

Revisiting Environment-Behaviour Research in Human-Centred Urban Planning and Design: A Cognitive Study on Berczy Park

by

Kiana Javaheri

supervised by

Laura Taylor

A Major Paper submitted to the Faculty of Environmental Studies

in partial fulfillment of the requirements for the degree of Master in Environmental Studies

York University, Toronto, Ontario, Canada

August 2018

Abstract

The purpose of this paper is to review and discuss Environment-Behaviour Research in Human-Centred Urban Planning and Design. Through conducting this cognitive study, I intend to understand and explain phenomena rather than changing them. The main objectives are to assess the design quality of Berczy Park in Toronto, explore users' interactions with the physical environment in terms of experiences and activities, and explain the underlying interrelationships among design qualities, activities, and experiences in a specific time and space rather than a generalizing study on the totality of this public space. This mixed-method explanatory study is an exploration of Environment-Behaviour research techniques, human-centred urban planning and design principles, and some insights from Cognitive Psychology into the process of human experience. Key findings from this study indicate that the interrelationships among design qualities, activities, and experiences are not unidirectional and studying each in isolation could be misleading. The results suggest that in the case of Berczy Park, successful design of public space can be explained by qualities such as human scale, aesthetics, creative features, high numbers of options for sitting, standing, playing, seeing, mobility, and socializing as well as users reporting high levels of attention, joy, attraction, safety, comfort and satisfaction alongside low levels of noise and stress.

Acknowledgments

I would like to thank my supervisor, Professor Laura Taylor, for her support, patience and confidence in me to pursue my multi-disciplinary interests in this program. I must also thank the faculty of Environmental Studies at York University to provide me with this opportunity.

My heartfelt thanks to my family and friends for their unconditional love and support through this journey.

Foreword

In this paper, I draw on major components of my plan of study as pillars of my work in terms of theoretical perspective, literature review and methodology and analysis. These components and the highlighted learning objectives that mainly shaped my paper are as follows: 1) Environmental Psychology, which has been heavily influential in the development of the broader field of Environment-Behaviour Studies through incorporating traditional theoretical frameworks on psychological grounds. Gaining deep insight into theoretical perspectives in Environment-Behaviour Research, conducting extensive literature review on influential works and controversial debates, and learning about research methods and techniques used in this field are among the objectives that were critical for writing this paper. 2) Behavioural Insights into Policy-Making, which advocates for integrating behavioural sciences with the realm of policy and decision-making to achieve successful evidence-based policies. This component is not directly discussed in this paper although it can arguably be viewed as the research application of Environment-Behaviour Studies. Gaining an understanding into the concept of planned intervention was important in shaping my view towards planning and design as practices that are responsible for evidence-based intervention in the built environment. 3) Urban Planning and Design from a human-centred lens, which are concerned with putting the users of cities—people—before other often capitalistic and technical concerns. Gaining critical insight into urban theories, exploring the line between design and planning practices, and developing analytical skills to evaluate contemporary planning and design principles from a human-centred viewpoint through post occupancy evaluations and neuro-environment evaluations are among the learning objectives that shaped the methodology and analysis sections of this paper.

Table of Contents

1	INTRODUCTION	1
1.1	Background Information	1
1.2	Research Problem.....	5
1.3	Theoretical Assumptions.....	5
2	LITERATURE REVIEW	8
2.1	Social and Behavioural Sciences.....	8
2.2	Human-Centred Urban Planning, Design and Architecture.....	11
2.3	Health and Natural Sciences	15
3	METHODOLOGY	21
4	FIELD STUDY AND RESULTS.....	27
4.1	Berczy Park	27
4.1.1	Site Introduction and History.....	27
4.1.2	Features, Design Elements and Built Form	30
4.1.3	User Interaction.....	39
4.2	Survey.....	41
5	DISCUSSION	48
5.1	Attention and Sensory Inputs	49
5.2	Judgements and Attributions.....	53
5.3	Emotions and Feelings	56
5.4	Preferences and Overall Satisfaction.....	59
6	CONCLUSION.....	66
7	APPENDICES	67
8	REFERENCES	72

List of Tables

Table 4-1: Attention and Sensory Inputs	42
Table 4-2: Noise.....	42
Table 4-3: Pleasantness.....	42
Table 4-4: Complexity	43
Table 4-5: Attraction.....	44
Table 4-6: Safety.....	45
Table 4-7: Comfort	45
Table 4-8: Stress	46
Table 4-9: Satisfaction	47
Table 5-1: Analytic summary	63

List of Figures

Figure 4-1: Berczy Park Timeline.....	29
Figure 4-2: Central Plaza Panorama. June 2018.....	32
Figure 4-3: Fountain. June 2018	33
Figure 4-4: Fountain Features	33
Figure 4-5: Old Layout	34
Figure 4-6: New Layout.....	34
Figure 4-7: Sitting Opportunities	35
Figure 4-8: Mural Garden	35
Figure 4-9: Flatiron Mural. June 2018.....	36
Figure 4-10: Grass Mounds	36
Figure 4-11: Jacob's Ladder. June 2018.....	36
Figure 4-12: Scott St.	37
Figure 4-13: Wellington Project	37
Figure 4-14: Built Form-Berczy Park Area. June 2018.....	38
Figure 5-1: Sensory Inputs, Categories and Factors	49
Figure 5-2: Visual Cues to the Fountain	50
Figure 5-3: Panorama of the Central Plaza. June 2018.....	53
Figure 5-4: Noise	54
Figure 5-5: Pleasantness	55
Figure 5-6: Complexity.....	55
Figure 5-7: Safety	57
Figure 5-8: Comfort	57
Figure 5-9: Stress	58
Figure 5-10: Satisfaction.....	60
Figure 5-11: Experience of Public Space.....	60
Figure 5-12: User Interaction Analysis.....	61
Figure 5-13: 12 Quality Criteria	62

List of Maps

Map 3-1: Participant Selection.....	25
Map 4-1: Location in Toronto.....	27
Map 4-2: Berczy Park Area	28
Map 4-3: Site Plan	31
Map 4-4: User Interaction.....	40

1 INTRODUCTION

1.1 Background Information

Over the centuries, architects have anecdotally learned about how human beings can be influenced by the environments they live, work, socialize and worship in. Periodic architectural styles throughout the history have taken advantage of this intuitive understanding through the power of design by inspiring awe or imposing obedience and agitation (e.g. Gothic religious architecture). Not certain about how and why, and not based on many proven principles, designers were somewhat aware of the effects of their decisions on the quality of human experience and therefore, their well-being and behaviour. Relevantly, the field of Psychology has been concerned with the severe effects of environments on people through famous classical experiments such as the Stanford Prison Experiment in 1971 which discussed how human beings can drastically change when put in a simulated prison environment (Smith & Haslam, 2017).

In the late 20th century, researchers from Social and Behavioural Sciences concerned with the quality of life were struggling with philosophical assumptions about how to view person-world interactions and fundamental concepts such as environment and person. Pioneer researchers from various fields such as Psychology, Sociology, Anthropology and Geography came together in the 1970s to develop new theoretical and paradigmatic approaches for confronting essential yet forgotten questions about the nature of environment, person, the interrelationships between the two, and the implications for human health and well-being (Wapner et. al., 2000).

In the same time period, in fields such as Architecture, City Planning and Urban Design which were mainly concerned with the domain of the built environment, there was an increasing focus on the users—people—replacing more traditional discussions about form, aesthetics and technical functionality. Starting in mid-1960s, criticisms against modernist architecture and city planning due to the rapid transition from traditional to modern city argued about how people are largely ignored in these processes in terms of their needs, use of space, satisfaction, physical and mental well-being, everyday life at eye-level, and in general their quality of life (Alexander, 1977; Appleyard, 1981; Craik, 1970; Gehl, 1987; Jacobs, 1961; Lang, 1974; MacEvan, 1974; Whyte, 1980). As a result of these criticisms, the first interdisciplinary public life studies were conducted to address the dynamics of life in public urban space with a human-centred approach, bringing

forward the psychological and behavioural factors in city planning and design (Gehl & Svarre, 2013).

Accordingly, extensive multi-disciplinary interest in people (individuals and groups), their environments (both built and natural), and their lives (especially the quality of public life) brought about the formation of a field called Environment-Behaviour Studies (EBS) concerned with Environment-Behaviour Relations (EBR). This field was heavily influenced by Environmental Psychology (Ittelson, Proshansky, Rivlin, 1974; Altman et. al., 1987; Stokols, 1995; Bell et. al, 2001), Ecological Psychology (Gibson, 1968; Barker, 1968; Wilson, 1984), Social Psychology (Hall, 1966; Sommer, 1969; Altman, 1973), Behavioural Geography (Golledge & Timmermans, 1990), and Cross-Cultural Studies (Rapoport, 1975, 1976a, 1976b, 1990; Wapner et. al. 1991). Following rapid growth over three decades, EBS was criticized by scholars such as Rapoport (Cited in Wapner et. al., 2000, 114) for adopting a humanistic “anti-science” biased attitude and not establishing further links with fields other than those it began with when there was a clear potential for the involvement of fields such as Cognitive Sciences, Neuroscience and Brain Science, Integrative Biology, Evolutionary Science, Genetics, Sociobiology, Artificial Intelligence and more computational approaches.

In this paper, drawing on my background in Urban Planning and Design, I discuss why I believe there is a need to revisit EBS in designing and planning for public urban space from a human-centred perspective and how we can think of such confluence in today’s planning and design practices. In addition to various theoretical perspectives from the traditional domain of EBS developed in the late 20th century, I also find myself fascinated by the more recent advances in fields such as Cognitive Psychology and Brain Science which have been trying to extend our understandings of the interactions between humans and the built environment by studying how our brains are coordinated with our physical environment, how we process environmental information that we receive every second of our lives, and how we respond to these experiences. First, I conduct a comprehensive literature review that goes beyond the scope of my field study to gain a general understanding of the unification that EBS can offer today, categorizing scholarly efforts in Social and Behavioural Sciences, Architectural Design and Planning, and Health and Natural Sciences. Next, I explain the flexible mixed methodology I adopted to conduct what Rapoport (cited in Wapner. et. al., 2000, 110) describes as a “cognitive” study—i.e. “to understand and explain phenomena rather than change them—on users’ interaction with Berczy Park in Toronto and their

individual experiences in a specific time period, as well as assessing urban design qualities in this space. Followed by a discussion of the results, I draw on what I learned from the combination of traditional Environment-Behaviour Studies, urban design quality assessment and some insights from Cognitive Psychology that together, can explain phenomena and therefore be applied to human-centred planning and design practices with the overarching goal of improving the quality of life.

As a graduate student in Environmental Studies [Planning] program, I have experienced a significant intellectual transition in light of introducing EBS into my work, wondering about the reasons behind its low presence in today's academic programs. Based on my limited experience, I present the following reasons for why I believe there is a need to revisit an expanded domain of EBS in human-centred urban planning and design practices in order to close the gap.

1. The fundamental problem of Environment-Behaviour Research is “human action and experience in the complex everyday life environment” (Wapner et. al. 2000, 290). Since we are constantly affecting and are affected by the environment around us, I believe Human-Centred Planning and Design is a field responsible for evidence-based intervention in the environment and therefore people, and thus, could strongly benefit from facing the layers of this complex problem. In my opinion, an evidence-based practice is one that employs the best available empirical knowledge to its goals which in this case are to improve the overall quality of life. For instance, in my field study on Berczy Park, I found out that “good” design (defined by a set of criteria) provokes certain positive experiences and activities that result in higher comfort and satisfaction levels for the individual and groups, which in turn provide a healthier, safer and more popular public space, prompting better maintenance and care for the space from both the City and the users of space.
2. Exploring Environment-Behaviour Relations using scientific measures provides an empirical framework where “science” does not have to be limited to the binarity of humanist or natural, hard or soft, but an attempt to acknowledge all known aspects of phenomena and explain them holistically, i.e. as part, whole and part-whole relations (Altman & Rogoff, 1987; Wapner et. al., 2000) while inquiring about what is unknown. In other words, the promise of EBS is “at once humanistic and scientific, concerned with developing an explanatory theory of Environment-Behaviour Relations” (Rapoport, 1990,

- 9). Since “person” is one pillar of this systematic whole that is deeply entangled with the rest of the system, I cannot think of a better way to address the notion of “human-centred”.
3. I believe that design is a process of both scientific and artistic merit. What I find fascinating about Environment-Behaviour Studies—or as Rapoport (cited in Wapner et. al., 2000, 107) states “the Science of Environment-Behaviour Relations”—is the opportunity for the process of design to be a scientific problem-defining and problem-solving effort complemented with creative conceptual ideas from the artistic realm. Applying this thought to human-centred planning and design practices could empower them to creatively achieve better results in favour of people—and planet—rooted in unification of sciences.
 4. Revisiting EBS can once again raise the importance of philosophical issues and assumptions underlying our work. As Altman et. al. (1987) explain, rethinking our assumptions and asking questions about the essence and relations of phenomena can be quite liberating because it provides the researcher/practitioner with an opportunity to put traditional views into perspective and realize they are only one of many possible ways. “We feel comfortable trying out alternative approaches and exploring new ways of thinking about studying phenomena” (cited in Wapner et. al., 2000, 21). Thus, I believe rethinking our assumptions helps us see how far we have come, what we have overlooked, and how we can evolve. For instance, controversies among Realism (objective and materialistic reality), Idealism (subjective and immaterialistic reality) and Dualism (both mind and matter) can be present in discussions about the definition of the city as an artifact comprising of minds, bodies, ideas, and materials. If cities are about experiences, and experiences relate to the mind-body, how can we design and plan cities without rethinking these notions (e.g. discussions in Cognitive Science and Neuroscience about whether mind is truly distinct from the brain and therefore our physical body)?
 5. Throughout my studies in urban planning and design, “evidence-based practice” are words I have heard countless times. As I familiarized myself with EBS and its domain mainly concerned with the quality of everyday life in complex environments, I realized that based on the previously mentioned reasons, EBS could provide a significant opportunity for fostering an evidence-based approach towards urban decision-making, planning and human-centred design.

1.2 Research Problem

In this study, my ultimate goal is to explain why there is a need to revisit Environment-Behaviour Research in human-centred urban planning and design as well as practically elaborating on such association through a field study on Berczy Park, Toronto. This field study explains users' interactions with Berczy Park and their individual experiences in a specific time period during the day, in addition to assessing urban design qualities in this space. I am interested in Berczy Park located in St. Lawrence neighbourhood, Toronto, because this public space is situated where Old Toronto and the modern Financial District converge, it is occupied by many diverse users from locals to tourists with different backgrounds, its recent revitalization/redesign plan has won awards in landscape architecture, and its small scale allows me to conduct psychological research as well as urban design quality assessments.

In order to explore the answers to these questions, I discuss three sub-questions as follows:

1. What is the design quality of Berczy Park from a human-centred perspective?
2. Over a specific time period during the day, how do the users of Berczy Park interact with this public space in terms of activities and use of space, and what is their experience in terms of attention, judgements, feelings, comfort and overall satisfaction?
3. Is there any relationship among the users' interactions with the environment, their experience of the environment, and the design quality of the environment?

1.3 Theoretical Assumptions

In general, I find myself truly interested in complex processes that structure the built environment such as socio-economic, political, historical, cultural, geographical, planning and design processes. During this program, I became increasingly interested in how design and planning practices are shaping people's everyday lives, experiences and actions through planned and designed environments—planned intervention. That is how I started my exploration of the field of Environment-Behaviour Studies to search for scientific explanations for the relationships between people and their environments. Soon it seemed like the right fit for me as I find it to be a cross-disciplinary field comprised of the unification of natural science and human science orientations, flexible world views, concerned with philosophical assumptions, and entailing a breadth of research methodologies dependent on the nature of the problem under study.

Research in EBS has been informed by different world views that hold various theoretical assumptions and definitions of person, world, and person-world relations. Altman & Rogoff (1987) have described four views rooted in Psychology including “trait” (behaviour is derived by internal characteristics), “interactional” (behaviour is driven by traits and situations in a causal manner), “organismic” (holistic system models comprised of separable subsystems and their relations) and “transactional” (holistic entities comprised of inseparable mutually-defining aspects and their patterns). In this study, I am mostly oriented towards the organismic view which is concerned with the study of “dynamic and holistic psychological systems in which person and environment components exhibit complex, reciprocal relationships and influences” (Altman & Rogoff, 1987, 19).

To elaborate, in this view, person-in-environment as the unit of analysis is a unified entity composed of certain parts and certain part-whole relationships. In other words, this view asserts that the whole is more than the sum of its parts, meaning we can not understand the qualities of the whole strictly based on isolated studies of the qualities of its parts in a unidirectional way. Rather, it is important to explore the complex set of relationships between elements and their contexts (Altman & Rogoff, 1987).

The basic assumptions of my theoretical framework are as follows:

- Empirical data (from observation and/or experience) are the most important source of knowledge.
- This approach is only one of the many ways to look at the problem at hand. In other words, the questions of this study can be explored from various angles and viewpoints that are concerned with different aspects of the problem.
- There are many ways that we interact with the world—e.g. mystic, economic, political, religious, etc.—however I am concerned with an explanatory, or in other words, a “cognitive” orientation towards the world, and I use Rapoport’s definition as “a desire to understand and explain phenomena rather than change them” (cited in Wapner et. al., 2000, 110).
- The users’ individual experience and interaction with Berczy park is considered as a holistic entity made of components that can be categorized in terms of levels of

organization including physical/biological, psychological, and sociocultural (Wapner et. al., 2000).

- In this study, I am mainly concerned with person at the psychological/intrapersonal level, environment at the physical and living organisms (people and pets) level, and the interrelationship between these components. In this view, it is possible to further dismantle the components that make the whole in order to study them thoroughly and better understand their interrelationships.
- To be neutral and address the diversity in individual experiences of reality, the most appropriate way to conduct such research involves recording individual experiences through self-reported measures. In this way, there is an opportunity to complement assessments of the physical environment with those of the experienced environment (Wapner et. al., 2000, 295).

To conclude this chapter, the topic of this study is to explore Environment-Behaviour Research in Human-Centred Urban Planning and Design in terms of insights into the interaction between people and their physical surroundings, their individual experiences and the design quality of public space. Reasons for why I believe Environment-Behaviour Research is of importance for planning and design include their mutual fundamental problem of the quality of everyday life in complex built environments, the opportunity for an explanatory scientific framework that attempts to analyze all known aspects of phenomena, the possibility for design to be both a scientific and an artistic process, the importance of philosophical thinking and inquiring about the essence of phenomena, and the promise of evidence-based human-centred insights into alterations in the built environment. This study relies on an Organismic view of person-in-environment as the unit of analysis and assumes that the users' individual experience and interaction with Berczy park is a whole comprised of two main components—person and environment—and their relationships. The component of person is studied at a psychological/intrapersonal level and the component of environment is studied at the physical and living organisms (people and pets) level.

