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Factors Affecting People Preferences toward Environment Landscape, Case Study: Shopping Mall in Kuala Lumpur

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Abstract This study focused on the influence of socio demographic factors on patrons' preference for interior landscape of shopping mall. Three dimensions namely green, business, and seating dimensions were identified, besides the effect of gender, age, income, ethnicity, house type, and usual spent time on preference dimensions were tested. The results showed no significant between gender groups. The other factors such as age, income, ethnicity, house types, and spent time groups had significant different effect on people preferences towards the three dimensions in shopping mall. The findings showed as the age and income level go up people prefer green dimension more. In other word, younger visitors like to see more business features rather than green and seating features. In addition, the results portrayed that green features received the highest preference from those spend much time in shopping malls.

Keywords Socio demographic Factors, Gender, Age, Ethnic, Income Level, House Types, and Interior Landscape Dimensions

1. Introduction

Unlike western developed countries, developing countries in Asia such as Malaysia has started to establish mega shopping mall centres in the recent decades. However, the research on the understanding of patrons' interaction with shopping mall interior landscape is lacked. However, a prior study revealed that demographic and social factors exert in forming environmental preferences [1]. This research motives to establish basic information regarding interaction of landscape attributes and human characteristics in shopping malls. Thus, the study aims to identify effect of the socio demographic factors on preference for interior landscape design in shopping mall. The research sub-questions to answer the objective is followed:

1. Is there significant difference between gender groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?
2. Is there significant difference between age groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?
3. Is there significant difference between race groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?
4. Is there significant difference between income groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?
5. Is there significant difference between housing types groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?
6. Is there significant difference between spent time groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

In this view, socio demographic factors those might influence preference for landscape are described in below.

2. Socio Demographic Factors Influence People's Preferences towards a Particular Landscape

Besides various factors such as the content and spatial quality of the scene which affect people's preferences, there are also many other factors involved in determining these preferences towards the environment. Some researchers have found that different factors influencing people's preference include the factors on culture or ethnicity [2-6]. The other factors identified include educational level [7-9], expertise [4, 9], income level [8, 9], gender [8, 9], age [8, 10]. All these are related to people's background information, but there are also other factors which have significantly found to affect the people's preferences such as the living environment [4], familiarity [9], housing

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density [9], and housing types [11]. Other than above-mentioned factors, Dearden (1984) carried out a study on the effect of environmental awareness, while Tips and Savasdisara (1986) studied on the effects of environmental background (urbanity, travel experience and macro-geographical background, etc.) towards preferences [12]. In their research on landscape preferences, there might be dual basic mod that would be useful to determine the influence of various factors towards landscape preference score [12]. The first mode involves the characteristics of landscape, the origin of the landscape scenes and the dimensional medium used for presentation, such as colours and the time the photos were shot. The researchers further added that the second mode was started from the interview and looking at background criteria to analyse their influences on the evaluation of one set of landscape view or its impact on preferences. The second mode is more important and much needed in landscape because it can help designers and architects to plan a setting based on people's backgrounds, while the first mode can be controlled by researcher during photo preparation procedures. The next section discusses on several background factors that may influence people's preferences.

2.1. Age

Yamashita (2002), Oguz (2000) and Malinowski and Thurber (1996) found that age indeed does have influence on the preferences towards a particular landscape [8, 10, 13]. Malinowski and Thurber (1996) found that younger boys were more interested in places for particular activities, while older boys were more inclined to places for aesthetics and cognitive values [13]. According to Oguz (2000), the age of the respondents did impose an influence on the frequency of visits to the three parks included in his study and the choice towards the favourite park. The findings of the study by Hami et al (2009) also revealed that people in the age group between 19 and 29 years old (47%) and the age group of 30 to 39 years (29.4%) used the park more often compared to those in the other age groups [14]. The choices towards their favourite parks were also found to be influenced by the age of the respondents, whereby this was influenced by the kind of activities and services or facilities provided at the park. For example, Oguz (2000) indicated that the people in the age groups of 12 – 18 years and 19 – 14 years preferred mostly a park with complete miscellaneous facilities and activities, including sport activities [8]. However, the people in the age groups of 56 and above preferred park with good catering service and more natural green environment. Therefore, it was proven in the previous studies that different age groups preferred different settings but this was still related to the other aspects which exist in the environment. Understanding the differences in terms of age could therefore guide designers in creating public places for the different age levels with a pleasant surrounding or environment at shopping malls.

