



**UNIVERSITI PUTRA MALAYSIA**

***UNDERGRADUATES' PERCEPTIONS OF VISUAL CHARACTERISTICS  
AND SAFETY OF URBAN PARKS' NATURALISTIC LANDSCAPES IN  
THE KLANG VALLEY, MALAYSIA***

***SARA FARBOD***

**FRSB 2013 22**



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KLANG VALLEY, MALAYSIA**

**By**

**SARA FARBOD**

**Thesis Submitted to the School of Graduate studies, Universiti Putra Malaysia  
in Fulfillment of the Requirement for the Degree of Doctor of Philosophy**

**July 2013**

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## DEDICATION

This thesis is dedicated to:

My beloved mother (Behjat), father (Mohammad Yousef),  
sister (Samira), brother in law (Mohammad), and my nephew (Surena)



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of  
the requirement for the degree of Doctor of Philosophy

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**SARA FARBOD**

**July 2013**

**Chairman: Prof. Mustafa Kamal Bin Mohd. Shariff, PhD**

**Faculty: Design and Architecture**

Human activities, including urbanization, continue to result in species extinction and threatening the biodiversity on which life depends. This prompted landscape architects to focus on creating more urban parks that are naturalistic. This could help to enhance biodiversity by increasing the variety of plants and wildlife in urban areas. However, some studies have cautioned that urban public may consider naturalistic landscapes to be unsafe and perceived safety influence urbanites willingness to use parks. Previous studies have shown the influence of visual characteristics on perceived safety. However, there is a dearth of systematic studies on the relationship between landscape visual characteristics and perceived safety of naturalistic landscapes in urban parks. This study

aimed to fill in this gap through the following objectives: 1) To examine public perceptions of safety; 2) To determine perceived safety according to visual characteristics; and 3) To determine the factors that influence perceived safety.

This study involved the selection and testing of naturalistic scenes in urban parks. The visual characteristics measured included *Prospect*, *Refuge* and *Escape* (each was measured by three indicators). Visual characteristics were also described verbally in the questionnaire. The study used photo-questionnaires of naturalistic landscapes in urban parks in Klang Valley, Malaysia. They were administered to 360 undergraduate students from Universiti Putra Malaysia in Serdang, Selangor. The data collected were analyzed using descriptive and inferential statistics such as Repeated Measure ANOVA, correlation and regression analysis.

Results indicated that there is a significant difference between respondents' perceived safety for different visual characteristics, even when the effect of non-visual factors (concerns about dangers, together with personal characteristics and experiences) was removed. Perceived safety for *Refuge* was lower than that for *Prospect* and *Escape*. The results revealed that the perceived safety for *Prospect*, *Refuge* and *Escape* are predictors of perceived safety for naturalistic landscapes. Significant relationship between photographs and verbal statements of measures of perceived safety confirmed the validity of the constructs.. Results also indicated violent crime and social incivilities successfully predicted perceived safety. In terms of demographic variables only ethnicity influenced the perceived safety of participants.

This study showed that perceived safety is a complex issue involving several elements, both physical and social. Therefore, physical and social measures should be combined in strategies to improve safety. This information can be useful for landscape planners, designers and authorities in the design and management of naturalistic landscapes in urban parks that are perceived to be safe by users.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PERSEPSI PELAJAR PRASISWAZAH MENGENAI CIRI VISUAL DAN KESELAMATAN LANDSKAP SEMULAJADI TAMAN BANDAR DI LEMBAH KELANG, MALAYSIA**

