Towards safe campus environments through environmental design: two universities as case studies

Stephanus Coetzee[1], Karen Puren[2]

Masters Graduate[1] and Senior Lecturer[2],
North-West University, Urban and Regional Planning,
School for Geo and Spatial Sciences,
Potchefstroom, South Africa,
e-mail: stehanq@gmail.com and karen.puren@nwu.ac.za

Universities are often considered to be safe sanctuaries. However, many higher education institutions have increasingly been confronted with crime and unrest. Violence and other crimes on campuses are currently an international concern. This paper reports on a study that investigated student's perceptions of safety on two campuses namely Lahti University of Applied Sciences in Finland and the North-West University in Potchefstroom, South Africa. Theories from Environmental Psychology and Urban Planning are combined in this study in order to incorporate aspects of the individual, social setting and spatial environment. Increasing people's safety help to optimise their experience of their environment and can in turn create an enabling context for people to flourish and improve their quality of life. The research followed a qualitative research approach. In this study, 21 participants from a Finnish university and 16 participants from a South African university were selected through purposive sampling. Data were generated through semi-structured interviews supported by visual data of the spatial environment. All data were transcribed verbatim and analysed through qualitative content analysis. The literature and findings of the research both support that the spatial and social environment influences safety. It is therefore recommended that safe campus environments require a multi-disciplinary and integrated approach to proactively develop a Comprehensive Safe Environment Plan (CSEP). From a planning perspective, students' perceptions of campus environments' safety may include the creation of compact dedicated campus areas, land uses, building placing and orientation, territoriality, landscaping, visibility, control over fear-inducing activities, maintenance, security measures and pedestrian orientated areas.

Keywords: Crime Prevention Through Environmental Design (CPTED), people-environment relationships, perception of safety, qualitative research

Contextualisation of the research: Background and problem statement

Universities have long been perceived as safe sanctuaries (Langford, 2004:2). Recently, campus environments have started to attract attention in the media due to incidents of violence, crime and unrest, which has led to campus safety being questioned (Makoni & MacGregor, 2016). Examples of such incidents include America's Kent State University riot of 2012, England's London student protest in 2015 and South Africa and Finland's student protests of 2015 and 2016. In the past few years, the idea of university campuses as safe havens have been questioned (Langford, 2004). With the increase of unrest and violence on campuses, safety has been placed high on the agenda of those responsible for the planning and management of campus environments. According to Bickel and Lake (1999), campus safety should be dealt with proactively. Understanding and addressing students' perceptions of safety on their campuses can enhance the overall quality of students' experience of campuses (Langford, 2004:3).

Safety extends beyond physical safety to include perceived safety. Physical safety involves the actual risk that an individual may be injured or victimised. Perceived safety is the individual's perception and experience of risk or safety and their level of comfort in their environment (Sorensen & Mosslemi, 2009 and Fyhri et al., 2014). Safety therefore has a real and perceived dimension.

The spatial environment and the way it is planned and designed can contribute greatly to issues such as safety (Grohe, 2006). Campuses generally combat safety issues through the use of reactive target hardening approaches such as security cameras, security guards and campus enclosure elements (e.g. fences and gates), but do not necessarily incorporate environmental design guidelines with regard to safety and experiences/perceptions of safety.

Armond (1993) states that a holistic perspective on crime is crucial as crime is a result of the dynamic interaction between people and the environment. Spatially orientated fields, like urban planning and design, have long focused on the alteration of the physical environment to combat crime and fear, but without including socio-cultural (Ekblom, 1995:117; Wekerle & Whitzman, 1995:13) and psychological aspects (e.g. the perception of the person in the environment and individual experiences) (Church-

man, 2016:1). Ekblom (1995:117) summarises the problem as:

"…in retrospect, neither side attempted to mount a study that would simultaneously embrace both social and design factors, preferring instead to remain each within its own independent domain of theory, method and findings."

Despite the growing expectation that campuses should proactively deal with safety issues, have mostly addressed these issues in a reactive manner. It is therefore necessary to develop an integrated and proactive approach in which the importance of the person and environment are acknowledged as agents in creating safe environments.

The experience of safety and how it relates to spatial environments were explored in two different campus environments with the goal of developing environmental guidelines for safety on campuses. In order for the research to accomplish this goal, secondary goals were included, namely (i) to explore students' perceptions/experiences of safety on two campus environment namely LUAS Campus (Lahti, Finland) and the NWU campus (Potchefstroom, South Africa) and (ii) to analyse the spatial environments of these campuses in terms of its environmental design in relation to the participants' experiences of safety.

Research Context

The research context includes two university campuses. The first is the North-West University's Potchefstroom campus in South Africa (Figure 1 and 3).

Two opposite characteristics of the two cases guided the selection of the two study areas – the first is the issue of safety and crime. The South African context is a high crime environment where crime and fear of crime are important issues (Ceccato, 2012). Finland, on the other hand, is a low crime environment with low levels of fear of crime (Cooper *et al.*, 2014). The second reason for the selection of the two campuses is their spatial configurations: the South African campus is a dedicated university campus space enclosed by a fence; the Finland university is spatially dispersed and integrated into the larger urban environment of Lahti.

The second campus is the Lahti University of Applied Sciences (LUAS) that is located in Lahti (Figure 2 and 4).

Figure 2. Geographical location of the city of Lahti in Finland (author's own construction)

Figure 3. Enclosed NWU Campus in Potchefstroom, South Africa (Google Earth)

Figure 4. Satellite image of the dispersed location of Lahti University of Applied Sciences (LUAS) (Google Earth)

Figure 1. Location of Potchefstroom, South Africa (author's own construction).

Literature review

Urban planning is a multidisciplinary field that is open to the methods and literature of the social sciences and that focuses on the interrelatedness of different aspects of the environment (Churchman, 2016:4). Therefore, theoretical concepts from environmental psychology and design theories were used to gain a holistic understanding of people–environment interaction and how it can inform people's perception of safety. While psychologists tend to focus on the individual and the social setting of people–environment relationships, spatial planners, architects and urban designers focus on the spatial environment. This field includes anyone who is interested in the relationship between people and the physical environment, including urban planners. Churchman (2016:4) argues that urban planning and environmental psychology are potentially important partners.

People–environment interaction – a point of departure to understand safety

Environmental psychology is particularly interested in the adaptive processes people use to cope with demands in the physical environment (Ittelson, 1978; Stamps, 2005; Gifford, 2011). This is referred to as the adaptational perspective in environmental psychology. The research mainly focuses on three characteristics of the adaptational viewpoint that are relevant to the study. The first is the holistic model of the adaptational view, which views the environment as a series of encircling contexts. The second is the adaptational view of an individual as a total person who interacts with the environment. The third is the emphasis of the adaptational viewpoint on the transactional relationship between the person and the environment. In the adaptational view, both the environment and the person are crucial. Aspects of both are discussed here.

The environment: The environment has simultaneous, overlapping and interrelated influences on people (Gifford, 2007). However, it is necessary to first understand that the physical environment itself is situated within extensive social and cultural contexts (Holahan, 1982:348). A holistic model of the environment that incorporates simultaneous influences of all aspects of the physical environment and their social and cultural context is useful in this regard. Holahan's (1982) holistic model (adapted from Bronfenbrenner's (1976; 1977; 1979; 2005) model – illustrated in Figure 5) consists of a series of encircling contexts that surround individuals and affect their functioning. According to Holahan (1982:348), the most immediate aspect within the physical environment that influences an individual is the interior design of an architectural setting. After the interior design, the structure of the building comes into play. The interior design and building can be seen as similar to Bronfenbrenner's microsystem. The next context within the physical environment is the broader geographic area of the building, including urban districts, natural landscapes and so forth.

All of these contexts within the physical environment are in turn surrounded by both formal and informal social structures. Informal social structures in Holahan's model can be compared to Bronfenbrenner's exosystem. Both the physical and social environments can be seen as encircled or incorporated in the cultural and subcultural patterns. These cultural patterns form Bronfenbrenner's macrosystem.

This holistic model portrays the environment as complex, so that the total person and environment are interrelated. A simplistic conception of people–environment aspects might incorrectly suggest that the influence of the physical setting on an individual's behaviour can simply be understood through a casual model in which a single cause produces a single effect.

