THE USE AND PERCEIVED VALUE OF GREEN SPACES: A COMPARISON OF TWO VANCOUVER PARKS

by

ALESSANDRA MONTI MSc Politecnico di Milano, 2005

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ADVANCED STUDIES IN ARCHITECTURE

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

December 2017

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ABSTRACT

Increasing urbanization has determined a progressive detachment of people from a daily contact with nature, causing a series of public health and social concerns. Nonetheless, various studies recognized that green spaces in urban contexts play an important role in providing a series of benefits to the surrounding communities. Typically, benefits of urban nature have been studied from an anthropocentric perspective. Conversely, this thesis adopts a 'regenerative approach', which recognizes that humans and nature are part of the same living system and therefore they both contribute to the health of the system. Accordingly, a classification of benefits was proposed, which distinguishes between social benefits (or benefits to humans) and environmental benefits (or benefits to nature).

Whilst social and environmental benefits of green spaces are numerous, review of the evidence demonstrates that different groups of people perceive and use green spaces differently, depending on a series of personal characteristics (such as age group, cultural background, everyday exposure to 'nearby nature', different images and values of nature, life experiences), physical characteristics (such as quality, quantity and proximity of green spaces, presence and maintenance of park features, support for certain activities) and on the type of exposure (intensity, frequency and duration of the experience).

Through the analysis – conducted through observations and questionnaires – and comparison of two case studies in Vancouver, patterns of use and perceived value of urban parks were investigated. In particular, two indicators were examined: 'social interactions' and 'perceived nature'. Results suggest that the intensity of the experience that urban parks provide – determined by the presence of certain park and natural features and by the opportunity of performing certain activities – positively affects their use and perceived value. In particular, social interactions were promoted by the presence of playgrounds and grass, while perception of nature was enhanced by the presence of street trees in the neighbourhood and by the exposure to a variety of natural elements within the park.

This suggests that perception of social and environmental benefits of urban nature may be enhanced by green space policies providing certain park and natural features at the park and neighbourhood scale.

LAY SUMMARY

This thesis investigates various characteristics that influence use and perceived value of green spaces, comparing two urban parks in Vancouver, BC. Results suggest that the two parks play different roles within their respective neighbourhoods and that they are used and perceived differently. However, some similarities could be identified. In particular, social interactions between park users have been associated with the presence of certain park features (such as playgrounds and grass) and the possibility of performing certain activities (such as taking the children to the playground and walking the dog). Moreover, the perceived value of urban parks has been associated with the intensity of the experience, meaning that the more facilities, activities and natural features the park offers, the greater the perception of benefits.

PREFACE

This dissertation is an original, unpublished intellectual product of the author, Alessandra Monti. The fieldwork conducted in PART 3 was covered by UBC Ethics Certificate number H16-02193.

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GLOSSARY

Biodiversity – compound word derived from 'biological diversity' which means "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems" (UN, 1992).

Biophilia – the innate attraction, affinity and preference towards nature and natural elements that people have as the result of the adaptations to the environment that occurred during human evolution. More generally, the term is used to indicate the human need for a positive contact with nature and the fact that humans, as a species, are still powerfully responsive to nature's forms, processes and patterns. (Alencar, 2013; Browning et al., 2012).

Contact with nature – various experiences of nature, including viewing natural scenes, being in natural settings, encountering plants and animals, participating in recreational activities, undertaking work in community gardens and similar. (Maller et al., 2005).

Ecosystem services – "Ecosystem services can be broadly defined as the aspects of ecosystems that provide benefits to people." (Turner et al. 2008, cited in Brown and Mooney, 2013). The concept dates back to the 1970s but was mainstreamed by the Millennium Ecosystem Assessment which distinguished provisioning, regulating, cultural and supporting services. The importance ('value') of ecosystems and their services can be expressed in different ways: ecological, socio-cultural and economic. (De Groot et al., 2010)

Environmental benefits (of green spaces) – the term has been used in this thesis to indicate the various benefits that green spaces provide to nature. A classification was proposed which includes three sub-categories of E. B. (Biodiversity, Regulatory Function and Policy and Environmental Strategies).

Experience of nature - see def. of 'Contact with nature'.

Exposure to nature – the type of contact with nature that depends on the intensity, frequency and duration of the experience and that influences people's perception of benefits (Shanahan et al., 2015).

Green residential atmosphere – definition by Crow, Brown and De Young (2006) that has been used in this thesis as a synonymous for 'nearby nature' (see def. of N. N. for further details).

Green spaces – the variety of private and public green areas of any size and attractiveness that can be found in urban contexts and that constitute the type of 'nearby nature' to which people are exposed in their everyday life (Matsuoka and Kaplan, 2008).

Nature – an organic environment where the majority of ecosystem processes are present (e.g. birth, death, reproduction, relationships between species). This includes the spectrum of habitats from wilderness areas to farms and gardens (Maller et al., 2005). In this thesis, the term has been used to indicate the abstract concept, in opposition to humans.

Nearby nature – various public and private spaces that people experience in their everyday life and that provide them with restorative benefits (Kaplan and Kaplan, 1989). The type of contact that people have with N. N. is thought to affect their overall experience of nature, including perceived benefits and values (Matsuoka and Kaplan, 2008).

Neighbourhood urban parks - See def. of 'Urban parks'.

Park features – the variety of purposes (at different times of the day, week and year), physical facilities (such as playgrounds, tennis courts, picnic tables, etc.), programs and activities (including scheduled programs and one-time events) that are available within a park setting (Bedimo-Rung, Mowen, and Cohen, 2005).

Perceived nature – many terms (such as 'nearby nature', 'green residential atmosphere', 'perceived neighbourhood greenness') have been used by the literature to indicate the

perception that people have of the surrounding natural environments (Crow, Brown and De Young, 2006; Matsuoka and Kaplan, 2008; Sugiyama et al., 2008).

Perceived neighbourhood greenness – definition by Sugiyama et al. (2008) that has been used in this thesis as a synonymous for 'nearby nature' (see def. of N. N. for further details).

Regenerative design, development, approaches – Regenerative design is usually defined as a shift from the objective of 'doing less harm', typical of green design, to the objective of 'doing more good', being 'net positive' in relation to the context, in order to generate positive outcomes from a social, economic and environmental point of view. Regenerative development proposes a shift from the mechanistic worldview, according to which humans control and manage nature, to a 'partnered relationship', where they both can be considered as a constituent and interactive part of the same living system. Regenerative approaches can integrate green design strategies, but their objective is broader, and extended over time. (Cole, 2012; Mang and Reed, 2012a; Mang and Reed, 2012b).

Regulatory function – the term has been used in this thesis to indicate one of the Environmental benefits of green spaces (see def. of E. B. for further details). It indicates the various 'regulating services' (processes that regulate aspects of nature, such as water filtration, carbon sequestration, etc.) as defined by the Ecosystem Services theory (see def. of E. S. for further details).

Sense of community – See def. of 'Social relations'.

Social benefits (of green spaces) – the term has been used in this thesis to indicate the various benefits that green spaces provide to humans. A classification was proposed which includes three sub-categories of S. B. (Social relations, Health and Wellbeing and Economic benefits).

Social cohesion – See def. of 'Social relations'.

Social interactions – formal (e.g., active, planned) or informal (e.g., casual, unplanned) social opportunity in which two or more residents attend to the quality of their relationships (Kim and Kaplan, 2004). In this thesis, the term has been used to indicate different types of verbal communications between two or more park users.

Social relations – various terms (such as 'sense of community' and 'social cohesion') have been used by the literature to indicate shared norms and values, positive and friendly relationships, feelings of being accepted and belonging, commitment to be together (De Vries et al., 2013; Francis et al., 2012a; Hartig et al., 2014). In this thesis, the term has been used to indicated the type of relationship that is thought to be promoted by social interactions in urban parks.

Urban parks – green spaces that are managed by municipal governments, have identifiable boundaries and provide the public with opportunities for outdoor recreation and pleasing natural environments (Shultis and Hvenegaard, 2016). In this thesis, the term has been used to indicate various definitions adopted by the literature, such as Public Open Spaces (POS), as in Francis et al. (2012a), Francis et al. (2012b) and Giles-Corti et al. (2005); Neighbourhood Open Spaces (NOS) as in Sugiyama et al. (2010) and Sugiyama and Ward Thompson (2008); and Small Public Urban Green Spaces (SPUGS) as in Peschardt, Schipperijn and Stigsdotter (2012).

ACKNOWLEDGMENTS

I would first like to thank my supervisor, prof. Ray Cole, for setting an example of scientific rigour and intellectual curiosity and for being my guide throughout this journey.

I would also like to thank my committee members, prof. Patrick Mooney and Dave Ramslie, for their interest in my research and their precious feedback and collaboration.

I really appreciated the contribution of any person who took the time to understand the motivations of this research and fill in the questionnaires during my fieldwork. I would like to thank them, even if their contribution was anonymous.

I finally must express my gratitude to my parents, for their unconditional love and support, to my husband Marco, for his trust, concrete help and constructive criticism and to my daughter Emma, for having been a wonderful company during our visits to the parks.

DEDICATION

To my family.

1. INTRODUCTION

1.1. Research motivations

Urban population accounted for 54.5% of the total global population in 2016 and it is projected to increase to 60% by 2030. In North America, more than half of the population resides in cities with 500,000 inhabitants or more; globally, cities of this size have grown at an average rate of 2.4% annually between 2000 and 2016 and are expected to continue (UN, 2016).

This fast and increasing urbanization has progressively detached the majority of the world population from a daily contact with nature and from its multiple benefits, causing the so-called 'nature deficit disorder', that is the increasing disconnection of people and especially children from nature (Louv, 2009). This is particularly relevant, because evidence demonstrates that children's relationship with nature has a positive effect in promoting their physiological and psychological development and also in predicting positive environmental attitudes in adulthood (Ward Thompson, Aspinall and Montarzino, 2008). Moreover, reduced time spent outdoor and sedentary lifestyles have contributed to the proliferation of various diseases related to obesity, such as hypertension and diabetes, which constitute important public health issues (WHO, 2016).

For these reasons, international organizations in Europe and in the United States defined 'access to nature' as an essential right (APHA, 2013; EU, 2010). In particular, the American Public Health Association (APHA) recognized the essential role of nature in urban contexts, affirming that a "rapidly growing body of evidence establishes that protecting and restoring access to nature in different spheres of people's lives, among those of all ages, social groups, and abilities, can alleviate some of the most important problems in public health, including obesity, stress, social isolation ..." (APHA, 2013, np).

On a smaller scale, cities all over the world recognize the importance of access to nature for their inhabitants and typically define a target for the provision of urban green spaces in urban

contexts. A common measure is the definition of a minimum walking distance from home to the nearest urban park (Barbosa et al., 2007; Boone et al., 2009). On that account, the City of Vancouver included in the Greenest City Action Plan the target to provide every resident with access to nature within a 5-minute walk to a park, greenway or other green space (City of Vancouver, 2010).

However, these kinds of targets only define the level of access to nature that the average person enjoys and do not capture differences in how social and environmental benefits are provided across society (Barbosa et al., 2007). Moreover, whilst it is usually accepted that walking distance is a determinant precondition for visiting urban green spaces (Ward Thompson et al., 2004), several studies demonstrated that physical proximity alone does not explain the actual use (Giles-Corti et al., 2005; Kaczynski, Potwarka and Saelens, 2008; Kessel et al., 2009; Sugiyama et al., 2010).

For this reason, this research thesis aims at identifying the potential existence of specific natural characteristics and park features that make urban parks attractive. In fact, whilst urban parks provide a series of social and environmental benefits to the surrounding communities, their use and perceived value depend on a series of interacting factors.

Various studies, for example, found an association between the quality of urban parks (determined by their size, location, features, maintenance, perceived greenness, etc.), and their attractiveness (Giles-Corti et al., 2005; Sugiyama et al., 2010); moreover, the presence of certain park features (Francis et al., 2012a) and the opportunity of performing certain activities (Kaźmierczak, 2013) was associated with increased opportunities for social interactions.

The role of urban parks in providing social and environmental benefits is central, to the point that it was associated with neighbourhood satisfaction and perceived quality of life (CABE, 2010b). However, people derive benefits from different types of green spaces, both public and private. The first category includes public owned and managed urban parks, community gardens and street trees, while the second category includes private gardens and backyards,

green roofs and facades.

Public and private green spaces have different roles and are managed differently, influencing the way in which people receive benefits from them. Public spaces, such as urban parks, are usually directly controlled through top-down planning and management by local municipalities and they are open to the public, so that everybody can benefit from their environmental and social benefits. Private spaces, on the other hand, are managed by their respective owners on the basis of the personal preferences and inclinations. Nonetheless, they constitute the majority of urban green space and act as green corridors through the urban matrix, thus contributing to urban biodiversity (Smith et al. 2005) for the benefit of the whole community.

Previous research argued that people derive restorative benefits from a variety of public and private green spaces which constitute the so-called 'nearby nature' (Kaplan and Kaplan, 1989) or 'green residential atmosphere' (Crow, Brown and De Young, 2006), that is the type of nature that people experience in their everyday life. According to these views, nature is perceived through direct experience of the green environment in which people live. As such, the type of contact that people have with nearby nature affects the general experience of nature they have, including perceived benefits and values. The importance of nearby nature is thought to be valid across cultures. However, people of different age and cultural background are reported to use and perceive nature differently (Matsuoka and Kaplan, 2008).

Since review of the evidence confirmed that urban parks are 'biodiversity hotspots' but also privileged spaces where social interactions can occur (Konijnendijk et al., 2013), this research thesis focuses on the analysis of two urban parks. In order to do that, two case studies in Vancouver, BC were selected and their use and perceived value were examined and compared. However, recognizing the relevant role that nearby nature and different age and cultural background play in influencing use of urban parks and perception of their benefits, the analysis extended over the boundaries of the parks themselves including the respective neighbourhoods. In synthesis, this research thesis aims at answering to the following research question:

- What characteristics influence use and perceived value of urban parks?

In order to capture these complex interrelationships, two indicators of use and perceived value of urban parks were identified, respectively 'social interaction' and 'perceived nature'. As such, related research questions are:

- Do 'social interaction' and 'perceived nature' effectively capture differences in use and perceived value of urban parks?
- Are there any park features or any performed activities that promote social interaction?
- Are there any natural features that enhance perception of environmental benefits?
- Does 'nearby nature' influence perception and use of urban parks?
- Do different age group and cultural background influence perception and use of urban parks?

The statement of the primary research question and the associated research themes shows that this research thesis recognizes the importance of understanding and evaluating the contribution of the numerous interacting factors that influence perception and use of green spaces. This is consistent with a 'regenerative approach', that is the research perspective which follows the relatively new concept of regenerative design and development (Cole, 2012; Mang and Reed, 2012b).

In brief, regenerative approaches accept that humans and nature are part of the same living system and therefore recognize that the health of the system depends on the positive coevolution of environmental, social and economic circumstances. As such, use and perceived value of urban parks depend on the positive interaction their presence is able to generate with the surrounding communities. Therefore, perceived social and environmental benefits of urban parks depend on the positive coevolution of humans and nature and are a manifestation of the health of the system. According to this perspective, the uniqueness of each place can be captured through the analysis of its physical and environmental characteristics (type of land, presence and disposition of trees and bushes, solar orientation, etc.), within the broader social and economic context in which it is situated, including analysis of demographics, ethnic background, social-economic characteristics, etc. (Mang and Reed, 2012a). For this reason, the study was extended to the neighbourhood scale, which is considered the ideal scale of analysis (Waldron, Cayuela and Miller, 2013).

On these premises, considering that use and perceived value of urban parks are affected by a series of interacting physical, social and personal characteristics whose analysis increases complexity, this research thesis recognizes the importance of adopting a whole-system approach. In fact, analysis of complex systems requires to consider the system as a whole (Snowden, 2015a). This means that the analysis should be kept open, because "the more we can hold open a description the more we scan, the more possibility of seeing novel solutions or interesting features" (Snowden, 2015b, n.p.).

1.1.1. Research strategy

An analysis adopting a whole system approach requires an extensive literature review and an open-ended approach. On the other hand, the scope of a master thesis requires a limited timeframe, clarity of intent and in the exposition of results.

For this reason, the research was organized in four parts:

- PART 1 which includes an extensive multidisciplinary research which investigates various benefits of green spaces, with the objective of proposing a categorization and identifying external factors that affect their provision and perception;
- PART 2 which focuses on the role of urban parks, investigating the benefits they
 provide and possible factors that influence their use and perceived value.

- PART 3 where the most important findings emerged from the literature review conducted in PART 1 and PART 2 are tested in two case studies in Vancouver, BC;
- PART 4 where the most important findings from PART 1 and PART 2 are discussed and compared.

The review of the evidence included in PART 1 was conducted adopting a multidisciplinary approach, as recommended by several authors (Bedimo-Rung, Mowen and Cohen, 2005; James et al., 2009). In fact, benefits of green spaces are of central interest for many disciplines and therefore have been extensively analyzed by previous research, often as separate research topics and according to distinct research perspectives. As such, many relevant contributions to the study described in this thesis were identified. However, as reported by Keniger et al. (2013), some limitations and imbalances also emerged, especially in relation to the strength of the evidence (mostly correlational), the preference for the study of certain benefits (for example, benefits to physical and psychological health were more studied than social benefits) and a geographic bias towards high latitudes and Western societies. Once a categorization of benefits was proposed, possible external factors that influence their perception and use were identified (see Chapter 3, *Provision, Access and Use of Green Spaces* for further details).

The review of the evidence conducted in PART 2 focuses on the role of urban parks and set the theoretical basis for the following case studies. In fact, factors influencing perceived value and use of urban parks were discussed and two indicators of social and environmental benefits were proposed.

The research included in PART 3 was developed adopting a conjunct strategy of observational methods and questionnaires (see Chapter 7, *Research methodology* for further details). Collected data were then discussed in relation to the findings emerged from the analysis conducted in PART 1 and PART 2.

The conclusions included in PART 3 identified similarities and differences in the perception and use of urban parks, as emerged from the literature review included in PART 1 and PART 2 and from the analysis of the case studies included in PART 3. Furthermore, differences between the two case studies were discussed, with the objective of identifying potential characteristics that make parks attractive and their benefits appreciated by the surrounding communities, considering an environmental and social perspective.

1.2. Thesis structure

Chapter 1 | Introduction

The first chapter provides an overview of the work included in the thesis, including research motivations, structure of the thesis and some notes on terminology.

PART 1 - BENEFITS OF GREEN SPACES

Chapter 2 | Benefits of Green Spaces

The second chapter includes a review of the evidence of the multiple benefits of green spaces. The literature review was conducted adopting a multidisciplinary approach which investigates findings from various disciplines. A possible classification was proposed, which identifies two main categories of benefits: social benefits (or benefits to humans) and environmental benefits (or benefits to nature).

Chapter 3 | Provision, Access and Use of Green Spaces

The third chapter includes an analysis of the most important external factors that are thought to influence perception and use of green spaces, namely physical proximity (distance from home to the nearest urban park), quality and quantity of green spaces (relationship between attractiveness and perceived benefits) and inequities in the provision (disadvantage due to affluence and ethnic background).

PART 2 – USE AND PERCEIVED VALUE OF URBAN PARKS

Chapter 4 | Role of Urban Parks

In the fourth chapter, history and current role of urban parks are investigated, with particular focus on identifying the specific social and environmental benefits that urban parks provide. Among these benefits, two indicators were selected: 'social interaction' as an indicator of social benefits and 'perceived nature' as an indicator of environmental benefits. Two external factors were also identified, which are thought to influence perceived value and use of urban parks: the role of exposure (intensity, frequency and duration of the experience) and being part of sensitive groups (especially depending on age and ethnic background). The selected indicators and the contribution of identified external factors were tested in the following case studies (as described in Chapter 8, *Case Studies*).

Chapter 5 | Perceived Value of Urban Parks

The fifth chapter includes a review of the evidence of the numerous interacting factors that are thought to influence perceived value of urban parks. In particular, the role of personal and cultural characteristics in determining perception of social and environmental benefits was investigated, examining the contribution of different images and values of nature (as determined by different cultural background and life experiences), the natural human predisposition to nature (biophilia hypothesis) and the restorative role of 'nearby nature'. On these bases, differences in the perceived value of urban parks for people from different age and cultural background were identified.

Chapter 6 | Use of Urban Parks

The sixth chapter includes a review of the evidence of the potential factors that influence actual use of urban parks. In particular, the contribution of the

presence of certain park features and the opportunity of performing certain activities was investigated, identifying possible associations with type of use and increased opportunities for social interactions. On these bases, differences among people from different age and cultural background were identified.

PART 3 – CASE STUDIES

Chapter 7 | Research methodology

The seventh chapter includes a description of the research methodology, consisting in observations and questionnaires, adopted to investigate differences in use and perceived value of two urban park case studies in Vancouver.

Chapter 8 | Case Studies

The eighth chapter includes an analysis of the two case studies, where the most relevant findings from PART 1 and PART 2 were examined. In particular, four factors were investigated: firstly, the effectiveness of the two indicators ('social interaction', indicator of social benefits and 'perceived nature', indicator of environmental benefits), as emerged from Chapter 4, *Role of Urban Parks*; secondly, the positive association between preferred features, preferred activities and use of urban parks, as emerged from Chapter 6, *Use of Urban Parks*; thirdly, the role of exposure (intensity, frequency and duration of the experience) in affecting perceived value of urban parks, as emerged from Chapter 4, *Role of Urban Parks*; lastly, the role of different age group and cultural background in affecting perception and use of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the role of urban parks, as emerged from Chapter 5, *Perceived Value of Urban Parks*; lastly, the r

PART 4 – CONCLUSIONS

Chapter 9 | Discussion of results

The ninth chapter includes a discussion of results as emerged from the review of the evidence included in PART 1 and PART 2 and the findings from the case studies included in PART 3.

Chapter 10 | Limitations and Future research

The tenth chapter includes an analysis of the limitations of the study and suggestions for future research.

1.2.1. Notes on terminology

Several terms are used by the literature to indicate natural features in urban contexts. In this research thesis, three terms were adopted:

Nature – an organic environment where the majority of ecosystem processes are present (e.g. birth, death, reproduction, relationships between species). This includes the spectrum of habitats from wilderness areas to farms and gardens (Maller et al., 2005). In this thesis, the term has been used to indicate the abstract concept, in opposition to humans.

Green spaces – the variety of private and public green areas of any size and attractiveness that can be found in urban contexts and that constitute the type of 'nearby nature' to which people are exposed in their everyday life (Matsuoka and Kaplan, 2008).

Urban parks – green spaces that are managed by municipal governments, have identifiable boundaries and provide the public with opportunities for outdoor recreation and pleasing natural environments (Shultis and Hvenegaard, 2016).

See the Glossary (p. xi) for a complete list of definitions.

PART 1

BENEFITS OF GREEN SPACES

2. BENEFITS OF GREEN SPACES

International and multidisciplinary studies have been undertaken that have proposed different classifications of nature-related benefits. For the scope of this research thesis, an extensive literature review was conducted to develop a possible classification relevant to the analysis of two urban park case studies in Vancouver. Scientific papers and international reports were selected among those which identified various categories of benefits and included a review of the evidence of the benefits of green spaces. This was intended to propose a classification of benefits that could constitute the grounding for the following research. The strength of the evidence and the most important findings are summarized below.

2.1. Review of the evidence

Review of scientific papers and international reports showed that a number of studies were developed from a public health perspective (Clark et al., 2007; Hartig et al., 2014; Keniger et al., 2013; WHO, 2016), evaluating the evidence of the relationship between green spaces and physical and mental health. These, however, often accepted a broad interpretation of health, including various social benefits. Other studies, whilst including health benefits, were developed from a wider social perspective (Rakhshandehroo et al., 2015; Zou and Parves Rana, 2012). In some cases, also environmental benefits of green spaces were included in the analysis (Bedimo-Rung, Mowen and Cohen, 2005; Konijnendijk et al., 2013; WHO, 2016). However, they were typically considered from an anthropocentric perspective, for their benefits to humans rather than their benefits to nature. In this sense, the contribution of the CABE report (2004) was particularly significant, because it adopted a more inclusive approach, analyzing a broad spectrum of social and environmental benefits that green spaces provide. Doing so, it effectively captured the role of urban parks as public, inclusive meeting places where people can foster social ties and develop common sense of place and cultural identity.

Results generally reported a positive association between green spaces and health and wellbeing. In particular, increased benefits were identified for economically deprived

communities, children, pregnant women and senior citizens (WHO, 2016). Moreover, in addition to direct health benefits, green spaces were found to provide indirect health benefits, in that they facilitate activities that are beneficial for human wellbeing (Keniger et al., 2013; Konijnendijk et al., 2013). Similarly, a positive association was identified between green spaces and property value (CABE, 2004; Konijnendijk et al., 2013), green spaces and biodiversity (CABE, 2004; Konijnendijk et al., 2013) green spaces and regulatory functions, such as air quality, water management and cooling effect (Bedimo-Rung, Mowen and Cohen, 2005; Konijnendijk et al., 2013) and between some types of green spaces (urban parks and community gardens) and social cohesion (Keniger et al., 2013; Konijnendijk et al., 2013).

However, some limitations were also identified. Hartig et al. (2014), for example, whilst confirming the positive effects of contact with nature, also argued that "nature contact should not be assumed always and automatically to be good for health; we have more to learn about for whom, when, how, and in which contexts it offers benefits" (p. 222). Other authors warned that results should be treated with caution, because the strength of the evidence shows various limitations due to the research methodologies adopted (Clark et al., 2007; Keniger et al., 2013; Konijnendijk et al., 2013). Moreover, as reported by Zou and Parves Rana (2012), quantifying benefits is complex because they are interconnected and their consumption varies depending on age range, professional, educational and cultural values, and socioeconomic status.

2.2. Proposed classification of benefits

As anticipated, the literature review showed that various classifications of benefits are proposed. However, the majority of the studies adopted an anthropocentric perspective, with a particular focus on health benefits, following the traditional mechanistic worldview. This research thesis, instead, accepts the regenerative principle that humans and nature are in a 'partnered relationship' where they both can be considered as a constituent and interactive part of the same living system (Cole, 2012; Mang and Reed, 2012a; Mang and Reed, 2012b).

As such, benefits of green spaces affect both humans and nature and therefore they can be classified in two main categories:

- Social benefits (or benefits to humans) and
- Environmental benefits (or benefits to nature).

Once the two main categories of benefits were identified, the most important findings from the literature review were classified accordingly, identifying three sub-categories for each category.

As such, Social Benefits were classified as following:

- Social relations: presence of green spaces is associated with improved social relations (De Vries et al., 2013; Francis et al., 2012a; Hartig et al., 2014; Sugiyama and Ward Thompson, 2007); in residential contexts, greenery in common spaces increases use and informal social contacts among neighbours (Coley, Kuo, and Sullivan, 1997; Kweon, Sullivan and Wiley, 1998; Sullivan, Kuo and DePooter, 2004); moreover, wellmaintained green spaces reduce crime (Kuo and Sullivan, 2001). At a neighbourhood scale, urban parks (Francis et al., 2012a; Gobster, 1998; Kaźmierczak, 2013; Konijnendijk et al., 2013; Peters, Elands and Buijs, 2010) and community gardens (Ghose and Pettygrove, 2014; Keniger et al., 2013; Konijnendijk et al., 2013; Shan and Walter, 2015) are inclusive spaces that enhance sense of place and stewardship and facilitate social cohesion, social interaction and social encounters.
- Health and wellbeing: green spaces have a positive impact on human physiology, functioning and mental health (Keniger et al., 2013; WHO, 2016) when considering both perceived health (Kardan et al., 2005; Maas et al., 2006) and physician assessed health (Maas et al., 2009a; Roe et al., 2013; Ward Thompson et al., 2012); numerous studies investigated the relationship between green spaces and physical activity (Bedimo-Rung, Mowen and Cohen, 2005; Kaczynski and Henderson, 2007; Lee and Maheswaran, 2011; McCormack et al., 2010) with mixed results; environmental

psychology studies identified a positive relationship between view of nature and health benefits (Kaplan, 1995; Kaplan, 2001; Velarde, Fry and Tveit, 2007).

 Economic benefits: access to (or view of) nature increases property value (CABE, 2004; Keniger et al., 2013; Konijnendijk et al., 2013; Mowen and Cohen, 2005); moreover, green spaces attract investments (CABE, 2004), increase tax revenue (CABE, 2004) and reduce societal costs (Browning et al., 2012; Harnik and Welle, 2009).

Similarly, Environmental Benefits were classified as following:

- Biodiversity: opinions about the richness of biodiversity in urban contexts are varied (Miller, 2005; Savard, Clergeau and Mennechez, 2000); however, its role in providing ecosystem services and their benefits is recognized (Bolund and Hunhammar, 1999; Brown and Mooney, 2013). Various studies (Blair, 1999; Gaston and Blackburn, 1995; Lombard, 1999) agreed that avian diversity can be considered as a good indicator of general biodiversity, as tested in various studies in Australia (Daniels and Kirkpatrick, 2006; Luck, Smallbone and Sheffield, 2013; Stagoll et al., 2012) and in Vancouver BC (Melles et al., 2003; Melles, 2005).
- *Regulatory function:* according to the 'ecosystem services approach', regulating services (processes that regulate aspects of nature) can be quantified in order to measure the overall 'landscape performance' (De Groot et al., 2010; Mooney, 2014). Various studies (Bedimo-Rung, Mowen and Cohen, 2005; Hartig et al., 2014; Konijnendijk et al., 2013; WHO, 2016) analyzed the role of regulatory functions of green spaces (such as air quality, water management and cooling effect) but results show that the strength of the evidence depends on the type of regulatory function (Konijnendijk et al., 2013).
- Policy and environmental strategies: green spaces in urban contexts provide various environmental benefits to urban residents (Bolund and Hunhammar, 1999); however, the distribution of these benefits is not equitable (Chakraborty and Landry, 2009; Tooke,

Coops and Klinkenber, 2010; CABE, 2010b). Therefore, the adoption of strategies for improving biodiversity by any level of government is considered crucial (Chakraborty and Landry, 2009). The City of Vancouver adopted a series of initiatives to improve access to nature (City of Vancouver, 2010-2015b-2016b), promote biodiversity (City of Vancouver 2014a-2014b-2015a) and increase canopy cover (City of Vancouver, 2015b-2016b).

On the basis of the classification proposed above, various characteristics of social and environmental benefits of green spaces were investigated, the strength of the evidence emerged from the literature review was evaluated and useful insights for the following phases of the research were identified. The most relevant findings are discussed below.

2.2.1. Social benefits of green spaces

The first macro-category includes a series of benefits that green spaces provide to humans, as individuals and as a community. As seen above, blurred boundaries can be identified between the different categories proposed by the literature. For example, many classifications considered social relations and social support as indicators of mental health, while others, more broadly, as indicators of social benefits. Moreover, economic benefits were generally overlooked, with only few studies explicitly considering the association between green spaces and property value (Bedimo-Rung, Mowen and Cohen, 2005; CABE, 2004; Konijnendijk et al., 2013). This research thesis proposes a more inclusive approach, classifying social benefits in three categories: *Social relations, Health and wellbeing* and *Economic benefits*. The most relevant findings are discussed below.

2.2.1.1. Social relations

The first sub-category of Social Benefits evaluates the role of green spaces in improving social relations. As reported by Hartig et al. (2014), a variety of terms have been used by the literature, often interchangeably, to express this concept, such as:

- social capital
- social support
- social cohesion
- sense of community.

In their study, Hartig et al. (2014) prefer the term 'social cohesion' arguing that it better describes a characteristic of neighbourhoods, while social capital better describes the resources that are available to individuals in case of need. Social cohesion in fact "refers to shared norms and values, the existence of positive and friendly relationships, and feelings of being accepted and belonging" (p. 215). Furthermore, they argue that social cohesion is supposed to be more likely influenced by physical features of the neighborhood, such as the availability and quality of green space and natural elements.

Francis et al. (2012a) instead prefer the term 'sense of community', which is similarly defined as a sense of affiliation and belonging and contains the idea that members' needs will be met through their commitment to be together. They also consider that the term best represents the people-place relationship and "reflects a focus on the social bonds within and between people and place, as well as the physical, symbolic, political and cultural implications of 'community'" (p. 401). De Vries et al. (2013) instead use 'social cohesion' as an equivalent of 'sense of community'.

Either way, the authors highlight that social relationships cannot be easily studied through experimental research, making it difficult to determine whether relations with environmental features are causal.

In this regard, Konijnendijk et al. (2013) argue that the review of the evidence shows a positive association between urban parks and social cohesion. In fact, by creating space for social interaction, parks are thought to enhance social cohesion; moreover, by facilitating contacts between persons of different social and ethnic background, they are also thought to promote social inclusion. However, the authors highlight that the interactions that do occur in urban

parks are usually cursory and informal and therefore the link with social cohesion should be treated with caution.

Despite the limitations, many studies have analyzed various implications that relate green spaces to improved social relations. The most important findings are summarized below.

The most influential research was developed by Coley, Kuo, and Sullivan (1997), who studied the role of natural elements in affecting social relations among public housing residents in Chicago. Their study was based on a series of observations in the outdoor areas of architecturally similar buildings, differing only for the presence of greenery. Results indicated that spaces with trees consistently attracted more mixed (youth and adults) and larger groups of people, suggesting that natural elements enhance use of common spaces and informal social contacts among neighbours. In fact, presence of greenery was associated with more opportunities for social interactions, monitoring of outdoor areas, and supervision of children. A similar study was conducted in the same area by Kweon, Sullivan and Wiley (1998), focusing on older adults. Results associated exposure to green outdoor common spaces with the formation and maintenance of social ties. This is particularly relevant, because social relations are considered predictors of wellbeing and longevity for older adults. A later study (Kuo and Sullivan, 2001) also found a positive relationship between presence of greenery and reduced crime.

These results were confirmed by Sullivan, Kuo and DePooter (2004), who developed a new study in the same housing complex with the objective of resolving a discrepancy in the literature. Observations showed that the presence of tree and grass was associated with increased face to face contacts and increased number of individuals involved in the interactions. By extension, the study concluded that the presence of greenery can be associated with improved neighbourhood vitality and social cohesion.

Congruently, later studies analyzed the relationship between green spaces and social cohesion at the neighbourhood scale. Sugiyama and Ward Thompson (2007), for example, evaluated

the relationship between the quality of neighbourhood environments and older people's health and concluded that supportive environments positively affect self-reported health. Since this positive relationship was registered even when people were not physically active, the study argued that older people derive health benefits from spending time outdoors, in contact with nature and presumably through social interaction with other people (such as friends and neighbours). De Vries et al. (2013), instead, evaluated how quantity and quality of street greenery positively affect social cohesion, in comparison with other health benefits (stress reduction and stimulating physical activity). The questionnaire-based research was conducted in four cities in the Netherlands. Social cohesion was evaluated through a series of statements whose answers were rated on a five-point scale and resulted to be an important mediator (with stress reduction). Quality and quantity of streetscape resulted to see interconnected, with quality playing an important role, being also related to residential satisfaction.

Many studies (Keniger et al., 2013; Konijnendijk et al., 2013) recognized that social interactions are favoured by certain types of green spaces, especially urban parks and community gardens. In particular, in their literature review study, Keniger et al. (2013) reported that community gardening has been associated with improved social cohesion, cooperation and inter-racial interaction. They also noted, however, that the evidence did not confirm that these benefits are extended to the wider community. Nonetheless, other studies reported that, over time, the shared activities of growing and eating food promote interactions that are thought to offer the residents the opportunity of exploring cultural and racial understandings and building mutual feelings of community (Ghose and Pettygrove, 2014). Similar results were reported in Vancouver, where a research conducted in two community gardens showed that gardening for six Chinese immigrant women acted as a practice-based learning experience, becoming an example of everyday multiculturalism (Shan and Walter, 2015).

The analysis of the role of urban parks as privileged spaces for social interactions is central for this research thesis and will be analyzed further in Chapter 6, *Use of Urban Parks*. However,
for the scope of this classification, the main results are synthesized below.

Francis et al. (2012a) compared urban parks with other public spaces (community centres, schools and shops) in the Perth metropolitan area, Australia, and concluded that subjective qualities of urban parks, such as perceived friendliness and safety, have a positive relationship with sense of community. Kaźmierczak (2013), instead, evaluated the contribution of local parks to neighbourhood social ties in Greater Manchester, UK, and concluded that urban parks, offering opportunities for repeated contact, promote new social ties or strengthen the existing ones. Both studies highlighted that type of activity (such as leisure, relax, etc.) are more conducive to social relations than frequency of use. Other studies specifically evaluated the role of urban parks in facilitating interactions between people from diverse socio-economic and ethnic backgrounds, generally finding a positive relationship. Gobster (1998), for example, evaluated the role of 'boundary parks' as 'green magnets' between interracial communities in the Chicago area; Peters, Elands and Buijs (2010), instead, studied how social cohesion can be enhanced through social interactions and place attachment in five urban parks in the Netherlands; lastly, Krellenberg, Welz and Reyes-Päcke (2014) evaluated opportunities of social interactions in socio-economic diverse neighbourhoods in the Metropolitan Area of Santiago del Chile.

2.2.1.2. Health and wellbeing

The second sub-category of Social Benefits evaluates the role of green spaces in improving human health and wellbeing.

As already mentioned, review of the evidence showed that studies have been conducted from different perspectives and contributions have been provided by various disciplines. Some studies were based on self-reported data, while others were supported by medical results. Overall, the wide range of results and the availability of scientific data contribute in reinforcing the evidence. However, while many critics identified a positive relationship between green spaces and physical and mental health (as reported by Keniger et al., 2013), others concluded

that the evidence is mixed (Kaczynski and Henderson, 2007) or weak (Lee and Maheswaran, 2011). Nonetheless, many aspects of this relationship have been investigated and results from the research are worth considering. The main findings are summarized below.

Some studies investigated the relationship between green spaces and perceived general health. Maas et al. (2006), for example, developed an epidemiological study in the Netherlands, evaluating the strength of the relation between amount of nearby green space and perceived general health. Results showed that people living in a greener environment (considering a 1 km or 3 km radius around their homes) registered better perceived health than people living in less green environments. The relationship was stronger for people who were likely to spend more time in the vicinity of their home, such as lower educated people, youth and elderly.

A similar research was undertaken by Kardan et al. (2005) in Toronto, Canada, investigating the relationship between a specific type of green space (tree canopy) and perceived health. Results reported that people who live in areas with higher street tree density report better health perception and fewer cardio-metabolic conditions compared with people living in areas with lower street tree density. These findings suggest that street tree canopy is more conducive to better health perception than tree canopy in other settings (such as urban parks or private gardens). This result may be explained by people possibly having greater contact (visual and presence) with trees along the streets and therefore gaining more benefits or, alternatively, street trees may provide more benefits because they play an important role in reducing air pollution deriving from traffic.

Other studies investigated whether, in addition to perceived health, a positive relationship exists between presence of green spaces and actual health. Maas et al. (2009a), for example, identified an association between a green living environment and morbidity (as determined by a physician), concluding that people living in close proximity to green spaces (1 km radius) were healthier than those living farther away. Similarly, Ward Thompson et al. (2012) and Roe et al. (2013) analyzed the relationship between green spaces and mental health in

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deprived urban communities in Scotland. Their results indicated that both perceived stress and physiological stress (measured by diurnal patterns of salivary cortisol levels) decline in presence of higher levels of green space.

Velarde, Fry and Tveit (2007), instead, conducted a literature review of environmental psychology studies with the objective of evaluating the evidence that relates the view of nature with health benefits. Generally, results suggested that presence of green spaces was associated to stronger positive health effects, especially for three kinds of health benefits: short-term recovery from stress or mental fatigue; faster physical recovery from illness; long-term overall improvement on people's health and well-being.

Among these studies, the Attention Restoration Theory developed by Rachel and Stephen Kaplan has been particularly influential. In synthesis, the theory argues that natural environments (including 'nearby nature') provide restorative experiences from mental fatigue. In particular, the so-called 'directed attention' – a voluntary attention that is necessary for 'human effectiveness' – is considered particularly important. Any prolonged mental effort leads to directed attention fatigue, but natural environments, with their soft fascinations (such as clouds, sunsets, snow patterns, leaves moving in the breeze, etc.), have specific characteristics (such as offering a 'sense of being away', a conceptual or physical 'sense of extent' and a sense of compatibility and resonance with nature) which provide effortless opportunities of restoration (Kaplan, 1995). Following studies evaluated different types of contact with nature and concluded that micro-restorative experiences, including simple view of nature from home, can be particularly effective when prolonged over time (Kaplan, 2001).

Other studies focus on the benefits of green spaces to physical health, specifically evaluating the role of green spaces in improving physical activity. In fact, exercising is thought to have positive effects in reducing morbidity and mortality by decreasing risks of heart disease, diabetes, high blood pressure and related diseases (Bedimo-Rung, Mowen and Cohen, 2005; Kaczynski and Henderson, 2007; Konijnendijk et al., 2013; Lee and Maheswaran, 2011). Findings on this topic showed mixed evidence and have been discussed through literature

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review (Kaczynski and Henderson, 2007; Lee and Maheswaran, 2011; McCormack et al., 2010).

Kaczynski and Henderson (2007), for example, conducted a review of studies investigating the empirical relationship between green spaces (namely parks and recreation settings) and physical activity. According to the authors, most of the studies showed a positive association between physical activity and proximity to home while mixed results were registered in relation to various settings of physical exercise. However, some positive association was generally found in relation to trails, parks, open spaces, golf courses and natural settings although caution was suggested in generalizing the results given differences in age and gender. Moreover, the authors affirmed that "inferring the causality or the direction of the relationship was nearly impossible" (p. 346).

Similarly, Lee and Maheswaran (2011) developed a literature review of the relationship between green spaces and physical and mental health and concluded that the evidence is weak. In fact, they argue that the presence of green spaces in itself is unlikely to explain the health benefits, since environmental characteristics (such as features, condition, accessibility and safety of green spaces) and individual characteristics (such as age, gender, ethnicity, disability of the users) can variously affect the provision and perception of benefits. So, while the evidence of the health benefits of physical activity is strong, the evidence of the link between physical activity levels and green space availability is weaker. Indeed, the authors argue that the relationship could be explained by 'reverse causality'. In fact, physical activity may be enhanced by proximity of green spaces or, on the contrary, people who are more physically active may prefer to live in proximity of green spaces.

McCormack et al. (2010), instead, developed a review of articles investigating the relationship between urban parks and physical activity, but only included studies based on qualitative methodologies, such as in-depth individual interviews, direct observations and participant observations. Results were consistent with findings from quantitative research, showing that certain environmental attributes can affect actual use of green spaces. Moreover, the study provided a relevant contribution, arguing that perceptions of the physical environment are strictly connected with perceptions of the social environment; so, physical activity patterns are influenced not only by certain physical attributes, but also by their perception.

In summary, even if a positive relationship between urban green spaces and health is generally recognized (Keniger, 2013; WHO, 2016), research shows that results are mixed and the attempts of proving a causal relationship have been inconclusive (Kaczynski and Henderson, 2007; Lee and Maheswaran, 2011).

Furthermore, little is known about how much or what type of nature is required for receiving health benefits (Shanahan et al., 2015). To this end, recent studies conducted in Australia (Shanahan et al., 2015) and in the US, University of Michigan (Green, 2015) investigated the existence of an optimal 'nature dose' to achieve physical and mental health benefits (see Paragraph 4.2.2.2, *Role of Exposure* for further details). However, the role of various interacting factors (such as different cultural background, age, life experiences and exposure to 'nearby nature') in affecting perception of benefits suggests that the optimal dose of nature would not be constant (see Chapter 5, *Perceived Value of Urban Parks* for further details).

2.2.1.3. Economic benefits

The third and last sub-category of Social Benefits evaluates the relationship between green spaces and economic benefits.

In this regard, a significant synthesis was included in the CABE report (2004) which identified three main economic benefits of public green spaces:

- Increasing property value: evidence suggests that proximity and view of green spaces contribute to increasing property value;
- Attracting investments: the presence of green spaces can be considered a business and marketing tool. In fact, companies are attracted by locations with good public

spaces; in turn, companies attract customers, employees and services.

Creating tax revenue: increasing property values, green spaces provide public benefits,
in the form of increased taxes paid to the government.

Browning et al. (2012), instead, evaluated the Economics of Biophilia, arguing that economic benefits of access to nature on health and societal costs are calculable. Among other benefits of biophilic design, they cite the significant influence that urban design can provide through increased contact with nature. In fact, links have been identified between presence of green spaces and improved physical and mental health as well as reduced conflictive behaviour and crime. As a consequence, improved public health and reduced crime, obtained through increased contact with nature, result in cost-savings for the community.

In this regard, Harnik and Welle (2009) proposed an estimate of the economic value of a city park system, developing a study for the Trust for Public Land, a US nonprofit organization. Their research identified the following benefits and associated economic value:

- Increasing hedonic (property) value: people are willing to pay more for a home close to a quality park (assumed average value of a park: 5%);
- Income from out-of-town park visitor spending (tourists): estimate of the total parkderived tourist spending and contribution to the local economy;
- Direct use value: willingness to pay for certain activities (general park use, sport facilities, special uses);
- Health value: medical savings gained by city residents because of park exercise;
- Community cohesion: the amount of time and money that residents devote to their parks through volunteering can be used as a proxy;
- Reducing the cost of managing urban stormwater: estimate of the value of retained stormwater runoff due to the presence of green spaces in parks;

 Removal of air pollution by vegetation: use of the air pollution calculator to estimate the value of pollution removal.

The cited studies offer interesting contributions to policy and city government from an economic perspective. Scientific papers, however, describe a more complex relationship between green spaces and economic benefits, whose evidence is mixed.

Most of the studies analyzed the relationship between green spaces and house prices. Konijnendijk et al. (2013), for example, evaluated the effect of urban parks on property values, conducting a literature review of studies from North America, Asia, Europe and Australia. Findings were generally consistent, suggesting that there is 'moderate to strong evidence' that green spaces (especially urban parks) have a positive impact on the value of nearby properties (houses, apartments, land). However, some studies identified a negative relationship between urban parks and property prices, generally due to crime, noise and light pollution.

Similar results were confirmed by Keniger et al. (2013), who highlighted the importance of considering the type and accessibility of green space, in addition to its proximity. In fact, results suggest that people place more value to green spaces they can access (such as public parks or golf courses) than to inaccessible private green spaces. Mowen and Cohen (2005) also confirmed their findings, adding that most of studies analyzed in their review only considered distance from property to park, without evaluating the quality of the green space. On the contrary, they note that future research should expand its scope, investigating the role of specific park attributes in affecting property prices and the local economy in general.

Konijnendijk et al. (2013), instead, specifically evaluated the role of urban parks in tourism, focusing on the recreational value that certain green spaces have, being able to attract visitors and consequent economic revenue and investments. Findings showed that there are

some indications that parks have touristic benefits. However, the scientific literature has not analyzed the topic in detail so far, and therefore the authors described the evidence as 'weak'.

In synthesis, whilst several economic benefits of green spaces can be identified (Browning et al., 2012; CABE, 2004; Harnik and Welle, 2009), review of the evidence shows that a positive association has been registered only between green spaces (especially urban parks) and property value. Therefore, further research is needed to reinforce the evidence of the other economic benefits and to better evaluate the role of type and quality of green spaces in the provision of economic benefits (Keniger et al., 2013; Mowen and Cohen, 2005).

2.2.2. Environmental benefits of green spaces

The second macro-category includes a series of benefits that green spaces provide preserving and enhancing nature.

As seen above, classification of the results is complex, because some studies analyzed environmental benefits from an anthropocentric perspective. So, for example, pollution reduction, noise buffering or exposure to sunlight have been considered for their benefits to human health (WHO, 2016) and not for their benefits to biodiversity and urban nature. This research thesis, instead, adopts an ecologic perspective, focusing on the quality and richness of green spaces. This approach is consistent with the definition of 'value' of ecosystem services as expressed by De Groot et al. (2010), which argues that the importance (or value) of ecosystem services can be expressed in different ways, from an ecological, socio-cultural or economic perspective. Adopting an ecological perspective, this thesis proposes to classify environmental benefits in three sub-categories: Biodiversity, Regulatory function and Policy and environmental strategies. The most relevant findings are discussed below.