2 LITERATURE REVIEW

I conduct a comprehensive literature review as a discrete task that goes beyond the scope of my field study to gain a general understanding of the breadth of the scientific “unification” that EBS represents; a principle that Rapoport (cited in Wapner. et. al., 2000) defines as not being limited to borders of one field or discipline, and rather benefit from the knowledge of other fields that best explain phenomena. I categorize several scholarly efforts in chronological order which have addressed the problem of human experience, well-being, behaviour and quality of life in relation to the physical environment from different lenses. These works hold various ontological and epistemological positions and are categorized as belonging to three groups: 1) Social and Behavioural Sciences, 2) Human-Centred Urban Planning, Design and Architecture, and 3) Health and Natural Sciences.

My general understanding of the scope of this cross-disciplinary research is shaped by the reviewed literature although in my field study, I specifically draw on theoretical perspectives discussed in Wapner et. al. (2000) and Altman & Rogoff (1987) from group 1 since they compile more recent and advanced theoretical views in the field of Environment-Behaviour Studies. In addition, I heavily draw on tools, methods and techniques introduced in Gehl (2010; 2013) from group 2 since they have been successfully implemented in many public space-public life studies throughout the world. Finally, I rely on Ramachandran (2012) from group 3 due to my lack of knowledge of Cognitive Psychology and Brain Sciences in order to educate myself with one of the most up-to-date and comprehensive encyclopaedias of human behaviour.

2.1 Social and Behavioural Sciences

Starting in the early 20th century, Social and Behavioural Sciences were concerned with the definitions and the interaction between human beings and their environments from different perspectives. Facing the Spatial Turn intellectual movement which emphasized on “place” and “space” in Humanities in addition to the social and ecological problems of living in the modern city as a human artifact gave rise to scientific interest in the relationship between the physical environment and human behaviour (Bodenhamer et. al., 2010).

Fields such as Psychology and Sociology were struggling with the concept of environment and its implications from different theoretical viewpoints. According to Porteous (1977), these theories —up to the 1970s— were as follows: Environmental Determinism, “the concept of environment

as dictator, directing man's actions in one direction rather than another" (1977, 135); Environmental Possibilism, "the environment as the medium by which man is presented with opportunities that may be realized or not" (1977, 137); and Environmental Probabilism, "lawful relationships exist between environment and behaviour, [the environment] does not dictate, ..., there exists a large number of latent opportunities for action or inaction, ..., the range of possible decisions and probability of making any one of them can be ascertained" (1977, 138).

Researchers from several different fields such as Anthropology, Geography, Psychology, and Sociology came together in the 1970s to develop new theoretical approaches for the study of what is known as Environmental Psychology as a branch of applied psychology. The emergence of Behavioural Geography gave the interaction between environment and human behaviour an ideological essence (Bell, et al., 2001). According to Stokols (1995, 821), with the advent of Barker's (1968) research on behavior settings, Hall's (1966) and Sommer's (1969) studies of territoriality and personal space, and Ittelson, Proshansky, Rivlin, and Winkel's (1974) articulation of foundational principles of Environmental Psychology, psychologists began to attend systematically to the study of people's interactions with their socio-physical surroundings.

Environmental Psychology is the study of transactions between individuals and their physical settings (Gifford, 2007). In these transactions, individuals alter their surrounding environments, and their behaviour and experiences are altered by their environments. According to Gifford et al. (2011), Environmental Psychology includes theory, research, and practice with the goal of humanizing the built environment and improving the relationship between human and nature. This field of study concentrates on understanding how individuals respond to complex everyday scenes. "Considering the enormous investment society makes in the physical environment and the huge cost of misusing nature and natural resources, Environmental Psychology is a key component of both human and environmental welfare" (2011, 440).

Furthermore, the development of behaviourally-based research has been documented in the field of Geography. According to Golledge and Timmermans (1990, 57), the reasons behind the emergence and development of Behavioural Geography are as follows:

1. a search for models of humanity which were alternatives to the economically and spatially rational beings of normative location theory;

2. a search to define environments other than objective physical reality as the milieu in which human decision making and action took place;
3. an emphasis on processural rather than structural explanations of human activity and relationship between human activity and the physical environment;
4. an interest in unpacking the spatial dimensions of psychological, social and other theories of human decision making and behaviour;
5. a change in emphasis from aggregate populations to the disaggregate scale of individuals and small groups;
6. a need to develop new data sources other than the generalized mass-produced aggregate statistics of government agencies which obscured and overgeneralized decision-making processes and consequent behaviour;
7. a search for methods other than those of traditional mathematics and inferential statistics that could aid in uncovering latent structure in data, and which could handle data sets that were less powerful than the traditionally used interval and ratio data; and
8. a desire to merge geographic research into the ever-broadening stream of cross-disciplinary investigation into theory building and problem solving.

At the same time, there was an increasing focus on people in Architecture and Environmental Design theories and practices in addition to the discussions about aesthetics and functionality. Critiquing the modernist paradigm, Craik (1970), Lang (1974) and MacEwan (1974) wrote about how the field of architecture intends to design for people and their needs, yet fails to address their use of space, satisfaction and well-being in the built environment, accusing architects of alienating human beings from their settings.

Thereupon, the field of Environment-Behaviour Studies known as EBS or E-B Studies was developed from the convergence of the Social and Behavioural Sciences, and Environmental Design –i.e. architecture, urban design and urban planning. According to Dayaratne (2002), there were two different concerns to be addressed: understanding the interrelationship between the built environment and people in order to improve the design and/or plan; and understanding the interrelationship between the built environment and people in order to understand, analyze and/or possibly change human behaviour. To elaborate, according to Moore (2006), from Social and Behavioural Sciences, E-B Studies were focused on understanding and analyzing behaviours and grew from the concern that while much was known about individual, group and cultural processes,

perception, cognition, preferences, values, attitudes, social norms and so on, little was known about the relation of these understandings to the physical environment. “When the word “environment” has been invoked in these social science disciplines, it most often, implicitly, refers to the socio-cultural environment of staff, curriculum, social interactions, and the cultural milieu—not the physical, planned and designed environment” (2006, 2). In addition, coming from Environmental Design, E-B Studies concentrated on the improvement of designs and plans, and grew from the concern that Environmental Design was not paying enough attention to behavioural, social, and cultural factors when planning and designing our environment, leading to physical settings that are unable to function well. According to Moore (2006), more recent theories in E-B Studies from a Post-Modernist and Constructivist perspective include Interactional theories, Organismic theories and Transactional Theories such as Wapner’s (1987) person-in-environment theory and the influencing work of Irwin Altman (1973) on Social Psychology and transactionally-oriented research (Altman et al., 1987).

Wapner et. al. (2000) compiled a comprehensive collection titled as *Theoretical Perspectives in Environment-Behaviour Research: Underlying Assumptions, Research Problems and Methodologies* on the more recent views in this field. My view towards EBS is heavily influenced by a few contributors to this reference work including Irwin Altman, Amos Rapoport, Leanne G. Rivlin, Daniel Stokols, and Seymour Wapner.

2.2 Human-Centred Urban Planning, Design and Architecture

As the theoretical knowledge of E-B Studies, Environmental Psychology and Geography was expanding, more scholars started working on the application of this empirically-gained knowledge to certain practices that deliberately shape the built environment in the urban context. This paper briefly reviews a number of influential works with regard to Urban Planning, Urban Design and Landscape Architecture. These influencing works paved the way towards a major movement in Urban Planning and Design which emerged from activists and urban thinkers who criticized Modernism’s ideals of space and structure which were operating on an inhuman scale with no attention towards everyday human experience and public life. The scholars mentioned in this section extensively worked on how “life” could be brought back in the modern city and addressed the importance of public life studies in contemporary urban planning and design.

Jane Jacobs published *The Death and Life of Great American Cities* in 1961 which became a wake-up call to people, planners and politicians, making them realize what was wrong with modern urban planning. She observed her own neighbourhood in Manhattan, New York as a method of learning from the interaction of public space and behaviour. She objected the standard technical solutions and believed planners and politicians need to go out on the streets and study life as it unfolds in the urban scene.

William H. Whyte, a colleague and a friend of Jane Jacobs, utilized Jacob's approach and made it a practical method of gathering data by observing with his own eyes and the help of time-lapse photography. In his significant work *The Street Life Project* (1971), he studied the use of New York City's urban spaces and released his results in a modest manual—as he calls it—titled as *The Social Life of Small Urban Spaces* (1980) which was the basis for his 1988 documentary with the same title. His work provides basic data on people's social and spatial behaviour in small public spaces and explains why some spaces are more attractive for people and work better than others.

A Pattern Language by Christopher Alexander (1977) became an important source of inspiration for public life and behaviour studies. In addition to observation and learning from people's behaviour in public spaces, he wanted users to design the spaces themselves. He argued that people know more about how cities should be than do planners and politicians. He criticized modern urban planning for its lack of ability to understand the complexities of everyday urban life. In his next book *The Timeless Way of Building* (1979), he argued that a shift is needed from “abstract, overly intellectualized design” to an approach that is built on “people's immediate daily needs” (1979).

Another inspiring resource is the work of J. Douglas Porteous (1977) on *Environment & Behavior: Planning and Everyday Urban Life* in which he drew from several Social Science and Design principles and was concerned with the interrelationship between behaviour, urban environments and the planning praxis. He asserted the necessity of bridging the gap between fields such as Environmental Psychology, Behavioural Geography, Social Biology, Architectural Psychology, Urban Anthropology, Urban Sociology, Planning, and Design Practices. Adopting an egocentric approach, he divided the world into self and not self and focused on everyday life of people in cities rather than irregularities such as responses to natural hazards (Porteous, 1977, 14). He advocated for the integration of behavioural insights into planning and design practices as he writes “the study of human behaviour in the urban environment may thus be of value for both the design

of new urban environments and for the better management of the old” (1977, 15). He suggested that if we desire cities that are sensitive and understanding of individual needs, “we may need more, or less, or better planning, but it is clear that such ends will never be realized unless we design with people and plan with man in mind” (1977, 15).

Donald Appleyard (1928-82) started his work on public life studies with Kevin Lynch (1960). He wrote the book *Livable Streets* (1981) echoing Jane Jacobs on the idea of street as a public space with significant social aspects. Later he worked with urban designer Peter Bosselmann (1998) and built a simulation laboratory that could simulate people’s experiences in spaces (Gehl & Svarre, 2013). One of his major contributions to the field of public life studies was a study in San Francisco that showed a significant connection between vehicular traffic and social life on the streets.

Allan Jacobs began his work by observing and gathering data to describe a street he once lived on in Pittsburgh. In *Looking at Cities* (1985), he stated that systematic observation should be used as a research method and a strategic decision-making tool in urban planning and design. In his book *Great Streets* (1993) he studied many streets across the world, stressing on physical factors and the success or failure of each street. As Gehl and Svarre (2013) put it perfectly, he believed that observing the interaction between public space and public life would prevent many unfortunate decisions that would affect people’s lives.

Jan Gehl, who is one of the most influential figures in the field, started his work as an architect and eventually focused on the human dimension which resulted in his significant publication *Life between Buildings* (1987). It became a classic in the field of public life studies and was extended into urban planning, urban design and strategic decision-making all over the world. Following Jane Jacobs’ path, in his other prominent publication *Cities for People* (2010), he wrote about recreating cityscapes on a human scale. As one of the strongest points of his work, he provided detailed explanations on the practical application of tools and methods he used to turn non-functional cityscapes into what they should be: cities for people. Lastly, In *How to Study Public Life* (2013), Jan Gehl and Birgitte Svarre drew from their combined experience of over 50 years of practice to provide a history of public space-public life studies around the world as well as hands-on methods, tools and strategies required for bringing the life back in the cities as an important city planning and design dimension.

In *The Meaning of the Built Environment*, Amos Rapoport (1990) focused on the meaning of everyday buildings and environments for their users and drew from different cultures and historical eras. His work shed light on understanding how the built environment has meaning for both individuals and groups in a certain era and introduced environmental meaning as part of a cultural and social system.

Kaplan & Kaplan (1998) coauthored *With People in Mind: Design and Management Of Everyday Nature* exploring how to design areas of “everyday nature” such as parks, open spaces, empty lots, fields and forests in a way that prioritizes human experience over technical and financial concerns and can create awe-inspiring places for people. In this framework, they considered the human dimensions as the main factor and offered a fresh perspective on Environmental Design.

Alain de Botton, a well-known philosopher who has worked on many areas including Architectural Philosophy and Aesthetics, extensively wrote about the relevance of Philosophy to everyday life. The concept of “beauty” and the happiness that results from it were deeply discussed in *Architecture of Happiness* (2006) in which he analyzed human desires and needs manifested in Architecture. He argued that the quality of our environment plays a significant role in our happiness and misery. Yet he is suspicious of this influence as he writes:

We are sometimes eager to celebrate the influence of our surroundings. [...] But sensitivity to architecture also has its more problematic aspects. If one room can alter how we feel, if our happiness can hang on the colour of the walls or the shape of a door, what will happen to us in most of the places we are forced to look at and inhabit? [...] It is to prevent the possibility of permanent anguish that we can be led to shut our eyes to most of what is around us, for we are never far from damp stains and cracked ceilings, shattered cities and rusting dockyards. We can't remain sensitive indefinitely to environments which we don't have the means to alter for the good –and end up as conscious as we can afford to be (Botton, 2006, 13).

A heavily quantitative approach to the quality of Urban Design was taken by Reid Ewing and Otto Clemente (2013) in *Measuring Urban Design: Metrics for Livable Places*. This work was focused on the street as urban public space and argued that alongside easily quantifiable qualities of a street such as building height, sidewalk width and block length, good urban design has “elusive” qualities that are measurable if using the right methods. Ewing specifically named and defined

“imageability”, “visual enclosure”, “human scale”, “transparency”, and “complexity” as the five intangible qualities of successful urban streets while demonstrating how to measure these qualities in field surveys using coefficients and mathematical computations. He stated that researchers, policy makers, designers, planners and “lay people” can employ this empirically based tool to measure those intangible qualities in a place that make us want to take a stroll, or in other words, quantify the unquantifiable.

2.3 Health and Natural Sciences

Alongside the above mentioned efforts in Social and Behavioural Sciences, Architecture, Urban Planning and Urban Design, Health and Natural Sciences have also been very curious about how living organisms including human beings interact with the environments around them and how they come to perceive, experience, feel, think and behave in it.

With a background in Landscape Architecture and Urban Planning, Clare Cooper Marcus has worked extensively on the connection between wellbeing and environmental design factors in space. Adopting an evidence-based approach, she strongly advocates for integrating scientific research into design guidelines that result in creating better places for people. In *People Places*, Marcus and Francis (1990) looked into seven types of urban open spaces including urban plazas, neighborhood parks, mini-parks and vest-pocket parks, campus outdoor spaces, outdoor spaces in housing for the elderly, child-care outdoor spaces, and hospital outdoor spaces, offering design recommendations to create more people-friendly places. In *Therapeutic Landscapes*, Marcus and Sachs (2013) provided an evidence-based overview of healing gardens and restorative outdoor spaces from the stage of participatory planning to post-occupancy evaluation. They discussed twelve patient-specific categories from burn patients and psychiatric patients, to hospice and Alzheimer's patients, among others. This comprehensive work addressed various types of outdoor space (e.g. garden, campus, courtyard, playground) designed in health care facilities, residential areas, child care facilities and senior homes. It strongly advocated for an approach to design that supports stress reduction, mental stability, recovery from illness or injury, and regaining lost or impaired abilities.

The Embodied Mind: Cognitive Science and Human Experience by Varela et. al (1991) was an influential work devoting itself to human cognition understood as everyday lived experience in an era when the scientific study of the mind was developing rapidly. They advocated for a sense of

common ground between mind in science and mind in experience to improve our understanding of cognition. It was one of the first works to propose the “embodied cognition” approach in cognitive science and introduced a new form called “enaction,” in which both the environment and first person experience are aspects of embodiment. In this sense, they defined “embodied action” as follows:

By using the term embodied, we mean to highlight two points. First, that cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological, and cultural context. By using the term action, we mean to emphasize once again that sensory and motor processes, perception and action, are fundamentally inseparable in lived cognition (1991, p.172).

The Eyes of the Skin by Pallasmaa (2005) which was first published in 1996 is considered a classic in architectural theory and philosophy. This work discussed the case of modern western architecture and how sight has been dominating the other four senses of human beings when interacting with their surrounding environments. He argued that the suppression of other senses has resulted in a deterioration in the built environment by overemphasizing on vision and limiting the holistic spatial experience of architecture. His work raised interest in the role of the body and other physiological senses in authentic architectural experiences, and strongly supported the case of “multi-sensory architecture” which fosters “a sense of belonging and integration” (1996).

John Zeisel first published *Inquiry by Design* in 1981 in which he discussed the importance of integrating research and design and how to intervene in design practices with an evidence-based approach. Later, he published *Inquiry by Design: Environment/Behavior/Neuroscience in Architecture, Interiors, Landscape and Planning* in 2006 where he proposed a new theoretical paradigm in Environmental Design Research called “the Environment/Behaviour/Neuroscience (E/B/N) paradigm”. In this paradigm, he strived to make a scientific connection between the Social Sciences, Neuroscience, and Environmental Design that can be used in Architecture, Landscape, Planning and Urban Design practices in order to achieve an ultimate goal: “healthier buildings, interiors, landscapes, and cities” (Zeisel, 2006, 12). While E-B Studies have developed our understanding of design’s impact on human experiences, Zeisel elaborates on how adding Neuroscience to this paradigm will enable us to understand why this happens. Fred “Rusty” Gage

—a neuroscientist— stated the following in his keynote speech in the American Institute of Architects (AIA) national convention and expo in 2003 (Zeisel, 2006, 11):

As neuroscientists, we believe that the brain is the organ that controls behaviour, that genes control the blueprint, the design, and structure of the brain, but the environment can modulate the function of genes, and ultimately the structure of our brain. Changes in the environment change the brain and therefore they change our behaviour. Architectural design changes our brain and our behaviour.