The person: A complex view of the total person is illustrated in Figure 6 & 7). In this integrated view of the person, information from the environment that impacts on the individual is received, evaluated and encoded by that individual's interlocking network of psychological pro-
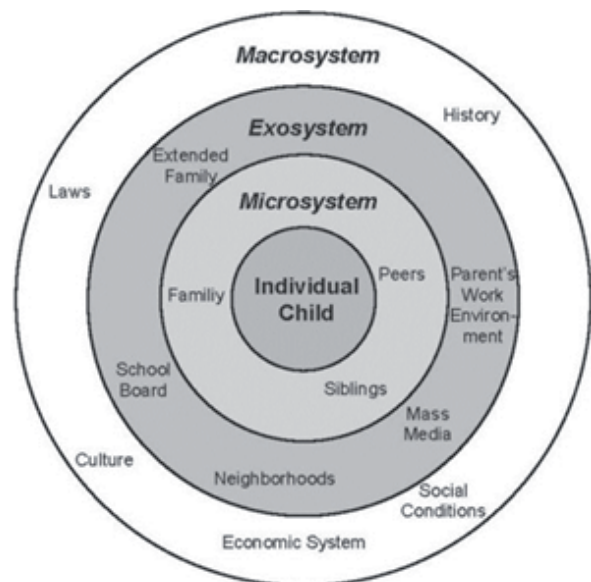

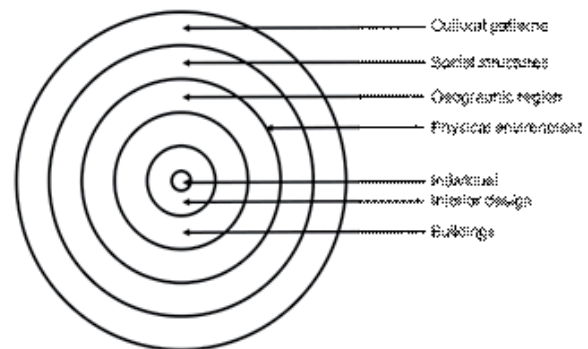Figure 5. Bronfenbrenner's Ecological Model (Eisenmann et al., 2008)

Figure 6. A holistic model of the environment (Holahan, 1982)

cesses. Psychological processes consist of environmental representations, environmental attitudes and environmental perception. Within the psychological processes of people (including representation, attitudes and perception), what is internally processed eventually informs actions or behaviour.

The processed environmental information, or environmental stimulus, becomes the foundation of the individual's decisions on how, when and where to act in accordance with the environment. All actions the individual engages in operate as an interrelated system (Holahan, 1982).

It is important to note that neither the person nor environment can be treated as a separate entity. People and their environment are in a transactional relationship. Ekehammer (1974) emphasises this interaction of the personal and environmental forces as a vital source of people's behaviour.

The transactional view is presented schematically in Figure 8. The transactional model shows that all components,
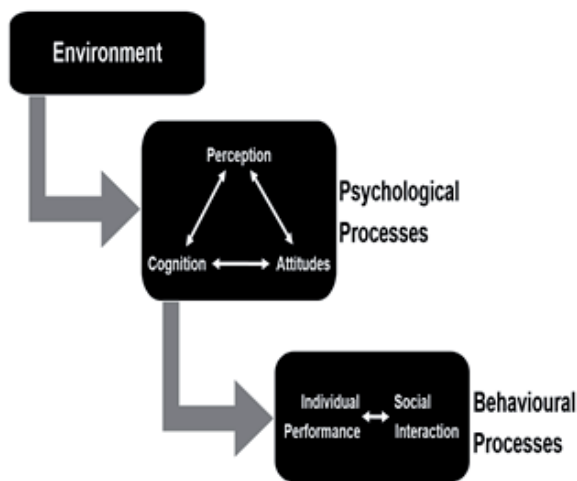

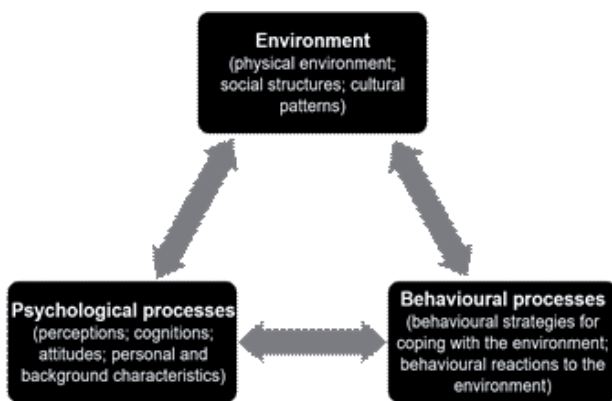Figure 7. Model of the total person (adapted from Holahan, 1982)

Figure 8. Adapted from the transactional model of the relationships between the environment, psychological processes and behavioural processes (Holahan, 1982:355)

namely psychological, environmental and behavioural, have a reciprocal relationship, meaning that all components influence and are being influenced by the other components, either directly or indirectly. In other words, if a personal factor like an individual's expectations influences a person's behaviour, it can bring about environmental changes that can further alter or reinforce that person's expectations regarding future outcomes.

Instead of viewing environmental factors as independent variables (psychological factors as mediating variables and behaviour as a dependant variable), the transactional model emphasises the reciprocal effects at work among all the components. The variables are shown as interacting parts of an integrated system. Each variable can therefore be seen to function as an independent, mediating or dependent variable, depending on the specific problem and focus selected (Bandura, 1978).

Within these complex transactions between people and their environment, people form particular perceptions of their environments. Greene and Hicks (1984:15) state that perception is a highly complex subject and entails the process through which all the environmental information is gathered by a person's senses.

Environmental aspects (e.g. visual features) that cause a person to like or dislike a certain environment are all relevant to the individual's perception of something like safety (Grohe, 2006:26). Ackerman (1996) states that when people evaluate the nature of the built environment and characteristics of safety, elements like physical attractiveness, proximity, familiarity and similarity may be important. Wilson and Kelling (1982) for instance found that well-maintained, attractive housing has a better probability of being perceived as more positive than an area that is run-down and exhibits signs of decay. Grohe (2006:26) found that well-maintained housing, or the physical built environment, will likely enhance a safer and more desirable image in people's minds. In this regard, aspects such as proximity are relevant because people tend to befriend and know others who interact with the environment in close proximity to them. This leads to an increase in familiarity and liking. Grohe (2006:27) continues that similarity is relevant for perception of the built environment because people view environments that are similar to those that they regularly experience as more positive than others. This aspect is important to the research as positive perceptions of the environment are not as likely to induce perceptions of fear (Cozens, 2004).

Another central aspect of perception is people's experience. Sperling and Gill (1972:73) refer to Immanuel Kant's observation that "we see things not as they are, but as we are." This observation of Kant is pertinent to the effect that experiences have on the individual's perception. Sperling and Gill (1972) state that everything a person does is based on previous experience. Similarly, the way in which a person perceives a situation is related to a previous experience,

e.g. an individual's past experience with specific urban design features may influence their perceptions of the safety of the environment (Cozens, 2004). However, except for past experience, an individuals' perceptions also depend on the actual stimulus and the background of the setting. This includes environmental features such as open views, protection from natural elements, protection from possible danger and the existence of lighting (Kaplan & Kaplan, 1982; Appleton, 1996). An understanding of the concept of fear within the spatial and built environment can help us understand people's perceptions of unsafety and fear when it comes to the spatial or built environment.

Fear is influenced by the individual characteristics within the person that can contribute to their fear and by the characteristics of the urban environment. Grohe (2006:64) states that a large amount of literature on fear indicates that certain groups are more vulnerable to fear than others. Hale (1996) states that women, the elderly and the poor are more vulnerable to fear of crime because they feel they are not able to protect themselves because they do not have the physical ability to ward off an attack or to get away, they cannot afford to protect their homes or it would take them longer to recover from physical or property damages. Except for gender, age and socio-economic status, Grohe (2006) found that a person's education and marital status are also significant predictors of levels of fear. Research generally supports a relationship between the racial composition of place and fear of crime. A persons' previous experience with crime further influences their perception of safety if they were either directly influenced by crime or the person knows someone else or has heard of someone who was a victim of crime (Hale, 1996).

Fear of crime can also be related to the environment itself. Research on the image of the environment and how this relates to fear shows that the spatial environment plays an important part in fear. Fear can also be seen as a characteristic of the neighbourhood itself. People may view other neighbourhoods as more dangerous and vulnerable regardless of the actual crime levels (Smith & Hill, 1991). People also tend to believe that outsiders are responsible for crime (Grohe, 2006:56; Brantingham *et al.*, 1981). Furthermore, the increased social diversity in urban environments (e.g. campuses) can lead to greater social uncertainty and conditions that foster fear. Fear can also resemble a more general unease than a specific concern. However, the fear of crime can be lessened through community involvement and attachment. Integration into a community can also lead to mental maps of dangerous and safe environments within the user's physical environment (Grohe, 2006:58).