2.2.2.1. Biodiversity

The first sub-category of Environmental benefits evaluates the role of green spaces in improving urban biodiversity.

The term 'biodiversity' is a compound word derived from 'biological diversity' which means "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems" (United Nations, 1992). According to the definition by Savard, Clergeau and Mennechez (2000), it "transcends all levels of life from genes to communities and all spatial and temporal scales" and is usually used "in a very comprehensive manner meaning the variability of life (composition, structure and function)" (p. 131). The value of biodiversity in urban contexts has been recently recognized and, as a consequence, various conservation and promotion strategies have been identified (Dearborn and Kark, 2010).

Opinions about the richness of biodiversity in urban contexts are quite varied. According to Savard, Clergeau and Mennechez (2000), from an ecological perspective, urban ecosystems can provide useful insights into the management of biodiversity in other ecosystems because they are characterized by a high level of heterogeneity and are highly dynamic (p. 132). By contrast, according to Miller (2005), "urbanization has a homogenizing effect on biodiversity as native habitats are much reduced and relatively few species, often non-native, that thrive in human-dominated landscapes tend to predominate" (p. 431). Nonetheless, he notes that "[e]ven in the most developed areas, opportunities for contact with nature abound" (p. 431). In this regard, Beatley (2011) affirms that

"[t]he *wildness* of cities, the *nature* of cities, extends well beyond the usual areas we tend of think of. It is not just the established public parks or green areas in a city but much more: the trees on streets, courtyards, rooftops, creeks, and hydrological features, many of which have been hidden and highly altered. We can see signs of this remnant nature everywhere we look. Thinking about the presence of nature in most spaces and dimensions that permeate a typical city offers a fuller view of urban biodiversity and wildness ... The city is a wild place indeed" (pp. 42-43).

Either way, the role of biodiversity is particularly important because it is the major component

of the ecosystem that provides ecosystem services and their benefits. Therefore, protecting biodiversity protects ecosystem services, even if not in a linear and predictable way (Brown and Mooney, 2013). This is particularly relevant because locally generated ecosystem services are reported to have a substantial impact on the quality of life in urban areas (Bolund and Hunhammar, 1999).

Within urban contexts, urban parks can be considered hotspots for biodiversity, due to their high levels of habitat diversity and microhabitat heterogeneity. In their review of the evidence, Konijnendijk et al. (2013) focused on species richness and concluded that there is strong evidence that urban parks are rich in biodiversity. Their analysis included a series of international studies investigating flora and fauna groups and covered a wide geographical context, suggesting that results can be generalized at the local and at the global scale.

Nonetheless, private spaces also have a significant role in enhancing biodiversity. In fact, even if they are not used by the public, their environmental benefits can be experienced by the whole community. Private gardens, in particular, contribute the greatest proportion of land to urban green space and can act as green corridors through the urban matrix, thus supporting diverse wildlife populations. As such, individual interventions in private domestic garden can considerably affect urban biodiversity (Smith et al., 2005).

Previous studies (Blair, 1999; Gaston and Blackburn, 1995; Lombard, 1999) agreed that avian diversity can be considered as a good indicator of general biodiversity. In particular, Gaston and Blackburn (1995) argued that avian genus and family richness can effectively predict general biodiversity, especially species richness. Blair (1999), instead, assessed that diversity of birds correlates with diversity of butterflies and both can be used as surrogate for biodiversity at a community level, when considering species richness, species diversity, rarity and representativeness. Lastly, Lombard (1999) affirmed that there is a positive relationship between avian richness and diversity of species from other taxa; as such, bird hotspots are the best predictor of hotspots of other vertebrate taxa. On these premises, various studies conducted in Australia evaluated biodiversity in urban contexts through the lens of avian characteristics. Stagoll et al. (2012), for example, analyzed the role of large native trees in affecting bird diversity in urban parks. Results confirmed that large trees are keystone elements that provide crucial habitat resources for wildlife; furthermore, as their size increases, their positive effect on bird diversity increases. In the same geographical area, Daniels and Kirkpatrick (2006) investigated the role of private garden characteristics in affecting abundance and richness of bird species. Results showed that domestic suburban gardens have an important role in the conservation of urban avifauna and that gardens that include exotic plants may be more conducive to biodiversity than exclusively native-friendly gardens. Finally, Luck, Smallbone and Sheffield (2013) argued that vegetation characteristics have a strong influence on the richness and diversity of urban birds, while socio-economic factors are less significant.

In the Canadian context, Melles et al. (2003) investigated the relationship between urban bird diversity and landscape complexity, conducting a multiscale analysis in Vancouver BC. Results suggested that species richness declines with increasing urbanization considering both local-level habitat features (such as large coniferous trees, berry-producing shrubs and freshwater streams) and landscape-level habitat features (such as forest cover and park area).

Recognizing the relevant role that private green spaces play in providing environmental benefits, many studies investigated the relationship between garden characteristics, human intervention and biodiversity. Loram et al. (2011), for example, argued that some features, such as presence of water, were associated with more species variety, considering amphibians, birds, and mammals. Furthermore, gardens where human intervention through garden management activities was stronger were reported to include more species richness than other semi-natural areas. This means that biodiversity can be positively affected by human intervention, which also depends on personal socio-economic characteristics and cultural background. This is particularly interesting in a highly multicultural context, characterized by socio-economic imbalance, such as Vancouver (Attili and Sandercock, 2008; Melles, 2005).

In this regard, Melles (2005) identified a positive association between socio-economic characteristics and avian diversity and abundance in Vancouver, registering that native birds increase in abundance as the socioeconomic status of the neighborhood improves, with wealthier neighborhoods reported to have the most. On the other hand, the poorest neighbourhoods, characterized by the highest population density and the highest proportion of people from aboriginal descent, were reported to have fewer bird species and mostly nonnative. This was associated with the fact that disadvantaged neighbourhoods have the fewest small parks and are the farthest away from large urban parks. In this regard, the author argues that bottom-up actions, such as tree planting, community gardens and park volunteering can have a profound influence at the local level and also contribute to large-scale spatial heterogeneity. However, she also noted that residents of impoverished areas tend to have lower involvement in this kind of community initiatives, therefore reinforcing their social and spatial segregation.

By contrast, individual interventions can have a profound effect on biodiversity. Kendal, Williams and Williams (2012), for example, investigated the significance of biophysical and social factors in determining species distribution of cultivated floras on an international scale, through literature review. Findings suggested that social factors are particularly significant, with settlements with a shared cultural background (measured using the proxy variable of a shared dominant language) having more similar floras than those that do not. Moreover, the authors argue that, with increasing globalization, cultivated floras are expected to change according to migrations, since people will continue to cultivate familiar plants as a mean to confirm their identity in new environments. As a consequence, biodiversity is expected to increase. So, individual actions, determined by personal preferences and happening at the local scale, can significantly affect global patterns.

In summary, both public (Konijnendijk et al., 2013; Stagoll et al., 2012) and private (Daniels and Kirkpatrick, 2006) green spaces contribute to biodiversity in urban contexts; moreover, human intervention has been reported to be highly influential in affecting biodiversity (Kendal, Williams and Williams, 2012; Loram et al., 2011; Melles, 2005). Therefore, the adoption of strategies for improving biodiversity by any level of government is considered crucial (see Paragraph 2.2.2.3, *Policy and environmental strategies* for further details).

2.2.2.2. Regulatory function

The second sub-category of Environmental Benefits evaluates the role of green spaces in providing regulating services.

Research about 'ecosystem services' identifies three components:

- The natural ecosystem
- The services it provides
- The benefits that people get from these services.

This anthropocentric approach does not include principles such as the value of nature in itself or the right of species to exist (Brown and Mooney, 2013). According to the 'ecosystem services' literature, services can be classified as following:

- Provisioning services (usable goods and services, such as water and lumber);
- Regulating services (processes that regulate aspects of nature, such as water filtration or carbon sequestration)
- Cultural services (recreation and spiritual benefits)
- Supporting services (bases for other services).

An ecosystem is "a natural unit consisting of all plants, animals and microorganisms (biotic factors) in a given area, interacting with all the nonliving physical and chemical (abiotic) factors of this environment" (Levin 2009 p. 779, cited in Brown and Mooney, 2013). This research thesis uses the term 'regulating services' or 'regulatory function' to indicate all the processes that can regulate the abiotic factors of the ecosystem in order to preserve and enhance its biotic factors. The other ecosystem services will not be considered in this analysis, because

they have been variously included in the evaluation of the social benefits of green spaces, as benefits to humans.

Recent studies have investigated how the ecosystem services approach can be applied to landscape design, planning and management. Mooney (2014), for example, argued that landscapes that maximize production of ecosystem services provide the highest levels of sustainability. So, the range and magnitude of ecosystem services delivered by a landscape can be adopted as a measure of its overall health and value, or 'landscape performance'. To this end, he proposes an evaluation matrix that includes a series of regulating services, classified according to five main categories:

- Climate and atmosphere
- Pollination
- Hazard regulation
- Water
- Soil.

The evaluation matrix was tested on three case studies and the analysis included references to the literature and possible quantification of the benefits provided, such as pollution removal, oxygen production, carbon sequestration, etc.

A similar analysis was developed by De Groot et al. (2010), who proposed an alternative classification, arguing that each regulatory function can be analyzed considering which ecological process or component provides the service (or influence its availability). Possible calculations of the benefits were also included in the study, such as leaf area index, carbon sequestration, water storage capacity, water retention capacity, denitrification, etc.

Whilst the 'ecosystem services approach' proposes some quantitative measures of regulating services, other studies analyzed such benefits from different perspectives.

Konijnendijk et al. (2013), for example, discussed the strength of the evidence of several

regulatory functions of urban parks (such as air quality, water management and cooling effect), identifying various levels of evidence. In relation to pollutants reduction, the study concluded that there is extensive literature linking the presence of urban trees with improved air quality, especially in comparison with other woody and non-woody vegetation. However, the evidence that urban parks in particular can improve air quality by capturing pollutants and particles was considered 'moderate to weak'. Similarly, the study highlighted that parks have potentially a very important role in reducing water runoff, since they are characterized by higher water infiltration rates than other urban land uses, with more impervious surfaces. However, the analyzed studies provided a 'weak evidence' of the effective contribution of urban parks in stormwater runoff management. Finally, the study considered the cooling effect that urban parks (especially trees) provide through evotranspiration and shading and concluded that the evidence is 'moderate to strong' at the local scale, while it becomes 'weak' beyond the parks' boundaries.

Other studies investigated the effect of specific environmental benefits of green spaces on health and wellbeing. Bedimo-Rung, Mowen and Cohen (2005), for example, identified two regulating functions of green spaces, air pollution reduction and cooling effect, and evaluated their positive effects on human health. The WHO report (2016) also identified a series of environmental benefits (anthropogenic noise buffering, reduced exposure to air pollution, reduction of the urban heat island effect and optimized exposure to sunlight) and analyzed their role as 'pathways to health'. The same anthropocentric perspective is evident in a study by Hartig et al. (2014), who, however, evaluated both positive and negative impacts of air quality on health, affirming that air quality is affected by several interacting processes, such as hydrocarbon emissions, pollen production or pollutant uptake. Therefore, they argue that selection of species, wind, shade and other local environmental characteristics should be considered in order to enhance health benefits and reduce harm.

In synthesis, the role of green spaces in providing regulating services is generally recognized (De Groot et al., 2010; Konijnendijk et al., 2013; Mooney, 2014). However, the strength of

the evidence varies depending on the type of regulatory function (Konijnendijk et al., 2013).

2.2.2.3. Policy and environmental strategies

In this third and final sub-category of Environmental Benefits, the important role of human intervention in enhancing urban nature will be analyzed. Different policies and environmental strategies will be briefly examined and examples from the city of Vancouver will be described.

Traditionally, biodiversity conservation focused on pristine and wild areas, following the principles of conservation biology; according to this perspective, urban areas are considered to be a threat to biodiversity because they destroy, fragment and degrade natural ecosystems (Brown and Mooney, 2013; Dearborn and Kark, 2010). More recently, however, attention has been moved to urban nature, applying biodiversity concepts to the study of urban ecosystems (Dearborn and Kark, 2010). In fact, cities are characterized by various types of green spaces, both public and private, which provide direct and indirect environmental benefits to urban residents (Bolund and Hunhammar, 1999). However, the distribution of these benefits is not equitable (Chakraborty and Landry, 2009; Tooke, Coops and Klinkenber, 2010; CABE, 2010b). For this reason, conservation and promotion of urban biodiversity is considered a responsibility of governments at any level (Chakraborty and Landry, 2009).

In this regard, Dearborn and Kark (2010), affirm that "[i]t is difficult to define and assign value to biodiversity in an urban context" (p. 433), because the "traditional conservation objective of maintaining or even increasing native species diversity is unrealistic in many urban landscapes." (p. 437) In their analysis, they compare the traditional approach of 'conservation biology' as postulated by Soulé in the 1980s (diversity of organisms is good; ecological complexity is good; evolution is good; and biotic diversity has intrinsic value) with the more recent 'reconciliation ecology' elaborated by Rosenzweig, according to which, "the goal is not necessarily to produce a semblance of previously existing habitats, but rather to modify the places dedicated to human activities so as to provide for the needs of a wider variety of native species" (Miller, 2005, p. 433). In their view, the 'reconciliation ecology'

approach shows the necessary "balance between ideals and pragmatism" that urban areas require, providing new solutions for "civilization and wildlife to coexist" (Dearborn and Kark, p. 437). On the contrary, they define 'radical-enthusiasts' (p. 436) the supporters of Rewilding Theories.

The City of Vancouver chose instead a quite radical position, launching in 2014 an Environmental Education and Stewardship Action Plan - Rewilding Vancouver from Sustaining to Flourishing (City of Vancouver, 2014a) with the stated objective of reintroducing special wild areas into public spaces, so that experience with nature becomes part of an everyday life for the residents and people and nature can flourish together. In this sense, "rewilding" means allowing nature to find its own way, so that "[t]he ecosystems that result are best described not as wilderness, but as self-willed: governed not by human management but by their own processes." (p. 7). More recently, the City also adopted a city-wide Biodiversity Strategy (City of Vancouver, 2016a), which includes general guidelines in accordance with the previous Urban Forest Strategy (City of Vancouver, 2014b) and Bird Strategy (City of Vancouver, 2015a) in order to protect and restore natural areas, species, and ecological processes, and improve access to nature in all the city neighbourhoods. In detail, the plan aims at restoring priority habitats such as forests, wetlands and shorelines and at increasing the amount and ecological quality of natural areas in parks and other public and private lands, creating a city-wide ecological network.

Vancouver has played a leading role in environmental strategies since 2011, when the City Council approved The Greenest city 2020 Action Plan (GCAP), a series of 15 environmental targets that the city defined with the objective of becoming the greenest city in the world by 2020 (City of Vancouver, 2010). In the following years, progresses and challenges were described in yearly Implementation Updates, while a GCAP Part 2 was released in 2015 (City of Vancouver, 2015b). For the scope of this research thesis, the Goal 5: Access to nature will be shortly analyzed. The initial plan included two targets:

- Target 1: all Vancouver residents will live within a five-minute walk of a park, greenway

or other green space;

Target 2: plant 150,000 new trees.

A new target was included later (City of Vancouver, 2015b, p.33):

- Target 3: increase canopy cover to 22% (by 2050).

In relation to the Target 1, it should be noted that the definition of a walking-distance target is a common strategy adopted by local, national and international governments in order to regulate the provision of public green spaces (Barbosa, 2007; Boone et al., 2009). In Vancouver, the latest update (City of Vancouver, 2016b) showed a slight improvement in the 5-minute walk target, corresponding to +0.1% from the baseline (from 92.6% in 2010 to 92.7% in 2014), still far short of the planned 100%. In the same report (City of Vancouver, 2016b), the City identified some limitations in the target itself, noting that "the five-minute walk target currently measures how much land is in proximity to green space, not how many people or the quality of the green space. As such, it does account for population density, constraints to access, or green space located on private land" (p. 26). Moreover, critics argue that physical proximity to urban parks alone does not explain the actual use (Giles-Corti et al., 2005; Kaczynski, Potwarka and Saelens, 2008; Kessel et al., 2009; Sugiyama et al., 2010) and that this kind of targets do not describe how access to public green space varies across society, and whether those who enjoy the greatest access include those who are most in need (Barbosa et al., 2007). So, research suggests that environmental strategies should focus more on the quality of green spaces than on its quantity or proximity to home (Francis et al., 2012b; Groenewegen et al., 2012; Sugiyama and Ward Thompson, 2007). These implications will be analyzed further in Chapter 3, Provision, Access and Use of Green Spaces.

In regard to Target 2, the latest implementation update (City of Vancouver, 2016b) reported that 48,900 new trees were planted on streets, parks and private lands since 2010. Native trees, in particular, were planted on urban parks, with the long-term objective of increasing the forest canopy, while at the same time enhancing habitat for birds, native mammals and

other species. To this end, the Target 3 (increasing canopy cover to 22% by 2050) was added in the GCAP Part 2 (City of Vancouver, 2015b).

In fact, the important role of canopy cover in enhancing environmental benefits has been supported by the literature. Whitford, Ennos and Handley (2001), for example, analyzed four areas of contrasting affluence in Merseyside UK and concluded that the percentage of green space (particularly trees) has the greatest influence on ecological performance. In fact, affluent areas were found to have lower temperatures, less run-off, more stored carbon and higher diversity, probably due to the higher presence of open area and woodland cover. However, it should be noted that, even if they provide public benefits, trees are often located on private properties. In this regard, Fraser and Kenney (2000) effectively stated that "[t]he benefits of the urban forest are benefits that the entire neighborhood enjoys. Air quality, microclimate amelioration, stormwater attenuation, property value, and aesthetics go far beyond the individual home owner and accrue to the community as a whole. However, the bulk of the trees in North American cities grow on private property" (pp.110-111). This confirms that the GCAP target, which includes tree planting on private lands, is appropriate and supported by the literature.

Nonetheless, interventions on public green areas are essential. Studies, for example, have examined the 'park cool island' (PCI) effect, that is the reduction in urban air temperatures that urban parks provide within and beyond their boundaries. In this regard, Spronken-Smith and Oke (1998) compared Vancouver, BC to Sacramento, CA and reported that in Vancouver urban parks are typically 1-2°C cooler than the surrounding urban areas, with a maximum of 5°C cooler in ideal conditions. Furthermore, parks with large canopies were found to reach their cooling peak earlier in the day, if compared with savannah type or open grass parks, thanks to the combination of shade and evaporative cooling effect that trees provide. Similar results were confirmed by Bowler et al. (2010), who developed a review of the evidence of the cooling effect of 'urban greening'. Findings, in fact, suggested that larger parks and those with trees are associated with lower temperatures, at least at the local scale. The

study, however, concluded that the strength of the evidence does not allow specific design recommendations.

In summary, this section provided an overview of various instruments that local governments can adopt in order to improve environmental benefits of green spaces in urban contexts. Examples from Vancouver were provided, because it is the city where the two case studies analyzed in Chapter 8, *Case Studies* are located.

2.2.3. Notes on the proposed classification

The proposed classification investigates the wide range of benefits that green spaces provide, as emerged from the literature review.

However, provision and perception of benefits are affected by a variety of external factors. Previous research, for example, argued that cultural and ethnic background can considerably affect perception of nature (Fraser and Kenney, 2000; Kendal, Williams and Williams (2012; Priego, Breuste and Rojas, 2008). Consequently, the benefits provided by green spaces have different value for different communities. In consideration of the multicultural mix that characterizes the city of Vancouver, these implications are worth analysis and have been described in Chapter 3, *Provision, Access and Use of Green Spaces*.

Moreover, whilst recognizing the important contribution that all the identified benefits provide, the scope of this research thesis requires to focus on selected indicators. As such, the following analysis (as described in PART 2) concentrates on the role of urban parks and on the specific characteristics that affect their use and perceived value.

3. PROVISION, ACCESS AND USE OF GREEN SPACES

The amount and type of data regarding the use of urban parks varies considerably. Review of the evidence suggests that a low proportion of the population actually visits public parks, reporting that visitation rates are influenced by factors such as park characteristics, age, gender, cultural background, preferences, and socio-economic advantage or disadvantage (McCormack et al., 2010; Shanahan et al., 2014). Research from the UK and Canada, by contrast, reported that almost nine out of 10 people use and value urban parks and green spaces (CABE, 2010b; TOcore, 2016). Either way, people derive benefits not only from actual visits of urban parks, but also from other experiences of nature, including everyday physical and visual contact with various types of public and private green spaces that constitute the so-called 'nearby nature' (Shanahan et al., 2014; Matsuoka and Kaplan, 2008). Different neighbourhoods are characterized by different provision of green spaces, which varies for quality, quantity and physical proximity and some communities have greater access to nature than others and receive more benefits from their daily interaction with it. In particular, inequities have been registered in relation to neighbourhood affluence and ethnic background.

3.1. The role of physical proximity in the perception and use of green spaces

Different targets have been defined in order to stipulate the provision of public green spaces in urban areas. Barbosa et al. (2007) report that in Europe, the European Environment Agency (EEA) recommends a maximum of 15 minute walking distance (corresponding to 900 m) between every household and the nearest green space. More stringently, English Nature (EN), a UK government agency, recommends a maximum distance of 300 m (or 5 minute walking distance) from home. Considering the North American context, Boone et al. (2009) affirm that a 400 m (equated to a 5 minute walk) can be considered the standard distance threshold that people are willing to walk to reach a park or recreation area. They further report that the National Recreation and Parks Association (NRPA), the Trust for Public Land, and the Congress for New Urbanism advocate for parks within a quarter mile (400 m) of all urban residents. The same target was set in Vancouver, as part of the Vancouver Greenest City Action Plan (City of Vancouver, 2010).

These targets, however, only define the level of access to green space that the average person should enjoy. They are targets and do not describe how access to public green space varies across society, and whether those who enjoy the greatest access include those who are most in need (Barbosa et al., 2007). Furthermore, even if it is usually accepted that walking distance is a precondition for visiting urban green spaces (Ward Thompson et al., 2004), several studies have demonstrated that physical proximity alone does not govern or explain the actual use (Giles-Corti et al., 2005; Kaczynski, Potwarka and Saelens, 2008; Kessel et al., 2009; Sugiyama et al., 2010).

Barbosa et al. (2007) analyzed the provision of public and private green spaces in Sheffield UK and reported that public green spaces are generally underprovided in that city. In fact, only 36.5% of households were found to meet the 5 minute target distance from the nearest green space, and the value lowered to 18% if only considering distance to municipal parks. Public and private spaces were found to have an opposing pattern of occurrence across the city, with neighbourhoods with more private green spaces having less public green spaces. This usually occurred in more affluent neighbourhoods, where the increase in availability of private green spaces and lower amount of public green spaces created an overall reduction of vegetation cover. In conclusion, their findings supported the fact that more deprived groups and older people enjoyed the greatest access to green spaces. However, the research only evaluated access to green spaces and not actual use.

In this regard, Kessel et al. (2009) analyzed the relationship between physical proximity and access to green spaces, studying the patterns of use of a community forest located in east London and south-west Essex (UK). The underlying premise of the study was that shorter distances would be associated with greater use of the community forest for recreation, consequently providing more health benefits to the surrounding communities. Their findings from a quantitative research supported the results of Barbosa et al. (2007), showing that

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people from deprived areas and in poorer health had better access to public green space than people from more affluent areas. These results were then analyzed further, developing an ethnographic research in order to understand how actual use of public green space was affected by different perceptions of access. Results demonstrated that access and use of green spaces are determined by more than physical proximity, being 'access' "a complex issue that related not just to the physical (and measurable) elements of access, such as distance to green space or availability of public transport, but more significantly to less tangible and more symbolic meanings" (Kessel et al., 2009, p.36). In fact, the experience of green spaces is affected by different factors, such as their attractiveness and appropriateness, personal perceptions of safety, maintenance and characteristics of the paths used to reach the green areas themselves (presence of busy roads, fences or other obstacles) and many other psychologic and symbolic barriers. Results from the ethnographic research confirmed these assumptions. One of the project's evaluation criteria, 'Seeing yourself in the picture', for example, was found to be a precondition of access: perceptions of exclusion (in relation to their own ethnicity, the proposed activities, the assumed right equipment and so on) made prospective users feel inadequate and acted as deterrent in participating.

Gobster (2002) and Tinsley, Tinsley and Croskeys (2002) explained the meaning of 'proximity' and 'accessibility' further, studying the patterns of use of Lincoln Park in Chicago by older adults and minorities. In particular, they investigated the relationship between distance from home and frequency and type of use (for physical activity or passive recreation) and concluded that it is unlikely that the total travel time *per se* can be a significant barrier to park use. Nonetheless, they noted that the need to drive could create a sort of psychological barrier to the visit of the park, compared to the perception that the park is within walking distance. Different perceptions of distance would then affect frequency and type of use. This assumption would explain why Caucasian park users, who typically lived closer to the park, were more likely to walk to the park and visit it frequently, but for shorter times. By contrast. other users, who typically lived farther away, were more likely to drive to the park and visit it less frequently, but for longer times.

Giles-Corti et al. (2005) examined the extent to which access to urban parks is associated with actual use in the area of metropolitan Perth, Western Australia. In particular, the aim of the study was to understand the role of proximity, attractiveness, and size of urban parks in influencing visitors' frequency of use and type of usage, with the objective of improving walking rates and achieving recommended levels of physical activity. An interesting contribution of the study is the clarification of the relationship between 'access' and 'distance' of green spaces. The research accepts the definition of accessibility as "a measure of the spatial distribution of facilities adjusted for the desire and the ability of people to overcome distance or travel time to access a facility or activity" (p. 171). As such, the impact of distance depends on several factors, such as attractiveness of the green space (size, location, features, maintenance, etc.) and users' behaviour (willingness or capabilities of walking, access to transport, etc.). Results confirmed that proximate parks generally encourage use. The size of parks, however, proved to be an important factor with larger parks tending to have more attributes (and therefore to be more attractive), providing more satisfying experiences, including promoting walking.

More recently, Sugiyama et al. (2010) developed a similar analysis in the same area (Perth, Australia), focusing on neighbourhood urban parks and investigating the associations between attractiveness, size and proximity of urban parks with walking for health benefits. The research considered three types of urban parks that adults may typically visit for recreation (the most attractive, the largest, and the nearest) and concluded that attractiveness is the most important factor. In fact, the presence of an attractive (large, high-quality) park within walking distance from home was more conducive to recreational walking than was the presence of any open space within a shorter distance. This study provides important insights for the research in this thesis, because it stresses the importance of considering the impact of overall green spaces (including perceived greenness) on residents' behaviour. In particular, it underlines the fact that focusing only a particular neighbourhood urban park (typically, the park closest to a person's place of residence) may be inadequate, because neighborhoods typically have many open spaces, each one with its own specific attributes (such as attractiveness, size, and proximity), and all these factors variously contribute in affecting residents' behaviour.

Similar studies that confirm the above results, were also undertaken in Canada. Kaczynski, Potwarka and Saelens (2008), for example, studied four neighborhoods in a medium-sized city in Ontario, examining the relative importance of park size, distance, and features in predicting the use of a specific park for physical activity. Results showed that physical activity was associated with the number of facilities that parks included, especially the presence of paved trails, unpaved trails, wooded areas and other features associated, while distance from home was not determinant regardless of neighbourhood characteristics.

In conclusion, proximity is commonly considered an important precondition for access to green spaces and municipalities often define walking distance targets in order to regulate the provision of public green spaces. However, several studies in Australia (Giles-Corti et al., 2005; Sugiyama et al., 2010), in the UK (Barbosa et al., 2007; Kessel et al., 2009), in Canada (Kaczynski, Potwarka and Saelens, 2008) and in the US (Gobster, 2002; Tinsley, Tinsley and Croskeys, 2002) described a much more complex relationship, where park characteristics (especially attractiveness) and individual perceptions variously contribute in explaining the actual use.

3.2. The role of quality and quantity in the perception and use of green spaces

As clearly expressed in the CABE report (2010b), "[t]he higher the quality of the green space, the more likely it is to be used. ... If an area has high quality parks, it is likely that more residents will use them more often" (p. 41). The study was commissioned in order to evaluate the state of England's urban green space and its impact on people's health and wellbeing and provided a complete picture of the situation. However, results showed that since perception of quality varies, the relationship between quality, quantity and use of green spaces is not straightforward. For example, in high density areas, where people have less access to private green space, public green spaces are valued more and used more. On the other hand, the quantity of green space resulted to be an important factor regardless of its quality, thanks to its positive effect on human and environmental health. As expected, suburban areas generally

registered a larger quantity of parks and green spaces than urban areas. Cities, however, showed a better provision of recreation grounds, sport pitches and playgrounds.

However, as reported by Francis et al. (2012b), research confirms that presence of green space alone does not explain its actual use. On the contrary, frequency of visits, time spent and type of activities depend on the quality of green spaces. So, referring to the classification of activities proposed by Gehl (1987), Francis et al. (2012a) argued that low quality spaces may be used for 'necessary' activities such as walking the dog, while high quality spaces may favour 'optional' uses, such as recreational activities or social encounters (see Chapter 6, *Use of Urban Parks* for further details on possible classifications of activities). The WHO report (2016) similarly argued that urban green spaces may have varying qualities that offer different opportunities of enjoyment, such as quiet relaxation, engagement with the natural environment, children's play, physical exercise and athletic activities or opportunities of getting away from unpleasant aspects of the urban environment, such as noise or heat.

Even if their important role in providing social and environmental benefits is generally recognized, different studies may use very different definitions of quantity and quality of green spaces. Sugiyama et al. (2010), for example, argue that quantitative measures such as the total size or density of green spaces in a certain area may be inadequate because they cannot distinguish open spaces that are attractive from those that are uninviting or inaccessible. For this reason, the CABE report (2010b) included two different measures of quantity, differentiating between total green spaces (ha) per population and area for sports/ leisure (ha) per population. Moreover, Ward Thompson et al. (n.d.) warn against the validity of measuring 'quality', affirming that it is "a very subjective judgment and we suspect the time of year, social context in which the different methodologies were conducted, and possibly other events influenced the pattern of outcomes." (p. 12). In this regard, the CABE report (2010b) used a variety of measures for quality, including important but subjective aspects such as user perceptions and ratings, and more objective measures such as biodiversity.

In relation to the measure of quality, Ward Thompson (2010) suggests to focus on specific

characteristics of the environment. In particular, in her opinion, researchers should identify what specific qualities of the environment make outdoor experiences meaningful for different individuals. In fact, environments that make chosen outdoor activities easy and enjoyable are expected to contribute to a better quality of life, but life circumstances and abilities vary widely. This is the case, for example, of disadvantaged people or the elderly. For these sensitive groups, use and perception of green spaces may be affected by specific qualities of the environment.

In this respect, Sugiyama and Ward Thompson (2007) evaluated the relationship between outdoor activity and older people's health, introducing the concept of 'supportiveness of neighbourhood environments' (SNE). According to the authors, the quality of neighbourhood environments can be defined as 'the degree of support neighbourhood outdoor environments provide for people to be physically active' (p. 170) and therefore contribute to older people's health. Their results confirmed the relationship between the quantity of outdoor activity and health, showing that people who live in a supportive environment (according to the definition above) are likely to walk more, and those who do so are likely to be in better health. Nonetheless, the quality of outdoor experiences showed an even wider contribution to overall health and wellbeing, providing opportunities for social interaction and contact with nature, which are considered important factors in improving quality of life, especially for the elderly.

Other studies associated the concept of 'quality' of green spaces with 'attractiveness' (Giles-Corti et al., 2005; Sugiyama et al., 2010; Kaczynski, Potwarka and Saelens, 2008). Kaczynski, Potwarka and Saelens (2008), in particular, identified several features (or qualities) of green spaces that are supposed to promote physical activity. These features were categorized as either 'facilities' (features of parks that are primary settings for physical activity, such as paved or unpaved trails, paths, open spaces, wooded areas, meadows, water areas, playgrounds, sports facilities) and 'amenities' (features of parks that might support opportunities for physical activity, such as drinking fountains, picnic areas, restrooms, tables and benches, shelters or pavilions, parking lots, etc.). Their results confirmed a positive relationship between quality and use of green spaces, registering in particular that the presence of paved trails, unpaved trails, and wooded areas was significantly associated with park-based physical activity.

Francis et al. (2012b) examined the relationship between attributes of green spaces and mental health. In particular, they investigated the association between quantity and quality of green spaces and mental health in residents of new housing developments in Western Australia. Quantitative measures included size of urban parks, distance from home and number of public spaces within the neighbourhood. Quality measures included 'subjective quality' (measured by asking participants the extent to which they agreed or disagreed with ten statements about their local urban park) and 'objective quality' computed as a weighted mean score of ten park attributes. The statements of the subjective measure of quality included: atmosphere, comfort, safety, attractiveness and maintenance, the variety of things to do, and the presence of adequate seating, public art and other people; the objective measure of quality included ten park attributes: walking paths, shade, water features, irrigated lawn, birdlife, lighting, sporting facilities, playgrounds, type of surrounding roads, and presence of nearby water. Results showed that urban parks which obtained high quality scores were associated with better mental health, irrespective of whether the park was used or not. On the contrary, quantity of neighbourhood park was not associated with better mental health, thereby suggesting that quality is more important than quantity in improving human wellbeing.

Groenewegen et al. (2012) developed a comprehensive analysis on the matter, as part of the so-called 'Vitamin G program' (where G stands for green), examining the relationship between presence of green space and health in the Netherlands. The research included three different indicators of health (stress reduction, physical activity and social cohesion) and was developed at three different scales: national, urban (neighbourhood) and local (community garden). The results confirmed that both quantity and quality of green space in residential areas were positively related to health. However, stress reduction and social cohesion were

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found to be the most important mechanisms, in that order, while no relation was found between the amount of green space and time spent on physical activity.

These conclusions are not consistent with results from Kaczynski, Potwarka and Saelens (2008) and Sugiyama and Ward Thompson (2007), who identified a positive relationship between green space and physical activity, confirming that there is mixed evidence on the matter. In this regard, however, Groenewegen et al. (2012) affirms that it "might be related to the intrinsic character of the motivation to exercise.... Moreover, some greenspaces invite passive forms of recreation rather than active forms. Thus, although intuitively plausible, the literature suggests that physical activity is not a strong candidate for explaining the relationship between greenspace and health". (p. 997)

Whilst accepting different definitions of quality, the previous examples all highlighted the relationship between quality of green spaces and certain uses (namely physical activity), focusing on the presence of specific supportive features. Fuller et al. (2007), instead, interestingly examined the relationship between quality of green spaces and human wellbeing from the perspective of biodiversity. In fact, their study investigated the relationship between perceived species richness and psychological benefits, identifying a strong association between perceived biodiversity and human wellbeing, especially in relation to plant richness. Their findings suggested that, depending on their quality, "greenspaces can vary dramatically in their contribution to human health and biodiversity provision" (p. 393), regardless the type of activities they support.

In conclusion, many studies (Francis et al., 2012; Groenewegen et al., 2012; Kaczynski, Potwarka and Saelens, 2008; Sugiyama and Ward Thompson, 2007; CABE, 2010b) confirm that 'quality' and 'quantity' are important attributes of green spaces which contribute in improving human health and wellbeing. However, quality seems to be more important than quantity in favouring social interaction and mental health (Francis et al., 2012b; Fuller et al., 2007; Groenewegen et al., 2012; Sugiyama and Ward Thompson, 2007). Furthermore, satisfaction with local parks has been associated with resident's satisfaction with their own

neighbourhood, providing "tangible evidence of the connection between quality of green space and quality of life" (CABE, 2010b, p. 19).

3.3. Inequities in the provision and use of green spaces: the role of affluence and ethnicity

Inequities in the provision of green spaces are usually explained through the so-called 'inequity hypothesis', according to which a lower proportion of green space can be expected in neighbourhoods that are characterized by a higher proportion of racial and ethnic minorities and socio-economically disadvantaged residents. The causal mechanisms of this relationship, however, have not been fully explained by the literature, as reported by Chakraborty and Landry (2009) and Tooke, Coops and Klinkenber (2010). Nonetheless, many studies investigated the existing differences in the provision and use of green spaces, with the objective of providing information to support policy measures and tackle inequities.

The CABE report (2010b), for example, described the state of green spaces in the UK, analyzing the benefits provided and the existing social inequities. In particular, results showed that the provision of public green spaces in deprived areas is far worse than in affluent areas. In fact, inner-city neighbourhoods, usually characterized by high-density housing, were reported to have only few good-quality public green spaces but many small, poor-quality green spaces. On the contrary, people living in the most affluent neighbourhoods were reported to have an above-average quantity of good parks nearby. This data is particularly significant because people who live in most deprived areas usually do not have access to private gardens, so they only gain benefits from the presence of high-quality public spaces. Similar differences were identified in relation to ethnic background, with people from minority ethnic groups having less green space and of a poorer quality. Affluence and ethnicity are in fact strictly related due to the so-called 'circularity of disadvantage', according to which minority ethnic groups are less likely to be in paid employment and more likely to be living in areas of deprivation than white residents. According to the CABE report (2010b), these differences in provision were then reflected on residents' general satisfaction with their neighbourhood.

In fact, considering affluence, satisfaction rates fell from around 80% in affluent places to around 50% in the most deprived places; similarly, considering ethnicity, rates fell from 70% in mostly white neighbourhoods to 50% in areas where minority residents were at least 40%. This is particularly significant, since neighbourhood satisfaction is strictly related to perceived quality of life.

Similar results were confirmed by various studies. Shanahan et al. (2014), for example, investigated how access to different kinds of nature experiences varies across society in Brisbane, Australia. In their analysis, they identified 'tree cover' as a measure of general greenness and 'native remnant vegetation cover' as a measure of access to higher quality natural areas. Results generally showed that people who live in socio-economically disadvantaged areas have reduced access to green spaces. However, the magnitude of this relationship varied markedly across the two different types of vegetation considered in the study. In fact, 'tree cover' resulted to be positively related to socio-economic advantage and mostly provided on private residential land. Conversely, most 'remnant vegetation cover' was located on public parkland and more equitably provided.

In the United States, Chakraborty and Landry (2009) focused on another type of public amenity – the spatial distribution of street trees – in the city of Tampa, Florida. Results confirmed the 'inequity hypothesis', showing that trees on public right-of-way were disproportionally distributed, primarily with respect to economic status (low-income residents) and, to a lesser extent, with respect to housing tenure (renters) and race and ethnicity (presence of African-American residents).

Similar results were also registered by Tooke, Coops and Klinkenber (2010), who analyzed differences in vegetation abundance in the three major Canadian cities (Montreal, Toronto and Vancouver). Their research, in fact, showed strong and consistent correlations between median family income (which is considered the best indicator of the economic situation in the census tract) and vegetation fraction for all the considered case studies. However, the estimates of vegetation used in the research derived from novel satellite imagery techniques

and considered an overall indicator of vegetation; therefore, it was not able to capture differences in provision of public and private green spaces.

As seen above, research generally confirms the 'inequity hypothesis', even if the relationship between disadvantaged neighbourhoods and provision of green spaces is not straightforward when considering more variables (such as differences between private and public spaces).

However, other studies provided different results. Barbosa et al. (2007), for example, analyzed the provision of green spaces for disadvantaged groups in Sheffield, UK. Their findings suggested that public parkland was in fact well provided for socially disadvantaged groups and older people; on the other hand, access to private green spaces was lacking for the same groups, in comparison with people living in more advantaged neighbourhoods. Jones and Coombes (2009), instead, undertook a research project in Bristol, UK that showed that residents of more deprived communities had better access to green spaces than residents of more affluent ones. However, they reported poorer perceived accessibility, poorer safety and less frequent use. According to the authors, "these results show how social factors appear to modify the relationship between what is provided and what is perceived as being available" (p. 504).

Results from Jones and Coombes (2009) confirm the findings included in the CABE report (2010a) when considering the relationship between perceived quality and actual use of green spaces. In fact, people living in deprived urban areas are reported to recognize and appreciate the value of local public green spaces, but they often underuse them because they are perceived as being unsafe and unattractive. As such, actual use of urban parks by ethnic minorities and disadvantaged people is not straightforward, but it is determined by a conjuncture of interacting factors which include provision and perception of neighbourhood green space, preferred features and activities and different images of nature, which in turn are affected by different cultural background.

In this regard, Boone et al. (2009) undertook an environmental justice research project

in Baltimore, Maryland that investigated the relationship between park provision and disadvantaged groups. The study is particularly significant in that provides new insights in understanding the meaning of 'equity' when considering the provision of green spaces. In fact, it differentiates between 'equal distribution' (calculated, for example, as equal numbers of acres per person) and 'equity' or fairness in distribution, which takes into consideration needs, choices and merits of different groups of people. According to this principle, or 'needs based assessment', it is possible to target a public good (such as urban parks) to those groups who are most likely to use it or need it. For example, it may be possible to identify people who are more likely to need access to green spaces within walking distance, due to limitations based on age, ability, or resources. The research adopted various methodologies but reported consistent results, concluding that poor, inner-city minority residents tend to have better access to parks, but white, wealthier suburban residents tend to have access to more park acreage per person.

In conclusion, results from many studies (Chakraborty and Landry, 2009; Tooke, Coops and Klinkenber, 2010; CABE, 2010b) confirm the 'inequity hypothesis' which associates better provision of green spaces with residents' affluence and ethnic majority. Others, however, obtained opposite results (Jones and Coombes, 2009) or identified a more nuanced relationship, when differences between private and public green spaces (Barbosa et al., 2007; Shanahan et al., 2014) or between access to parks and park acreage per person (Boone et al., 2009) were considered. Therefore, results are not conclusive. Nonetheless, regardless their provision, an association was identified between underuse of green spaces in disadvantaged neighbourhoods and their poorer perceived accessibility and safety (Jones and Coombes, 2009).

PART 2

USE AND PERCEIVED VALUE OF URBAN PARKS

4. ROLE OF URBAN PARKS

Social and environmental benefits of green spaces have been extensively examined in Chapter 2, *Benefits of Green Spaces*. Here, the most important findings in relation to urban parks will be summarized in order to provide a theoretical grounding for the following research. In particular, a social and environmental indicator will be identified, with the objective of investigating the social and environmental value of two selected urban parks in Vancouver. Moreover, various personal characteristics (such as age and cultural background) influencing use and perceived value of urban parks will be identified and their relevance for the present research thesis will be discussed.

4.1. History and current role of urban parks

As reported by Shultis and Hvenegaard (2016), the term 'urban park' was first used in Britain in the mid 1800s to describe large natural areas situated in urban environments. In the early 1900s, it began to refer also to smaller neighbourhood spaces and playgrounds. Today, the term is used to indicate many different green spaces, including athletic fields, neighbourhood parks, community parks, greenways, parkways, and urban forests. Whilst characterized by specific features and attributes, all these green spaces have something in common: they are publicly accessible, have identifiable boundaries, provide the community with pleasing natural environments and opportunities for outdoor recreation, and are created, developed and managed by municipal governments. In this research thesis, the term 'urban park' is used to refer to neighbourhood parks, if not explicitly stated otherwise.

Before the 1800s, several cities in Canada and in the US had something similar to public parks called 'commons'. Here, public recreation was allowed even if other functions such as pasturage and military use were the primary purpose. Central Park in New York City, however, is generally considered the first urban park in North America. Designed by Fredrick Law Olmsted and completed in 1873, it was directly inspired by the British example and became the blueprint for all the other urban parks in Canada and in the US.

As reported by Shultis and Hvenegaard (2016) and variously analyzed in many other studies (Banerjee, 2001; Marshall and Corkery, 2011; Ward Thompson, 1998; Ward Thompson, 2011), large urban parks in the US and in Canada served a variety of functions since their origin:

- Acted as 'lungs of the city', providing physiological health benefits to city residents;
- Provided psychological comfort from the crowded and unsanitary urban conditions; _
- Acted a 'safety valve' for the tensions between the classes in the industrial age;
- Offered opportunities for social cohesion;
- Were designed for specific recreation activities which were thought to improve health and increase workers' productivity.

As such, historically, urban parks are thought to provide four principal benefits (Shultis and Hvenegaard, 2016):

- Public health
- Economic prosperity
- Democratic equality
- Social coherence.

These virtues of urban parks are still recognized today, although they are interpreted according to new perspectives (Shultis and Hvenegaard, 2016; Ward Thompson, 1998; Ward Thompson, 2011). Some of the original principles show in fact a clear actuality. In relation to public health, for example, Fredrick Law Olmsted was a precursor in associating mental restoration with contact with nature, as verified more than a century later through empirical studies (Kaplan and Kaplan, 1989). In his proposal for Fairmount Park in Philadelphia, for example, he claims that parks

"provide for counteracting the special evils that result from the confinement of life in cities" and help to turn visitor's thoughts "away from the mental contemplation of objects associated with conditions which have produced previous strain or mental fatigue" and that such urban parks supply a "change of scene and suggestion to the 55
mind as shall as much as possible reverse that which is commonly established by the ordinary things of town." (Olmsted, 1871, Draft Report on Fairmont Park, in Schuyler 1986 p. 107)

Banerjee (2001) suggests that urban parks faced a crisis in the 1970s when budget cuts resulted in low maintenance and safety issues, making them vulnerable to abuses and less attractive to people, especially families. In the following years, the lack of use of parks in the inner cities and changing social and consumption habits led to the creation of privately owned spaces (such as shopping malls) that challenged the role of public parks as a public good. Nonetheless, since the 1990s, urban parks, mostly based on a public/private ownership, have regained importance, attracting families and individuals with specific recreation and leisure activities. A growing attention for sustainability issues developed since then, with particular focus on the relationship between environmental and human health (Marshall and Corkery, 2011, np).

Recent research and planning in relation to urban parks, as reported by Shultis and Hvenegaard (2016) and Marshall and Corkery (2011), shows two main directions:

- Building on the principles of urban ecology, urban parks are considered as a synthesis of physical, socio-economic and biotic systems working at multiple scales;
- Building on a new interest in the relationship between green spaces and public health, urban parks are considered as ideal spaces for more active lifestyles and physical and psychological restoration.

The first approach resonates the theoretical principles of regenerative development and design, which aims at considering social, economic and environmental benefits of green spaces from a whole system approach perspective. To this end, interventions in design and management of green spaces are intended to benefit and enhance both environmental and human health.

4.2. Benefits of urban parks

As defined in Chapter 2, *Benefits of Green Spaces*, the benefits of urban parks can be classified as following:

- Social Benefits:
 - Social Relations
 - Health and Wellbeing
 - Economic Benefits
- Environmental benefits:
 - Biodiversity
 - Regulatory function
 - Policy and environmental strategies.

Previous research (Bedimo-Rung, Mowen and Cohen, 2005; Konijnendijk et al., 2013; Kuo, 2010) conducted a review of the evidence of the benefits of urban parks. These studies typically did not adopt a whole system approach in evaluating the interrelationships between social and environmental benefits; however, many relevant contributions for the scope of this research thesis were identified.

Konijnendijk et al. (2013) for example, provided an extensive overview of social and environmental benefits of urban parks and discussed the strength of the evidence for each category of benefits. Both benefits to humans (direct and indirect health effects, social cohesion, tourism, house prices) and benefits to nature (air quality and carbon sequestration, water management, cooling) were analyzed. The research concluded that there is scientific evidence for a range of benefits, especially for what concerns human and social wellbeing, either directly (for example by making people more physically active) or indirectly (enhancing opportunities for nature experience and recreation). In particular, evidence was defined 'from moderate to strong' for the positive impacts of parks on biodiversity, property prices, physical activity, reduced obesity and local cooling, while in the other cases the evidence was described as 'from moderate to weak'. In particular, the relationship between parks and social cohesion, which is particularly interesting for the scope of this research, was defined 'weak', due to the limited number of studies as well as their quality.