2.2. Gender

The gender of the respondents (male and female) has also been speculated to have different needs and preferences in certain matters. On the other hand, Yu (1995) revealed that gender did not influence the people's preference towards landscape though only a few differences were detected for the sceneries with water domination. This finding is almost similar to the ones found by Gwo-Fang (2002) who revealed that there were no significant differences between the male and female respondents in their presences towards the water element in interior spaces [2]. However based on the finding of Gwo-Fang research in 1999, the male respondents were found to be more eager towards water elements in interior spaces compared to the females [2]. Hami and his colleague stated that the male participants compared to the female were major park users in urban park in Tabriz [15, 16]. As a conclusion, the findings of these studies indicate that the effect of gender on the people's preference towards a landscape remains unproven. Therefore, it was important for this study to look further into this issue as it might be useful in the planning of the interior public spaces at shopping malls in Malaysia.

2.3. Ethnicity

The difference in race and culture might contribute to different preferences because different races or cultures have different background, living environment and living styles. Nonetheless, Yu (1995) in his comparison, among a small group of Chinese and Americans regarding the variants in culture and preference towards landscape, found that a different sub-culture (East and West) was rather weak but it was very important for a number of specific landscapes which added special cultural meanings. Nevertheless, the findings by Fraser and Kenny (2000) on the cultural impact towards the perception of the urban forest in Canadian City were much different, whereby they found that certain community cultures showed different reactions towards a particular landscape and its elements. They also came to know that the British community showed a strong positive reaction towards shady trees and they were the only group which preferred hiking paths. This is in contrast with the findings gauged for Italians and the Portuguese community who had more preferences for fruit trees, vegetable gardens and showed a negative reaction towards having shady trees in their gardens. However, in the same study, the Chinese community was shown to react positively toward scenes without trees and that they preferred a park which required less maintenance and no trees in comparison to the other communities.

There are a number of studies which show that people in same cultural group prefer foreign landscape style rather than their own. For instance, the studies by Yang and Brown (1992), and Yang and Kaplan (1990) revealed that both the Western and Korean groups preferred foreign landscape style (i.e. Japanese style) than their own styles

[5, 6]. This finding seems to suggest that people do not prefer whatever is familiar to them in their own culture.

2.4. Income Level

The respondents' preferences and their responses towards an environment might also be influenced by their income level. For instance, in his study on the preferences towards the urban parks in Ankara, Oguz (2000) found that even each park was used by the people with different income groups, which obviously it was dominated by those of the lower-middle income groups in his study, and the people of different income groups' preferred different parks or spaces [8]. People of the low-income group were found to prefer Genclik Park, which is classified as the oldest park and has a low quality of service, whereas those from the middle-income group were indicated to choose Altinpark and Segmenler Parks. The findings of his study also revealed that the people from the high-income group also preferred Segmenler Park, which possesses a more organized natural landscape, is well-maintained and with more greenery. Nevertheless, it is important to highlight that Genlick Park, Altin Park and Segmenler Park are surrounded by different housing areas; Genlick Park is surrounded a housing area which is owned by the people of the lowest income group, Altin Park is located in the middle-income neighbourhoods, while Segmenler Park is surrounded by houses of those from the upper income group. Based on Oguz's findings, the income level had also been indicated as one of the factors which might influence people's preferences [8]. In shopping malls, purchasing power is always determined by the level of income, but one aspect which should also be considered is the fact that different income groups may prefer different settings; the fact which can be used by designers and architects to plan indoor public spaces at shopping malls.

2.5. Current Housing Types

Sullivan (1994) found that the participants' current housing types significantly affected their preferences. The finding is supported by Dearden (1984) who found that the effect of housing density was significant in influencing people's preferences. Dearden (1984) revealed that the participants who occupied a low-density housing environment preferred natural scenes and vice versa. The findings of Sullivan's study also suggest that the participants who are currently living in single family house showed a significantly higher preference towards the 'Large-Lot Category' (scene which consists of houses, mature trees in the background and lacks of trees in foreground) as compared to the participants who are currently living in multiple family houses. For the purpose of this study, the effects of the participants' current housing types would also be identified to provide a useful implication for the architects and developers in developing indoor public spaces at shopping malls. This is largely due to lack of research conducted on the influence of housing types on the people's preferences in Malaysia. In fact, most of these malls are located in the urban areas, usually surrounded by low-cost and medium-cost housing types such as flats, apartments, single- and double-storey houses. Meanwhile, the malls which were built in the city centre (especially in Kuala Lumpur city centre) are surrounded mostly by the medium-cost to high-cost housing types, such as single and double-storey houses, semi-detached, bungalows and condominiums. Apart from these, another possibility which could be taken into consideration is that the users of certain malls mostly of those who own certain housing types in the areas where the malls are located. Based on this discussion, it might be useful for designers to plan and design public spaces in malls based on housing types of the people.