Crime, criminality and victimisation relate to both particular places and the ways in which individuals and organisations shape their activities with spatial factors (Bottoms & Wiles, 1992). In the past, criminologists focused mainly on offenders, mostly ignoring the role of the environment and the targets in criminal events (Eck & Weisburd, 1995;

Weisburd, 1997). This oversight has led to a minimal understanding of criminal events (Garofalo, 1987). Fattah (1993) states that the victim's role in criminal events is neglected when the place and targets of crime are ignored. No crime can occur without a victim or a spatial component being targeted (Robinson, 1996). In other words, the space and the target are two important dimensions of crime. The spatial component forms the focus of the next section.

Safety through environmental design – a theoretical overview

Theories on the spatial dimension of creating safe urban environments mostly aim at predicting crime by focusing on elements that include target distribution, land use patterns, transportation pathways and offender residence distribution (Rhodes & Conley, 1981; Rengert, 1992). Certain spaces can have highly negative associations and be fear-inducing (Grohe, 2006:24). Numerous theories were developed that address safety in the spatial and built environment. These include the works of Wood (1961), Jacobs (1961), Angel (1968), Newman (1972), Jeffery (1971; 1977; 1990), Clark (1980), Wilson and Kelling (1982), Wekerle and Witzman (1995) and Ekblom (1995).

Elizabeth Wood (1961)

Wood (1961) focused on lower income residential areas with the goal to create richer and more fulfilling areas. As Wood (1961) strove towards enhancing quality of life for residents through design changes and increasing the aesthetic quality of residential environments, she developed guidelines for improving these environments' security and safety (Paulsen & Robinson, 2004).

Wood's (1961) main design goals are (i) visibility and (ii) the surveillance of pedestrians. Visibility, according to her, relates to ways to improve residents' visibility, for example using windows to make lobbies clearly visible from the outside and well-lit in the evenings, while surveillance relates to ways to survey residents and their property by for example redesigning public and semi-public spaces into places of relaxation to attract people and improve informal surveillance.

Jane Jacobs (1961) – Eyes on the Streets

Jacobs' (1961) influential work, entitled *The Death and Life of Great American Cities* sparked a widespread interest in how crime can be prevented through environmental conditions.

Jacobs' (1961) work discusses how safer environments can be created through the use of natural surveillance by creating eyes on the street. Jacobs (1961) states that active streets can be seen as a deterrent to crime. She identifies three main characteristics to make city streets safer: (i) public and private space should have a clear demarcation between them, (ii) diversity in street use (mixed land uses)

and (iii) active use of the sidewalks (Paulsen & Robinson, 2004).

Schlomo Angel (1968) – Safer Cities through City Planning

Angel (1968) followed Jacobs (1961) and argued that crime can be prevented through effective planning in his book *Discouraging crime through city planning*. Angel (1968) understood crime prevention from the perspective of rational choice theory. Angel (1968) debates that citizens of a city should play an active role in preventing crime by starting with a diagnosis of which areas in their surrounding urban area offer the most opportunities for criminal behaviour (Jusiewicz, 2005). In other words, Angel (1968) assumes that some areas have higher levels of crime than others because rational offenders have higher levels of opportunity in those areas. Offenders could choose their targets by weighing the effort and risk against potential payoffs and then targets could be identified that offer only a small amount of risk (Paulsen & Robinson, 2004).

Like Jacobs (1961), Angel (1968) argues that high intensity use of an area deters crime because of the larger number of effective witnesses. Low intensity land use in turn decreases the number of potential victims (Newman, 1973). In other words, if areas are subject to only moderate use, the opportunities for crime would rise because there are enough victims to identify a target, but not enough witnesses to deter crime or offenders. Angel (1961) advises that city planners (i) channel pedestrian traffic by delineating areas and increasing or decreasing accessibility to a point where there would either be too many witnesses or too few victims (Clark et al., 1996) and (ii) zoning businesses into areas that have mass transit and parking facilities nearby. Angel (1968) notes that crime tends to occur in close proximity to, or alongside, commercial corridors and areas between 6 p.m. and 2 a.m. (Clark *et al.*, 1996). He links the rise in crime to the reduced use of the area between these hours, poor lighting and intoxication of victims.

Oscar Newman (1972) – Defensible space

The architect and planner Oscar Newman (1972) conceptualised the term "defensible space" by combining social and spatial mechanisms to create zones of territorial influence, to provide natural surveillance opportunities and to positively affect the often negative perception of public housing with his book, *Defensible space: Crime prevention through urban design* (Newman, 1972). According to Mayhew (1981), the term "defensible space" describes residential environments that are designed with the purpose of enabling and encouraging the residents to supervise their own neighbourhood and to give outsiders the impression that the residents take responsibility for the neighbourhood.

Newman's (1972) concept of environmental design is based on improving security by (i) developing coordinated design standards for street layout, (ii) street lighting, (iii) architecture; and (iv) land use. The main goal is to create environments that would not only reduce the opportunities for crime, but also to encourage people to use public space to contribute to their safety and to increase their sense of community (LEAA Newsletter, 1974:12-13). Newman's (1972) notion of environmental design has a higher complexity than simply redesigning space. Paulsen and Robinson (2004) are of the opinion that it includes the redesign of residential environments to enable residents to use these areas and to become willing to defend their territory.

The main goal of Newman's (1972) defensible space approach is to inspire a sense of community and territoriality in inhabitants to allow these traits to translate into their assumptions of responsibility for conserving a safer and well-maintained living environment (Newman, 1976:4). He adds that the defensible space theory also aims to increase residents' potential to see and report possible offenders and thereby empowers residents to control their physical environment. Paulsen and Robinson (2004) are of the opinion that Newman's (1972) work attempts to reduce not only crime, but also fear of crime in specific environments (public housing) by reducing opportunities for crime and encouraging positive social interaction between legitimate users of the area. Murray (1994) offers the explanation that residents who have less defensible space, like in larger cities, do not experience feelings of ownership and community spirit and are thus thought to be more vulnerable to crime. The residents in these areas are also thought to be less likely to identify outsiders or potential criminals. Murray (1994) continues that areas where the presence of defensible space is thought to be higher, like small towns, the effectiveness of informal social control was increased and opportunities for crime decrease.

C.R. Ray Jeffery 1971 – Crime Prevention through Environmental Design (CPTED)

Crime prevention through environmental design (CPTED) is a term that first appeared in 1971 in Ray Jeffery's book *Crime prevention through environmental design*. According to Jeffery (1971), crime should be prevented by designing the total environment to decrease opportunities for crime.

Contemporary interpretations of CPTED involve less deterministic approaches to crime prevention. In this approach, the environment cannot influence behaviour directly, but the response that the person or organism shows in accordance with the physical environment is a product of the brain, and the brain is a product of both genes and the environment. Therefore, models of crime prevention must include both the person and the physical environment (Jeffery & Zahm, 1993:330; Jeffery, 1990).

The CSIR (2001:6) defines CPTED as "… the implementation of measures to reduce the case of, and the opportunities for criminal events, and to addresses the fear of

crime through the application of sound design and management of principles to built environment". CPTED guidelines presented for the creation of safe environments are (i) to increase surveillance and visibility, (ii) promoting territoriality and defensible space, (iii) managing access and escape routes, (iv) maintaining the image and aesthetics of areas, and (v) target hardening.

Ronald V. Clark (1980) – Situational Crime Prevention

Hough *et al.* (1980) and Hayward (2007:235) define SCP as "The use of measures directed at highly specific forms of crime which involve the management, design to manipulation of the immediate environment in which these crimes occur . . . so as to reduce the opportunities for these crimes". Situational crime prevention (SCP) emphasises micro-preventative crime strategies. It encourages local businesses, authorities and the public to employ practical deterrents to ensure that the people themselves, along with the urban public spaces and buildings, do not provide soft targets for criminals and for criminal behaviour (Hayward, 2007:235).

SCP has two main goals: (i) to understand and predict how the three core elements (motivated offenders, soft targets and the absence of capable guardians) come together and (ii) to reduce crime opportunities in the locations specified (Hayward, 2007:236). Hayward (2007:236) explains that once a "hot spot" is identified by using crime pattern analysis and police data, city planners can use SCP to counteract crime opportunities by bringing these "criminogenic pockets of urban space" back in line with the proper processes of city planning.

James Q. Wilson and George Kelling (1982) – Broken Windows Theory

Wilson and Kelling suggest that serious crimes can be reduced by targeting minor disorders. These minor disorders include neighbourhood stressors such as graffiti, vacant lots, crime, drug use and loitering (Begall et al., 2006:1). According to Wilson and Kelling (1982), there is a link between serious crimes and minor street disorder. The explanation behind the theory holds that individuals and communities interpret an area as unsafe if that community tolerates and ignores disorderly cues (Begall et al., 2006:1). Potential offenders, as Wilson and Kelling (1982:4) states, "… believe they reduce their chances of being caught or even identified if they operate on streets where potential victims are already intimidated by prevailing conditions."