Oleh

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Kegiatan manusia, termasuklah proses urbanisasi, terus mengakibatkan kepupusan spesies hidupan liar dan mengancam biodiversiti yang menjadi tempat bergantungnya kehidupan. Keadaan ini telah mendorong arkitek-arkitek landskap untuk lebih bertumpu kepada rekaan taman bandaran yang lebih naturalistik. Ini mungkin dapat meningkatkan biodiversiti dengan menambahkan kepelbagaian flora dan fauna di kawasan bandar. Akan tetapi, terdapat kajian yang menunjukkan bahawa masyarakat bandar mungkin menganggap landskap naturalistik sebagai tidak selamat. Ini menjadi isu yang penting kerana tanggapan masyarakat bandar mengenai keselamatan akan mempengaruhi kesanggupan mereka menggunakan taman-taman tersebut. Kajian-kajian yang terdahulu telah menunjukkan pengaruh ciri-ciri visual terhadap tanggapan mengenai keselamatan. Walau bagaimanapun, kajian mengenai hubungkait antara ciri-ciri landskap visual dan



tanggapan mengenai keselamatan landskap naturalistik di taman-taman bandaran serba kekurangan. Kajian ini bertujuan untuk mengisi jurang-jurang yang ada melalui pencapaian objektif-objektif berikut: 1) Untuk memeriksa tanggapan awam mengenai keselamatan; 2) Untuk menentukan tanggapan mengenai keselamatan mengikut ciri-ciri visual; 3) Untuk menentukan faktor-faktor yang mempengaruhi tanggapan mengenai keselamatan.

Kajian ini melibatkan pemilihan dan ujian ke atas pemandangan naturalistik di taman bandaran. Ciri-ciri visual yang diukur termasuklah *Prospect*, *Refuge* dan *Escape* (masing-masing diukur dengan tiga penunjuk). Ciri-ciri visual juga digambarkan secara lisan di dalam borang soal selidik. Kajian ini menggunakan borang soal-selidik bergambar berdasarkan landskap naturalistik taman-taman bandaran di sekitar Lembah Klang, Malaysia. Kajian ini melibatkan 360 pelajar pra-siswazah daripada Universiti Putra Malaysia di Serdang, Selangor. Data yang dikutip dianalisa dengan menggunakan statistik deskriptif dan statistik inferensi seperti Repeated Measure ANOVA, korelasi, dan analisis regresi.

Dapatan kajian menunjukkan bahawa terdapat perbezaan yang signifikan dalam tanggapan responden terhadap keselamatan untuk ciri-ciri visual yang berbeza, walaupun kesan faktor-faktor bukan visual (kebimbangan mengenai bahaya, beserta ciri-ciri dan pengalaman peribadi) dikeluarkan. Tanggapan mengenai keselamatan untuk *Refuge* lebih rendah daripada *Prospect* dan *Escape*. Keputusan kajian menunjukkan bahawa tanggapan mengenai keselamatan untuk *Prospect*, *Refuge* dan *Escape*

merupakan faktor peramal untuk tanggapan mengenai keselamatan bagi landskap naturalistik. Hubungkait yang signifikan antara gambar-gambar dan kenyataan lisan bagi ukuran tanggapan mengenai keselamatan telah mengesahkan kesahihan kontrak. Keputusan juga menunjukkan bahawa jenayah ganas dan ketidaksopanan sosial berjaya meramalkan tanggapan mengenai keselamatan. Dari segi pembolehubah demografik pula, hanya perbezaan etnik didapati mempengaruhi tanggapan mengenai keselamatan di kalangan peserta kajian.

Kajian ini menunjukkan bahawa tanggapan mengenai keselamatan merupakan satu isu yang kompleks dan melibatkan beberapa elemen, fizikal mahupun sosial. Oleh yang demikian, ukuran fizikan dan sosial perlu digabungkan dalam strategi untuk meningkatkan keselamatan. Maklumat ini dapat digunakan oleh perancang landskap, perekabentuk dan pihak berkuasa dalam usaha untuk merekabentuk dan mengurus landskap naturalistik di taman-taman bandaran yang dianggap sebagai selamat oleh para pengguna.

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Lastly, but not least, I would like to thank God for giving me “Faith”, “Love” and “Hope” not only during my study but throughout my life.



## APPROVAL

I certify that a Thesis Examination Committee has met on 18 July 2013 to conduct the final examination of Sara Farbod on her thesis entitled “Visual Characteristics and Perceived Safety Of Urban Parks' Naturalistic Landscapes” in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the doctor of philosophy.