3. Research Method

The research was held by doing a photo- questionnaire among 240 participants who visit shopping malls in Kuala Lumpur, Malaysia. 204 respondents were selected by using Mitra and Lankford (1999) formula explaining that sampling error = Square root of [(p) (1-p)/proposed sample size], where p is the probability which condition exists, p value is assumed to be 50% [17] Regarding to the photos, after selecting 32 photographs, four extra photographs were then added at the beginning and another four photographs at the end of the photo sequence. The purpose of having four extra scenes at the beginning was to make the participants familiarise the photo rating procedure, whereas the four extra photos at the end of photo-questionnaire was to prevent the participants from anticipating, which could cause them to make it easier [17, 18]. The reliability analysis demonstrated that all the reliability indices for each category are higher than 0.7 as minimum value and any item with value below 0.3 should be removed from the category.

4. Results

The data analysis revealed three dimensions for interior landscape design in shopping mall namely green, seating, and business dimensions. The results of data analysis also showed that gender groups didn't have significant mean difference towards preference dimensions for interior landscape design in shopping mall. However, there was significant differences towards preference dimensions among the other socio demographic factors such as age, income level, ethnic, current housing types, and spent time in the mall. More details about these results are explained in the below paragraphs.

4.1. Preference for Interior Landscape Dimensions of Shopping Mall

The purpose of this analysis is to identify the magnitude

of preference in shopping mall landscape dimension. From table 1, the green dimension has the highest mean (mean = 4.15, s.d. = .641), followed by seating dimension (mean= 3.80, s.d.= .616), and business dimension (mean= 2.86, s.d.= .893). The business dimension has the lowest mean because it only highlights the businesses in the public spaces at shopping malls. On the contrary, the green dimension has the highest mean and all scenes in this dimension show high coherence and high legibility. The green dimension also has natural elements especially plants, water features, and seating places. The seating dimension, which somehow emphasized on the interior landscape elements for the customers especially in the form of seating places, received moderate mean score.

The results of this study is strongly consistent with the previous study such as the one revealed by R. Kaplan (1985) and her reviews of 15 preference studies found that scenes, which were dominated by natural elements, had the tendency to form a different group [19]. This could be seen in the green dimension, which was dominated by natural elements especially green plants while the business dimension was dominated by businesses and the seating dimension was dominated by seating places. In terms of the spatial quality, coherence, and legibility play important roles in determining the categorization of green and seating dimension while for the business dimension these two spatial qualities did not trigger a similar response from the participants. For business dimension, only the content of the scenes played a central role in preferences but for the green and seating dimensions, both spatial and content qualities played an important role to determine preference for indoor public spaces at malls. The below figures expose mean scores for components of all three dimensions of interior landscape in shopping mall.

4.2. Participants' Background Information

The participants for this study have various backgrounds in terms of gender, age, ethnicity, monthly income, and current housing types. Table 2 shows that 240 participants were involved in this study. There are 127 males (52.9%) and 112 females (46.7%), while one participant missed to indicate the gender. Most of the participants are in the age group of 18 to 30 years (n = 90, 37.5%), followed by 31 to 40 years (n = 66, 27.5%), 41 to 50 (n= 40, 16.7%), and above 50 (combined groups of 51-60 and above 60 years old) years old (n= 44, 18.3%). Generally, majority of the participants are between 18 to 50 years old (table 2).

The participants were distributed almost equally based on their races. There were 87 Malays (36.3%), 82 Chinese (34.2%) and 79 Indians (29.2%) participants. Only one participant (0.4%) identified his race as others (Iban). In terms of the monthly income, most of the participants earned between RM 1000 to 2999 (n =103, 42.9%) and RM 3000 to 4999 (n = 67, n = 27.9%). Only few participants received monthly income of RM 5000 and above (n = 25, 10.4%) and less than RM 1000 (n = 45, 18.8%). Majority of the participants lived in terrace houses (n = 97, 40.4%), followed by apartments (n = 34, 14.2%) and semi-detached houses (n = 31, 12.9%). For the other current housing types (bungalows, condominiums and flats) the number of cases was between 21 to 28 participants. However, village houses (n = 3, 1.3%) were excluded for further analysis to identify the effects of housing types on visual preferences because the number was too small.