Visual signs of disorder result in two separate impacts in the community. First, disorder causes more disorder and continues to raise crime levels (Wilson & Kelling, 1982; Skogan, 1990; Kelling & Coles 1996). Second, the increase in disorder within the neighbourhood generates feelings of fear (Covington & Taylor, 1991; Kelling & Cole, 1996; Ross & Jang, 2000; Doran & lee, 2005) and behaviour that can be related to fear, such as mistrust (Kelling & Coles, 1996; Ross & Jang, 2000). With the first signs of disorder (local street disorder that is not repaired or fixed) show potential offenders that the crimes will be tolerated within that neighbourhood. Offenders are drawn to these areas as they get the idea that they will not be punished for their petty crimes, which later on can escalate (Kelling & Cole, 1996).

Wekerle and Whitzman (1995) – Safe Cities

The Safe Cities initiative originated as a product of Britain's Crime Prevention Unit (Oc & Tiesdell, 1997:77). The initiative led to the viewpoint that opportunity reduction crime prevention is the entire community's responsibility and not only that of the police, as was believed before.

Authors Wekerle and Whitzman (1995) and Oc and Tiesdell (1997) explain this theory as an attempt to combine individual and collective crime prevention strategies with the goal of creating safer cities for everyone. Oc and Tiesdell (1997:79) stated that the approach has three goals, namely (i) to decrease crime, (ii) decrease fear of crime and (iii) to create safe cities where economic and community life can flourish.

The Safe Cities approach includes all the guidelines offered by opportunity reduction theories (e.g. CPTED), but also emphasises interdisciplinary participation between various stakeholders in crime prevention and social fairness (Wekerle & Whitzman, 1995:9; Oc & Tiesdell, 1997:76).

Paul Ekblom (1995) – The ecological approach

Ekblom (1995:118) defines crime prevention as the intervention to address the mechanisms that lead to criminal events. Ekblom's (1995) work can be seen as a much wider approach than the physical determinates' point of view as it includes the perpetrator and a determined location where the criminal event takes place. At the same time it does not place less of an emphasis on design. In other words, areas can be designed to encourage social interaction and thus create a link between criminal-orientated prevention and physical environment-orientated approaches (Ekblom, 1995:119).

According to Ekblom's (1995) ecological approach, an equilibrium can be achieved in crime prevention so that crime reaches an all-time low (measured against financial and social cost and reductions in freedom) and a highest possible level, measured against the risk and effort it takes to commit it (see Figure 9 below). This balance can be kept for a long time; however, it can also be disrupted by external factors like new technology and socioeconomic factors (Ekblom, 1995:129). In other words, a change in physical, social or economic circumstances can lead to the perpetrator adapting and finding new targets. Therefore, it is im-

portant to take a variety of elements into account during the design process to address crime. These elements include the perpetrator, the victim (individual or community) and all the different disciplines that can aid in the prevention processes.

Figure 9. The crime: cost equilibrium (in: Puren & Steÿn, 2003)

Table 1. Summary of key themes and recommendations in crime prevention theories

Authors:	Key themes:	Recommendation:
Wood (1961)	Increase quality of life in residential areas through design.	Increase aesthetic quality of the area and visibility.
Jacobs (1961)	Create safe streets and public spaces.	Increase natural surveillance by incorporating mixed land use and activities.
Angel (1968)	The risk of crime can be decreased through city planning.	Increase the intensity of use of problematic areas.
Newman (1972)	Use spatial and social mechanics to create areas of territorial influence and defensible space.	Redesign areas to inspire a sense of community and territoriality.
Jeffery (1971)	Reduce opportunities for crime and fear by designing the total environment.	Surveillance, territoriality, access, aesthetics and target hardening.
Clark (1980)	Identification of specific forms of crime and micro-preventative crime strategies.	Reduce crime opportunities in identified problematic areas.
Wilson and Kelling (1982)	Serious crimes can be reduced by targeting minor disorders.	No tolerance policy for minor disorder and immediate action.
Wekerle and Whitzman (1995)	The combination of individual and collective crime prevention strategy.	Opportunity reduction for crime and interdisciplinary participation.
Paul Ekblom (1995)	Crime prevention needs to include the perpetrator and determined location.	Creative problem solving based on available funds and manpower.

(Source: author's own construction)

Designers and other stakeholders will have to be creative in the problem-solving process to satisfy all needs and achieve all goals. They will also have to take into account the financial costs and additional manpower required to achieve these goals.

Table 1 below shows a summary of the key themes that emerged from the theories discussed along with the main recommendation from the theory.

Research design

The research followed a qualitative design with the broad aim of interpreting criteria in terms of the meaning that people bring to it (Denzin & Lincoln, 2005:3). Qualitative research studies commonly focus on the meaning that people assign to social problems (Creswell, 2007:37). In an effort to study the meaning that people assign to a problem, data should be collected in the relevant setting. The data are sensitive to the places that form part of the research and the people (Creswell, 2007:37). As the research was about a social phenomenon, namely perceptions of safety and fear on campuses, and the aim was to interpret participants' perceptions of campus environments and how the spatial environments contribute to these perceptions, a qualitative design was considered appropriate.

The research design was structured according to Maxwell's (2008) interactive model (Figure 10). According to Maxwell (2008:215), a good research design consists of various interacting components. Each of these components focuses on different issues central to creating coherence in the research (Maxwell, 2008:216). The components are:
- Research questions: The questions the research aims to answer.
- Goals: The main issues the research aims to address.

Figure 10. Adapted from the interactive research design model (Maxwell, 2005)

- Conceptual framework: The system of concepts, assumptions, expectations, beliefs and theories that informed the study.
- Methods: The approaches and techniques used to collect and analyse the data.
- Validity/Trustworthiness: The steps taken to ensure that the research is accurate and trustworthy.

a. Research questions and goals

The research questions form the core of the design, while the goals guided and justified the study. Table 2 summarises the research questions and aligns the questions with the aims of the research.

Table 2. Research questions and aims

Research questions:	Research goals:
Main question:	**Main goal:**
What does a safe campus environment entail?	To develop environmental guidelines for safe campus environments.
Sub-questions:	**Secondary goals:**
Sub-question 1: How do students experience different campus settings in terms of safety?	**Secondary aim 1:** To explore students' perceptions/experiences of safety on two campus environment, namely LUAS Campus (Lahti, Finland) and the NWU campus (Potchefstroom, South Africa)
Sub-question 2: What environmental attributes contribute to feelings of safety and fear in campus environments?	**Secondary aim 2:** To analyse the spatial environments of these campuses in terms of its environmental design in relation to the participants' experiences of safety.

(Source: author's own construction)

b. Conceptual framework

According to Maxwell (2008:223), the conceptual framework includes the ideas and beliefs about the phenomena under study. The researcher's conceptual framework was informed by his background in psychology and urban and regional planning. This combination has the advantage of knowledge in two subject fields (human behaviour and the spatial environment) to aid the understanding of social phenomena such as perceptions of safety/unsafety. The perspectives of psychology, symbolic interactionism and the adaptational view are used as the conceptual framework.

The adaptational viewpoint was used to view the individual within the environment as an active and dynamic participant that interacts with the environment in a transactional manner, which in turn influences behaviour. Identifying the person as a social and interacting entity as opposed to an element being influenced only by the environment, supports the use of symbolic interactionism as part of the conceptual framework.

According to symbolic interactionism, people act towards elements based on the meanings that they assign to that element (Blumer, 1969). People are here not viewed as entities that are acted upon by society, but rather as active in shaping their world (Herman & Reynolds, 1994). In other words, people respond to their social understanding of reality and the response can differ based on an individual's perception. Blumer (1969) explains that people exist in a world made of physical, social and abstract objects to which they respond and interact.

The perspectives of symbolic interactionism informed the research in the sense that people are not seen as mere instruments influenced by their environment (Jones, 1996). The study rather includes people on an individual level to understand their perceptions of their environment.

c. Methods

Semi-structured interviews, supported by visual material was used to generate the data. Pascale (2011:88) states that unstructured interviews and the use of a combination of textual and visual media (e.g. photographs and maps) are common modes of study for research that uses the lens of symbolic interaction because of the meanings that people assign to objects, events and behaviour within their environments. These objects, events and behaviour can then be portrayed with the supporting visual media in the semi-structured interviews.

Participants

The research made use of purposive sampling to select participants. Purposive sampling can be described as sampling that consist of a series of strategic choices regarding who participates and where and how researchers go about doing their research. It is virtually synonymous with qualitative research (Palys, 2008:697).