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## DECLARATION

### Declaration by graduate student

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## LIST OF ABBREVIATIONS

PS	Perceived safety for naturalistic landscapes in urban parks
PSVC	Perceived safety according to visual characteristics
PSVCI	Perceived safety according to visual characteristics indicators
PSVCP	Perceived safety according to visual characteristics measured by photographs
PSVCIP	Perceived safety according to visual characteristics indicators measured by photographs
PSVCS	Perceived safety according to visual characteristics measured by statements
PSVCIS	Perceived safety according to visual characteristics indicators measured by statements
NLUP	Naturalistic landscapes in urban parks

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

There is no doubt that the rich diverse forms of life on earth such as plants, animals, microorganisms, their genes and the ecosystems they develop is of immense value. Such biodiversity can have aesthetic, ethical, and direct or indirect economic values (Ehrlich & Ehrlich, 1992) or, more simply, resource and non-resource values (World Conservation Monitoring Centre, 1992). Nevertheless, human activities lead to the global extinction of many species and threaten the biodiversity on which life depends (Williams & Cary, 2002). Throughout the recent decades, the growth of human population and urbanization has led to a huge environmental loss such as ecosystem deterioration and reduction of green spaces (Gairola & Noresah, 2010) and more importantly, the significant loss of habitats in the urban landscape (McKinney, 2002). Urban green spaces have very significant conservation values because they are remnant habitats of rare and endangered species with a high level of biological diversity (Gairola & Noresah, 2010). It is generally recognized that the biological diversity of green spaces in urban landscape is very crucial for the ecosystem which is consecutively important for the wellbeing of humans and the environment (Gairola & Noresah, 2010).

As a result of this, issues related to the conservation of urban wildlife are becoming increasingly important study objects (Vuorisalo, Lahtinen, & Laaksonen, 2001). Natural and semi-natural landscapes such as parks, which are often also valuable wildlife

habitats, can form an important part of the landscape in towns and cities (Tregay & Gustavsson, 1983).

The matters mentioned above are prompting landscape architects worldwide to put forward plans for creating more ecologically friendly urban landscapes. The point is “to preserve nature, keep disturbance to nature at a minimum and to restore, create or emulate nature where it does not exist” (Jim & Chen, 2006, P. 346). In this style of landscape design, artificial features tend to be limited. This approach is termed naturalistic.

Despite the values and benefits of naturalistic landscapes documented by a number of scholars, there are some negative aspects to them, which will be explained in the next paragraphs.

## **1.2 Statement of problem**

Although, naturalistic landscapes have great benefits and values for people (Berman, Jonides, & Kaplan, 2008), but the perceived threats of naturalistic landscapes either through humans, accidents, or the subconscious mind is far more than within the traditional, formal, and well-maintained urban landscapes (Özgüner, Kendle, & Bisgrove, 2007). Gobster and Westphal (2004) mention that one of the key elements in designing urban environments is safety, although it does not always seem to be in complete compatibility with the naturalness and beauty of urban green space. In a study

by Jorgensen, Hitchmough, and Dunnett (2007) naturalistic woodlands were considered to be unsafe because of fears of assault, theft or harassment and threats from groups of youngsters. This is confirmed by previous studies (Coles & Bussey, 2000; MacNaghten & Urry, 2000). Forsyth (2003), Parsons (1995), and Ulrich (1986) have found that, as the naturalistic dense vegetation increases, the sense of safety in urban areas decreases. Similar to that, parks with dense, unmaintained vegetation become a big risk to people (Schroeder, 1989). In confirmation of this, Anderson and Stokes (1989) found that, in a small-scale urban context, well-maintained vegetation that clearly appears to have been “designed” enhances the security and attractiveness of urban parking lots in the United States.