Similarly, John P. Eberhard (2008), the author of *Brain Landscape: The Coexistence of Neuroscience and Architecture* linked architectural design criteria to neuroscience hypotheses and raised the possibility of brain science tools demonstrating a neurobiological foundation for the interaction of human brain and the built environment. Contrarily, he discussed about how brain research might learn from well-functioning designed spaces.

In *Places of the Heart: The Psychogeography of Everyday Life*, Colin Ellard (2015) who works at the intersection of Cognitive Psychology and Architectural Design introduced the concept of “psychogeography” in an attempt to explain how certain places, cities, buildings and technological devices influence us every day. According to Ellard (2015), there are scientific reasons behind why human beings react to places as they do and this knowledge can be misused to deliberately manipulate people. He addressed the evolutionary roots behind our preferences and demonstrated the importance of this evidence-based information for architects, city planners, designers and decision-makers. He writes about nature, affection, lust, boredom, anxiety, inspiration (awe) and technology in space and how the ancient history of the interaction between people and the built environment can go back to prehistoric monuments such as the Stonehenge in the UK.

Ann Sussman and Justin. B. Hollander (2015) published *Cognitive Architecture: Designing for How We Respond to the Built Environment* in an attempt to reveal “unconscious tendencies” when we are faced with environmental stimuli around us. They drew on human evolution specifically from the lens of Psychology and Neuroscience to explain why people favor certain buildings, conditions and space configurations. They believe if we are able to understand the human brain better, we are one step closer to build more humanely and more successfully. Another significant work of Sussman (2016) is *Planning for the Subconscious* in which she delves into the human experience of space and how in the 21st century, Biology is going to help Urban Planning and

Design better understand people's senses, feelings, and perceptions of their surroundings, "not as machines, but as animals keen on connection and ruled by anxieties" (2016, 31). In this study, she focused on human vision as she stated that when we understand how much of our brains is occupied with seeing things, we can realize the importance of visual stimulation for our spaces through biometric eye-tracking. In her work, she makes a strong case on the genetics and biology of design.

Today it's possible. With affordable new tools, we can track subconscious predispositions and use metrics to explain the human response to an existing development or predict responses to a new development. Planning will become trackable and quantifiable in ways unimaginable in the 20th century (Sussman & Ward, 2016, 31).

The "*Conscious Cities*" movement was established in 2016 as a response to the increasing need of addressing how our cities might influence our minds, emotions and experiences. According to Palti (2016) who is a cofounder of this movement, "Conscious Cities gives a name and definition to a new field that differentiates itself [from Smart Cities] by proposing to replace our focus on [service] efficiency with a focus on human well-being". This movement is directly concerned with the idea of "conscious design"; design that is aware, responsive and responsible towards its users' needs and activities. The challenge is to empower designers with new tools and extensive knowledge as well as having a meaningful influence on the priorities of policy-makers and market players.

This movement states that throughout years of planning and design practices, we have created a shared urban environment that is "numb" to the quality of human experience of space, yet behavioural and neuro-psychological insights into Environmental Design are increasingly advocating for improving the human experience of urban environment and its mental and physiological effects on the quality of life. This movement recognizes the importance of Big Data—highly complex data sets—and other advanced technologies for achieving its goals in the future. "Increasingly, we are a society that creates a constant stream of data reflecting our day-to-day experiences. A conscious city could combine cutting-edge data, technology and planning techniques to address stable patterns while also reacting on a short-term notice by temporarily adapting the streetscape" (Palti & Moshe, 2015). A conscious street might be able to sense an

overload of environmental stimuli and adapt accordingly. For instance, turning off extremely bright advertisement billboards when the sensors recognize an overload of visual stimuli in a space.

This movement's main criticism of today's planning and design practices is that urban public spaces (streets, footpaths, waterfronts, squares, parks, plazas, etc.) fail to "prioritize the human experience over other, often capitalistic, concerns" (Palti & Moshe, 2015). While delving into individual personalities and experiences of the city, a Conscious City is also passionate about the totality of urban experience and advocates for the "right to the city" proposed by French Marxist philosopher and sociologist Henri Lefebvre which according to Harvey (2012, 4) is "far more than a right of individual or group access to the resources that the city embodies: it is a right to change and reinvent the city more after our heart's desire. It is, moreover, a collective rather than an individual right, since changing the city inevitably depends upon the exercise of a collective power over the processes of urbanization".

The first Conscious Cities conference was held in London in 2016 which brought together a number of neuroscientists, psychologists, architects, engineers, urban planners and developers to discuss their collaborative efforts on research in these fields and how it can be applied to better design. "Giving city consciousness allows more people to make conscious decisions themselves during their day to day life" said Josef Hargrave in his keynote speech. One of the main concerns in this movement has been about ethics, cyber security and privacy issues regarding the mass collection of data from everyday life. Similar to the Smart Cities movement, how knowledge is gained in the Conscious City, how to use it in the right way, and who decides what is right are among the major questions this movement has raised. In addition, there has been a historical debate about the concept of consciousness; a key theme in ancient and modern philosophy, science and spiritual studies around the definition of the term "consciousness" in terms of human, non-human and artifact consciousness (e.g. computing machinery). While this debate has been going on for decades, the Conscious Cities movement is straightforward about its stance on the matter by dehumanizing the concept of consciousness and applying it to the city as a human artifact; a claim that many find problematic.

Sarah Williams Goldhagen (2017), who is a recognized architecture critic, published *Welcome to Your World: How the Built Environment Shapes Our Lives* where she explained how the built environment can shape our feelings, memories, and well-being, and strongly discussed about how

today's societies are obligated to employ this knowledge to build a more suitable world designed for human experience. She drew on recent research in Cognitive Neuroscience and Psychology to explain how people's experiences of the built environment are central to their mental well-being, physical health, social lives, and their very sense of themselves. Goldhagen presents a powerful case that societies must use this knowledge to rethink what and how they build: the world needs better-designed, healthier environments that address the complex range of human individual and social needs (Goldhagen, 2017).

Finally, the *Encyclopedia of Human Behaviour* compiled and edited by Ramachandran (2012) is a comprehensive three-volume reference source comprised of 300 articles by leading scholars and scientists in the fields of physiological psychology, perception, personality, abnormal and clinical psychology, cognition and learning, social psychology, developmental psychology, language, and their applied contexts. They provide a range of historical and up-to-date insights on human action and reaction, thoughts, feelings, and physiological functions.

3 METHODOLOGY

The primary purpose of this study is to test Environment-Behaviour Research in a specific public space over a specific time period during the day. I realize the limitations of this approach towards the totality of this public space and issues of diversity and plurality. However, I am more concerned with explaining phenomena in this space through testing EBR methods and more recent insights from Cognitive Psychology, and since there are too many variables to consider, I designed my research in a way to control environmental factors, time of the day and consequently the population present in the space. My objectives are to assess the design quality of Berczy Park in Toronto, explore users' interactions with the physical environment in terms of experiences and activities, and explain the underlying interrelationships among design qualities, activities, and experiences in a specific time and space rather than a generalizing study.

Adopting such a multi-disciplinary perspective in my research, I needed to find the answers to three sub-questions: 1) What is the design quality of Berczy Park from a human-centred perspective? 2) Over a specific time period during the day, how do the users of Berczy Park interact with this public space in terms of activities and use of space, and what is their experience in terms of attention, judgements, feelings, comfort and overall satisfaction? 3) Is there any relationship between the users' interactions with the environment, their experience of the environment, and the design quality of the environment?

To explain the reasons behind some modifications to my proposal, I should mention that as a result of my comprehensive literature review, I changed the main question from revisiting "Environmental Psychology" to "Environment-Behaviour Research" since I learned that Environmental Psychology is only one aspect of a much broader field named Environment-Behaviour Studies which conducts Environment-Behaviour Research and relates to Health and Natural Sciences as well. In addition, I did not use the terms "objective environment" in stating my question about assessing the quality of design since discussions about objectivity/subjectivity are not relevant in my theoretical framework which advocates for person-in-environment as a whole from an Organismic view. Lastly, I changed the word "measuring" to "assessing" regarding the quality of design in public space as well as not including Ewing's (Ewing & Handy, 2009) work on heavy quantitative measurements of design since I could not relate to his methods.

Through adopting a flexible mix of quantitative and qualitative methods from EBS, public space-public life studies, and design quality assessments, I took advantage of an epistemological paradigm that stands between positivist and interpretivist research philosophies (Tashakkori & Creswell, 2007) and tries to explore the totality of users' experiences of Berczy Park through studying a limited number of underlying components. Since the three sub-questions address different topics and use different methodologies, it is best if I explain how I gathered and analyzed data for answering each question.

Question 1: What is the design quality of Berczy Park from a human-centred perspective?

I used archival data from websites and blogs to familiarize myself with the history, context and design plan behind Berczy Park. I found very useful information on the landscape architect's website¹, the Canadian Society of Landscape Architects' website², Landezine International Landscape Award's website³, and a community blog named "Friends of Berczy Park"⁴, in addition to reading about the park's history in Mackay's (2012) work. After learning about the park's story and its features, I paid several visits to the site to simply observe the space and learn about the site's current conditions. I used the landscape architect's base-map of the new design and developed a site plan (see appendix B) using Adobe Photoshop to map the current bold features in this public space, followed by delving deeper into a number of these features using photography, note taking and observation as my data collection methods. I mainly drew on Gehl's (Gehl & Svarre, 2013) 12 Quality Criteria of a successful human-centred urban space (see appendix A) as a general framework to study the qualities of the environment although I explored more specific features and arranged my findings in a slightly different way that was complemented later with results from sub-question three. The overall results were analyzed in the Discussion chapter using a qualitative checklist based on these 12 criteria. These include: protection against traffic and accidents, protection against harm by others, protection against unpleasant sensory experience, options for mobility, options to stand and linger, options for sitting, options for seeing, options for talking and listening/hearing, options for play, exercise, and activities, scale, opportunities to enjoy

¹ <http://www.claudecormier.com/en/projet/berczy-park/>

² <http://www.csla-aapc.ca/awards-atlas/berczy-park>

³ <http://landezine-award.com/berczy-park-toronto/>

⁴ <https://berczy.wordpress.com/>

the positive aspects of climate, and experience of aesthetic qualities and positive sensory experiences.

Question 2: Over a specific time period during the day, how do the users of Berczy Park interact with this public space in terms of activities and use of space, and what is their experience in terms of judgements, feelings, comfort and overall satisfaction?

This question consists of two parts. First, I studied the users' interactions with space. In order to conduct an observation of their interactions during a specific time, I selected a partly sunny day with fairly pleasant temperature and low level humidity since these environmental factors are influential in the interaction with outdoor space and are in fact considered as the control variables of this study i.e. stay unchanged throughout the study. On June 13th, I picked two spots in this space (on the grass mounds) with a clear view of the park and observed the activities occurring with a direct relationship to the physical environment. I was able to identify the most observable categories of behaviour and their whereabouts. For the purposes of this study, I did not go into full detail about these activities. For instance, if someone was sitting and reading a book, their activity was categorized as sitting. These categories include: sitting, standing, socializing, children playing, dogs playing, taking pictures, and walking. From 5 to 8 pm on this day, I recorded this information in terms of where they happened in space through mapping, annotated plans, taking notes and pictures. To elaborate on the process of mapping, I was not concerned with the exact numbers and locations of the activities at an exact time. Rather through coding the categories and scanning the space for three consecutive hours, I developed a behaviour map (see appendix C) that represents the activities in space in an accumulative manner. The goal of this map was not to document a screenshot of the space, but rather demonstrate the overall patterns of interaction. Therefore, this behaviour map illustrates more generic patterns in observable uses of this space. In other words, each dot on the map does not stand for exactly one person doing one activity, but shows the spot or path that activity was often observed on. Finally, this hand-made map was turned into a digital map using Adobe Photoshop. I drew on research techniques introduced in Gehl and Svarre (2013), Whyte (1980), and Zeisel (2006) for developing this section.

Secondly, based on my theoretical framework that advocates for a holistic approach towards person-in-environment interrelationships, I complemented my observational assessments of the physical environment and user interactions with the experienced environment through surveying

park users. In order to capture their lived experience to some degree, I designed a questionnaire (see appendix D) featuring a mix of open and closed questions, allowing them to use their own words while rating certain aspects of the environment based on a standard 1-5 scale. I relied on Wapner et. al. (2000) and Ramachandran (2012) to generally learn about empirical explorations of experience and address different layers of this process. Therefore, I designed the survey in a specific order to guide the participants through a series of processes that according to these resources, shape the human experience including cognitive (e.g. perception, thought, attention), affective (e.g. emotion, feeling) and evaluative processes (e.g. assessment, satisfaction). Since these processes can be very complex and it might be effortful for the participants to reflect on them (as it was for me), I used a very simple language and mostly asked for clear reasons behind their experiences, hoping this enables them to think about their understandings, feelings and evaluations. Before answering the questions, the respondents were asked to take a few seconds and deliberately focus on their surroundings for a quick scan—i.e. the cognitive process of “attention” (Spence, 2012). Drawing on the various levels of information processing in our brains (Fisher, 2012), the rest of the questions addressed sensory inputs, judgements and attributions, emotions and feelings, preferences and overall satisfaction.

The survey was conducted on June 20th, 2018 on a Wednesday between 5 to 8 pm (exactly one week later than my observational study on users’ interaction). During these 3 hours, the sky was partly sunny and partly cloudy which made it a very nice day to be outside, and the weather was 24 degrees Celsius with low humidity and wind. Overall, the environmental conditions were very similar to June 13th when I conducted my observations of the use of space. 20 respondents participated in this survey and were selected based on a number of criteria.

Participants were selected from:

- Users who were sitting on stretched benches in the area as presented on Map 3-1. Since this area looks like an X, it will be referred to as the x-shaped. Reasons for this selection were in light of three insights: First, Embodied Cognition (Varela et. al. 1991) mainly suggests that in addition to mental processes, our bodies are also responsible for the process of cognition. By limiting the type of participant activity and the used furniture in this space, I tried to address the concept of embodiment hoping to minimize the differences in experience due to different uses of body—activities. Second, Public Space-Public Life

Studies have shown there is a better accuracy rate in sensory results obtained from participants with stationary activities (Gehl & Svarre, 2013). Third, I believe it is more convenient for the participants to be sitting when asked to fill out a detailed questionnaire.

- Adults, with no consideration of age, sex, individual/cultural background, familiarity with place, and being a local/tourist. Unfortunately, this is mainly due to my limited time and resources for including these factors in my study.



Map 3-1: Participant Selection

[Base map source: <http://www.claudecormier.com/projet/berczy-park/>]

I randomly approached the individuals and/or groups of two people who fit the selection criteria and asked whether they wanted to participate in this research.

Data management methods for this section include digital mapping, MS Excel and tabling textual data. I should mention that since this questionnaire featured many open questions, in many cases participants had similar responses in different words. As a part of data management, I categorized their responses based on what this study was concerned about. For instance, I categorized tourists, kids and businessmen as people in question 1.

Question 3: Is there any relationship between the users' interactions with the environment, their experience of the environment, and the design quality of the environment?

In order to find the answer to this question, I performed three complementary analyses to find the relationships between the findings of previous questions. Main discussed themes were supported by different data and methods as follows:

- I used MS Excel to analyze numerical data by drawing bar charts for each theme and at the end, I compiled all in a 100% stacked bar chart that is used for comparing different groups of data, showing the patterns and relationships (relative difference) between them.
- I heavily relied on the *Encyclopedia of Human Behaviour* (Ramachandran, 2012), a comprehensive up-to-date reference by many top scholars to cover a vast area of knowledge I did not have and benefit from clear explanations of scientific phenomena.
- I assessed the quality of this space from a human-centred urban planning and design perspective using Gehl's (Gehl & Svarre, 2013) 12 Quality Criteria introduced in the first sub-question. One issue I faced when performing this assessment was incorporating my personal judgements about the environment directly into data I objectively—as much as possible—gathered in the previous steps. This issue raises the question of whether it is possible for the Environment-Behaviour researcher to be truly objective.
- I used Adobe Photoshop to develop a visualization of user interactions on a black background to demonstrate the visible spatial patterns of activities in this public space.

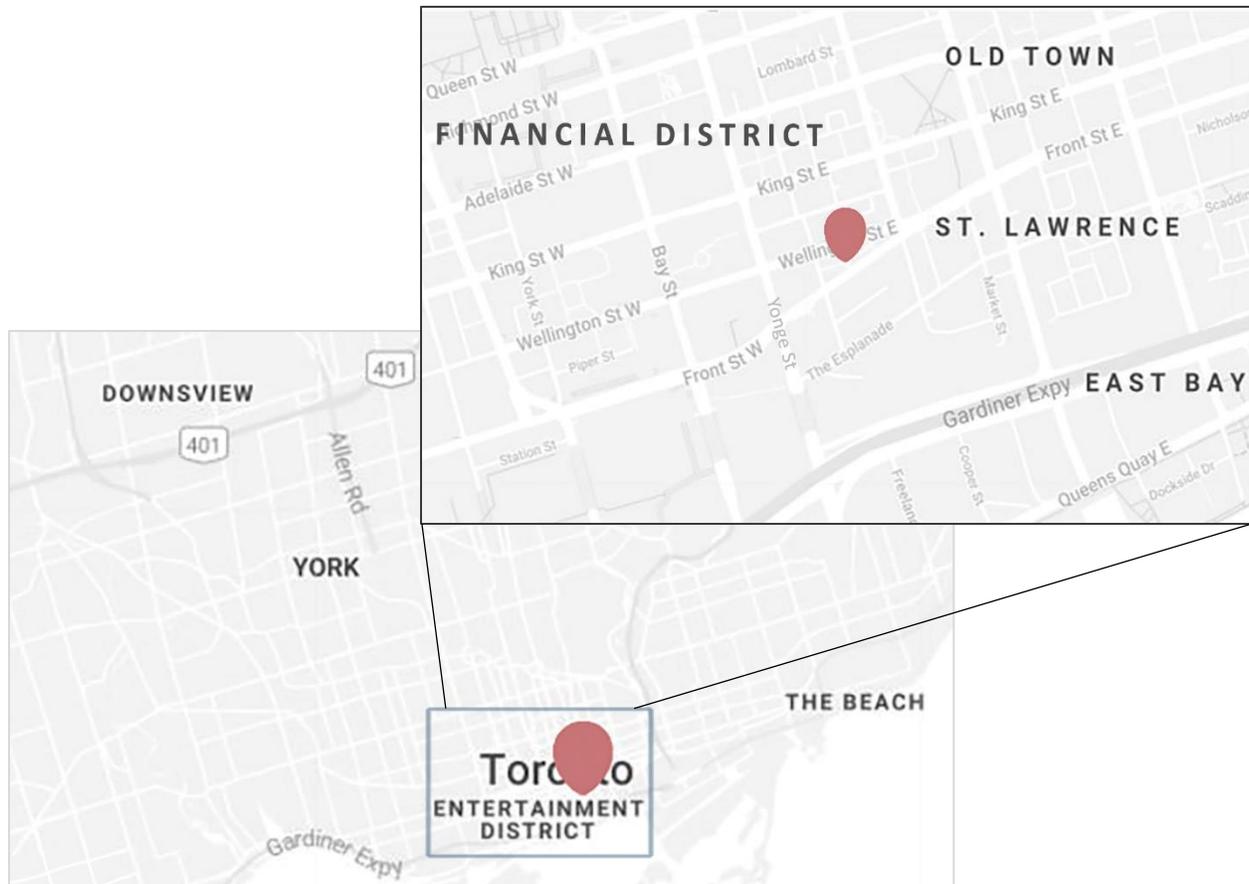
4 FIELD STUDY AND RESULTS

This chapter includes my field study conducted on Berczy Park in two main parts. In the first section, I discuss the park in terms of history, location, surrounding landmarks and destinations, features and design elements, and user interaction with the space. In the second part, I conduct a survey on the users' perceptions, judgements, feelings and overall evaluation of this park. The results are demonstrated in the following.