Clusters of students were selected from the LUAS and NWU Potchefstroom Campuses from selected faculties according to a list provided by academic student bodies of the faculties. This ensured that the participants in a cluster would have a similar central area of daily spatial interaction, which minimises students' stereotyped views of unknown locations.

Thirty-seven participants (21 from NWU and 16 from LUAS) were purposively sampled for the study. They ranged from the ages of 19 to 39 years (as LUAS students start full-time studies at a later age than the NWU students) and divided into 17 male and 20 female students. Clusters of students were selected from the LUAS and NWU Potchefstroom Campuses to ensure that students from all areas of campus would be included.

The number of participants were determined by the level of data saturation that occurred. Data saturation is central to qualitative sampling (Baker and Edwards, 2012:5). Data saturation entails that no new information is gained with more data or interviews.

Data generation

Data for the research was generated through face-to-face semi-structured interviews with open-ended questions. Phellas, Bloch and Seale (2011:183) state that face-to-face interviews are beneficial for a number of reasons: (i) these interviews allow complex questions to be explained; (ii) interviews can have a longer time span; (iii) visual aids can be used in the interview; (iv) it allows the researcher to use open-ended questions; and (v) participants are more inclined to participate as there is no need for written answers. A strict interview protocol (Creswell, 2007; De Vos *et al.*, 2011) was followed to ensure that the participant were informed and that the researcher did not influence the data.

Four open-ended qualitative questions were asked based on the research questions and aims. The questions were also develop to flow from the main question and sub-questions of the research (Creswell 2007:133). The questions were also arranged from simple to complex and from broader opinions to more specific detail (Bailey, 1982: 196). Questions included the following:

- Please indicate the general pattern of movement you follow when on campus.
- What is your overall experience of the campus environment? Please expand on this experience.
- How would you consider safety on the campus/campus environment? Please expand on this feeling of safety/unsafety.
- How would you describe a safe campus environment?

The interviews were supported with the use of visual data to assist the participant by first spatially orientating the participant and then aiding them in relating their experience to spatial areas and to help the researcher to understand the experiences within the context/setting.

Data analysis

Transcribed data consisted of 255 pages that were analysed by means of qualitative content analysis. Content analysis can be described as a systematic coding and categorising approach that is used to determine trends and patterns, along with their frequency, relationship and structure from large amounts of textual information (Mayring, 2000; Pope *et al.*, 2006; Gbrich, 2007). Inductive content analysis was used to create coded categories directly from the textual data (Hsieh & Shannon, 2005). The goal of the content analysis was to create categories of elements that could contribute to the creation of themes and sub-themes relevant to the research questions and that could therefore aid in answering these questions.

For this research, the visual data gathered were not analysed separately, but integrated with the content analysis to support the elements, categories, sub-themes and themes as they emerged from the interview data. The visual data were also used to construct spatially accurate maps of the empirical data. Each research context's data were analysed separately to ensure thoroughness.
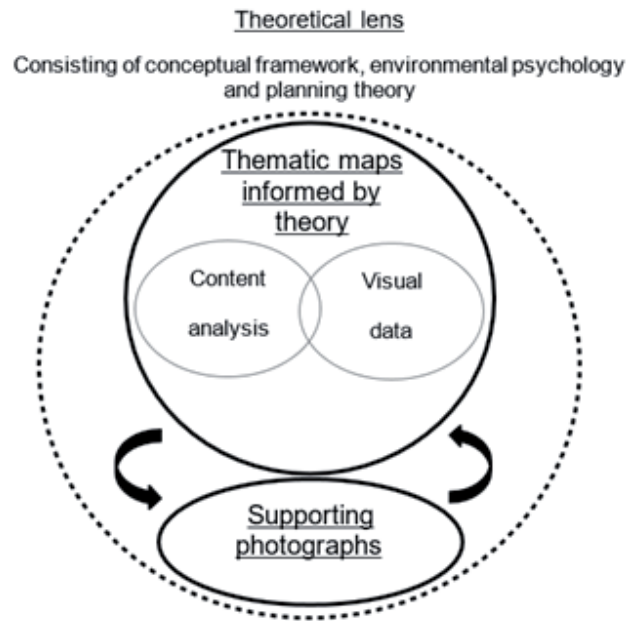

Figure 11. Visual representation of data interpretation phase (author's own construction)

Data interpretation

This phase of the research was not approach as a linear process, but rather a continuous cycle where the three main parts of the research (theory, thematic maps and visual images) continued to influence and alter one another until all questions had been answered and the information relevant to the study obtained (see Figure 11).

The conceptual frameworks used to construct a theoretical lens to identify the elements for the thematic maps (constructed from the content analysis and visual data from the interviews) and the supporting photographs formed elements that influence each other in a continuous cycle.

d. Trustworthiness

In order to ensure that a true picture of the phenomenon under study is presented and not merely the researcher's own predispositions, strict criteria for trustworthiness were applied (Shenton, 2004:1). The four criterion to consider for qualitative researchers to ensure that they deliver a trustworthy study as set out by Guba and Lincoln (2005) are (i) credibility, (ii) transferability, (iii) dependability and (iv) confirmability.

- Credibility: Merriam (2009) believes that the qualitative investigator's concern surrounding credibility is to determine how congruent their findings are with the reality;
- Transferability: Guba and Lincoln (2005) and Firestone (1993) suggest that the researcher should ensure that the study is accompanied by sufficient contextual information about the area of study to enable the reader to make a transfer;

- Dependability: The changing nature of the phenomena studied through qualitative research makes it problematic in the sense that if the research were to be repeated in the same context and with the same methods and participants, the results and findings could still differ (Fidel, 1993:219-247 and Marshall & Rossman, 1999). This dependability issue can be addressed by reporting the processes used in the study in detail (Shenton, 2004:9);
- Confirmability: Shenton (2004:10) is of the opinion that the concept of confirmability is comparable to the concern about objectivity for the qualitative researcher. He continues to state that it is important to ensure that the research's findings are not influenced by the preferences and characteristics of the researcher, but only the results of the ideas and experiences of informants.

Ethical aspects

Attention to ethical issues in qualitative research has been increasingly recognised as an essential part of the research (Christians, 2000; Denzin & Lincoln, 2005). Maxwell (2005:216) believes that ethical concerns should be considered in all the aspects of a design and should specifically be addressed in correlation with methods, but is relevant to other factors like the goals, the research questions, validity or trustworthiness and the conceptual framework (Maxwell, 2005:217). As advised by Creswell (2007:288), informed consent was discussed with each participant at the start of the interview, after which they signed informed consent forms.

Findings

Two main themes emerged from the semi-structured interviews. *Theme 1: Perceptions of safety and fear: spatial and built environment*, are supported by the spatial and built environment and *Theme 2: Perceptions of safety and fear: social environment*, are supported by the social environment. Sub-themes with regard to Theme 1 include that the spatial/built environment can induce the perception of safety (Sub-theme 1), while it can also contribute to perceptions of fear (Sub-theme 2). With regard to Theme 2, sub-themes include the social environment as supporting perceptions of safety (Sub-theme 1) or supporting perceptions of fear (Sub-theme 2). Various individual elements (categories) of both the spatial/built environment and social environment could be identified as contributing factors in how participants experience the overall safety on the two campuses (see Figure 12 and 16).

Theme 1: Perceptions of safety and fear are supported by the spatial and built environment
(Sub-theme 1: safety and Sub-theme 2: fear)

Elements in the spatial and built environment that are conducive for safety include: (i) land uses, (ii) the overall environmental design and maintenance, (iii) pedestrian-

orientated areas and circulation, and (iv) building elements.

1) Land uses (Figure 13)

Participants relate specific land uses, such as residential areas, social services, commercial areas and entertainment areas to their perception of safety and fear. This is supported by the following quotes from participants:
- Residential land uses: "There it's all like, very suburban, so I'm used to everything being, yes, entirely safe (LUAS)."; "At night I feel the safest at my hostel, because I live there (NWU)"
- Social services: "…you feel safe enough because we got police nearby (LUAS)"; "The library can also be safe, because there are people (NWU)"
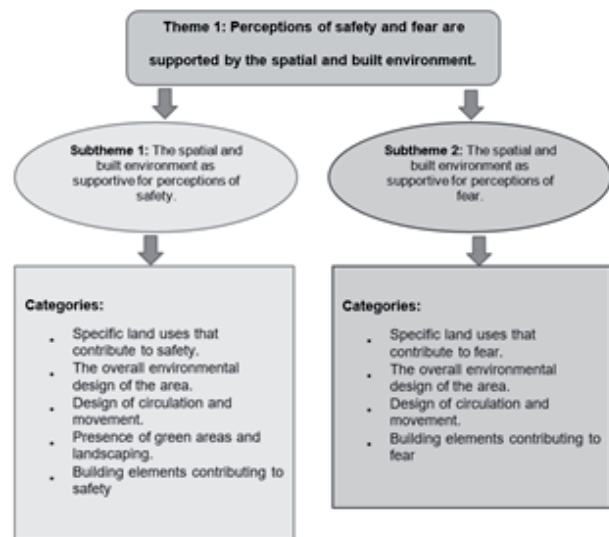

Figure 12. Structure of Theme 1 with sub-themes and categories (author's own construction)

Figure 13. Satellite image and photos of residential land use contributing to perceptions of safety for LUAS (author's own construction)

- Commercial areas: ".... you know if you need help, if you need someone… when there's a, like, a lot of shops and stores around (LUAS)" and "… definitely a safer area for me, the closer you get to the SS (Student centre/ cafeteria) (NWU)"

Similarly, certain land uses are related to perceptions of fear, such as bars and restaurants and a psychiatric hospital.

