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AN EXAMINATION OF USERS' PREFERENCE TO PHYSICAL EDGES IN URBAN PARKS, WITH REFERENCE TO CAIRO, EGYPT

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ABSTRACT

Urban parks play an important role in the lives of people and cities. Their success to respond to people's preferences is owed to several characteristics; one of which is their physical edges. Physical edges are generally classified under topographic, vegetation, water-featured and manmade edges. The present research examines empirically the impact of these edges upon people's preference of urban parks in Cairo - Egypt. Towards the accomplishment of this aim, the study first develops the theoretical framework that addresses the types of park edges together with the theories of human preference. This part concludes to the landscape preference variables to be examined in relation to park edges. The empirical study then undergoes two consecutive phases. Phase One sets the exploratory study, to identify the preference variables that are most relevant to the Egyptian context. These variables are then examined in relation to four parks in Cairo, representing the main edge types. Phase Two of the empirical study then employs a questionnaire survey that was distributed to ninety professional and lay participants. The findings of the survey are statistically examined using T-test and Chi-square indexes, to find out how both groups relate preference variables to different edge types. Finally, the research concludes to a set of edge design guidelines to promote people's preference of urban parks, towards improving the overall environmental qualities.

KEYWORDS: Urban parks, User preference, Park edges, Egypt.

1.0 INTRODUCTION

Parks are very important to the livability of the city; some parks fail to grasp the user preference, hence losing their role in attracting people and promoting social interaction. Indeed the reasons that determine the success or failure of parks are numerous. They vary between physical and nonphysical reasons. One important physical reason is park edges. Therefore, the intent of this research is to investigate the impact of edges upon people's preference of urban parks.

Urban parks are generally classified into six main types: mini-parks, neighborhood parks, community parks, regional parks, special use parks, greenway parks. The areas of these types vary between 1000 m^2 to more than 600,000 m^2 (Bricker and Cannady, 2001).

Landscape preference is a concept that is used in many disciplines. It is an evaluation of how people perceive the surrounding environment and what preferred landscapes that people have in mind. It denotes liking or appreciating. The term preference implicitly contains an assumption that something is favored over something else. The assessment of visual quality is sometimes based on the expert theory, and sometimes relies on the public surveys. Therefore, this research refers to preference as "a liking for something", and applies it to both: experts and laypeople, to explore the characteristics of edges that may promote user preference toward urban parks with reference to Cairo, Egypt (Nicholson, 2002).

2.0 THEORETICAL FRAMEWORK

This part introduces the main definitions and classifications of physical edges. It then addresses the theories of landscape preference, to conclude to the main variables that will be examined empirically afterwards. Merriam Webster dictionary defines 'edge' as the line where an object or area begins or ends- the narrow part adjacent to border. An edge can also be expressed as the linear interface between two spaces or regions of a landscape that have different functions and/or physical characters, like a plane wall splitting spaces or a transitional zone between two adjacent places (Bennet, 2003).

Park edges are generally categorized under four main groups. These groups are manmade, vegetated, topographic and water-featured edges. The topographic edges are represented to parks in the form of split levels, cliffs, ramps or ridges. On the other hand, vegetated edges include avenues, trees, shrubs and meadow edges. However, the studied literature classified manmade edges under five types; those are barriers, semi-block barriers, light structures, buildings and difference of materials. At last, the water features comprised flat, overlooking or splitting water edges (Whyte, 1999; Bennet, 2003; Abdelhadi, 2009).

Many theories were developed to identify the major elements and constructs of landscape preference. Out of these theories, this research addresses the habitat selection theory, prospect-refuge theory, psycho-evolutionary theory and information processing theory, to learn about the means of forming human preference, and how it may reflect to the edges of parks in particular.

Analyzing the main findings of these theories, the present research concluded the major attributes for landscape preference, which will be examined with reference to the Egyptian context in the forthcoming empirical study. These attributes are aesthetics, risks, depth, ease of movement,

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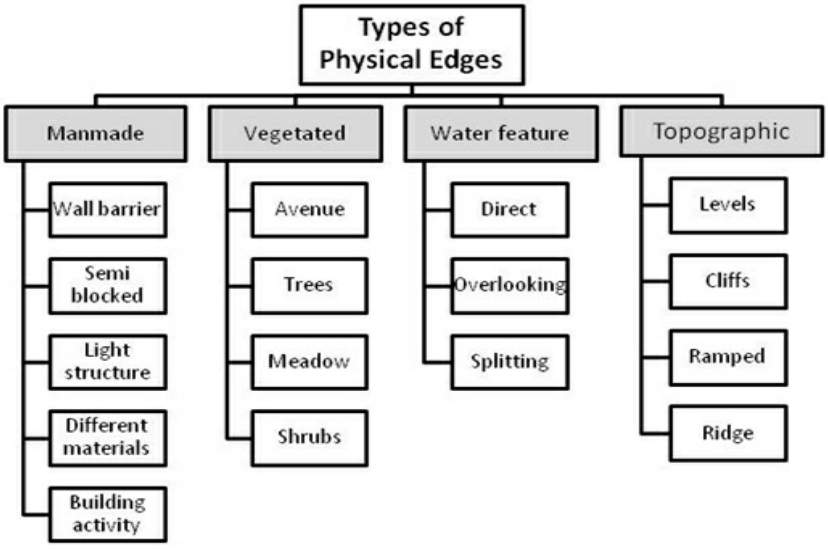

complexity, degree of surprise, novelty, incongruity, patterns, changes in elevation, lookouts, pathways, borders or edges, perceived danger, water features, trees, topographic variation, prospect, refuge, gathering information, good views, panoramas, shelters, origins, substance, accessibility, efficiency, openness, visual continuity, safety, focality, ground surface texture, deflective vistas, threat, dominance, independently perceived, landmarks, definable bands, line of sight, curved, coherence, legibility, mystery, security, privacy and sociability (Ruddell et al., 1989; Herzog and Kropscott, 2004, Herzog, 1985; Tahvanainen and Tyrvainen, 1998; Jensen, 1993; Kaltenborn and Bjerke 2002; Appleton 1975).

3.0 METHODS

The theoretical framework above sets the foundation for examining the relationship between park edges and preference variables. Yet, it was not possible to examine all 46 variables against 16 edge types at once due to the research limitations, timely and financially. Therefore, the research had to devise means for selecting the variables that are most relevant to the Egyptian context, to undergo the subsequent empirical examination.

3.1 Exploratory Survey

The abovementioned assumption complies with Rofianto's (2011) statement that exploratory surveys are valid means for obtaining the information needed to structure conclusive research studies. He further explains that this can be done with the intent of selecting which aspects of the data are to be emphasized, minimized, or set aside for the research at hand.