Aside from that, some scholars have pointed out that the more cautioned people are towards safety, the less they go to certain public parks (Molnar, Gortmaker, Bull, & Buka, 2004; Jorgensen, Hitchmough, & Calvert, 2002; Jacobs, 1961). Those who intend to offer ideas for new park planning, have tried to show the sites as 'natural' in order to increase the number of animals and plants in their parks, but this seems to have become a big alarm and create higher levels of fear among those who use the parks, especially females (Malek & Mariapan, 2009). Glass, More, and Zwick, (1994) stated that a user's perception of personal safety in urban recreational parks was more important than their visual attractiveness. This is supported by Madge (1997) who concluded that fear is a major issue structuring the use of public parks in Leicester. Scott and Jackson (1996) found that a strategy of making parks safer was the most important change for increasing park use. Additionally, Westover, Flickinger, & Chubb, (1980) reported that 30 percent



of Ohio state park visitors avoid Ohio's urban parks because of concern for personal safety and security. In the study of Mumcu, Düzenli, and Özbilen, (2010), people pointed out that they would prefer not to sit in places in urban open areas that have low levels of safety. George (2003), in his study regarding tourists, found that feelings of unsafely may cause tourists to keep away from particular destinations and participation in certain activities at a destination. Fisher and Nasar (1992) noted that fewer people are found in areas considered unsafe on college campuses.

The importance of park use cannot be ignored in urban contexts. Urban parks and green spaces provide various physical, psychological, social, and environmental benefits that improve the quality of life in the urban environment. Parks benefit people, physically, by increasing opportunities for physical activities (Maas, Verheij, Spreeuwenberg, & Groenewegen, 2008; Tzoulas et al., 2007; Giles-Corti et al., 2005; Gobster, 2002). Also some studies (Chang, Hammitt, Chen, Machnik, & Su, 2008) show that viewing nature improved people's physiological responses such as blood volume pulse. The psychological benefits of having parks is that they can cause stress reduction (Chiesura, 2004; Godbey, Roy, Payne, & Orsega-Smith, 1998), improvement in cognitive functioning (Berman, Jonides, & Kaplan, 2008), improvement in people's moods (Barton, & Pretty, 2010), create situations in which people can be able to relax more, and finally they are great places for people who want to experience nature and escape from the city (Berto, Massaccesi, & Pasini, 2008; Abkar, Kamal, Mariapan, Maulan, & Sheybani, 2010; Karmanov & Hamel, 2008; Han, 2007; Chiesura, 2004). Social benefits, furthermore, are defined by an increasing sense of community and belonging

(Glover, Shinew, & Parry, 2005; Shinew, Glover, & Parry, 2004; Kweon, Sullivan, & Wiley, 1998), and opportunity for affiliation with others (Tinsley, Tinsley, & Croskeys, 2002). A significant relationship was found between the use of the parks and perceived state of health: Study participants who often used local parks were more likely to report good health than those who did not (Nor Akmar, Konijnendijk, Stigsdotter, & Nilson, 2012; Nielsen & Hansen, 2007).

A lack of sense of safety caused by naturalistic landscapes conclusively leads to a decline in park use, which in turn contributes to the decline in urban residents' sense of peacefulness and involvement in outdoor physical activities. This may be a significant negative factor that contributes to urban health problems, such as increase in cases of obesity, hypertension, heart disease and depression. The World Health Organization's 1986 Ottawa Charter highlighted the importance of creating supportive environments and building healthy public policy as two major goals for promoting health.

A number of scholars argue that actual and perceived safety is influenced by design. "Crime prevention through environmental design" theories (so-called CPTED), such as "defensible space theory", are based on this assumption. Many scholars have also explored the role of design in perceived safety. Yücel (2008) indicated that park design is an effective factor in safety perception. Luymes and Tamminga (1995) stated that the environment of a park will have the biggest impact on people who are very sensitive towards safety issues. Chapin's study in Central Park, New York, indicated that park design besides citizen involvement, programming and maintenance, and enforcement

makes public parks safer (Chapin, 1991). Egan (1991) found that the potential park users' behavioral responses are affected by their impressions of the physical design of a park. Roman and Farrell (2002) contended that parks with poor designs can lead to major social costs (crime), which result not from the producers of the designs, but from people in the community. Elsewhere, the possibility of reducing visitors' fear through design is discussed (Jorgensen, 2004; Jorgensen et al., 2002; Sangster, 1995).