4.1 Berczy Park

4.1.1 Site Introduction and History

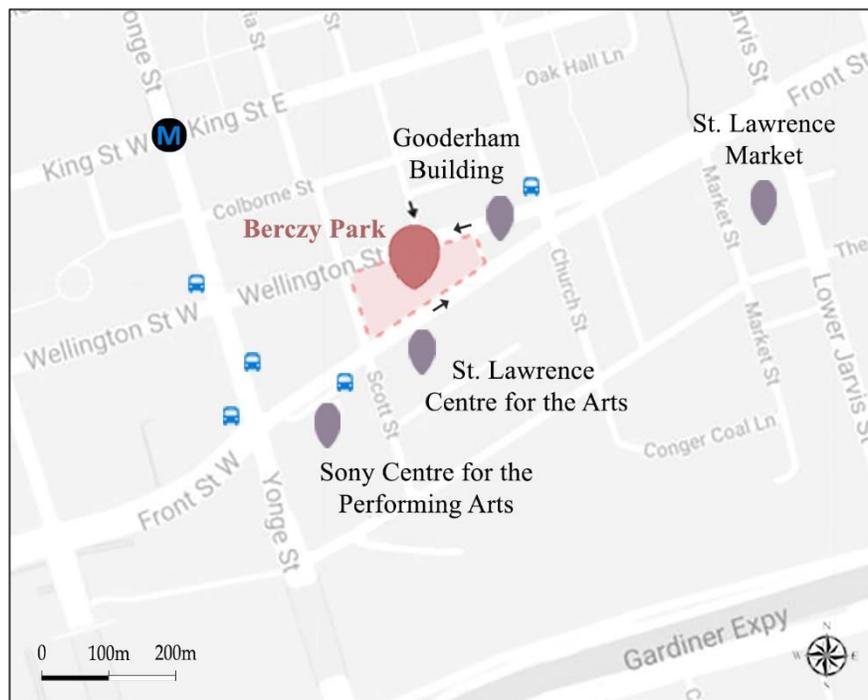
Berczy Park is a 3,606 square metre triangle-shaped urban park established in 1980, located in Old Toronto between Wellington East, Front East and Scott streets. It is identified as an active urban space in a dense mixed-use area associating with three iconic neighbourhoods in Toronto, including St. Lawrence, the Old Town, and the Financial District.



Map 4-1: Location in Toronto

Among the most iconic destinations around this park are St. Lawrence Market, Gooderham (Flatiron) Building, St. Lawrence Centre for the Arts, and Sony Centre for the Performing Arts. Front St. E is the southern edge of this park and is comprised of four-storey late 19th and early 20th century warehouses and office buildings that are designated heritage sites and are turned into shops, restaurants and bars today. On the northern edge, Wellington E is a mix of residential and offices and is a considerably less lively and mixed-use urban edge compared to Front Street. On the west, there is Scott Street which has been merged into the park as a curbsless, pedestrian-oriented, flexible street functioning as a shared space for cars, people and dogs. To the east, the park is bounded by the famous Gooderham Building, also known as the Flatiron building, which is an historical office building constructed in 1882 with a Romanesque architectural style.

Public transit access to Berczy Park is available via the King subway station, the 503 Kingston Rd east-west streetcar route, and the buses on Yonge St, Front St and Wellington St.



Map 4-2: Berczy Park Area

According to Mackay (2002), a pasture occupied the Berczy Park lot in 1818. By 1840, the buildings thrived on the lot included the Wellington Hotel, a stagecoach office, alongside a tented circus and livery stable. By 1900, the Flatiron building was constructed at the corner which invited a dominating office/commercial character to the lot. By the 1950s, the lot was a busy commercial urban block served by electric street cars. Between 1965 and 1975, the city demolished more than

18,000 buildings and only the Flatiron building survived on the triangular block where the rest was turned into a parking lot. At that time, a handful of concerned residents formed a strong community group and demanded that the city convert the parking lot to a park when they discovered that the lot behind the Flatiron building was listed as parkland in the city plan. By preparing a petition and lobbying the local businesses alongside official decision-makers, this community group managed to practically remove the parking lot and replace it with a park named Berczy Park constructed in 1980. Through working tightly with the local community, the City of Toronto planned for the revitalization of this park to address the diverse needs of a rapidly evolving community. The park was closed in 2015 to be redesigned by architect Claude Cormier and Associés of Montreal, and was reopened to the public in 2017.

1950s



1970s



1980s



2018

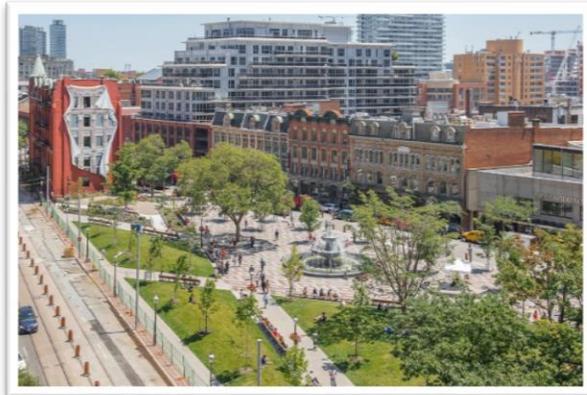


Figure 4-1: Berczy Park Timeline

[Source: <https://berczy.wordpress.com/2017/06/>]

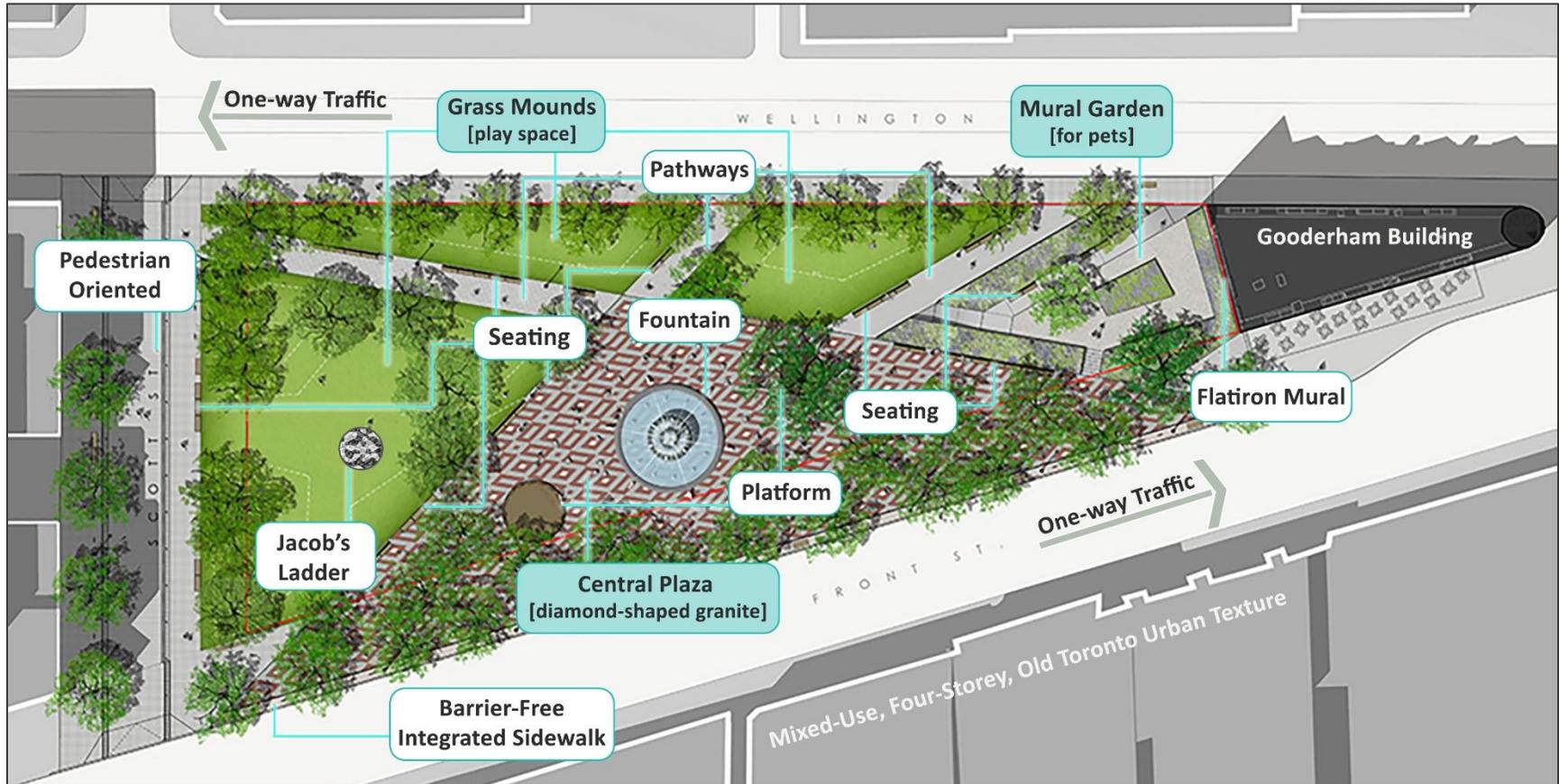
4.1.2 Features, Design Elements and Built Form

Due to rapid intensification in the area, Berczy Park was overwhelmed by a rapidly growing vocal and diverse community mainly consisting of local business owners, families with children, and pet owners that were demanding the park to adapt itself with the community's complex needs. After a series of public hearings, engagement workshops and stakeholder debates, the city started the project for the revitalization of Berczy Park in 2015, ending in 2017. The design was completed by landscape architects Claude Cormier and Associés of Montreal, winning the Landezine International Landscape Award and the Canadian Society of Landscape Architects' 2018 award.

Berczy Park has many features that make it a unique destination in downtown Toronto. The park is divided into three sections: a) Mural Garden: an irrigated gravel patch for dogs and a garden on the east side; b) Central Plaza: the granite-paved plaza for the general public at the centre; and c) Green Space: grass mounds for children and dogs to play on the west side. In this section, I focus on the distinctive elements in each section that could significantly affect the users' experience of this public space. Consequently, these elements are assessed using Gehl's (Gehl & Svarre, 2013) 12 Quality Criteria and are associated with the results from the survey. Map 4-3 illustrates these elements on the site plan.

In this section, I discuss the following in detail:

- Central Plaza: Fountain
 - Layout
 - Seating
- Mural Garden: Flatiron Mural
- Green Space (Grass Mounds): Jacob's Ladder Public Art
- Connection to Peripheral Streets and Sidewalks: Front East St.
 - Wellington East St.
 - Scott St.
- Built Form



Map 4-3: Site Plan

[Base map source: <http://www.claudecormier.com/projet/berczy-park/>]

- Central Plaza

The central plaza is a triangular area with granite diamond-patterned paver that connects all the areas together, acting more like an urban plaza than a park. It consists of shade trees, fixed benches along the edges, two small stage platforms that are also used for sitting, colourful movable chairs and tables, and a unique fountain.

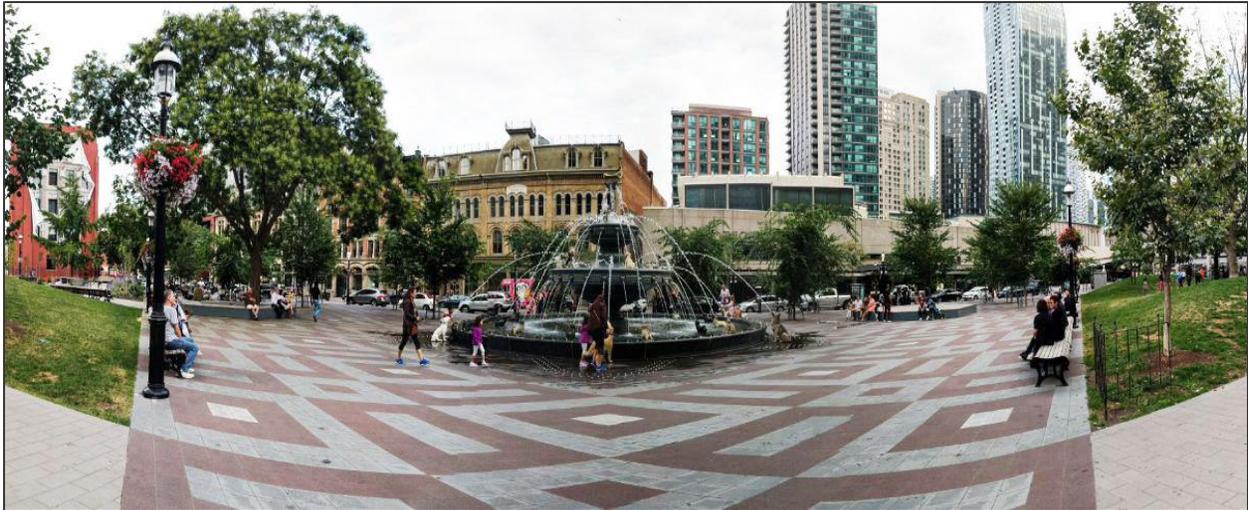


Figure 4-2: Central Plaza Panorama. June 2018

Fountain

In order to prevent the park from being separated into three sections each with a particular type of user, the fountain was designed as a focal point that could bring all the sections together. As mentioned in the Canadian Society of Landscape Architects website, it is “an active and aesthetically charged landmark which transforms contention into consensus”. This two-tiered fountain has a Victorian style and is decorated with 27 life-sized dog sculptures that spray water into the fountain while looking at the top of the fountain where there is a golden bone; the object of their desire. Two cat sculptures disrupt the order by carelessly looking away at two cast birds. The outer perimeter of the lower bowl features a drinking trough that provides drinking water for the dogs.



Figure 4-3: Fountain. June 2018



Figure 4-4: Fountain Features

[Source: <http://www.claudecormier.com/projet/berczy-park/>]

Layout

As shown in Figure 4-5, before redesigning, the park used to have a radial layout with a very small plaza surrounded by green space; just a small local park. As illustrated in Figure 4-6, the new layout follows the unusual triangular shape of the block to expand perspectives at eye level and help the park be perceived larger as it is. In order to strengthen the sight lines for human eyes, the pathways follow diagonal lines that guide the gaze towards the focal point of the park—the fountain—and the historical architecture at the background. Perfectly aligning with the diagonal pathways and bold sightlines in this space, the diamond-shaped granite that paves the plaza reinforces centrality and movement. In addition, the paver distinguishes the plaza from the rest of the park while simultaneously inviting all the sections to be united.



Figure 4-5: Old Layout

Source: www.google.ca/maps



Figure 4-6: New Layout

Source: <http://www.csla-aapc.ca/awards-atlas/berczy-park>

Seating

There are a variety of surfaces and furniture providing opportunities for seating that support private space and encourages socializing with strangers. The diversity allows for the users to define their comfort using the stretched benches in the plaza and along the pathways, stage platform surfaces, fountain edge, lawns, or movable chairs as they desire. Contrary to the rest of the park, the eastern section—Mural Garden and the pathway behind—provides a more private and calmer sitting experience that is not dominated by the fountain.

Benches



Lawns



Movable Chairs



Figure 4-7: Sitting Opportunities

Source: <http://www.csla-aapc.ca/awards-atlas/berczy-park>

- Mural garden

The Mural Garden is a small multi-use area right next to the Flatiron Building featuring planting beds, an irrigated gravel surface for dogs to use and play in, and a quieter space to sit, socialize or read. This area is slightly isolated from the lively plaza and highlights the admired Flatiron Mural artwork.



Figure 4-8: Mural Garden

Source: <http://www.csla-aapc.ca/awards-atlas/berczy-park>

The Flatiron Mural



Figure 4-9: Flatiron Mural. June 2018

- **Green Space (Grass Mounds)**

Contrary to the old flat berms, the new design features green mound-like hills as an active play space for children and dogs. The largest mound is located on the west side of the park and is especially dedicated to children featuring a child-friendly artwork (Jacob's Ladder). The edges are bordered with shade trees, benches and shrubs to increase safety. The overlapping horizon lines due to the dynamic shape of the mounds mask the ongoing traffic.

Jacob's Ladder

This recent addition to the park includes two colossal bronze hands that hold a rope between the fingers. This public artwork draws on the popular string game and functions as a kids' play structure as well as a photography spot. The hand sculptures could also create human scale in a dense area in the core of downtown Toronto.

This iconic artwork on the back of the Flatiron Building that is considered to be a part of Toronto's landscape employs a trompe-l'œil effect—deceive the eye—to create the illusion of having more windows. It also mirrors a 3D image of the Perkins Building located directly across the street.



Figure 4-10: Grass Mounds

<http://www.claudecormier.com/en/projet/berczy-park/>



Figure 4-11: Jacob's Ladder. June 2018

- Connection to Peripheral Streets and Sidewalks

Sidewalks on Front and Wellington streets are integrated into the park with a barrier-free connection. This expands the park edges to street curbs, inviting more people to spend time in the park. At the western edge, the new curbless Scott Street has been narrowed and stone paved to prioritize pedestrians while merging with the park and expanding it further than its physical borders.



Figure 4-12: Scott St.