In line with this assumption, the present exploratory study targeted an extended sample, which intentionally involved a wide spectrum of age-groups, professions, genders, academic degrees and social backgrounds. The overall sample encompassed 120 participants, out of which 102 returned valid responses.

In this single-question survey, respondents were given a full list of the landscape preference variables concluded from the theoretical part. They were then asked to identify the ones they perceive as most important for addressing Egyptian parks.

Working out the statistical results of the valid responses, ten variables showed to have scored the highest frequencies. These variables are shown in descending order of their frequencies in Table (1).

The results of this survey were not subject to any further statistical tests; for that it is only meant to distil the variables that will be used for designing the questionnaire hereunder, or to 'set aside the date needed for the research at hand' in Rofianto's words.

Table 1: highest frequency preference variables

Variables	Freq.
Legibility	91
Accessibility	87
Prospect	87
Privacy	84
Aesthetics	81
Visual continuity	78
Sociability	75
Security	72
Coherence	66
Complexity	63

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3.2 Questionnaire Survey

The questionnaire is designed in two parts represented by four pages. It initially aimed to study the importance of edges to users, while its second part was meant to evaluate the impact of different types of edges upon the qualities of human preference.

Information about participant's age, gender, occupation and level of education are first investigated. Following, the respondents are asked to answer ten questions (preference attributes) to evaluate the attached photographs (edge type) on a five-point scale.

3.2.1 Validity

In many research studies, questionnaire surveys proved to provide numeric description of trends, attitudes or opinions of a population by studying a representative sample. Based on sample results, researchers may generalize the findings to the broader population (Creswell, 2003).

Furthermore, the use of colored printed graphics and sketches as visual stimuli in this research was based on precedent studies which have concluded that colored graphics are acceptable substitutes for site visits if they represent the visual elements of the studied landscape. Groat and Wang (2002) reported that investigation tasks, with a visual exercise can be an effective alternative to simply asking people to state their preference in a conversation or interview. In addition, this type of task can resemble a board game format, which reduces test anxiety and the monotony that is often associated with surveys (Marsden, 1999).

To further examine the validity of this survey, a pilot study was carried out before the final version distribution. The main objective of the pilot was to test the overall validity of the procedure, the formulation and the understanding of the interview by respondents; the test was carried out by ten randomly chosen respondents.

All in all, the pilot study suggested that approach of the study was feasible, and the procedure was able to extract useful information for further statistical analysis. It also showed that the questionnaire takes about 12 to 18 minutes to be completed by respondents.

After finishing the pilot survey, a few questions were eliminated an rephrased due to repletion of answers and difficulty to understand. For example, asking about nationality showed to be of no relevance with all participants being Egyptian. On another hand, "what is the importance of designing any parks edges?" was eliminated for that none of the pilot participants had answered it, which was interpreted as an unneeded complexity in its phrasing.

3.2.2 Sampling

In this research probability sampling was chosen, because it relies on the use of random selection. It is known as probability sampling because it is based on statistical theory relating to the normal distribution of events.

The theory behind its use is that the best way to get a representative sample is to ensure that the researcher has absolutely no influence on the selection of people/item to be included in the sample (Denscombe, 1998). However, there are two types of probability samples: random and stratified. A stratified sample is a mini-reproduction of the population. Before sampling, the population is divided into characteristics of importance for the research. For example, by gender, social class, education level, religion, etc. Then the population is randomly sampled within each category. Stratified samples are as good as or better than random samples, but they require fairly detailed advance knowledge of the population characteristics (Scheaffer et. al, 1996). Therefore, the present sample can be categorized under random sampling.

Landscape assessment studies generally fall into two main categories; the views of experts, and the perceptions, preferences and experiences of the public (Aurther et al., 1977; Daniel and Vining, 1983; Lothian, 1999; Terkenli, 2001; Zube et.al., 1982). Therefore, when evaluating landscape, one should use an interdisciplinary approach, communicate with other evaluators and more importantly be familiar with the academic respectability of the elementary.

Therefore, the examined sample involved ninety cases divided into two main categories, namely 33 experts and 57 laypeople, with different educational levels, age groups and genders, as shown in the table below.

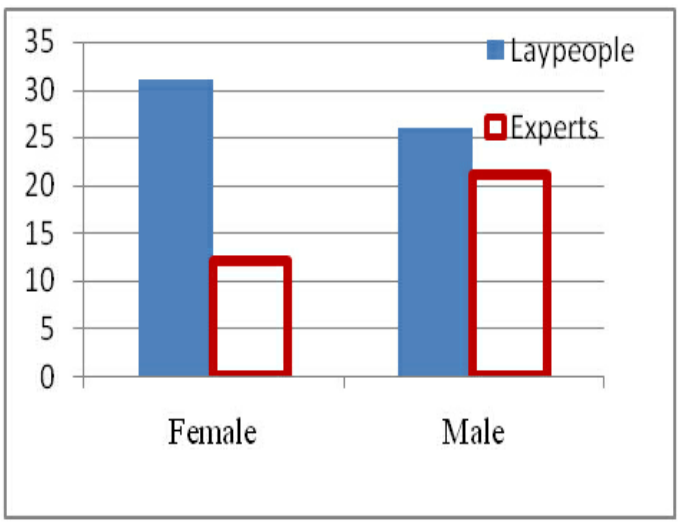

Fig 1: the different genders of people

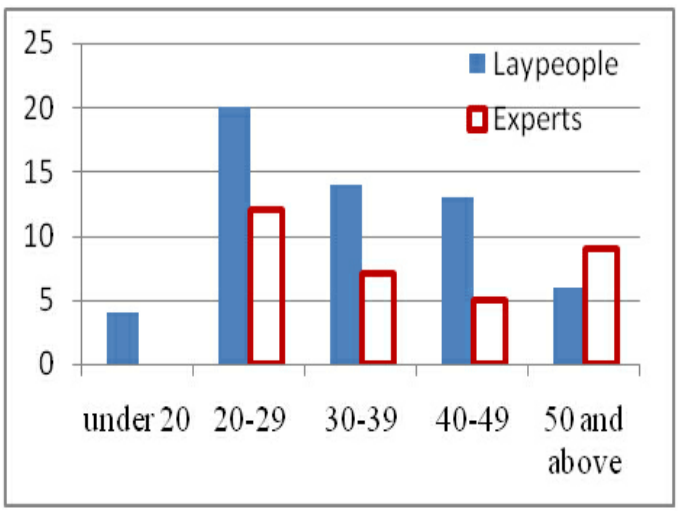

Fig 2: the different ages of people

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3.2.3 Procedures

According to Nicol (1993) the statistical analysis is the most common way of analyzing data obtained out of field studies, where the comfort votes are treated as the dependant variable and the environmental parameters as the independent variable. The data obtained were analyzed statistically using SPSS (Statistical Packages for Social Sciences).

