliefs and attitudes. Research on emotions within marketing has evolved three approaches: the categories approach, the dimensions approach and the cognitive appraisals approach (**Watson and Spence, 2007**). **Khare (2010)** showed that consumers' gender and age played an important role in determining their attitude towards shopping in malls.

A study was conducted by **Tendai and Crispen (2009)** to investigate the influence of in-store shopping environment on impulsive buying among consumers. A 5% test of significance showed that in-store factors of an economic nature such as price and coupons were more likely to influence impulsive buying than those with an atmospheric engagement effect like background music and scent.

Park and Farr (2007) indicated that consumers were aroused and pleased by certain lighting effects and that cultural differences influenced perceptions as well as the behavioural intentions of "approach-avoid" in a retail environment.

Tullman et al. (2000) conducted a study to know whether the dynamic full spectrum digital lighting of retail displays positively affects consumer behaviour. The study also showed that more shoppers stopped to look at storefront displays and they spent more time in front of those displays looking at products. The customers' propensity for handling and purchasing products in the storefront area increased. Subjectively, increases in customers' mood, ratings of the quality of time spent in the store, the use of colour within the store and overall impression of the store were found at the prototype location. The results of the study concluded, from the standpoint of customers' behaviours and impressions that the prototype storefront had shown to be a more

effective selling space as compared to the traditional storefront design.

Changjo et al. (1998) indicated that store characteristics have a pronounced effects on consumers in-store emotions, and that these emotional experiences served as critical mediators in the store characteristics and store attitudes relationship.

A study was conducted by **Sherman and Smith (1987)** to understand mood states of shoppers and store image and their promising interactions and possible behavioural effects and the researcher interviewed shoppers immediately after a purchase and solicited responses regarding their shopping experience, their mood, and demographic characteristics. They found positive relationships between shoppers' reported mood and how favorably shoppers perceived the store, how many items they purchased, and how much time they spent in the store. Unfortunately, as a correlational study, cause and effect was indeterminate.

In retail cloth stores, lighting has a major influence on how consumers arrive at in store purchase decisions. Lighting is a powerful form of visual communication between the retailer and the consumer and is keys to the overall success of the shopping experience. Lighting can also be applied to effectively speed transaction time, improve accuracy at the cash counter and generally facilitate the sale. The purpose of the study is to find out the lighting impact on consumer shopping behaviour in retail cloth stores.

2. Methodology

2.1 Area of the sample

Exploratory research design was selected for this study. From each store, the list of ten consumers was selected immediately after a purchase and solicited responses regarding their demographic characteristics, planned purchase, impulse buying, time spent and money spent. The researcher conducted a study with a sample size of 100 consumers of different age groups randomly selected in retail cloth stores of Hyderabad and Secunderabad, the twin cities of Andhra Pradesh for investigating the effect of lighting parameters on consumer's shopping behavior in retail cloth stores.

2.2 Variables and their measurement

The independent variables of the study were quantity of lighting parameters in retail cloth stores. The dependent variables selected for the study were planned purchase, impulse buying, time and money spent. In the present investigation the quantity of illumination in retail cloth stores was taken as a base for understanding the differences among retail cloth store. According to United States environmental protection agency (1997), the quantitative parameters of illumination are luminous flux (lm), illuminance (lux), luminance (cd/m^2). Hence these lighting parameters were taken as independent variables. These parameters were measured on floor, ceiling, backside of the consumer seating (wall 1), left hand side of the consumer

seating (wall 2), wall facing the consumer seating (wall 3) and right hand side of the consumer seating (wall 4).

2.3 Tools Used

Planned purchase, impulse buying, time spent and money spent were measured by developing an interview schedule.

2.4 Data Analysis

Frequencies and percentages were calculated for the profile of the respondents on the variables. The four outcome groups based on the similarities of lighting conditions were treated as independent variables for data analysis. The data was subjected ANOVA, to find out the association between independent and dependent variables of the study. The data collected on consumer's planned purchase, impulse buying, time spent and money spent was tabulated, presented and discussed below. Hypothesis was formulated to test the relationship between independent and dependent variables.