Source: <http://www.csla-aapc.ca/awards-atlas/berczy-park>



Figure 4-13: Wellington Project

Source: <https://berczy.wordpress.com/>

A construction project on Wellington Street has been initiated in summer 2018 to upgrade the electrical system as well as improving the streetscape. The focus is on improving the quality of pedestrian experience through wider sidewalks, suitable benches, shade trees, heritage lighting, patio zones and bike corrals.⁵

- Built form

Berczy Park is located in a dense area with mixed identities and architectural styles. The park itself is truly loyal to human scale and reinforces the importance of design at eye level through its many well-thought features such as sculptures, artwork, furniture, diagonal lines and open space.

To the south, the park faces historical four-storey buildings along Front St. East that belong to the late 1900s and early 20th century Toronto. To the east, it is bordered by the iconic Flatiron Building and continues to connect to the St. Lawrence Market at Front and Jarvis; a major historical public market.

⁵ Retrieved from <https://berczy.wordpress.com/2018/07/02/street-construction-around-berczy-park-wellington-st/>

To the north, Wellington Street is a mix of red brick mid-rise buildings with modern high-rises and towers and a less vibrant street edge. And finally, to the west, the park is faced with the modern face of Toronto's Financial District featuring overwhelming dense skyscrapers and high-rises. Figures 4-14 helps illustrate how Berczy Park has a unique setting.

Looking South East, Front St.



*View East



Looking North, Wellington St.



Looking West, Yonge St.



*View South, Front St.



Figure 4-14: Built Form-Berczy Park Area. June 2018.

* Source: Source: <https://berczy.wordpress.com/>

4.1.3 User Interaction

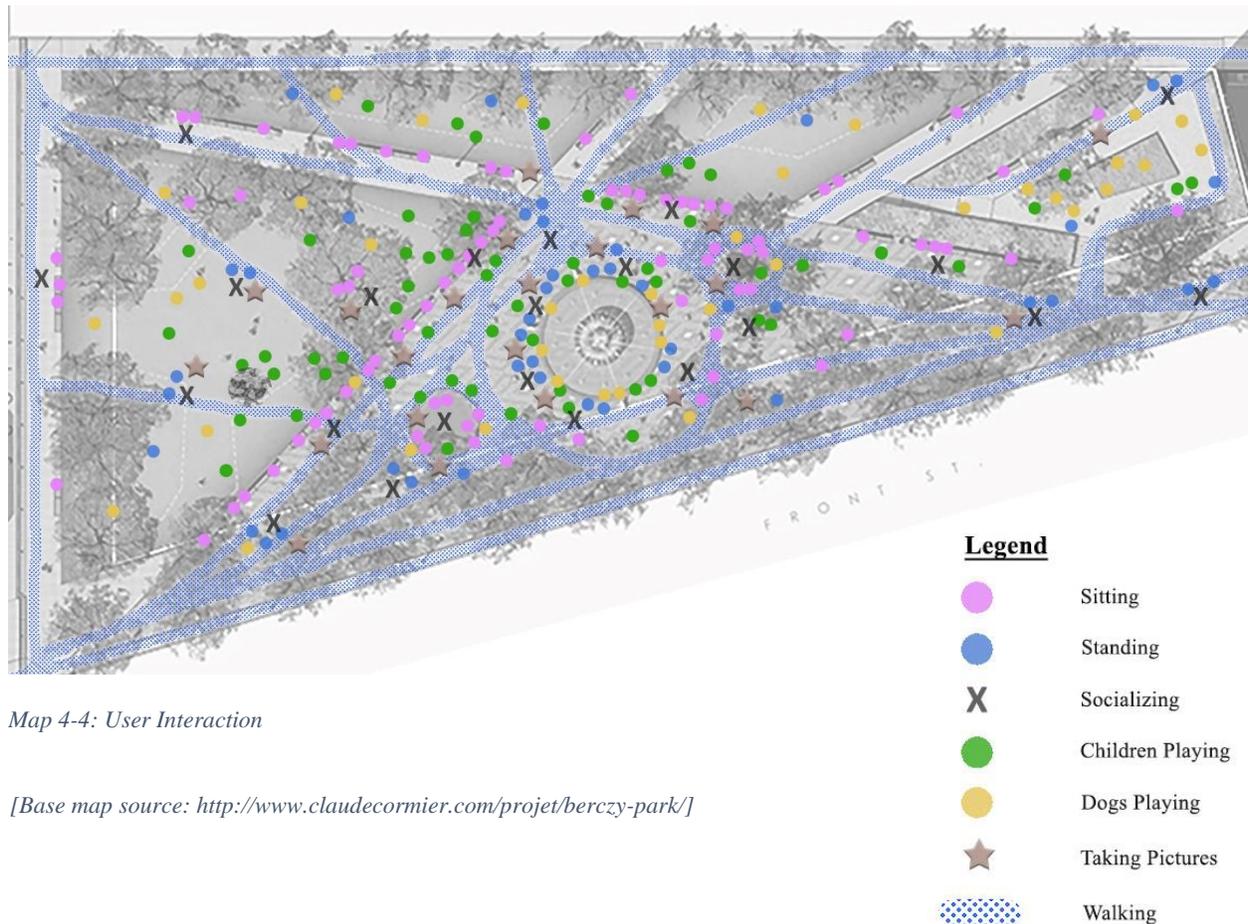
As explained in the Methodology chapter, I have studied how the users interact with Berczy Park in a specific time period during the day through observation and have recorded this information via mapping, notes, photos and annotated plans, resulting in a behaviour map (see Map 4.4). Based on my observations and for the purposes of this study, I have identified seven most observable categories of behaviour in this space that occur in direct relationship with the physical environment. These categories include: sitting, standing, socializing, children playing, dogs playing, taking pictures, and walking. To analyze the interrelationships between these activities and in relation to the physical environment, the categories are coded and put on one single map where they occurred in the space. As mentioned in the Methodology chapter, this observation was carefully made on June 13th, exactly one week before the user survey on the same day of the week—Wednesday—from 5 to 8 pm with very similar weather conditions and environmental circumstances. Since the goal of this study was not to document an instant freeze-frame of the space and rather watching the overall interaction during three consecutive hours, the results are not absolute. What was achieved is a behaviour map illustrating a more generic pattern in observable behaviours. In other words, each dot on the map does not stand for exactly one person doing one activity, but shows the spot or path that activity was often observed on.

The fountain is truly the focal point of the park since it invites all activities to join together—except for sitting as the edge is not dry. However, park users turn that into an opportunity to take a picture standing besides the fountain and socialize while watching the children play and the pets drink water.

Sitting is the most observed activity in the park which indicates the users enjoy spending time in this place. The most popular spots for sitting are the stretched benches at the Central Plaza facing the fountain, and the platforms close to the fountain. Socializing is mostly observed around the fountain, on the benches and platforms in the Central Plaza, and under tree shades. The very active green space on the west seems to act as more than a successful play space for children, but also a space for dogs to play in and for people to sit on the grass, enjoy the shades, read a book, eat, talk on the phone, and socialize. Jacob's Ladder is also very popular among the children, and to a lesser degree amongst the adults. The fountain and Jacob's Ladder are the most popular spots for photographs.

The Mural Garden is a somewhat popular spot for dogs to play in however, it is visibly calmer and less active compared to the rest of the park. This allows for a more private space that mostly attracts the individual user to sit, read a book, occasionally watch the dogs play, and admire the Flatiron Mural. This is the only area of the park that is not focused on the fountain and the benches are facing the iconic historical architecture on Front and Wellington Streets.

There are several major nodes visibly defined by the pathways, the fountain and the platforms that show the generic walking patterns. An interesting observation was made noticing how the pedestrians who are passing by the southern edge of the park—where the integrated sidewalk is—slightly turn their way, walk towards the fountain, pause briefly, take a picture or simply look at the fountain to express their enthusiasm. There are also visible patterns of informal paths crossing over the grass mounds that the users prefer to take instead of going around the mounds using the established pathways. It is also demonstrated that the Central Plaza, and specifically the fountain and the seating furniture, spatially shape the walking patterns in a somewhat symmetrical way that obeys the design of the space.



Map 4-4: User Interaction

[Base map source: <http://www.claudecornier.com/projet/berczy-park/>]

4.2 Survey

As previously mentioned in the Methodology chapter, the respondents were selected among those who were sitting on the benches according to Map 3-1. To focus on the lived experience of these respondents at the moment and to control the environmental variables as much as possible, the survey was conducted on June 20th, 2018 on a Wednesday 5 to 8 pm. During these 3 hours, the sky was partly sunny and partly cloudy which made it a very nice day to be outside, and the weather was 24 degrees Celsius with low humidity and wind. 20 respondents participated in the survey in this timeframe. This is a mixed-method survey and the results demonstrate both quantitative and qualitative data. Since statistical analysis is not the main point of this study, the percentages are rounded to the nearest whole number.



Map 3-1: Participant Selection

[Base map source: <http://www.claudecormier.com/projet/berczy-park/>]

Question 1: Please name the first three things you notice about this place specifically. (It can be any of the following: an object, a sound, a smell, a feeling, people, etc.)

Table 4-1: Attention and Sensory Inputs

Water Fountain and Sculptures	People	Animals	Trees & Green Space	Paver & Lack of Grass	Park Layout & Furniture
36%	18%	13%	7%	4%	4%
Old Buildings, Shops & Restaurants	The Flatiron Mural	Jacob's Ladder Public Art	Peace	Smell of Food	Breeze
4%	2%	2%	4%	2%	2%

Question 2: How noisy do you find this park?

Table 4-2: Noise

Very Noisy	Noisy	Neutral	Quiet	Very Quiet
0	20%	46%	27%	7%

Question 3: How pleasant do you find this park?

Table 4-3: Pleasantness

Very Unpleasant	Unpleasant	Neutral	Pleasant	Very Pleasant
0	0	13%	34%	53%

Please specify why? (Factors are sorted from the most mentioned to the least mentioned.)

Very pleasant/pleasant:

- The fountain, water, art and sculptures, park furniture and the paver
- The unusual layout and the interesting shape of the park

- The historical architecture including the old urban texture and the Gooderham Building
- Trees and open space, making it more of an urban plaza than an isolated park.
- The sight and sound of different people and their activities
- The sight and sound of animals, mostly dogs
- The fact that it is a small relaxing place in the heart of downtown Toronto that can be experienced everyday at any time of the day.

Neutral:

- Being close to traffic on Front St. and Wellington St.
- Lack of green space and unimpressive maintenance

Question 4: How complicated do you find this park? (Complicated: too much is happening in the space; for example there are too many things to look at, or too many people.).

Table 4-4: Complexity

Very Complicated	Complicated	Neutral	Simple	Very Simple
0	13%	13%	14%	60%

Please specify why? (Factors are sorted from the most mentioned to the least mentioned.)

Very simple/simple:

- Enough open space with good sightlines (visual axis)
- Concise and small compared to other parks in Toronto
- Unusual angles but understandable design
- Balanced in landscaping and gardening, not too many details
- Barrier-free access from the surrounding streets

Neutral:

- Not complicated compared to other areas in downtown Toronto.
- Too many dogs.

Complicated:

- Too much is happening with all the cars, people and dogs being a part of this park
- The park is dwarfed by the surrounding buildings

Question 5: How interesting do you find this park?

Table 4-5: Attraction

Very Boring	Boring	Neutral	Interesting	Very Interesting
0	7%	20%	20%	53%

Please specify why? (Factors are sorted from the most mentioned to the least mentioned.)

Very interesting/interesting:

- Location in downtown core
- Unique features such as the fountain, dogs sculptures, the Flatiron mural and Jacob's Ladder public art
- The sight and sound of water
- Lively and busy occupied by interesting people and lovely animals
- The surrounding architecture, old buildings, shops and restaurants on Front St. and Wellington St.
- Unique triangular layout with curious diagonal angles

Neutral:

- A reasonably decent place to spend time in, relax, walk dogs or bring kids.

Boring:

- There are much more interesting places out there.

Question 6: How safe does this place make you feel?

Table 4-6: Safety

Very Unsafe	Unsafe	Neutral	Safe	Very Safe
0	0	27%	46%	27%

Please specify why? (Factors are sorted from the most mentioned to the least mentioned.)

Very safe/safe:

- Enough open space
- A busy and lively place, attracting people who behave well socially
- Located in a busy area in downtown Toronto
- Giving positive vibes
- Familiarity with the place
- Enough distance from traffic on the streets
- Appropriate lighting at night, specially the lights installed on the fountain

Neutral:

- Not too close to the ongoing traffic, not too far away
- Too busy, attracting non-locals and all kinds of people

Question 7: How comfortable do you feel being in this park?

Table 4-7: Comfort

Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
0	0	7%	53%	40%

Question 8: How would you rate your level of stress at the moment?

Table 4-8: Stress

Very Stressed	Stressed	Neutral	Relaxed	Very Relaxed
0	0	13%	34%	53%

Question 9: What do you like best about this park? (The results are sorted from the most mentioned to the least mentioned)

- The fountain
- People
- Sight and sound of water
- Sculptures and artwork
- Historical architecture
- Seating furniture
- Location
- Shops and restaurants around the park
- Grass mounds

Question 10: In your opinion, what is the worst feature of this park? (The results are sorted from the most mentioned to the least mentioned)

- Proximity to the streets and ongoing traffic
- Traffic noise
- No bad features
- Too small
- Stage platforms
- Not providing enough shade
- Sound of kids screaming

Question 11: Overall, how satisfied are you with this place?

Table 4-9: Satisfaction

Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
0	0	13%	54%	33%

Question 12: Is there anything else you would like to say about your experience of this park?

- “I think this park is a unique relaxing heaven in downtown Toronto, where you do not expect it at all”.
- “Somehow it seems to be a very relaxing friendly environment to come to and read a book in the middle of the financial district. It is not even a quiet space”.
- “At night, when they switch off the fountain’s lights at 11pm—which are gorgeous by the way—I prefer not to walk through the park. I wish they would leave the lights on longer”.
- “Whenever I come to this place, it makes me feel joy and peace for some reason”.
- “Although it was renovated, the place has kept its meaningful character for us locals”.
- “It simply makes me happy! We need more of this in Toronto.”

5 DISCUSSION

In this chapter, I provide a detailed analysis of the results from my field study on the users' experiences of Berczy Park as a public space. The goal is to discuss the underlying patterns and reasons identified in the respondents' answers in relation to their interactions with the environment and the design qualities of this space in a meaningful way. I draw on findings from my field study in addition to insights from Cognitive and Environmental Psychology to structure this section and support the points raised by this discussion. As explained in the Methodology chapter, this study is not in a generalizing manner and the focus of this chapter is on a discussion about individuals' experiences of a public space in a specific time period during the day, with the hope of exploring the complex relationships between these experiences and the physical environment.

Four major themes are raised that are partly responsible for the process of experiencing space: Attention and Sensory Inputs, Judgements and Attributions, Emotions and Feelings, and Preferences and Overall Satisfaction. Each will be discussed thoroughly in the following. Map 3-1 from the methodology chapter shows the participant selection once again, since this is of crucial importance for the discussion.



Map 3-1: Participant Selection

[Base map source: <http://www.claudecormier.com/projet/berczy-park/>]

Participants were selected from adults who were sitting on the stretched benches in the demonstrated X-shaped area. The selection was random in terms of age, sex, cultural background, familiarity with place and other individual differences. According to their declaration, all 20 respondents happened to have no extreme sensory impairments.

5.1 Attention and Sensory Inputs

According to Spence (2012), our brains have a limited capacity to process incoming sensory information and in order to prevent overload, most of us have the ability to selectively attend to certain features of the environment. In this study, the respondents were first asked to take a few seconds and deliberately focus on their surroundings for a quick scan. Next, they identified what they noticed specifically about the environment at that moment. Since this was an open question, the respondents reported what they were aware of regarding their own experience in their own words. In my opinion, the association between design and the cognitive process of attention is one of the most curious discussions raised by this section. Looking into what directs our attention, why and how, could inform design significantly—assuming all designs need attention but to different degrees.

Our attention can be directed in many ways and through different sensory modalities. (Spence, 2012). Figure 5-1 demonstrates that among the respondents who were required to name three factors specifically—giving a total of 60 factors—there are twelve factors that directed their attention. Since the majority of these are a result of spatial attention, I have divided them into three main categories based on the relevant sensory inputs.

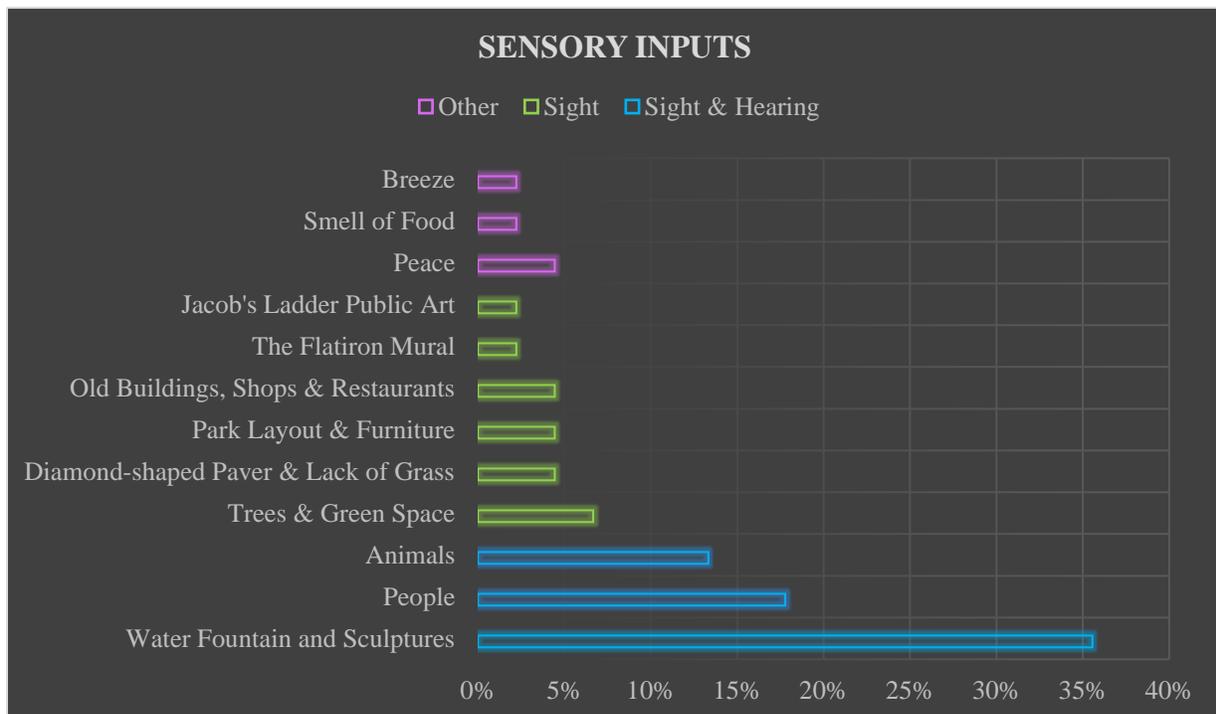


Figure 5-1: Sensory Inputs, Categories and Factors

As shown in Figure 5-1, amongst the 60 reported factors, two-thirds belong to the category of sight and hearing which is a combination of visual and audio inputs. In this category, the sight of the fountain and its sculptures in addition to the sound of water are the strongest stimuli in this public space being reported by a third. Next, the sight and sound of people’s social presence in the space, regardless of their activities⁶, has caught the respondents’ attention by a fifth. Following that, a tenth of the reported factors were the sight and sound of animals in this park; mostly dogs, but also cats and pigeons.