The study conducted by Kuo (2010) showed a less broad scope, focusing exclusively on benefits that urban parks provide to humans (social functioning, psychological functioning and physical functioning). However, an interesting contribution of the research was the concept that nature must be experienced to yield benefits (see Paragraph 4.2.2.2, *Role of Exposure* for further details).

A different approach was suggested by Bedimo-Rung, Mowen and Cohen (2005), who proposed a conceptual model to evaluate the relationships between park benefits and park use. This framework includes three categories:

- Outcomes (Benefits of parks and park usage):
 - Physical health benefits
 - Psychological health benefits
 - Social benefits
 - Economic benefits
 - Environmental benefits
- Behaviour (Park use):
 - Physical activity within park
 - Park visitation
- Antecedents (Correlates of park use/non use):
 - User characteristics (inter-personal, intra-personal)

Park characteristics (structural).

This framework has been particularly useful for the definition of the research design for this thesis. However, the objective of the study by Bedimo-Rung, Mowen and Cohen (2005) was the understanding of the various components that affect the relationship between urban parks and physical activity, and consequently public health. As such, it is primarily an anthropocentric perspective, where urban parks are considered for their potential benefits to human health. This research thesis, instead, aims at considering benefits of urban parks to humans and to nature as a whole, supporting the idea that humans and nature are in a 'partnered relationship' (Cole, 2012; Mang and Reed, 2012a). As such, they are a constituent and interactive part of the same living system and their overall health depends on their positive coevolution.

Some studies supported this perspective and showed a more integrated approach. Boone et al. (2009), for example, explicitly identified the relationship between human and environmental benefits of urban parks affirming that:

"Depending on their configuration, parks can provide important habitats for flora and fauna, spaces for nutrient cycling, stopover points for migrating species, and other ecosystem functions. The ecosystem function of parks can also return environmental benefits to humans in the form of cooler temperatures, amelioration of pollutants, reduction in stormwater loads, and other services." (p. 784)

Other studies highlighted the importance of a theoretical framework in order to understand the complex interrelationships between social and environmental benefits. James et al. (2009), for example, reported that:

"The goals of urban green space provision are the outcome of the multiple, dynamic and complex interplay between social, economic and environmental factors. These are primarily focussed on improvements in the quality of life in urban areas and in the quality of urban green space." (p. 72)

Mooney (2014), instead, argued that:

"Human induced changes in landscape structure affect resilience of natural system functions, processes, and outcomes in both positive and negative ways. They may lead to the enhancement or diminishment of a landscape's capacities for regeneration" (p. 146)

and that:

"Measuring the impacts and effects of these reciprocal relationships between human and natural systems in a changing landscape requires a systematic means of evaluating feedback between the systems. In other words, creating self-renewing, regenerative landscapes that enhance resilience of biophysical systems in the landscape and generate human well-being ... requires a means of measuring and evaluating performance of both human and natural systems ..." (p. 146).

4.2.1. Social benefits of urban parks

As anticipated, Konijnendijk et al. (2013) examined a wide range of social benefits of urban parks and discussed the strength of the evidence of each category. In synthesis, their findings can be summarized as following:

Social relations | Strength of the evidence: weak

A positive association was found between urban parks and social cohesion. In fact, by creating space for social interaction, parks are thought to enhance social cohesion; moreover, by facilitating contacts between persons of different social and ethnic background, they are also thought to promote social inclusion. However, the interactions that do occur in urban parks are usually cursory and informal and therefore the link with social cohesion should be investigated further.

Health and Wellbeing | Strength of the evidence: depending on the indicator

A positive association was identified between urban parks and direct and indirect health benefits. In particular a 'strong evidence' was defined for increased physical activity and a 'moderate to strong' evidence for reduced obesity. All the other indicators that were analyzed showed a positive relationship, but the evidence was weaker.

Economic benefits | Strength of the evidence: moderate to strong

A positive association was found between urban parks and the value of nearby properties (houses, apartments, land). However, some studies identified a negative relationship due to crime, noise and light pollution. A separate analysis evaluated the relationship between urban parks and tourism, but found a weak evidence, due to lack of scientific literature.

This analysis highlights that although the potential is widely recognized, according to Konijnendijk et al. (2013), the current evidence that urban parks can enhance social relations is weak. Furthermore, even if urban parks have embodied social meanings since their origins (Banerjee, 2001; Marshall and Corkery, 2011; Shultis and Hvenegaard, 2016; Ward Thompson, 1998; Ward Thompson, 2011) their role is even more crucial today.

In fact, increasing urbanization has progressively detached the majority of the world population from a daily contact with nature and from its multiple benefits, causing the so-called 'nature deficit disorder' – the increasing disconnection of people and especially children from nature (Louv, 2009). Moreover, urban sedentary lifestyles and unhealthy food habits have contributed to the proliferation of various diseases related to obesity, such as hypertension and diabetes, which constitute important public health issues. As discussed

in Chapter 2, *Benefits of Green Spaces*, a positive relationship between presence of urban parks and increased physical activity (and consequent health benefits) is generally recognized (Bedimo-Rung, Mowen and Cohen, 2005; Kaczynski and Henderson, 2007; Konijnendijk et al., 2013; Lee and Maheswaran, 2011). Nonetheless, urban parks also play other meaningful roles for urban residents, such as providing spaces for social gatherings, relaxation, contact with wildlife and restoration.

Understanding the various social benefits that urban parks provide is particularly complex in multicultural cities such as Vancouver (Attili and Sandercock, 2008), where people from different cultural backgrounds have very different images and experiences of nature and consequently use urban parks and perceive their benefits differently (Alves et al., 2008; Elmendorf et al., 2005b; Foster, Hillsdon and Thorogood, 2004; Fraser and Kenney, 2000; Kendal, Williams and Williams, 2012; Payne, Mowen and Orsega-Smith, 2002; Priego, Breuste and Rojas, 2008). In this sense, urban parks are important not only because they enhance human health and wellbeing, but also because they are the privileged spaces where social interactions – and ultimately social inclusion – can potentially occur (Peters, Elands and Buijs, 2010).

In consideration of the specific role that urban parks embody in the Canadian context, their contribution in favouring social relations will be analyzed further. To this scope, a 'social interaction indicator' has been selected (see below). Such indicator (as reported in Chapter 8, *Case Studies*) will be adopted to evaluate the frequency, type and perceived value of social interactions that typically occur in urban parks through the analysis of two case studies in Vancouver.

4.2.1.1. Social interaction indicator

Kim and Kaplan (2004) argue that "social interaction is defined as formal (e.g., active, planned) or informal (e.g., casual, unplanned) social opportunity in which two or more residents attend to the quality of their relationships" (p. 316). As such, social interaction consists of:

- Neighboring: interactions with residents living next door or in the same block;
- Casual social encounters: informal social contact between residents who do not know each other and are not neighbors;
- Community participation: interactions about community issues or engagement in community problems and related activities;
- Social support: friendship networks and the development of small groups that foster feelings of caring for each other.

Social interactions in urban parks, offering opportunities for repeated contact, are thought to promote new social ties or strengthen the existing ones (Kaźmierczak, 2013; Konijnendijk et al., 2013), enhancing neighbourhood vitality and social cohesion (Peters, Elands and Buijs, 2010; Sullivan, Kuo and DePooter, 2004).

The terms 'social cohesion' (De Vries et al., 2013; Hartig et al., 2014; Peters, Elands and Buijs, 2010; Sullivan, Kuo and DePooter, 2004) or 'sense of community' (Francis et al., 2012) have been used by the literature to indicate a series of shared norms and values, positive and friendly relationships, feelings of being accepted and belonging, commitment to be together that communities build with their surroundings.

In this section, a brief analysis of previous studies regarding the relationship between green spaces and social interaction will be developed, with the objective of exploring the most interesting results and evaluating the variety of research methodologies that were adopted. This analysis is intended to explore the characteristics of social interaction as an indicator of social value and to provide the basis for the research methodology that will be adopted in the following case studies (see Chapter 8, *Case Studies* for further details).

A series of studies conducted in Chicago were some of the first to explore the relationship between green spaces and social interaction. Coley, Kuo, and Sullivan (1997) investigated the characteristics of social interactions occurring among residents in a specific residential setting (inner city public housing). Results showed that the presence of natural elements enhanced informal social contacts among neighbours, favouring social interactions. Their research methodology consisted in 'observational walks-in', that means that observers recorded data while walking through the outside spaces; only persons or groups engaged in an activity were recorded (not people just passing through), and information about the presence, number and distance of trees were noted. Kweon, Sullivan and Wiley (1998), by contrast, used structured interviews to investigate the benefits of exposure to green space for older adults. Their findings suggested that higher contact with nature in outdoor spaces was associated with greater formation and maintenance of social ties. A later study (Sullivan, Kuo and DePooter, 2004) confirmed the association between tree and grass with increased face to face contacts and with increased number of individuals involved in the interactions. Observations followed a predefined route and data were recorded on a table sheet and a map. Activities were grouped in social/non social and every observed instance of social interaction, even when it occurred between the same individuals, was recorded. However, in accordance with Coley, Kuo, and Sullivan (1997) people just passing through were not counted.

Kaźmierczak (2013), instead, specifically analyzed social interactions in urban parks conducting a research in Greater Manchester, UK. The study adopted a combination of quantitative and qualitative social research methods. Firstly, a questionnaire including questions about the visits to local parks (frequency, duration, company) and the types of activities (necessary, optional or social) was posted to a random sample of people. Then, respondents were asked to participate in a focus group where they discussed how they used the park, how they related to other people there, and whether they established any new relations as a result of these visits. Results showed that duration and the reasons for the visits were more important in developing social ties than frequency of use.

Peters, Elands and Buijs (2010) also analyzed social interactions in urban parks, with a special focus on interactions between different ethnic groups. Their study consisted of a combination of quantitative (a survey) and qualitative (observations and interviews) research conducted in five urban parks in the Netherlands. The survey included information about 'meeting other

people' at the park, with reference to both passive forms of meeting other people (watching other people, hanging around) and active forms (communication with relatives and friends). During observations, both verbal and non-verbal behaviour was observed and three main indicators were investigated: what social groups were present; with whom and where people spent their time; if interactions happened, with whom. Results showed that most social interactions were cursory. Nonetheless, in contrast to native Dutch park users, some non-Western migrants affirmed that they were interested in having more social interactions in urban parks, even if they did not feel comfortable in taking the initiative themselves.

Whilst a positive association between presence of green space and social interaction is generally accepted (Francis et al., 2012a; Gobster, 1998; Kaźmierczak, 2013; Krellenberg, Peters, Elands and Buijs, 2010; Welz and Reyes-Päcke, 2014), other studies showed opposite results. Maas (2009b), for example, concluded that no significant relation was found between the percentage of green space and whether or not people often contacted neighbours or friends in the neighbourhood. This research was based on face to face interviews and did not account for casual interactions with strangers.

On the contrary, other studies argue that different typologies of social interactions can occur in public spaces. Gehl (1987), for example, affirmed that interactions can happen under different forms, to the point that simply seeing or hearing other people can be considered as a primitive form of interaction. In fact, the mere presence of others affects how public spaces are perceived and used. However, 'talking' is a more self-evident form of social interaction and for this reason it has been investigated further. In this regard, Gehl (1987) identified three different categories of outdoor conversations:

Talking with people one accompanies:

Conversations that take place while walking, standing or sitting, with no special requirements regarding place or situation;

Talking with acquaintances one meets:

Conversations that take place when friends and acquaintances meet: people stop to talk where they meet;

Talking with strangers (relatively rare):

Conversations that usually start between people who are doing the same thing – such as standing or sitting side by side – in regard to common activities and experiences or, on the contrary, about something unexpected happening.

Whilst rare, the last type of conversation is the most interesting for the scope of the research described in this thesis. In fact, casual interactions between strangers were accounted as an indicator of the social role of urban parks in providing opportunity for social interaction. In this regard, Peters, Elands and Buijs (2010) refer to the so-called 'triangulation', which is an external stimulus that can provide a necessary linkage between strangers to trigger interaction. For example, conversations can be initiated by the presence of an event or amenity that can draw strangers together. Interactions can also be created by people who enjoy making contact with others in public spaces, having casual conversations. In these cases, civil inattention – that is the recognition that strangers have of the presence of others in close proximity and the consequent respect of their own personal boundaries – can be breached and social interactions subsequently initiated.

Moreover, different activities in urban parks can variously provide opportunities for social interactions. Observations conducted by Jan Gehl in public spaces (Gehl, 1987; Gehl, 2010) showed that people generally engage in three types of activities:

 Necessary activities (to pass through on the way elsewhere, to take a short cut, to walk the dog);

- Optional activities (to relax, to get fresh air, to enjoy the surroundings, to walk, jog or run, to ride a bike);
- Social activities (to watch the world go by, to meet friends, to play sports or games, to spend time with children or family).

Various studies have examined how social and optional activities are more conducive to social interaction than necessary activities (Bedimo-Rung, Mowen, and Cohen, 2005; Francis et al., 2012; Kaźmierczak, 2013; McCormack et al., 2010;). Moreover, research has shown that people's use and perception of urban parks, and consequently their opportunity for social interaction, are affected by their cultural background (Gobster, 1998; Ho et al., 2005; Peters, Elands and Buijs, 2010; Tinsley, Tinsley and Croskeys, 2002). These interrelationships will be investigated further in Chapter 6, *Use of Urban Parks*.

Nonetheless, social interactions in urban parks do occur and, according to Peters, Elands and Buijs (2010), the frequent use of urban parks offers opportunities for repeated contact that evoke a sense of familiarity. In this regard, Kaźmierczak (2013) distinguishes between 'weak ties' (superficial acquaintanceships, i.e., people recognized and greeted in the neighbourhood) and 'strong ties' (friendships). The author argues that nowadays, due to increased mobility for work and use of social media as an alternative to face to face contact, "the extent, strength and importance of neighbourhood ties in everyday life seem to be declining". However, she also adds that "[f]or the elderly, those in poor health, or those with young children, who may have limited access to social networks, opportunities to socialise in the local area may be even more important" (p. 32).

Social interactions and place attachment, expressed by a sense of familiarity, are considered by Peters, Elands and Buijs (2010) as indicators of social cohesion. In fact, they argued that "two indicators for social cohesion are relevant, namely social interaction and place attachment. By using urban parks, visitors connect with the area and interact with other people who use the same area. Both dimensions potentially contribute to social cohesion" (p. 94).

4.2.1.2. Social value of urban parks for sensitive groups

As anticipated, urban parks represent a series of social values (Banerjee, 2001; Marshall and Corkery, 2011; Shultis and Hvenegaard, 2016; Ward Thompson, 1998; Ward Thompson, 2011).

In particular, Ward Thompson (1998) effectively described how their role changed throughout history, affirming that the first urban parks in the US were a physical representation of the 'melting pot' ideology, namely "a democratic place where democracy meant conformity and a means to create a unified nation" (p. 5). These principles were also reflected in the characteristics of park design. In fact, historical parks represented a certain idea of nature – the paradise as a tamed and productive place – that was characteristic of the European colonization of North America, which consisted in the replacement of native woods with trees that symbolized domesticity and comfort, such as the apple tree or the shade tree (p. 20). Nowadays, instead, parks are thought to represent the multicultural idea of the 'salad bowl', "where different cultures can each find individual expression" (p. 5) and therefore landscape characteristics should be an expression of different cultural preferences. As such, the author argues that urban parks "serve the same, central function in society's self-definition that they did over a century ago" (p. 21).

As such, urban parks are considered privileged spaces where people from diverse ethnic backgrounds can interact. Moreover, quality parks are thought to attract different age groups and people with different abilities. In this regard, some terminology clarifications should be made. As reported by Rishbeth (2001), an 'ethnic community' can be defined as a population with myths of common ancestry, shared historical memories, common culture, a link with a homeland and some sense of solidarity between its members (p. 352). When using the terms ethnic 'minority' or 'majority', numerical comparisons within a defined geographic area are made. However, so defined minority groups include key differences regarding national and religious backgrounds. Moreover, people who are born in a certain country but have parental roots elsewhere, or have parents of different background are also considered, so that various

range of immigration experience and assimilation are included.

Similar considerations were reported by Attili and Sandercock (2008) in their critique of the Canadian multiculturalism. According to their analysis, 'ethnicity', like race, is a cultural construct, with flexible definitions. As such, 'ethnic' is commonly used to refer to any group other than those whom the speaker considers 'normal' or 'dominant'. According to the authors, in the 20th century, multiculturalism in Canada became the celebration (but also the stereotyping) of ethno-cultural identities, representation of a static understanding of culture. This vision, however, is betrayed by the complexities of identity, and by the inevitable mutations and hybridities that occur over time as people are exposed to different ways of living and adapt to them (p. 21).

Research confirms that, even if the importance of urban parks as inclusive spaces for ethnic minorities is recognized, nature recreation is still a very 'white' activity (Buijs, Elands and Langers, 2009). Moreover, as presented above, the term 'ethnic minorities' includes a wide range of variables that depend on people's different cultural background and different levels of adaptation to the dominant culture. Therefore, understanding reasons for underrepresentation is complex. In fact, as reported by Bell and Ward Thompson (2008), there are many different social, physical and psychological barriers to participation. However, a group that is underrepresented may not feel excluded if it has full access but declines to participate.

A similar phenomenon is evident in relation to age groups, with older people generally underrepresented in urban parks (Cohen, 2016). Many studies have analyzed how perception of the natural and physical environment can affect older people's preference and use of urban parks (Alves et al., 2008; Sugiyama and Ward Thompson, 2008). Others have investigated the importance of social interactions for their general health and longevity (Kweon, Sullivan and Wiley, 1998; Sugiyama and Ward Thompson, 2007). However, results are mixed (CABE, 2010b; Marshall and Corkery, 2011), suggesting that different social and cultural backgrounds may also contribute in affecting participation.

In consideration of the various social benefits that urban parks provide for people from different cultural backgrounds and different age groups, specific analysis will be developed in the following Chapter 5, *Perceived Value of Urban Parks* and Chapter 6, *Use of Urban Parks*.

4.2.2. Environmental benefits of urban parks

Konijnendijk et al. (2013) examined and discussed the strength of the evidence in relation to the environmental benefits that urban parks provide. Their findings can be summarized as following:

Biodiversity | Strength of the evidence: strong

A positive association was found between urban parks and species richness. The international scope of their analysis, investigating flora and fauna groups in a wide geographical context, suggested that results can be generalized to other geographical and cultural contexts.

Regulatory function | Strength of the evidence: depending on the indicator

A positive association was found between urban trees and air quality, especially in comparison with other woody and non-woody vegetation. However, the evidence that urban parks in particular can improve air quality by capturing pollutants and particles was considered 'moderate to weak'. Similarly, a positive association was found between areas with high infiltration rates (in comparison with more impervious surfaces) and reduced water runoff. However, the current evidence in relation to urban parks was considered weak. Finally, a positive association was found between urban parks (especially trees) and cooling effect, thanks to their functions of evapotranspiration and shading. However, the evidence was considered 'moderate to strong' at the local scale and 'weak' beyond the parks' boundaries. Policy and environmental strategies

Various policies and environmental strategies adopted by the City of Vancouver (and yearly updates discussing progresses and challenges) were analyzed in Paragraph 2.2.2.3, *Policy and environmental strategies*.

This summary of previous research highlights that the relationship between urban parks and various environmental benefits has been supported by the review of the evidence (Konijnendijk et al., 2013). In particular, as examined in Chapter 2, *Benefits of Green Spaces,* biodiversity has been studied through the indicator of avian characteristics (Clergeau and Mennechez, 2000; Daniels and Kirkpatrick, 2006; Luck, Smallbone and Sheffield, 2013; Melles, 2005; Stagoll et al., 2012). Regulating services, instead, have been examined adopting specific quantitative measures, such as pollution removal, oxygen production, carbon sequestration, leaf area index, water storage capacity, water retention capacity, denitrification, etc. (De Groot et al., 2010; Mooney, 2014).

For the scope of this research thesis, the analysis of the environmental benefits of green spaces was developed adopting a qualitative methodology (see Chapter 7, *Research methodology* for further details). In particular, building on the environmental psychology literature (Kaplan and Kaplan, 1989; Kaplan, 1995; Kaplan, 2001; Matsuoka and Kaplan, 2008; Velarde, Fry and Tveit, 2007), environmental benefits of green spaces were evaluated as perceived by the surrounding communities. In fact, the abstract concept of nature can only be fully understood through direct experience of greenery (Crow, Brown and De Young, 2006).

Furthermore, according to the 'biophilia hypothesis', humans have a natural attraction, affinity and preference for natural landscapes (Alencar, 2013; Beatley, 2011; Browning et al., 2012; Browning, Ryan and Clancy, 2014) and especially for species richness (Dearborn and Kark, 2010, p. 436). Therefore, since people show a natural inclination for a biologically diverse urban environment, their perception of environmental benefits is expected to be greater in presence of more biodiverse landscapes. At the same time, since biodiversity is an

indicator of nature's health, it can be argued that preferred green spaces are those that are biologically diverse. As such, variety and richness of nature elements contribute to human and nature health, enhancing perceived nature benefits.

These assumptions are in line with regenerative principles that argue that humans and nature are in a 'partnered relationship', which means that – being part of the same living system – they can achieve mutual benefits through a positive coevolution.

In order to capture the perceived environmental value of urban parks, a 'perceived nature indicator' has been selected (see below). Such indicator will be tested through the analysis of two case studies in Vancouver (see Chapter 8, *Case Studies* for further details).

4.2.2.1. Perceived nature indicator

Many terms have been used by the literature to indicate the perception that people have of the surrounding natural environments. In this section, these studies will be briefly analyzed with the objective of identifying a theoretical reference for the analysis of the two Vancouver case studies. Furthermore, the relationship between perceived nature and perceived biodiversity will be explored, in order to investigate how perception of environmental benefits can vary.

Kaplan and Kaplan (1989) introduced the term 'nearby nature' to indicate various types of green spaces that people experience in their everyday life. Subsequent studies confirmed that various and repeated contact with nature can be associated with perceived restoration, sense of satisfaction and improved emotional, mental and physical health (Hartig, Mang and Evans, 1991; Matsuoka and Kaplan, 2008; Velarde, Fry and Tveit, 2007).

By contrast, Crow, Brown and De Young (2006) used the term 'green residential atmosphere' to define the composition and structure of the green environment in which people live. In this regard, they interestingly argued that the value of nature (or 'nature capital') cannot be perceived through its 'ethereal processes', such as biodiversity or regulating services, but only through direct experience of the green environment in which people live (p. 298).

Similarly, Sugiyama et al. (2008) used the term 'perceived neighbourhood greenness' in their evaluation of the associations between green spaces and perceived physical and mental health. Their indicator was based on five questions, measuring not only access to and presence of green spaces, but also aesthetic perceptions:

- Access to a park or nature reserve;
- Access to bicycle or walking paths;
- Presence of greenery;
- Presence of tree cover or canopy along footpaths;
- Presence of pleasant natural features.

Answers were evaluated according to a four-point scale format (from 'strongly disagree' to 'strongly agree') and results measured the perception that people had of the presence and quality of green features in their neighbourhoods. Results showed a particularly strong association between perceived neighbourhood greenness and mental health.

Fuller et al. (2007), instead, specifically investigated the relationship between biodiversity and human psychological benefits, conducting semi-structured interviews in selected green spaces in Sheffield, UK. Results showed that a positive association was found between species richness and visitors' reported wellbeing. Generally, the results showed that perceived biodiversity corresponded with sampled biodiversity but respondents' ability to perceive ambient species richness varied across taxonomic groups. In particular, more accuracy was registered in recognizing plants than bird and butterfly richness.

Nonetheless, the relationship between perceived nature and expected benefits of biodiversity is not straightforward. Dearborn and Kark (2010), for example, note that conservation goals can vary depending on what the expected benefits of biodiversity in urban contexts are:

- Benefits to humans or
- Benefits to nature.

Thus, for example, "increased richness in such areas may be valuable if the goal is to maximize human residents' exposure to different species, but may be less valuable if the goal is to maintain functional, sustainable parcels of the native landscape" (p. 433).

In fact, perception of biodiversity is complex. Buijs et al. (2008), for example, investigated how perception of biodiversity varies among the general public in different countries (the Netherlands, Germany and Scotland) and concluded that functions and benefits of biodiversity can be classified in five categories:

- 1. 'Biodiversity as the basis of human life', expressing the feeling that biodiversity is essential to human health and human survival;
- 'Biodiversity as providing and ensuring balance in nature', often emphasizing the importance of every animal and plant in the food chain, and the role of species in ensuring an equilibrium in natural systems;
- 'Aesthetic functions of biodiversity', appreciating habitat diversity within landscapes and species diversity within habitats as visually appealing (colours of leaves and flowers, presence of water, etc.);
- 'Biodiversity as creating a sense of place', describing how typical species can add to the authenticity of an area, inspire pride and provide orientation;
- 5. 'Economic values of biodiversity', emphasizing that many economic activities such as fisheries, forestry, farming and tourism depend directly or indirectly on biodiversity.

Moreover, according to the authors, the above functions and benefits of biodiversity are perceived in different ways, depending on the various ideas of nature that people have. For this reason, a set of attributes of nature were identified:

- 'Vitality', describing nature as being constituted by living beings;
- 'Autarky', considering nature as independent, untouched by humans, unpredictable or imposing;

- 'Diversity' as an attribute that makes nature more valuable for aesthetic reasons and is instrumental in ensuring balance;
- 'Balance', as equilibrium in natural systems (generally considered healthy and desirable);
- 'Robustness versus fragility' expressing opposite understandings of the character of nature;
- 'Stasis versus dynamics' opposing the idea of nature as static (in relation to an ideal or former state) to nature as a continuous flux.

Moreover, various meanings of 'diversity' emerged: for some respondents, for example, biodiversity contributes to ecological balance; others highlighted that a more diverse nature is more beautiful, attributing to biodiversity an aesthetic value; some respondents focused on a larger scale, considering the scenic value of habitat and structural diversity within a landscape, while others on species diversity.

So, different people hold different ideas of nature, some of them completely opposite. In addition to that, they may have contrasting ideas about the relationship between humans and nature, namely (1) humans as part of nature or (2) humans as separate or distinct from nature.

In this regard, it should be noted that most of the benefits of biodiversity that Buijs et al. (2008) identified (with the only exception of the second benefit, 'Biodiversity as providing and ensuring balance in nature') are an expression of an anthropocentric perspective. This confirms that not only does the dualism registered by Dearborn and Kark (2010) clearly exists, but also suggests that people generally expect that biodiversity in urban contexts provide benefits to humans more than to nature. These findings are noteworthy especially because the research considered different countries and therefore different social and cultural contexts, but identified a quite clear general trend.

Nonetheless, results from Fuller et al. (2007) confirmed that a relationship between perceived

biodiversity and sampled biodiversity exists. Furthermore, the authors argued that the quality of green spaces can considerably affect the contribution that urban parks provide to species richness and to human health, enhancing biodiversity, providing ecosystem services, creating opportunities for contact with nature and enhancing psychological wellbeing (p. 393).

As a consequence, while recognizing that numerous interacting factors affect perception of nature – and especially of biodiversity – in urban context, the Perceived Nature Indicator can be considered a valuable instrument in evaluating environmental benefits of urban parks.

In fact, in summary, the previous analysis has demonstrated that the 'ethereal processes' of nature can only be understood through direct experience of everyday nature, either called 'nearby nature' (Kaplan and Kaplan, 1989), 'green residential atmosphere' (Crow, Brown and De Young, 2006) or 'perceived neighbourhood greenness' (Sugiyama et al., 2008). Furthermore, research has suggested that people have a preference for biodiversity, in the form of species richness (Dearborn and Kark, 2010, p. 436). Since Fuller et al. (2007) concluded that perceived biodiversity is a good representation of effective biodiversity, it can be argued that preferred natural landscapes are likely to be the most biodiverse.

4.2.2.2. Role of exposure (intensity, frequency and duration)

As analyzed in the previous section, perception of nature depends on several interacting factors, including many personal characteristics, such as cultural background, different images of nature, age group and also the type of 'nearby nature' that characterizes the places where people live and work. All these elements contribute in defining how different groups of people perceive social and environmental benefits of urban parks. Nonetheless, perception of benefits is also influenced by external factors, such as the type of interactions that people engage with urban parks, and especially by the intensity, frequency and duration of exposure.

Ryan et al. (2014), for example, discussing the inherent complexity of quantifying human responses to biophilia, affirmed that perception of benefits may depend on "the frequency

and duration of the experience; ... the user's experience up to that point; and how the individual perceives and processes the experience" (p. 71). Specifically referring to urban parks, Kuo (2010), argued that nature must be experienced to yield benefits, thereby affirming that benefits are particularly significant if exposure to nature is extended, concentrated or immersive and the greener the environment, the greatest or more reliable the benefits.

The most interesting contribution in this regard, however, was provided by Shanahan et al. (2015), who investigated the existence of a 'nature dose', namely a minimum level of exposure to nature that people would require to receive benefits. Even if the study particularly investigated the relationship between nature and health responses, results can be extended to a wider typology of social and environmental benefits. The study identified three key components of exposure and relative measures:

- Intensity of nature exposure (how much):
 - Measure of the quantity and quality of nature elements;
- Frequency of nature exposure (how often):
 - Number of times a person is exposed to a nature element during a particular time frame;
 - Pattern of exposure (e.g., cyclic, random, or intermittent);
- Duration of nature exposure (how long):
 - Time during which a person is exposed to a nature element.

The authors confirmed that many other personal characteristics (such as culture, socioeconomic advantage and disadvantage, personal preferences and knowledge, demographic and health characteristics) influence the perception of nature benefits. However, they highlighted that the concept of 'nature dose' can be used to simplify complex information for the public or for informing green space policy and planning guidelines. By extension, the 'nature dose' concept proposed by Shanahan et al. (2015) – and the related measures of exposure – can also be considered a useful tool for the scope of this research, acting as a framework for the discussion of the results in the following case studies (see Chapter 8, *Case Studies* for further details).

5. PERCEIVED VALUE OF URBAN PARKS

The perception and consequent experience and engagement with urban green spaces are affected by numerous individual and subjective meanings and values that people associate with nature. Moreover, social, cultural, demographic and personal characteristics (including the type of contact with nature that people experience everyday) may also have an influence. Consequently, understanding the human-nature relationship is particularly complex.

In this chapter, the specific value of urban parks, as perceived by different groups (especially on the basis of different age and cultural background) will be evaluated through literature review. The most important findings, as emerged from the analysis conducted below, will be tested on the following case studies (as reported in Chapter 8, *Case Studies*).

5.1. Different images and values of nature

In order to capture the complexity of the human-nature relationship, previous research studies have proposed methodological frameworks with possible classification criteria, evaluating the characteristics of various views and values of nature (Buijs 2009; Marwijk and Elands 2007).

Marwijk and Elands (2007), for example, argued that the physical environment assumes personal meanings and emotions as people interact with it and so the same environment can have different meanings and offer different experiences for different people. As a consequence, the physical environment becomes a 'symbolic environment'. Their study evaluated how nature was experienced by different visitors of a National Park in the Netherlands and assumed that four categories of value can be associated with the environment:

- 1. Use value (orientation, facilities and accessibility);
- 2. Perception value (attractiveness, tranquility or busyness, naturalness, annoyance);
- 3. Narrative value (stories, history and cultural value) and

4. Appropriation value (sense of place).

Their results confirmed that people associate various values to nature, and these values are the result of their worldview and personal experiences. As a consequence, their perception of nature is affected by specific and personal symbolic meanings that are associated with those values. Furthermore, similar attitudes could be identified amongst visitors so that they could be classified in four different groups, representing different personalities and types of behaviour: (a) the 'happy hiker', (b) the 'connoisseur', (c) the 'demanding hiker' and (d) the 'disturbed hiker'. Each group was thought to represent a different way of perceiving the environmental values of the park and to have a different experience of nature, from less problematic to more problematic.

Similar findings were confirmed by Buijs (2009) whose research affirms that "images of nature can be described as mental frameworks that combine different beliefs, values and value orientations" (p. 428). His research was based on interviews conducted with the general public in the Netherlands and resulted in the identification of five different ideal types of images of nature:

- The 'wilderness image', based on a strict nature-culture divide (only pristine nature is real nature) with its focus on holistic, ecocentric values, like the protection of species and ecosystems;
- The 'autonomy image', based on a nature-culture contrast (real nature can be observed everywhere and should be kept free of any human interference) with its focus on individualistic, biocentric values (value is attributed to every individual living being);
- The 'inclusive image', based on a nature-culture inclusion (all living beings including humans belong to nature) with its focus on individualistic and biocentric values (human admiration for the life force of nature);
- 4. The 'aesthetic image', based on a nature-culture balance (nature should be managed so that humans can use it for recreation) with its focus on hedonistic and aesthetic

values; and, finally,

5. The 'functional image', based on a total control of nature by humans for production purposes, with its focus on utilitarian values.

The study challenges the traditional idea that lay people's values and attitudes towards nature can be classified according to the simple ecocentric-anthropocentric divide. In fact, according to the author, while the 'wilderness image' can be considered fully ecocentric and the 'functional image' fully anthropocentric, images 3-5 embody a more holistic and complex interpretation of the intrinsic value of nature, including appreciation for both aesthetic and utilitarian values. Even though this research provides useful insights in understanding the complex relationship between humans and nature, the author highlights that these interpretations of nature may be place-specific and emphasizes that:

"this study is focused on the Dutch context. The images of nature described in this article cannot simply be applied to other countries and cultures. Different physical as well as cultural contexts may lead to different sets of images. ... [adding though that] [a]lthough the content of the different images of nature may differ between cultures, the concept itself may be applicable in all cultures" (p. 429).

In this regard, in a later Buijs, Elands and Langers (2009) tested the same five images of nature reported by Buijs (2009), with the objective of evaluating if immigrants and native people in the Netherlands have different perceptions of nature. Results revealed significant differences between the two groups, with the majority of native Dutch endorsing the wilderness image and immigrants (mostly from Turkey and Morocco) the functional image. Furthermore, it showed a significant relationship between images of nature and landscape preferences – the wilderness image related to the preference for unmanaged landscapes and the functional image.

Attitudes observed among the general public in relation to different images and values of nature have also been identified among park managers, city administrators, practitioners

and various stakeholders. This is a relevant consideration. In fact, if design choices and policy and management decision-making are influenced by specific ideas of nature, in turn, the experience of nature that is offered to the public is already influenced by someone else's perception of nature.

In this regard, Gobster (2001) analyzed how different visions of nature can lead to different decisions in urban park restoration. Through a dialogue with various stakeholders in relation to the restoration of a parkland area along Chicago's lakefront, four visions of nature were identified:

- 1. Nature as designed landscape;
- 2. Nature as habitat;
- 3. Nature as recreation;
- 4. Nature as pre-European settlement landscape.

These visions were classified according to five implicit criteria:

- a. Function (perceived purpose of nature);
- b. Structure (character and appearance of the landscape as defined by vegetation);
- c. Values (perceived meanings);
- d. Use (balance between humans and nature) and, finally,
- e. Icons (perceived special character of the place as defined by symbolic natural or cultural features).

According to the author, the last criterion resulted to be the most important element in shaping the different attitudes toward nature observed among the various stakeholders, demonstrating the importance of symbolism in defining the sense of attachment to places.

5.2. Perception of nature and preferences

Özgüner and Kendle (2006) suggest that the majority of people recognizes the value of having nature in the city, but "it is also evident that some people do not respond to natural landscapes and find them untidy, ugly, or in some way a compromise of civilised aesthetic values, and even sometimes frightening" (p. 140). Nonetheless, they continue, "statements are often highly speculative about what modern people appreciate about nature in cities ... Casual observation suggests that people are selective about what they see as natural, and nature means different things to different categories of people. ... For some people nature is reserved for wilder places and does not exist in the urban context" (p. 141). In this regard, they hypothesize that these contrasting attitudes may depend on different perceptions of nature, which are considered "one of the main factors shaping people's relationships with natural world throughout history" (p. 140). Understanding people's preference is therefore related to identifying their different perceptions of nature. As such, many variables can interact and affect preferences that are variously related to the observer such as age, gender, social characteristics, cultural background, education, past experience, motives, and the daily routine and specific interests of the individual (Fraser and Kenney, 2000; Matsuoka and Kaplan, 2008; Özgüner and Kendle, 2006; Priego, Breuste and Rojas, 2008). Moreover, as already mentioned, people's relationship with nature and their consequent use of green spaces depend on a series of meanings and values they attribute to the physical environment, which in turn becomes a 'symbolic environment' (Marwijk and Elands, 2007).

Nonetheless, a number of general attitudes can be identified. Kuo, Bacaicoa and Sullivan (1998), for example, suggest that "there is universal human preference for urban nature" (p. 52) and that "within the urban residential context, the most preferred planting density may be the maximum recommended density" (p. 53). In this regard, Henwood and Pidgeon (2001) investigated why woods and trees are important to people and concluded that they are valued for the personal, local, community and cultural meanings that people attribute to them. Other studies, cited in Özgüner and Kendle (2006), affirm that people prefer natural

over built landscapes and, in general, people appreciate the landscape type they are more familiar with. More specifically, people prefer certain natural elements such as trees, water and forested areas, with water resulting the most preferred landscape element regardless of cultural differences. (p. 142).

Starting from this premise, Özgüner and Kendle (2006) examined two public green spaces of Sheffield, UK – the Botanical Garden and a naturalistic site – with the objective of understanding how different perceptions of nature may affect attitudes of the general public towards urban naturalistic landscapes. Results from questionnaires showed that the general public appreciates and derives multiple benefits from both kinds of urban nature (naturalistic or designed landscapes). The Botanical Garden was preferred by the interviewees because aesthetically attractive, peaceful, clean, well looked after, safe, and rich in diverse plants and flowers; the naturalistic site instead was favoured because more natural, functional and social, with recreation facilities and a children playground. Moreover, preferred landscape features were not associated with specific 'formal' or 'naturalistic' features: in both sites 'animals, birds and wildlife birds' were the preferred feature, followed by formal features such as 'flowers and flower beds', 'specimen trees', 'greenhouse' in Botanical Garden and natural features such as 'water, stream and ponds', 'trees', 'woods and woodlands' in the naturalistic site. Preferences were therefore clearly related to the specific natural setting. Özgüner and Kendle's results confirm that different kinds of urban nature, natural or formal and ornamental, may be perceived and consequently preferred by different groups or people. As a consequence, the benefits urban nature can provide are various and affect people differently. In fact, "[s]ociety is diverse and different groups express different attitudes to the natural world." (p. 142) For example, "[p]eople who value formal ornamental landscapes will often see wild areas as untidy, unmaintained or in some other way degraded. For others, the degradation is associated with too much human influence, when an area becomes 'manicured', 'over-formal' or loses its 'naturalness'" (p. 142).

5.2.1. Biophilia

As seen above, many interacting factors affect perception of nature and, consequently, environmental preferences. However, it is argued that people have an innate attraction, affinity and preference towards nature and natural elements. According to the theories on environmental preferences such as the 'Biophilia Hypothesis', this natural predisposition is a signal for adaptations to the environment that occurred during human evolution and confirms the existence of universal preferences that range across culture, individuals and time (Alencar, 2013).

The term 'biophilia', from the Greek 'love of nature', was coined by the social psychologist Erich Fromm in the 1960s and then popularized in the 1980s by the American biologist Edward O. Wilson who used the term to indicate the need to bring humans back in contact with nature. According to Wilson, biophilia – the natural emotional affiliation that humans have with other living systems – is part of our genetic heritage and a common thread through humanity. Sensory interactions with nature and various natural elements have been an integral part of our development as a species. As such, increasing contact with nature in urban contexts, where the majority of the world's population currently live, would improve human health and wellbeing, productivity and societal relationships. This proposition has a physiological cause. In fact, the human nervous system consists of two elements:

- 1. The sympathetic system (that stimulates the body when cognitive function is needed) and
- 2. The parasympathetic system (that serves to relax the body).

In chaotic and unsettling environments such as urban contexts, the natural balance between these two systems typically fails, resulting in energy drain and mental fatigue and consequently stress, frustration, irritability, and distraction. On the contrary, human interaction with nature provides an increase in parasympathetic activity which results in improved bodily function, decreased stress and irritability and increased ability to concentrate. More generally, the term 'biophilia' is now used to indicate the human need for a positive contact with nature and the fact that humans, as a species, are still powerfully responsive to nature's forms, processes and patterns. (Alencar, 2013; Browning et al., 2012).

Focusing on urban contexts, Beatley (2011) and Browning, Ryan and Clancy (2014) analyzed the role of urban nature in providing biophilic experiences. In the context of the built environment, most nature is designed, in some cases *deliberately* – for function or aesthetic purposes, in other cases *arbitrarily* – for navigability or access to resources, or *passively* through neglect or hands-off preservation (Browning, Ryan and Clancy, 2014). Beatley (2011) uses the term 'wildness' to refer to this kind of nature "which is inherently human impacted or influenced. Urban wildness is not wilderness ... It is not distant and pristine, defined by how little humans have used or impacted it, but nearby and nuanced ... defined by its resilience and persistence" (p. 3). Moreover, he affirms that nature in cities "is all around us is large and small, visible and hidden ... ever present yet highly dynamic ... Nature reaches our senses, well beyond sight, in the sounds, smells, textures, and feelings of wind and sun." (pp. 16-17). The same concept is reinforced by Browning, Ryan and Clancy (2014) who define nature as "living organisms and non-living components of an ecosystem – inclusive of everything from the sun and moon and seasonal arroyos, to managed forests and urban rain-gardens" (p. 8). So, from a biophilic perspective, cities may offer many opportunities of meaningful experiences with nature.

Browning, Ryan and Clancy (2014), in their proposal for biophilic design patterns, identify three categories that describe different experiences of nature: Nature in the Space, Natural Analogues, and Nature of the Space. For the scope of this research, Nature in the Space is the most interesting category, because it describes how humans can achieve fulfilling experiences of the natural world through meaningful, direct connections with natural elements. In detail, seven types of experience of Nature in the Space can be identified:

 Visual Connection with Nature: view of nature elements, living systems and natural processes;

- Non-Visual Connection with Nature: auditory, haptic, olfactory, or gustatory stimuli that generate a deliberate and positive reference to nature, living systems or natural processes;
- 3. Non-Rhythmic Sensory Stimuli: casual, unpredictable connections with nature;
- 4. Thermal & Airflow Variability: changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments;
- 5. Presence of Water: experience of a place through seeing, hearing or touching water;
- 6. Dynamic & Diffuse Light: varying intensities of light and shadow that change over time and mimic natural conditions;
- 7. Connection with Natural Systems: awareness of natural processes, especially seasonal and temporal changes.

As seen above, many different kinds of relationship with nature can be experienced in urban contexts. In this regard, Gochma (2016) conducted a research comparing non-biophilc (without presence of nature) and biophilc sites in New York, in order to evaluate their different attractiveness for people during their breaks from work. Biophilc sites offered different types of contact with nature, such as greenery, open views and auditory buffer from the urban noise. Results showed that biophilic sites attracted people who walked disproportionally longer distance to reach them than the non-biophilic sites. Moreover, most of the participants at the biophilic sites named at least one biophilic element (such as greenery, view, flowers, sun, etc.) as their preferred feature of the space. However, a large proportion of participants valued the combined presence of nature and short distance, suggesting that convenience can enhance nature benefits and it is valued more than nature alone. In general, these results support the concept of biophilia by suggesting that people have a preference for nature and gain benefits from contact with it, whether consciously or not.

Nonetheless, according to Ryan et al. (2014), "[s]ome aspects of biophilia are inherently difficult to quantify" and are affected by numerous interacting factors. In fact, "the built environment can have a positive, neutral or negative effect on an individual, and responses

may differ with the user's health baseline; the frequency and duration of the experience; socio-cultural norms and expectations; the user's experience up to that point; and how the individual perceives and processes the experience." (p. 71)

5.2.2. Nearby nature and restorative experiences

As posited by the 'biophilia hypothesis', people have an innate preference for natural environments and receive multiple benefits from contact with them. However, different images and values of nature affect people's relationship with urban green spaces, their visitation patterns and the perception of the benefits they provide. This is particular relevant for the research presented in this thesis. In fact, as effectively stated by Lin et al. (2014), [i]f orientation is an important motivator for park visitation, the benefits of the interaction would mainly be gained by people with a high orientation towards nature and nature experiences, and those with a low orientation may be less frequent visitors to parks" (p. 2). However, park visitation is not the only way people can derive benefits from urban nature. On the contrary, research about the restorative function of 'nearby nature' argues that any kind of nature provides benefits, and people are effortlessly advantaged by any type of contact with it.

The mechanisms of the Attention Restoration Theory were explained by Kaplan (1995). This theory argues that any prolonged mental effort leads to directed attention fatigue, that is a voluntary attention that is necessary for 'human effectiveness'. In other words, it is the type of attention that people need to achieve focus and control distraction, particularly for problem solving or when dealing with stressful situations. Contrary to fascination (or involuntary attention), directed attention is under voluntary control and therefore it is susceptible to fatigue. According to the theory, natural environments, with their soft fascinations (such as clouds, sunsets, snow patterns, leaves moving in the breeze, etc.), offer effortless restorative experiences and contribute to reduce mental fatigue. Restorative environments, in fact, offer a 'sense of being away, a conceptual or physical 'sense of extent' and a 'sense of compatibility and resonance with nature' which are conducive to mental restoration. In particular, according to Kaplan (1995), human inclinations towards nature can be classified in various categories,

such as:

- The predator role (hunting, fishing, etc.);
- The locomotion role (hiking, boating, etc.);
- The domestication of the wild role (gardening, caring for pets, etc.):
- The observation of other animals (bird watching, visiting zoos, etc.);
- Survival skills (fire building, constructing shelter, etc.)
- and so on.

Nearby nature cannot provide the context for all these purposes, but it can be supportive of various human inclinations, providing a sense of compatibility and resonance with nature (Kaplan, 1995). As such, the type of contact people have with nearby nature not only provides restoration from mental fatigue, but also affects the general experience of nature they have, including perceived benefits and values. A similar concept was expressed by Crow, Brown and De Young (2006), who used the term 'green residential atmosphere' to argue that nature "is not perceived in terms of ethereal processes such as production of oxygen, maintenance of biological diversity, purification of water, or decomposition of organic wastes" (p. 298) but through direct experience of the green environment in which people live. In fact, as reported by Bell and Ward Thompson (2008), "it is with the places where we live that we develop the closest relationships" (np).

With the term 'nearby nature' many different types of green spaces are considered: larger areas (such as greenways, parks, stream corridors, urban forests), smaller areas (such as gardens, rooftops, school playgrounds, streetscapes), derelict lands overgrown with vegetation, naturalistic lands and botanical gardens (Matsuoka and Kaplan, 2008, p. 9). All these different green spaces provide benefits, and these benefits are experienced through different types of interactions with nature, including indirect contact and views, if repeated over time. That is the case of 'micro restorative' effects of view of nature from home (Kaplan, 2001). In sum, various types of contact with nature in the places where people spend most of their time (e.g., residential settings, workplaces, schools, retirement homes, health facilities,

etc.) have been found to have considerable positive effects on human wellbeing, providing a sense of satisfaction and improving emotional, mental and physical health (Matsuoka and Kaplan, 2008).

Furthermore, as argued by Matsuoka and Kaplan (2008), the review of the evidence shows that the importance of nearby nature for human wellbeing is valid worldwide and across different cultures. In particular, they affirm that "[a]lthough the needs are addressed in different ways in separate regions of the world, the nature of the needs themselves is very similar" (p. 14). At the same time, though, they note that "[w]hile the importance of nearby nature is a constant, people of different ages, gender, and socio-economic status can differ greatly in how they use and perceive both built and more natural urban landscapes. Many of these differences are shared across diverse cultures" (p. 14). These implications will be analyzed further in the next paragraphs.