3. Results and Discussion

The results of the data are discussed below:

3.1 Profile of the Consumers
Age of the consumers visiting the retail cloth stores ranged from 20 to 69 years. Only seven per cent of the consumers fell in the age group of above 46. Comparatively young consumers were 21 per cent and nearly three-fourth of consumers were middle aged. it was revealed that the consumers in the age group of 24 to 45 were more actively involved in shopping.

Most of the female consumers were more actively involved in shopping at retail cloth stores than the male consumers. Cloth shopping was found to be a women dominated area.

From the education and occupation, it was observed that, highly educated and employed consumers were more involved in shopping in retail cloth stores. Young consumers before starting their own personal income were found highly involved in shopping.

3.2 Lighting impact on consumers planned purchase in shopping

Impact of lighting in retail cloth stores on the planned purchase of consumers was explored in the study. The respondents were asked to indicate the frequency level of influence of lighting in retail cloth store on their planned purchase in terms of always, sometimes and never.

Table 1: Distribution of sample by consumers planned purchase in shopping

			N=100
Planned purchase	*Frequency*		*Percentage (%)*
Below 7	14		14
Between 8-10	59		59
Above 11	27		27
Total	100		100
Mean		9.23	
S.D		1.59	

The possible score range was between 4 and 12. The score of the respondents in the study ranged between 6 and 12. The mean score was 9.23 with a standard deviation of 1.59. More than half of the sample (59%) scored between 8 and 10. Twenty seven per cent of the sample had more influence of lighting on their planned purchase. The remaining 14 per cent of the sample scored below 7 (Table 1).
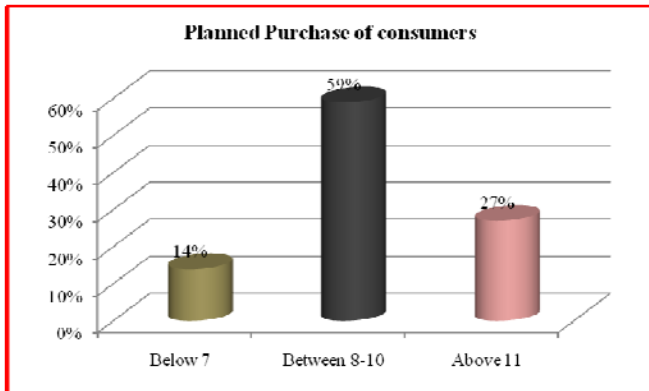

Figure 1: Percentages of lighting impact on consumers planned purchase in shopping

More than one fourth of the consumers were highly influenced by lighting in retail cloth stores and made unplanned purchased. In general the impact of artificial lighting in the retail cloth stores on the planned purchase of consumers was found to be moderate (Fig.1).

3.2.1 ANOVA among groups in planned purchase with regard to lighting effect on consumers

According to planned purchase, Analysis of variance was performed among groups of retail cloth stores. The 'F' value was found to be non significant (Table 2).

Table 2: Analysis of variation among groups in planned purchase with regard to lighting effect on consumers

Effect	Within groups	Between groups	F - Value	Probability F-Value	Level of significance
Group	3	96	1.37[NS]	0.2562	NS
** - significant at 0.01 level, *- significant at 0.05 level, NS – Non Significant					

Hence, the null hypothesis was accepted.

There exists no relationship between lighting condition in retail cloth stores and planned purchase of consumers. Lighting conditions in retail cloth stores were not exerting any impact on planned purchase.

3.3 Lighting impact on consumer's impulse buying in shopping

Impact of lighting in retail cloth stores on the impulse buying of consumers was explored in the present study. The respondents were asked to indicate the level of influence of lighting in retail cloth stores on their impulse buying in terms of always, sometimes and never. Scores 3, 2 and 1 were allotted for always, sometimes and never respectively. The scores were interpreted such that the higher the score higher the impact of lighting on the impulse buying of consumers.