There are a several analytical methods used in the exploratory model of perception and preference studies. They very basic method used is descriptive analysis. This method includes visually observed frequency, means and standard deviation. One specific method used to find important factors or characteristics of the environments is analysis of the most and least preferred scenes. The undertaken procedure follows these steps:

- First, to rank all of the scenes by their means preference.
- Second, select a group of scenes with the highest means and another group with the lowest means.
- Third, examine the characteristics or contents that are common to the most and the least preferred scenes. The comparison of the common characteristics is expected to reveal the important characteristics, causing positive and negative tendencies in preference.

3.2.4 Statistical Tests and Indexes

Because one major objective of this questionnaire is examining how both groups (experts and laypeople) perceive the impact of edge configurations upon park preference, Chi-Square Test is basically used to compare the mean values of the examined variables in relation to the studied sample.

The present study employed a five-point scale to examine people's perception of the relationship between edge design and preference attributes. On that scale, the top preference was given a value of "1", while the value "5" represented least preferred aspects. Therefore, higher scores should denote very weak preference. In addition, the value of "2.5" works out as the mathematical mean value of the studied spectrum. Therefore, it can be dealt with as a datum, against which the significance of preferred attributes per edge-type may be measured; i.e. attributes with less than 2.5 mean value are highly preferable when examined against different edge types.

On another hand, the analysis of T-Chart is defined as a hypothesis testing procedure that is used to evaluate mean differences between two populations. The format for reporting the results states that the degrees of freedom for between and within treatments respectively (Gravetter and Wallnau, 2004). Therefore, it is used in this study to compare preferred edge-types among experts and before and after discussing the details of their sub-categories and preference attributes.It is known that significant difference can be detected when the T-test mean significance is less than 0.05. Therefore, attributes that scored mean significance less than 0.05 were highlighted as a representation of significant difference between both groups.

4.0 RESULTS AND DISCUSSIONS

As explained earlier, this phase examines the significance of edge design; the preferred sub-category under every edge-type, together with the associated preference attributes; and a Chi-square comparison between both group perceptions before and after detailed investigation.

Significance of Edge Design:

As shown in table (2), all 33 experts rated edge design as 'very important'. This could be partly referred to their professional background. On the other hand, the majority of laypeople (23 out of 57) found it of no importance. Despite the surprising result, laypeople got to interact more positively with the subject as the progressed in the subsequent sections of the questionnaire. Again, this could be due to lack of knowledge about what an edge is, or how it may be designed. More interestingly, this seems to contradict with Dee (2001) statement of designers' attention being most paid to the center rather than the edge of the park.

Table 2: the difference between the public and experts towards importance edges design

	1 (not important at all)	**2**	**3**	**4**	**5** (very important)
Experts	0	0	0	8	25
Laypeople	23	10	5	9	5

Preferred Edge Type:

Peoples' perception of preferred edge types was investigated in two phases. First, participants were asked to identify their most preferred edge type, in relation to simple sketches showing the four major types. After addressing the different categories under each type, and examining their relation to the preference attributes, participants were asked once more about the preferred type, in relation to shown-groups. Interestingly, the findings were different as shown in hereunder.

Figure (3) shows a comparison between the preferences of the two main groups [experts/laypeople] in regard to the four main types of edges. The statistical tests show that most experts preferred the vegetated edges (63.6%), just as did (64.9%) of the laypeople. This could be a result of associating parks generally with vegetation, as well as the wide appreciation of the environmental benefits of plants.

On the other hand, experts showed no preference to manmade edges (D), and this could be due to associating manmade walls with limiting freedom, and setting barriers

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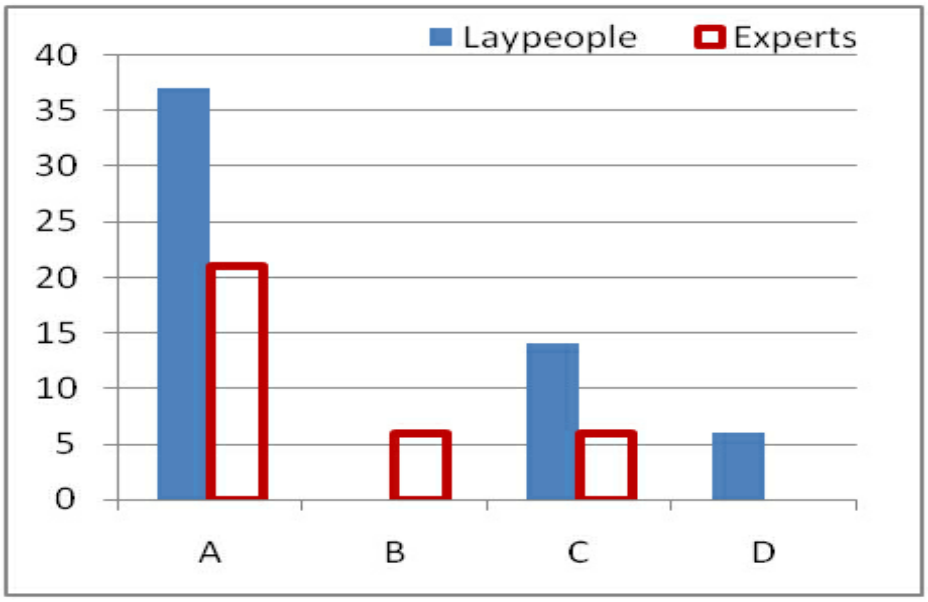
between people and public facilities in the city (physically and visually).

However, a small amount of lay people (10.5%) did choose this type of edge due to preferring closed edges and their own sense of privacy and security, as explained in the prospect refuge theory. Likewise, topographic edges were not chosen by lay people, properly due to the lack of knowledge about this certain type of edges and their relatively scarce presence in Egyptian parks.

Figure 3: The Experts /Lay people preference to the four types of edges.



Topographic Edges:

The subsequent section of the survey examines the detailed preferences of edge types amongst both target-groups. The first set of questions is related to topographic edges. Both groups are asked to choose one of four images representing the four topographic edge types.

Figure (4) below outlines the statistical findings, which showed that most experts preferred the ramped type (60.6%), just as did (65%) of the lay people.