5.3. Perceived value of urban parks

As already mentioned, Marwijk and Elands (2007) argue that people attribute personal meanings and emotions to the environment, which in turn becomes a 'symbolic environment'. Their study examined the visitation patterns of a National Park in the Netherlands, that was chosen for its recreational attractiveness and ecological quality. Results confirmed that symbolic meanings are associated with the environment in different ways by different groups of people, so that the experience of nature depends on both the characteristics of the place and the subjective values and beliefs that are associated with the environment. The recreation experience that the visitors reported was a consequence of these multiple interacting factors.

In this research thesis, the primary focus is on neighbourhood urban parks, which generally provide a different type of recreation experience than large national parks: they typically include only basic facilities and are not characterized by exceptional ecological quality. Nonetheless, they provide numerous social and environmental benefits and are usually considered a central focus for the community.

However, since Marwijk and Elands (2007) identified and studied general human inclinations, it can be assumed that their findings are valid regardless the type and size of green spaces. Moreover, results from Marshall and Corkery (2011) confirmed that people value different types of green spaces equally (np). Therefore, we can argue that the assumptions reported by Marwijk and Elands (2007) can be extended also to the analysis of neighbourhood urban parks.

In this regard, the research conducted by Chiesura (2004) among visitors of an urban park in Amsterdam is particularly significant. In fact, the study evaluated the emotional dimension of nature based experiences, the benefits people perceive and the relation with their wellbeing in general, arguing that "the feelings and the emotions we perceive in the natural environment form a relevant part of our experience in it" (p. 134). Visitors were asked to answer two questions: "Which feeling does nature evokes you?" and "How important are these feelings for your daily wellbeing?". Possible answers can be grouped in two categories:

- Recreation (including "Freedom", "Happiness", "Adventure" and "Luck") which assumes that the experience of nature is source of positive feelings, such as sense of relaxation and re-generative enjoyment;
- Spirituality (including "Unity of my self" and "Unity with nature") which assumes that the experience of nature inspires reflection, meditation, and a general feeling of harmony between one self and the surrounding.

Results showed that both dimensions of nature are experienced, with most respondents selecting "Freedom" (64%), followed by "Unity with nature" (43%) and expressing similar thoughts in open end questions. When asked to rank the importance of these feelings and emotions for their personal wellbeing, the emotional experience resulted to be very important.
Furthermore, as previously anticipated, research (Crow, Brown and De Young, 2006; Matsuoka and Kaplan, 2008) suggests that people's overall perception of nature and its benefits depend on the quality, frequency and type of contact with nearby nature they experience every day. So, the value that people attribute to urban parks depends on the contact with nearby nature they have during their daily activities.

In this regard, a study conducted by Kaplan, Austin and Kaplan (2004) in Hamburg Township, Michigan compared different communities in the same town, some 'conventional communities' and some 'open space communities' (established using an open space ordinance) in order to understand how outdoor spaces are perceived by the residents. Results showed that residents from both types of communities have a similar perception of their neighbourhood and rate 'nature view from home' as the highest priority. Open space communities, however, showed a higher level of satisfaction with their nearby natural environment. These findings suggest that higher exposure to nature in the places where people live enhances satisfaction with nearby nature and consequent perception of the benefits green spaces provide.

Moreover, Quayle and Driessen van der Lieck (1997) argued that neighbourhoods can be considered as hybrid landscapes where public parks and street trees coexist with other green spaces (especially front and backyards) that are personalized by individual small-scale appropriations. As such, residents perceive their neighbourhoods as familiar and restorative landscapes, where the sense of identity for individuals and communities is built. Therefore, urban parks assume special meanings that are an emotional response to the sense of community promoted by hybrid landscapes. Moreover, "the intensity of this experience varies in people, depending on personality, memory, imagination, and the richness of the landscape itself" (p. 102). These findings illustrate that the perceived value of urban parks depends on a series of interacting factors, which are partly related to the park's natural characteristics and partly related to the individual experiences of the visitors, including extremely personal characteristics, such as their cultural background, their values and beliefs, their life experiences, the type of dwelling they live in, their everyday exposure to nature, and so on.

Consequently, understanding and evaluating perceived value is particularly complex. The CABE report (2010b), for example, asserts that assessing value was one of the most elusive elements of the project. In fact, as they note, there are not existing data sources capturing what green spaces mean to people. For this reason, they suggested to measure value combining data obtained from different surveys conducted in the UK in the previous years. In particular, two indicators were evaluated:

- Percentage of people who think that local parks and open spaces are important in making somewhere a good place to live;
- Percentage of people who think that access to nature near to where they live is important.

In addition, the number of volunteer days contributed to local parks and green spaces was considered and, indeed, people's willingness to give their time is considered one of the most telling measures of public value.

Results suggested that local green spaces are appreciated, and this appreciation is increasing. In fact, in 2007, 91 % of people thought it was very or fairly important to have green spaces near to where they live, and by 2009 this percentage had risen to 95 %. Interestingly, when considering access to nature in general (indicator 2), results showed that it is more valued in suburban areas than in dense urban areas and less valued in more deprived areas than in affluent areas. This may suggest that appreciation of urban parks reflects the basic need for green space associated with urban living, while valuing nature in and of itself captures a higher order need. This interpretation is in line with the general assumption that environmental values are a middle-class preoccupation (p. 38).

Marshall and Corkery (2011) instead analyzed this topic thoroughly, studying how and why open spaces are valued generation after generation. Their research was developed in

Western Sydney Parklands, Australia, and consisted in face-to-face questionnaires. General results indicated that parks are highly valued with 95% of respondents describing parks as 'very important' (74%) or 'important' (21%). Only 5% said parks were somewhat or not important to them. Analyzed in further detail, survey data showed several variables related to the perceived value of urban parks. The most important findings are summarized below:

- Significant relationships were identified between demographics and park appreciation:
 - The age group 55-74 years was found to value parks the most, followed by the group 35-54 years. People aged 75+ years valued parks the least;
 - Families with children under 18 years of age valued parks more and had higher visitation rates than those without children;
 - Larger households were reported to value parks less than smaller households (but had higher visitation rates);
 - Those who had lived in their postcode area for more than 10 years valued parks and open spaces the most. However, parks were described as very important also by more recent residents;
- Most types of parks (local parks, nature reserves and national parks) are valued relatively equally, with over 90% of respondents ranking them as being very important or important. Sports fields were not valued quite as highly;
- People attribute value to built facilities, if they do not jeopardize the ability of enjoying the natural environment. Parking, picnic facilities, sport facilities, toilets and shade structures were highly valued, while camping sites, cafes and educational facilities were less valued. Off-leash dog areas resulted to be the least valued;
- In relation to parks' management, environmental protection was considered the most important objective, followed by providing free events, providing programmed activities and business activities, protecting indigenous culture and, finally, promoting culture;
- Three quarters of the respondents agreed that proximity to parks increases property

value. The minority who did not agree referred to fear of crime;

- Social events were ranked as the most meaningful experiences in parks, followed by being immersed in nature, wellbeing, physical activities, sport, aesthetics, emotional experiences; the least valued were educational, cultural and spiritual experiences;
- People attribute special meanings to parks mostly because they offer specific activities, are associated to special memories, or are privileged spaces for meeting people or socializing; relaxing, appreciating parks' beauty or escaping urban life were also significant. No importance was attributed to the park as a place to be alone;
- The most common negative experiences were associated with undesirable human behavior, lack of facilities or maintenance.

5.3.1. Differences by age group

Many studies have analyzed the relationship between perception of nature and age, assuming that people value green spaces differently in various stages of their life.

Payne, Mowen and Orsega-Smith (2002), for example, analyzed park users' recreation and landscape preferences in Cleveland, Ohio and concluded that a young age was the best predictor of the perceived need for additional parkland and frequency of park visitation. This study reported that older adults are a minority among park users and, according to the authors, this is "a challenge for park agencies that are making considerable efforts to increase participation from older adults ... in that older populations are more likely to vote and have political leverage in their communities" (p. 195).

In this regard, however, it should be noted that Payne, Mowen and Orsega-Smith (2002) grouped various age groups into a dichotomous variable that distinguished between young to middle adulthood (ages 18-49) and older adulthood (50 years of age and older). This broad classification does not appreciate the significant differences that were identified by Marshall and Corkery (2011) in their Australian study, which reported that the age group 55-74 valued

urban parks the most and the age groups 75+ valued urban parks the least. Moreover, Marshall and Corkery (2011)'s survey data reported that younger people (18-24 years) used parks less than all the other groups.

On the other hand, findings from Payne, Mowen and Orsega-Smith (2002) are aligned with the CABE report (2010b) which concluded that in the UK the age group 25-44 years of age reported the highest perceived value of parks, with just over 30 % saying that parks are important. According to the authors, this may reflect the age at which people have children and are likely to make a greater use of this service. That was confirmed also by Marshall and Corkery (2011) who noted that families with children under 18 years of age valued parks more and had higher visitation rates than those without children. This data is particularly significant. In fact, as reported by Ward Thompson, Aspinall and Montarzino (2008), exposure to nature during childhood improves children's physiological and psychological development and also predict their positive environmental attitudes in adulthood. In fact, results suggest that lack of a green place experience in childhood may inhibit the desire to visit green places as an adult and may affect their perception as places for physical activity or emotional (or even spiritual) renewal.

Other studies have identified a series of benefits that older people can derive from exposure and use of green spaces, such as perceived general health (Maas et al., 2006) and social relations (Kweon, Sullivan and Wiley, 1998; Sugiyama and Ward Thompson, 2007). Consequently, research has investigated what characteristics are associated with perception of value and preferences in older adults. Foster, Hillsdon and Thorogood (2004), for example, studied the relationship between adults' perceptions of the social and physical environment and their self-reported walking behaviour. Their results suggest that perceived sense of safety is an important factor in determining the walking behaviour among women and the elderly, while men are positively influenced by the presence of a local park or open space in their neighbourhood.

In this regard, an interesting approach was adopted by Alves et al. (2008) who examined

older people's preferences for certain environmental attributes of local parks in the UK. Their study, in fact, extended the analysis beyond the urban parks' boundaries and also evaluated the routes and spaces around people's homes that give access to them. The first stage of the study identified a series of attributes, some of them related to the environment 'en route' (such as distance to the space, pavement quality, presence of tree and seats along footpaths, and levels of traffic) and others to the environment within a local park (such as the density of trees and plants, the availability of facilities such as cafes and toilets, the presence of seats, water features, car parks or things to watch, levels of maintenance and aspects of nuisance). The second part of the study included questionnaires where participants were asked to choose a preferred park from a pair of images differing on four of the identified attributes. Results reported that older people are more likely to visit a local park if it is free from nuisance (youngsters hanging around, dog fouling, signs of vandalism), has facilities such as a cafe and toilets, has natural elements like trees and plants, and provides entertaining views or things to watch. Routes to parks are preferred if they are characterized by low traffic speed and presence of seats.

Another research conducted in the UK in the same period (Sugiyama and Ward Thompson, 2008) confirmed similar results. The associations between level of walking in older adults and six attributes of urban parks (pleasantness, good paths to the urban parks, safety, good facilities, nuisance and water features) were evaluated. Results showed that pleasantness of open space and lack of nuisance were associated with walking for recreation, while good paths and good facilities were associated with walking for transport. According to the authors, enhancing these aspects of urban parks may contribute to active lifestyles for older adults. In fact, as reported by Sugiyama and Ward Thompson (2007) neighbourhood environments can be 'supportive', in that they can provide support for meaningful experiences. That is the case of neighbourhoods that are characterized by certain attributes (or qualities) that are specifically valued by sensitive groups, such as the elderly.

5.3.2. Differences by cultural background

Since Canadian cities are multicultural (Attili and Sandercock, 2008), the role of cultural background in affecting nature perception, and therefore perception of urban parks, is particularly relevant.

Whilst Canada was originally inhabited by the First Nations, who had an intimate relationship with nature, according to Blaviesciunaite (2012), the current predominant ideologies "are based on a deeply rooted understanding that demarcated human and natural worlds. ... Human beings are considered superior to nature since they have managed to "conquer" it by being united and equal among each other or, as in the environmental discourse, as intruders and destroyers of nature. In one way or another, the distinction between humans and nature is evident, reinforcing not only the dichotomy, but also a hierarchical understanding of the relationship between them" (pp. 42-43).

This analysis can be considered as an extreme synthesis of the current understanding of the human-nature relationship in Canada. However, many different variations can be identified when considering specific cultural and ethnic minorities. In this regard, Fraser and Kenney (2000) analyzed distinct cultural communities in Toronto with the objective of understanding if cultural background and landscape history affect the perception of the urban forest. Initially, they identified three landscaping traditions: the British, dominated both economically and culturally by large forests; the Mediterranean, which emulates small-scale agriculture; and the Chinese tradition, which evolved from abstract ornamental gardens. Through tree inventories and interviews, the research was able to identify a distinctive picture of the four communities:

- The British were shown to appreciate shade trees (that were predominant in their private gardens) and naturalized parks (hiking paths);
- Italian and Portuguese communities preferred fruit trees and vegetable gardens,
 and were not favourable to shade trees if they were in any way in conflict with their

gardens;

 The Chinese community was the least interested in their yard maintenance and in the possibility of adding trees to their property.

These results illustrate that cultural differences related to landscape traditions have been maintained among North American immigrant populations. Thus, the researchers concluded that "[f]ar from being assimilated, therefore, cultural differences continue to manifest themselves in the subtle ways that people perceive and use nature in the city" (p. 111). The same results were confirmed by Kendal, Williams and Williams (2012), who analyzed 72 published international studies about cultivated floras in gardens, parks and streetscapes in order to determine the significance of biophysical and social factors in determining species distributions. They concluded that "[p]eople will continue to cultivate familiar plants, and that behaviour becomes more important after migration as gardens are used by people to confirm their identity in new environments" (p. 649).

Priego, Breuste and Rojas (2008) also evaluated an international context, by analyzing perception and value of nature in urban landscapes, in cities in Germany, Chile and Spain. In particular, they were interested in whether nature is perceived differently by people having more or less access to urban nature and whether the value that is attributed to nature varies for different social strata within different cities and across cultures and countries. Results reported that urban nature plays an important role for urban dwellers regardless their social status and nationality. In fact, being in contact with nature is a fundamental human need and therefore it is common to different cultures and geographies. Nonetheless, urban nature is perceived and used differently. Results, for example, showed that nature-related outdoor activities may be influenced by social status. Higher social status, in fact, may favour certain types of use (private gardens, natural sites accessible only by cars, etc.). Nonetheless, the study does not support the idea that residents of higher socio-economic status use or value urban nature to a greater degree than those of lower means. Both groups use nature as it is existing, accessible and near to their homes and according to their own 'idea of nature' which

can be an expression of different cultural background, accessibility and tradition. Hence, the authors conclude that "the political, cultural, historical, religious, scoio-economic [sic] issues interact for sure with peoples' behaviour to urban nature, but there is a broad common basis of nature perception independent from social conditions. ... The social dimension is less influencing than may be expected" (Priego, Breuste and Rojas, 2008).

In the broader context of cultural background, several studies have focused on the role of race in affecting perception of nature. Results included in the CABE report (2010b), for example, indicated that Caucasians reported higher perceived value of urban parks than black or minority ethnic people in the UK, with Black African and African-Caribbean people recording the lowest level of reported value (p. 37). Buijs, Elands and Langers (2009) also confirmed that in Europe nature recreation is still a very 'white' activity. However, the CABE report (2010b) suggested caution in the analysis of the results, because they may be influenced by external factors, such as socio-economic status, perception of safety or quality and quantity of green spaces.

In this regard, Payne, Mowen and Orsega-Smith (2002) analyzed the role of residential location, race and age in explaining variations in recreation and park preferences, focusing on a specific urban park in Cleveland, Ohio. Their results showed that race is an important predictor of park preferences, with Blacks (over Whites) more likely to prefer park lands with a recreation role (over a conservation role) and organized recreation opportunities (over nature-based opportunities). These results were confirmed by Elmendorf et al. (2005b) who analyzed differences in park participation and landscape preferences between Blacks and Whites, through literature review. Their analysis demonstrated that race is still an important factor in urban park and forest participation and landscape preference. In particular, Afro-Americans are more likely than Whites to prefer developed facilities and services, while Whites are more likely than Blacks to prefer undeveloped and more nature-based settings. According to the authors, however, decision making and participation may be affected by external factors, such as racial discrimination.

While the analysis of race through contraposition between Blacks and Whites is relevant in the United States, it may be less pertinent to the Canadian context. Similar considerations, however, can be extended to other minority groups that experience discriminatory treatment for their ethnicity and minority status. In this regard, Gobster (2002) analyzed patterns of use of Lincoln Park in Chicago by ethnic minorities, such as Blacks, Latinos and Asians and compared them to the White majority. With regard to environmental perception, the study reported differences in environmental and development preferences that appeared to be more complex than previously thought. In fact, results confirmed that Blacks are more likely than Whites to prefer facilities and social activity over park attributes (in line with results from Payne, Mowen and Orsega-Smith, 2002 and Elmendorf et al., 2005b). However, results from Latinos and Asians reported more complex attitudes, showing that they tended to put emphasis on attributes that were also appreciated by Whites, such as: scenic view, open space, trees, water, and other natural attributes. Furthermore, nonvisual attributes of the park experience were found to be important to certain groups, such as 'fresh air' for Latinos, suggesting that some sensory dimensions may be important to some groups but that would be missed in visual perception assessments.

Considering 'favored park attributes', the top responses common to all groups included: lake and ponds; beaches; zoo; peaceful, friendly atmosphere; people and varied activities; and the park's proximity to the lake and to people's homes. However, it was also possible to identify some specificities by ethnicity: Asians for example mentioned the scenic beauty, Latinos the cool refreshing 'lake effect' and Whites the trees and other park vegetation. Differences were also identified in perception of safety, with Whites more than twice as likely as other groups to say the park was unsafe. Considering 'favoured locations in the park', many respondents recognized the presence of popular areas where members of their racial or ethnic group went and reported some kind of racial/ethnic discrimination.

6. USE OF URBAN PARKS

As anticipated in Chapter 3, *Provision, Access and Use of Green Spaces*, there is considerable variation in the use of urban parks. A review of the evidence suggests that a low proportion of the population actually visits public parks (McCormack et al., 2010; Shanahan et al., 2014). Research conducted in the UK and Canada, however, reported opposite results and showed that almost nine out of 10 people use and value urban parks (CABE, 2010b; TOcore, 2016).

In this regard, Lin et al. (2014) interestingly conducted a study in Brisbane, Australia, investigating what motivations drive people to visit urban parks the most, either opportunity – having a park in close proximity to home – or orientation – nature relatedness, or feeling a strong connection with the natural world. Results suggested that 40% of the population did not visit urban parks and had a relatively weak nature orientation. Park users, on the contrary, exhibited higher nature relatedness and were found to spend more time in parks and to be willing to travel further and more frequently to visit them. Moreover, the same group was also found to spend more time in their own residential yards, suggesting that the motivation to visit parks and interact with nature in general is driven more by nature orientation than opportunity. That means that park users not only were found to their lives.

Various implications related to 'opportunity' as a motivation to visit urban parks were investigated in Chapter 3, *Provision, Access and Use of Green Spaces*. In this chapter, patterns of use of urban parks will be examined, considering preferred activities, preferred features and their role in supporting social interactions. The most important findings will be tested in the following case studies (see Chapter 8, *Case Studies* for further details).

6.1. Patterns of use of urban parks

Recent studies provide information about the physical characteristics, distribution and role of urban parks in the North American context. Cohen et al. (2016), for example, conducted an

extensive analysis of the visitation patterns of neighbourhood parks in the US, investigating park use, park-based physical activity and park conditions of a sample of 174 neighborhood parks in 25 major cities across the U.S. Data were collected through direct observations during the period spring/summer of 2014.

In general, results showed that neighbourhood parks can be considered the backbone of city park systems. Their dimension is usually between 2 and 20 acres and are intended to serve local residents living within a 1-mile (1.5 km) radius around parks. They are attractive for different age groups, because contain multiple diverse facilities, such as playgrounds, picnic tables, basketball courts, green spaces, and shade trees.

Collected data showed that the average neighborhood park was 8.8 acres and registered 20 users/hour (or an estimated 1,533 person hours of weekly use). However, parks located in lowincome neighbourhoods were used less than the ones located in high-income neighborhoods. As seen in Chapter 3, *Provision, Access and Use of Green Spaces,* this may depend by the fact that urban parks in deprived areas are underused because they are perceived as unsafe or unattractive (CABE, 2010a; Jones and Coombes, 2009).

Furthermore, general data showed that different age groups had different visitation rates, with particularly low use registered among adults, seniors, girls, and women. In fact, comparing visitation rates with population data, it emerged that:

- Seniors represented 4% of park users, but 20% of the general population;
- Adults represented 45% of park users, but 54% of the general population;
- Teens represented 13% of park users, but 7% of the general population;
- Children represented 38% of park users, but 20% of the general population.

Findings regarding visitation rates per age group are consistent with previous studies in the same geographic context. In fact, Cohen et al. (2007), investigating the patterns of use of eight urban parks located in low-income minority communities in Los Angeles, similarly

reported that adolescents were over-represented users of urban parks and the elderly underrepresented, in relation to the general population. The same analysis will be conducted in relation to the two urban parks case studies in Vancouver and results will be discussed in Chapter 8, *Case Studies*.

In the Canadian context, an extensive analysis of the patterns of use of urban parks was developed in Toronto (TOcore report, 2016) in the period June/August 2015. The report included 127 downtown parks, that were visited twice a day, at midday (10am to 2pm) and in the evening (4pm to 8pm). Estimated age range, gender and group size of park visitors were also documented. The most important findings can be synthetized as following:

- The most common uses for all age groups were walking, sitting and cycling through the park, followed by playing (specifically for children aged 0-15);
- When comparing midday and evening users, there was no significant difference in the average number of park users, but there was slightly higher usage in the evening than midday;
- Some parks were more popular during the weekends than the weekdays, others registered similar visitation rates during weekend or weekday use, with the lowest observed park use occurring during weekend midday;
- The density of users changed significantly if stationary uses (e.g. sitting, eating and playing) and passing-through park uses (e.g. walking and cycling) were separated;
- The overall density comparison resulted to be affected by the size of the park. So, in some cases, density was low overall but high in concentrated areas.

Various surveys were conducted in Toronto among park users in the period 2011-2015. Their results are summarized in the TOcore report (2016) as following:

- 90% felt that parks are important to their quality of life;
- Almost 90% visited parks at least once a week (26% every day; 25% 4 or more times/

week; 28% 2-4 times/week; 10% once a week);

- Preferred activities: passive uses, walking, enjoying green space and nature;
- Preferred features: trees, naturalized areas and walkways;
- Most frequent activities: enjoy nature, use walkways and trails, use sports fields.

Results from the TOcore report (2016) are particularly significant for this thesis, especially because they refer to the same (Canadian) context and because the research methodology is comparable. Similarities and differences will be evaluated in the discussion of results included in Chapter 8, *Case Studies*.

The research conducted by Marshall and Corkery (2011) in Australia, instead, showed different results, especially in relation to frequency of visits. In fact, data collected through face to face questionnaires reported that only 50% of respondents visited a park at least once per week (compared to 90% of respondents in Toronto, as reported by TOcore, 2016). In particular, frequency of use appeared to be associated with household size, showing that larger households (especially families with children) visited parks more frequently than smaller households.

Research from Denmark (Peschardt, Schipperijn and Stigsdotter, 2012), instead, showed various similarities with the study presented in this thesis, conducting observations and onsite questionnaires in nine urban parks in Copenhagen. The most relevant findings can be summarized as following:

- Visitation rates reported that well educated people between the ages of 30 and 49 were over-represented users in comparison with the general population. Moreover, data showed that park users rarely had access to a private garden and also visited other green areas frequently;
- Analysis of preferred activities reported that most common reasons for visiting urban parks were 'socialising' (30.6%) and 'rest and restitution' (31.2%), with younger people more likely to visit parks to socialize and older people for rest and restitution;

Considering the type of exposure (specifically duration and frequency of visits) it emerged that most respondents' visits (74.3%) lasted for 15–60 min; in particular, people who went to the park to socialize spent more time in the park than those who went for 'rest and restitution'. Moreover, a positive relationship was identified between distance from home and frequency of use. However, other factors (such as different trajectories) were influential. In particular, activities such as 'walking the dog' and 'going to the playground' were typically carried out 'coming from home and going home', while others, such as 'rest and restitution' were often 'en route' or 'on the way home'.

6.1.1. Preferred activities

As already mentioned (see Paragraph 6.1.1.1, *Social interaction indicator*), according to Gehl (1987) people engage in three types of activities in public spaces: 'necessary activities' (to pass through, to walk the dog, etc.), 'optional activities' (to relax, to get fresh air, to walk, jog, run, etc.) and 'social activities' (to meet friends, to play sports, etc.). Moreover, the quality of the surroundings affects the occurrence and duration of the activities. In this regard, Kaźmierczak (2013) added that in urban parks:

- Necessary activities occur irrespective of the conditions of the surroundings. However,
 in high-quality spaces they tend to last longer;
- Optional activities are pursued only when the surroundings are considered attractive;
- Social activities result from necessary and optional activities and depend on the presence of others.

Rung et al. (2011), instead, proposed a different classification, identifying three different types of activities, depending on the level of physical activity:

- Sedentary activity (i.e. lying down, sitting, or standing);
- Moderate activity (i.e. walking at a casual pace);

- Vigorous activity (i.e. jogging, swinging).

Various studies further examined the occurrence of determined activities in urban parks, in order to identify the relationship between preferred activities, supporting features and perceived benefits of urban parks.

Chiesura (2004), for example, investigated the perceived benefits of urban nature through a survey conducted among visitors of an urban park in Amsterdam. Respondents were given a series of possible choices to answer the question "Why do you come here?". The most frequent answers and implicit motives are summarized below:

- "To relax" (73%), assuming that the silent and timeless atmosphere of natural environments help people to forget the daily worries, breathe fresh air and relax, both mentally and physically;
- "To be in nature" (54.4%), assuming that people have a natural need to feel nature around, to observe its elements, and experience them through the senses (i.e. smell, hearing, and sight);
- "To escape from the city" (32.2%), assuming that the park is a sort of "oasis", a refuge from the traffic, the noise and the pollution of the city;
- "To be with the children" (20%), assuming that, providing a safe place to play, parks fulfill important social functions, strengthening family ties;
- "To contemplate and meditate" (17.9%), "To walk the dog" (14.8), and "To get artistic inspiration" (7%), assuming that parks offer a place to be on your own and experience solitude;
- "To meet others" (11.8%), "To sport" (10.7%), assuming, on the contrary, that parks can be place for social activities and encounters.

These results suggest that, among visitors of urban parks in the Netherlands, optional

activities are a much more common reason for visiting than social activities.

Cohen et al. (2007), instead, analyzed eight urban parks in Los Angeles, evaluating preferred activities in low income, minority neighborhoods. Data were collected through observations and interviews and suggested that social activities were preferred. In fact, two thirds of the individuals were observed while engaging in sedentary activities, with the most common being sitting or picnicking (22%), followed by playing basketball (15%), being a spectator of organized sports (13%), playing soccer (9%), and using the playground (8%). However, it should be noted that the scope of the research was directed at identifying the contribution of urban parks to physical activity. As such, attention was directed to the classification of various activities through intensity levels (sedentary, moderate and vigorous). Therefore, the importance of optional activities may have been overlooked.

Other studies analyzed park use in order to identify preferred activities among people from different cultural background. In particular, many studies in the US focused on the differences between African Americans (Blacks) and Caucasians (Whites) and analyzed how differences in landscape preferences affect the actual use of urban parks (Gobster, 2002; Elmendorf et al., 2005a; Elmendorf et al., 2005b).

Results showed that Blacks, more than Whites, prefer developed facilities and services, while Whites are more likely to prefer undeveloped and more nature-based settings. These differences are then reflected on visitation patterns and preferred activities. In fact, Blacks are more likely to visit parks in large groups, while Whites alone or as couples; Blacks prefer group activities and activities involving social interaction such as team sports, picnicking, talking and socializing; Whites instead prefer nature-based or solitary activities, such as individual sports, walking and jogging. Elmendorf et al. (2005a), in particular, argued that "social motives may drive African Americans more than Whites in urban park and forest use. This was seen in African Americans' preferences for socially developed landscapes, group activities, and their willingness to volunteer" (p. 324). Ho et al. (2005), however, extended the analysis to people from other cultural backgrounds (African American, Hispanic/Latino,

Chinese, Japanese and Korean) and concluded that "[f]or all the ethnicities, visiting parks was largely a social rather than a solitary activity" (p. 302).

Moving to the European context, Ward Thompson and Aspinall (2011) examined preferred park activities among Black and Minority Ethnic groups (BME) living in the UK and concluded that minorities rated social uses, such as shared outdoor meals and entertainment, higher than white British respondents. Indian respondents, in particular, were most likely to go to a park for a family outing or to take the children/grandchildren out, and to value a good playground. Nonetheless, Indian respondents also showed appreciation for a variety of optional activities such as relaxing and enjoying the peace and quiet of green space. This appreciation was shared with white British, while Bangladeshi respondents were least likely to value this quality. Finally, Indian respondents also showed high interest in performing physical activity, followed by white British.

Peters, Elands and Buijs (2010), instead, investigated differences in preferred park activities between native Dutch people and non-Western migrants in the Netherlands. Results showed similarities with Ward Thompson and Aspinall (2011), reporting that all activities were important to both groups of people. However, the activities 'having a picnic or a barbecue' and 'meeting other people' resulted to be much more important to non-Western migrants than to native Dutch people, while 'walking' and 'cycling' were more or less equally important to both groups. Interestingly, differences between first-and second-generation immigrants were not statistically significant.

6.1.2. Preferred features

An interesting analysis of the associations between the presence of certain park features and the actual use and perceived benefits of urban parks was undertaken by Bedimo-Rung, Mowen, and Cohen (2005). The authors, in fact, developed a conceptual framework to guide the analysis of the complex relationships between use and benefits of urban parks, and identified the important role that park features play. In particular, they noted that different features promote different uses (sports fields attract sports team, natural areas induce passive contemplation of nature, and so on). Moreover, they argued that "[p]eople are attracted to parks so that they may partake in specific behaviors and realize certain benefits, and the presence or absence of a variety of park attributes can be an important determinant" (p. 164).

Accepting the definition proposed by Bedimo-Rung, Mowen, and Cohen (2005), the term 'park features', includes:

- Physical facilities that are available to users, such as tennis courts, picnic tables, or security lighting;
- Programs or activities that take place within a park setting, including scheduled programs (recreation programs, after-school activities for children, etc.) and one-time events (concerts, races, etc.);
- Diversity, that is the variety of purposes that characterize the park at different times of the day, week, and year.

Moreover, Kaczynski, Potwarka and Saelens (2008) argue that features can be categorized as either 'facilities' or 'amenities', where:

- Facilities are features of parks that are primary settings for physical activity (e.g., paved trail, unpaved trail, path, open space, wooded area, meadow, water area, playground, ball diamond, soccer pitch, tennis court, basketball court, and pool);
- Amenities are features of parks that might support opportunities for physical activity (e.g., drinking fountain, picnic area, restroom, table, bench, trash can, shelter or pavilion, historical or educational feature, landscaping, bike rack, parking lot, rules sign, sidewalk adjacent, roadway through, and having more than 1 entrance).

Methodologically, in order to understand the role that certain features have in affecting

the use and benefits of urban parks, Bedimo-Rung, Mowen, and Cohen (2005) recommend cataloging the features that are actually present, arguing that later studies can then assess relationships between certain activities and specific features. Francis et al. (2012a) adopted this approach in their study investigating the importance of urban parks for social relations and created an 'amenities score', which reflected the presence of amenities conducive to social interaction, such as barbecues, seating, picnic tables, rubbish bins, club rooms, toilets and public art.

In addition to that, Bedimo-Rung, Mowen, and Cohen (2005) argue that the condition of the features should be investigated, with particular attention to the safety of the equipment. In fact, lack of maintenance or misuse of park features can impact people's perception of safety within the parks, and consequently affect their use and perception of benefits.

Several studies investigated the relationship between the presence of certain features and the physical activity levels in urban parks. McCormack et al. (2010), for example, conducted a review of the evidence investigating the relationship between urban parks and physical activity and concluded that several features influence park use. Park visits, for example, were encouraged by the presence of features that facilitated both structured (sports fields, courts) and unstructured (paths, trails) physical activity. Moreover, the provision of amenities such as water fountains and washrooms was associated to longer periods of use. Nonetheless, some differences could be identified in relation to the specific necessities of certain groups. Caregivers and children for example, mentioned the importance of safe and age appropriate play equipment, while dog owners appreciated the presence of dog litter bins and bags and dog-specific agility equipment. However, park amenities such as barbecues, seating, water fountains, picnic tables, and bathrooms appeared to be important regardless of age and type of users.

Similar results were confirmed by several studies conducted in the US. Cohen et al. (2007), for example, argued that in Los Angeles people were more likely to be engaged in walking and vigorous activity when facilities such as multipurpose fields, volleyball courts, tennis courts,

basketball courts and playgrounds were present. Furthermore, results suggested that the availability of structured, supervised activities was associated with increased use. Rung et al. (2011), instead, analyzed a series of neighbourhood parks in New Orleans in order to identify how many people were engaged in various types of activities (sedentary, moderate or vigorous). Results reported that basketball courts had the highest mean number of park users, followed by sports fields, playgrounds and green space. Supporting features such as shelters, drinking fountains and benches also appeared to attract visitors. However, different types of supporting features were associated with different activities: drinking fountains, for example, were associated with more vigorous activities, while benches and picnic tables were associated with more sedentary activities. Analysis of feature condition also provided interesting insights, suggesting that there may be a minimal condition necessary for attracting visitors. Once that minimum was met and people were present, however, better conditions did not seem to improve physical activity levels.

In a Canadian study, Kaczynski, Potwarka and Saelens (2008) obtained a slightly different result, arguing that it is the number of features (more than the type of features) that influenced physical activity in urban parks. The research was developed in a medium-sized city in Ontario and focused on the presence or absence of 28 specific features (13 facilities and 15 amenities). Results showed that the number of features was the most significant predictor of the use of a park for physical activity. Among those features, paved trail, unpaved trail and wooded areas showed the strongest association with physical activity.

Other studies focused on the relationship between certain park features and preferred use by ethnic minorities. Ho et al. (2005), for example, examined the associations between ethnic and gender differences and urban park preferences in Atlanta, Georgia and Philadelphia, Pennsylvania. Their results suggested that African Americans and Hispanics gave the highest importance ratings to the presence of recreational facilities, followed by the Koreans, the Chinese and Whites and, lastly, the Japanese.

Tinsley, Tinsley and Croskeys (2002), instead, investigated the relationship between cultural

background and leisure behavior, conducting interviews among visitors of Lincoln Park in Chicago. Differences among the ethnic groups were observed in the use of several park features. The African-American and Caucasian park users, for instance, were more likely than the Hispanic and Asian park users to report enjoying the natural features of the park, such as trees, flower gardens and beaches. In particular, the Caucasian visitors were more likely than the Asian visitors to use the water and lakefront. Furthermore, the Caucasian park users were significantly more likely than the other three groups to use the bicycle and footpaths. The Hispanic visitors, on the other hand, were the most frequent users of the parking facilities, restrooms and concession stands. Conclusions reported that the evidence associating park features preferences with ethnic heritage was not strong enough to exclude other possible explanations. However, it was hypothesized that some characteristics of the ethnic heritage could affect the use of certain park features indirectly. For example, Hispanic and Asian participants visited the park as members of large groups much more frequently than Caucasian and African American park users and this may be a reason for their greater need of parking facilities, restrooms and concession stands.

6.2. Social interactions in urban parks

Referring to previous research, Boone et al. (2009) effectively synthetized various ways in which social relations are enhanced by the presence and use of urban parks:

- People who live near parks benefit from access to public space and opportunities for social interaction;
- Strength of social ties and sense of security are typically greater in neighborhoods with public parks;
- More than a recreation space, parks serve the critical functions of providing public space and a right to the city;
- As public places in highly privatized urban areas, parks provide opportunities for:
 - social and community engagement;
 - linger or loiter or express civil disobedience;

 a refuge for the homeless from increasingly fortified and monitored urban spaces.

This analysis effectively captures various characteristics of social relations in urban parks and provides a good overview, but also clearly shows its environmental justice perspective. For example, the use of term 'civil disobedience' may be too extreme. Other studies (Peters, Elands and Buijs, 2010) more appropriately referred to the term 'civil inattention' (that is the respect of other people's personal boundaries in public places), arguing that urban parks are privileged spaces where 'civil inattention' can be breached and social interactions can occur.

Many studies, however, investigated the theme further, offering relevant insights for the analysis of the relationships between urban parks and social relations. Kaźmierczak (2013), for example, analyzed the contribution of local parks to neighbourhood social ties in Greater Manchester, UK. Two types of ties were considered: weak (superficial acquaintanceships, i.e. people recognized and greeted in the neighbourhoods) and strong ties (friendships). Results showed that, due to their role as recreational spaces, parks attract visitors and, offering opportunities for repeated contact, promote new social ties or strengthen the existing ones. Duration and character of visits appeared to be more important in developing social ties than frequency of use. In fact, adopting the definition proposed by Gehl (1987) optional activities, such as spending time with children and family, that typically last longer, were found to be much more conducive to developing social ties than short necessary activities, such as simply walking through. External factors such as length of residence in the area and characteristics of the neighbourhood were also found to play an important role.

Other studies focused on the role of urban parks in promoting interactions between people from different socio-economic status or ethnic background. Gobster (1998), for example, examined the role of 'boundary parks' (parks located between two different communities) as 'green walls' or 'green magnets'. The study tested the thesis supported by previous research that boundary parks become barriers to use and appreciation and compared different parks in the Chicago area. Results showed that parks that are perceived as a safe environment with attractive opportunities can act as catalysts instead of barriers. In fact, leisure activities attract different groups of people and allow for contact and interaction to take place, consequently improving interracial and ethnic relations.

Similar results were confirmed by Peters, Elands and Buijs (2010) who argued that

"[g]reen areas may provide opportunities par excellence for exchange between ethnic communities, as members of these communities can visit them, meet other people and enjoy the area, while remaining anonymous in the world of strangers" (p. 93).

The study specifically examined the role of urban parks in stimulating social cohesion, investigating differences between native Dutch people and non-Western migrants. Results showed that both groups valued the opportunity for social interaction that urban parks offer and saw them as places where they wanted to spend time with their friends and family and to meet other people. However, as reported, in most cases meeting 'other people' meant meeting people they already knew and that going to the park to meet strangers was not one of the main motivations. On the contrary, most of the visitors used the park as a kind of back garden. Results from observations, however, reported that social interactions did occur and were valued, even if they were rather short and mostly the result of triangulation. In fact, they were usually related to either specific issues (such as children and dogs) or to everyday issues, like the weather. The main difference between the two groups was observed when asked about the opportunity of having more social interactions within the park. In fact, while some non-Western migrants expressed their whish to have more social interactions, native Dutch people did not.

Krellenberg, Welz and Reyes-Päcke (2014), instead, examined patterns of use of green spaces in socio-economic diverse neighbourhoods in the Metropolitan Area of Santiago del Chile. Their assumption was that urban parks attract a diverse clientele and therefore play a potential role for the spatial interaction of diverse groups. When different socio-economic groups share the same spaces, then social interaction can potentially occur. Results showed that some urban parks did attract people from diverse socio-economic background. However, 70% of households affirmed to travel more than 900 m to visit their green space of choice, disproving the general assumption that people use the nearest one. Moreover, more affluent families were recorded to use public green spaces the least, so in some parks opportunities of interactions were minimal. Whilst providing interesting insights and a different geographical perspective, this study, however, did not consider actual social interactions, but rather the role of spatial interaction as a precondition of social interaction.

In this regard, the study conducted by Cattell et al. (2008) in a multi-ethnic area of East London provided a comprehensive analysis of how social interactions in public spaces do occur. In particular, they argued that some pre-requisites are necessary for casual social exchanges in public spaces to take place, such as: familiarity with spaces, regular use, positive perceptions of the area, feeling comfortable with fellow users, and the endurance of a space over time. Results from discussion groups, observations and interviews showed that opportunities for social interaction can be generated and supported in different ways:

- Simple gestures such as nods and smiles are reassuring they provide a 'feel good effect' that can establish the basis for future, closer contact;
- Routine and regular social encounters can help to maintain loose ties between neighbours and familiar strangers; at the same time, they can provide the first step towards friendships;
- The impression that 'everybody knows everybody else' enhances sense of safety and increases opportunities for sensitive groups (such as the elderly) to spend time outdoor.

Considering the role of urban parks in particular, results suggested that, when parks were used on a frequent basis, for cut-through routes to somewhere else or for routine activities like walking a dog, people appeared to be more likely to acknowledge their everyday encounters with others. Furthermore, the role of urban parks in enhancing opportunities for social interactions appeared to be stronger for certain groups of people, such as youths and parents with small children. In fact, parks were mostly perceived in terms of the facilities they offered and the activities that were conducted there. As such, parks were considered as informal places for meeting peers or were associated with family trips.

Nonetheless, according to Cattell et al. (2008), urban parks cannot be simply considered as containers of activities. On the contrary, being places for social interactions, they assume symbolic meanings that accumulate over time, providing sense of security, identity, and a sense of place. As such, social interaction in public spaces is thought to "provide relief from daily routines, sustenance for people's sense of community, opportunities for sustaining bonding ties or making bridges, and can have a direct influence on wellbeing by raising people's spirits" (p. 552).

Similar results were reported by Francis et al. (2012), which investigated the role of urban parks in creating sense of community in the Perth metropolitan area, Australia. Results, in fact, suggested that urban parks can promote sense of community; more specifically, perceived (emotive, subjective) quality of parks, such as perceived friendliness and safety, was more strongly associated with sense of community than objective attributes, such as water features or birdlife.

6.2.1. Differences by age group

Generally, it is argued that perception of safety is an important precondition for older people to spend time outdoors (Alves et al., 2008; Cattell et al., 2008). For that to happen, neighbourhood environments must be 'supportive', (Ward Thompson, 2007), meaning that they need certain attributes that are specifically valued by sensitive groups, such as the elderly, to support meaningful experiences.

Results reported by Newton, Burton and Ward-Thompson (2007) from their research in Britain, however, showed that older people go out into their local neighbourhood very frequently, regardless of the season, mostly walking. Interestingly, the first reason given for going out was socializing, followed by getting physical exercise, enjoying fresh air and contact with nature.

As such, neighbourhood urban parks seem to be privileged spaces where older people can fulfill their needs. In this regard, Sugiyama and Ward Thompson (2008) investigated what characteristics of urban parks are supportive to certain uses among older people. Their research was intended to investigate the relationship between park characteristics and walking, but results provide insights for some broader considerations. In particular, results suggested that the 'pleasantness' factor, providing a welcoming and relaxing atmosphere, was associated to longer recreational walking, but also to the opportunity of chatting with other people. Therefore, attractiveness of urban parks appeared to be associated with better opportunities for social interaction with friends and neighbours.

Alves et al. (2008), moreover, reported that older people are more likely to visit urban parks if they are free from nuisance (youngsters hanging around, dog fouling, signs of vandalism), have facilities such as a cafe and toilets, have natural elements like trees and plants, and provide entertaining views or things to watch. Cohen et al. (2007), instead, observed that few seniors use urban parks; however, visitation rates increase when special programs or incentives for seniors are in place.

In this regard, it is interesting to note that Sugiyama and Ward Thompson (2008) observed that the presence of playgrounds in urban parks was an attractive feature for the elderly. According to the authors, this may be related to the fact that older people are frequently caregivers for children. Similar results were confirmed also by Chiesura (2004), who argued that some general differences can be identified in relation to age, when considering preferred activities in urban parks. In particular, sporting and meeting other people resulted to be preferred by the youngest age-categories, while the other motives and activities (relax, stay with children and contemplating nature) were preferred by adult and elderly visitors. This is particularly significant, since research has argued that spending time with children at the playground is associated with increased opportunities of social interaction; in turn, social interactions – and consequent social cohesion or sense of community – are associated with increased sense of wellbeing, especially for the elderly (Cattell et al. 2008; Francis et al., 2012a; Maas, 2009b; Peters, Elands and Buijs, 2010).

Nonetheless, use of urban green spaces by different age groups is not straightforward. Ward Thompson et al. (2005), for example, analyzing woodland use in Scotland, argued that "[p] atterns of perception and woodland use in relation to age are not what might be predicted from the literature" (p. 142), reporting that younger people associate more fearful perceptions to woodlands than the older age groups (45-54 years of age and over 65). According to the authors, this may depend on the increasing experience of, and interest in, the natural environment which increases with age, or, on the contrary, with the fact that older people had more contact with, and understanding of, woodlands when young.

In this regard, the role of the 'childhood experience' is paramount. Ward Thompson et al. (2004), for example, argued that the childhood experience, that is the frequency of visits to woodlands during childhood, is the single most important predictor of how often people visit woodlands as adults. Moreover, as reported by Ward Thompson, Aspinall and Montarzino (2008), exposure to nature during childhood improves children's physiological and psychological development and also predict their positive environmental attitudes in adulthood. In fact, frequency of childhood visits is associated with aspects of healthy activity, emotional engagement with natural or green places, ease of access, and confidence to visit places alone.

6.2.2. Differences by cultural background

As seen above, repeated contact with neighbours and acquaintances in urban parks are thought to promote social interactions (Kaźmierczak, 2013; Konijnendijk et al., 2013) and consequently enhance social cohesion, or sense of community (Cattell et al., 2008; Francis et al., 2012; Peters, Elands and Buijs, 2010; Sullivan, Kuo and DePooter, 2004). Furthermore,

the preference for some activities or park facilities has been associated with increased opportunities for social interaction (Cattell et al. 2008; Chiesura, 2004; Francis et al., 2012a; Peters, Elands and Buijs, 2010). However, as already highlighted, differences between people from different ethnic background can be identified.

In this regard, many studies (Ho et al., 2005; Peters, Elands and Buijs, 2010; Tinsley, Tinsley and Croskeys, 2002) argued that distinctive cultural differences (namely more individualistic or collectivistic) may be responsible for, or partly influence, activity patterns in urban parks, and consequently variously affect opportunities for social interactions. Tinsley, Tinsley and Croskeys (2002), in particular, examined the theme in detail, investigating the most relevant ethnic influences that emerged from their research.

Comparing different attitudes between Blacks and Whites, Tinsley, Tinsley and Croskeys (2002) argued that North American culture is generally recognized as highly individualistic. However, whilst the Caucasian culture emphasizes the 'rugged individual', the African-American culture expresses the same individualism differently, emphasizing the development and maintenance of small groups of close friends.

The same difference could be observed in the results of their research, showing that African-American park users were more likely to visit the park with their friends, while Caucasians were more likely to use the park alone or with a member of their immediate family. Neither group visited the park with an extended family group or with an organized group. In fact, even if the two groups affirmed to gain different benefits from the use of urban parks (African Americans cited 'pleasure seeking and personal self-enhancement', while Caucasians 'exercise'), however, both groups' preferred benefits reflected a focus on the individual.

On the contrary, Hispanic and Asian culture are considered collectivist, because of the greater emphasis given to the family unit in Hispanic culture and the importance of larger social organizations in Asian culture. These cultural characteristics are also reflected in the use of urban parks and in the perception of their benefits. In fact, results from Tinsley, Tinsley and Croskeys (2002) reported that Hispanic and Asian park users were most likely to visit the park with their extended family or with an organization. Moreover, Asians were the least likely to visit the park alone. These cultural inclinations were then reflected on their perceived benefits, with both Asian and Hispanic park users rating 'satisfaction of the need for affiliation' very highly.

Similar results were reported also by Peters, Elands and Buijs (2010) in their research in the Netherlands. In that case, with the term 'non-Western migrants' people from Turkey, Morocco, Suriname, the Dutch Antilles or Aruba were identified. Results showed that non-Western migrants were most likely to visit urban parks in groups, whereas native Dutch people tended to visit in small groups, as couples or alone. Also in this study, such difference was explained by the fact that non-Western migrants (especially Muslims) put more value on their family ties than native Dutch people, showing a collectivistic leisure behavior.