4.3. Effect of Socio demographic Information on Shopping Mall Interior Landscape Dimensions

The part analysed the impact of the various participants' backgrounds on three preference dimensions namely green, seating, and business dimensions. The independent t-test was applied to identify the impact of gender on each preference dimension while one-way between groups ANOVA was applied to identify the impact of age, ethnic groups, monthly income, and current housing types on the visual preference in each dimension.

Table 1. Mean preference scores for each interior landscape dimension of shopping mall

Name of dimension	Mean	St. Dev.	Content quality	Spatial quality
Dimension 2 (Green Dimension)	4.15	.641	Have green trees or emphasize on natural elements Majority (six of eight scenes) have seating places No business entities	High in coherence High in legibility
Dimension 3 (Seating Dimension)	3.80	.616	Have seating places. Do not emphasize on natural elements Majority (four of five) do not have business entities	High in coherence High in legibility Low in complexity
Dimension 1 (Business Dimension)	2.86	.893	Have business stall/ entities Does not have water features Does not have healthy green plants (except one scene with a Christmas tree)	Not similar in spatial quality

Scene 29 (Mean 2.65, loading .873)

Scene 19 (Mean 2.90, loading .831)

Scene 13 (Mean 2.58, loading .808)

Scene 6 Mean 2.59, loading 0.761)

Scene 7 (Mean 3.17, loading 0.635)

Fig. 1. The First Dimension (Business Dimension)

Scene 21 (Mean 4.16, loading .775)

Scene 30 (Mean 4.07, loading .727)

Scene 2 (Mean 4.26, loading .658)

Scene 23 (Mean 4.07, loading .627)

Scene 16 (Mean 3.68, loading .615)

Scene 14 (Mean 4.48, loading .606)

Scene 18 (Mean 4.19, loading .605)

Scene 24 (Mean 4.32, loading .570)

Fig. 2. The Second Dimension (Green Dimension)

Scene 8 (Mean 3.875, loading .680)

Scene 12 (Mean 3.88, loading .654)

Scene 5 (Mean 3.50, loading .637)

Scedne 32 (Mean 3.96, loading .629)

Scene 4 (Mean 3.78, loading .402)

Fig. 3. The Third Dimension (Seating Dimension)

Figure 1. Mean values for components of three dimensions

Table 2. Distribution of participant's socio demographic information

Participants		Number	Percentage
Total number of participants		240	100
Category	Sub-category	Number	Percentage
Gender	Male	127	52.9
	Female	112	46.7
	Missing	1	0.4
Age	18-30 years	90	37.5
	31-40 years	66	27.5
	41-50 years	40	16.7
	51-60 years	37	15.4
	61 years and	7	2.9
Race	Malay	87	36.3
	Chinese	82	34.2
	Indian	70	29.2
	Others	1	.4
Participant s' monthly income	X< RM 1000	45	18.8
	RM 1000-2999	103	42.9
	RM 3000-4999	67	27.9
	x> RM5000	25	10.4
Current housing types	Bungalow	26	10.8
	Semi-detached	31	12.9
	Single or two-storey terrace house	97	40.4
	Flat	21	8.8
	Apartment	34	14.2
	Condominium	28	11.7
	Others (village house)	3	1.3
Time spent in the malls	X< 1 hour	12	5.0
	1-3 hours	74	30.8
	3-4 hours	43	17.9
	x> 4 hours	111	46.3

4.4. Effect of Age on Shopping Mall Interior Landscape Dimensions

1. Is there significant difference between age groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

All dimensions showed significant differences among the age groups. As summarized in Table 3, Business dimension (using Welch test) showed a significant difference at $p < .05$ followed by green dimension $F(2, 237) = 6.079$, $p < .05$ and Seating dimension $F(2, 237) = 4.595$, $p < .05$ showed significant differences. This result concurred with Yamashita's (2002), Oguz's (2000) and Malinowski and Tuber's (1996) which stated the age of the participants did affect their level of preferences [8, 10, 13].