- Bars: "It's like everywhere where there are bars. (LUAS)" and "When the students come out of the Draak (name of a restaurant/bar) and they are bombastic it makes me uncertain if I could get attacked or not (NWU)"
- Psychiatric hospital: "…very dangerous and scary because there is psychiatry hospital (LUAS)"

2) Overall environmental design and maintenance
In terms of overall environmental design, the LUAS students reported that urban design, well-maintained areas and territoriality increased perceptions of safety. This view is supported by the following quotes:

- Urban design: "…they try to make it safe … the way they built the city, and the way the city is designed."
- Well maintained areas: "…it's really kept well, so there aren't much graffiti on the walls, and it's always clean."
- Territoriality: "I think if there's a certain area that people can see that this is the campus…"

The NWU Potchefstroom participants focused on campus layout, proximity of campus elements and security measures employed by an enclosed campus environment as supported by the following quotes:

- Campus layout: "Because we are separate from main campus (referring to Engineering campus), I feel it is safer"

- Proximity between campus elements: "The more you can limit your area and have your hostel and all you classes at one point, you can ensure that you are safer because you are going to have to walk less."
- Enclosed campus environment: "…when you swipe in you have to use a student card, so basically it is only students on campus."

Both groups of participants identified a large number of elements within the overall design of their campus environment that influenced their perceptions of fear:

- Overall design: "Especially the road that I drive on campus. It is a bit dodgy. It looks like a quilted environment where all the buildings were just erected randomly. So it is a bit informal (NWU)"
- Enclosed spaces: "There are walls on both sides of you. You can only go back or forward. It is easy for someone to corner you (NWU)"
- Dark areas: "…It's quite dark. There's not too much light… it's safe but it feels a bit unsafe. (LUAS)" and "It is not comfortable for me to walk there… at night it feels a bit dark. (NWU)"
- Unmaintained areas: "A large amount of that area is neglected, for example the paint is peeling (NWU)"
- Unfamiliar areas: "…that areas are less safe. The unknown areas. (NWU)"
- City centre: "Here in the city… around there it's less safe. (LUAS)"
- Areas outside of campus: "I am just afraid when I have to walk out of campus (NWU)"
- Unkempt vegetation: "… what I think can also contribute (to feelings of fear) are the trees and their density. (NWU)" / "When I come in to an area with trees,
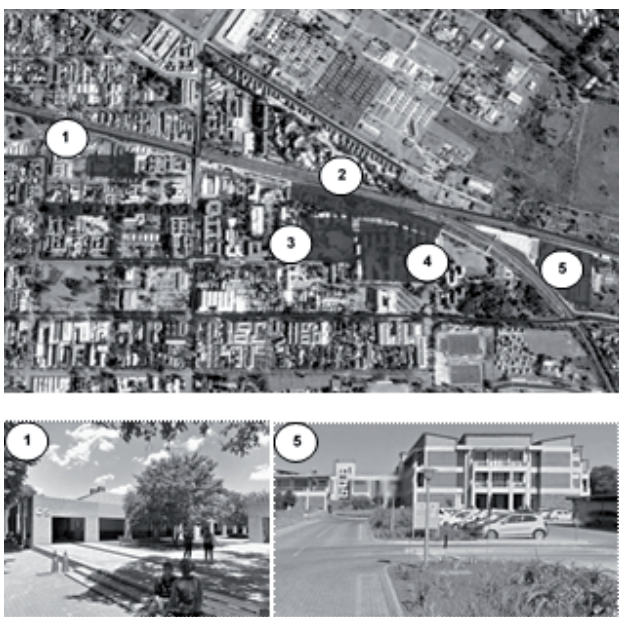

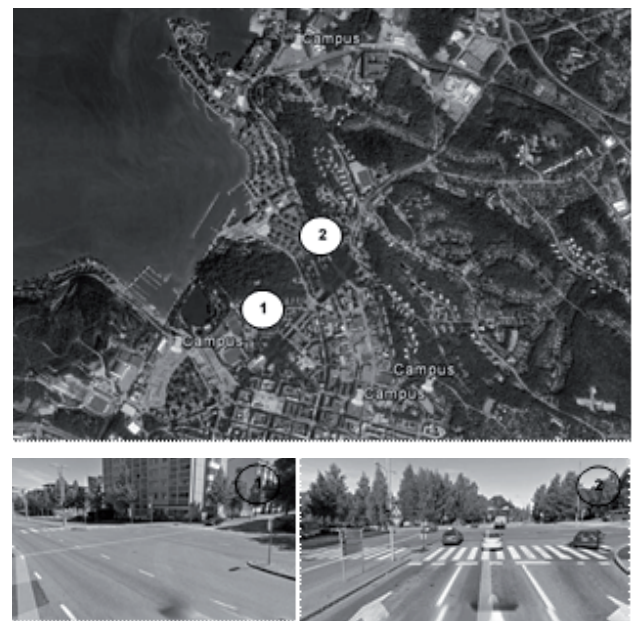Figure 14. NWU Campus class areas with dark corners and alleys (author's own construction)

Figure 15. Two main intersections identified by LUAS participants as fear-inducing (author's own construction).

then I know that somebody can maybe hide behind it. (NWU)"

3) Pedestrian-orientated areas and circulation
Both groups of participants identified pedestrian-orientated areas as being among the safest areas. This includes streets where different lanes are assigned for pedestrians, bicycles and motor traffic separately. Road crossings and speed bumps also contribute to perceptions of safety:

- Pedestrian-orientated areas: "I feel safer on campus than I do in the middle of the street. (NWU)" and "Well, this side I like all the roads that they made where you can walk. (NWU)"
- Specified lanes: "…it's quite safe also, because you have the separate roads to walk on or go by bike (LUAS)"
- Road crossings: "There are no road crossings at any of the places where I have to cross the road (NWU)"
- Speed bumps: "All the speedbumps. I am not afraid that somebody will run me over or so (NWU)"

Participants from LUAS and NWU Potchefstroom Campus both identified the following elements as contributing to fear:

- Busy intersections: "This crossroads here, if you walk… that is quite dangerous… (LUAS)"
- Unspecified lanes: "…for cyclists there are not specified lanes on the road (NWU)"
- Traffic: "…where there's more traffic, I feel more unsafe (LUAS)"

4) Building elements
Both universities' participants reported higher perceptions of safety for areas with adequate light, more safety during the day, rather than the night, areas that have security cameras (active surveillance) and also public spaces that have windows overlooking them (passive surveillance). See the following quotes as examples:

- Lighting: "When you walk at night through the student centrum area, there are always lights so it is safe"
- Daytime: "I would say I always feel safe in the day, anywhere on campus"
- Security cameras: "I think it makes an area safe when there are cameras on…"
- Windows: "I also think windows make it kind of feel safer."

Both groups of participants identified the following building design elements as contributing towards fear:

- Limited visibility: "You feel unsafe…because you cannot see, when walking on the one side you cannot see what is happening on the other side (NWU)."
- Dark and enclosed areas: "…It's quite dark. There's not much light… it's safe, but it feels unsafe (NWU)"
- No windows: "You've got no life in there, no windows… (LUAS)"

The participants from the two different contexts shared very similar perceptions of safety when it came to the social environment. The research identified numerous categories from the transcribed data that lead to the identification of Theme 2. These categories include (i) Presence/absence of people, (ii) Social behaviour, (iii) Past experience.

Theme 2: Perceptions of safety and fear are supported by the social environment
(Sub-theme: Safety and fear)

Elements in the social environment that are conducive to safety include: (i) the presence and absence of people, (ii) peoples' behaviour in the environment, and (iii) the person's previous experience with the environment.