The next category represents the features that have been sensed solely through vision and are physical elements in the space. Greenery is at the top of this group by 7% followed by the diamond-shaped granite paver of the plaza, park layout, furniture, and the historical architecture on Front St. by 4%. Surprisingly, at 2% the Flatiron Mural and Jacob’s Ladder are at the bottom of the reported factors that directed the respondents’ attention.

The third and the smallest category labeled as “other” includes reporting a sense of peace, smell of food, and breeze by a total of 8%. According to the results, I raise these questions:

Why is the participants’ attention directed to the fountain more than any other factor in this space?

- Sensory cues and prior entry: According to Spence (2012), it has been shown that the presentation of spatial cues affect the processing of the target that exists at the cued location. In fact, researchers have demonstrated significantly higher perceptual sensitivity for stimuli that are present at the cued location.



Figure 5-2: Visual Cues to the Fountain



One of the farthest spots from the fountain

⁶ Since this was an open question, respondents took the liberty to use their own words and stress certain activities or user groups. However for the purposes of this study, I have put all under the category of “people”, which includes tourists taking photos, adults having conversations, children playing, etc.

Furthermore, “prior entry” explains how the cued target reaches the state of consciousness sooner when it directs attention. From this point of view, as shown in Figure 5-2 the diamond-shaped granite paving the central plaza, aligning perfectly with the diagonal lines and the layout of the park, acts as spatial visual cues that significantly direct the attention to the location of the fountain (See 4.1.2. Features, Design Elements and Built Form). Moreover, the sound of water functions as a strong auditory cue that has the same effect. In this case, according to the phenomenon of prior entry, the fountain should be the first object that reaches consciousness for the majority of the respondents.

- **Biophilia:** According to Charles and Sommer (2012, 8), Wilson’s (1984) concept of Biophilia “describes the innate evolutionary bond between humans and other living organisms” and consequently, highlights our intrinsic attraction to natural elements. Studies in Ecological and Environmental Psychology have demonstrated that “the presence of natural elements in a scene can evoke positive emotions, induce positive physiological conditions, facilitate cognitive functioning, evoke positive and prosocial behaviors, and help restore the individual” (Spencer & Gee, 2012, 51). According to Riaz et. al. (2018, 200), many studies have found that when “a situation involves emotion-inducing stimuli”, it directs our attention. Furthermore, when our attention is directed toward the emotion-inducing stimulus, we continue to pay attention to the spatial location of that stimulus (Brosch et. al., 2013). Accordingly, that is how the rushing water as a natural element in this space directs our attention towards the location of the fountain.
- **Thought-provoking detailed design:** Oxford English dictionary defines “thought-provoking” as “stimulating careful consideration or attention”. In the case of this fountain, in addition to the widely popular dog sculptures installed on and around it, the architect has taken advantage of a hierarchical structure to prolong the time people spend to look at his design. As discussed above, there are a number of cognitive and ecological reasons the fountain grabs the user’s attention, however, the thought-provoking design allows the user to keep paying attention to the fountain, absorbing the details, discovering new features and appreciating the architecture. The architect has established a thoughtful order by positing a golden bone as the object of desire at the top of the fountain to direct the dog sculptures’ gaze (and consequently ours) towards a point in space. He takes it one step further by introducing two cat sculptures that intentionally break the order and look for

their own desirable object in the opposite direction, which has no conformity to the established order by the majority.

- Focal point of user interaction: It is evident that we are social beings who are attracted by different forms of social life and interactions of others with space. People-watching is an excellent example of this matter. As demonstrated in the previous chapter, the fountain is the focal point of this space that unites all user groups and harmonizes the use of space (see 4.1.3. User Interaction). As a result, the fountain is perceived as a truly vital and lively object that directs the respondents' attention through watching its successful interaction with others.

What is cross-modal attention and what does it mean for the design of public space?

One of the major inquiries in the field of cognitive psychology has addressed the cross-modal configuration of attention, which means the association between different sensory modalities when the cognitive process of attention takes place (Spence, 2012). Studies have found that there are strong cross-modal links between attending to visual and auditory stimuli. For instance, “visually attending to a particular location in space will lead to a shift of auditory and tactile attention to the same spatial location, or at the very least in the same direction” (Spencer, 2012, 215). As a matter of fact, the most attended items or category of items in this public space have been sensed cross-modally through a combination of visual and audio inputs. However, only one of these factors is considered as a designed physical feature: the fountain. It would be interesting to see whether other features such as Jacob's Ladder public art structure would be noticed by more users if it was for instance a musical structure; or if it scented the air with a pleasant smell. I can argue that depending on the designer's intention and how much attention they intend to direct (followed by a chain of cognitive and psychological effects), utilizing various sensory modalities (not just visual) can result in creative and influential design.

What is the reason behind participants' initial inattention to two popular features in this public space: the Flatiron Mural, and Jacob's Ladder?

Throughout my study of the history, design and features of the park, I found out that the Flatiron Mural and Jacob's Ladder had very interesting stories behind their design concepts and are quite well-known in the area. They are also the subject of many photographs by professional city photographers, curious tourists, and residents. However, the results show that they only occupy

2% of the mentioned factors by respondents (which means it was reported by only one person). As shown in Figure 5-3, I should mention that they are both visible from the benches in the X-shaped area although they are not situated in the Central Plaza (See Map 3-1: Participant Selection).



Figure 5-3: Panorama of the Central Plaza. June 2018

*Red ellipses show the benches in Central Plaza, green ellipse on the left shows the Flatiron Mural, green ellipse on the right shows Jacob's Ladder.

Drawing on Cognitive Psychology, a possible explanation could be a phenomenon called “inattention blindness” which according to Spence (2012, 213) means that “we frequently miss (i.e., fail to notice) even highly salient visual stimuli, if our attention happens to be directed elsewhere (i.e., to another object or stimulus)”. For the practices concerned with the design of public space, this could imply that people are likely to miss important stimuli when in a complex space.

5.2 Judgements and Attributions

“Judgment is the process of making rapid decisions concerning stimulation or information from the environment” (Charlton & Sobel, 2012, 494). As a critical part of mental life, we collect information from the environment, evaluate the information, and make a decision about our response. According to Charlton and Sobel (2012, 487), our psychological interpretation of events that occur around us—and consist of a number of stimuli—depends on two factors: the characteristics of the event (stimuli) and the surrounding context of the event. In this study, the respondents were asked to share their judgments about specific aspects of this environment and in some cases, highlight the reasons behind their judgments; answering the question of “why?”

Looking into the contextual triggers behind these judgements could inform designs and planning decisions.

Noise

Figure 5-4 shows how noisy the respondents have perceived this park to be. With the majority of the results as neutral, quiet and very quiet (total of 80%) it can be said that the respondents do not experience this park as a noisy place. Based on the first part of my field study, Berczy Park is a vibrant urban environment in the heart of downtown Toronto that attracts many users (e.g. locals, tourists, children, dogs) doing various activities (e.g. socializing, touring, playing, barking) with a location in the immediate proximity to ongoing traffic and construction projects on Front and Wellington streets. Considering these, the results about the amount of perceived noise in this park seem to be somewhat surprising at first thought.

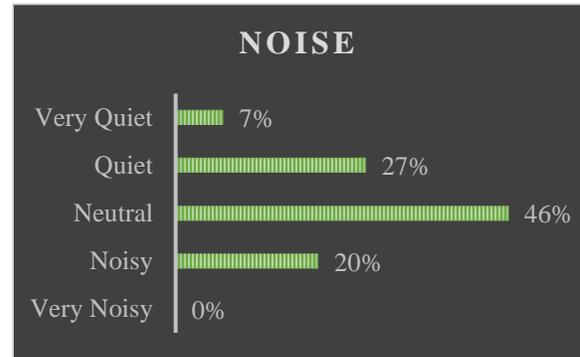


Figure 5-4: Noise

Why do the participants experience Berczy Park as “not noisy”?

If we look back at Figure 5-1, we can conclude that 67% of the respondents have received the strongest auditory inputs from the rushing water, people and animals while traffic or construction noises are not mentioned at all. As mentioned above, it could be arguable that the characteristics of these stimuli have led to the respondents’ judgements about whether they experience this place to be noisy (in a negative sense). Furthermore, the context of this park as a public space in downtown Toronto contributes to this judgment compared to a suburban park in a residential area with the same amount of noise which could be considered as disturbingly noisy. Due to the sound of water, people having conversations, children laughing and dogs barking, it seems that Berczy Park provides a space that is neither too noisy for reading a book, nor too quiet to feel isolated from the flow of urban life.

Pleasantness

As shown in Figure 5-5, 87% of the respondents find this space to be pleasant. The concept of “pleasantness” is a subjective judgement among individuals and that is why they were asked to give their reasons for why they judge this space as they do.

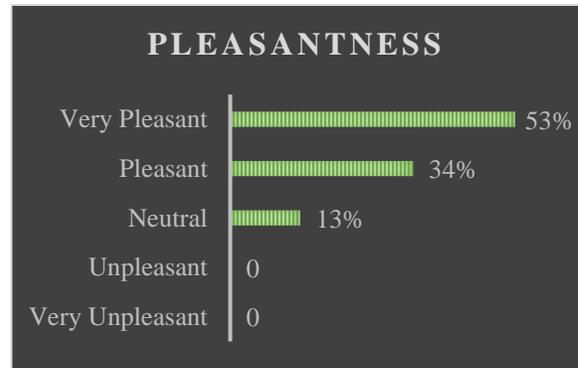


Figure 5-5: Pleasantness

Why do the participants experience Berczy Park as highly pleasant?

According to Schueller (2012) we decide something is pleasant if we physiologically and cognitively respond to it with the positive feeling of pleasure or joy. According to the respondents (see 4.2. Survey, question 3) the fountain, water, art and sculptures, park furniture and layout, surrounding historical architecture, trees, people and their dogs, have all shaped the experience of Berczy Park to be vibrant, social, and picturesque; a pleasant everyday public space that seems to be inducing positive emotions for the majority of its users. It should be mentioned that the traffic on Front and Wellington streets was the reason 13% of the respondents were neutral about this park’s pleasantness.

Complexity

From an Environmental Psychology perspective, complexity is directly concerned with the volume, variety and significance of elements in a space. Bell et. al. (2001, 504) have defined the complexity of spatial layout as “the amount and difficulty of information that must be processed in order to move through [or understand] the environment”. In this study, I provided the respondents with a simple

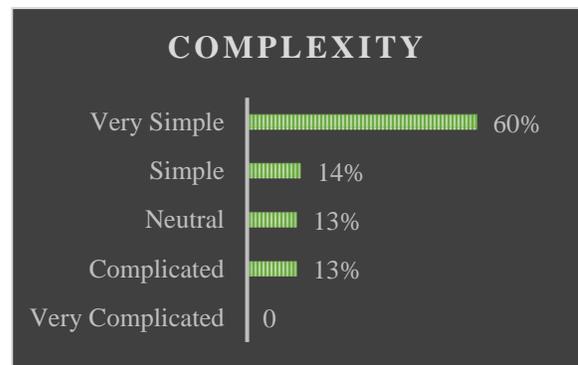


Figure 5-6: Complexity

definition of a complicated environment: too much is happening in the space; for example there are too many things to look at, or too many people. In the first part of my field study, I learned that this space attracts many groups of users inviting many activities, it is in the heart of urban life, and is surrounded by a bold mix of historical and modern architecture. Nevertheless 60% of the

respondents have found the park very simple and 0 have decided it is very complicated. As another subjective (or at least partly subjective) judgment, respondents were asked to explain their reasons (see 4.2. Survey, question 4).

Why do the participants experience Berczy Park as a very simple space?

According to the results, the main reason for the perceived simplicity of this space is how the diagonal lines provide long sightlines that give the illusion of bigger size, which is equal to more open space and consequently, more simplicity. Although the users are illusioned to experience the park as bigger as it is, in comparison to other park lots in Toronto it is a significantly small lot. This is a notion that the users are aware of and interestingly, they tend to judge the place as simpler as it is just because they know as a matter of fact that it is small-scale. Finally, curbsless Scott St. and the integrated sidewalks on Front and Wellington streets provide the users with a barrier-free access and a simpler experience to enter/exit the park (see 4.1.2. Features, Design Elements and Built Form). It should be mentioned that 26% have not experienced this space as simple due to the high number of people, dogs, cars, and colossal buildings around.

5.3 Emotions and Feelings

“Emotions are physiological and cognitive responses to our environment that motivate and organize behavior to function adaptively” (Schueller, 2012, 140). Cognitivists believe that emotions are then processed and experienced, providing feedback that shapes our feelings of that emotional experience. In this study, I have tried to encourage the respondents to think about their feelings through the use of the word “feel” in the questions—e.g. how safe does this place make you feel? In order to understand the reasons behind these feelings, the respondents explained why they felt what they felt in this place. Looking into these explanations could inform design that is considerate of mental well-being and prioritizes the quality of user experience over other concerns.

Safety

Safety is believed to be a positive psychological state that occurs due to many personal and environmental reasons (Schueller, 2012). When evaluating an environment, it can be objectively

safe through taking all the necessary precautions yet individuals who are directly experiencing the environment might feel differently. For the purposes of this study, I am not going to delve into different meanings and types of safety and preferred to directly ask about the respondents' emotional experience and their reasons why they felt safe or unsafe.



Figure 5-7: Safety

According to the results, enough open space—which was discussed previously regarding how it makes the place easier to understand—in addition to being located in a lively area filled with socially well-behaved people are among the main reasons why 73% of the respondents feel safe. A number of respondents had a hard time pointing to a particular reason why they feel safe and stated that they just receive so many positive vibes from this place, which points to Schueller’s (2012, 141) argument that “positive emotions signal safety in the environment, which presents opportunities to increase long-term survival by building resources”. Familiarity with the place was also an expected explanation from the locals who have been caring for this park for so long (see 4.1.1. Site Introduction and History). I should mention that being in proximity to ongoing traffic alongside attracting all types of people were the reasons almost a third of the respondents do not experience this public space to be truly safe.

Comfort and Stress

Comfort is a term used for a state of ease that is defined from different perspectives and has many aspects. Having emotional security, proper personal space in social situations, pleasant temperature conditions, joy, sense of safety and trust, and low stress rates can all lead to a state of comfort that is experienced as a positive emotion (Schueller, 2012; Gifford, 2012; Goodvin & Sarb,

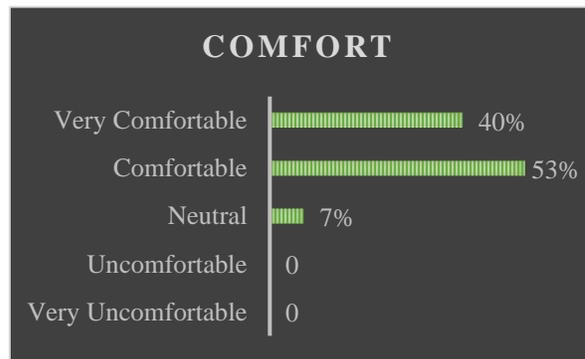


Figure 5-8: Comfort

2012). For the purposes of this study, I have not focused on the many different types of comfort as a complex physiological and cognitive process, but on the respondents' experience of this

complex process. Considering that a significant part of experiencing comfort is dependent on individual/cultural characteristics, and the fact that participants were randomly selected among adults with random age, sex and cultural backgrounds, a general agreement by 93% of the respondents on experiencing high levels of comfort and no one being uncomfortable addresses the qualities of their surrounding environment regardless of their individual differences.

According to Blum et. al. (2012, 596), the term “stress” was defined by an endocrinologist named Hans Selye as “any change to an organism that requires or elicits adjustment from that organism in order to return to homeostasis”. They explain “as changes occur in the human body, the autonomic nervous system works to restore everything to a state of balance, called homeostasis” (2012, 596).

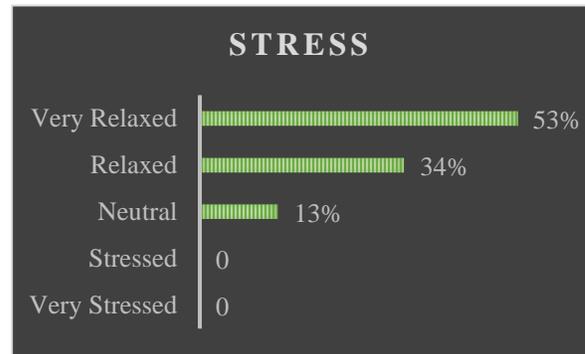


Figure 5-9: Stress

In the scope of this study, I am concerned with understanding the participants’ overall experience of a public space filled with numerous alternating events and circumstances that challenge stability and therefore, trigger stress. Similar to the discussion about comfort, despite the individual and psychological differences, 87% of the respondents have felt relaxed in their encounter with this park and there was no report of experiencing stress. It is true that stress is a very personal matter and depends on a number of controllable and uncontrollable aspects of life, regardless of what place we are at. As explained in the methodology chapter, I have designed the questionnaire in a way that the question about stress is almost at the end of the survey, hoping that guided by the questions, the process that respondents go through temporarily distracts them from personal struggles and emphasizes on the surrounding space instead. I will anonymously quote one respondent: “I have a lot of stress in my life right now. But right here, right now, I feel very relaxed. I cannot explain it, I just do”. I believe this point accurately argues that successful design can be measured in part by users reporting a lack of/reduction in stress.

Why do the participants feel very comfortable and relaxed at Berczy Park?