In sum, according to these studies, preferences for certain features or activities in urban parks are influenced by cultural background. In turn, different uses offer different opportunities for social interactions. In general, results showed that ethnic minorities appear to be more willing to pursue social activities in urban parks and are more open to social interactions than the White majority. Peters, Elands and Buijs (2010), however, reported that ethnic minorities don't feel comfortable in taking the initiative themselves.

PART 3

CASE STUDIES

7. CASE STUDIES – RESEARCH METHODOLOGY

The most relevant findings emerged from the literature review, as described in the previous chapters, were tested on two case studies located in two distinct neighbourhoods in Vancouver, BC. This chapter contains an analysis of the reasons for choosing the selected case studies (neighbourhoods and urban parks) and the research methodology adopted.

7.1. Selection of case studies

Two neighbourhood case studies in Vancouver, BC were selected and analyzed:

Strathcona

One of the oldest neighbourhoods of the city and one of the most culturally and economically diverse. It includes the historic Chinatown and it is adjacent to the problematic Downtown Eastside. It is characterized by an older population, mainly of Asian descent, but moderate real estate prices currently attract a new generation of younger and varied inhabitants.

- Mount Pleasant

A vast neighborhood, characterized by a much younger and multicultural community. In particular, the area called South East False Creek, whose core is the 2010 Olympic Village, is a new development, that was designed as a leading model for its use of efficient energy solutions, high performance green buildings and easy access to transit. It is a mixed-use community for a total population of 11,000-13,000 people, planned to be completed in 2020.

The selection of two neighbourhoods with contrasting characteristics offers the opportunity of evaluating the role of urban parks in different socio-economic contexts. Moreover, the role of urban parks as potential places for social interaction may differ when considering a well-established neighbourhood in comparison with a new development (Quayle and Driessen van

der Lieck, 1997; Sullivan, Kuo and DePooter, 2004). In the first case, it is assumed that urban parks can act as a central core of the community, where sensitive groups can find support and build social capital (Kweon, Sullivan and Wiley, 1998; Sugiyama and Ward Thompson, 2007). In the second case, it is assumed that repeated contact can generate a sense of familiarity and thereby contribute in creating a sense of community (Cattell et al., 2008; Kaźmierczak, 2013).

Moreover, differences in the landscape structure of a neighbourhood (Crow, Brown and De Young, 2006; Kaplan, Austin and Kaplan, 2004; Kim and Kaplan, 2004) can affect the general perception of nature. In fact, previous research argued that everyday exposure to 'nearby nature' influences the perception of the benefits that urban parks provide (Crow, Brown and De Young, 2006; Matsuoka and Kaplan, 2008). Therefore, older neighbourhoods, characterized by more mature street trees and private gardens, provide a different type of 'nearby nature' than newer neighbourhoods, where the trees and gardens are still underdeveloped (Quayle and Driessen van der Lieck, 1997; Sullivan, Kuo and DePooter, 2004). As a consequence, depending on their characteristics, perceived benefits of urban parks may vary considerably from one neighbourhood to another. In this regard, an explorative survey was conducted in April, 2016 with the objective of verifying the various types of exposure to green spaces that residents experience in each of the two Vancouver neighbourhoods. Results from the survey are explored in the following discussion of results (see Chapter 8, *Case Studies* for further details).

Furthermore, differences between the two neighbourhood case studies were analyzed from a socio-demographic perspective, considering official data from the Vancouver Census (2011). In particular, three sets of data were considered:

- Total population by age groups (Children, Youth, Adults, Seniors);
- Total population by mother tongue (proxy for cultural background);
- Total number of occupied dwellings by type.

The first two indicators were collected in order to obtain information about different cultural background and age groups characterizing the neighbourhood population. The third indicator, instead, was intended to verify whether a relationship exists between type of dwelling (single house with private garden vs high rise apartment) and perception and use of green spaces by the respective residents. It should be noted that complete 2017 data from the Canada Census are not available yet and therefore that used in this thesis refers to data from the 2011 Census.

A summary of the most relevant data is reported in Table 1, *Demographic data per neighbourhood* below, which includes information about the two neigbourhoods in comparison with the overall city.

	STRATHCONA		MOUNT PLEASANT		VANCOUVER CITY	
TOT POPULATION	12,165	%	26,400	%	603,500	%
CHILDREN (0 to 14 years)	1,010	8.30%	2,505	9.49%	71,340	11.82%
YOUTH (15 to 24 years)	895	7.36%	2,385	9.03%	73,380	12.16%
ADULTS (25 to 64 years)	7,500	61.65%	19,490	73.83%	376,845	62.44%
SENIORS (65 years and over)	2,750	22.61%	2,025	7.67%	81,930	13.58%
MOTHER TONGUE*	10,705	%	26,150	%	595,720	%
ENGLISH	5,400	50.44%	17,835	68.2%	299,285	50.24%
FRENCH	245	2.29%	550	2.10%	8,905	1.49%
ABORIGINAL LANGUAGES	55	0.51%	30	0.11%	325	0.05%
ASIAN LANGUAGES	4,145	38.72%	5,060	19.35%	223,230	37.47%
EUROPEAN LANGUAGES	515	4.81%	1,795	6.86%	43,650	7.32%
AFRICAN LANGUAGES	85	0.79%	100	0.38%	1,275	0.21%
OTHER LANGUAGES	25	0.23%	115	0.44%	2,015	0.34%
BILINGUAL	235	2.20%	665	2.54%	17,035	2.86%
PRIVATE DWELLINGS	5,320	%	14,575	%	264,570	%
APARTMENT (<5 STOREYS)	2,295	43.14%	10,070	69.09%	87,425	33.04%
APARTMENT (5+ STOREYS)	1,935	36.37%	2,340	16.05%	70,265	26.56%
SINGLE-DETACHED HOUSE	340	6.39%	400	2.74%	47,535	17.97%
APARTMENT, DUPLEX	330	6.20%	1,170	8.03%	45,845	17.33%
ROW HOUSE	285	5.36%	220	1.51%	9,045	3.42%
OTHER DWELLING	135	2.54%	375	2.57%	4,455	1.68%

 TABLE 1 - DEMOGRAPHIC DATA PER NEIGHBOURHOOD (CENSUS 2011)

* Total population excluding institutional residents

Some important characteristics emerge from the analysis of the Census data:

- Compared to the city's overall population, Strathcona is an older neighbourhood (22.61% of residents are over 65 years of age), while Mount Pleasant is a younger neighbourhood (only 7.67% of residents are over 65);
- Strathcona well represents the multicultural nature of the city, showing the presence of all ethnic minorities with percentage rates that are consistent with the overall city. Only exceptions are European residents (underrepresented) and Aboriginal residents (overrepresented). These data, however, are consistent with the historic distribution of inhabitants within the city (City of Vancouver, 2013). In Mount Pleasant, by contrast, the percentage of people speaking English as first language is considerably higher than in the overall city (68.2% compared to 50.24% in Vancouver) and the percentage of people speaking Asian languages is proportionally lower (19.35% compared to 37.47% in the city).
- Single detached houses are not very common in both neighbourhoods. In particular, in Mount Pleasant, they account for only 2.74% of the total and most people live in apartments (85.71% in Stathcona and 93.17% in Mount Pleasant).

Demographic data were also collected through observations (estimated age and ethnicity) and questionnaires (age, mother tongue, time spent in Canada, type of dwelling), with the objective of building comparable data sets and ultimately being able to find associations between neighbourhood characteristics and park users' characteristics. The findings are discussed in the following discussion of results.

After the neighbourhood case studies were identified and analyzed, one urban park was selected in each neighbourhood:

- Mac Lean Park in Strathcona
- Hinge Park in Mount Pleasant.

The two urban park case studies were selected with the objective of evaluating similarities and differences in how they are used and their value is perceived. The two urban parks were selected for their central role within the respective communities and for their comparable characteristics (see Table 2, *Comparison between the two urban park case studies* below).

The selected case studies were analyzed through a combination of two research methods:

- Observations | July/September 2016

Visitors of the two urban parks were observed through 'on site' observations whose results were recorded on charts and contextualized on maps.

Questionnaires | October/December 2016

Visitors of the two urban parks or people passing by in close proximity were informed about the research and, if interested, asked to fill in a questionnaire.

A detailed analysis of the two research methodologies adopted is conducted in the following paragraphs.

TABLE 2 – COMPARISON BETWEEN THE TWO URBAN PARK CASE STUDIES

MAC LEAN PARK (STRATHCONA)	HINGE PARK (MOUNT PLEASANT)			
AREA: 1.21 hectares	AREA: 0.95 hectares			
GRASS AREAS	GRASS AREAS			
BENCHES-PICNIC TABLES	BENCHES-PICNIC TABLES			
PLAYGROUND W/WATER FEATURES water and spray park	PLAYGROUND W/WATER FEATURES water pump with metal runnels			
NATURAL FEATURES sweetgum trees	NATURAL FEATURES rainwater wetland with native plants			
RESIDENTIAL HOUSING FACING THE PARK	RESIDENTIAL HOUSING FACING THE PARK			
7.2. Observation methodology

Observations have been used as a common research method in a number of previous studies exploring the role of green spaces in improving social relations. Coley, Kuo, and Sullivan (1997), for example, conducted so-called 'observational walks-ins', meaning that researchers recorded data while passing through the observed open spaces. Similarly, Sullivan, Kuo and DePooter (2004) conducted observations following a predefined route and recorded data on a table sheet and a map. The combination of data and mapping is considered a valuable methodology. Goličnik and Ward Thompson (2010), for example, underlined "the value of observational methods in environment-behaviour research for gaining insight into research questions and problems ... [identifying] the purpose of behavioural mapping in locating behaviour on the map itself to identify kinds and frequencies of behaviour and to demonstrate their association with particular sites" (p 38).

Another example was provided by Peters, Elands and Buijs (2010), who adopted an integrated methodology which also included observations in urban parks. This is particularly pertinent to the scope of this thesis, because social interactions between people from different ethnic background were also investigated. In this regard, the study provided a number of valuable insights, suggesting that observations should evaluate three main factors:

- what social groups were present;
- with whom and where people spent their time;
- if interactions happened, with whom.

The analysis of the various methodologies adopted in similar studies provided an important contribution to the definition of the research strategy for the current study. However, the most relevant support to the design of the research methodology was provided by the results from the ongoing research in the study of public life conducted by Jan Gehl since the 1980s. In particular, the observation strategy adopted in this research was built in accordance with the methodological framework described in Gehl et al. (2013).

Considering the specific characteristics of the selected case studies and the objectives of the research, the following recommendations were accepted:

- Observations should be conducted during both weekdays and weekends, because use of urban parks may vary;
- Observations should be conducted during good weather because it is a precondition for stationary activities;
- In residential areas and in presence of a playground, the afternoon is the best period of the day to conduct observations;
- Observations should be conducted adopting various tools. In this case, a combination of Counting & Mapping (conducted simultaneously) and Tracing was selected:
 - Counting: data were registered on a chart with the objective of collecting various information that could be utilized for making comparisons during data analysis;
 - Mapping: information was reported on a map, in order to draw a picture of a certain moment in a given place;
 - Tracing: people's movements were drawn on a map, in order to understand preferred trajectories and general use of the area.

During site visits, observations were conducted as represented in Table 3, *Observation* sessions - schedule below:

TABLE 3 – OBSERVATION SESSIONS - SCHEDULE

COUNTING & MAPPING #1	TIME VARIED
TRACING #1	10 minutes
COUNTING & MAPPING #2	10 minutes
TRACING #2	10 minutes
COUNTING & MAPPING #3	10 minutes
TRACING #3	10 minutes
	·

During the first Counting & Mapping session, a complete representation of the initial situation was conducted. This means that every person that was present in the park at that time was registered. So, depending on the number of persons engaged in stationary activities, the duration of this phase could vary from a minimum of 10 minutes to a maximum of one hour or more. During the following Counting & Mapping sessions, any change occurred in a 10-minute period was registered (persons arriving, leaving or passing through). During every session of Counting & Mapping, each person was classified on a chart considering:

- Group composition (number of persons, gender, age group);
- Ethnicity (Asian Caucasian, African, Aboriginal);
- Activity (Walking, Walking the dog, Standing, Sitting, Lying, Playing, Running, Cycling);
- Social Interactions (Casual Interactions or Scheduled interactions).

Each group and each person were assigned a number which was reported on a map, thereby making it possible to identify where the activities took place. Moreover, through the number attributed to each person, it was possible to identify among whom every instance of interaction took place (gender, age group, ethnicity, activity), and where (see Appendix 1 for a facsimile).

In particular, during observations, two typical forms of social interactions were identified:

- Casual interactions:

Interactions involving people who did not have any previous relationship or just superficial acquaintanceship. Typically, they occurred between caregivers supervising children at the playground or between people walking their dog. Generally, they consisted in brief greetings or small talk.

- Scheduled interactions:

Interactions between people who had a previous relationship with each other, such as family or friends. Typically, they consisted in two or more people meeting at the park to do some activity. In some cases, activities were structured (such as soccer classes, activities for children, barbecues organized by the community centre, etc.); in other cases, they were private gatherings for families or friends. Generally, they consisted in various activities (such as sitting/standing/laying down, talking, eating, playing, etc.) and lasted for a long time (often hours).

A Tracing session was conducted following each Counting & Mapping session. During this phase, people's movements occurring in a 10 minutes period were drawn on a map. In this way, an analysis of the preferred trajectories was conducted, highlighting the relationship between the type of activities performed by people just passing through the park compared with those engaged in various activities within the park.

According to Gehl et al. (2013), Counting & Mapping sessions should be conducted for 10 minutes every hour to gain a reliable representation of the overall 1-hour period. Although the time between observations varied in this research thesis, as already mentioned, considering the fact that various sessions of Counting & Mapping and Tracing were alternated, a complete representation of the whole period was provided.

During observations, every person in the parks was counted, including those only passing through. This is in contrast with Coley, Kuo, and Sullivan (1997) and Kuo and DePooter (2004), whose studies only included persons engaged in stationary activities, or persons who stopped to interact with others. For the scope of this research, the relationship between the number of persons who used the park to perform some sort of activity in comparison with the number of persons only passing through was considered particularly relevant. As such, people passing through were included in Counting & Mapping sessions and their preferred trajectories were considered through Tracing sessions. In fact, research suggests that the total number of visitors alone cannot explain the different types of use of urban parks. For example, the TOcore report (2016) highlighted that the density of users changes significantly if stationary uses (e.g. sitting, eating and playing) and passing-through park uses (e.g. walking

and cycling) are separated.

Taking these considerations into account, this research was designed in order to investigate the totality of uses. For this scope, a comprehensive analysis considering the ways in which people utilize the two parks (preferred activities, preferred features, preferred trajectories) was conducted. Where necessary, data were separated during the analysis of results, as suggested by the TOcore report (2016). In a first stage, collected data were examined in order to identify possible relationships between demographic characteristics (mainly age group and ethnic background) and use of urban parks. Then, the existence of any possible relationship between preferred activities, preferred features and social interaction was examined.

7.3. Questionnaire methodology

As investigated in the previous chapters, the perception and use of green spaces vary depending on various personal characteristics, such as age and cultural background. Furthermore, perceived value of urban parks is affected by the overall experience that people have of 'nearby nature' in their everyday life (Kaplan and Kaplan, 1989). These personal characteristics cannot be fully understood through observations alone. As such, questionnaires were distributed among park users and people passing by in close proximity, with the objective of gathering more information about the personal meanings that people attribute to urban parks and their relationship with nature in general.

People were approached at the park or along the surrounding streets and were informed about the intentions of the research. If interested, they were asked to fill in the questionnaire at that time. In some cases, people answered that they were interested in the research and they were willing to participate if a digital copy of the questionnaire was sent them by email. In these cases, their personal emails were collected and a digital copy was sent.

The questionnaire included a series of questions that were intended to identify personal characteristics of the users and their perception of the social and environmental benefits

of urban parks (see Appendix 2 for a facsimile). In synthesis, information can be grouped according to four categories, as represented in Table 4, *Questionnaires – Categories of questions* below.

Questionnaires included various kinds of answer responses (yes/no; rating questions; open questions). In the case of rating questions, respondents were asked to rate the answers on a scale from 1 to 5 where 1 was the least important and 5 the most important. Respondents often chose the same value for different answer choices. When some of the answer choices were left blank or the value 0 was entered, the researcher assumed that the respondents considered the answer choice as not important and entered the value 1 (meaning that it was the least important), so that data could be considered and the weighted average could be calculated.

Questionnaires were subsequently analyzed and answers categorized according to the scheme described above and the results analyzed according to the following:

 Data regarding Personal characteristics and Social Interaction indicator were cross referenced with data gathered from observations in order to identify similarities and

1 - PERSONAL CHARACTERISTICS	Age, gender ethnicity, time spent in Canada, type of dwelling Distance travelled from home Frequency of visits Average time spent
2 - PERCEIVED NATURE INDICATOR	Perceived neighbourhood characteristics Perceived environmental benefits/value of urban parks Preferred natural features Observed wildlife
3 - SOCIAL INTERACTION INDICATOR	Preferred activities Preferred features Feeling welcome/free to perform activities Opportunities for social interactions Urban park as a central focus for the community
4 - COMMUNITY GARDENS	Member/not member Perceived social and environmental value of Community Garden

TABLE 4 – QUESTIONNAIRES – CATEGORIES OF QUESTIONS

differences. The fact that some questions were open ended or requested personal opinions offered opportunities for investigating potential reasons for the observed events. Such data were then utilized to inform the analysis of Social Interaction in the two urban parks.

- Data regarding Personal characteristics, Social Interaction indicator and Perceived Nature indicator were utilized in order to investigate how benefits of urban parks and benefits of nature in general are perceived by the residents of the two communities.
- Data regarding Community Gardens were excluded from the analysis

The most important findings are discussed in the following Chapter 8, Case Studies.

8. CASE STUDIES

Data collected adopting the methodology described in Chapter 7, *Research methodology* were catalogued and discussed on the basis of the literature review conducted in the previous Part 2, Use and Perceived Value of Urban Parks. Following the same framework adopted to conduct the review of the evidence, results from the case studies will be analyzed according to the following scheme:

- Use of Urban Parks
 - Preferred activities
 - Preferred features
 - Social interaction indicator
 - Differences by age group and cultural background
- Perceived value of urban parks
 - Perceived value of social interactions
 - Perceived nature indicator
 - Role of exposure (intensity, frequency and duration).

8.1. Use of the selected urban park case studies

As described in Chapter 7, *Research methodology*, data about park users were collected adopting two conjunct methods: Observations and Questionnaires.

Observations were conducted during the period July/September 2016, in the afternoon, if the weather was good. More than 4,000 people were observed and classified during 56 hours of observations. Further details are summarized in Table 5, *Observation data* in the following page.

Observations were conducted during weekdays and weekends in the same period of the

day (afternoon, 3pm-7pm), with the objective of identifying potential usage differences. However, results showed that, whilst the number of users was generally higher during the weekend (especially in Hinge park), the patterns of use within each urban park (expressed in percentage of activities performed) were consistent on weekdays and weekends. Therefore, data regarding weekdays and weekends were reported in each table and relevant differences were highlighted. However, charts were produced and results were commented considering the totality of the observations.

Demographic data collected through observations are synthesized in Table 6, *Demographic* data – Mac Lean Park, Strathcona (data from observations) and Table 7, *Demographic* data – Hinge Park, Mount Pleasant (data from observations) in the following page.

Questionnaires were distributed during visits to the parks afterward, in the period October/ December 2016. Park visitors or people passing by in close proximity were approached, informed about the research and asked if they were interested in participating. 95% of respondents filled in the questionnaire *in situ*. A number of people showed interest in the

NUMBER OF OBSERVATIONS	40 20 during Weekdays + 20 during Weekends				
HOURS OF OBSERVATION	56 hours 1 hour 30 minutes on average				
TIMEFRAME OF OBSERVATIONS	Afternoon 3pm-7pm				
WEATHER	Average 21 °C (min 17°C max 25°C)				
PEOPLE COUNTED	4,265 persons 2,225 in Mac Lean Park 2,040 in Hinge Park 1,794 groups 760 groups in Mac Lean Park 1,034 groups in Hinge Park				
NUMBER OF INTERACTIONS COUNTED	62 interactions counted 36 interactions in Mac Lean Park 26 interactions in Hinge Park				

TABLE 5 - OBSERVATION DATA

research and asked a digital copy of the questionnaire by email in order to fill it in at a convenient time. A reminder was sent after a couple of weeks. 16% of the digital questionnaires sent by email were returned.

Details about questionnaires are summarized in Table 8, *Questionnaire data* below.

TABLE 6 - DEMOGRAPHIC DATA – MAC LEAN PARK , STRATHCONA (DATA FROM OBSERVATIONS)

AGE GROUP		0-14		15-24		25-64		65+	
	TOT* 2,221	847	38.1%	238	10.7%	1,056	47.6%	80	3.6%
ETHNICITY**		ABORIGINAL		AFRICAN		ASIAN		CAUCASIAN	
	TOT* 2,180	186	8.6%	30	1.4%	389.5	17.9%	1567.5	72.1%

* Total park visitors in relation to Age group and Ethnicity do not correspond because some people's age or ethnicity was not assessed (N.A.)

** In case of multi-racial families, children were assigned to both ethnicities (0.5 each)

TABLE 7 - DEMOGRAPHIC DATA – HINGE PARK, MOUNT PLEASANT (DATA FROM OBSERVATIONS)

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AGE GROUP		0-14		15-24		25-64		65+	
	TOT 2,040	448	22.0%	311	15.2%	1,194	58.5%	87	4.3%
ETHNICITY**		ABORIGINAL		AFRICAN		ASIAN		CAUCASIAN	
	TOT 2,018	4	0.2%	9.5	0.47%	460.5	22.82%	1,544	76.51%

* Total park visitors in relation to Age group and Ethnicity do not correspond because some people's age or ethnicity was not assessed (N.A.)

** In case of multi-racial families, children were assigned to both ethnicities (0.5 each)

TABLE 8 - QUESTIONNAIRE DATA

60 34 Hinge Park + 26 Mac Lean Park
57 33 Hinge Park + 24 Mac Lean Park
3 1 Hinge Park + 2 Mac Lean Park
45% 36.6% Hinge Park 65% Mac Lean Park
10 hours 6.5 hours Hinge Park + 3.5 hours Mac Lean Park

Only people who had reached the age of majority could participate in the questionnaire phase. Therefore, not all the age groups were represented. Information about time lived in Canada and mother tongue was also collected, with the objective of further investigating the relationship between cultural background and perception and use of urban parks.

Demographic data gathered from the responses to the questionnaires distributed in the two parks are summarized in the following Table 9, *Demographic data – Mac Lean Park, Strathcona (data from questionnaires)* and Table 10, *Demographic data – Hinge Park, Mount Pleasant (data from questionnaires)* below.

However, data collected through questionnaires did not seem to represent the variety of

• • • • • • • • • • • • • • • • • • • •	
TABLE 9 - DEMOGRAPHIC DATA – MAC LEAN PARK, STRATHCONA	
(DATA FROM QUESTIONNAIRES)	

					'n			
AGE GROUP	0-14		15-24		25-64		65+	
TOT* 26	0	0.0%	4	4 15.4% 22 84.6%		84.6%	0	0.0%
TIME LIVED IN CANADA	WHOLE LIFE		30 YEARS +		10 YEARS +		LESS THAN 10	
TOT* 25	21	84.0%	1	4.0%	0	0.0%	3	12.0%
ENGLISH MOTHER T.	YES		NO					
TOT 25*	21	84.0%	4	16.0%				
OTHER LANGUAGES	FRE	NCH	GEI	RMAN	DL	ЛТСН	OTH	IERS
TOT 15	7	46.7%	4	26.7%	1	6.7%	3	20%

* Total respondents in relation to Age group and Time lived in Canada/Mother tongue do not correspond because some questions were not answered (N.A.)

TABLE 10 - DEMOGRAPHIC DATA – HINGE PARK, MOUNT PLEASANT (DATA FROM QUESTIONNAIRES)

AGE GROUP	0-14		15	5-24	25	5-64	65+	
TOT 34	0	0.0%	5	14.7%	26	76.5%	3	8.8%
TIME LIVED IN CANADA	WHOLE LIFE		30 YEARS +		10 YEARS +		LESS THAN 10	
TOT 34	21	61.8%	3	8.3%	3	8.3%	7	20.6%
ENGLISH MOTHER T.	YES		NO					
TOT 34	27	79.4%	7	20.6%				
OTHER LANGUAGES	CANT	CANTONESE		FRENCH		OGUESE	OTH	IERS
TOT 15	3	20.0%	3	20.0%	2	13.3%	7	46.7%
								.

users that were noted during the observation phase of the research. In particular, in Mac Lean Park, many older people, apparently from Chinese descent were approached and asked to participate but all refused to take part to the research, often affirming that they could not speak English. Therefore, data regarding age and cultural background included in the questionnaires were not considered significant and were not included in the following analysis of results.

Once data from observations and questionnaires were collected and analyzed, similarities and differences regarding how the two urban parks provide benefits to the surrounding communities were investigated. An extensive analysis of data considering preferred activities, preferred features and type of exposure to urban parks (intensity, frequency and duration) was conducted with particular interest in understanding potential differences due to various age groups and cultural background. The most relevant results are discussed in further detail below.

8.1.1. Preferred activities

Previous research studies had identified a positive association between certain activities (namely optional and social activities, as defined by Gehl (1987)) and social interactions (Kaźmierczak, 2013). For this reason, preferred activities in the two urban parks were identified, with the objective of verifying potential relationships. For the scope of this research thesis, activities were classified according to two main categories:

- Stationary activities, including all the activities that were performed within the park (standing, sitting, lying and playing);
- Transition activities, including all the activities that were performed passing through the park (walking, running, cycling, walking the dog).

Results from observations suggested that Mac Lean Park is a destination park within the neighbourhood. In fact, people were observed reaching the park to perform a variety of

stationary activities, typically taking children to the playground, resting and relaxing and having social encounters.

In particular, as represented in Table 11 (w/ graphic), *Preferred activities from observations* – *Mac Lean Park* below, collected data reported that 91.2% of the activities that occurred were stationary, mostly sitting (42.5%) or playing (32.8%), followed by standing (11.2%) and lying (4.6%). Number of visitors and type of activities were generally fairly consistent. However, during the weekend, transition activities (especially walking and walking the dog) were more frequent than during weekdays, while playing was less frequent.

Higher playing rates during weekdays than during weekends may be explained by the fact

TABLE 11 - PREFERRED ACTIVITIES FROM OBSERVATIONS – MAC LEAN PARK

•••••	•••••	••••	•••••	•••••		•••••	•••••	••••	•••••
STATIONARY ACTIVITIES			TR	ANSITION A					
STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE		
11.2%	42.5%	4.6%	32.8%	1.8%	5.0%	0.0%	1.9%	2,225	TOTAL*
8.6%	44.1%	5.4%	35.9%	1.2%	2.9%	0.1%	1.8%	1,087	WEEKDAYS
13.7%	41.0%	3.9%	29.9%	2.5%	7.1%	0.0%	1.9%	1,138	WEEKENDS

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



that organized activities were scheduled during the week, such as after school programs and soccer schools, and therefore the percentage of children was typically higher. Higher transition activities during weekends may be expected and were registered also in Hinge Park, probably reflecting the fact that more people is present in the neighbourhood when the working week is over.

Results from questionnaires, however, revealed a different pattern of preferences than results from observations. In fact, whilst observations showed that stationary activities were largely preferred, respondents to the questionnaire, as represented in Table 12 (w/ graphic), *Preferred activities from questionnaires – Mac Lean Park* below, attributed very similar values to all the answer options. Moreover, some of the results were in clear contrast with findings from observations. Walking the dog, for example, was one of the least frequently observed

TABLE 12 - PREFERRED ACTIVITIES FROM QUESTIONNAIRES – MAC LEAN PARK

STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
TAKE CHILDREN TO THE PLAYGROUND	3.07	WALK THE DOG	3.13
REST AND RELAX (SIT, LIE DOWN, ETC.)	3.07	PHYSICAL ACT. (WALK, RUN, ETC.)	2.93
HAVE SOCIAL INTERACTIONS	2.73		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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activities (only 1.8%), but it was rated as the most important one. Similarly, physical activities obtained a fairly high rating (2.93) in the questionnaires, while observations showed that the sum of walking, running and cycling accounted for only 6.9% of the total performed activities. Lastly, social interactions (score 2.73) was ranked as the least important, even though many social gatherings were observed during observations.

Although many differences emerged, some results were also confirmed. The second most preferred activities such as taking the children to the playground and resting and relaxing, resulted to be equally important for the respondents and their high rating (score 3.07) confirmed the importance that emerged from observations.

The fact that transition activities obtained higher ratings from questionnaires than expected from observations may be explained by the fact that Mac Lean Park is considered a destination place within the neighbourhood. As such, people consider it important to take a walk and go there. However, once they reach the park, they often sit down or engage in some other stationary activities. In particular, the fact that walking the dog was over-rated may depend by the fact that people who walked the dog in Mac Lean Park had reached their final destination. As such, they had some time to spend at the park and they were willing to participate in the questionnaire. This is in contrast with findings from Hinge Park.

By contrast, analysis of preferred activities in Hinge Park generated different results. Here, in fact, transition activities were the majority (58.3%): mainly walking (37.2%) or walking the dog (14.2%), followed by cycling (6.2%) and running (0.7%). However, the second most frequent activity was a stationary activity, playing, which was performed by 17.8% of the users.

The most relevant difference between weekdays and weekends was the number of users (more than 60% higher during weekends than weekdays), while preferred activities were similar. In particular, percentage of people going to the park to use the playground remained constant. Transition activities (mostly walking), instead, resulted to be slightly more frequent

during weekends than weekdays and stationary activities (especially sitting) less frequent during weekends than weekdays. This suggests that the use of Hinge Park during weekends was even more cursory than during weekdays. See Table 13 (w/ graphic), *Preferred activities from observations – Hinge Park* below for further details.

The role of Hinge Park as a place where people go to take a walk or take the children to the playground was confirmed by the answers provided by the respondents to the questionnaires, as represented in Table 14 (w/ graphic), *Preferred activities from questionnaires – Hinge Park* in the following page.

In fact, when asked to rate their preferred activities on a scale from 1 to 5 where 1 was the least

TABLE 13 - PREFERRED ACTIVITIES FROM OBSERVATIONS – HINGE PARK

•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
STATIONARY ACTIVITIES			TR	ANSITION A					
STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE		
8.3%	14.4%	1.1%	17.8%	14.2%	37.2%	0.7%	6.2%	2,040	TOTAL*
8.4%	18.1%	0.5%	18.6%	15.2%	33.2%	0.9%	5.1%	778	WEEKDAYS
8.3%	12.1%	1.4%	17.4%	13.6%	39.6%	0.6%	6.9%	1,262	WEEKENDS

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



important and 5 the most important, respondents affirmed that physical activity (walking, running, biking, etc.) was the most important (score 3.76), followed by taking children to the playground (score 3.06). Results from observations were also confirmed by the importance that respondents attributed to rest and relax (score 2.94), which reflected the number of people sitting on the benches to read, relax or eat their lunch. A certain importance was also attributed to social interactions (2.65), while walking the dog appeared to be the least important (2.12).

The rating attributed to walking the dog in the questionnaires was lower than expected from observations but results from observations reported that it was a fairly common activity (14.2% of the total). The fact that this activity obtained lower ratings than expected may depend by the fact that people who walked the dog in Hinge Park were mostly passing

TABLE 14 - PREFERRED ACTIVITIES FROM QUESTIONNAIRES – HINGE PARK

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STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
TAKE CHILDREN TO THE PLAYGROUND	3.06	WALK THE DOG	2.12
REST AND RELAX (SIT, LIE DOWN, ETC.)	2.94	PHYSICAL ACT. (WALK, RUN, ETC.)	3.76
HAVE SOCIAL INTERACTIONS	2.65		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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through to reach the adjacent dog park. As such, they often refused to participate in the questionnaire, saying that they were heading somewhere else. This is in contrast with results from Mac Lean Park, where, on the contrary, people walking the dog were more willing to participate because they had already reached their final destination and therefore they had some time to spare.

In conclusion, data from observations highlighted the different roles that the two parks play within their respective neighbourhoods (Mac Lean Park an attractive destination place for stationary activities and Hinge Park a pleasant setting for transition activities). However, when results were cross-referenced with findings from questionnaires, it emerged that the relationship between most frequent activities and perceived value attributed to the same activities was not straightforward. Therefore, further analyses were developed, with particular interest in investigating the role of park features in determining use and perceived benefits of urban parks. The most relevant findings are discussed below.

8.1.2. Preferred features

Once preferred activities were identified, data from observations were analyzed in order to understand what park features are more attractive for the surrounding communities. This is particularly relevant, because previous research argued that different park features influence perception and use of urban parks (Bedimo-Rung, Mowen and Cohen, 2005) and that certain park features (such as seating, picnic tables, toilets, etc.) enhance opportunities for social interaction (Francis et al., 2012). For the scope of this research thesis, four park features were identified:

Playground: it includes various areas provided with recreational equipment, including water features (a water pump with runnels in Hinge Park and a water spray park in Mac Lean Park). Since children typically moved from an area to the other during their visits, all play areas were considered together.

- Grass: ground for various casual and organized activities. The most common were sitting or lying. In some cases, people went to the park alone or as couple to relax, read a book or have a chat. In other cases, large social gatherings were organized, with people eating, playing and interacting within the group while sitting or standing. Also walking the dog was included among the activities happening on the grass, if the activity was prolonged over time (i.e. the person was observed in at least two consecutive observations). An analysis of shady areas on the grass was conducted separately, showing that 28% of the activities in Hinge Park and 25% of the activities in Mac Lean Park occurred on shady areas;
- Seating: it includes benches and picnic tables;
- Paths: it includes all the walking paths passing through the park.

Observations in Mac Lean Park confirmed that stationary activities were largely preferred and showed that they mostly took place on the grass (52.6%) or at the playground (31.7%). A comparison between weekdays and weekends highlighted that seating options (benches and picnic tables) were much more used during the week (11.9%) than during the weekend (4.2%); conversely, the grass was more used during the weekends (55.3%) than during the week (49.8%). This suggests that sitting - the most common activity in Mac Lean Park (42.5%) - mostly occurred on the grass, especially during the weekends. This is not surprising, because seating options (benches and picnic tables) are disproportionately limited compared to the vast grassy area. See Table 15 (w/ graphic), *Preferred features from observations – Mac Lean Park* in the following page for further details.

Results from questionnaires (data not shown) generally confirmed data from observations. In fact, when asked about their preferred park feature through an open-ended question, respondents of Mac Lean Park mentioned either the playground/waterpark (51%) or the grass field (49%) as the most frequented areas. No other park features were identified. The same analysis was developed in Hinge Park. Results from observations, as shown in Table 16 (w/ graphic), *Preferred features from observations – Hinge Park* in the following page, confirmed the fact that Hinge Park is a transition place. In fact, the main paths were the preferred features (57.1% of the activities occurred there). The main reason to stop was taking the children to the playground, where 20.8% of the activities took place, while the grass generally resulted to be much less attractive than in Mac Lean Park.

A comparison between weekends and weekdays highlighted the fact that more people passed through the main paths during weekends than during weekdays and that they were more likely to stop at the playground. On the other hand, more people were seen engaging in stationary activities during the week than during the weekends both using seating options

TABLE 15 - PREFERRED FEATURES FROM OBSERVATIONS – MAC LEAN PARK

	F STATIONARY A		IOC. TRANS. ACTIVITIES		
PLAYGROUND GRASS SEATING		PATHS			
31.7%	31.7% 52.6% 8.0%		7.7%	2,224	TOTAL*
33.0%	49.8%	11.9%	5.3%	1,086	WEEKDAYS
30.5%	55.3%	4.2%	10.0%	1,138	WEEKENDS

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



(benches or picnic tables) and stopping on the grass.

Results from questionnaires (not shown) provided additional interesting insights. When asked to indicate their preferred park feature, almost half of the respondents mentioned the playground or specifically its water features. Other respondents chose seating options (benches or picnic tables) or the beaver/duck pond (10% each feature) and one respondent mentioned walking paths. All the other respondents mentioned features that are located adjacent to or outside the park boundaries, such as the community garden or the dog park, or even the habitat island, the seawall, or False Creek in general. This confirms the fact that Hinge Park is not considered a destination place, but an interesting spot to pass through within a wider context.

TABLE 16 - PREFERRED FEATURES FROM OBSERVATIONS – HINGE PARK

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LOCATION OF STATIONARY ACTIVITIES			LOC. TRANS. ACTIVITIES		
PLAYGROUND	GRASS	SEATING	PATHS		
20.8%	20.8% 12.5% 9.6%		57.1%	2,040	TOTAL*
15.6%	16.3%	14.5%	53.6%	778	WEEKDAYS
24.1%	10.2%	6.5%	59.2%	1,262	WEEKENDS

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



In conclusion, the results from the study of preferred activities were generally confirmed by the study of preferred features in that the two parks have unique characteristics and are used and perceived differently. Further analysis investigated whether different users' age group or cultural background may affect how these characteristics are perceived. The most relevant findings are discussed below.

8.1.3. Differences by age group

The perception and use of green spaces can vary when considering people at different stages of their life and, as such, data were also examined in relation to different age groups.

Initially, a general analysis was conducted in order to classify park users by their age group. In particular, a comparison was proposed between percentage of park users (as counted during observations) and percentage of residents in the relative neighbourhoods.

This analysis is consistent with the approach proposed by Cohen et al. (2016), who conducted an extensive analysis of neighbourhood parks in the United Stated. As already examined in Chapter 6, *Use of Urban Parks*, results from their study suggested that seniors are underrepresented users of urban parks (4% of park users, but 20% of the general population), while children and teens are overrepresented (51% of park users, but only 27% of the general population). These reference data are particularly valuable because the study was conducted across a vast geographic area in a North American context. Based on their work, park visitors here were classified according to four broad age groups:

- Children (age from 0 to 14);
- Youth (age from 15 to 24);
- Adults (age from 25 to 64) and
- Seniors (age 65 or over).

Then, each age group of park users was compared to the corresponding age group of neighbourhood population. Findings from the two urban parks, compared to the respective

neighbourhoods (data from Census 2011) are summarized in Table 17, Visitation and population rates - comparison by age below.

Some interesting insights emerged from the analysis of the two urban parks. In particular, results from Mac Lean Park were fairly consistent with the findings reported by Cohen (2016), showing that seniors are underrepresented users of urban parks, and children and youth are overrepresented users. In fact, seniors were only 3.6% of the park visitors, but 22.61% of the neighbourhood population. On the other hand, the sum of children and youth visitor groups corresponded to almost half of the park users (48.8%), but only to 15.66% of the neighbourhood population.

Results from observations in Mount Pleasant, however, showed divergent results. In fact, in the neighbourhood, the senior population is limited (only 7.67% of residents are 65 years and over); nonetheless, 4,3% of park users in Hinge Park were seniors. This means that a high percentage of older people in Mount Pleasant use the local park. On the other hand, data confirmed that the youngest are overrepresented users of the urban park. However, if data from the two neighbourhoods are compared, it emerges that participation rates of younger people in Mount Pleasant are much lower than in Strathcona. In fact, while population data by age groups are similar (15.66% in Strathcona and 18.52% in Mount Pleasant).

	MACI	EAN PARK - S	TRATHCONA	HINGE PARK - MOUNT PLEASANT			
	PARK VISITORS		POP.	PARK VISITORS		POP.	
TOTAL *	2,221	%	12,165	2,040	%	26,400	
CHILDREN (0 to 14)	847	38.1%	8.30%	448	22%	9.49%	
YOUTH (15 to 24)	238	10.7%	7.36%	311	15.2%	9.03%	
ADULTS (25 to 64)	1,056	47.6%	61.65%	1,194	58.5%	73.83%	
SENIORS (65 +)	80	3.6%	22.61%	87	4.3%	7.67%	

TABLE 17 - VISITATION AND POPULATION RATES – COMPARISON BY AGE

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* Total park visitors reported here do not sum up to total park visitors reported elsewhere because some visitors' age was not assessed (N.A.)

No apparent reasons for the high participation rates among the elderly in Hinge Park could be found. On the other hand, some possible explanation can be posited about the higher presence of younger people in Mac Lean Park than in Hinge Park. During observations in Mac Lean Park, after-school programs were noted; as such, large groups of children were seen visiting the park with few older supervisors in various occasions; moreover, soccer schools were observed. As such, large groups of children appeared to use the park on a precise schedule. On the contrary, in Hinge Park, children generally went to the park with their caregivers and a relatively large group of children was observed only once. So, the lack of organized activities can explain the lower visitation rates of children and youth in Hinge Park than in Mac Lean Park. This is in line with the definition of 'park features' proposed by Bedimo-Rung, Mowen, and Cohen (2005), which includes programs or activities that take place within a park setting. According to this view, the variety of programs organized in Mac Lean Park may be an additional feature which attracts more young visitors.

As seen above, analysis of general data provided information about park visitation rates, suggesting that the two urban parks attract people of different age within their neighbourhood. Moreover, within each park, different patterns of use can be identified per age group, when considering preferred activities and preferred features. For this reason, results from observations and questionnaires were also analyzed in relation to different age groups. The most relevant results are discussed below.

8.1.3.1. Preferred activities by age group

Previous research examined potential associations between preferred activities and various age groups. In particular, the relationship between older people walking behavior and perceived health and wellbeing was investigated, registering a positive relationship (Alves et al., 2008; Sugiyama and Ward Thompson, 2008; Ward Thompson, 2007). This is particularly relevant, because, as seen above, seniors are generally underrepresented users of urban parks; on the contrary, research found a positive relationship between use of urban parks and improved health and wellbeing, especially for the elderly (Bedimo-Rung, Mowen and Cohen,

2005; Hartig et al., 2014; Konijnendijk et al., 2013; WHO, 2016). So, the fact that seniors do not visit urban parks very often is considered a public health concern. In relation to younger people, previous research also identified a positive relationship between exposure to nature during childhood and pro-environmental behaviour during adulthood (Ward Thompson, Aspinall and Montarzino, 2008). Moreover, experience of nature during childhood was associated with a positive relationship with nature during various stages of life, for example reducing fear and promoting a positive perception and use of green spaces (Ward Thompson et al., 2005). For this reason, the analysis of the type of activities performed by the youngest is particularly relevant.

On these premises, data gathered from observations and questionnaires in the two parks were investigated in order to understand potential associations between preferred activities and different age groups. The most interesting interrelationships are discussed below.

Results from observations in Mac Lean Park, analyzed by age group, confirmed that stationary activities (mostly sitting) were the preferred activities for all the age groups except for children, whose preferred activity, as predictable, was playing (67.4%). However, also among children the second preferred activity in Mac Lean Park was sitting (22.8%). Among the elderly, the preferred activity was also sitting (60%). However, in contrast with all the other age groups, the second preferred activity for seniors was walking (12.5%). See Table 18 (w/ graphic), *Preferred activities by age group – Mac Lean Park* in the following page for further details.

Data regarding walking for older adults is particularly significant, because it suggests that – contrary to the general trend registered in the park – seniors choose Mac Lean Park also for passing through and not necessarily as a destination place. This data can be considered positively, because it suggests that Mac Lean Park promotes walking behaviour among the elderly and therefore enhances their perceived health and wellbeing (Alves et al., 2008; Sugiyama and Ward Thompson, 2008; Ward Thompson, 2007).

Analysis of data from observations in Hinge Park confirmed that transition activities were

generally preferred, independently from age. In fact, walking was the preferred activity for all the age groups, except for children. However, also among the youngest, walking (23.4%) was the second preferred activity after playing (54.7%). Interestingly, seniors appeared to be the most active group. In fact, walking (52.9%) and walking the dog (19.5%) were the preferred activities, meaning that over 70% of the activities performed by older people in Hinge Park involved moving. Data related to sitting in Hinge Park were consistent for all the age groups around 15%, except for children (10.7%). See Table 19 (w/ graphic), *Preferred activities by age group – Hinge Park* in the following page for further details.

Analysis of the results from the two parks suggested that visitors' general experience does not change in relation to age. In fact, the type of use that emerged from the general data (Mac

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TABLE 18 - PREFERRED ACTIVITIES BY AGE GROUP – MAC	: LEAN PARK
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	ST	ATIONARY		S		TRANSITIO		
	STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE
CHILDREN	3.9%	22.8%	0.4%	67.4%	0.2%	3.8%	0.1%	1.4%
YOUTH	12.6%	51.7%	15.1%	8.4%	3.4%	5.9%	0.0%	2.9%
ADULTS	16.9%	54.7%	5.7%	12.5%	2.8%	5.3%	0.0%	2.1%
SENIORS	11.2%	60.0%	5.0%	8.8%	1.3%	12.5%	0.0%	1.2%

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



Lean Park being a destination place, Hinge Park a transition place) was generally confirmed when considering different age groups.

However, findings regarding older people's walking patterns were particularly significant. In fact, in both cases, seniors appeared to value the presence of the park as a place for walking more than the other age groups. This is particular significant for its positive association with general health. However, it should be noted that such benefits in Mount Pleasant reach a larger part of the older population than in Strathcona. In fact, as already noted, only a small percentage of the seniors living in Strathcona visit Mac Lean Park, while a considerably higher percentage of seniors living in Mount Pleasant uses Hinge Park.

TABLE 19 - PREFERRED ACTIVITIES BY AGE GROUP – HINGE PARK

	STATIONARY ACTIVITIES					TRANSITIO		·
	STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE
CHILDREN	5.8%	10.7%	0.0%	54.7%	0.9%	23.4%	0.0%	4.5%
YOUTH	8.4%	14.5%	1.9%	2.6%	19.6%	44.0%	1.6%	7.4%
ADULTS	9.9%	15.7%	1.0%	9.1%	17.4%	39.4%	0.6%	7.0%
SENIORS	4.6%	14.9%	1.1%	5.8%	19.5%	52.9%	0.0%	1.2%

* Total park visitors may differ from total park visitors reported elsewhere because some visitors' activity was not assessed (N.A.)



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8.1.3.2. Preferred features by age group

Previous research examined potential relationships between preferred features and age groups. In addition to a general association between presence of certain features and use by determined age groups (playgrounds attract children, sport fields attract youth, benches attract seniors and so on), an important relationship was identified between maintenance, sense of safety and use, with particular reference to the safety of the play equipment (Alves et al., 2008; Bedimo-Rung, Mowen, and Cohen, 2005; McCormack et al., 2010). In particular, Alves et al. found a positive association between presence of certain features (facilities such as cafes and toilets, natural elements like trees and plants, entertaining views or things to watch) and use of urban parks by older people. However, park amenities such as barbecues, seating, water fountains, picnic tables, and bathrooms appeared to be important regardless of age and type of users (McCormack et al., 2010).

As already mentioned, the two parks in this study are characterized by the presence of similar features, but their patterns of use are significantly different. Results from observations by age group confirmed previous results and provided further insights.

Analysis of data from observations in Mac Lean Park, for example, confirmed that most of the activities were stationary and occurred on the grass. In fact, the grass was highly appreciated by all the age groups, including children, who used the grass and the playground with almost the same frequency. The second most attractive feature was the playground; in fact, in addition to children, 13.9% of seniors, 26.9% of adults and 10.9% of youth were observed at the playground. This is explained by the fact that, as caregivers, they were observed performing different activities, such as playing themselves or supervising children's play while sitting or standing. Seating options, such as benches and picnic tables, were particularly appreciated by the elderly. Nonetheless, confirming the results emerged from the analysis of the preferred activities, seniors were also reported to use the walking paths with higher frequency than all the other age groups. This confirms that the presence of the park was seen as an opportunity for physical activity for the older population.

See Table 20 (w/ graphic), *Preferred features by age group – Mac Lean Park* below for further details.