Many studies examine the role of visual characteristics in perceived safety. Some of these are in the context of urban parks. Currently there is only one study that addresses the issue of perceived safety in naturalistic landscapes in urban parks (Jorgerson et al., 2002) by focusing on visual characteristics: spatial arrangement (full enclosure, partial enclosure, no enclosure) and edge treatment (no understory, no understory with flowers, dense understory with flowers, dense understory and native woodland edge). The results of this study suggest that we can make more naturalistic parks, parks in which we can have more vegetation, while maintaining them safe.

However, there are many other visual characteristics (including Prospect, Refuge, and Escape) that are not examined in the above-mentioned research. In addition, despite there being a huge number of studies regarding Prospect and Refuge, It is not clear how their indicators affect perceived safety. This presents a knowledge gap that needs to be closed by new research. Therefore, the point of departure for this study was a systematic study regarding the relationship between the mentioned visual characteristics (and their indicators) and perceived safety in naturalistic landscapes in urban parks.

The following research questions will be addressed in this study.

### **Main research question**

How do visual characteristics of naturalistic landscapes in urban parks contribute to perceived safety?

### **Sub-research questions**

Sub RQ 1: What is the people's perception of safety for naturalistic landscapes in urban parks?

Sub RQ 2: What is the people's perception of safety according to the visual characteristics in naturalistic landscapes in urban parks?

Sub RQ 3: What are the factors that affect the perceived safety of naturalistic landscapes in urban parks?

### **1.3 Goal and objectives**

The goal of this study was to determine the influence of visual characteristics on perceived safety of naturalistic landscapes in urban parks. The objectives are:

1: To examine the people's perceived safety of naturalistic landscapes in urban parks.

2: To determine the people's perceived safety according to visual characteristics in naturalistic landscapes in urban parks. This objective will be addressed by two sub-

objectives: a) to determine whether, people's perceived safety varies according to visual characteristics; b) to determine whether differences (if there are any), once the effect of non-visual factors is removed, are still significant.

3: To determine the factors that influence perceived safety of naturalistic landscapes in urban parks. This objective has three sub-objectives: a) to determine the relationship between perceived safety of naturalistic landscapes in urban parks and perceived safety according to visual characteristics; b) to determine the relationship between perceived safety of naturalistic landscapes in urban parks and concerns regarding dangers; c) to determine whether personal characteristics and experiences cause difference on the perceived safety of naturalistic landscapes in urban parks.

#### **1.4 Study hypothesis**

In line with the first objective and with reference to the work of Loewen, Steel, and Suedfeld (1993) and Fisher and Nasar (1992), this study hypothesized that:

*H1: There are significant differences among scores for perceived safety according to visual characteristics.*

The differences among safety scores according to visual characteristics suggest two possibilities: a) The visual characteristics create these differences; or b) The differences are created by non-visual factors. However there is no existing study that tests these

possibilities, since previous studies ignore the effect of non-visual factors. Thus, with regard to these differences, the present study hypothesized that:

*H2: Differences among scores for perceived safety according to visual characteristics are not influenced by non-visual factors and, when the effects of non-visual factors are removed, the differences are still significant.*

Appleton (1975) states that through evolution, humans prefer a setting in which they can see a broad vista (Prospect) without being seen (Refuge). People want these preferences to increase their chance of life by being able to have a safe observation point and the potential to react well against their enemies. If a person were to be attacked by an offender, what could he or she do? If people feel unable to defend themselves, they will try to escape. In this case, it is of the utmost importance that no surroundings obstruct their escape (Appleton, 1975). Based on this theory the following hypotheses were put forward for testing:

*H3: There is a significant relationship between perceived safety of naturalistic landscapes in urban parks and perceived safety according to visual characteristics.*

*H4: There is a significant relationship between perceived safety of naturalistic landscapes in urban parks and concerns regarding dangers.*

The fourth hypothesis is not a direct result from the Prospect–Refuge Theory; However If we want to elaborate that theory psychologically, we could say that one's perception of safety would be related to his or her self-perception of defenselessness to attack, or self-assurance in the aptitude to deter or escape it. Reasonably, those who are more concerned about their safety (against different types of dangers) have more fears of vulnerability to attack. Which in turn cause less safety perception.

A number of scholars found that demographic factors including gender (eg. warr, 1990; Box, Hale, & Andrews, 1988; Skogan & Maxfield, 1980), and ethnicity (eg. Perkins & Taylor, 1996) as well as familiarity (eg. Bannister & Fyfe, 2001) and previous victimization experience (eg. George, 2003) are influential in perceived safety. With reference to the mentioned studies this study hypothesized that:

*H5: Personal characteristics and experiences cause difference on perceived safety of naturalistic landscapes in urban parks.*

### **1.5 Study assumptions and limitations**

A. The context of this study is naturalistic landscapes in urban parks. As the focus is only on naturalistic landscapes rather than the whole park, characteristics of parks (such as park size, location, number of activities organized and staff) that have been associated with perceived safety in previous research, are not considered in this study.

B. Previous studies demonstrate that there are different types of naturalistic landscape. However, because the issue of safety in terms of visual characteristics by focusing on naturalistic landscapes is not well addressed, this study is interested only in naturalistic landscapes in urban parks in general. Therefore it is not concerned about types of naturalistic landscapes.

C. Since light availability affects perceptions of visual characteristics, to exclude this effect the focus of this study is limited to the daytime.

### **1.6 Justification for this study**

The present research attempts to explore the relationship between perceived safety and visual characteristics in two ways. The first is to test whether safety perceptions (for naturalistic landscapes in urban parks) vary according to visual characteristics. The second involves testing whether perceived safety according to visual characteristics affects perceived safety of naturalistic landscapes in urban parks. This framework can be expanded and applied in different contexts by science researchers. Herzog and Miller (1998) mentioned that the context includes both physical and non-physical factors. Physical factors include the type of setting as well as informational and perception-based predictors. Non-physical factors include knowledge, culture, ethnic status, expertise and personality. In terms of practice, it should be pointed out that those involved in landscape management have traditionally focused more on issues regarding the beauty of the landscape rather than safety (Schroeder & Anderson, 1984). The findings of this



study will inform landscape managers, planners, designers and authorities of people's wishes and provide them with some guidelines from design to management level in regards to safety perceptions. This in turn will help strike a balance between what is beneficial for people and what the public expect from the landscapes. In order for urban greening plans to get far, it is necessary to consider public attitudes and people's support (Gobster & Hull, 2000). Finally, this research can contribute to public health by increasing park usage and encouraging outdoor physical activities.

### **1.7 Definition of terminologies**

*a. Design style* “reflects how key objectives such as vegetation type, abundance, dimension, shape, color, density, configuration, location, seasonality and management define social and private spaces” (Jim & Chen, 2006, p. 345).

*b. Danger versus fear:* *Danger* carries a stronger implication of cognitive appraisal, fear or emotional reaction. *Danger* can be attractive (Herzog & Kutzli, 2002)

- *Physical danger:* a danger stemming from the physical structure of the environment (Herzog and Smith, 1988)
- *Social danger:* a danger stemming from a social source (Herzog and Smith, 1988)

*c. Fear* is defined as the feeling of distress, alarm or worry caused by perceived impending danger and/or harassment (Madge, 1997).

*d. Formal landscape* is “a more formal-looking landscape marked by: artificial features or geometric or uniform patterns; a neat and tidy appearance or intensive maintenance; and obvious human control in its design and management” (Özgüner et al., 2007, p. 37).