To answer this question, I draw on 6 findings from this study that have been discussed so far. 1) As mentioned in Attention and Sensory Inputs section (see 5.1) participants have mostly directed their attention to the salient fountain which features rushing water and admirable animal

sculptures. It also invites kids, tourists, locals and dogs to enjoy the space together. Therefore, it can be said that overall, it provides the participants with a joyful and calming experience, not to mention Biophilia and the influence of the sound of water on positive emotions. 2) This public space is so active and lively, it helps its users get away from their struggles temporarily and reinforces positive emotions that might result in better coping with personal issues. 3) Mainly because of the sound of water, people and dogs, it is not a noisy space—noise as unwanted sounds—yet it is not quiet and private. I can say it fits the context. 4) Judging by how many people take pictures in this space (one of the most observed activities) it is found to be pleasant and picturesque by most users, which again, induces positive emotions. 5) Despite being a small park lot, the designers have made the best use of space by forcing diagonal lines that provide the users with just enough open space to feel at ease and not anxious. 6) The history and character of this place for St. Lawrence neighbourhood plus the community's concern for it can be seen through so many details (e.g. them bringing movable chairs and tables to the space) which induces a sense of security and trust; even for non-locals.

5.4 Preferences and Overall Satisfaction

According to Igou et. al. (2012), when we like an object over other objects—the term object can refer to things, people, ideas, etc.—we are making a preference judgment. Preference judgments are based on comparisons between objects and preferring one over others. Psychological research has been concerned with the origin and rationality/predictability of preference judgments. Discussion about the essence of preference is outside the scope of this paper. Respondents were asked to identify the best and worst features of this park without giving a reason, as looking into the causes of these preferences would start a very complex analysis and is not the goal of this research. Expectedly, the fountain was voted as the best feature of this space followed by the presence of people, the sound of water, sculptures and artwork, historical architecture, seating furniture, location, shops and restaurants, and the grass mounds. Proximity to ongoing traffic on Front and Wellington streets and traffic noise were the major complaints about this space followed by small size and lack of shade.

Finally, respondents were asked to rate their level of satisfaction. The term “satisfaction” has been essentially used in western philosophy in discussions about happiness and meaning of life. However, if we think of public space as a product that is planned, designed and constructed, in a

sense we are talking about user satisfaction. Based on Johnson’s (2015) definition of “customer satisfaction”, I would define “satisfaction of public space” as a user’s evaluation of their experience with a public space which indicates whether the user would want to experience that space again. According to Figure 5-10, Berczy Park has been very successful at keeping its users satisfied which mutually results in better care and maintenance for the space.

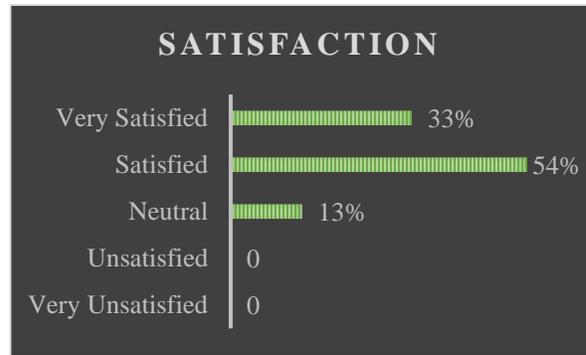


Figure 5-10: Satisfaction

Looking over all the results, there seem to be meaningful relationships among design qualities, activities, and experiences in this space. In order to be able to explore these complex relationships, I use three types of analyses. First, a 100% stacked bar chart that is used for comparing users’ experiences demonstrates the relative similarity/difference between them (Figure 5-11). Second, the users’ interaction and activities are shown on a black background to visualize the visible spatial patterns of interaction throughout this park (Figure 5-12). Third, the quality of design in this public space is assessed based on Gehl’s (Gehl & Svarre, 2013) 12 Quality Criteria as discussed in the methodology (Figure 5-13).

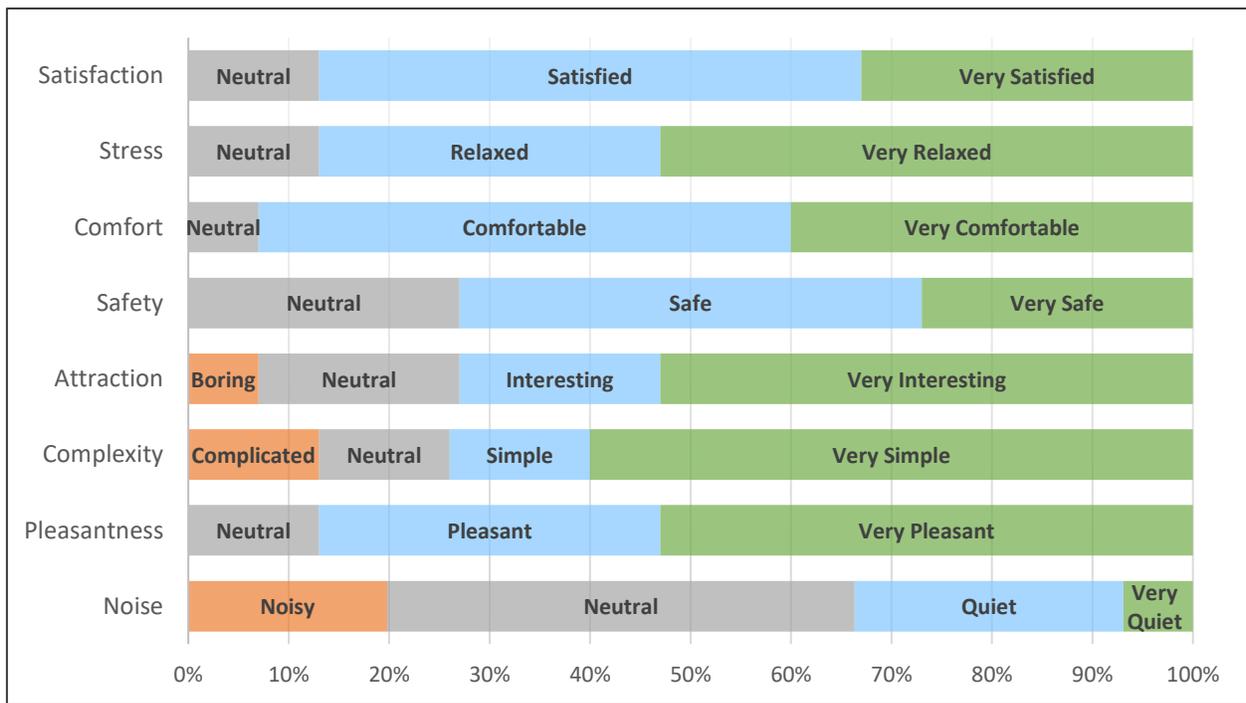


Figure 5-11: Experience of Public Space

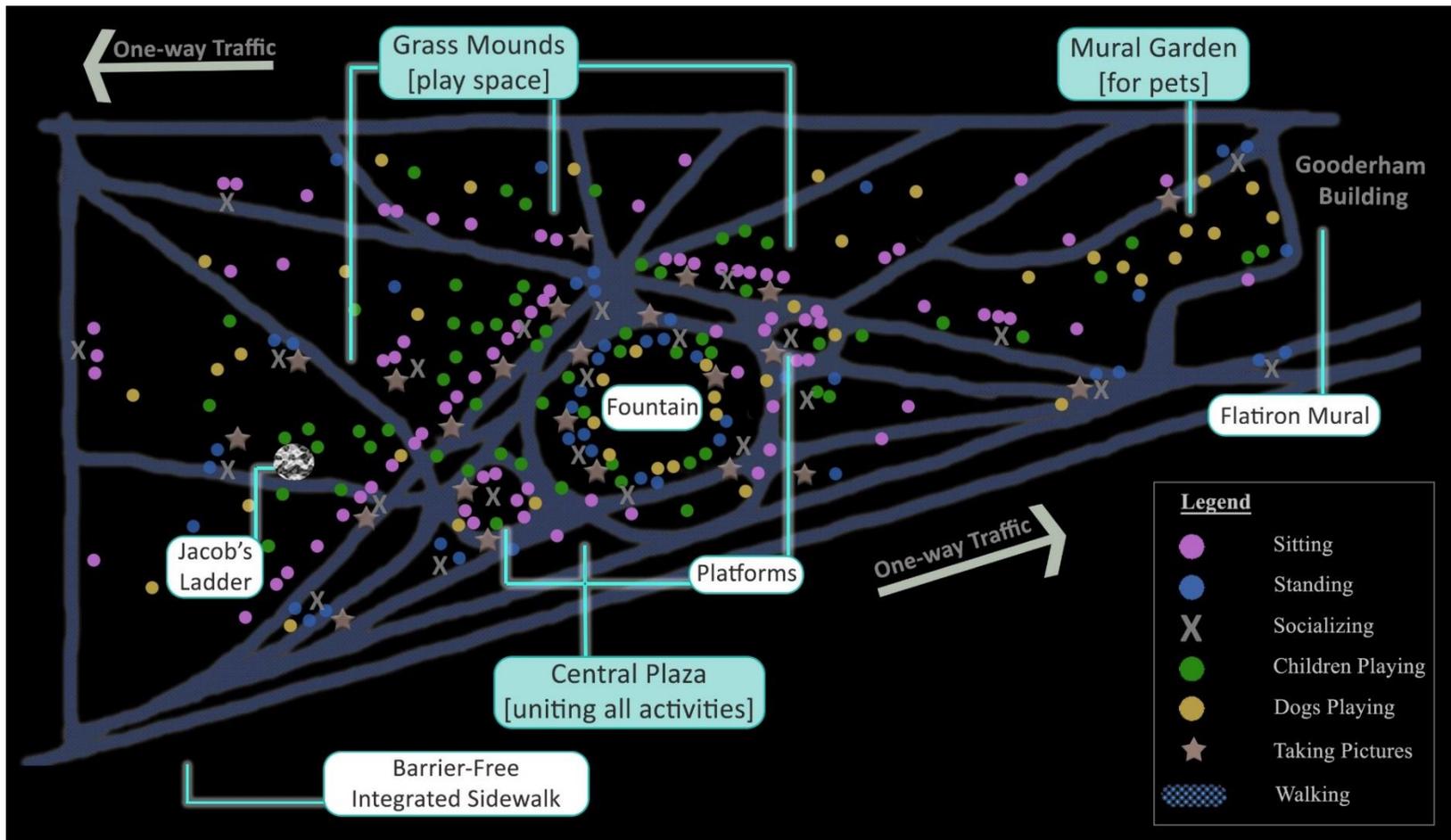


Figure 5-12: User Interaction Analysis

12 Quality Criteria

Low
 Medium
 High

Protection	<p>Protection against traffic and accidents.</p> <ul style="list-style-type: none"> - Scott St. pedestrian oriented - One-way traffic on Front and Wellington St. East - Several trees bordering the edges - Wide sidewalks - Curb parking - No crosswalk, jaywalking - No bike lanes 	<p>Protection against harm by others.</p> <ul style="list-style-type: none"> - Good lighting at night - Lively and busy all the time - Mixed-use area: residential, offices, commercial - Positive atmosphere - High numbers of families with kids and dogs - Historical character and sense of community 	<p>Protection against unpleasant sensory experiences.</p> <ul style="list-style-type: none"> - Noisy: traffic, construction, kids, dogs, tourist groups, school visits - Pet waste on grass mounds - Overwhelming load of visual stimuli - Lack of protection against wind, rain, snow, strong sun - Fountain and sound of water effective in covering some noise 	
Comfort	<p>Options for mobility.</p> <ul style="list-style-type: none"> - Highly accessible for walking, biking, wheelchair, stroller - Sidewalk integration into the park on Front E. - Extension to barrier-free & curb-less Scott St. - Ongoing sidewalk widening project on Wellington E. - Clear pathways and wayfinding 	<p>Options to stand and linger.</p> <ul style="list-style-type: none"> - Under tree shades - Around the fountain - Grass mounds - Mural garden (animal gravel patch) - Jacob's ladder 	<p>Options for sitting.</p> <ul style="list-style-type: none"> - Stretched benches - Movable chairs & tables - Stage platform surfaces - Grass lawns - Fountain edge 	
	<p>Options for seeing.</p> <ul style="list-style-type: none"> - Fountain & dog sculptures - People & their pets - Flatiron building & mural - Jacob's ladder - Historical architecture, shops & restaurants on Front E. - Futuristic skyscrapers on Yonge St. in the background - City sightseeing buses - Cultural, historical, haunted Toronto & Toronto ghosts walking tours - Occasional art performances 	<p>Options for talking and listening/hearing.</p> <ul style="list-style-type: none"> - Couples - Small social groups - Large social groups/tours - Community meetings 	<p>Options for play, exercise, and activities.</p> <ul style="list-style-type: none"> - Play (kids & dogs): Fountain & sculptures, Grass mounds, Jacob's ladder, Mural garden - Photography favourites: Selfies, Fountain & sculptures, Flatiron mural, Jacob's ladder, Historical buildings & modern towers, People, Dogs - Dog-walking - Reading: Mural garden, lawns, plaza - Stage platforms - Public art in the plaza 	
Enjoyment	<p>Scale.</p> <ul style="list-style-type: none"> - Complicated scale and overwhelming built form - Human scale, wide integrated sidewalks, 4 storey buildings to the south (Front St.) - Human scale, Gooderham building (mid-rise) to the east - Mix of mid-rise & high-rise, sidewalk widening project to the north (Wellington St.) - Semi-human scale, pedestrian-oriented stone-paved street to the west (Scott St.) - View to the Financial District's massive skyscrapers (Yonge St.) 	<p>Opportunities to enjoy the positive aspects of climate.</p> <ul style="list-style-type: none"> - A very enjoyable "summer park" - No protection against wind, rain, snow and strong sun - Surrounding buildings do not cast shadows on the main plaza - Shade provided by the trees, yet insufficient - Sufficient open space to enjoy a mild breeze 	<p>Experience of aesthetic qualities and positive sensory experiences</p> <ul style="list-style-type: none"> - Picturesque - Artistic and thoughtful fountain architecture featuring 27 life-size dog sculptures - Sufficient landscaping & gardening - Flatiron mural 3D artwork - Interesting structure of Jacob's ladder - No Littering - Engaging diamond-shaped paver - Intriguing grass mounds & dynamic horizon lines - Smart layout, perspectives and straight lines creating an illusion of bigger size - The fountain sprays water 	

Figure 5-13: 12 Quality Criteria

In order to provide a summary of the results and explore these interrelationships one step further, Table 5-1 explains the connections between design quality, activity and experience in this space and draws on the previous findings and discussions of this study. As can be seen, these connections are not unidirectional or linear, but rather developed around a number of patterns that could be difficult to point at. Findings of this study show that when exploring phenomena, if we look at isolated components of the whole (system) we could find unexpected results that are not able to correctly explain the whole and could be rather misleading. For instance, this public space technically provides low protection against noise and it is situated in a noisy area of downtown core, however 0 respondents find it noisy, unpleasant, uncomfortable and/or stressful. The underlying factors explaining these seemingly paradoxical results could include the mere presence of water, people having conversations, children laughing and dogs barking, and the respondents' awareness of the lively urban context thus managing their expectation-satisfactions.

Table 5-1: Analytic summary

Design quality	Activity	Experience
Low protection against unpleasant sensory experiences, except for the fountain/water	All converge in the central plaza where the fountain strongly dominates the space, activities and experiences.	Almost half are <u>neutral</u> about noise. More than half find it <u>very pleasant</u> . Fountain/water is the <u>best</u> feature. Traffic noise is the <u>worst</u> feature. Fountain is the <u>first</u> object to see and hear.
Medium protection against traffic and accidents	Few bikers Jaywalking across Front St. street	Almost half feel <u>safe</u> . More than half feel <u>very relaxed</u> . <u>Proximity to traffic is the worst feature</u> .
Medium human scale	Not using benches on Scott St. or facing Wellington St. Almost everyone is facing Front St. Mostly standing & lingering in the central plaza with more open space.	Almost two-thirds find it <u>very simple</u> . More than half feel <u>very relaxed</u> .

High number of opportunities to enjoy the positive aspects of climate [in the summer]	Sitting, Standing, Socializing, Children playing, Dogs playing, Taking pictures, Walking. Highly popular	More than half find it <u>very pleasant</u> . More than half feel <u>very relaxed</u> . More than half are <u>comfortable</u> .
High protection against harm by others	High numbers of kids and dogs playing in all areas	Almost half feel <u>safe</u> . More than half are <u>comfortable</u> . More than half feel <u>very relaxed</u> .
High number of options for mobility	Walking (strong patterns, excellent navigation) Desire paths over the grass mounds Quick detours into the space since it is extended and barrier-free	Almost two-thirds find it <u>very simple</u> .
High number of options to stand and linger	Standing, Socializing, Taking pictures	More than half find it <u>very interesting</u> . Attention to people.
High number of options for sitting	Sitting, Socializing, Taking pictures	More than half are <u>comfortable</u> . Attention to furniture.
High number of options for seeing	Sitting, Standing, Socializing, Taking pictures	More than half find it <u>very interesting</u> . More than half find it <u>very pleasant</u> . Attention to the fountain, people, dogs, trees, paver, layout, furniture, buildings, public art, play structure.
High number of options for talking/listening	Sitting, Standing, Socializing, Taking pictures	Almost half are <u>neutral</u> about noise. Almost half feel <u>safe</u> . More than half are <u>comfortable</u> . Attention to sound of water, people, dogs.