Results from observations in Hinge Park also provided interesting insights. As anticipated, even though the grass area of the park is particularly vast, it is considered not very attractive, presumably because of the lack of shady areas. In fact, the grass was rarely used for resting and relaxing. Furthermore, dogs are not allowed on the grass, since a dog park is situated in close proximity. So, even if a number of people were seen walking the dog on the grass anyway, most of the dog owners only passed through the park, without stopping on the grass. Consequently, walking paths resulted to be the most preferred feature for all the age

TABLE 20 - PREFERRED FEATURES BY AGE GROUP – MAC LEAN PARK

	LOCATION OF	ACTIVITIES	TRANSITION ACT.							
	PLAYGROUND	GRASS	SEATING	PATHS						
CHILDREN	45.3%	44.9%	4.6%	5.2%						
YOUTH	10.9%	68.1%	10.1%	10.9%						
ADULTS	26.9%	54.8%	9.0%	9.3%						
SENIORS	13.9%	46.8%	24.1%	15.2%						



groups, except for children. In fact, as expected, children mostly used the playground (45.1%), accompanied by 16.9% of adults, 12.6% of seniors and 3.2% of youth. Differently from Mac Lean Park, in Hinge Park sitting on the grass was not very common; on the contrary, visitors valued the presence of various seating options and used benches or picnic tables with similar frequency, independently from age. See Table 21 (w/ graphic), *Preferred features by age group – Hinge Park* below for further details.

In summary, results from the two urban parks suggested that taking the children to the playground was an important motivation to go to the park. However, while users of Mac Lean Park were very likely to perform various stationary activities while there, especially on the

LOCATION OF STATIONARY ACTIVITIES TRANSITION ACT. PLAYGROUND SEATING PATHS GRASS CHILDREN 45.1% 16.7% 9.2% 29.0% YOUTH 3.2% 12.6% 12.2% 72.0% ADULTS 16.9% 8.9% 63.3% 10.9% SENIORS 12.6% 73.6% 2.3% 11.5%



TABLE 21 - PREFERRED FEATURES BY AGE GROUP – HINGE PARK

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grass, in Hinge Park users were more likely to stop for a short period at the playground, and then walk away.

8.1.4. Differences by cultural background

As analyzed in the previous chapters, differences in cultural background affect how people perceive and use green spaces. For this reason, during observations, park visitors were classified in four categories: Aboriginal, African, Asian, and Caucasian. This coarse classification was intended to create data sets that could be compared to the Census data (2011) which adopts mother tongue language as a proxy for ethnic background. In case of multicultural families, children were assigned to both categories (0.5 to each category). Results from observations are reported in Table 22, *Visitation and population rates by cultural background* below, which also includes a comparison with data from the neighbourhood population.

Results, however, showed that most of the visitors were Caucasian or Asian. In Hinge Park, in particular, they accounted for 99.3% of the visitors (76.5% were Caucasian and 22.8% were Asian). These data are in line with the neighbourhood population. However, the statistical significance of African and Aboriginal visitors in Hinge Park cannot be considered strong enough to make meaningful considerations about their preferences. For this reason, only the relationship between the two largest ethnic groups (Asians and Caucasians) and their preferred activities and preferred features was examined. Nonetheless, a complete data set

TABLE 22 - VISITATIC	ΝΙ ΔΝΙΟ ΡΟΡΓΙΙ ΔΤΙΛ	ΟΝΙ RATES BV CHILTHE	
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	MAC LEAN	I PARK - STRA	THCONA	HINGE PARK - MOUNT PLEASANT							
	PARK VISITORS		POP.	PARK VISITORS		POP.					
TOTAL *	2,180 %		10,705	2,018 %		26,150					
ABORIGINAL	186	8.6%	0.5%	4	0.2%	0.1%					
AFRICAN	30	1.4%	0.8%	9.5	0.5%	0.4%					
ASIAN	389.5	17.9%	38.7%	460.5	22.8%	19.3%					
CAUCASIAN	1567.5	72.1%	57.5%	1,544	76.5%	77.2%					

IABLE 22 - VISITATION AND POPULATION RATES BY CULIURAL BACKGROUND

* Total park visitors reported here do not sum up to total park visitors reported elsewhere because some visitors' ethnicity was not assessed (N.A.)

is reported in the tables.

Similarly, data from Mac Lean Park reported that Asian and Caucasian users were the majority (90% in total). However, visitation rates of African and Aboriginal people were also significant; in fact, they were overrepresented users of the park, if compared to the neighbourhood population. In particular, data regarding participation rates of Aboriginal people were significantly high (8.6% of visitors compared to 0.5% of the neighbourhood population). The presence of Aboriginal visitors in Mac Lean Park is not unexpected, because the majority of First Nations Aboriginal communities live in Downtown Eastside (City of Vancouver, 2013). However, the percentage of Aboriginal users was higher than expected, suggesting that the park is an attractive and welcoming place for sensitive minorities.

8.1.4.1. Preferred activities by cultural background

Previous research analyzed the relationship between preferred activities and ethnic background. In general, studies conducted in the United States (Gobster, 2002; Elmendorf et al., 2005a; Elmendorf et al., 2005b; Ho et al., 2005) and in Europe (Ward Thompson and Aspinall, 2011; Peters, Elands and Buijs, 2010) agreed that Caucasian users are more likely to go to the park alone or as couples and prefer solitary activities, such as walking and cycling. Ethnic minorities, by contrast, are more likely to visit the park in groups and engage social activities, such as having a picnic or barbecue or meeting other people.

Results from observations partly confirmed these general trends, even if differences could be identified in the two case study parks. In particular, in Hinge Park the behaviour observed among Asian and Caucasian users was very similar. This may depend on the fact that Asian Canadians observed in Hinge Park were more integrated in the Canadian society (lower rate of first generation immigrants). This was investigated through questionnaires with specific questions related to mother tongue and years lived in Canada. However, the data proved inconclusive. Considering Hinge Park, patterns of use between Caucasian and Asian visitors were also very similar. As already mentioned, walking was the preferred activity in Hinge Park. When considering the sum of walking and walking the dog, it accounted for 52.2% of the activities performed by Caucasian users and 51.0% of the activities performed by Asian users. Also taking the children to the playground appeared to be equally important for both categories, with playing accounting for 18.2% of the activities in both cases. A difference, however, could be identified in relation to the other stationary activities. In fact, their sum accounted for a total of 22.7% for Caucasian users and 26.7% for Asian users. These results suggest that Asian users were more likely to choose Hinge Park as a destination place to sit and relax than Caucasians, who were more likely to pass through the park (walking, cycling or running) without stopping by. See Table 23 (w/ graphic), *Preferred activities by cultural background – Hinge Park* below for further details.

 TABLE 23 - PREFERRED ACTIVITIES BY CULTURAL BACKGROUND – HINGE PARK

	ST	ATIONARY	ACTIVITIE	S	TRANSITION ACTIVITIES			
	STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE
ABORIGINAL	18.7%	0.0%	0.0%	6.3%	0.0%	75.0%	0.0%	0.0%
AFRICAN	7.9%	21.1%	0.0%	28.9%	10.5%	10.5%	0.00%	21.1%
ASIAN	7.8%	18.5%	0.4%	18.2%	10.6%	40.4%	0.9%	3.2%
CAUCASIAN	8.7%	12.9%	1.1%	18.2%	15.5%	36.7%	0.5%	6.4%



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Mac Lean Park appeared to be more multicultural; in fact, Aboriginal and African users were also represented with higher participation rates than expected from their population rates. This means that Mac Lean Park is an attractive and inclusive place for ethnic minorities. However, data about African users should be treated with caution since they only accounted for 1.38% of the total visitors (which corresponds to 30 people counted).

Nonetheless, analysis of data suggests several conclusions. In general, as emerged from the previous analysis, in Mac Lean Park, playing and stationary activities were strongly preferred by the vast majority of users. In many cases, as suggested by the analysis of the preferred park features, standing and sitting activities were associated with supervision of children's play. In other cases, visitors took part to big social gatherings. In any case, people spent long time at the park, often alternating different stationary activities. These considerations are valuable for all the ethnic groups.

Therefore, analysis of preferred activities per ethnic background showed similar trends in every category. However, some differences could be appreciated. In particular, Aboriginal users were seen engaging in stationary activities more than the other ethnic groups. In fact, the sum of all the stationary activities they performed (including playing) accounted for 95.7% of the total. In particular, they were observed sitting or standing in groups, interacting with each other while supervising children's play. Caucasian and Asian users registered a lower and very similar participation rate, with 90.7% and 90.6% of stationary activities performed respectively. However, the fact that more Asian users were observed playing and more Caucasian users were observed lying may suggest that taking the children to the playground was a more frequent reason to go to the park for Asian users than Caucasian users who also went to the park for rest and relax. Data also showed that African users were the most active. In fact, their stationary activities summed up to a total of 86.7%, among which playing was the most common activity (56.7%).

In regard to playing, data from African users were discordant from those emerging from the patterns of other ethnic groups, among which playing accounted for lower and consistent

rates (min 28.9% max 36.5%). Therefore, it was supposed that the majority of African users were children. This may depend on the fact that African children took part to programs organized in the park (such as after school programs and soccer schools) and therefore they visited the park for these activities more often than they visited the park with their families. These results suggest that all the ethnic groups, whilst frequenting the park for different reasons, were likely to consider Mac Lean Park as a welcoming destination place within the neighbourhood. See Table 24 (w/ graphic), *Preferred activities by cultural background – Mac Lean Park* below for further details.

In summary, analysis of preferred activities per cultural background in the two urban parks suggested that Mac Lean Park is more multicultural than Hinge Park and more welcoming. This may also depend on the fact that in Mac Lean Park specific programs are in place, which

	STATIONARY ACTIVITIES				TRANSITION ACTIVITIES			
	STAND	SIT	LIE	PLAY	WALK. DOG	WALK	RUN	CYCLE
ABORIGINAL	20.0%	42.4%	4.4%	28.9%	0.0%	4.3%	0.0%	0.0%
AFRICAN	0.0%	30.0%	0.0%	56.7%	0.0%	10.0%	0.0%	3.3%
ASIAN	11.8%	39.9%	2.4%	36.5%	2.3%	6.9%	0.0%	0.2%
CAUCASIAN	10.6%	44.2%	5.4%	30.5%	2.0%	4.7%	0.1%	2.5%

TABLE 24 - PREFERRED ACTIVITIES BY CULTURAL BACKGROUND – MAC LEAN PARK



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attract different types of users.

8.1.4.2. Preferred features by cultural background

Previous research analyzed the relationship between preferred features and ethnic background. Tinsley, Tinsley and Croskeys (2002), for example, reported that Caucasian park users were significantly more likely than any ethnic minority to use the bicycle and footpaths. In general, however, they argued that cultural background seems to affect preference of park features indirectly. In fact, Caucasian users are more likely to go the park alone or as couples, while ethnic minorities are more likely to go to the park in groups, with their extended families and for social gatherings. Therefore, Caucasian users tend to prefer naturalistic elements or walking paths, while ethnic minorities appreciate park features that are associated with stationary activities.

Observations in Hinge Park showed that the patterns of preferences supposed by the literature could be identified, even if differences between ethnic groups were not striking. Since African and Aboriginal users were only a small minority (0.5% and 0.2% respectively) their statistical significance was not considered strong enough. So, only Caucasian and Asian users were considered in the analysis.

The results showed that Asian and Caucasian users had very similar preferences in relation to park features. In fact, they largely preferred walking paths (58.3% and 54.9% respectively), followed by the playground (20% and 23.8% respectively). However, some differences emerged that were consistent with the suppositions from the literature.

Caucasian users, for example, appeared to be more likely to use walking paths or the grass than Asian users; on the other hand, Asian users appeared more likely to use the playground and to sit on the benches than Caucasian users. This may depend on the fact that Caucasian users are more likely to go to the park alone or as couples, and therefore they more often use the walking paths and the grass (to rest and relax or to walk the dog); Asian users, instead,
are more likely to go to the park with their families, and therefore they more often stop at the playground and sit on the benches situated in close proximity.

See Table 25 (w/ graphic), *Preferred features by cultural background – Hinge Park* below for further details.

The statistical significance of the various ethnic minorities in Mac Lean Park was stronger and therefore a complete analysis of the preferred features was developed. Some caution in considering the results is necessary, however, especially in relation to data related to African users who were a minority.

TABLE 25 - PREFERRED FEATURES BY CULTURAL BACKGROUND – HINGE PARK

	LOCATION OI	STATIONARY	ACTIVITIES	TRANSITION ACT.
	PLAYGROUND	GRASS	SEATING	PATHS
ABORIGINAL	25.0%	0.0%	0.0%	75.0%
AFRICAN	57.9%	0.0%	0.0%	42.1%
ASIAN	23.8%	10.4%	10.9%	54.9%
CAUCASIAN	20.0%	12.3%	9.4%	58.3%



Results from observations in Mac Lean Park reached some expected and some unexpected results. A complete data set is represented in Table 26 (w/ graphic), *Preferred features by cultural background – Mac Lean Park* below.

As already noted, data show that the grass was generally the preferred feature in Mac Lean Park. Results by ethnic background, however, highlight that Caucasian visitors used the grass the most (55.4%), followed by African, Asian and Aboriginal users. This may be explained by the fact that Caucasian users are thought to have a preference for natural features. By contrast, the playground was preferred by Aboriginal users (44.3%), followed by African, Asian and, finally, Caucasian users. The fact that Caucasian visitors used the playground the least may be explained by the fact that they are more likely than the other ethnic groups to

TABLE 26 - PREFERRED FEATURES BY CULTURAL BACKGROUND – MAC LEAN PARK

	LOCATION O	STATIONARY	ACTIVITIES	TRANSITION ACT.
	PLAYGROUND	GRASS	SEATING	PATHS
ABORIGINAL	44.3%	34.6%	16.8%	4.3%
AFRICAN	43.3%	46.7%	0.0%	10.0%
ASIAN	35.3%	42.4%	13.1%	9.2%
CAUCASIAN	30.1%	55.4%	6.1%	8.4%



go to the park alone or as couples. Contrary to what might be expected by the literature, however, Caucasian users did not use walking paths more than the other ethnic groups. In fact, the most frequent users were African (10%), followed by Asian visitors.

In summary, the study of preferred features by cultural background confirmed the overall trend observed in the two parks, which was generally consistent with the results from the literature. However, some additional considerations emerged when considering walking paths as privileged spaces for transition activities in Mac Lean Park.

In fact, cross referencing results from Table 24, *Preferred activities by cultural background* – *Mac Lean Park* and Table 20, *Preferred features by age group* – *Mac Lean Park, Strathcona,* it emerged that preferred users of walking paths in Mac Lean Park were Asian and seniors. This is contrary to the literature. Possible reasons for the fact that the Mac Lean Park seems to be more attractive for older people of Asian descent than for their White counterpart was investigated through questionnaires, but no valuable findings emerged, especially for their unwillingness to participate in the research.

8.1.5. Social interaction indicator

Previous research argued that certain activities (Kaźmierczak, 2013) and certain features (Bedimo-Rung, Mowen and Cohen, 2005; Francis et al., 2012a) enhance opportunities for social interactions in urban parks. Moreover, different age or cultural background may affect how people use and perceive nature and consequently how visitors interact with others in urban parks (Gobster, 2002; Peters, Elands and Buijs, 2010).

For this reason, data from observations in the two parks were analyzed in order to understand what types of social interactions occurred, where and among whom. To this end, building on the previous analysis, specific characteristics were analyzed, such as:

- Preferred activities performed by the persons involved in the interactions;
- Preferred features where the social interactions took place;

- Age group of the persons involved in the interactions;
- Cultural background of the persons involved in the interactions.

As anticipated, two types of social interactions were identified:

- Casual interactions, generally consisting in brief greetings or small talk among people
 who did not have a previous relationship or just a superficial acquaintanceship;
- Scheduled interactions, generally consisting in a person (or group) joining another person (or group) at the park, to perform various stationary activities. They usually occurred between people who had a previous relationship, such as family or friends.

Interactions were recorded when two different groups of people talked to each other. Groups could be composed by one or more persons visiting the park separately. In some cases, interactions involved the whole group of people and in other cases, only one (or more) persons of the group interacted with someone from outside their group. Particular attention was paid to identifying multicultural interactions; in fact, previous research argued that urban parks can favour social interactions between people from different cultural background and therefore enhance social cohesion and sense of community (Cattell et al. 2008; Francis et al., 2012a; Peters, Elands and Buijs, 2010).

General results regarding the two parks are reported in Table 27, *Social interactions* below, including total number of interactions counted and number of groups and persons involved

	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
	MAC LEAN PARK	HINGE PARK
NUMBER OF INTERACTIONS	36 INTERACTIONS	26 INTERACTIONS
HOURS OF OBSERVATION	30 HOURS	26 HOURS
NUMBER OF INTERACTIONS PER HOUR	1 INTERACTION/50 MIN	1 INTERACTION/60 MIN
NUMBER OF PERSONS COUNTED	173 PERSONS	104 PERSONS
NUMBER OF GROUPS COUNTED	70 GROUPS	51 GROUPS
WHOLE-GROUP INTERACTIONS	31 GROUP INT. (86.1%)	21 GROUP INT. (80.8%)

TABLE 27 - SOCIAL INTERACTIONS

in the interactions.

Results from the two parks showed similar patterns. In Mac Lean Park, 36 interactions were counted during observations, which corresponds to 1 interaction every 50 minutes. Interactions involved 70 groups and a total of 173 persons. Similarly, in Hinge Park, 26 social interactions were registered, corresponding to 1 interaction per hour. Interactions involved 51 groups and 104 persons. In both parks, most of the social interactions (more than 80%) involved the whole group, which means that two groups merged (scheduled interaction) or that multiple casual interactions happened between various members of the group. Children, for example, from different groups were observed playing together; at the same time, their parents were making small talk while supervising. Only occasionally one (or more) persons left their group to interact with someone from outside the group. Similarities and differences between the two parks are discussed in the following analysis.

General information about the number, type and characteristics of the social interactions observed in Mac Lean Park is reported in Table 28, *Social interactions – Mac Lean Park* below.

Data from observations showed that the majority of interactions (61.1%) were casual, which means that they occurred between people who did not have a previous relationship, and generally cursory. However, the fact that the remaining 38.9% of interactions were scheduled (or consisted in two or more groups merging together) means that the park played an important role as a meeting place within the neighbourhood. In these cases, social gatherings were observed, often with family and friends.

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	TABLE 28 - SOCIAL INTERACTIONS – MAC LEAN PARK	

	[INTERACT	IONS						
	TOT	CASU	IAL INT.	SCHED	JLED INT.	SAME E	THNICITY	INTER-ETHNIC		
TOTAL	36	22	61.1%	14	38.9%	15	41.7%	21	58.3%	
WEEKDAYS	15	9	60.0%	6	40.0%	5	33.3%	10	66.7%	
WEEKEND	21	13	61.9%	8	38.1%	10	47.6%	11	52.4%	

Data about weekdays and weekends were consistent, showing that patterns of use did not change significantly during weekends. General data also reported that the majority (58.3%) of interactions occurred in Mac Lean Park were inter-ethnic.

In this regard, data were further analyzed in order to examine potential differences between people from different cultural background in engaging social interactions in urban parks. Relevant findings are reported in Table 29, *Social interactions per cultural background – Mac Lean Park* below.

Results showed that Mac Lean Park is an inclusive place for people from different cultural backgrounds. In fact, people from all the ethnic groups were present and were observed interacting. Caucasian visitors interacted the most (73.4%), followed by Aboriginal (14.5%), Asian (9.8%) and African (2.3%) users.

However, whilst the number of people who interacted among Caucasian and African users was proportional to their visitation rates, data about Aboriginal and Asian users provided different results. In fact, social interactions among Aboriginal visitors were higher than expected from their visitation rates (14.5% of interactions compared to 8.6% of visitors); on the contrary, Asian users interacted less often than expected from their number (9.8% of interactions compared to 17.9% visitors). This suggests that Aboriginal users were very likely to interact with people from outside their group, while Asian users were not.

Data were then analyzed in relation to different age groups, as reported in Table 30, *Social interactions per age group – Mac Lean Park* in the following page.

•••	•••	••	••	••	•••	•••	•••	••	•••	••	••	•••	•••	••	••	••	••	••	• • •	•••	•••	••	••	••	••	••	••	•••	•••	• • •	••	••	•••	••	•••	•••	••	••	•••	• • •	••	•••	•••	••	•••	••	•••	••••
		T/	٩B	SLE	2	9	- 5	60	CI	A	LI	Ν	TE	ER	Α	C	TIC	C	٧S	i F	PE	R	С	U	LT	Ū	R	A	LI	B/	۱C	K	GF	RC	U	Ν	D	_	Μ	A	CI	LE	AI	Ν	PA	٩R	К	

	TOT	ABOR	IGINAL	AFR	ICAN	A	SIAN	CAUC	ASIAN
TOTAL	173	25	14.5%	4	2.3%	17	9.8%	127	73.4%
WEEKDAYS	57	5	8.8%	2	3.5%	5	8.8%	45	78.9%
WEEKEND	116	20	17.2%	2	1.7%	12	10.4%	82	70.7%

Results showed that adults interacted the most (50.3%), followed by children (36.4%), youth (10.4%) and seniors (2.9%). Since children are expected to visit the park with adult supervisors, these data suggest that presence of children in the group increased opportunities for interactions.

This assumption was later tested considering potential associations between specific activities and increased opportunities for social interactions. Results are reported in Table 31, Social interactions per activity – Mac Lean Park below.

Results from observations suggested that 94.2% of the social interactions occurred while people were either performing stationary activities (standing, sitting or lying) or playing. This confirms that supervision of children's play (either playing with them or standing/sitting in close proximity) had a positive relationship with social interactions. These results were also confirmed by the analysis of preferred park features, as reported in Table 32, Social interactions per features – Mac Lean Park in the following page.

In fact, data reported that 87.9% of the interactions occurred either on the grass or at the playground, confirming the positive relationship emerged from previous analyses. The

• • • • • • •	•••••	•••••	•••••	•••••	•••••	•••••	•••••	••••
TOT	CHIL	.DREN	YC	UTH	AD	OULTS	SENI	ORS
173	63	36.4%	18	10.4%	87	50.3%	5	2.9%
57	15	26.3%	11	19.3%	30	52.6%	1	1.8%
116	48	41.4%	7	6.0%	57	49.1%	4	3.5%
•	TOT 173 57 116	TOT CHIL 173 63 57 15 116 48	TOT CHILDREN 173 63 36.4% 57 15 26.3% 116 48 41.4%	TOT CHILDREN YC 173 63 36.4% 18 57 15 26.3% 11 116 48 41.4% 7	TOT CHILDREN YOUTH 173 63 36.4% 18 10.4% 57 15 26.3% 11 19.3% 116 48 41.4% 7 6.0%	TOT CHILDREN YOUTH AD 173 63 36.4% 18 10.4% 87 57 15 26.3% 11 19.3% 30 116 48 41.4% 7 6.0% 57	TOT CHILDREN YOUTH ADULTS 173 63 36.4% 18 10.4% 87 50.3% 57 15 26.3% 11 19.3% 30 52.6% 116 48 41.4% 7 6.0% 57 49.1%	TOT CHILDREN YOUTH ADULTS SENI 173 63 36.4% 18 10.4% 87 50.3% 5 57 15 26.3% 11 19.3% 30 52.6% 1 116 48 41.4% 7 6.0% 57 49.1% 4

TABLE 30 - SOCIAL INTERACTIONS PER AGE GROUP – MAC LEAN PARK

• • • • • •	•••••	•••••	• • • • • • • • • • • • • • • •	•••••	• • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • •
	TABLE 31 -	SOCIAL INT	ERACTION	S PER ACTI	VITY – MAC	LEAN PARK	

	тот	STAND	SIT LIE	PLA	YING	WALKI	NG DOG	WALK RUN CYCLE		
TOTAL	173	101	58.4%	62	35.8%	4	2.3%	6	3.5%	
WEEKDAYS	57	44	77.2%	13	22.8%	0	0.0%	0	0.0%	
WEEKEND	116	57	49.1%	49	42.2%	4	3.5%	6	5.2%	
			1		1	1		1		

remaining interactions occurred in the proximity of seating places (7.5%) or walking paths (4.6%).

In this regard, contrasting trends were identified when comparing weekdays and weekends. In fact, opportunities for social interactions while sitting on the benches or picnic tables resulted to be much higher during weekdays than during weekends; on the contrary, opportunities for interactions while walking on the main paths were higher during weekends. This may depend on the fact that some activities, such as walking the dog, were more frequent during weekends than during the week in Mac Lean Park (see Table 11, Preferred activities from observations – Mac Lean Park for further details). As such, during weekends, opportunities for social interactions while walking the dog were higher. This hypothesis was confirmed by the analysis of the relationships between preferred activities and social interaction. In fact, as previously reported in Table 31, Social interactions per activity, all the interactions occurred among people walking the dog were registered during weekends and presumably while passing through the main paths (see Table 32, Social interactions per features – Mac Lean Park below).

The same analysis was developed for Hinge Park in order to identify similarities and differences in how the two parks are conducive to social interactions. General data from observations are reported in Table 33, Social Interactions – Hinge Park in the following page, which identifies number, type and characteristics of the interactions occurred.

Data showed that most of the interactions in Hinge Park (80.8%) were casual and therefore occurred among people who presumably did not have a previous relationship. Comparison

TABLE 32 - SOCIAL INTERACTIONS PER FEATURES – MAC LEAN PARK														
TOT PLAYGROUND GRASS SEATING PATHS														
TOTAL	173	46	26.6%	106	61.3%	13	7.5%	8	4.6%					
WEEKDAYS	57	9	15.8%	37	64.9%	11	19.3%	0	0.0%					
WEEKEND	116	37	31.9%	69	59.5%	2	1.7%	8	6.9%					
WEEKDAYS WEEKEND	57 116	9 37	15.8% 31.9%	37 69	64.9% 59.5%	11 2	19.3% 1.7%	0 8						

of data from weekdays and weekends provided further insights. In fact, no scheduled interactions were registered during weekends. This confirms that Hinge Park is not considered a destination place for social gatherings with family and friends, which typically occur in this period of the week. General data also reported that in 76.9% of cases, social interactions occurred between people from the same ethnicity.

Further analysis examined potential differences between different ethnic groups, investigating existing associations between social interactions and cultural background, as reported in Table 34, *Social interactions per cultural background – Hinge Park* below.

Data showed that all the interactions involved either Asian or Caucasian users. This is not unexpected, because African and Aboriginal visitors were a minority in Hinge Park (less than 0.5%). Among the two groups, Caucasian users accounted for 79.3% of the social interactions counted and Asian users for the remaining 20.7%, confirming results expected from their visitation rates. This means that Asian and Caucasian visitors in Hinge Park were equally likely to interact with persons from outside their group.

Data were then analyzed in relation to different age groups, as reported in Table 35, Social

TABLE 33 - SOCIAL INTERACTIONS – HINGE PARK

		TYPE OF INTERACTIONS				MULT	ICULTURA	LINTERA	CTIONS
	TOT	CASU	AL INT.	SCHEDU	JLED INT.	SAME E	THNICITY	INTER-	ETHNIC
TOTAL	26	21	80.8%	5	19.2%	20	76.9%	6	23.1%
WEEKDAYS	9	4	44.5%	5	55.5%	8	88.9%	1	11.1%
WEEKEND	17	17	100%	0	0.0%	12	70.6%	5	29.4%

TABLE 34 - SOCIAL INTERACTIONS PER CULTURAL BACKGROUND – HINGE PARK

•••••	•••••	•••••	• • • • • • • • • • • • •	•••••	••••	•••••	•••••	•••••	•••••
	TOT	ABOR	IGINAL	AFR	RICAN	AS	SIAN	CAUC	ASIAN
TOTAL	104	0	0.0%	0	0.0%	21.5	20.7%	82.5	79.3%
WEEKDAYS	27	0	0.0%	0	0.0%	3	11.1%	24	88.9%
WEEKEND	77	0	0.0%	0	0.0%	18.5	24.0%	58.5	76.0%

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interactions per age group – Hinge Park below. Observations showed that most of the persons who interacted (61.5%) were adults; however, in 29.8% of the cases, children were involved. This suggests that presence of children increased opportunities for social interactions.

These data are consistent with results emerged from the study of Mac Lean Park and were confirmed by the analysis of preferred activities and preferred features associated with social interactions in Hinge Park, as further analyzed below.

In this regard, Table 36, *Social interactions per activity* – *Hinge Park* below reports the activities that users were performing in Hinge Park when the social interactions occurred. Analysis of results indicates that stationary activities (standing, sitting or lying) were the most conducive to social interactions (40.4%), followed by playing (37.5%). This suggests that most of the interactions happened while people were taking care of their children, actively playing with them or supervising their play while standing or sitting. Walking the dog also appeared to be a good opportunity for interacting (14.4%), with people briefly stopping to exchange few words, presumably about the dog, with other dog owners or people passing by; a certain number of people (7.9%) was also observed while interrupting a transition activity (walking, running or cycling) to interact with someone (presumably a person or a group with whom

TABLE 35 - SOCIAL INTERACTIONS PER AGE GROUP – HINGE PARK

	TOT	CHIL	DREN	YC	UTH	AD	DULTS	SEN	IIORS
TOTAL	104	31	29.8%	4	3.9%	64	61.5%	5	4.8%
WEEKDAYS	27	7	25.9%	1	3.7%	16	59.3%	3	11.1%
WEEKEND	77	24	31.2%	3	3.9%	48	62.3%	2	2.6%

TABLE 36 - SOCIAL INTERACTIONS PER ACTIVITY- HINGE PARK

•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••
	тот	STAND	SIT LIE	PLAYING		WALKING DOG		WALK RUN CYCLE	
TOTAL	104	42	40.4%	39	37.5%	15	14.4%	8	7.7%
WEEKDAYS	27	16	59.3%	7	25.9%	4	14.8%	0	0.0%
WEEKEND	77	26	33.8%	32	41.5%	11	14.3%	8	10.4%

they had a previous relationship).

Finally, relationships between park features and social interactions were investigated, with the objective of identifying where socially interactions occurred, as reported in Table 37, Social interactions per features – Hinge Park below.

Results suggested that, in Hinge Park, the playground was the most common location (38.5%) associated with social interactions, followed by the grass (27.9%) and the walking paths (22.1%). This is consistent with findings emerged from the analysis of preferred activities, which found a positive relationship between playing (and related stationary activities), and increased opportunities for social interactions. In fact, children were most likely to play at the playground or on the grass. Similarly, walking the dog preferably occurred on the walking paths or on the grass. The results showing the relatively low percentage (11.5%) of interactions happening in proximity of benches (or picnic tables) should be considered with caution. In fact, it should be noted that seating places occupy a small area of the park; as such, their role in favouring social interactions is actually relevant. This is especially true when considering data from weekdays. During the week, 40.8% of interactions happened in proximity of benches or picnic tables and only 14.8% at the playground. No conclusive reasons could be found to explain this discrepancy.

On the contrary, interactions seemed to occur according to unpredictable patterns. Some instances of social interaction were registered during most of the observations (85% of cases in Hinge Park and 80% of cases in Mac Lean Park). However, in some cases, the number of social interactions counted, whilst occurring in the same setting under the same conditions,

TABLE 37 - SOCIAL INTERACTIONS PER FEATURES – HINGE PARK									
	тот	PLAYG	ROUND	GF	RASS	SEA	TING	PA	THS
TOTAL	104	40	38.5%	29	27.9%	12	11.5%	23	22.1%
WEEKDAYS	27	4	14.8%	8	29.6%	11	40.8%	4	14.8%
WEEKEND	77	36	46.7%	21	27.3%	1	1.3%	19	24.7%

was higher than expected. In particular, it was noted that social interactions promoted other interactions and the simple fact of watching other people interacting seemed to create a positive setting for other interactions to happen. So, for example, 40% of social interactions observed during weekends in Hinge Park occurred during a single visit. This may be explained by the so-called 'triangulation effect', according to which interactions between strangers generally occur as a natural response to an external stimulus (Peters, Elands and Buijs, 2010).

In summary, observations showed similar patterns of social interactions occurred in the two parks, suggesting that the mere presence of certain park features or certain activities promote social interactions and that this happens independently from the role that the park plays for the community. In fact, the different characteristics of Mac Lean Park and Hinge Park (the first one an inclusive and multicultural meeting place in Strathcona, the second one a pleasant transition place in Mount Pleasant) were confirmed by the analysis of the social interactions that occurred. In particular, in Mac Lean Park people from different cultural background were observed interacting and most of the interactions were inter-ethnic, while in Hinge Park they were not. However, the type of interactions observed in the two parks had similar characteristics and occurred under similar circumstances. In particular:

- The majority of social interactions were casual and cursory (they happened between people who did not have a previous relationship);
- A consistent positive association was identified between social interactions and children's play;
- A less relevant association was identified between social interactions and the activity 'walking the dog'.

These results are consistent with findings from previous research (Cattell et al., 2008; Kaźmierczak, 2013; Peters, Elands and Buijs, 2010), which found a positive relationship between social and optional activities, especially spending time with children at the playground, and social interactions. Moreover, the relationship identified between the activity 'walking the dog' and social interactions supports the fact that social interactions are

promoted by repeated contact which generates sense of familiarity.

An additional evaluation was conducted in relation to frequency of interactions, as reported in Table 38, *Frequency of social interactions* below. Results suggest that interactions in Mac Lean Park were more frequent than in Hinge Park. This is consistent with findings from previous research, which found a positive association between stationary activities and social interactions (Kaźmierczak, 2013). In fact, it is not unexpected that social interactions are less frequent when people only pass through the park, and more frequent when people spend time at the park to perform some sort of stationary activities.

Therefore, the same comparison between the two parks was conducted considering only people performing stationary activities, as reported in Table 39, *Frequency of social interactions (stationary activities only)* below.

For this scope, walking the dog was considered a stationary activity, because dog owners were often observed standing on the grass, while playing with their dogs. On this basis, 91% of the activities registered in Mac Lean Park and 52.8% of the activities registered in Hinge

	MAC LEAN PARK	HINGE PARK
NUMBER OF INTERACTIONS	36 INTERACTIONS	26 INTERACTIONS
NUMBER OF INTERACTIONS PER HOUR	1 INTERACTION/50 MIN	1 INTERACTION/60 MIN
NUMBER OF INTERACTIONS PER PERSON	1 INTERACTION / 62 PERSONS	1 INTERACTION / 78 PERSONS
NUMBER OF INTERACTIONS PER GROUP	1 INTERACTION / 21 GROUPS	1 INTERACTION / 40 GROUPS

TABLE 38 – FREQUENCY OF SOCIAL INTERACTIONS

TABLE 39 – FREQUENCY OF SOCIAL INTERACTIONS (STATIONARY ACTIVITIES ONLY)

	MAC LEAN PARK	HINGE PARK
NUMBER OF INTERACTIONS	36 INTERACTIONS	26 INTERACTIONS
NUMBER OF INTERACTIONS PER HOUR	1 INTERACTION/50 MIN	1 INTERACTION/60 MIN
NUMBER OF INTERACTIONS PER PERSON	1 INTERACTION / 56 PERSONS	1 INTERACTION / 41 PERSONS
NUMBER OF INTERACTIONS PER GROUP	1 INTERACTION / 19 GROUPS	1 INTERACTION / 21 GROUPS

Park were considered, for a total of 2,025 visitors (692 groups) in Mac Lean Park and 1,077 visitors (546 groups) in Hinge Park.

Results were particularly relevant. The frequency of interactions per hour did not change, because the duration of observations was the same. However, if only stationary activities were considered, frequency of interactions per number of persons and frequency of interaction per number of groups was higher in Hinge Park than in Mac Lean Park.

Given that Mac Lean Park appeared to be a more conducive setting to social interactions than Hinge Park, these results may seem surprising. However, they provide evidence that it is the presence of certain features (mainly the playground) and the performing of certain activities (supervising children's play, walking the dog) that promote social interactions, independently by the role that the park plays within the neighbourhood.

8.2. Perceived value of the selected urban park case studies

As analyzed in Chapter 7, *Research methodology*, the perceived value of the two urban park case studies was investigated through specific questions included in the questionnaire, as reported in Table 4, *Questionnaires – Categories of questions*. The questionnaire included various typologies of questions (yes/no; rating questions; open questions) whose analysis provided different insights for the following discussion of results.

8.2.1. Perceived value of social interactions

Results from observations provided numerous information about the typology (casual or scheduled), character (same ethnicity or inter-ethnic) frequency (per hour, per number of persons or groups) and occurrence (relationship with specific activities or features) of social interactions; however, they could not explain how these social interactions were perceived and valued by the community. For this reason, specific questions were included in the questionnaires in order to understand the perceived value of those interactions and specifically if they were conducive to sense of community, as argued by various studies (Cattell

et al. 2008; Francis et al., 2012; Peters, Elands and Buijs, 2010).

A comparison between the social value of the two parks, as perceived by the respective communities, is summarized in Table 40, Perceived *social value - Questionnaires* below.

Results from the questionnaires show that respondents almost unanimously affirmed that they felt welcome in the two parks (96,2% in Mac Lean Park and 94.1% in Hinge Park). Presence of homeless people in Mac Lean Park and restrictions about dogs in Hinge Park were the reasons mentioned for feeling otherwise.

However, when considering the role of the two parks as a central focus for the wider community, results from the two parks diverged. Nonetheless, data from questionnaires generally confirmed the findings that emerged from observations.

Results from Mac Lean Park reported that 88.5% of respondents agreed with the statement that the park is a central focus for the wider community. Moreover, having the opportunity of specifying why they thought so, respondents argued that "it is a gathering place", "it is central to most in the community", "it's a place that brings people together", "it seems to be shared by all", "it's a hub, it is a well-used and well-loved space all year round". A respondent specified: "I used to come here as a child and now I bring my children to the playground everyday; everybody comes here - every second Sunday there is a barbecue organized by the Strathcona Society". All these answers confirmed the role of the park as an inclusive meeting place, as emerged from the observations. Other respondents provided additional insights, affirming that the park acts as "the backyard of the surrounding houses" and also that it plays

TABLE 40 – PERCEIVED SOCIAL VALUE - QUESTIONNAIRES

	MAC LEAN	P STRATHO	HINGE PARK – MT. PLEASANT			
	YES	NO	N.A.	YES	NO	N.A.
FEELING WELCOME	96.2%	3.8%	-	94.1%	5.9%	-
PARK FOCUS FOR THE COM.	88.5%	3.8%	7.7%	61.8%	32.4%	5.8%
MEETING NEW PEOPLE	80.8%	15.4%	3.8%	58.8%	41.2%	-

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a role in "a network of community markets with the park in the middle". In consideration of its attractive and inclusive role, it is not surprising that more than 80% of the respondents affirmed that they had opportunity of meeting new people at the park.

Responses collected in Hinge Park also recognized the role of the park as a central focus for the community, but people did not agree to the statement to the same extent (61.8%). Specific reasons to go to the park were identified, with respondents affirming that it "attracts neighbours, people with similar interests", "there is the only playground in the neighbourhood, so families converge here" or, more generally, "no one has private gardens so people come here"; someone also mentioned 'picnics', which was not a common activity registered through observations. However, the role of the park as a transition place was also effectively captured, with visitors affirming that "you can run, bike and walk dogs" or "people can pass through or walk their dogs". Other visitors also recognized the environmental value of the park, affirming that "it's nature", "it is an oasis, a space to get away because the surrounding area is very industrial", or, more generally, "it has an inviting atmosphere". These responses suggest that Hinge Park plays different roles for different people in the neighbourhood; moreover, it is perceived more as an attractive place for being in contact with nature than a place for stationary activities and social encounters. Nonetheless, 58.8% of respondents affirmed that they had occasion of meeting new people at the park.

8.2.2. Perceived nature indicator

In addition to the social value that people attribute to urban parks as privileged spaces for social interactions, this research thesis equally concerned with the environmental value that people associate with nature in general and urban parks in particular.

As anticipated, perceived benefits of urban parks depend on a series of interacting factors, including personal characteristics and exposure to 'nearby nature' in everyday life. For this reason, questionnaires investigated three principal domains:

- Respondents' demographic characteristics;
- Respondents' perception of 'neighbourhood greenness'
- Respondents' perception of environmental benefits of urban parks.

Considering the neighbourhood scale, different perceptions of 'nearby nature' were investigated, with particular interest in examining two characteristics:

- Overall perception of neighbourhood greenness;
- Relative importance of specific green features within the neighbourhood.

In order to investigate what type of green space can be experienced in the two neighbourhoods, an exploratory survey was conducted. During the site visit, presence of grass and trees were mapped and photographs were taken in order to capture the quality, quantity and species richness of the existing green space. The study area was defined as a 400-metre radius (corresponding to a 5-minute-walk distance) around the selected urban parks. This measure was chosen because it corresponds to the typical minimum distance prescribed by municipal regulations, including the Vancouver GCAP (City of Vancouver, 2010) and following updates. As such, it is considered to include the expected catchment areas of the two urban parks (see Chapter 3, *Provision, Access and Use of green spaces* for further analysis in this regard).

However, results from questionnaires showed that the two parks attracted people from a greater distance. Mac Lean Park, for example, is a typical neighbourhood park and in fact the majority of users (58.3%) were included in a 5-minute-walk distance radius from home; an additional 8.3% of visitors lived in a 10-minute-walk distance from home. However, the remaining 33.4% of visitors came from various parts of the city. In Hinge Park, instead, the number of visitors living in close proximity to the park was considerably lower (28.3% in a 5-minute distance and an additional 14.3% in a 10-minute-distance from home). In fact, the majority of users (57.4%) came from other parts of the city. This may depend by the fact that Hinge Park was also used by workers in their lunch break. So, even if their residency was elsewhere, they could easily reach the park within a walking distance from their workplace.

Due to these limitations, the relationship between exposure to 'nearby nature' and perceived value of urban parks could not be fully captured by the responses to the questionnaires. However, some possible associations between the physical characteristics of the context and perceived neighbourhood greenness could be hypothesized.

To this end, findings emerged from the exploratory survey were captured through maps and photographs, as represented in Figure 1, *Survey of neighbourhood greenness* and Figure 2, *Photo-survey of neighbourhood greenness* in the following pages. In particular:

- Maps show the location and extension of public green space (street trees represented by green dots and grass represented by green areas);
- Photographs show how private and public green areas are perceived from the street.
 It can be considered an example of 'nearby nature' as experienced by people living in the neighbourhood and simply passing by.

Differences clearly emerged between the two locations, with Strathcona showing a more mature and diverse provision of public and private green space. However, it should be noted that for residents of Mount Pleasant, South East False Creek compensates for the relative lack of exposure to street trees and private gardens with the open view of the ocean and the mountains that is possible from various locations, including the park itself.

Results from questionnaires generally showed a positive perception of 'nearby nature' in the neighbourhoods. In particular, when asked to express their reaction to the statement that their neighbourhood (Mount Pleasant or Strathcona) was 'a green neighbourhood', the great majority expressed a positive reaction. In fact, almost 81% of respondents in Strathcona considered that neighbourhood a green neighbourhood (19.2% Strongly agreed, 30.8% Agreed and 30.8% Partly agreed) and 94% of respondents in Mount Pleasant considered that neighbourhood (14.7% Strongly agreed, 38.2% Agreed and 41.2% Partly agreed).



FIGURE 1 - SURVEY OF NEIGHBOURHOOD GREENNESS

.

STRATHCONA – MAC LEAN PARK



MOUNT PLEASANT – HINGE PARK

FIGURE 2 - PHOTO-SURVEY OF NEIGHBOURHOOD GREENNESS



STRATHCONA – MAC LEAN PARK



MOUNT PLEASANT – HINGE PARK

When asked to indicate what kinds of green spaces characterize their neighbourhood the most, respondents from both case studies indicated local neighbourhood parks as the most important green features. This is particularly significant because previous research had argued that satisfaction with local parks can be associated with satisfaction with the overall neighbourhood and, by extension, with satisfaction with quality of life (CABE, 2010b).

However, some differences could be identified in regard to the perception of various green spaces. In Strathcona, for example, local neighbourhood parks obtained a high score (4.22), followed by Local community gardens (3.44) and Tree lined streets (3.33). Private gardens were not considered very important (2.33) and View of the mountains/ocean was considered the least important (2). These results are represented in Table 41 (w/ graphic), *Perception of neighbourhood greenness - Strathcona* below.

TABLE 41 - PERCEPTION OF NEIGHBOURHOOD GREENNESS – STRATHCONA

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STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
LOCAL NEIGHBOURHOOD PARKS	4.22	PRIVATE GARDENS	2.33
LOCAL COMMUNITY GARDENS	3.44	TREE LINED STREETS	3.33
VIEW OF THE OCEAN/THE MOUNTAINS	2		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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In Mount Pleasant, instead, local neighbourhood parks (3.64) and view of the mountains/ ocean (3.32) were both considered important. This is consistent with the fact that an open view toward the ocean or the mountains is possible from many locations within the neighbourhood. Tree lined streets were considered the third most important green feature (score 3), followed by local community gardens (2.92) and private gardens (2.24). These results are represented in Table 42 (w/ graphic), *Perception of neighbourhood greenness – Mount Pleasant* below.

The high importance attributed to street trees in Mount Pleasant is worth further analysis. In fact, the exploratory survey conducted in the neighbourhood showed that tree lined streets in Mount Pleasant were less mature and widespread than in Strathcona. However, the importance of street trees in defining the 'neighbourhood greenness' in Mount Pleasant

TABLE 42 - PERCEPTION OF NEIGHBOURHOOD GREENNESS – MOUNT PLEASANT

STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
LOCAL NEIGHBOURHOOD PARKS	3.64	PRIVATE GARDENS	2.24
LOCAL COMMUNITY GARDENS	2.92	TREE LINED STREETS	3.00
VIEW OF THE OCEAN/THE MOUNTAINS	3.32		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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obtained a similar score than in Strathcona (3 versus 3.33 respectively).

This may suggest that, whilst the quality of green spaces is beneficial, the mere presence (or quantity) of some green features in the neighbourhood is more important than their quality in providing perceived benefits. This is in line with the findings from the CABE report (2010b), which recognized the role of the quantity of green space in improving human and environmental health, regardless of its quality (see Chapter 3, Provision, *Access and Use of Green Spaces* for further details).

The high score attributed to street trees also confirmed that this amenity is greatly appreciated, as supported by previous research which identified a positive relationship between street greenery and social cohesion (De Vries et al., 2013) and between street greenery and perceived health (Kardan et al., 2005).

The fact that higher value is attributed to street trees than trees in other settings could also explain why private gardens were not considered particularly important in defining 'neighbourhood greenness' in both case studies. In fact, respondents may be less inclined to associate benefits to green spaces they cannot physically access, as noted by Keniger et al. (2013). Moreover, other studies (CABE, 2010b) argued that in high density areas, where people have less access to private green space, public green spaces are valued more and used more.

In this regard, the questionnaires included a question about the type of dwelling where people lived. This was intended to examine the potential relationship between type of dwelling and perceived benefits of nature. In particular, the objective was to verify whether living in a single detached house with a private garden influences the perception and use of neighbourhood urban parks. However, no significant relationship emerged. In Hinge Park, only one respondent lived in a single detached house and therefore it was not possible to draw significant conclusions. Results from Strathcona, by contrast, reported a higher number of people living in a single detached house (30.8%); however, their responses were in line

with the rest of the sample.

Even if respondents of the questionnaire did not seem to attribute great value to the role of private gardens in providing environmental benefits, this relationship is supported by the literature. In fact, most of tree canopy is concentrated on private properties (Fraser and Kenney, 2000) and, as a result of personal preferences in garden characteristics, private green spaces contribute in enhancing urban biodiversity (Daniels and Kirkpatrick, 2006; Loram et al., 2011; Smith et al. 2005).

In addition to questions intended to analyze the perception of 'nearby nature' at the neighbourhood scale, respondents were also asked to rate their perception of environmental benefits of the two selected urban parks. In fact, although the two parks have many similar

TABLE 43 - PERCEPTION OF NATURE BENEFITS – MAC LEAN PARK

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STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
LOCAL NEIGHBOURHOOD PARKS	3.50	PRIVATE GARDENS	1.38
LOCAL COMMUNITY GARDENS	3.19	TREE LINED STREETS	3.19
VIEW OF THE OCEAN/THE MOUNTAINS	1.88		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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characteristics, perceived nature could be different. This possibility is investigated in the following discussion.