The difference in preference level [even amongst the same group] seems significant. Where the professional group ratings dropped down from 60% to 21%, 18% and 0%, the lay people record showed 65%, 15%, 10% and then 8%. This gap between 60% - 21% and between 65% - 15% can be interpreted as a significant preference of this type over the others. When designers get to address the major difference between the 'ramped' edge and other topographic types, it seems to be the one with least radical change in contour, compared to others.

Therefore, designers are generally recommended to introduce smooth and gradual level transitions when dealing with park edges in Egyptian cities.

After the specific preferred type is identified, respondent groups were asked ten questions to relate their preferred type to the major preference attributes outlined in phase one of the empirical study. The findings are graphically represented in figure (5) below.

Figure 4: the statistical findings of four types of topographic edge

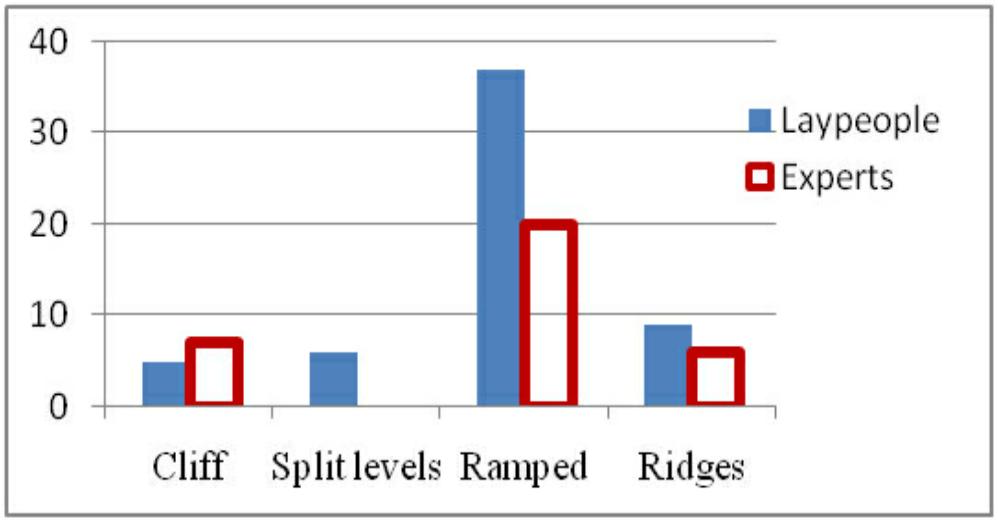


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Fig 5: Qualities of edge / educational background, with reference to topographic edges

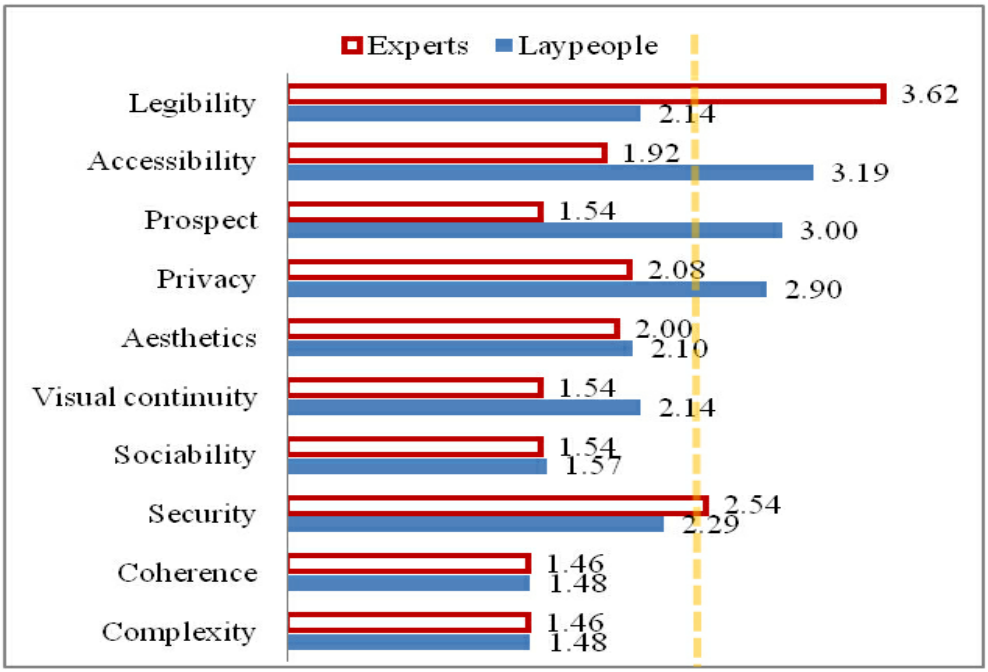

Table 3: the mean significance of qualities in topographic edge type.

Mean significance	
Complexity	·957
Coherence	·957
Security	·543
Sociability	·144
Visual continuity	·842
Aesthetics	·144
Privacy	·027
Prospect	·006
Accessibility	·008
Legibility	·010

A first look at figure (5) above suggests that 'social interaction', 'coherence' and 'complexity' were the attributes that are most associated with ramped edges for both groups [ranging between 1.4 – 1.5 mean values]. This is based on the fact that the value "1" was given to "very much" while the value "5" represented "Not At All". Therefore, higher scores should denote very weak relationship. Thus, the lower the mean value is, the more relevant is the attribute to the preferred edge type.

On another hand, both 'prospect' and 'visual continuity' were at a similar significance to professionals [1.5], but not for lay people [2.1 and 3.1] respectively. The converse result can be seen in 'legibility' and 'security' which were of higher relevance to the lay people, as shown in the graph above. It is quite interesting that the consequential relationship between these two attributes was addressed by the **information processing theory**.

It is known that significant difference between the preferences of both groups can be detected when the T-test mean significance is below 0.05. Therefore, it is pretty interesting that 'privacy' and 'accessibility' scored the most significant differences, with professionals giving them higher importance than lay people genuinely believed.

This finding should disseminate two primary messages; first, the professional/layman perceptions are different. Second, park designers should not follow their beliefs in isolation from the genuine user preferences, particularly in terms of preference attributes they associate to ramped edges.

Vegetated Edges:

It is known from the literature that vegetated edges are

classified into hilly, avenue, shrub and gradient edges. Table (3) below shows a comparison between the preferences of the two main groups (experts/laypeople) in regard to the four main types of vegetated edges. The statistical tests show that most experts preferred shrub edges (45.5%), just as did (65.3%) of the lay people.