The post-hoc comparisons using the Turkey HSD (Honestly Significant Difference) verified that all age groups had significant differences on visual preference scores in business dimension. For green dimension, only the 18 to 30 year old group had a significant difference with the 51 years and above age group. However, for seating dimension, the results showed that only 18 to 30 ages had a significant difference with the 31 to 50 year old age group. For business dimension, as the participants' age increased, their preferences towards this dimension were decreased. In contrast, for green dimension, the participants' preferences towards this dimension increased as their age increased, while for seating dimension their preferences were slightly reduced as their age increased. Generally, the results of this study proved that the older participants preferred green dimension but they least preferred business dimension in the malls' public spaces compared to the other age groups. However, there was an agreement, where all participants from all age groups preferred green dimension the most and preferred business dimension the least.

Table 3. ANOVA results to identify the impact of age on interior landscape dimension[1]

Dimensions	Ethnic Groups			P value
	18-30 years old	31-50 years old	Above 50 years old	
Business Dimension	3.15a	2.80b	2.38c	0.000
Green Dimension	3.99a	4.20ab	4.38bc	0.00**3**
Seating Dimension	3.95a	3.71b	3.70ab	0.**011**

Note: [1]Cell entries are mean values based on 5 point Likert scale (1= least preferred, 2= somewhat preferred, 3= neither preferred nor preferred, 4= preferred, 5= most preferred). 2The raw mean with different superscript differ significantly at $p<0.05$. 3Tukey was used for Post Hoc test.

4.5. Effect of Ethnic Groups on Shopping Mall Interior Landscape Dimensions

2. Is there significant difference between ethnic groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

Table 4 shows only business and green dimensions which showed significant mean difference for ethnic group, $p < .05$, while, there was no significant difference between ethnic group for seating dimension at $p > .05$.

Table 4. ANOVA results to identify impact of ethnic groups on interior landscape dimension[1]

Dimensions	Ethnic Groups			P value
	Indian	Malay	Chinese	
Business Dimension	3.16a	2.47b	2.93ac	0.000
Green Dimension	3.98a	4.26b	4.24bc	0.005
Seating Dimension	3.61a	3.64a	3.72a	0.176

Note: [1]Cell entries are mean values based on 5 point Likert scale (1= least preferred, 2= somewhat preferred, 3= neither preferred nor preferred, 4= preferred, 5= most preferred). 2The raw mean with different superscript differ significantly at $p<0.05$. 3Tukey was used for Post Hoc test.

The post-hoc comparisons indicated that for business dimension, a significant difference only found between Malay and Chinese, and also Chinese and Indian. For green dimension, there were only significant differences in Malay and Chinese scores as well as Malay and Indian. The results also indicated that the participants' ethnic groups only affected the visual preference in Business and green

dimension. Business dimension, which mainly highlights business in public spaces, was mostly preferred by the Malay participants but least preferred by the Chinese participants. This might be related to the Malays' attitude, which was expected to enjoy spending their money on buying things while the other ethnic groups especially the Chinese were known to be always involved in business or selling goods. This is an interesting finding because traditionally the Chinese were known to prefer business and they have a long history of their involvement in this since the day before the independent day. Moreover, nowadays they are dominating the businesses in Malaysia. However, the findings illustrated that they liked green dimension, which emphasised on natural elements, better than the business dimension. Compared to the Chinese and the Indian, the Malay preferred green dimension the least. However, all the ethnic groups preferred green dimension the most, which emphasised on the nature compared to the other dimensions. The only difference was their strength of preferences for each dimension. This was parallel with Ulrich (1985) who stated that there was a high agreement in terms of the preferences where the different ethnic groups preferred a similar thing which was nature [20].

4.6. Effect of Monthly Income on Shopping Mall Interior Landscape Dimensions

3. Is there significant difference between income groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

Table 5 shows there was a statistically significant difference between income levels towards business dimension $p < .05$, and green dimension $F(3, 236) = 5.615$, $p < .05$, however, there was no significant difference for seating dimension $F(3, 236) = 2.168$, $p > .05$.