1) Presence and absence of people
The participants from both research contexts reported high perceptions of safety in areas where there were large numbers of people (particularly other students). The participants from LUAS had the opinion that they were safe when alone and the NWU participants reported higher perceptions of safety when security guards were present in an area as shown by these quotes:

- Large number of people: "…it feels safe when there's many people… (LUAS)" and "It feels very comfortable. There are a lot of people (NWU)"
- Person alone (LUAS): "…when in other parts when there is no one, it's safe…" and "I think it's safe because there isn't a lot of people".
- Security guards: "… I have seen security guards there." / "I know there are security people as well… it makes you feel a bit safer (NWU)"

The NWU Potchefstroom participants reported higher perceptions of fear when alone, while the participants in both research contexts reported high perceptions of fear for the following:

- Person alone (NWU): "… it is not nice to walk there alone, because you hear all kinds of strange things and shadows and stuff" /and "I would not specifically walk around alone."
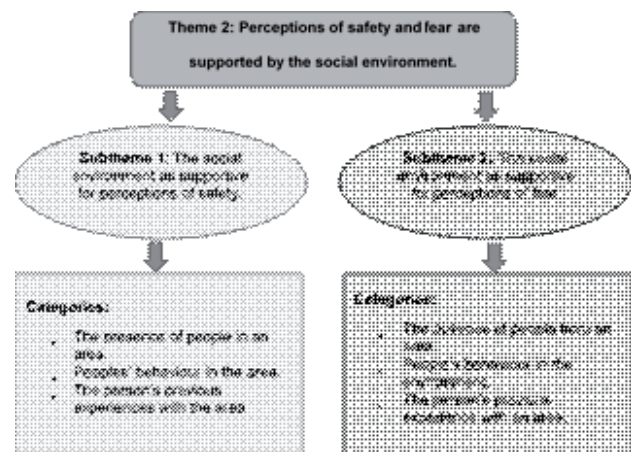

Figure 16. Structure of Theme 2 with sub-themes and categories (author's own construction)

- Only a few people: "Especially if there are not a lot of people. I would not walk there" and "Where there are only a few people at night, or you feel separated. That is where you feel unsafe (NWU)" and "…but if there are only few people that is shady or something, it just doesn't feel so nice (LUAS)".

2) Social behaviour

Participants from both research contexts reported high perceptions of safety when people in their environments shared a clear similar purpose as shown by the following quotes:

- People with similar purpose: "…when you're in the residence, surrounded by all the students, you feel really safe (LUAS)" and "Everyone around me are people that are studying. They are not here for a different purpose (NWU)".

A variety of social behaviours contributed to the perceptions of fear of the participants from LUAS and the NWU campus:

- Suspicious behaviour: "…there's some shady people hanging around (LUAS)"
- People with an unknown purpose: "There are a lot, you know, alcoholics or, you know, some kind of homeless people sitting there…(LUAS)"
- Alcohol and drug abuse: "…there are also a lot of alcoholics and drug addict there that move around in this area…(LUAS)" and "There are regularly people there that drink (NWU) "
- Aggressiveness: "People come from there and they behave aggressively… (LUAS)"

- Vandalism: "…here it's more like the people just want to break things for fun and just to do something bad to you… (LUAS)"
- Social unrest: "Well I think the strikes that where here now made many people scared to be on campus (NWU)".

3) Past experience

The participants from both research contexts identified two elements within the category of previous experience that contributed to their perception of the safety of an area. The first is the participant's own past experience with an area and the second is the past experience of other people that the participant knew of, as shown by these quotes:

- Self: "…I never met anybody who tried to rob or mug me. (LUAS)" and "… I never met any threats there (NWU)"
- Other: "You do not really hear of cases where people were attacked and so (NWU)".

Just like the participants' previous experience contributed to perceptions of safety, participants from both research contexts identified these elements as contributing to perceptions of fear:

- Self: "My car gets broken into a lot (LUAS)" and "I can't tell you how many times I have almost been run over there (NWU)"
- Others: "…it is a little bit dangerous. There have been some accidents (LUAS)" and "I heard the other day of incidents where people were attacked on campus (NWU)"
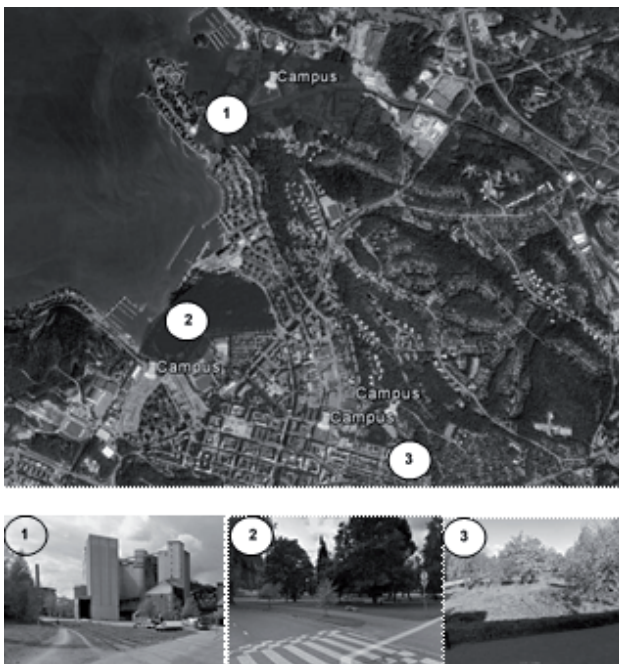

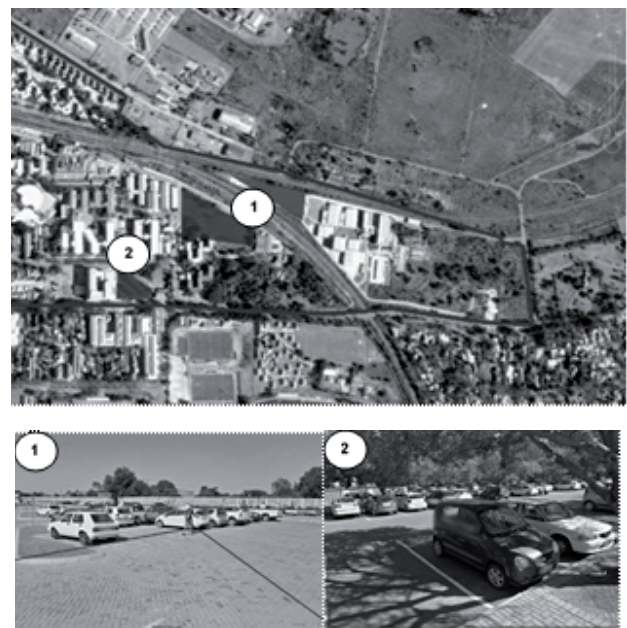Figure 17. LUAS areas contributing to fear because of lack of people (author's own construction)

Figure 18. Parking lots that are abandoned at night on the NWU Potchefstroom Campus (author's own construction)

Discussion

Crime and fear should be understood from a holistic perspective on people and their environment that view this relationship as a dynamic interaction (Armond, 1993). In order to obtain this perspective, the research departed from the adaptational viewpoint, according to which people's behaviour is acknowledged as dependent on the transactional interaction between the environment and the total person.

The environment consists of a number of encircling contexts that surround the person within. First is the physical environment. As identified from Theme 1 (*Perceptions of safety and fear are supported by the spatial and built environment*) and its content, the spatial and built environment strongly contributes to participants' perceptions of safety and fear. Different aspects of the environment have simultaneous, overlapping and interrelated influences on behaviour, as suggested by Gifford (2007). It is therefore necessary to incorporate the social and cultural contexts in which the physical environment is situated (Holahan, 1982). Theme 2 of the research (*Perceptions of safety and fear are supported by the social environment*) emphasises that people's perceptions are not only influenced by the physical environment, but also by the social context encircling the physical environment. The findings suggest that an integrated view of people and their environment by combining perspectives from psychology and urban planning/urban design are valuable to understand safety on campuses.

Passive surveillance and visibility, as proposed by Jacobs (1961), were identified as important environmental aspects in creating safer campus environments in this research. Also, a mixture of land uses (Jacobs, 1961), the creation of territoriality and defensible space (Newman, 1972), well-designed public spaces (Jacobs 1961, Jeffery 1971), the use of accessibility and pedestrian routes (Angel, 1968, Jeffery 1977) are all environmental aspects that increase the number of pedestrians, and thereby increasing the passive surveillance within an area. The importance of visibility is also supported by aspects such as lighting and landscaping, which played a role in how participants perceived safety (as suggested by Jeffery, 1997). Furthermore, perceptions of safety were also influenced by how well areas are maintained, the image and aesthetics of parks and buildings and the degree of minor disorders, for example alcohol and drug abuse (as suggested by Wilson & Kelling, 1982).