While both groups rated gradient edges as their least preferred, it is quite interesting that none of the experts voted for it (0%). Figure (6) clearly shows that 'visual

continuity' is the attribute that lay people [1.4] and experts [1.5] most associate with shrubs. Likewise, they both found it of no relevance to 'privacy' and 'accessibility'. When it comes to comparing their different perceptions, the T-Test mean significance values suggest a major difference in perceiving the significance of 'coherence' to shrub-edges. Lay people thought it had more importance than did professionals. It is therefore recommended that landscape architects take this into consideration while designing vegetated edges.

Despite the high significance factor for 'visual continuity', it should be understood that it scored the 'most preferable' for both groups individually. Therefore, researchers should not be misled by numeric evaluations, which may have been a result of sample size. However, this complies with the emphases laid by **the psycho-evolutionary theory** addressed earlier in the **theoretical framework** of the present study. This can be also seen in the case of 'accessibility' and 'privacy'. They were obviously the least associated with shrubs for both groups. This can be explained by the physical properties of horizontally-extended little-height shrubs. The continuum of interwoven branches does not make it easy to cross them, while their limited height can potentially reveal more than hide.

Fig. 6: Qualities of edge / educational background, with reference to vegetated edges

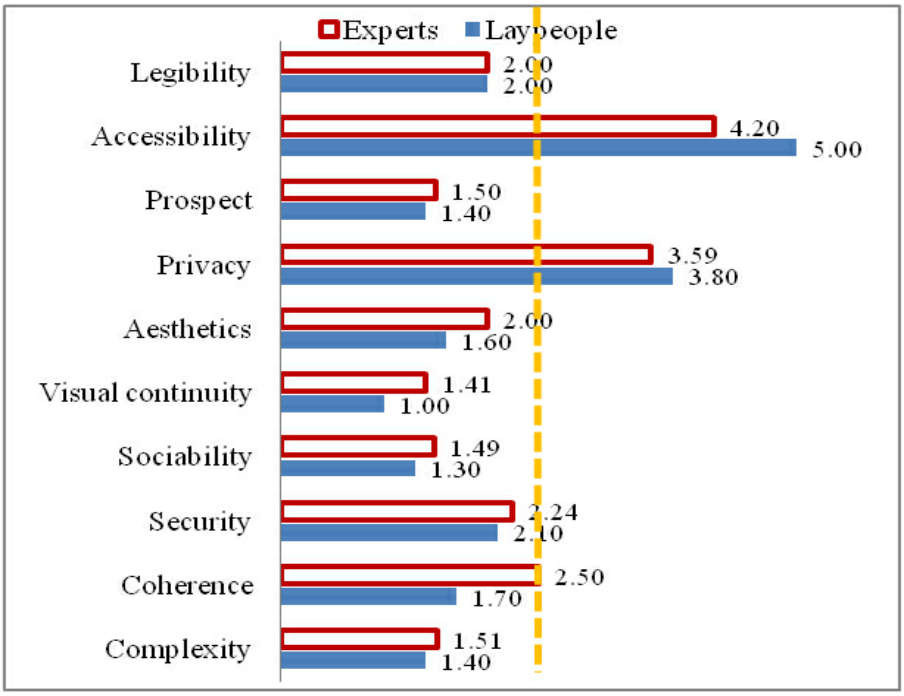

Table 4: the mean significance of qualities in vegetated edge type.

Mean significance	
Complexity	·530
Coherence	·007
Security	·566
Sociability	·289
Visual continuity	·016
Aesthetics	·050
Privacy	·005
Prospect	·579
Accessibility	·001
Legibility	1·00

Manmade Edge:

Based on the theoretical findings the questionnaire introduced the manmade edges under walls, buildings, light structures, semi-blocking elements and material differences. Table (5) below shows that the employment of material differences for edge definition was the most preferred for both groups, i.e. (63.3%) of the experts and (70.1%) laypeople.

On the other hand, experts' preference to 'semi-blocking elements' and 'light structures' showed to be very marginal (3.4%) and (0.0%) respectively. Examining this against laypeople's preferences, 'semi blocking elements' results

showed to comply with the professional findings (0.0%), where 'light structures' recorded a clear variance of (19.3%). This indicates that people's preference to edges defined by materials' diversity conforms with the theoretical explanation adopted by **the prospect refuge theory,** discussed earlier.

The following figure (7) represents the statistical findings of preference attributes in relation to the chosen edge type, as outlined by the responses of laypeople and experts.

Fig 7: Qualities of edge / educational background, with reference to manmade edges

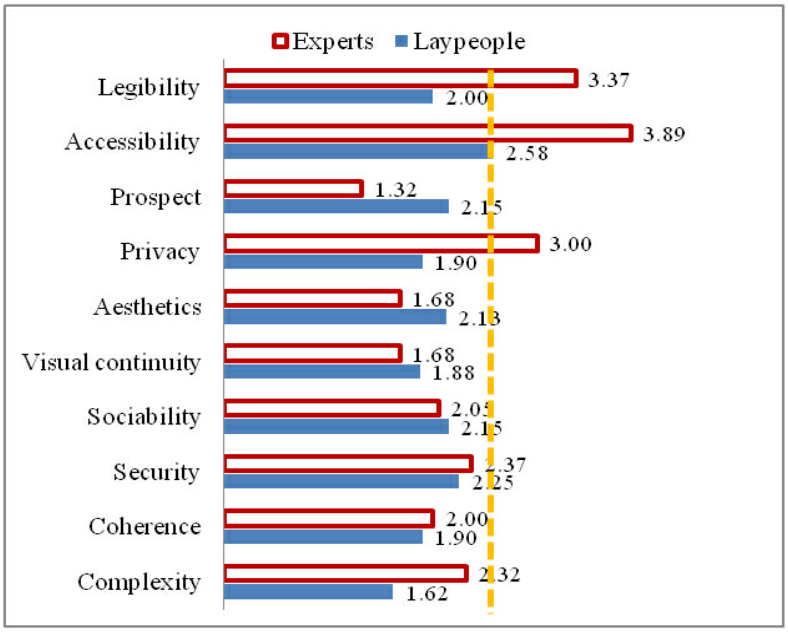

Table 5: the mean significance of qualities in manmade edge type.

Mean significance	
Complexity	·009
Coherence	·722
Security	·690
Sociability	·670
Visual continuity	·353
Aesthetics	·066
Privacy	·000
Prospect	·630
Accessibility	·002
Legibility	·000

Experts here showed general disapproval to some qualities like legibility [3.37], privacy [3.0] and accessibility [3.89], whose mean values are all above [2.5]. This was the same perception reported by lay people. Lay people confirmed that manmade edges could achieve higher level of complexity and visual continuity for visitors. On the contrary, experts gave more weight to aesthetics, prospect and visual continuity [1.68], [1.32] and [1.68] respectively being the main variables associated with this type of edges.