As represented in Table 43 (w/ graphic), *Perception of nature benefits – Mac Lean Park* in the previous page, results from Mac Lean Park reported that breath fresh air was the most important perceived benefit (score 3.5), followed by relieving stress and feeling restored (both score 3.19). Enjoying the view (1.88) and being in contact with wildlife (1.38) were rated as significantly less important. The fact that being in contact with wildlife obtained the lowest score presumably depends on the fact that opportunities of contact with wildlife in Mac Lean Park are scarce.

As reported in Table 44 (w/ graphic), Perception of nature benefits - Hinge Park below,

TABLE 44 - PERCEPTION OF NATURE BENEFITS - HINGE PARK

STATIONARY ACTIVITIES	SCORE*	TRANSITION ACTIVITIES	SCORE*
LOCAL NEIGHBOURHOOD PARKS	3.50	PRIVATE GARDENS	2.50
LOCAL COMMUNITY GARDENS	3.50	TREE LINED STREETS	2.90
VIEW OF THE OCEAN/THE MOUNTAINS	3.15		

* Score from 1 to 5 where 1 is the least important and 5 the most important



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results from Hinge Park confirmed that breathing fresh air and relieving stress were the most important perceived benefits (both scored 3.50). However, also the other indicators obtained high ratings, namely enjoying the view (3.15), feeling restored (2.90) and being in contact with wildlife (2.50). The relatively high score attributed to contact with wildlife presumably depends on the fact that opportunities of contact with wildlife in Hinge Park are more frequent than in Mac Lean Park. In particular, many respondents referred to the presence of a beaver dam that was spotted in the rainwater wetland stating that they were aware of it and passed by explicitly to see the beaver.

Analysis of results suggests that visitors of Hinge Park felt to be exposed to a higher range of environmental benefits than visitors of Mac Lean Park. In fact, if the most important benefits obtained comparable ratings in both the urban parks, while the least important benefits were rated higher in Hinge Park than in Mac Lean Park.

The greatest difference could be observed in the rating of enjoying the view that was considered much more important in Hinge Park (3.15) than in Mac Lean Park (1.88). This is consistent with findings at the neighbourhood scale and can be explained by the fact that Hinge Park has an open view of the city skyline, the ocean and the mountains. Mac Lean Park, instead, is a more defined space, surrounded by trees and heritage houses. In order to provide a visual support to the analysis, some pictures of the two parks are provided in Figure 3, *Photo-survey of the selected neighbourhood urban parks* in the following page.

In conclusion, visitors of the two urban parks expressed a positive perception of their neighbourhood greenness, attributing particular value to their local urban parks and, more generally, to green spaces they could physically access. This is consistent with results from previous studies (Keniger et al., 2013) and suggests that the presence of certain natural features may be more important than their quality in providing perceived benefits (CABE report, 2010b). However, an analysis at the park scale highlighted that the variety of natural features to which visitors are exposed during their visits to urban parks may enhance the quality of the experience and therefore the perception of benefits.

FIGURE 3 – PHOTO-SURVEY OF THE SELECTED NEIGHBOURHOOD URBAN PARKS



STRATHCONA – MAC LEAN PARK



MOUNT PLEASANT – HINGE PARK

8.2.3. Role of exposure (intensity, frequency and duration)

The analysis so far has examined the ways in which various personal characteristics (age, ethnicity, type of dwelling, exposure to 'nearby nature') can influence the perception of benefits that urban parks provide. A final analysis, supported by previous research (Kuo, 2010; Ryan et al., 2014; Shanahan et al., 2015) investigates the role that the type of exposure (namely intensity, frequency and duration of the experience) plays in affecting perceived value of urban parks.

As explored in Chapter 3, *Provision, Access and Use of Green Spaces*, various studies (Francis et al., 2012b; WHO, 2016) argued that quality – or attractiveness – of urban parks influences type of uses, including frequency of visits, time spent and type of activities. So, certain urban parks are more conducive to short but frequent activities, such as walking or walking the dog, while others favour stationary activities (such as recreational activities or social encounters) that typically are less frequent but last longer. These characteristics have an influence on the perception of both social and environmental benefits.

Considering social benefits, the relationship between type of exposure (especially related to duration and frequency of use) and social relations has been variously interpreted by the literature. Several authors (Francis et al., 2012; Kaźmierczak, 2013) argued that type and duration of performed activities are more conducive to social relations than frequency of use. By contrast, other studies (Cattell et al., 2008; Peters, Elands and Buijs, 2010), highlighted that frequent use offers opportunities for repeated contact that evoke a sense of familiarity and consequently sense of community. In particular, Cattell et al. (2008) argued that regular use of urban parks is a precondition for social interactions. In fact, results from their study showed that when park visitors used the park frequently, for example passing through or walking the dog, they appeared to be more likely to acknowledge the presence of acquaintances and maintain loose ties with them. As a consequence, urban parks become places that – in addition to provide opportunities for certain activities – promote sense of familiarity and assume symbolic meanings which accumulate over time, enhancing sense of community.

Considering environmental benefits, the 'biophilia hypothesis' argues that humans have a natural attraction, affinity and preference for natural landscapes (Alencar, 2013; Beatley, 2011; Browning et al., 2012; Browning, Ryan and Clancy, 2014) and especially for species richness (Dearborn and Kark, 2010, p. 436). Moreover, previous studies identified a strong association between perceived biodiversity and human wellbeing, especially in relation to plant richness (Fuller et al., 2007). Research on the restorative effects of 'nearby nature' (Hartig, Mang and Evans, 1991; Kaplan, 2001; Matsuoka and Kaplan, 2008; Velarde, Fry and Tveit, 2007) identified a positive relationship between frequency of contact and perceived restoration, sense of satisfaction and improved emotional, mental and physical health. Other studies focused specifically on the perceived benefits of urban parks and identified a positive association between exposure to nature and the perception of environmental benefits (Kuo, 2010; Ryan et al., 2014; Shanahan et al., 2015). In particular, Shanahan et al. (2015), investigated the existence of a 'nature dose' – a minimum level of exposure to nature that is necessary for people to receive benefits in terms of intensity, frequency and duration (see Chapter 4, *Role of Urban Parks* for further details).

The analysis described here accepts the definitions of 'exposure' proposed by Shanahan et al. (2015) and investigates the different types of interaction with nature that visitors experience in the two urban park case studies, with the objective of identifying possible relationships with the previous findings.

With the term 'intensity' Shanahan et al. (2015) identify the quantity and quality of nature elements to which park users are exposed. For this reason, an analysis of the nature elements that characterize the two parks was conducted. Results are reported in Table 45, *Intensity of exposure to* nature in the following page.

Analysis of the natural characteristics of the two parks illustrates that Hinge Park shows a greater variety of exposure to nature, offering a more 'intense' experience. In fact, in addition to the vast grass area, shrubs and trees, it includes a rainwater wetland which is a natural habitat for native wildlife. This is particularly relevant because previous research argued that

water is the most preferred landscape element regardless of cultural differences. (Özgüner and Kendle, 2006). Mac Lean Park, instead, is characterized by a more homogeneous landscape, mostly grass. However, the presence of numerous mature trees provides a vast shady area that makes the park more attractive than Hinge Park for stationary activities.

These results show that visitors of Hinge Park are exposed to a greater variety of natural elements. Congruently, as previously described in Table 43, *Perception of park benefits – Mac Lean Park, Strathcona* and Table 44, *Perception of park benefits – Hinge Park, Mount Pleasant* respondents to the questionnaire in Hinge Park attributed overall higher rates to perceived environmental benefits than in Mac Lean Park. This may depend on the fact that people have a natural predisposition toward nature (biophilia hypothesis), and especially toward more biodiverse environments (Dearborn and Kark, 2010; Fuller et al., 2007). So, visitors of Hinge Park perceived more environmental benefits from exposure to nature because their experience was more intense, considering the quantity and quality of nature elements they were exposed to (Shanahan et al., 2015).

In regard to the frequency of visits, results from questionnaires in the two urban parks provided similar results and, as reported in Table 46 (w/ graphic), *Frequency of visits – Mac Lean Park* and Table 47 (w/ graphic), *Frequency of visits – Hinge Park* in the following pages, the two parks registered a fairly constant use throughout the year.

		• • • • • • • • • • • • • • • • • • • •
	MAC LEAN PARK	HINGE PARK
GRASS AREA	10,400 sqm (35% SHADY AREA)	6,000 sqm (ONLY 1 SHADY SPOT)
TALL TREES	# 42 MATURE TREES	# 15 YOUNG TREES
SHRUBS/SMALL TREES	920 sqm	670 sqm
WATER (STRORMWATER WETLAND)	-	2,700 sqm
NATIVE WILDLIFE*	COYOTE	BEAVER, DUCK, BIRDS, SEA OTTER

TABLE 45 – INTENSITY OF EXPOSURE TO NATURE

* As emerged from responses to questionnaires

In Mac Lean Park, for example, about 30% of the respondents affirmed to visit the park everyday, independently from the season, with an increase in visitation rates in the summer (43.5%). Similarly, almost 40% of the respondents declared to visit the park at least once a week throughout the year, with higher visitation rates during spring (52.2%).

The results were similar in Hinge Park with about 30% of the respondents affirming to visit the park everyday throughout the year, except during winter where visitation rates were lower (17.9%). Similarly, more than 50% of respondents declared to visit the park at least once a week independently from the season, except for winter, when the value decreased to 42.9%.

As mentioned above, previous research found a positive relationship between frequency of use and perceived social and environmental benefits of urban parks. In particular, routine and

TABLE 46 - FREQUENCY OF VISITS - MAC LEAN PARK

	SPRING	SUMMER	FALL	WINTER
EVERYDAY	26.1%	43.5%	34.8%	30.4%
1/WEEK OR MORE	52.2%	39.1%	39.1%	39.1%
1/MONTH OR MORE	21.7%	13.0%	21.7%	21.7%
NEVER	0.0%	4.3%	4.3%	8.7%



repeated contact was associated with increased opportunities for social interactions (Cattell et al., 2008; Peters, Elands and Buijs, 2010). Moreover, repeated contact with nature – in any form, including simple view from home – was associated with micro-restorative experiences, general sense of satisfaction and wellbeing (Kaplan, 2001).

These relationships identified by the literature are worth consideration. However, since data regarding frequency of visitation in the two urban parks are similar, it was not possible to verify if frequency of visits influences perceived value of urban parks as an external factor.

Further analyses were conducted in relation to duration of exposure, that was investigated both through observations and questionnaires. During observations, people were registered when the first session started and their presence was reconfirmed at the beginning of the

TABLE 47 - FREQUENCY OF VISITS – HINGE PARK

	SPRING	SUMMER	FALL	WINTER
EVERYDAY	25.0%	32.1%	25.0%	17.9%
1/WEEK OR MORE	57.1%	53.6%	53.6%	42.9%
1/MONTH OR MORE	17.9%	14.3%	21.4%	32.1%
NEVER	0.0%	0.0%	0.0%	3.6%



following two sessions. Since duration of sessions varied depending on the time necessary to count all the visitors, the time passed between observations varied. Nonetheless, it was possible to determine the effective duration of visits for each group of people. Detailed data are reported in Table 48, *Average time spent - Observations* below.

Analysis of data regarding duration of visits confirmed the general trend emerged from observations, that is that visitors to Mac Lean Park prefer stationary activities prolonged over time, while visitors of Hinge Park prefer short transition activities.

The data from observations showed that visitors of Mac Lean Park spent considerably more time at the park than visitors of Hinge Park (37.6% of visitors lingered for more than 1 hour during observations in Mac Lean Park, compared to only 3.8% in Hinge Park). On the other hand, 56.1% of visitors of Hinge Park simply passed through the park without stopping, compared to only 7.1% in Mac Lean Park. However, considering only stationary activities, relevant similarities emerged. In fact, the relative majority of people in both parks had visits lasting between 30 minutes and 1 hour (46.1% in Mac Lean Park and 32.1% in Hinge Park).

Considering that people just passing through rarely accepted to take part to the questionnaires, it is not surprising that results from questionnaires in Hinge Park generally reported higher duration of visits than that emerged from observations. However, results from questionnaires

TOTAL	MAC LEA	AN PARK	HINGE PARK	
	%	2,224	%	2,040
AT LEAST 80 MINUTES	5.6%	125	-	-
AT LEAST 70 MINUTES	25.2%	561	-	-
AT LEAST 60 MINUTES	6.8%	152	3.8%	78
AT LEAST 50 MINUTES	-	-	5.2%	106
AT LEAST 30 MINUTES	39.3%	873	23.1%	472
AT LEAST 10 MINUTES	16.0%	355	11.7%	239
PASSING THROUGH	7.1%	158	56.1%	1,145

TABLE 48 - AVERAGE TIME SPENT – OBSERVATIONS

generally confirmed results from observations when only stationary activities were considered. In fact, most people affirmed to spend at the park 'between 30 minutes and 1 hour', (62.5% in Mac Lean Park and 45.2% in Hinge Park). Moreover, many respondents of Hinge Park confirmed to prefer shorter visits, with 38.7% of visitors spending less than 30 minutes at the park, compared to only 12.5% of respondents in Mac Lean Park. Detailed results from questionnaires are reported in Table 49, *Average time spent - Questionnaires* below.

Results from observation and questionnaires confirmed that park users spent considerably more time in Mac Lean Park than in Hinge Park. However, the role of duration of visits in influencing perception of social and environmental benefits is not straightforward.

In fact, considering perceived social benefits, as previously commented and represented in Table 39, *Frequency of social interactions (stationary activities only)*, data showed that, when considering only stationary activities performed within the park, frequency of interactions per number of persons and per number of groups was higher in Hinge Park than in Mac Lean Park, even if average time spent at the park was lower. This means that, whilst a positive relationship was found between certain stationary activities (especially taking the children to the playground) and social interactions, the duration of the activity was not significant in increasing opportunities for social interactions.

Nonetheless, when perceived value of social interactions and sense of community were investigated, as previously discussed and represented in Table 40, *Social value – Questionnaires*, respondents of Mac Lean Park showed greater appreciation of the role of their neighbourhood

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TABLE 49 - AVERAGE TIME SPENT – QUESTIONNAIRES	

	MAC LEAN PARK	HINGE PARK
MORE THAN 1 HOUR	25.0%	16.1%
BETWEEN 30 MIN AND 1 HOUR	62.5%	45.2%
BETWEEN 15 AND 30 MINUTES	12.5%	22.6%
LESS THAN 15 MINUTES	0.0%	16.1%

park as a focus for the whole community. This may suggest that duration of the experience does not influence actual opportunities for social interaction, but considerably affects their perception.

By contrast, considering perception of environmental benefits, users of Mac Lean Park did not seem to perceive more environmental benefits thanks to their longer visits. In fact, perceived benefits of urban parks were rated higher by visitors of Hinge Park than by visitors of Mac Lean Park, as discussed above and represented in Table 43, *Perception of park benefits – Mac Lean Park, Strathcona* and Table 44, *Perception of park benefits – Hinge Park, Mount Pleasant*. These results suggest that intensity of the experience was more conducive to perceived environmental benefits than duration of the experience.

In conclusion, the evaluation of the role of exposure in influencing perception of value of urban parks generally confirmed the findings that emerged from the previous analyses described in this thesis. In fact, data from observations and questionnaires concurred in suggesting that the two urban parks play different roles within their neighbourhood. As such, they have very different visitation patterns and people attribute them different values. However, the way in which they provide social and environmental benefits (in this study analyzed through the lenses of two indicators: 'social interactions' and 'perceived nature') is similar.

In fact, results suggested that it is the presence of certain park features and the opportunity of performing certain activities that was positively associated with the perception of social benefits. Similarly, it is the presence, variety and quality of certain natural features in the park that was positively associated with the perception of environmental benefits. These characteristics constitute the 'intensity' of the experience. A positive association was also identified between duration of exposure and perceived sense of community, while analysis of frequency of visits was inconclusive.

Therefore, the intensity of the experience – as defined by the variety of physical and natural features that the park provides – seems to be the best predictor of park users' satisfaction.

This is particularly significant, because previous research identified a positive relationship between park satisfaction, neighbourhood satisfaction and perceived quality of life (CABE, 2010b).

8.3. Summary of results

As described above, congruently with the analysis of the literature review conducted in Part 2 – *Use and Perceived Value of Urban Parks*, the role of the two urban park case studies was investigated according to two perspectives:

- Use of urban parks, including analysis of preferred activities, preferred features and instances of social interactions, with particular focus in identifying potential differences in regard to age group and social background;
- Perceived value of urban parks, including analysis of perceived social benefits (perceived value of social interactions) and environmental benefits (perceived nature indicator), with particular focus in identifying potential influences of exposure to nature (intensity, frequency and duration of the experience) in the perception of benefits.

Analysis of preferred activities and preferred features showed that the two urban parks play different roles within their respective neighbourhoods:

- Mac Lean Park is a destination park: people reach the park to spend time there, engaging different kinds of stationary activities, such as taking the children to the playground, taking part to various social gatherings (birthday parties, picnics, community barbecues, etc.) or scheduled activities (soccer school, after school programs, etc.), or just to rest and relax; many different park features are used and appreciated, such as playgrounds and water features, benches and picnic tables, or just the grass, especially shady areas under the trees;
- Hinge Park is a transition place: people enjoy passing through the park and occasionally
stop for some time, especially to take the children to the playground or to sit on the benches located beside the main walking path. Secondary paths are also attractive, especially the one passing through the sewer pipes bridge. However, not many stationary activities are performed in the park; in fact, the lack of shady areas makes the grass underused and an inadequate place for social gatherings.

Whilst playing different roles within their neighbourhood, the two urban parks provide a similar range of benefits to the surrounding communities.

Considering opportunities for social interactions, it emerged that:

- Certain park features (especially playgrounds) and certain activities (especially supervising children's play, walking the dog) promote opportunities for social interactions in both parks;
- Analysis of frequency of social interactions highlighted that a certain duration of visits is beneficial for creating opportunities for social interactions; in fact, a positive relationship was identified between stationary activities and social interactions. However, when only stationary activities were considered, duration of visits was not found to increase opportunities for social interactions;
- No striking differences were identified when considering the relationship between social interaction and different age or social background. However, a more multicultural setting (as in Mac Lean Park) seems to be more conducive to inter-ethnic interactions.

Considering the perceived value of the two urban parks, it emerged that:

- The Perceived Nature indicator showed that people gain benefits from contact with nature at different scales of analysis:
 - At the neighbourhood scale, the presence of certain natural features (such as street trees) enhances positive perception of neighbourhood greenness;

moreover, people attribute more value to green spaces they can physically access – especially urban parks – than to private gardens they cannot use;

- At the park scale, a positive relationship was identified between the variety and quality of natural features to which visitors are exposed during their visits and the perception of benefits;
- The Perceived value of Social Interactions (and, by extension, of sense of community) appeared to be associated with duration of exposure. In fact, whilst number of social interactions did not increase proportionally with duration of visits, their perception did.
- Analysis of the role of exposure suggested that the intensity of the experience as defined by the variety of physical and natural features that the park provides – is associated with improved perception of both environmental and social benefits.

In this Chapter, an extensive analysis of data has been conducted with reference to the current literature. Potential associations between type of use and perceived value of urban parks were identified and comparisons between the two case studies were conducted. As a result, whilst recognizing the different roles that the two urban parks play within their neighbourhoods, common threads were identified, as summarized above.

A final synthesis of the results is represented in Figure 4, *Mac Lean Park – mapping of results* and Figure 5, *Hinge Park – mapping of results* in the following pages. In these maps, the most relevant findings discussed above are conceptually represented on the park maps with the objective of highlighting the relationship between the observed patterns of use, the perceived social and environmental value of urban parks (as emerged from analysis of the questionnaires) and the physical characteristics of the parks. In particular, the maps include:

- The location of the park features associated with stationary activities;
- The location of the most attractive natural features;

- An icon representing social interactions (proportional to the number of persons involved);
- An icon representing perceived nature (proportional to the perceived value of nature as emerged from analysis of the questionnaires);
- Transition activities (number of persons passing through, as counted during Tracing sessions);
- Tables representing the relationship between social interactions, preferred features and preferred activities;
- A Graphic summarizing the most appreciated motives for visiting the park, as emerged from analysis of the questionnaires.

This last graphic includes pieces of information about preferred activities and perceived nature benefits that were previously discussed in Table 12 and Table 43 (Mac Lean Park) and in Table 14 and Table 44 (Hinge Park) respectively. Since all the results were gathered through rating questions (where 1 is the least important and 5 the most important), they are comparable. Therefore, data were combined in order to identify what motives to go to the park obtained higher ratings. A comparison between the two parks suggests that in Mac Lean Park perceived nature benefits obtained the highest scores (breath fresh air being the most important, followed by feel restored/relieve stress), while in Hinge Park the highest score was attributed to physical activities (a human benefit), followed by relieve stress/breath fresh air (perceived nature benefits).





FIGURE 5 – HINGE PARK SUMMARY OF RESULTS – MAPPING

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PART 4

CONCLUSIONS

9. CONCLUSIONS

Analysis of literature review and case studies provided a series of findings, mostly consistent, about the relationship between characteristics and quality of green spaces and their use and perceived value by a variety of users, with a focus on urban parks. The most relevant findings are summarized below.

9.1. Results from the literature review

A preliminary literature review showed that several benefits of green spaces are recognized by multiple disciplines; however, benefits are typically considered from an anthropocentric perspective. On the contrary, this thesis adopts a 'regenerative approach', that is the research perspective which follows the relatively new concept of regenerative design and development (Cole, 2012; Mang and Reed, 2012b). According to this perspective, humans and nature are part of the same living system. As such, the health of the system depends on their positive coevolution (Cole, 2012; Mang and Reed, 2012b).

A classification of benefits was proposed accordingly, identifying two macro categories: Social benefits (or benefits to humans), including *Social Relations, Health and Wellbeing and Economic benefits*, and Environmental benefits (or benefits to nature), including *Biodiversity, Regulatory function and Policy and environmental strategies*. Whilst benefits of green spaces are numerous, different groups of people are exposed to and benefit from them differently, depending on a series of external factors.

Among these interacting physical, social and personal factors, three elements that are thought to influence perception and use of green spaces were identified: the role of 'proximity' (typically distance from home to the nearest urban park), the role of 'quantity and quality' of green spaces and the role of 'affluence and ethnicity'. Results from the literature review showed that the influence of these elements is not straightforward.

The first factor, 'proximity', is generally considered an important precondition for access to 206

green spaces (Ward Thompson et al., 2004); as such, a minimum walking distance target is a common measure adopted internationally by various levels of government in order to regulate the provision of public green spaces (Barbosa et al., 2007; Boone et al., 2009). However, review of the evidence showed that physical proximity alone does not control or explain actual use of green spaces. In fact, several studies in Australia (Giles-Corti et al., 2005; Sugiyama et al., 2010), in the UK (Barbosa et al., 2007; Kessel et al., 2009), in Canada (Kaczynski, Potwarka and Saelens, 2008) and in the US (Gobster, 2002; Tinsley, Tinsley and Croskeys, 2002) described a much more complex relationship, where park characteristics (especially attractiveness) and individual perceptions variously affect patterns of use.

These interrelationships are partly captured by the second factor considered in this analysis, that is the role of 'quality' and 'quantity' of green spaces in providing various kinds of benefits. A positive association was generally identified between these characteristics of green spaces and human health and wellbeing (Francis et al., 2012b; Groenewegen et al., 2012; Kaczynski, Potwarka and Saelens, 2008; Sugiyama and Ward Thompson, 2007; CABE, 2010b). However, results showed that quality seems to be more important than quantity in providing some kinds of benefits, such as favouring social interaction and mental health (Francis et al., 2012; Fuller et al., 2007; Groenewegen et al., 2012; Sugiyama and Ward Thompson, 2007). Francis et al. (2012b), in particular, argued that quality of urban parks was associated with improved mental health, irrespective of whether the park was used or not. Different studies adopted various definitions of 'quality': Ward Thompson (2007; 2010), for example, suggested to use the plural 'qualities', meaning that specific characteristics of the environment play a determinant role in supporting certain kinds of activities; other studies, instead, associated the concept of 'quality' of green spaces with 'attractiveness' (Giles-Corti et al., 2005; Sugiyama et al., 2010; Kaczynski, Potwarka and Saelens, 2008).

The third and final external factor is related to the role of affluence and ethnicity. In fact, provision of green spaces is generally thought to be worse in disadvantaged neighbourhoods and for ethnic minorities, due to the so-called 'inequity hypothesis' which associates

better provision of green spaces to residents' affluence and ethnic majority (CABE, 2010b; Chakraborty and Landry, 2009; Tooke, Coops and Klinkenber, 2010). However, if research from the UK (CABE, 2010b) argued that also the quality of green spaces was worse in poorer neighbourhoods, other studies identified a more nuanced relationship, when differences between private and public green spaces were considered (Barbosa et al., 2007; Shanahan et al., 2014). Shannan et al. (2014), in particular, reported that people who live in socioeconomically disadvantaged areas in Brisbane, Australia have reduced access to green spaces in general, but a more equitably provision of higher quality natural areas on public land. An even more positive result was reported by Jones and Coombes (2009), which concluded that residents of more deprived communities in Bristol, UK had better access to green spaces than residents of more affluent ones. However, perception of nature appeared to be determinant in affecting their actual use. In fact, residents reported poorer perceived accessibility, poorer safety and less frequent use.

As apparent from these initial findings, perception and use of green spaces are determined by numerous interacting factors. This thesis recognizes the importance of understanding and evaluating their contribution adopting a whole-system approach. However, considering the fact that a master thesis requires a limited timeframe, a specific intent and clarity in the exposition of the results, the following analysis focused only on a specific type of green spaces: urban parks. In fact, their role in urban contexts is particularly significant, because they are thought to provide both social and environmental benefits to the surrounding communities for their role as 'biodiversity hotspots', but also privileged spaces where social interactions can occur (Konijnendijk et al., 2013). However, the role of 'nearby nature' (Kaplan and Kaplan, 1989) in affecting perception and use of urban parks was also considered.

In order to capture social and environmental characteristics of urban parks and define a theoretical grounding for the following analysis of the case studies, two indicators were identified: Social Interaction indicator and Perceived Nature indicator.

Social Interactions in urban parks can be considered an effective indicator of social value

because, offering opportunities for repeated contact, they are thought to evoke a sense of familiarity (Peters, Elands and Buijs, 2010) and to promote new social ties or strengthen the existing ones (Kaźmierczak, 2013; Konijnendijk et al., 2013; Peters, Elands and Buijs, 2010), consequently enhancing neighbourhood vitality and social cohesion (Peters, Elands and Buijs, 2010; Sullivan, Kuo and DePooter, 2004). Whilst a positive association between urban parks and social interaction is generally accepted (Francis et al., 2012; Gobster, 1998; Kaźmierczak, 2013; Krellenberg, Peters, Elands and Buijs, 2010; Welz and Reyes-Päcke, 2014), Maas (2009b) reported opposite results, affirming that no significant relation was found between the percentage of green space and whether or not people often contacted neighbours or friends in the neighbourhood. This may depend on the quality (or attractiveness) of urban parks. In fact, use of urban parks is affected by the presence of certain park features (Bedimo-Rung, Mowen, and Cohen, 2005; Cohen et al., 2007; Kaczynski, Potwarka and Saelens, 2008; McCormack et al., 2010) which are thought to promote certain activities. Various classifications of activities are proposed. However, the definition adopted by Gehl (1987) differentiating between social, optional and necessary activities resulted to be particularly influential. Various studies accepted this classification (Bedimo-Rung, Mowen, and Cohen, 2005; Francis et al., 2012a; Kaźmierczak, 2013; McCormack et al., 2010) reporting that social activities (to watch the world go by, to meet friends, to play sports or games, to spend time with children or family) and optional activities (to relax, to get fresh air, to enjoy the surroundings, to walk, jog or run, to ride a bike) are more conducive to social interactions than necessary activities (to pass through on the way elsewhere, to take a short cut, to walk the dog). However, other studies (Cattell et al., 2008; Peters, Elands and Buijs, 2010) argued that social interactions are favoured by repeated contact, which is typical of routine (necessary) activities such as walking the dog or passing through on the way elsewhere.

Previous research identified various measures of environmental health of green spaces in urban contexts. Some studies examined biodiversity through the indicator of avian characteristics (Blair, 1999; Clergeau and Mennechez, 2000; Daniels and Kirkpatrick, 2006; Gaston and Blackburn, 1995; Lombard, 1999; Luck, Smallbone and Sheffield, 2013; Melles et al., 2003; Melles, 2005; Stagoll et al., 2012). Other studies investigated the role of regulating services, adopting specific quantitative measures, such as pollution removal, oxygen production, carbon sequestration, leaf area index, water storage capacity, water retention capacity, denitrification, etc. (De Groot et al., 2010; Mooney, 2014). By contrast, building on the environmental psychology literature (Kaplan and Kaplan, 1989; Kaplan, 1995; Kaplan, 2001; Matsuoka and Kaplan, 2008; Velarde, Fry and Tveit, 2007), other studies argued that environmental benefits of green spaces can be analyzed as perceived by the surrounding communities.

The Perceived Nature indicator accepts the last approach, recognizing that the 'ethereal processes' of nature can only be understood through direct experience of everyday nature, either called 'nearby nature' (Kaplan and Kaplan, 1989), 'green residential atmosphere' (Crow, Brown and De Young, 2006) or 'perceived neighbourhood greenness' (Sugiyama et al., 2008). Previous research argued that people from different cultural background and life experiences have various views and values of nature (Buijs 2009; Marwijk and Elands 2007) which, in turn, affect perception of nature and preferences (Fraser and Kenney, 2000; Matsuoka and Kaplan, 2008; Özgüner and Kendle, 2006; Priego, Breuste and Rojas, 2008). However, according to the 'biophilia hypothesis', humans have a natural attraction, affinity and preference for natural landscapes (Alencar, 2013; Beatley, 2011; Browning et al., 2012; Browning, Ryan and Clancy, 2014) which can be observed in a series of general attitudes toward urban nature, such as preference for trees, water and forested areas (Kuo, Bacaicoa and Sullivan, 1998; Henwood and Pidgeon, 2001; Özgüner and Kendle, 2006). In general, people are thought to have a natural preference for biodiversity and especially for species richness (Dearborn and Kark, 2010). In particular, Fuller et al. (2007) affirmed that perceived biodiversity is a good representation of effective biodiversity, suggesting that preferred natural landscapes are likely to be the most biodiverse.

Analysis of the two indicators of social and environmental benefits highlights that they are affected by various interacting factors. In order to evaluate their contribution to affect use

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and perceived value of urban parks, the most relevant findings from the literature review were categorized according to two research perspectives:

- Use of urban parks, where relationships between preferred features, preferred activities, different age group, different cultural background and social interactions were investigated;
- Perceived value of urban parks, where the relationship between different perceptions and preferences for nature, the role of exposure to nature and different age group and cultural background were investigated.

The theoretical grounding summarized above, as emerged from the analysis of the contents included in PART 1 and PART 2, was adopted as a framework for the analysis of the case studies included in PART 3. The most relevant findings are summarized below.

9.2. Results from the case studies

The two selected case studies (Mac Lean Park in Strathcona and Hinge Park in Mount Pleasant) have comparable characteristics in regard to park size, presence of park features and proximity to residential areas. The analysis conducted in this thesis was intended to investigate whether their use and perceived value vary within their respective neighbourhoods, located in Vancouver, BC and, if so, why.

The first part of the analysis investigated various factors influencing the patterns of use of the two urban parks, identifying preferred activities, preferred features and differences depending on different age or cultural background, with the objective of identifying potential associations with social interactions.

Analysis of preferred activities proposed a classification between stationary activities (including all the activities that are performed within the park, such as standing, sitting, lying and playing) and transition activities (including all the activities that are performed passing through the park, such as walking, running, cycling and walking the dog). Data from observations highlighted that the two parks play a different role within their respective neighbourhoods. In fact, Mac Lean Park appeared to be an attractive destination place for stationary activities, while Hinge Park a pleasant setting for transition activities. Analysis of various types of activities is particularly significant because previous studies found a positive association between certain types of activities and social interactions. However, results in this regard were not univocal. In fact, even if a positive association is generally recognized between stationary activities and social interactions (Bedimo-Rung, Mowen, and Cohen, 2005; Francis et al., 2012; Kaźmierczak, 2013; McCormack et al., 2010), the role of some kinds of transition activities was also identified. In fact, routine activities such as walking the dog or passing through the park on the way elsewhere have been associated with increased opportunities for social interactions (Cattell et al., 2008; Peters, Elands and Buijs, 2010).

Analysis of preferred park features (playground, grass, seating, paths) confirmed results from observations, reaffirming that in Mac Lean Park the most used features were the ones related to stationary activities (playground, grass, seating) while in Hinge Park walking paths were the preferred. Analysis of park features is significant, because previous studies found a positive association between various park features and perception and use of urban parks (Bedimo-Rung, Mowen and Cohen, 2005); moreover, certain park features (such as seating, picnic tables, etc.) were found to be associated with improved opportunities for social interaction (Francis et al., 2012a).

Analysis of use of urban parks per age group showed differences between the two urban parks. Results from Mac Lean Park generally confirmed findings from an extensive recent research in the US (Cohen et al., 2016) reporting that seniors are underrepresented users of urban parks. Results from Hinge Park, by contrast, showed that a high percentage of the (limited) older population in Mount Pleasant use the local park. Moreover, analysis of preferred activities by age group showed that, in both parks, seniors valued the presence of the park as a place for physical activity (mostly walking) more than the other age groups. This is particular significant for its positive association with general health, as reported by multiple studies (Bedimo-Rung, Mowen and Cohen, 2005; Hartig et al., 2014; Konijnendijk et al., 2013; WHO, 2016). Analysis of preferred features showed that playgrounds were the most attractive features for children and their caregivers in both parks. This is particularly significant, because previous research found a positive association between well-maintained playgrounds and presence of older people (Chiesura, 2004; Ward Thompson, 2008) and between playgrounds and social interactions (Cattell et al. 2008; Francis et al., 2012; Maas, 2009b; Peters, Elands and Buijs, 2010).

Analysis of use of urban parks by cultural background showed that Mac Lean Park is generally more multicultural than Hinge Park and more welcoming. Whilst preferred activities in the two parks generally confirmed the general trend, some differences by cultural background could be identified. In Hinge Park, Caucasian and Asian users accounted for almost the totality of park users and their behaviour was very similar. However, Asian users appeared to be more likely to choose Hinge Park as a destination place to sit and relax, while Caucasians were more likely to pass through the park (walking, cycling or running) without stopping by. Results from Mac Lean Park, instead, reported that all the ethnic groups enjoyed stationary activities, but Aboriginal users the most. Asian and Caucasian visitors showed similar behaviours; however, Asian users appeared to be more likely to go to the park to take the children to the playground than Caucasian users, who also reached the park for rest and relax. These findings are generally consistent with previous research conducted in the United States (Gobster, 2002; Elmendorf et al., 2005a; Elmendorf et al., 2005b; Ho et al., 2005) and in Europe (Ward Thompson and Aspinall, 2011; Peters, Elands and Buijs, 2010) which agree in reporting that Caucasian users are generally more likely to go to the park alone or as couples and to prefer solitary activities, while ethnic minorities are more likely to visit the park in groups and engage in social activities. Analysis of preferred features by cultural background confirmed these general trends. However, results from Mac Lean Park suggested that preferred users of walking paths were Asians and seniors, that is contrary to the literature. Possible reasons for this discrepancy were investigated through questionnaires, but no valuable findings emerged. Analysis of social interactions confirmed the different characteristics of the two parks, reporting that in Mac Lean Park – a multicultural and inclusive place – people from various cultural background had some sort of social interaction and most of the interactions were inter-ethnic, while in Hinge Park – a pleasant transition place preferred for transition activities - multicultural interactions were a minority. However, the type of interactions observed in the two parks had similar characteristics and occurred under similar circumstances, suggesting that it is the mere presence of certain park features or certain activities that promote social interactions and that this happens independently from the role that the park plays for the community. Two types of interactions were identified in this research: 'casual interactions' (which typically occurred between people who did not have a previous relationship, consisting in brief greetings or small talk) and 'scheduled interactions' (which typically occurred between people who had a previous relationship and used the park as a meeting place for various activities). Results reported that the majority of social interactions in both parks were casual and cursory and mostly occurred in relation to the activities 'taking the children to the playground' and – to a lesser extent – 'walking the dog', that are typically associated with the park features 'playground' and 'grass'. These results confirm findings from previous research which associated stationary activities (such as supervising children's play) and social interactions (Bedimo-Rung, Mowen, and Cohen, 2005; Francis et al., 2012a; Kaźmierczak, 2013; McCormack et al., 2010) but also confirm that routine transition activities (such as walking the dog) enhance opportunities for social interactions, because repeated contact create sense of familiarity, which is a precondition for social interactions to happen (Cattell et al., 2008; Peters, Elands and Buijs, 2010). Analysis of frequency of interactions reported that social interactions in Mac Lean Park were more frequent than in Hinge Park. However, when the same analysis was conducted considering only stationary activities (with the addition of walking the dog, which often consisted in fairly long visits), it emerged that Hinge Park was more conducive to social interactions than Mac Lean Park.

The second part of the analysis of the case studies investigated the perceived social and environmental value of the two urban parks as determined by different age and cultural background and different exposure to nature at the neighbourhood and park scale. Data were collected though specific questions included in the questionnaires and through an exploratory survey conducted in the two neighbourhoods with the objective of evaluating different exposure to 'nearby nature'.

As emerged from the observations, social interactions were registered in both parks. However, their perceived value as an indicator of sense of community varied. In fact, respondents to the questionnaire in Strathcona were more likely to recognize the role of Mac Lean Park as an inclusive meeting place for the whole community, while respondents in Mount Pleasant typically recognized the role of Hinge Park as an attractive place to conduct a variety of transition activities, in addition to taking the children to the playground. These results are consistent with the findings emerged from the observations and are significant in that they investigate the relationship between social interactions and sense of community that is supported by various studies (Cattell et al. 2008; Francis et al., 2012a; Peters, Elands and Buijs, 2010).

Analysis of the environmental characteristics of the two neighbourhoods (considering a 5-minute-walk distance radius around the park) showed that Strathcona has a more mature and diverse provision of public and private green space than Mount Pleasant. However, residents of South East False Creek compensate for the relative lack of exposure to street trees and private gardens with the open view of the ocean and the mountains. When asked to indicate what kinds of green spaces characterize their neighbourhood the most, respondents from both case studies cited local neighbourhood parks as the most important. This is particularly significant because satisfaction with local parks is associated with satisfaction with the overall neighbourhood and, by extension, with satisfaction with quality of life (CABE, 2010b). However, an important value was also attributed to street trees, confirming results from previous research that associated presence of street trees with improved perceived health (Kardan et al., 2005) and with improved social cohesion (De Vries et al., 2013). Moreover, Keniger et al. (2013) argued that people generally attribute greater value to street canopy

than trees in other settings (such as private gardens), supposedly because they attribute less benefits to green spaces they cannot physically access. However, the fact that the value of private green is underestimated does not diminish its role in providing environmental benefits to the whole community (Fraser and Kenney, 2000), especially for its role in enhancing urban biodiversity (Daniels and Kirkpatrick, 2006; Loram et al., 2011; Smith et al. 2005).

Perception of nature benefits at the park scale reported that visitors of Hinge Park felt to be exposed to a higher range of environmental benefits than visitors of Mac Lean Park, suggesting that the variety of natural features to which visitors are exposed during their visits may enhance the quality of the experience and therefore the perception of benefits. This is consistent with the fact that people have an innate preference for nature, as supported by the 'biophilia hypothesis' (Alencar, 2013; Beatley, 2011; Browning et al., 2012; Browning, Ryan and Clancy, 2014) and especially for trees and water (Kuo, Bacaicoa and Sullivan, 1998; Henwood and Pidgeon, 2001; Özgüner and Kendle, 2006) and species richness (Dearborn and Kark, 2010).

Analysis of the role of exposure (intensity, frequency and duration of the experience) in affecting perceived value of urban parks generally confirmed results from the previous analyses, suggesting that it is the intensity of the experience – as defined by the variety of physical and natural features that the park provides – that enhances perception of benefits.

9.3. Possible insights for green space policies

Even if an overview of the various measures adopted by the City of Vancouver in relation to 'access to nature' was discussed in Chapter 2, *Benefits of Green Spaces*, this thesis did not focus on the analysis of green space policies. However, analysis of the results from the literature review conducted in PART 1 and PART 2 and from the case studies conducted in PART 3 suggests some general considerations.

Analysis of the case studies evaluated the role of green spaces in neighbourhoods with different

characteristics: an older, multicultural and traditionally disadvantaged neighbourhood (Strathcona) and a new development in a younger and more affluent area (South East False Creek in Mount Pleasant). Analysis of results reported that their use and perceived value were different. However, it also showed that 'social interactions' and 'perceived nature', the two indicators of – respectively – social and environmental benefits, were associated with some specific features and activities which are independent from the location.

These findings suggest that quality (or attractiveness) of green spaces is particularly important in providing some kinds of benefits, such as favouring social interaction and mental health, as argued by previous studies (Francis et al., 2012; Fuller et al., 2007; Groenewegen et al., 2012; Sugiyama and Ward Thompson, 2007). This is particularly true in disadvantaged neighbourhoods, where use of urban parks is affected by poorer perceived accessibility, and poorer safety which determine less frequent use (Jones and Coombes, 2009)

In fact, analysis of preferred activities and preferred features in the case studies indicated that the presence of certain park features (especially presence of a playground, grass with shady areas, comfortable seating, well-maintained paths) promote use of urban parks for a variety of users of different age and cultural background. Moreover, the activities 'taking the children to the playground' and 'walking the dog' appeared to be the most conducive to social interactions, as supported by previous studies (Bedimo-Rung, Mowen, and Cohen, 2005; Cattell et al., 2008; Francis et al., 2012a; Kaźmierczak, 2013; McCormack et al., 2010; Peters, Elands and Buijs, 2010).

Therefore, if the objective of green space policies is the promotion of sense of community and inter-ethnic interactions, these results suggest that provision and maintenance of various park features (including organized activities) improve use and perceived value of urban parks for a variety of users.

On the other hand, analysis of perceived environmental benefits in the two park case studies suggested that it is the 'intensity' of the experience – that corresponds to the quantity and

quality of nature elements to which park users are exposed – that contribute the most to enhancing perceived value of urban parks. This may depend on the fact that people have a natural preference for species richness (Dearborn and Kark, 2010). However, park size or natural characteristics not always are supportive of such experience of nature.

Nonetheless, previous studies argued that people derive benefits not only from actual visits to urban parks, but also from everyday physical and visual contact with various types of public and private green spaces that constitute the so-called 'nearby nature' (Shanahan et al., 2014; Matsuoka and Kaplan, 2008). In particular, results from the case studies at the neighbourhood level reported that street trees enhance perceived environmental benefits. This is particularly relevant, because previous research identified a positive relationship between street trees and perceived health (Kardan et al., 2005) and improved social cohesion (De Vries et al., 2013).

Therefore, if the objective of green space policies is the enhancement of biodiversity or regulating services, these results suggest that intervention should be extended beyond the parks' boundaries. This approach has been supported by recent policies adopted by the City of Vancouver in relation to the increase of canopy cover (City of Vancouver, 2015b).

In synthesis, these results contrast the common measure of prescribing a minimum walking distance target which regulates the provision of public green spaces, arguing that physical proximity alone does not explain the actual use of urban parks (Giles-Corti et al., 2005; Kaczynski, Potwarka and Saelens, 2008; Kessel et al., 2009; Sugiyama et al., 2010). On the contrary, it emerges that various simple actions can effectively increase use and perceived benefits of green spaces, depending on different priorities and policy perspectives. As an example, two possible perspectives are analyzed below: a public health perspective and a social program perspective.

Adopting a public health perspective, various studies identified a positive association between use of urban parks for physical activity and health and wellbeing (Bedimo-Rung,

Mowen and Cohen, 2005; Hartig et al., 2014; Keniger et al., 2013; Konijnendijk et al., 2013; WHO, 2016). This is particularly significant for the older population, who is more exposed to risks related with obesity, hypertension and diabetes. Results from case studies suggested that older people in both parks valued the opportunity of using the park for walking more than all the other age groups. This is particularly significant, because the elderly are typically underrepresented users of urban parks (Cohen et al., 2016). To attract more older visitors, various studies identified the importance of the relationship between sense of safety and use (Alves et al., 2008; Bedimo-Rung, Mowen, and Cohen, 2005; McCormack et al., 2010). Cohen et al. (2016), for example, underlined the relevenace of well-maintained paths for improving older people's walking; other studies, instead, particularly referred to the safety of the play equipment (Chiesura, 2004; Ward Thompson, 2008). In fact, playgrounds are considered the most attractive features for all the age groups, including children and their caregivers of all ages. This is relevant in that previous studies identified a positive association between playgrounds and social interactions and – by extension – sense of community (Cattell et al. 2008; Francis et al., 2012a; Maas, 2009b; Peters, Elands and Buijs, 2010). Furthermore, having playgrounds in natural settings addresses another public health concern, the so-called 'nature deficit disorder', that is the increasing disconnection of people and especially children from nature (Louv, 2009). In fact, evidence demonstrates that children's relationship with nature has a positive effect in promoting their physiological and psychological development (Ward Thompson, Aspinall and Montarzino, 2008).

Adopting a social program perspective, analysis of case studies suggested that Mac Lean Park in Strathcona is a multicultural and inclusive place, while Hinge Park is not. This only partially depends on the characteristics of the neighbourhood population. In fact, results from observations showed that Mac Lean Park was very attractive for ethnic minorities, to the point that Aboriginal and African visitors were overrepresented users of the park in comparison with the neighbourhood population. In this thesis, it is argued that this may depend on the fact that in Mac Lean Park various structured activities are in place (such as after-school programs, soccer school, community barbecues) which attract a variety of users. This assumption is supported by previous research. In fact, Cohen et al. (2007) reported that the availability of structured, supervised activities was associated with increased use in low-income minority communities in Los Angeles. In fact, according to Bedimo-Rung, Mowen, and Cohen (2005) programs or activities that take place within a park setting can be considered a typology of 'park features' and contribute in increasing park attractiveness.

In conclusion, analysis of literature review and case studies provide some insights in relation to green space policies, suggesting that simple actions intended to maintain and promote the quality of various types of green spaces may enhance perception of social and environmental benefits from the surrounding communities.

10. LIMITATIONS AND FUTURE RESEARCH

In this final section, some limitations emerged during the development of the thesis will be highlighted, with the objective of providing some indications for possible improvements and future research.

10.1. Limitations

The analysis conducted through case studies provided a range of relevant insights in order to investigate the use and perceived value of urban parks. In particular, information collected through observations constituted a reliable dataset thanks to their appreciable amount (more than 4,000 people counted in 56 hours of observation).

However, some limitations in the scope of the research and in the methodology adopted were identified, as described below.

10.1.1. Limitations in the scope

This research thesis was initially designed with the objective of comparing the role of urban parks and community gardens in providing the surrounding communities with social and environmental benefits. In fact, research supports the idea that community gardens offer opportunities for improved social cohesion, cooperation and inter-racial interaction (Keninger et al., 2013). For this reason, two community gardens and two urban parks were initially selected within the two neighbourhood case studies.

Over time, however, difficulties emerged in relation to the analysis of the community garden sited in Mount Pleasant. In fact, hardly ever people were seen working at their plots and every attempt of contacting the coordinators was unsuccessful. Other community gardens in the same neighbourhood were contacted, but they were either unresponsive or unwilling to participate. Moreover, differences between the two community garden case studies were striking. In fact, the Strathcona Community Garden is a well established and long-lasting community garden, fully integrated in the community. It counts 200 plots and 95 members who participate in various individual and collective activities. During the research, it was possible to approach a group of them during a work party. A copy of the questionnaire was also sent by email to all the members. The community garden in Mount Pleasant, on the contrary, only counts 46 plots and appeared to be less frequented. Only in a couple of occasions, a person was seen going to the community garden for a short activity, such as picking up vegetables and immediately going away. No communal activities appeared to be on place and any attempt of contacting their members was unsuccessful. These differences in garden size and performed activities were a potential limitation of the research, regardless the effective participation by prospective respondents.