The post-hoc comparison using The Turkey HSD on business and green dimension found that there were significant differences for the participants who had monthly income RM 5 000 & above and the participants who had monthly income less than RM 1000, RM 1000 – RM 2999 and RM 3000 – RM 3999. In general, a significant difference only occurred between the participants who earned RM 5 000 & above with all the other income groups. It could be said that the monthly income group of RM 5000 and above set a benchmark in differentiating the participants' desire in determining their preferences on business and green environment of malls' public spaces. The result showed as participants' income level increased, their preferences towards business dimension decreased while for green dimension the participants who had monthly income RM 5000 and above had the most preference compared to the other income groups. Thus great consideration is needed when designing the interior public spaces at malls which involve many customers from high income group. This indicated that the designers, architects, and mall developers need to provide appropriate public spaces for the public. They must also emphasis on the natural elements in the malls' public spaces especially at areas where majority of the residents receive a monthly income of RM 5000 and above.

Table 5. ANOVA results to identify the impact of monthly income on interior landscape dimension[1]

Dimensions	Monthly income				P value
	Less than 1000 RM	RM1000-RM2999	RM3000-RM4999	RM 5000 and Above	
Business Dimension	3.18a	2.87a	2.85a	2.24b	0.000
Green Dimension	3.97a	4.19a	4.07a	4.58b	0.001
Seating Dimension	3.61a	3.64a	3.72a		0.092

Note: [1]Cell entries are mean values based on 5 point Likert scale (1= least preferred, 2= somewhat preferred, 3= neither preferred nor preferred, 4= preferred, 5= most preferred). 2The raw mean with different superscript differ significantly at $p<0.05$. 3Tukey was used for Post Hoc test.

4.7. Effect of Current Housing Types on Shopping Mall Interior Landscape

4. Is there significant difference between housing types groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

Table 6. ANOVA results to identify the impact of current housing types on interior landscape dimension[1]

Dimensions	Housing Types						P value
	Condo.	Bungalow	Semi-detached house	Terrace house	Apart.	Flat	-
Business Dimension	2.04a	2.56ab	2.51ac	3.05b	3.15b	3.32b	0.000
Green Dimension	4.46a	4.32ab	4.26ab	4.06b	4.08b	4.93ab	0.015
Seating Dimension	3.91ab	3.61ab	3.55a	4.84ab	4.00b	4.73ab	0.023

Note: [1]Cell entries are mean values based on 5 point Likert scale (1= least preferred, 2= somewhat preferred, 3= neither preferred nor preferred, 4= preferred, 5= most preferred). 2The raw mean with different superscript differ significantly at $p<0.05$. 3Tukey was used for Post Hoc test.

From one-way analysis result, as stated in Table 6, all three dimensions showed statistically significant differences at the $p < .05$ level of significance in visual preference scores for the current housing types being studied.

The post-hoc analysis indicated that for business dimension, there were statistically significant differences between the participants living in condominiums and those living in terrace houses, semi-detached houses and terrace houses, apartments and flats. For the green dimension, there were significant differences between condominiums and terrace houses and apartments. However, the seating dimension only revealed significant difference between who lives in semi-detached houses and apartments. Generally, the effect of housing types is obviously observable in the business and green dimensions but it is still blurred and chaotic in seating dimension. The effect of the housing types on participants' preferences might be due to this issue that those who live in condominium and bungalow experienced a convenient and well-organised environment and this contradicted the other housing types especially the apartment and flat. For the condominium type of house, its environment is also well landscaped and well maintained, thus it somehow different from the condition surrounding the apartment and flat. Hence, it influenced the participants' visual preferences towards the interior public spaces at malls.

Based on the descriptive analysis, the participants who live in condominium and bungalow preferred green dimension more and they preferred business dimension the least. Therefore, in order to design the malls' public spaces, consideration should be given in providing comfortable public spaces in all malls with greatest emphasise on the natural elements in those malls which are surrounded by high-class housing types such as bungalows and condominiums. This is a new finding especially related to the preferences of interior public spaces at shopping malls which concurred with Sullivan's (1994) who found that the participants' housing types significantly affected their preferences on the environment [11].

4.8. Effect of Usual Time Spent in Malls on Shopping Mall Interior Landscape Dimensions

5. Is there significant difference between spent time groups toward interior landscape design in shopping mall in Kuala Lumpur, Malaysia?

As shown in Table 7, from the one-way analysis, time spent category showed significant differences with all dimensions namely business dimension at $p < .05$, followed by green dimensions $F(3, 236) = 4.690$, $p < .05$ and seating dimension $F(3, 236) = 5.604$, $p < .05$.