The T-chart results indicated interesting differences between the priorities of both groups, particularly in relation to legibility, accessibility and privacy, which seemed to be more significant to lay people than to experts. The very special experiential dimension associated with these three qualities explains why they came more important to park users. Therefore, it is strongly recommended that professional park designers lay further emphases upon these qualities as major driving forces for their future endeavors, so that they come more appealing to the genuine preferences of the end users.

Water-featured Edge:

The last set of questions is related to water-featured edges. In this set of results of the two groups are totally dissimilar. The statistical tests showed that most experts preferred the overlooking edges (63.3%), while (19.2%) of the laypeople did. This could be a result of preferring the more dynamic, natural, interactive edges to experts than laypeople. On another hand, most laypeople preferred the flat water edges (66.6%), unlike expert who gave this type (24.2%). This could be due to the wide appreciation to the environmental benefits of water, particularly in relation to the humidification, reflection and noise reduction effects it

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possesses. The table below shows the differences between the two studied groups.

In order for the study to understand the different group perceptions of attributes associated with the preferred edge-type, the analysis is undertaken in two consecutive steps. First, figure (6) below represents the attributes associated with 'overlooking' water edges, as addressed by segments of both groups who preferred it. In a subsequent step, Figure (8) will show how other segments (of both groups) who preferred 'flat edges' elated it to the studied attributes. It shows that most attributes remained below the mean value (2.5). This can be seen in 'aesthetics' [1.45], 'legibility' [1.45], 'complexity' [1.91] and 'coherence' [1.91]. Only laypeople's responses to 'security' and 'legibility' exceeded the average mean value. This may be explained in the light of the perceived drowning threats associated with this edge-type. Experts on the other hand, associated this edge type with 'coherence' [1.35], 'complexity' [1.91], 'aesthetics' [1.35], 'prospect' [1.35] and 'legibility' [1.45].

Understanding this in relation to the theoretical framework of this study strongly suggests the relevance of the addressed theories. The study of water-featured edge-preferences made reference to a wide range of attributers, which were not all covered by one theory. A number of the above variables were basically highlighted by the **information processing theory** [e.g. 'coherence', 'legibility', 'complexity']. Similarly, an aspect like 'aesthetics' was only seen in the **habitat selection theory**; while others like 'prospect' and 'security' were primary driving forces in the **prospect refuge theory**.

Fig 8: Qualities of edge / experts background, with reference to 'overlooking 'water featured edges

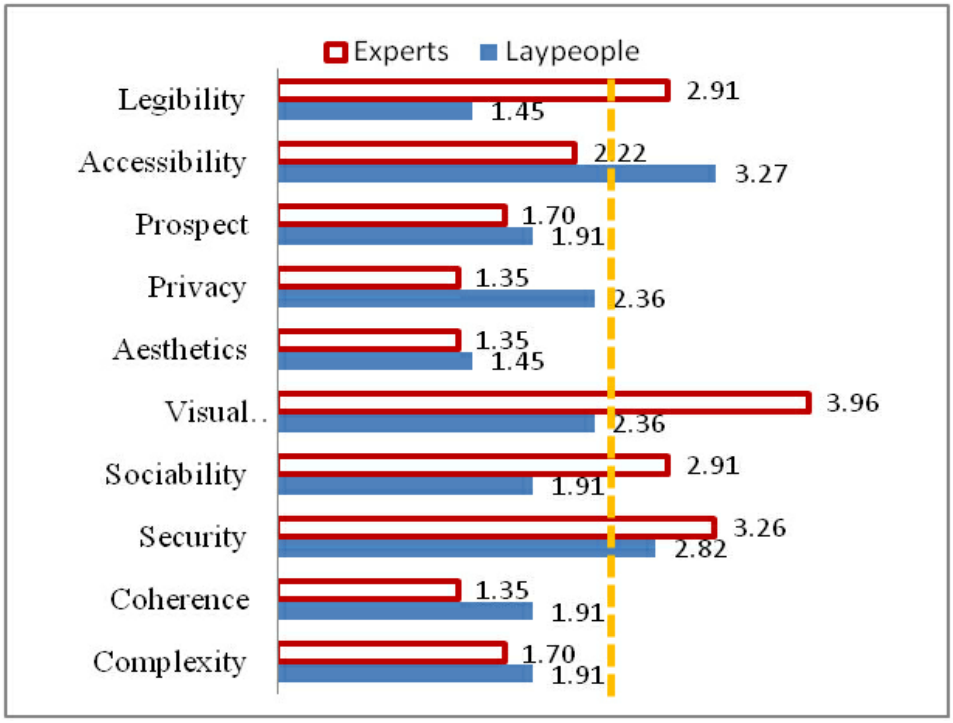

Table 6: the mean significance of qualities in water featured edge type.

Mean significance	
Complexity	·485
Coherence	·051
Security	·030
Sociability	·048
Visual continuity	·001
Aesthetics	·563
Privacy	·417
Prospect	·563
Accessibility	·020
Legibility	·012

Despite the unexpected public dissociation of 'overlooking' edges from 'legibility', the mean significance value confirms that experts have a seriously different view [0.012], as seen in table (5.9) above. However, 'visual continuity' shows another vast difference, in which experts showed less favorable scores. This is probably due to pre-conceived professional experiences / ideas, where the genuine encounter shows otherwise. Just as in previous edge types, major emphases on 'security' are laid by the public more than the experts [0.03]. However, it is quite interesting that

professionals do not seem to be troubled with 'accessibility' via this type of edges, which could be a result of their extended knowledge about possible technical means for overcoming this concern; a kind of knowledge the public may likely lack.

The following figure (9) represents the investigated attributes in association with 'flat' water edges, as addressed by both involved population. Laypeople preferring this edge type have found it most related to 'legibility' [1.34], 'complexity' [1.79] and 'coherence', [1.42]. Expert advocates of this type have seen it at an interesting significance of [1.12] and [1.37] to 'complexity' and 'coherence'. It is partly understandable that experts may not be able to judge precisely what is more remember-able / remarkable to park visitors, i.e. their judgment of legibility can be quite questioned. On the other hand, rating 'flat' water edges as least associated with 'accessibility' can raise other questions, particularly when compared to their favorable association of other water edges with the same attribute.