For these reasons, analysis of community gardens through specific questionnaires was excluded. However, various benefits of community gardens in Vancouver, and in particular their role as inclusive places, was investigated through literature review, as analyzed by previous master theses. See for example Lowcock (2014), McKercher (2013), Seto (2011) and Shan and Walter (2015) for further details.

10.1.2. Limitations in the methodology

Whilst observations provided a considerable amount of data, the methodology, as described in Chapter 7, *Research methodology*, included implicit limitations. In particular:

- Possible errors in defining age group and ethnicity due to distance, speed (ex. people cycling, running, etc.) or unintentional bias;
- Very coarse ethnic groups were considered. As such, differences between ethnic minorities could not be fully appreciated. Moreover, a vast range of people was included in the category 'Caucasian', including English and French Canadian, European immigrants and Latinos.

 In Hinge Park, some parts of the park were difficult to observe. So, patterns of use of those areas may have been underestimated.

The adoption of questionnaires as an integrated methodology of analysis was intended to address some of these limitations. In particular, specific questions included in the questionnaire investigated mother tongue, eventual other languages spoken in the household and time spent in Canada with the objective of identifying potential differences in the perception and use of urban parks between Canadians and first or second-generation immigrants. However, results from questionnaires proved to be partly inconclusive. In particular:

- Analysis of mother tongue as a proxy for cultural background did not capture differences between new immigrants and Canadians; in fact, most of the new immigrants (among respondents to the questionnaire) spoke English as first language;
- Minorities often declined the opportunity of taking part to the research. In particular, among people approached in Mac Lean Park, a number of older Asians (apparently of Chinese descent) and Aboriginal youth refused to participate;
- Respondents not always followed instructions correctly. Some interpretations of results were put in place during analysis of data, as explained in Chapter 7, *Research methodology*.

10.2. Future research

As mentioned earlier, the initial intent of the thesis was a comparison between urban parks and community gardens for what concerns their provision of social and environmental benefits. However, analysis of community gardens was excluded later, due to difficulties in the selection of the case studies and in the research methodology. Nonetheless, analysis of potential differences between the two kinds of green spaces is still considered particularly relevant.

To this scope, case studies could be selected among the number of urban parks which

include a community garden within their land. In this way, observations could be conducted simultaneously. In particular, it could be interesting to evaluate differences in patterns of use. In fact, urban parks are public spaces, while community gardens are open to the public, but only their member can actively work at their plot.

As a consequence, different kinds of social interactions could be observed when considering the ones occurring between garden members (presumably acquaintances or friends) or between gardeners and casual visitors (presumably people who did not have a previous relationship). It could be interesting to investigate the type, frequency and perceived value of the two categories of social interactions and evaluate their role in promoting sense of community.

Furthermore, analysis of perceived environmental benefits of green spaces would be enriched by the evaluation of gardening as a form of concrete engagement with nature. In fact, it would be possible to identify three different contributions to 'perceived nature': the visual and physical contact with 'nearby nature' at the neighbourhood scale, the immersive experience of nature at the park scale and the direct contact with nature at the garden scale.

In relation to the research methodology, observations appeared to be a valid tool (except for the limitations already identified) and their adoption is advisable. By contrast, results from questionnaire were partly inconclusive. Adoption of structured interviews as an alternative research method could be evaluated.

BIBLIOGRAPHY

- Alencar, Tatiana Abaurre. 2013. Biophilic Design Framework: Structuring the Relationship between Exposure to Nature and Health Benefits. Unpublished MASA Thesis. University of British Columbia. Vancouver, B.C.
- Alves, Susana, Peter A. Aspinall, Catharine Ward Thompson, Takemi Sugiyama, Roger Brice and Adrian Vickers. 2008. Preferences of Older People for Environmental Attributes of Local Parks. *Facilities* 26.11/12: 433-53.
- APHA. 2013. Policy Statement #20137: Improving Health and Wellness through Access to Nature, APHA American Public Health Association https://www.apha.org/policiesand-advocacy/public-health-policy-statements/policy-database/2014/07/08/09/18/ improving-health-and-wellness-through-access-to-nature [June 15, 2016]
- Attili, Giovanni and Leonie Sandercock. 2008. Where Strangers Become Neighbours: Integrating Immigrants in Vancouver, Canada. Dordrecht, NLD: Springer. ProQuest ebrary. [November 5, 2015]
- Banerjee, Tridib. 2001. The Future of Public Space: Beyond Invented Streets and Reinvented Spaces. *Journal of the American Planning Association* 67(1): 9-24
- Barbosa, Olga, Jamie A. Tratalos, Paul R. Armsworth, Richard G. Davies, Richard A. Fuller,
 Pat Johnson and Kevin J. Gaston. 2007. Who Benefits from Access to Green Space? A
 Case Study from Sheffield, UK. Landscape and Urban Planning 83(2): 187-195. Web.
- Beatley, Timothy. 2011. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. Washington: Island Press.
- Bedimo-Rung, Ariane L., Andrew J. Mowen, and Deborah A. Cohen. 2005. The Significance of Parks to Physical Activity and Public Health. *American Journal of Preventive Medicine* 28(2): 159-68.
- Bell, Simon and Catharine Ward Thompson. 2008. *Health, identity and sense of place: the importance of local landscapes*. In Berlan Darqué, M., Luginbuhl, Y and Terrasson, D.

(Eds). Landscape: from knowledge to action. Éditions Quae, Versailes cedex. <u>https://</u> www.researchgate.net/publication/254286332_HEALTH_IDENTITY_AND_SENSE______ OF_PLACE_THE_IMPORTANCE_OF_LOCAL_LANDSCAPES [November 14, 2015]

- Blair, R.B. 1999. Birds and butterflies along an urban gradient: Surrogate taxa for assessing biodiversity? *Ecological Applications* 9(1): 164-170.
- Blaviesciunaite, Aiste. 2012. Cultural Values Embedded in Building Environmental Performance Assessment Methods: A Comparison of LEED-Canada and Japan's CASBEE. Unpublished MASA Thesis. University of British Columbia. Vancouver, B.C.
- Bolund Per, Sven Hunhammar. 1999. Ecosystem services in urban areas Ecological Economics, 29: 293-301
- Boone, Christopher G., Geoffrey L. Buckley, J. Morgan Grove and Chona Sister. 2009. Parks and People: An Environmental Justice Inquiry in Baltimore, Maryland. *Annals of the Association of American Geographers* 99(4): 767-87.
- Bowler, Diana E., Lisette Buyung-Ali, Teri M. Knight and Andrew S. Pullin. 2010. Urban Greening to Cool Towns and Cities: A Systematic Review of the Empirical Evidence. *Landscape and Urban Planning*. 97(3): 147-155.
- Brown, Glenn and Patrick Mooney. 2013. Ecosystem Services, Natural Capital and Nature's Benefits in the Urban Region: Information for Professionals and Citizens. Vancouver, BC: School of Architecture and Landscape Architecture, The University of British Columbia http://www.bcsla.org/initiatives/ubclacf-publications [September 29, 2015].
- Browning Bill, Chris Garvin, Catie Ryan, Namita Kallianpurkar, Leslie Labruto, Siobhan Watson and Travis Knop. 2012. The Economics of Biophilia Why designing with nature in mind makes financial sense. New York: Terrapin Bright Green, LLC. <u>https://www.terrapinbrightgreen.com/report/economics-of-biophilia/</u> [October 13, 2016]

____Ryan, C.O., Clancy, J.O. 2014. 14 Patterns of Biophilic Design. New York: Terrapin

Bright Green, LLC., 2014. <u>https://greenplantsforgreenbuildings.org/wp-content/</u> <u>uploads/2015/01/14-Patterns-of-Biophilic-Design-Terrapin-2014e.pdf</u> [March 14, 2016]

- Buijs, Arjen. 2009. Lay People's Images of Nature: Comprehensive Frameworks of Values, Beliefs, and Value Orientations. *Society & Natural Resources* 22(5): 417-432.
- _____Birgit H. M. Elands and Fransje Langers. 2009. No Wilderness for Immigrants: Cultural Differences in Images of Nature and Landscape Preferences. *Landscape and Urban Planning* 91(3): 113-23.
- CABE. 2004. The Value of Public Space How high quality parks and public spaces create economic, social and environmental value. <u>https://www.designcouncil.org.uk/sites/</u> <u>default/files/asset/document/the-value-of-public-space1.pdf</u> [September 9, 2015]
- CABE. 2010a. Community green using local space to tackle inequality and improve health, London: Commission for Architecture and the Built Environment. <u>http://</u> <u>www.designcouncil.org.uk/sites/default/files/asset/document/community-green-</u> <u>full-report.pdf</u> [June 16, 2016]
- CABE. 2010b. Urban green nation: Building the evidence base. London: Commission for Architecture and the Built Environment. <u>http://webarchive.nationalarchives.gov.</u> <u>uk/20110118110347/http://www.cabe.org.uk/files/urban-green-nation.pdf</u> [June 16, 2016]
- Cattell, Vicky, Nick Dinesb, Wil Geslerc and Sarah Curtis. 2008. Mingling, Observing, and Lingering: Everyday Public Spaces and their Implications for Well-being and Social Relations. *Health and Place* 14(3): 544-56.
- Chakraborty, Jayajit, and Shawn M. Landry. 2009. Street Trees and Equity: Evaluating the Spatial Distribution of an Urban Amenity. *Environment and Planning A* 41(11): 2651-26570.

Chiesura, Anna. 2004. The Role of Urban Parks for the Sustainable City. Landscape and

Urban Planning 68(1): 129-38.

- City of Vancouver. 2010. GCAP Greenest City 2020 Action Plan. <u>http://vancouver.ca/files/</u> <u>cov/Greenest-city-action-plan.pdf</u> [July 17, 2015]
- City of Vancouver. 2013. Downtown Eastside Local Area Profile. <u>http://vancouver.ca/files/</u> <u>cov/profile-dtes-local-area-2013.pdf</u> [May 28, 2017]
- City of Vancouver. 2014a. Rewilding Vancouver from Sustaining to Flourishing (An environmental education & Stewardship Action Plan for the Vancouver Park Board, July 2014) <u>http://vancouver.ca/files/cov/enviromental-education-stewardshipaction-plan.pdf</u> [July 17, 2015]
- City of Vancouver. 2014b. Urban Forest Strategy. <u>http://vancouver.ca/files/cov/Urban-</u> <u>Forest-Strategy-Draft.pdf</u> [May 28, 2017]
- City of Vancouver. 2015a. Bird Strategy. <u>http://vancouver.ca/files/cov/vancouver-bird-</u> <u>strategy.pdf</u> [May 28, 2017]
- City of Vancouver. 2015b. GCAP Greenest City 2020 Action Plan Part 2. <u>http://vancouver.ca/</u> <u>files/cov/greenest-city-2020-action-plan-2015-2020.pdf</u> [May 28, 2017]
- City of Vancouver. 2016a. Biodiversity Strategy. <u>http://parkboardmeetings.vancouver.</u> <u>ca/2016/20160201/REPORT_BiodiversityStrategy20160201.pdf</u> [May 28, 2017]
- City of Vancouver. 2016b. GCAP Greenest City 2020 Action Plan: Implementation update 2015-2016 <u>http://vancouver.ca/files/cov/greenest-city-action-plan-implementation-update-2015-2016.pdf</u> [May 28, 2017]
- Clark, Charlotte, Rowan Myron, Stephen Stansfeld and Bridget Candy. 2007. A Systematic Review of the Evidence on the Effect of the Built and Physical Environment on Mental Health. *Journal of Public Mental Health* 6(2): 14-27.
- Cohen, Deborah A., Thomas L. McKenzie, Amber Sehgal, Stephanie Williamson, Daniela Golinelli and Nicole Lurie. 2007. Contribution of Public Parks to Physical Activity. *American Journal of Public Health* 97(3): 509-514

Bing Han, Catherine J. Nagel, Peter Harnik, Thomas L. McKenzie, Kelly R. Evenson, Terry Marsh, Stephanie Williamson, Christine Vaughan and Sweatha Katta. 2016. The First National Study of Neighborhood Parks. *American Journal of Preventive Medicine*, 51(4): 419 – 426

- Cole Raymond. 2012. Regenerative Design and Development: Current Theory and Practice. Building Research & Information 40(1): 1-6
- Coles, R. W. and S. C. Bussey. 2000. Urban Forest Landscapes in the UK Progressing the Social Agenda. *Landscape and Urban Planning* 52(2): 181-188.
- Coley, Rebekah L., William C. Sullivan and Frances E. Kuo. 1997. Where does Community Grow?: The Social Context Created by Nature in Urban Public Housing. *Environment and Behavior* 29(4): 468-494.
- Crow, Thomas, Terry Brown and Raymond De Young. 2006. The Riverside and Berwyn Experience: Contrasts in Landscape Structure, Perceptions of the Urban Landscape, and their Effects on People. *Landscape and Urban Planning* 75(3): 282-99.
- Daniels, G. D. and J. B. Kirkpatrick. 2006. Does Variation in Garden Characteristics Influence the Conservation of Birds in Suburbia? *Biological Conservation* 133(3): 326-335.

De Groot, Rudolf, Rob Alkemade, Leon Braat, Lars Hein, and Louise Willemen. 2010. Challenges in integrating the concept of ecosystem services and values in Landscape planning, management and decision making. *Ecological Complexity* 7(3): 260–272

- Dearborn, Donald C. and Salit Kark. 2010. Motivations for Conserving Urban Biodiversity. *Conservation biology: the journal of the Society for Conservation Biology* 4(2): 432-440.
- De Vries, Sjerp, Sonja M.E. van Dillen, Peter Groenewegen and Peter Spreeuwenberg. 2013. Streetscape greenery and health: stress, social cohesion and physical activity as mediators. Social Science & Medicine: 2013, 94(Oct), 26-33

Elmendorf, William F., Fern K. Willits, Vinod Sasidharan and Geoffrey Godbey. 2005a. Urban

Park and Forest Participation and Landscape Preference: A Comparison between Blacks and Whites in Philadelphia and Atlanta, U.S.. *Journal of Arboriculture* 31(6): 318.

- Fern K. Willits and Vivod Sasidharan. 2005b. Urban Park and Forest Participation and Landscape Preference: A Review of the Relevant Literature. *Journal of* Arboriculture 31(6): 311.
- EU Council on Environmental Law. 2010. Resolution on the Right of Access to Nature, in Environmental Policy and Law, 40(5): 259
- Foster, Charles, Melvyn Hillsdon and Margaret Thorogood. 2004. Environmental Perceptions and Walking in English Adults. *Journal of Epidemiology and Community Health* (1979-) 58(11): 924-8.
- Francis, Jacinta, Billie Giles-Corti, Lisa Wood and Matthew Knuiman. 2012a. Creating Sense of Community: The Role of Public Space. *Journal of Environmental Psychology*. 32(4): 401-409
- _____, Billie Giles-Corti, Lisa Wood and Matthew Knuiman. 2012b. Quality Or Quantity? Exploring the Relationship between Public Open Space Attributes and Mental Health in Perth, Western Australia. *Social Science & Medicine*. 74(10): 1570-1577.
- Fraser, Evan D.G. and Andrew W. Kenney. 2000. Cultural background and landscape history as factors affecting perceptions of the urban forest. *Journal of Arboriculture*, 26, 106–113
- Fuller, Richard A., Katherine N. Irvine, Patrick Devine-Wright, Philip H. Warren and Kevin J. Gaston. 2007. Psychological Benefits of Greenspace Increase with Biodiversity. *Biology Letters* 3(4): 390-394.
- Gaston, K.J. and T.M. Blackburn. 1995. Mapping biodiversity using surrogates for species richness: Macro-scales and New World birds. Proceedings: Biological Sciences 262(1365): 335-341.

Gehl, Jan. 1987. *Life between Buildings: Using Public Space*. Van Nostrand Reinhold, New York.

_____. 2010. Cities for People. Island Press, Washington, DC.

_____and Birgitte Svarre. 2013. *How to Study Public Life*. Island Press/Center for Resource Economics, Washington, DC.

Giles-Corti, Billie, Melissa H. Broomhall, Matthew Knuiman, Catherine Collins, Kate
Douglas, Kevin Ng, Andrea Lange, Robert J. Donovan. 2005. Increasing Walking:
How Important is Distance to, Attractiveness, and Size of Public Open Space?
2005. American journal of preventive medicine 28(2S2): 169-176.

Gobster, Paul H. 1998. Urban Parks as Green Walls Or Green Magnets? Interracial Relations in Neighborhood Boundary Parks. *Landscape and Urban Planning* 41(1): 43-55.

______. 2001. Visions of Nature: Conflict and Compatibility in Urban Park Restoration. *Landscape and Urban Planning* 56(1): 35-51.

______. 2002. Managing Urban Parks for a Racially and Ethnically Diverse Clientele. *Leisure Sciences* 24(2): 143-59.

Gochma, Sam. 2016. Seeking Parks, Plazas, and Spaces. The Aluure of Biophilia in Cities. New York: Terrapin Bright Green, LLC. <u>https://www.terrapinbrightgreen.com/wp-content/uploads/2016/06/seeking_parks_plazas_spaces_2MB.pdf</u> [October 13, 2016]

- Gočová Anežka. 2015. Urban Agriculture Garden Guide Manual for starting and designing urban agriculture projects (for the Vancouver Board of Parks and 4. Recreation and the City of Vancouver as an initiative of the Greenest City Scholar program, 2015) <u>http://vancouver.ca/files/cov/urban-agriculture-garden-guide.pdf</u> [September 12, 2015]
- Goličnik, Barbara and Catharine Ward Thompson. 2010. Emerging Relationships between Design and use of Urban Park Spaces. *Landscape and Urban Planning* 94(1): 38-53.

- Green Jared. 2015. What Dose of Nature Do We Need To Feel Better? <u>https://www.</u> <u>huffingtonpost.com/jared-green/what-dose-of-nature-do-we-need-to-feel-better-</u> <u>b_7653620.html</u> [October 12, 2017]
- Groenewegen, Peter P., Agnes E. van den Berg, Jolanda Maas, Robert A. Verheij and Sjerp de Vries. 2012. Is a Green Residential Environment Better for Health? if so, Why? *Annals of the Association of American Geographers* 102(5): 996-1003
- Harnik, Peter and Ben Welle. 2009. Measuring the economic value of a City Park System. The Trust for Public Land. Washington D.C. <u>http://cloud.tpl.org/pubs/ccpe-econvalueparks-rpt.pdf</u> [May 24, 2017]
- Hartig, Terry, Marlis Mang, and Gary W. Evans. 1991. Restorative Effects of Natural Environment Experiences. *Environment and Behavior*. 23(1): 3-26
- _____, Richard Mitchell, Sjerp de Vries and Howard Frumkin. 2014. Nature and Health. *Annual Review of Public Health*. 35(1): 207-228.
- Henwood, Karen and Nick Pidgeon. 2001. Talk about Woods and Trees: Threat of
 Urbanization, Stability, and Biodiversity. *Journal of Environmental Psychology*. 21(2):
 125-147.
- James, P., K. Tzoulas, M.D. Adams, A. Barber, J. Boxd, J. Breuste, T. Elmqvist, M. Frith, C.
 Gordon, K.L. Greening, J. Handley, S. Haworth, A.E. Kazmierczak, M. Johnston, K.
 Korpela, M. Moretti, J. Niemela, S. Pauleit, M.H. Roe, J.P. Sadler, C. Ward Thompson.
 2009. Towards an Integrated Understanding of Green Space in the European Built
 Environment. Urban Forestry & Urban Greening 8(2): 65-75.
- Jones, Andy, Melvyn Hillsdon, and Emma Coombes. 2009. Greenspace Access, use, and Physical Activity: Understanding the Effects of Area Deprivation. *Preventive Medicine* 49(6): 500-505.
- Kaczynski, Andrew T. and Karla A. Henderson. 2007. Environmental Correlates of Physical Activity: A Review of Evidence about Parks and Recreation. *Leisure Sciences* 29(4):

315-354.

_____, Luke R. Potwarka and Brian E. Saelens. 2008. Association of Park Size, Distance, and Features with Physical Activity in Neighborhood Parks. *American Journal of Public Health* 98(8): 1451-1456.

- Kaplan, Rachel and Stephen Kaplan. 1989. *The Experience of Nature: A Psychological Perspective*. Cambridge, New York: Cambridge University Press.
 - _____. 2001. The Nature of the View from Home: Psychological Benefits. *Environment and Behavior* 33(4): 507-542.
- _____, Maureen E. Austin and Stephen Kaplan. 2004. Open Space Communities: Resident Perceptions, Nature Benefits, and Problems with Terminology. *Journal of the American Planning Association* 70(3): 300-312.
- Kaplan, Stephen. 1995. The Restorative Benefits of Nature: Toward an Integrative Framework. *Journal of Environmental Psychology* 15(3): 169-182.
- Kardan, Omid, Peter Gozdyra, Bratislav Misic, Faisal Moola, Lyle J. Palmer, Tomáš Paus and Marc G. Berman. 2015. Neighborhood Greenspace and Health in a Large Urban Center. *Scientific reports*, 5: 1-13.
- Kaźmierczak, Aleksandra. 2013. The Contribution of Local Parks to Neighbourhood Social Ties. *Landscape and Urban Planning* 109(1): 31-44.
- Kendal, Dave, Nicholas S. G. Williams and Kathryn J. H. Williams. 2012. A Cultivated Environment: Exploring the Global Distribution of Plants in Gardens, Parks and Streetscapes. Urban Ecosystems 15(3): 637-652.
- Keniger, Lucy E., Kevin J. Gaston, Katherine N. Irvine and Richard A. Fuller. 2013. What are the Benefits of Interacting with Nature? *International journal of environmental research and public health* 10(3): 913-935.
- Kessel, A., J. Green, R. Pinder, P. Wilkinson, C. Grundy and K. Lachowycz. 2009. Multidisciplinary Research in Public Health: A Case Study of Research on Access to

Green Space. Public Health 123(1): 32-38.

- Kim, Joongsub and Rachel Kaplan. 2004. Physical and Psychological Factors in Sense of Community: New Urbanist Kentlands and Nearby Orchard Village. *Environment and Behavior* 36(3): 313-340.
- Konijnendijk, Cecil C., Matilda Annerstedt, Anders Busse Nielsen, Sreetheran
 Maruthaveeran. 2013. *Benefits of Urban Parks: A Systematic Review*. International
 Federation of Parks and Recreation Administration. <u>http://data.arpahub.ca/images/</u>
 <u>uploads/comments/1802-5-20130224113800-1.pdf</u>. [January 28, 2016]
- Krellenberg, Kerstin, Juliane Welz and Sonia Reyes-Päcke. 2014. Urban Green Areas and their Potential for Social Interaction – A Case Study of a Socio-Economically Mixed
 Neighbourhood in Santiago De Chile. *Habitat International* 44: 11-21
- Kuo, Frances E., Magdalena Bacaicoa and William C. Sullivan. 1998. Transforming
 Inner-City Landscapes: Trees, Sense of Safety, and Preference. *Environment and Behavior.* 30(1): 28-59.
- ______. 2010. Parks and Other Green Environments: Essential Components of a Healthy Human Habitat. National Recreation and Park Association, Research Series. <u>http://</u> www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/ Papers/MingKuo-Research-Paper.pdf [August 11, 2015]
- _____ and William C. Sullivan. 2001. Environment and Crime in the Inner City: Does Vegetation Reduce Crime? *Environment and Behavior* 33(3): 343-367.
- Kweon, Byoung-Suk, William C. Sullivan, and Angela R. Wiley. 1998. Green Common Spaces and the Social Integration of Inner-City Older Adults. *Environment and Behavior* 30(6): 832-858.
- Lee, A. C. K. and R. Maheswaran. 2011. The Health Benefits of Urban Green Spaces: A Review of the Evidence. *Journal of public health (Oxford, England)*. 33(2): 212-222.

Lin, Brenda B., Richard A. Fuller, Robert Bush, Kevin J. Gaston and Danielle F. Shanahan.

2014. Opportunity Or Orientation? Who Uses Urban Parks and Why. *PloS one 9*(1): 1-7.

- Lombard, A.T. 1995. The problems with multi-species conservation: Do hotspots, ideal reserves and existing reserves coincide? *South African Journal of Zoology* 30: 145-163.
- Loram, Alison, Philip Warren, Ken Thompson and Kevin Gaston. 2011. Urban Domestic Gardens: The Effects of Human Interventions on Garden Composition. *Environmental Management* 48(4): 808-824.
- Louv, Richard. 2009. A walk in the woods: a right or privilege? *Orion Magazine* March/ April. <u>https://www.commondreams.org/views/2009/03/08/walk-woods-right-</u> <u>or-privilege?utm_campaign=shareaholic&utm_medium=printfriendly&utm_</u> <u>source=tool</u> [August 10, 2016]
- Lowcock, Ashley S. 2014. Inclusive Community Gardens : Planning for Inclusive and Welcoming Spaces in Vancouver. Unpublished Master Thesis. University of British Columbia. Vancouver, B.C.
- Luck, Gary W., Lisa T. Smallbone and Kathryn J. Sheffield. 2013. Environmental and socioeconomic Factors Related to Urban Bird Communities. *Austral Ecology* 38(1): 111-120.
- Maas, Jolanda, Robert A Verheij, Peter P Groenewegen, Sjerp de Vries and Peter Spreeuwenberg. 2006. Green Space, Urbanity, and Health: How Strong is the Relation? *Journal of Epidemiology and Community Health (1979-)* 60(7): 587-592.
 - _____, R. A. Verheij, S. de Vries, P. Spreeuwenberg, F. G. Schellevis and P. P. Groenewegen. 2009a. Morbidity is Related to a Green Living Environment. *Journal of Epidemiology and Community Health* (1979-) 63(12): 967-973.
- _____, Sonja M. E. van Dillen, Robert A. Verheij and Peter P. Groenewegen. 2009b. Social Contacts as a Possible Mechanism Behind the Relation between Green Space and
Health. Health and Place 15(2): 586-595.

- Maller, Cecily, Mardie Townsend, Anita Pryor, Peter Brown and Lawrence St Leger. 2005. Healthy Nature Healthy People: 'Contact with Nature' as an Upstream Health Promotion Intervention for Populations. *Health promotion international* 21(1): 45-54.
- Mang Pamela and Bill Reed. 2012a. Designing from place: a regenerative framework and methodology. Building Research & Information 40(1): 23-38.
- and Bill Reed. 2012b. *Regenerative Development and Design*. In *Encyclopedia Sustainability Science & Technology*, ed. Robert A Meyers, Ch. 303. New York: Springer-Verlag. http://regenesisgroup.com/wp-content/uploads/2015/02/ Encylopedia_Sustainability_Science_Ch303.pdf [May 11, 2017]
- Marshall, Nancy and Linda Corkery. 2011. Generation After Generation: How and Why we Value Open Space, in Fincher R; Whitzman C (eds.), State of Australian Cities Research Network, Melbourne, presented at State of Australian Cities, Melbourne, 29 November - 2 December 2011 <u>http://soac.fbe.unsw.edu.au/2011/papers/</u> <u>SOAC2011 0110 final.pdf</u> [October 20, 2016]
- Marwijk R.v. and B.H.M. Elands. 2007. Experiencing nature: the recognition of the symbolic environment within research and management of visitor flows. *Forest Snow and Landscape Research* 811(2): 59–76.
- Matsuoka, Rodney H. and Rachel Kaplan. 2008. People Needs in the Urban Landscape: Analysis of Landscape and Urban Planning Contributions. *Landscape and Urban Planning* 84(1): 7-19.
- McCormack, Gavin R., Melanie Rock, Ann M. Toohey and Danica Hignell. 2010. Characteristics of Urban Parks Associated with Park use and Physical Activity: A Review of Qualitative Research. *Health and Place* 16(4): 712-726.

McKercher, Kimberly. 2013. The Role of Community Gardens in Supporting Quality of Life in

Urban Dwelling Older Adults. Unpublished Master Thesis. Simon Fraser University.

- Melles, S., S. Glenn, and K. Martin. 2003. Urban bird diversity and landscape complexity:
 Species–environment associations along a multiscale habitat gradient. *Conservation Ecology* 7(1): 5. <u>http://www.consecol.org/vol7/iss1/art5/</u> [October 29, 2017]
- ______. 2005. Urban Bird Diversity as an Indicator of Human Social Diversity and Economic Inequality in Vancouver British Columbia. *Urban Habitats* 3(1): 25-48. <u>http://www.urbanhabitats.org/v03n01/vancouver_full.html</u> [September 26, 2016]
- Miller, James R. 2005. Biodiversity Conservation and the Extinction of Experience. *Trends in Ecology & Evolution* 20(8): 430-434.
- Mooney Patrick. 2014. A Systematic Approach to Incorporating Multiple Ecosystem Services in Landscape Planning and Design. *Landscape Journal* 33(2): 141-171.
- Newton, Rita, Elizabeth Burton and Catharine Ward-Thompson. 2007. Outdoor Environments - Access for Older People. *Access by Design* 111: 27-31.
- Özgüner, H. and A. D. Kendle. 2006. Public Attitudes Towards Naturalistic Versus Designed Landscapes in the City of Sheffield (UK). *Landscape and Urban Planning* 74.2: 139-157.
- Payne, Laura L., Andrew J. Mowen and Elizabeth Orsega-Smith. 2002. An Examination of Park Preferences and Behaviors among Urban Residents: The Role of Residential Location, Race, and Age. *Leisure Sciences* 24(2): 181-198.
- Peters, Karin, Birgit Elands and Arjen Buijs. 2010. Social Interactions in Urban Parks: Stimulating Social Cohesion? *Urban Forestry & Urban Greening* 9(2): 93-100.
- Priego, C., J. -H Breuste and J. Rojas. 2008. Perception and Value of Nature in Urban Landscapes: A Comparative Analysis of Cities in Germany, Chile and Spain. *Landscape Online* 7: 1-22.
- Quayle, Moura and van der Lieck Tilo C. Driessen. 1997. Growing Community: A Case for Hybrid Landscapes. *Landscape and Urban Planning* 39(2): 99-107.

- Rakhshandehroo, Mehdi, M. J. Mohdyusof, O. M. Tahir and M. Y. M. Yunos. 2015. The Social Benefits Of Urban Open Green Spaces: A Literature Review. *Management Research and Practice*, 7(4): 60-71.
- Rishbeth, Clare. 2001. Ethnic Minority Groups and the Design of Public Open Space: An Inclusive Landscape? *Landscape Research* 26(4): 351-366.
- Roe, Jenny J., Catharine Ward Thompson, Peter A. Aspinall, Mark J. Brewer, Elizabeth I. Duff, David Miller, Richard Mitchell and Angela Clow. 2013. Green Space and Stress: Evidence from Cortisol Measures in Deprived Urban Communities. *International journal of environmental research and public health* 10(9): 4086-4103.
- Rung, Ariane L., Andrew J. Mowen, Stephanie T. Broyles and Jeanette Gustat. 2011. The Role of Park Conditions and Features on Park Visitation and Physical Activity. *Journal of physical activity & health* 8(S2): S178-S187.
- Savard, Jean-Pierre L., Philippe Clergeau and Gwenaelle Mennechez. 2000. Biodiversity Concepts and Urban Ecosystems. *Landscape and Urban Planning* 48(3): 131-42.
- Schuyler, David. 1986. *The New Urban Landscape: The Redefinition of City Form in Nineteenth-Century America*. Johns Hopkins University Press, Baltimore.
- Seto, Darlene. 2011. Diversity and Engagement in Alternative Food Practice : Community Gardens in Vancouver, British Columbia. Unpublished Master Thesis. University of British Columbia.
- Shan, Hongxia and Pierre Walter. 2015. Growing Everyday Multiculturalism: Practice-Based Learning of Chinese Immigrants through Community Gardens in Canada. *Adult Education Quarterly* 65(1): 19-34.
- Shanahan, Danielle F., B.B. Lin, K.J. Gaston, R. Bush, R.A. Fuller. 2014. Socio-Economic
 Inequalities in Access to Nature on Public and Private Lands: A Case Study from
 Brisbane, Australia. Landscape and Urban Planning 130: 14-23.

_____, Richard A. Fuller, Robert Bush, Brenda B. Lin, And Kevin J. Gaston. 2015. The Health

Benefits of Urban Nature: How Much do we Need?" BioScience, 65(5): 476-485.

- Shultis John and Glen Hvenegaard. 2016. Urban Parks in Canada: History, Benefits, and Current Issues Prepared for the 2016 Canadian Parks Summit <u>http://lin.ca/sites/</u> default/files/attachments/urban-parks-in-canada-2016.pdf [May 31, 2017]
- Smith, Richard M., Kevin J. Gaston, Philip H. Warren and Ken Thompson. 2005. Urban Domestic Gardens (V): Relationships between Landcover Composition, Housing and Landscape. Landscape Ecology 20(2): 235-53.
- Snowden, Dave. Deal with the system as a whole please. Cognitive edge. 5 January 2015a. <u>http://cognitive-edge.com/blog/deal-with-the-system-as-a-whole-please/</u> [February 17, 2015]
- ______. Describe don't evaluate. Cognitive edge. 12 February 2015b. <u>http://cognitive-edge.</u> <u>com/blog/describe-dont-evaluate/</u> [February 17, 2015]
- Spronken-Smith, R. A. and T. R. Oke. 1998. The Thermal Regime of Urban Parks in Two Cities with Different Summer Climates. *International Journal of Remote Sensing* 19(11): 2085-2104.
- Stagoll, Karen, David B. Lindenmayer, Emma Knight, Joern Fischer and Adrian D. Manning.
 2012. Large Trees are Keystone Structures in Urban Parks: Urban Keystone
 Structures. *Conservation Letters* 5(2): 115-22.
- Sugiyama, Takemi and Catharine Ward Thompson. 2007. Older People's Health, Outdoor Activity and Supportiveness of Neighbourhood Environments. *Landscape and Urban Planning* 83(2): 168-175.
 - _____, E. Leslie, B. Giles-Corti and N. Owen. 2008. Associations of Neighbourhood Greenness with Physical and Mental Health: Do Walking, Social Coherence and Local Social Interaction Explain the Relationships? *Journal of epidemiology and community health* 62(5): 1-6.
 - ____, Jacinta Francis, Nicholas J. Middleton, Neville Owen, Billie Giles-Corti. 2010.

Associations between Recreational Walking and Attractiveness, Size, and Proximity of Neighborhood Open Spaces. *American journal of public health* 100(9): 1752-1757.

- Sullivan, William C., Frances E. Kuo and Stephen F. Depooter. 2004. The Fruit of Urban Nature: Vital Neighborhood Spaces. *Environment and Behavior*, 36(5): 678-700.
- Tinsley, Howard E. A., Diane J. Tinsley and Chelsey E. Croskeys. 2002. Park Usage, Social Milieu, and Psychosocial Benefits of Park use Reported by Older Urban Park Users from Four Ethnic Groups. *Leisure Sciences* 24(2): 199-218.
- TOcore Planning Downtown. 2016. Downtown Parks TOcore Phase 1 Background report. Parks Forestry & Recreation, Toronto, March 2016 <u>https://www1.toronto.ca/City%20</u> <u>Of%20Toronto/City%20Planning/Core/File/pdf/TOcore-Phase1-Background-Report-</u> <u>Downtown-Parks-Accessible.pdf</u> [April 5, 2017]
- Tooke, Thoreau R., Nicholas C. Coops and Bria Klinkenber. 2010. A Geographical Approach to Identifying Vegetation-Related Environmental Equity in Canadian Cities. *Environment and Planning B: Planning and Design* 37(6): 1040-1056.

United Nations, Convention on Biological Diversity. 1992. <u>https://www.cbd.int/doc/legal/</u> <u>cbd-en.pdf</u> [October 17, 2017]

_____, Department of Economic and Social Affairs, Population Division. 2016. The World's Cities in 2016 – Data Booklet (ST/ESA/ SER.A/392). <u>http://www.un.org/en/</u> <u>development/desa/population/publications/pdf/urbanization/the_worlds_cities_</u> <u>in_2016_data_booklet.pdf</u> [July 29, 2017]

Velarde, M., G. Fry, and M. Tveit. 2007. Health Effects of Viewing Landscapes – Landscape Types in Environmental Psychology. *Urban Forestry & Urban Greening* 6(4): 199-212.

Waldron, David, Alberto Cayuela and Devon Miller. 2013. Regenerative Neighbourhoods

 – scaling up from net positive buildings, CaGBC National Conference & Expo,
 Vancouver BC, June 4, 2013 <u>https://www.irbnet.de/daten/iconda/CIB_DC26167.pdf</u>
 [November 13, 2015]

Ward Thompson, Catharine. 1998. Historic American Parks and Contemporary Needs. *Landscape Journal* 17(1): 1-25.

- _____, Peter Aspinall, Jenny Roe and Affonso Zuin. nd. Understanding the impact of quality of urban green space on people's wellbeing in deprived communities. <u>https://www.</u> <u>academia.edu/874767/Understanding_the_impact_of_quality_of_urban_green_</u> <u>space_on_peoples_wellbeing_in_deprived_communities.pdf</u> [March 23, 2017]
- ______, Peter Aspinall, Simon Bell, Catherine Findlay, JoAnna Wherrett and Penny Travlou. 2004. Open space and social inclusion: Local Woodland Use in Central Scotland, Edinburgh, Forestry Commission. <u>https://www.researchgate.net/profile/Catharine_</u> <u>Ward_Thompson/publication/265433540_Open_Space_and_Social_Inclusion_</u> <u>Local_Woodland_Use_in_Central_Scotland/links/5519caf50cf26cbb81a2b26b/</u> <u>Open-Space-and-Social-Inclusion-Local-Woodland-Use-in-Central-Scotland.pdf</u> [March 23, 2017]
 - _____, Peter Aspinall, Simon Bell and Catherine Findlay. 2005. It Gets You Away from Everyday Life: Local Woodlands and Community use-what Makes a Difference? *Landscape Research* 30(1): 109-146.
 - ____, Peter Aspinall and Alicia Montarzino. 2008. The Childhood Factor: Adult Visits to Green Places and the Significance of Childhood Experience. *Environment and Behavior* 40(1): 111-143.
 - ______. 2010. Landscape quality and quality of life. In Ward Thompson C, Aspinall P, Bell S, editors, Innovative Approaches to Researching Landscape and Health: Open Space: People Space 2. Abingdon: Routledge: 230-255. <u>https://www.researchgate.net/</u> publication/241758422_Landscape_quality_and_quality_of_life [November 13, 2015]
- _____. 2011. Linking Landscape and Health: The Recurring Theme. *Landscape and Urban Planning* 99(3): 187-195.
- _____ and Aspinall, P. 2011. Natural environments and their impact on activity, health and

quality of life Applied Psychology: Health and Well-Being 3(3): 230-260

- _____, Jenny Roe, Peter Aspinall, Richard Mitchell, Angela Clowd and David Miller. 2012. More Green Space is Linked to Less Stress in Deprived Communities: Evidence from Salivary Cortisol Patterns. *Landscape and Urban Planning* 105(3): 221-229.
- Whitford, V., A. R. Ennos, and J. F. Handley. 2001. "City Form and Natural process" indicators for the Ecological Performance of Urban Areas and their Application to Merseyside, UK. *Landscape and Urban Planning* 57(2): 91-103.
- Zhou, Xiaolu, and Masud Parves Rana. 2012. Social Benefits of Urban Green Space. *Management of Environmental Quality: An International Journal* 23(2): 173-

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Intera	Within the group																				
	Cycling																				
	Running																				
	Playing																				
vity	Lying																				
Acti	Sitting																				
	Standing																				
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dno.	Adults (25 to 64)																				
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	Children (0 to 14)																				
	NA/ Baby																				
Gender	Female																				
	Male																				
Person	#																				
Group	#																				
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APPENDIX 1 – OBSERVATION SHEET AND MAPS

189.

OBSERVATION CHART - FAC SIMILE

FINISHING TIME FINISHING TIME FINISHING TIME

Mac Lean Park – Observation sheet (facsimile)

APPENDIX 1 – OBSERVATION SHEET AND MAPS



APPENDIX 1 – OBSERVATION SHEET AND MAPS



Mac Lean Park – Observation map (facsimile)

APPENDIX 2 – QUESTIONNAIRE



UBC Applied Science School of Architecture

QUESTIONNAIRE CONSENT COVER LETTER

STUDY TEAM Principal Investigator: Raymond J. Cole School of Architecture and Landscape Architecture (UBC) Professor ray.cole@ubc.ca 604 822 2857

Co-Investigator: Alessandra Monti School of Architecture and Landscape Architecture (UBC) MASA candidate

WHY SHOULD YOU TAKE PART IN THIS STUDY?

You are being invited to take part in this research study because you are a park user (Mac Lean Park or Hinge Park), a community garden member (Strathcona Community Garden or The Village on False Creek Community Garden) or you are passing by in close proximity to these locations.

With this study, we would like to learn more about the role of green spaces in benefiting the surrounding communities from an ecological perspective (pollution mitigation, biodiversity, attraction of wildlife, etc.) and a social perspective (social encounters, sense of belonging, food security, etc.).

In particular, we would like to understand how urban parks and community gardens are perceived within their neighbourhoods. What are the benefits for the surrounding communities? Are they good places to meet people? Do they provide meaningful contact with nature?

HOW IS THE STUDY DONE?

If you decide to participate in the study, we will give you a form with questions to answer. It will take approximately 15-20 minutes.

RESULTS

The results of this study will be reported in a graduate thesis and may also be published in journal articles and books.

1 of 2 August 22, 2016

Consent letter (facsimile) page 1/2

If you are interested in knowing more about the research results, you can contact the study team at any time. The email addresses are listed at the top of the first page of this form.

IS THERE ANY WAY BEING IN THIS STUDY COULD BE BAD FOR YOU?

We do not think there is anything in this study that could harm you or be bad for you. Some of the questions we ask may seem sensitive or personal to you. Please let one of the study staff know if you have any concerns.

WHAT ARE THE BENEFITS OF PARTICIPATING?

As a participant, you could make an important contribution to the study. In the future, the City of Vancouver may introduce new policies that are based on the findings of this research.

MEASURES TO MAINTAIN CONFIDENTIALITY

The questionnaire is completely anonymous. Your identity and confidentiality will be respected. Data records will be kept in a secure locked location, computer files will be password protected and encrypted.

WHO CAN YOU CONTACT IF YOU HAVE QUESTIONS ABOUT THE STUDY?

If you have any questions or concerns about what we are asking of you, please contact the study leader or the co-investigator. The names and telephone numbers are listed at the top of the first page of this form.

WHO CAN YOU CONTACT IF YOU HAVE COMPLAINTS OR CONCERNS ABOUT THE STUDY?

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail <u>RSIL@ors.ubc.ca</u> or call toll free 1-877-822-8598.

If the questionnaire is completed, it will be assumed that consent has been given

2of 2 August 22, 2016

Questionnaire (Urban Parks)

Postal code			
Age range			
18 to 24 years 🗆 25 to 3	34 years 🗆 35 to 44 years 🗆		
45 to 54 years 🗆 55 to 6	54 years □ over 65 □		
Gender			
Male 🗆 Female 🗆			
How long have you been li	ving in Canada?		
My whole life □ over 3	0 years □ over 20 years □ ove	er 10 years 🗆	
less than 10 years □ le	ss than 5 years □		
Is English your mother ton	gue?		
YES 🗆 NO 🗆	-		
What other languages a	re spoken in your household? ((specify)?	
What kind of dwelling do y	ou live in?		
Apartment, building th	at has fewer than five storeys	🗆 🗆 Apartment, build	ing that has five or more storeys \Box
Apartment, duplex 🛛	Single-detached house	er dwellings □	-
Do you live in the neighbor	urhood (Strathcona/Mount Ple	asant)?	
YES 🗆 NO 🗆			
What is your reaction to th	e statement that "Strathcona/M	lount Pleasant is a gree	en neighbourhood"?
I strongly agree 🗆 I ag	ree 🗆 I partly agree 🗆		
I partly disagree 🗆 I di	sagree 🗆 I strongly disagree 🗆		
What kinds of green space	es characterize this neighbou	rhood the most? (rat	te from 1 to 5 where 1 is the least
important and 5 the most i	mportant)		
Local neighbourhood I	oarks 🗆 🛛 Local commun	ity gardens 🗆	View of the ocean/
the mountains \Box	Private gardens 🗆	Tree lined streets \Box	Other (specify) □
Within your household, w	no values visiting urban parks	the most? (rate from	1 to 4 where 1 is the least important
and 4 the most important.	Use 0 if the age group is not pre	esent)	
Children (0 to 14 years	Youth (15 to 24	years) 🗆	
Adults (25 to 64 years)	□ Seniors (65 and over)		
Which outdoor space do ye	ou/your family visit more often	?	
Mac Lean Park/Hinge l	Park □		
My other local neighbo	urhood park (specify) 🗆 🛛 🔄		
My family's preferred o	utdoor space in Vancouver (spe	ecify) 🗆 🛛	
Have you/your family visite	d Mac Lean Park/Hinge Park i:	n the past year?	
YES \Box NO \Box			
Spring			

Questionnaire (facsimile) page 1/3

Summer Everyday Once a week or Fall Everyday Once a week or Winter Everyday Once a week or Winter Everyday Once a week or If YES, Whenever you/your family visit the park more than 1 hour between 30 less than 15 minutes Do you/your family feel like you can pursue of YES NO If NOT, why not? (specify) What are your/your family's preferred activitied important) Physical activities (walk, run, bike, play, of Have social interactions (meet friends/har Walk the dog Take child	more Once a month or m more Once a month or m more Once a month or m c, what is the average time spe minutes and 1 hour betwee different kinds of activities w ties there? (rate from 1 to 5 v etc.) Rest an ave picnics-barbecues/meet n dren to the playground	ore Never C ore Never Never ore n15 and 30 minutes ore n15
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Walk the dog □ Take child	dren to the playground \Box	Other (specify) \Box
What is your/your family's preferred facility		// =
Do you/your family feel welcome in Mac Lea YES D NO D	an Park/Hinge Park ?	
If NOT, why not? (specify)		
Have you/your family ever had occasion of n	neeting new people in Mac L	ean Park/Hinge Park?
Do you/your family think that Mac Lean Par	rk/Hinge Park is a central foc	us for the wider community?
If YES, why? (specify)	1	
YES □ NO □	sed in nature when you are in	Mac Lean Park/Hinge Park?
What is your/your family's preferred natural	l feature in Mac Lean Park/Hi	nge Park (specify)?
What are your/your family's proformed has of		
vy nat are your/your family's preferred benef	fits there? (rate from 1 to 5 w	here 1 is the least important and 5 the mo
important)	fits there? (rate from 1 to 5 w	here 1 is the least important and 5 the mo
important) Breathe fresh air □	fits there? (rate from 1 to 5 w Relieve stress□	here 1 is the least important and 5 the mo Enjoy the view □

Questionnaire (facsimile) page 2/3

Q

•	Do you/your family think that Mac Lean Park/Hinge Park adds ecological value to its neighbourhood?
	YES \Box NO \Box
•	Have you/your family ever observed native wildlife attracted by Mac Lean Park/Hinge Park?
	YES \Box NO \Box
•	Have you ever been or are you currently a member of a Community Garden?
	YES \Box NO \Box
	If YES,
	Do you think Community Gardens are better places than Urban Parks to meet people?
	YES 🗆 NO 🗆
	Why? (specify)
	Do you think Community Gardens are better places than Urban Parks to be in contact with nature?
	YES 🗆 NO 🗆
	Why? (specify)
•	Overall, is the experience of being in Mac Lean Park/Hinge Park more rewarding than being in other public open
	spaces?
	Why or Why not? (specify)