The post-hoc analysis for business and green dimension revealed significant differences between those who spent time in the malls more than four hours with those spent between 3-4 hours. Finally, for the seating dimension, the significant differences were seen between more than 4 hours and 1-3 hours. The descriptive analysis as shown in Table 7 indicates that for the business dimension, the participants who spent time longer in the mall, least preferred this dimension. This is in contrast to the green dimension, where the participants who spent time more than four hours, preferred this dimension more compared to the other dimensions. Therefore, consideration should be given to provide this green dimension in the indoor public spaces especially in Kuala Lumpur's malls as the majority of the participants spent more than 4 hours in malls. It seems that green dimension was the most preferred dimension in any background cases.

Table 7. ANOVA results for usual time spent groups towards interior landscape dimensions[1]

Dimensions	Usual time spent				P value
	Less than 1 hour	1-3 hours	3-4 hours	More than 4 hours	
Business Dimension	3.06ad	3.11ab	3.09ac	2.57d	0.000
Green Dimension	3.86ac	4.07ac	3.96a	4.31bc	0.003
Seating Dimension	3.53ac	4.01ab	3.83ac	3.67c	0.001

Note: [1]Cell entries are mean values based on 5 point Likert scale (1= least preferred, 2= somewhat preferred, 3= neither preferred nor preferred, 4= preferred, 5= most preferred). 2The raw mean with different superscript differ significantly at $p<0.05$. 3Tukey was used for Post Hoc test.

5. Findings and Conclusions

The results exposed that only gender groups did not affect their visual preferences of the interior public spaces at shopping malls. This study found that the participants' age, monthly income, ethnicity, current housing types and usual time spent in the malls significantly affected the subjects' preferences in two different extremes (the most and the least preferred dimensions). However for the seating dimension, only the age of the participants, their current housing types and the usual time spent in the malls significantly affected their preferences. One of the main findings of the study showed that the mall's indoor space in Kuala Lumpur is a place where the public spend their time. The findings revealed that the greatest percentage (46.3%) of the participants spent more than four hours during each visit to the malls compared to the others. Nevertheless, besides those who spent their time in the mall, the most important thing was the participants' usual time spent in the malls significantly affected their visual preferences. Those participants who spent more than four hours in the malls preferred the green dimension better than the business dimension. It can be argued that people consider shopping mall not only for buying needs and goods but as public space that they can spend weekend leisure times. Therefore, green and seating dimensions might play important role in providing comfortable and joyful venue for visitors.

5.1. People's Age Matter

The age factor is a critical issue in this study because the analysis of the participants' background showed that few

elderly participants utilized the malls (18.3% for the category of 51 years and above) and most of the malls' users were dominated by those in 18 to 30 years and 31 to 50 years groups. In this study, even though the results generally stated that the most preferred dimension was Green Dimension and the least preferred dimension was Business Dimension, the magnitude of preferences were different in relation to age. Older participants preferred the Green Dimension more than the Business Dimension.

The study revealed that, as the participants' age increased, their preferences towards the Green Dimension would also increase. However, their preferences towards the Business Dimension would decrease as they aged. Based on this evidence, it could be assumed that the older participants less utilise the malls since the current conditions of the malls did not provide the interior public spaces with a comfortable environment. They may want a better condition of public spaces in malls because of their age; they might become tired easily, thus need the interior public spaces, which could help them to relax physically or psychologically. The finding was supported by previous research who studied a big scale multipurpose centre [21]. Their research identified that the elderly needed special condition as they sat the longest in seating places (mean = 11.2 minutes), followed by the teenagers (mean = 6.8 minutes) and the children (mean= 10.2 minutes) [21]. Therefore, this required the malls' designers and architects to plan and design the interior public spaces with great consideration to the elderly customers.

5.2. Designing the Interior Public Spaces for People of All Ages

A great consideration is needed in designing public spaces that can cater to everyone's need regardless of the age. The results of this study also suggested that all the participants showed similar preference to the Green Dimension of the environment in public spaces at malls but their magnitude in each dimension differed. In order to develop a mall in certain areas, the mall's architects must work together with the policy makers, town planner and the other parties to identify the customers' age. Based on the above discussion, before planning and designing a mall, a series of survey must be conducted at new malls development areas especially based on the people's age. They should accentuate the best quality of interior public spaces in areas where many older generations are found as the customers. However, since the findings showed that all participants preferred a green environment and certain interior landscape elements, which contribute to form a comfortable venue, the architects and mall designers should plan such areas in every mall's indoor public spaces. This will also provide an opportunity for the public from all age groups to enjoy themselves at the comfortable public spaces, thus influence them to spend their time at the mall. The results of this study verified that the participants' backgrounds (especially age, which became a critical issue in this study) gave an impact on their visual preferences. Therefore, it might be necessary for the designers and mall architects to plan and design the malls' public spaces upon considering that the public who utilise the spaces come from various age groups.