Fig 9: Qualities of edge / laypeople background, with reference to 'flat' water featured edges

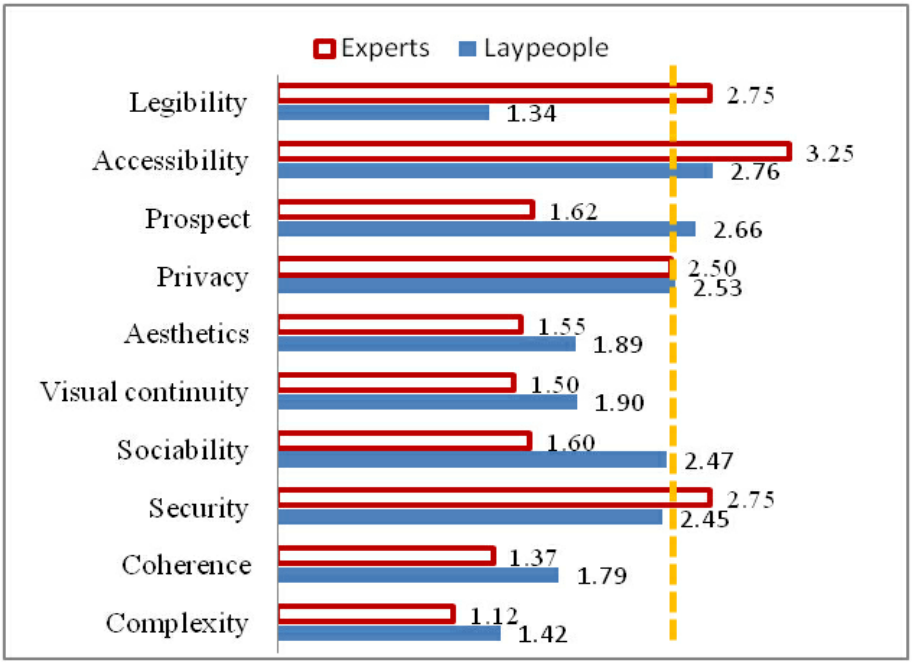

Table 7: the mean significance of qualities in water featured edge type.

Mean significance	
Complexity	·060
Coherence	·211
Security	·032
Sociability	·000
Visual continuity	·103
Aesthetics	·077
Privacy	·269
Prospect	·003
Accessibility	·030
Legibility	·000

One very interesting finding is the professional stereotyping of water features social potentials, which came at odds with the public perceptions [0.00]. The public boldly expressed the neutral effect [2.47] of flat water edges on their social activities. A similar difference [0.00] can be seen in legibility, but in the counter direction. It is the experts who found it less relevant [2.75], in a quite different perception from the lay-participants' [1.34]. Moreover, the difference in perceptions of both groups to the relationship between prospect and flat water edges' [0.003] draws attention to preconceived priorities adopted by professionals, which did not show to be at similar importance to genuine users.

Preferred Edge Type - Chi-Square Test:

Peoples' perception of preferred edge types was investigated in two phases, as stated above. The findings of the first phase were addressed in detail earlier. The present investigation is meant to examine the perceptions of both groups to the most preferred edge type [main categories], after they were introduced to their detailed sub-categories and correlated attributes. This suggests that researchers and practitioners should rely more on the findings of this phase as more representative to the reality of their underlying landscape preferences.

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Figure (10) the statistical findings of the four types of edge – after questionnaire Figure (10) below shows the direct frequencies reported by both groups in this question. It shows from the illustration that experts place water-featured edges as the top preference. But laypeople's most preferable type is 'manmade' edges.

This preliminary reading suggests a shift between phase one and the present phase. A chi-square test was undertaken to analyze the differences between both questions, i.e. between both group perceptions before and after being introduced to detailed categories and qualities.

Figure (11) The statistical findings of the four types of edge vs. experts– before and after questionnaire It is known in SPSS that chi-square test is a way to find the commons and differences by comparing two groups of frequencies, i.e. two sets of answers.

In the present study, chi-square test is employed to compare the answers of either group before and after the detailed questions about edge types/ qualities. The test confirmed that the expert results were different.

Figure (12) the statistical findings of the four types of edge vs. laypeople – before and after questionnaire The discrepancies in experts' responses draw attention to several points. First, the top choice shifted from 'manmade' edges to 'water features'. Likewise, the zero-frequencies shifted. While the 'topographic' edges received no preference in phase one, it is the 'vegetated' edges that scored (0.0%) in this final phase. This may be explained in the light of stereotypical pre-conceived ideas that evolve with the repetitive nature of practice.

On the contrary, the other group – laypeople were consistent. The findings of chi-square showed minor differences between both phases, while maintaining the same relationship of most / least preferred edge-types. This shows clearly in figure (12) below. Though, the middle-preference types exchanged positions, this could be ranked of less significance. However, the overall finding of this test confirms that the undertaken survey could trigger the genuine priorities of lay-participants, in a way that surfaces the sub-conscious and unconscious preferences to the level of conscious and consistent expressions.

Fig 10: the statistical findings of the four types of edge - after questionnaire

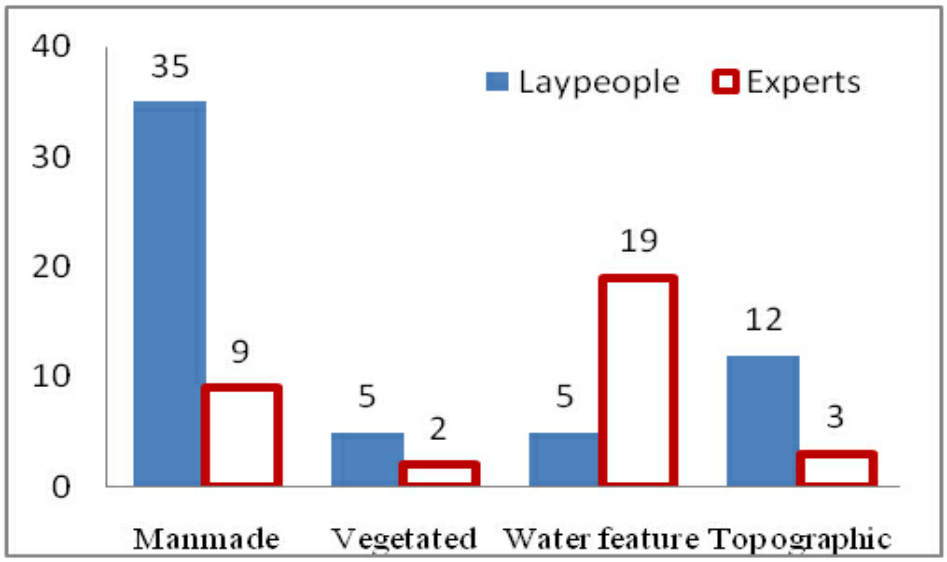

Fig 11: The statistical findings of the four types of edge vs. experts- before and after questionnaire