However, the findings of this particular study emphasises the fact that the environment does not determine safety alone. Safety and how people (in this case students on two campuses) perceive safety is attained through the interplay of the person (e.g. past experience), the spatial environment and its features as well as the social environment.

Recommendations for the creation of safe campus environments

In accordance with both the literature review and empirical findings, the following recommendations are suggested for planners.

Developing a Comprehensive Safe Environment Plan (CSEP)

The main recommendation to ensure safe campuses for students is the development of a Comprehensive Safe Environment Plan (CSEP) for each campus. A CSEP is a strategic document with spatial plans that provide an integrated approach to address safety, including social and spatial aspects and perceptions of safety. A CSEP is a formal institutional document that is compiled based on the input of a multi-disciplinary group that can contribute to safety on campuses. The CSEP should contain both proactive and reactive measures and guidelines for safe campus environments. Proactive measures are guidelines that are implemented beforehand to ensure safe environments. Reactive measures are guidelines and responses to crime and incidents that contribute to students fear in their campus environment.

A CSEP should have two sets of guidelines adapted to the specific context of each university. First, generic principles should be kept in mind as points of departure. Second, specific guidelines for the spatial planning of campus environments should be compiled. These sets of guidelines are discussed in the following sections. However, a few points of departure are necessary to take into account with the formulation of a CSEP.

Points of departure for a CSEP

Individual CSEP: Each university campus is unique and has its own strengths and weaknesses. It is therefore necessary for each university campus to create their own CSEP that is case-specific. Guidelines could vary according to scenarios.

Inter-university forum: It is proposed that an inter-campus safety forum be established among various campuses (especially where safety becomes an issue, e.g. in South Africa) in order to share experiences, obtain insight from experts and stimulate debate about crime and perceptions of safety/fear on campuses.

Students' perceptions as the basis: A CSEP should be inclusive in nature and should involve students as they are the main users of a campus The CSEP should be constructed based on the needs of the users in the area. It is therefore important to probe the opinions and perceptions of the students of the relevant campus in terms of their spatial perceptions of safety;

Integrated and multi-disciplinary input: A CSEP should be compiled by including various measures of safety as a psychological, social and spatial issue – this will ensure

Table 3. Key stakeholders of a CSEP

Stakeholder:	Focus:
Psychologists	Focuses on the person within the environment.
Urban and regional planners	Focuses on the layout and design of the spatial environment the people interact with.
Environmental psychologists	Focuses on the relation and interaction of people and their environment.
Architect	Focuses on the design of buildings for safety.
Sociologist	Focuses on the broader social and cultural context.
Criminologist	Focuses on criminals and crime-related aspects.
Head of campus security	Proactive regulations and law enforcement.
Traffic department	Proactive regulations for circulation and enforcement.
Students, staff	Community investment and programmes.

Source: Author's own construction.

a more integrated approach to people's perception of safety on campuses

Aspects to address in the CSEP
The multidisciplinary group required for a CSEP includes psychologists, who focus on the person; urban and regional planners; environmental psychologists; architects, focusing on the physical environment and sociologists and criminologists focusing on the broader social and cultural context. It is also important to proactively include heads of campus security and traffic departments in order to enforce security measures and traffic laws. Students and staff should also be included as the users of the campus. Table 3 below shows the key role-players of a CSEP.

It is essential that each of the stakeholders from their respected disciplines should work as an integrated and multi-disciplinary team to address safety as a holistic issue.

The next section provides guidelines for creating safe campus environments within the CSEP for the urban and regional planner and designer to plan and design for perceptions of safety.

Spatial planning and design recommendations
Although each stakeholder forms part of the integrated and multidisciplinary team, each member will still have specified responsibilities and instructions to follow. These instructions, however, must be taken into account by all members and implemented into the guidelines of each discipline. The instructions for the urban and regional planner are as follows:
• Creation of compact dedicated campus areas: with the creation of a walkable, compact and dedicated campus environment, familiarity between the student and his/her campus environment can be created.

• Mixed land uses: A variety of land uses will have an optimal effect on perceptions of safety. Some land uses that form part of campus environments, like large workshops and warehouses, can have a fear-inducing effect and therefore the design of these buildings and areas is important to ensure safety.
• Building placement and orientation: buildings should face public areas and streets to ensure visibility. Entrances and windows contribute to safety, while solid walls contribute to fear, especially next to pedestrian movement.
• Territoriality: Each campus area should have its own identity. No areas should be left vacant or without a clear use. There should be clear separation between private, semi-public and public areas. This creates a feeling of trespassing among outsiders and causes to them avoid areas with clear borders and spatial character.
• Landscaping: Well-designed and maintained public spaces contribute to safety as it increases feelings of ownership and spatial character. Well-kept vegetation also helps to contribute to visibility for users in the area and pedestrians passing by.
• Visibility: Visibility within the built environment is central to safety. It is important to ensure that no dark corners or alleys are created that could serve as possible hiding places for offenders. Pedestrians should always be visible from public spaces and buildings next to pedestrian routes. All public and pedestrian areas should be adequately lit.
• Control over fear-inducing activities: All activities on campuses that lead to social behaviour and could cause aggression (bars for example) should have strict law enforcement and good surveillance and visibility, especially at night.
• Maintenance: All areas and building should receive regular maintenance so as to not create a feeling of abandonment and attract disorder.
• Presence of security measures: security guards and cameras should be used to increase safety in in isolated and other potentially dangerous areas.
• Pedestrian-orientated areas: Students feel safer in areas that are dedicated to pedestrians. A separation between pedestrian and bicycle lanes and networks are also important.

As previously mentioned, each university campus is unique and presents its own strengths and weaknesses. It is necessary to evaluate each campus according to its own elements and by its own participating students.

Conclusion

This paper reports on the research that aimed to provide insight into students' perception of campus environments. The research suggested an integrated approach to safe campus environments where the spatial environment (in particular layout and design) and the social environment both

play an important role in contributing to campus environments being perceived as safe. The research found that safe campus environments in essence require a multi-disciplinary and integrated approach to safety. It is important to consider the physical environment and relevant social aspects in both proactive prevention methods and supporting reactive target hardening methods. It is also key to incorporate adaptability into the design as context can change over time. Planners and designers have to facilitate the multi-disciplinary process of creating proactive safe campus environments by incorporating the knowledge of other fields, like socially orientated fields, to create safe environments according to students' views of the relevant campus needs.

The main findings of the research revolved around the important role of the environment (spatial environment through planning and design and the social environment through people's behaviour) and how it contributes to the creation of campus environments where students can feel safe. These two aspects with regard to the environment are integrated. They do not only fall into the domain of the urban and regional planner, but involve several other relevant disciplines that should be involved in developing a Comprehensive Safe Environment Plan (CSEP) for campuses. There should be a platform for inter-campus debate and the sharing of knowledge and experience.

From a planning perspective, the main contribution to enhance students' perceptions of campus environments' safety may include principles such as the creation of compact dedicated campus areas, land uses, building placing and orientation, territoriality, landscaping, visibility, control over fear-inducing activities, maintenance, presence of security measures and pedestrian orientated areas. Although the spatial environment alone cannot prevent crime or fear, it could prove to be fruitful to apply and enhance students' perceptions of safety and to help create a context for better wellbeing and a more fulfilling student life. It is, however, important to note that crime, safety and fear are complex issues situated in a broader psychological, social, historical, cultural and political context. Although these fall outside the scope of the research, it may be rewarding to include these dimensions in a comprehensive study elsewhere.

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Author(s): Stephanus Coetzee – Stephanus Coetzee holds a four year professional degree and a Master's Degree in Urban and Regional Planning from the North-West University in Potchefstroom, South Africa. While busy with his undergraduate degree he completed additional modules in Psychology. The combination of planning and psychology sparked a research interest in how psychological and social aspects can be used in the planning and design of the physical environment in order to enhance the well-being of people. After the completion of his undergraduate dissertation he was awarded an international bursary to take part in a student exchange program in Lahti, Finland where he completed a part of the research this paper is based upon.

Karen Puren – Karen Puren is currently a senior lecturer in Urban and Regional Planning at the North-West University in Potchefstroom, South Africa. She holds a four year undergraduate degree in Architecture and a Master's Degree in Urban and Regional Planning from the University of the Free State. She is currently in the final stages of completing a PhD in Urban and Regional Planning entitled "The silent voice of sense of place in spatial planning: Vredefort Dome World Heritage Site, South Africa as a case study" for which she obtained a research grant from the National Research Foundation in South Africa. Her focus includes qualitative and social oriented studies with a special interest in the interactional nature of people and their environment. She uses a critical realist point of departure to explore various people-environment aspects with regard to spatial planning. Her teaching focus includes urban design, housing and planning theory. She has published widely in international and national academic journals and have presented at various conferences worldwide.