*e. Naturalistic landscape* is “a more natural looking landscape marked by: species diversity, structural complexity of plant communities or absence of uniformity; maximized use of natural elements and usually, but not always, native plants and animal species; minimized use of artificial elements and overt human control in the design and management; and maximized use of natural or spontaneous processes and ecological principles in the design and management” (Özgüner et al., 2007, p. 37).

*f. Perceived personal danger* can refer to a general fear of becoming a victim (Blöbaum & Hunecke, 2005)

*g. Safety*” is the condition of being safe from risk or danger: the quality or state of not presenting or involving risk or danger” (Van den berg, 2006, P. 7). In the present study, by “safety”, we mean both personal safety and physical safety.

- *Physical safety*: refers to being safe from physical danger (Gobster and Westphal, 2004)
- *Personal safety*: refers to being safe from social danger (Gobster and Westphal, 2004)

*h. Security* is the quest for a situation or moment in which something undesirable does not exist or does not occur (Crawford, 2002).

*i. Security versus safety:*” the notion of security is broader than safety. Safety concerns physical protection in particular (for example, against robberies, violence and traffic accidents). Security also concerns more intangible threats, such as terrorist attacks, natural disasters and war” (Van den berg, 2006, P. 7).

*j. Visual characteristics* include Prospect, Refuge and Escape, which are defined as follows.

*i. Escape:* “Either an exit route from a potential threat, or a connection to others who could respond in case of an attack” (Fisher & Nasar, 1992, P. 40)

*ii. Prospect:* “An unimpeded opportunity to see” (Appleton, 1975, P. 73)

*iii. Refuge:* “An opportunity to hide” (Appleton, 1975, P. 73).

*k. Visual characteristics indicators* include *Panorama, Vista, Secondary Prospect, Primary Refuge (Concealment), Secondary Refuge, Shadow, Multiple Pathways, Movement Ease* and *Proximity to Occupied Buildings*, which are defined as follows:

- i. *Movement Ease*: Refers to the ease of moving through a setting (Herzog & Kropscott, 2004).
- ii. *Multiple Pathways*: Refers to providing the opportunity for unpredictable or changeable routes for escape.
- iii. *Panorama*: Refers to “a wide view from a good vantage-point” (Appleton, 1975, P. 85)
- iv. *Primary Refuge (Concealment)*: Refers to “the view from within a hiding place” (Herzog & Kutzli, 2002, P. 821; Woodcock, 1982).
- v. *Proximity to Occupied Buildings*: Refers to being close to buildings or structures where people who may help are available.
- vi. *Secondary Prospect*: Refers to a view from hill or other vantage point from which one might expect to have a good view (Woodcock, 1982).
- vii. *Secondary Refuge*: Refers to “the view of a hiding place from a vantage point outside it” (Herzog & Kutzli, 2002, P. 821; Woodcock, 1982).

viii. *Shadow*: Dominant shadows in the setting (Herzog & Flynn-Smith, 2001)

ix. *Vista*: Refers to “a view which is restricted by conspicuous boundary margins” (Appleton, 1975, P. 85)

### **1.8 Organization of thesis**

This thesis is organized as follows to facilitate reading and discussion:

Chapter 1 of this thesis introduces the study background, issues, gaps and needs which motivated the researcher to conduct this study. It also explains who and how they will benefit from this study, as well as the research goal and objectives. Finally, selected terminologies pertinent to this study are defined.

Chapter 2 discusses a review of the literature regarding perceived safety (with an emphasis on the role of visual characteristics), naturalistic landscapes and urban parks.

Chapter 3 explains the methodology adopted for this study. It includes the research design, sampling design, sample size, the development of the data collection instrument, and data analysis.

Chapter 4 describes the results of the data analyses, which includes descriptive and inferential data analyses. It then discusses the findings.

Chapter 5 consists of the summary of findings, the conclusion in light of the study goal and objectives, and finally, recommendations for future studies.



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