REFERENCES

[1] Lyons, E., Demographic correlates of landscape preference. Environment and Behaviour, vol. 4, no. 15, pp: 487-511, 1985.

[2] Gwo-Fang, L., Human Responses to Water Elements in Interior Environments: A Cultural and Gender Comparison, Washington State University, 2002.

[3] Fraser, E.D.G. and Kenny W.A., Cultural factor affecting perception of urban forest, Journal of Arboriculture, vol. 2, no. 26, pp: 106-113, 2000.

[4] Yu, K., Cultural variations in landscape preference: Comparisons among Chinese sub-groups and Western design experts, Landscape and Urban Planning, vol. 32, pp: 107-126, 1995.

[5] Yang, B. and Brown, T.J., A cross-cultural comparison of preferences for landscape styles and landscape elements, Environment and Behaviour, vol. 4, no. 24, pp:471-507, 1992.

[6] Yang, B-E. and Kaplan, R., The perception of landscape style: A cross cultural comparison. Landscape and Urban Planning, vol. 19, pp: 251-262, 1990.

[7] Acar, C. and Sakici, C., Assessing landscape perception of urban rocky habitats, Building and Environments, vol 43, no.6, pp:1153- 1170, 2008.

[8] Oguz, D., User surveys of Ankara Urban Parks, Landscape and Urban Planning, vol. 52, pp: 165-171, 2000.

[9] Dearden, P., Factors influencing landscape preferences: An empirical investigation, Landscape Planning, vol. 4, no.1, pp:293-306, 1984.

[10] Yamashita, S., Perception and evaluation of water in landscape: Use of Photo-projective method to compare child and adult residents' perceptions of Japanese river environment, Landscape and Urban Planning, vol. 1, no. 62, pp: 3-17, 2002.

[11] Sullivan, W. C., Perceptions of the rural-urban fringe: citizen preferences for natural and developed settings. Landscape and Urban Planning, vol. 29, pp: 85-101, 1984.

[12] Tips, W.E.J. and Savasdisara, The influence of the environmental background on their landscape preference evaluation. Landscape and Urban Planning, vol. 13, pp:125-133, 1986.

[13] Malinowski, J.C. and Thurber, C.A, Developmental shifts in the place preferences of boys aged 8-16 years, Journal of Environmental Psychology, vol. 16, pp: 45-54, 1996.

[14] Hami A., Users' Preferences of Usability of Urban Parks in Tabriz, Iran, Universiti Putra Malaysia, 2099.

[15] Hami A, Suhardi M, Manohar M, shahhosseini H., Users' preferences of usability and sustainability of old urban park in Tabriz, Iran, Australian Journal of Basic and Applied Sciences, vol. 11, no. 5, pp: 1899-905, 2011.

[16] Hami A, Suhardi M, Manohar M, Malekizadeh M., Natural elements spatial configuration and content usage in urban park, International Journal of Architectural Engineering & Urban Planning, vol. 1, no. 24, pp: 15-23, 2014.

[17] Suhardi, M., A Perceptual Study of Wetlands Implications for Wetland Restoration in the Urban Areas in Malaysia. Unpublished doctoral dissertation, Virginia Polytechnic Institute & State University, Virginia: USA, 2006.

[18] Lekagul, A., Toward preservation of the traditional marketplace: A preference study of traditional and modern shopping environments in Bangkok Thailand. Doctoral dissertation, Virginia Polytechnic Institute and State University, USA, 2002.

[19] Kaplan, R., The analysis of perception via preference: a strategy for studying how the environment is experience, Landscape Planning, vol. 12, pp: 161-176, 1985.

[20] Ulrich, R.S., Human responses to vegetation and landscapes, Landscapes and Urban Planning, vol. 13, pp: 29-44. 1085.

[21] Anthony, K.H., Psychological Aspects, In M.M. Ali, and P.J. Armstrong, Architecture of Tall Buildings, McGraw Hill Inc, USA, 1995.