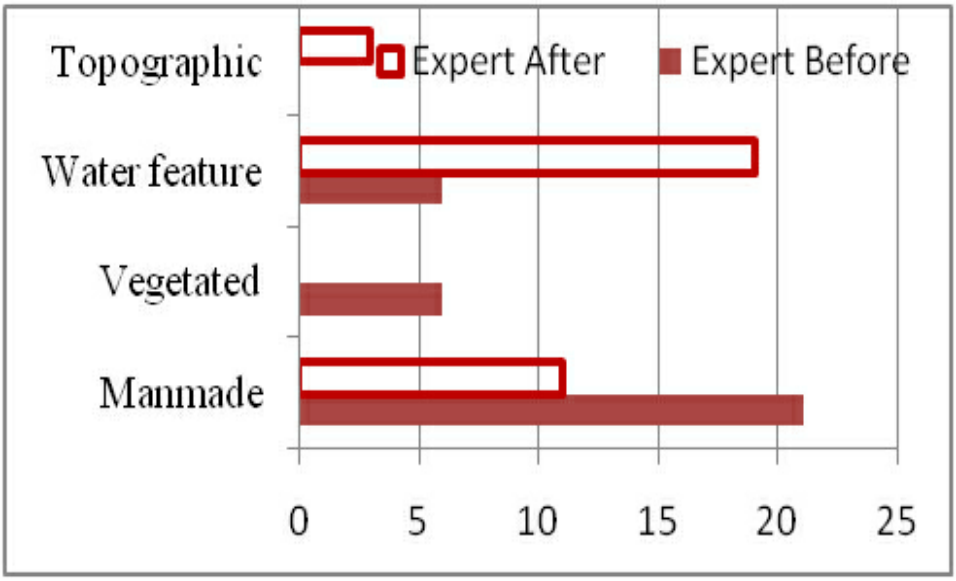

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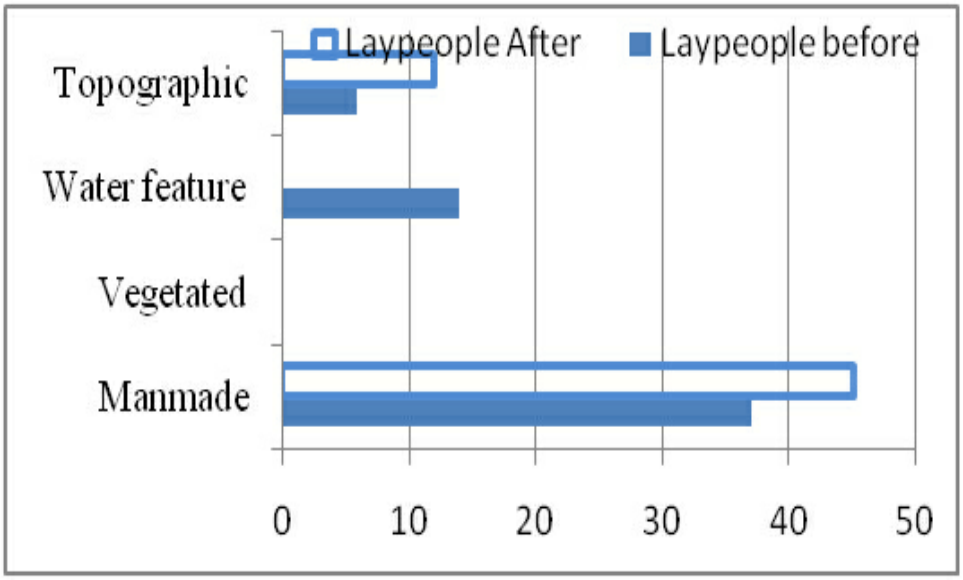
Fig 12: the statistical findings of the four types of edge vs. lay people - before and after questionnaire



5.0 CONCLUSIONS AND RECOMMENDATIONS

This study has primarily addressed the significance of edges to park visitors and designers, which proved to be vitally important. Afterwards it investigated the preferred types in two subsequent phases. Each of which concluded to interesting findings, which were in favor of abandoning the stereotypical professional perceptions. The preferred edge types were investigated in relation to the ten examined preference attributes. The findings of this section are graphically represented in Table (8).

Table 8: Matrix between types of edges and the ten selected variables

Based on the above, landscape designers are recommended to pay special attention to edge designs, which showed to have a direct influence upon people's preference to urban parks. Landscape qualities cannot be analyzed, evaluated

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and judged by experts and professionals only. Public preference should always be considered to guide and complement the professional expertise. In other words, users' participation in the decision making during the design, implementation and evaluation processes is quite important to improve design ideas and environmental qualities.

Therefore, understanding the design process, particularly in landscape contexts, strongly suggests incorporating public preferences at early stages of the process, in order to narrow down the gap between user needs and professional decisions. Based on public perceptions and professional expertise, every edge type is associated with particular preference attributes, which must be recognized by landscape designers. Park designers are recommended to make best use of manmade edges, which showed to be most relevant to local public preference in Egypt. However, this does not deny that the right employment of other edge types can be a positive contribution to people's wellbeing and environmental qualities.

The most preferred type of topographic edges is the 'ramped'. When landscape architects get to deal with this type, they may lay particular emphases on its complexity, coherence, security, sociability, aesthetics and legibility. Similarly, the most preferred type of vegetated edges is 'shrubs'. Thus, park designers should pay added attention to its associated preference attributes. Those include complexity coherence, security, sociability, visual continuity, aesthetics, prospect and legibility. 'Semi-blocking elements showed to be a top preference, compared with other manmade edges. Had a designer been in a situation to deal with this type, s/he ought to realize its most associated attributes - i.e. privacy, complexity coherence, security, sociability, visual continuity, aesthetics, prospect and legibility.

At last, the most preferred type in water-featured edges is the 'flat' type, while its most associated variables are complexity coherence, security, sociability, visual continuity, aesthetics and privacy. It is important to deal with these elements and attributes in holistic manner that recognizes the natural causes of their occurrence, as well as their complex interactions within the built environment.

Yet, park edges should not be perceived as barriers between parks and their cities. They should be rather recognized as healthy agents for interaction, and introductory medium to urban parks. Had the potentials of these edges been realized, the encounter with nature may be significantly promoted, with all the social, economic and ecological benefits it may entail on individuals, communities and the overall environment.

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