Table 3: Distribution of sample by impulse buying

N=100			
Impulse buying	*Frequency*		*Percentage (%)*
Below 8	12		12
Between 9-11	73		73
Above 12	15		15
Total	100		100
Mean		10.55	
S.D		1.88	

The possible score range was between 5 and 15. The score of the respondents in the study ranged between 5 and 14. The mean score was 10.55 with a standard deviation of 1.88. Nearly three-fourth of the sample scored medium. Fifteen per cent of the sample scored above 12 (Table 3).
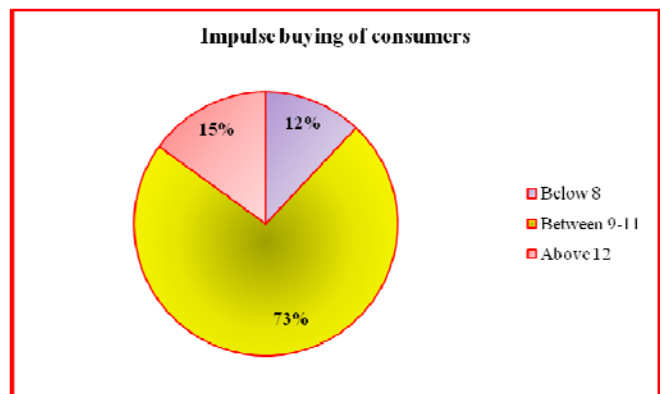

Figure 2: Percentages of lighting impact on consumers impulse buying in shopping

The impact of artificial lighting in the retail cloth stores on the impulse buying of consumers was found to be moderate. Only 15 per cent of the consumers were highly influenced by lighting in retail cloth stores and made impulse buying. In case of 73 per cent of the sample lighting in retail cloth stores tempted them to go for impulse buying sometimes (Fig. 2). According to the study it can be concluded that lighting in retail cloth stores do tempt consumers to go for impulse buying.

3.3.1 ANOVA among groups in impulse buying with regard to lighting effect on consumers

According to impulse buying, Analysis of variance was performed among groups of retail cloth stores. The 'F' value was found to be significant at 0.01 level (Table 4).

Table 4: Analysis of variation among groups in impulse buying with regard to lighting effect on consumers

Effect	Within groups	Between groups	F – Value	Probability F-Value	Level of significance
Group	3	96	5.55**	0.0015	0.01
** - significant at 0.01 level, *- significant at 0.05 level, NS – Non Significant					

3.3.2 Mean comparision and significant probabilities between the scores of different groups in body temperature before work with regard to lighting effect

For further study, pairs of groups were tested at 1 per cent level of significance and 5 per cent level of significance by using 't'-test (Multiple Comparison Test). Computed 't' values revealed significant difference between group 1 and 2

935

at 0.01 level, between group 1 and 3 at 0.05 level and between group 1 and 4 at 0.01 level (Table 5).

Table 5. Mean comparision and significant probabilities between the scores of different groups in impulse buying with regard to lighting effect

Effect	Group	_Group	Estimate	Standard Error	D F	t- Values	Probability >t-value	Level of significance
Group	1	2	-1.5500	0.5079	96	-3.05**	0.0029	0.01
Group	1	3	-1.1500	0.5564	96	-2.07*	0.0414	0.05
Group	1	4	-2.0167	0.5079	96	-3.97**	0.0001	0.01
Group	2	3	0.4000	0.5079	96	0.79NS	0.4329	NS
Group	2	4	-0.4667	0.4543	96	-1.03NS	0.3069	NS
Group	3	4	-0.8667	0.5079	96	-1.71NS	0.0912	NS

** - significant at 0.01 level, *- significant at 0.05 level, NS – Non Significant

Hence, the null hypothesis was rejected.

There exists a relationship between lighting conditions in retail cloth stores and impulse buying of consumers. Lighting condition in retail cloth stores had an impact on impulse buying behaviour of consumers. Bright lighting in retail cloth stores might be a tempting factor for consumers to buy clothes.

3.4 Lighting impact on consumer's time spent in shopping

The respondents were asked to indicate the level of influence of lighting in retail cloth stores on their time spent in shopping. **Table 6.** Distribution of sample by consumer's time spent in shopping

N=100			
Time spent	*Frequency*		*Percentage (%)*
Less than 2 hours	0		0
Between 3-5	99		99
More than 6 hours	1		1
Total	100		100
Mean		8.61	
S.D		1.74	

The mean score was 8.61 with a standard deviation of 1.74. Ninty nine Per cent of the sample spent their time in between 3 to 5 hours (Table 6).

The impact of artificial lighting in the retail cloth stores on the time spent by consumers in shopping was found to be moderate. The lighting condition in the shop was not a factor that can influence the time spent in shopping by consumers to a great extent. However the lighting condition showed moderate level of influence on consumer time spent in shopping.

Figure 3: Percentages of lighting impact on consumers time spent in shopping

The impact of artificial lighting in the retail cloth stores on the time spent by consumers in shopping was found to be moderate. Only one per cent of the consumers were highly spent their time more than 6 hours in a day in retail cloth stores. In case of 99 per cent of the sample lighting in retail cloth stores tempted them to spend their time in shopping under lighting sometimes (Fig. 2).

3.4.1 ANOVA among groups in time spent in shopping with regard to lighting effect on consumers

According to time spent, Analysis of variance was performed among groups of retail cloth stores. The 'F' value was found to be non significant (Table 7). Table 7. Analysis of variation among groups in planned purchase with regard to lighting effect on consumers.

Effect	Within groups	Between groups	F – Value	Probability F-Value	Level of significance
Group	3	96	1.30NS	0.2774	NS
** - significant at 0.01 level, *- significant at 0.05 level, NS – Non Significant					

Hence, the null hypothesis was accepted.

There exists no relationship between lighting conditions in retail cloth stores and time spent by consumers in shopping. The findings of the study were in line with the study conducted by Tai and Fung (1997), wherein it was revealed that environmental stimuli are positively related to the level of pleasure experienced in the store which, in turn, positively influence in-store shopping behaviour such as extra money spent, extra time spent and desire to explore the store.

3.5 Lighting impact on consumer's money spent in shopping

Impact of lighting in retail cloth stores on money spent by consumers in shopping was studied. The respondents were asked to indicate the level of influence of lighting in retail cloth stores on their money spent in shopping.

Table 8: Distribution of sample by consumer's money spent in shopping

Money spent	Frequency		Percentage
	N=100		
Below 5	0		0
Between 6-9	99		99
Above 10	1		1
Total	100		100
Mean		7.64	
S.D		1.81	

The mean score was 7.64 with a standard deviation of 1.81. Sometimes Ninety nine Per cent of the sample spent their money highly (Table 8).

Figure 4: Percentages of lighting impact on consumer's money spent in shopping

The impact of artificial lighting in the retail cloth stores on the money spent by consumers was found to be moderate. The lighting condition in the shop was not a factor that can influence the consumer money spending behaviour in shopping to a great extent. However the lighting condition showed moderate level of influence on money spent by consumers in retail cloth stores.

3.5.1 ANOVA among groups in money spent in shopping with regard to lighting effect on consumers

According to money spent, Analysis of variance was performed among groups of retail cloth stores. The 'F' value was found to be non significant (Table 9). Table 9. Analysis of variation among groups in planned purchase with regard to lighting effect on consumers.

Effect	Within groups	Between groups	F - Value	Probability F-Value	Level of significance
Group	3	96	1.30NS	0.2777	NS
** - significant at 0.01 level, *- significant at 0.05 level, NS – Non Significant					

Hence, the null hypothesis was accepted.

There exists no relationship between lighting conditions in retail cloth stores and money spent by consumers in shopping. The findings of the study were in line with the study conducted by Tai and Fung (1997), wherein it was revealed that environmental stimuli are positively related to the level of pleasure experienced in the store which, in turn, positively influence in-store shopping behaviour such as extra money spent, extra time spent and desire to explore the store.

4.   Conclusion

An attempt was made to study the lighting impact in retail cloth stores on consumer shopping behaviour. The study revealed that the consumers in the age group of 24 to 45 were more actively involved in shopping. Highly educated and Young and employed consumers were more involved in shopping in retail cloth stores.

It was concluded that the lighting condition in the shop was not a factor that can influence the consumer's planned purchase, impulse buying, time and money spent towards shopping to a great extent; it showed moderate level of influence on consumers' planned purchase, impulse buying, time and money spent while shopping.

5.   Acknowledgements

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