<p>High number of options for play</p>	<p>Children, dogs, adults playing concentrated in central plaza and green spaces. Taking pictures</p>	<p>More than half find it <u>very interesting</u>. More than half are <u>comfortable</u>. More than half feel <u>very relaxed</u>. Attention to people, dogs, green space, Jacob’s Ladder play structure</p>
<p>High aesthetic quality and positive sensory experiences</p>	<p>Sitting, Standing, Socializing, Children playing, Dogs playing, Taking pictures, Walking. Highly popular</p>	<p>More than half find it <u>very interesting</u>. More than half find it <u>very pleasant</u>. More than half are <u>comfortable</u>. More than half feel <u>very relaxed</u>. Almost half are <u>neutral</u> about noise.</p>
<p>Overall score: 27/36. High quality design</p>	<p>Sitting, Standing, Socializing, Children playing, Dogs playing, Taking pictures, Walking. Highly popular</p>	<p>Almost half are <u>neutral</u> about noise. More than half find it <u>very pleasant</u>. Almost two-thirds find it <u>very simple</u>. More than half find it <u>very interesting</u>. Almost half feel <u>safe</u>. More than half are <u>comfortable</u>. More than half feel <u>very relaxed</u>. More than half are <u>satisfied</u>, a third are <u>very satisfied</u>, and 0 are <u>unsatisfied</u>.</p>

6 CONCLUSION

Environment-Behaviour Research (EBR) is a cross-disciplinary exploration of everyday human experience and action in complex real-life environments. Although the field of Environment-Behaviour Studies (EBS) was established on the grounds of Environmental Psychology, Behavioural Geography and Cultural Studies, today there is an opportunity for incorporating other relevant fields such as Cognitive Psychology and Brain Science into the domain of EBS. In this study, I mainly advocate for the need to revisit an expanded domain of EBS in Human-Centred Urban Planning and Design practices since the fundamental problem of EBR is firmly entangled with everyday public spaces in cities. EBS provides planning and design practices with an empirical scientific paradigm that could result in a more evidence-based bottom-up approach through prioritizing human experiences and actions. In other words, evidence-based human-centred urban planning and design could be viewed as the research application of EBS. In addition, revisiting philosophical assumptions in this field can encourage planning/design researchers and practitioners to rethink their views, put traditional methods into perspective and explore new ways of approaching issues using the best available knowledge.

The objectives of this study were to conduct cognitive research—understand phenomena rather than changing them—on the users of Berczy Park in Toronto on a psychological level (their experiences and actions), assessing the quality of design in the physical environment as well as exploring the relationships between user interactions, experiences, and quality of design. Key findings from this study support the theoretical assumption of viewing phenomena as holistic systems comprised of components and their complex reciprocal relationships. To elaborate, relationships between design qualities, activities and experiences are not unidirectional and studying them in isolation could be misleading. The findings indicate that in the case of Berczy Park which functions a lot more like an urban plaza than a park, successful design of public urban space can be measured by qualities such as human scale, aesthetics, creative features, high number of options for sitting, standing, playing, seeing, mobility and socializing, as well as users reporting high levels of attention, joy, attraction, safety, comfort and satisfaction alongside low levels of noise and stress. This study presented me with a number of further questions among which I find the association between design and the cognitive process of attention to be very interesting.

7 APPENDICES

Appendix A: Gehl's 12 criteria on urban design quality, Gehl & Svarre (2013).

Current version retrieved from <https://gehl.institute.org/tool/quality-criteria/>

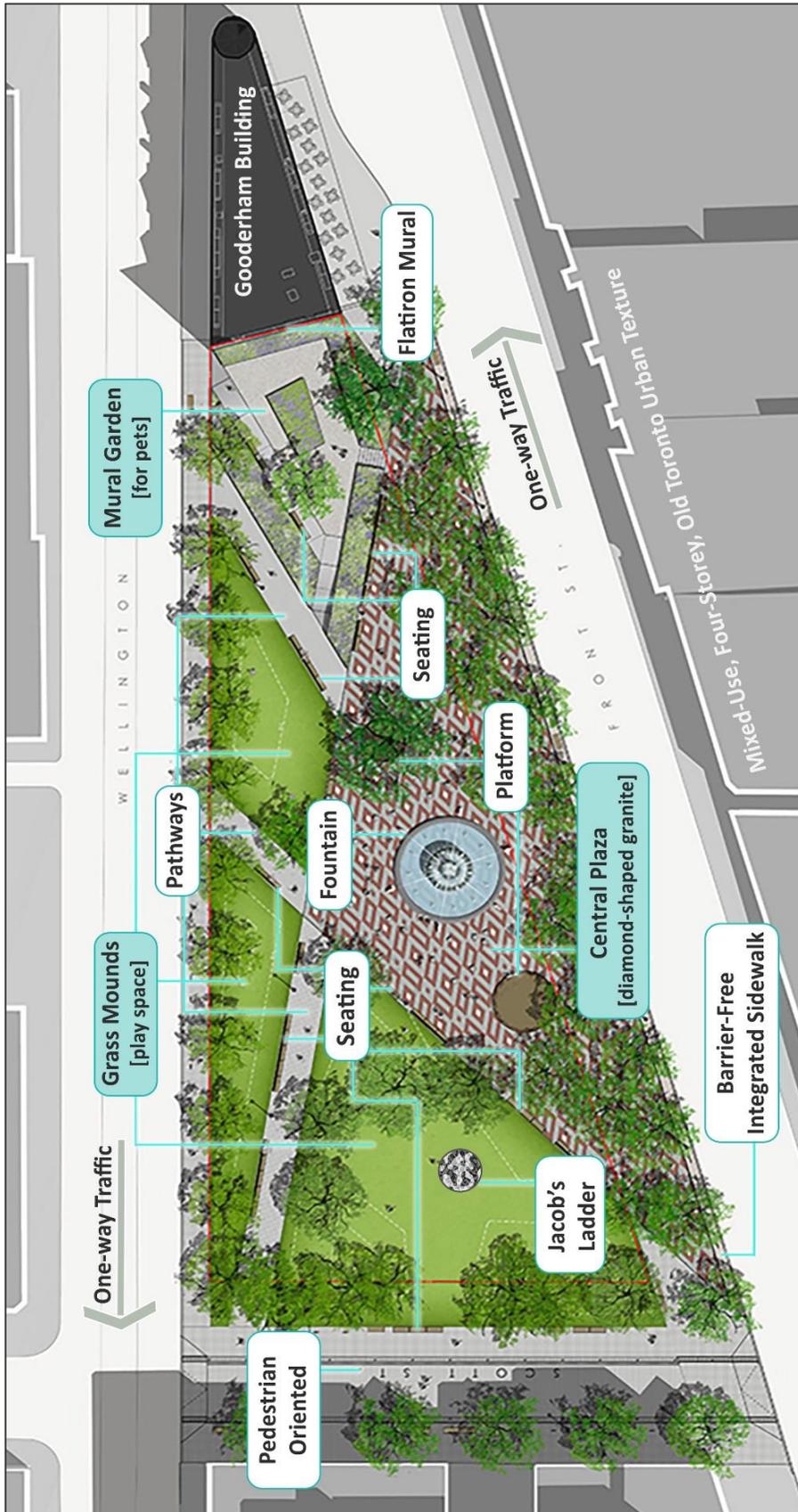
TWELVE URBAN QUALITY CRITERIA

LOCATION:

3 = YES
2 = IN BETWEEN
1 = NO

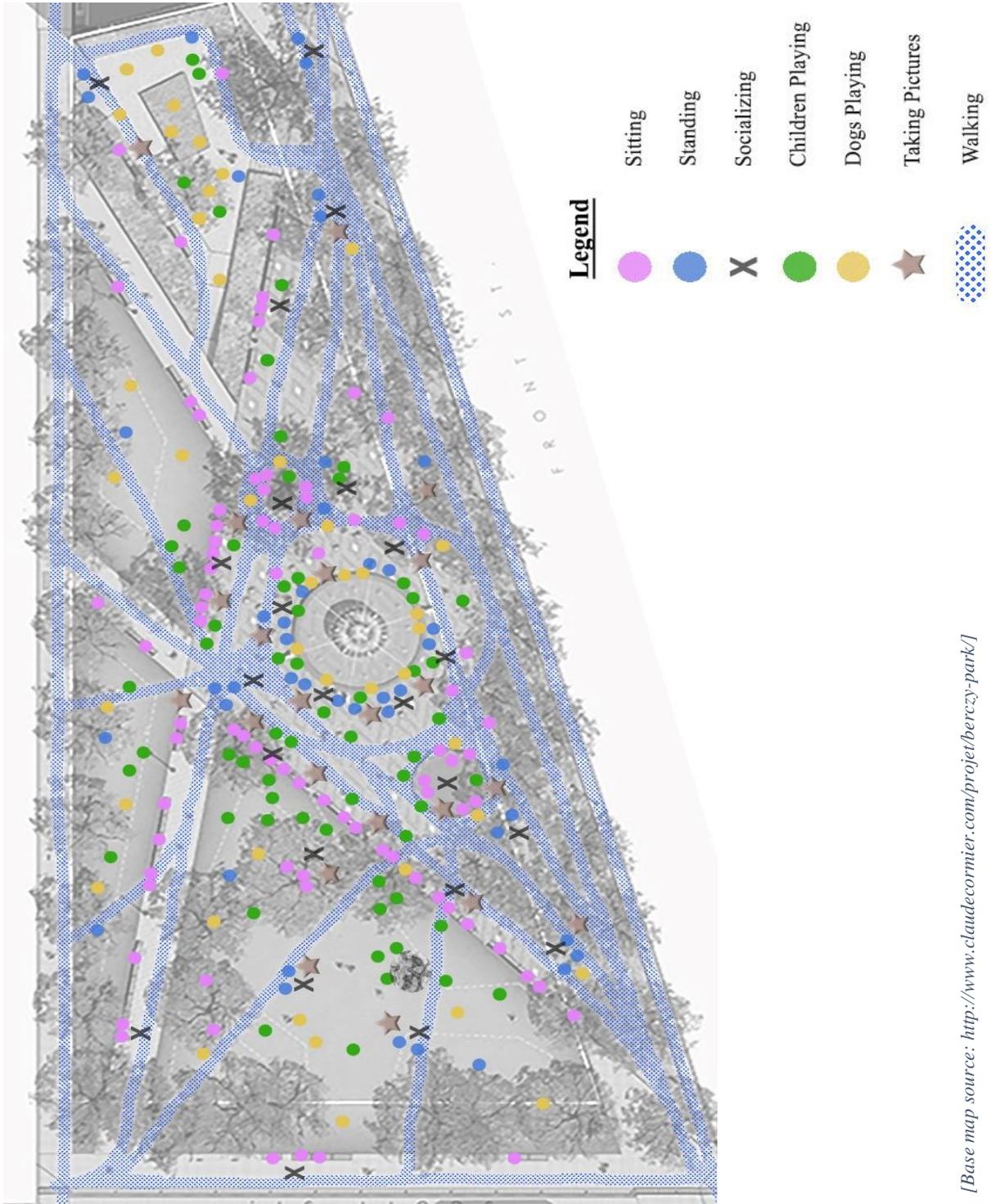
Protection	<p>Protection against traffic and accidents. Do groups across age and ability experience traffic safety in the public space? Can one safely bike and walk without fear of being hit by a driver?</p>	<p>Protection against harm by others. Is the public space perceived to be safe both day and night? Are there people and activities at all hours of the day because the area has, for example, both residents and offices? Does the lighting provide safety at night as well as a good atmosphere?</p>	<p>Protection against unpleasant sensory experience. Are there noises, dust, smells, or other pollution? Does the public space function well when it's windy? Is there shelter from strong sun, rain, or minor flooding?</p>
	<p>Options for mobility. Is this space accessible? Are there physical elements that might limit or enhance personal mobility in the forms of walking, using of a wheelchair, or pushing a stroller? Is it evident how to move through the space without having to take an illogical detour?</p>	<p>Options to stand and linger. Does the place have features you can stay and lean on, like a façade that invites one to spend time next to it, a bus stop, a bench, a tree, or a small ledge or niche?</p>	<p>Options for sitting. Are there good primary seating options such as benches or chairs? Or is there only secondary seating such as a stair, seat wall, or the edge of a fountain? Are there adequate non-commercial seating options so that sitting does not require spending money?</p>
	<p>Options for seeing. Are seating options placed so there are interesting things to look at?</p>	<p>Options for talking and listening/hearing. Is it possible to have a conversation here? Is it evident that you have the option to sit together and have a conversation?</p>	<p>Options for play, exercise, and activities. Are there options to be active at multiple times of the day and year?</p>
Enjoyment	<p>Scale. Is the public space and the building that surrounds it at a human scale? If people are at the edges of the space, can we still relate to them as people or are they lost in their surroundings?</p>	<p>Opportunities to enjoy the positive aspects of climate. Are local climatic aspects such as wind and sun taken into account? Are there varied conditions for spending time in public spaces at different times of year? With this in mind, where are the seating options placed? Are they located entirely in the shadows or the sun? And how are they oriented/placed in relation to wind? Are they protected?</p>	<p>Experience of aesthetic qualities and positive sensory experiences. Is the public space beautiful? Is it evident that there is good design both in terms of how things are shaped, as well as their durability?</p>

Appendix B: Site plan



[Base map source: <http://www.claudecormier.com/projet/berczy-park/>]

Appendix C: User interaction



Appendix D: Questionnaire

Questionnaire

1. **Please name the first 3 things you notice about this place specifically. (It can be anything: an object, a sound, a smell, a feeling, people, etc.)**

1) _____

2) _____

3) _____

2. **How noisy do you find this park?**

Very noisy 5 4 3 2 1 Quiet

3. **How pleasant and beautiful do you find this park?**

Very pleasant 5 4 3 2 1 Unpleasant

Please specify why? _____

4. **How complicated do you find this park? (complicated: too many things to look at, too many people, or too much is happening overall)**

Complicated 5 4 3 2 1 Simple

Please specify why? _____

5. **How interesting do you find this park?**

Interesting 5 4 3 2 1 Boring

Please specify why? _____

6. **How safe does this place make you feel?**

Safe 5 4 3 2 1 Dangerous

Please specify why? _____

7. **How comfortable do you feel being in this park?**

Comfortable 5 4 3 2 1 Uncomfortable

8. **How would you rate your level of stress at the moment?**

Stressed 5 4 3 2 1 Relaxed

9. **What do you like best about this park?**

10. **In your opinion, what is the worst feature of this park?**

11. **Overall, how satisfied are you with this place?**

Very satisfied 5 4 3 2 1 Not satisfied

12. **Is there anything else you would like to say about your experience of this park?**

8 REFERENCES

- Alexander, C. (1977). *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.
- Alexander, C. (1979). *A Timeless Way of Building*. Oxford: Oxford University Press.
- Altman, I., Werner, C. M., Oxley, D., & Haggard, L.M. (1987). "Christmas Street" As an Example of Transactionally Oriented Research. *Environment and Behaviour*, 19: pp. 501-524.
- Altman, Irwin (1973). Reciprocity of interpersonal exchange. *Journal for Theory of Social Behavior*, 3: pp. 249–261.
- Appleyard, D. (1981). *Livable Streets*. Berkeley: University of California Press.
- Blum S., Brow, M., Silver, R.C. (2012). Coping. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 596-601.
- Bodenhamer, D. J., Corrigan, J., & Harris, T. M. (2010). *The spatial humanities: GIS and the future of humanities scholarship*. Bloomington: Indiana University Press.
- Bosselmann, P. (1984). *Sun, Wind, and Comfort: A Study of Open Spaces and Sidewalks in Four Downtown Areas*. Berkeley: Institute of Urban and Regional Development, College of Environmental Design, University of California.
- Botton, A. D. (2006). *The Architecture of Happiness*. London: Hamish Hamilton.
- Broadly, M. (1968). *Planning for People: Essays on the Social Context of Planning*, London: Bedford Square press.
- Brosch, T., Scherer, K., Granjean. D., Sander, D. (2013). The impact of emotions on perception, attention, memory and decision-making. In *Swiss Med. Wkly*:143. w13786.
- Charlton, S. R., Sobel, K.V. (2012). Judgment. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 487-494.
- Craik, K. H. (1970). *Environmental Psychology*. New Directions in Psychology. New York: Holt.
- Dayaratne, R. (2002). Environment-Behavior Research and the Practice of Architecture: Paradigms and Paradoxes. *Built-Environment Sri Lanka*, 3, 1: pp. 38-46.
- Eberhard, J. P. (2008). *Brain landscape: The coexistence of neuroscience and architecture*. New York: Oxford University Press.
- Ellard, C. (2015). *Places of the heart: The psychogeography of everyday life*. New York: Bellevue Literary Press.
- Ewing, R., Handy, S. (2009). Measuring the Unmeasurable: Urban Design Qualities Related to Walkability. *Journal of Urban Design*, 14, 1: pp. 65-84.
- Gehl, J. & Svarre, B. (2013). *How to Study Public Life*. Washington, DC: Island Press.

- Gehl, J. (1987). *Life between Buildings: Using Public Space* (trans. By Loch, J.), New York: Van Nostrand Reinhold.
- Gehl, J. (2010). *Cities for People*. Washington, DC: Island Press.
- Gehl, J. (2011). *Life between buildings: using public space*. Washington, DC: Island Press.
- Gibson, J. J. (1968). *The senses considered as perceptual systems*. London: Allen & Unwin.
- Gifford, R. (2007). Environmental psychology and sustainable development: Expansion, maturation, and challenges. *Journal of Social Issues*, 63: pp. 199–212
- Gifford, R. (2012). Environmental Psychology. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 54-60.
- Gifford, R., Steg, L., & Reser, J. P. (2011). Environmental Psychology. In *IAAP Handbook of Applied Psychology*, pp. 440–470. Oxford, UK: Wiley-Blackwell.
- Goldhagen, S. W. (2017). *Welcome to your world: How the built environment shapes our lives*. New York, NY: HarperCollins.
- Goodvin, R., Sarb, B.A. (2012). Social Development (Attachment, Imprinting). In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 470-478.
- Harvey, D. (2012). *Rebel Cities: From the right to the city to the urban revolution*. London: Verso.
- Igou, E.R., van Dongen, F., van Tilburg, W.A.P. (2012). Preference Judgments (Individuals). In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 153-159.
- Jacobs, A. B. (1985). *Looking at Cities*. Cambridge, MA: Harvard University Press.
- Jacobs, A. B. (1993). *Great Streets*. Cambridge, Mass.: MIT Press.
- Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.
- Jacobs, J. (2011, Sep). *Downtown is for People*. Fortune. NYC: Time Inc. (Reprinted from Fortune, 1958)
- Johnson, M. D. (2015). Customer Satisfaction. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences*, pp. 630-632.
- Kaplan, R., Kaplan, S. & Ryan, R. L. (1998). *With People in Mind: Design and Management of Everyday Nature*. Washington, DC: Island Press.
- Lang, J. (1974). *Designing for Human Behaviour: Architecture and the Behavioural Sciences*. Community Development Series. Pennsylvania: Dowden, Hutchinson & Ross.
- Lynch, K. (1960). *The Image of the City*. Cambridge, MA: MIT Press.
- MacEvan, M. (1974). *Crisis in Architecture*. London: RIBA Publications Ltd.
- Mackay, C. (2002). *The Toronto story*. Toronto: Annick Press.

- Marcus, C. C., & Sachs, N. A. (2013). *Therapeutic landscape: An evidence-based approach to designing healing gardens and restorative outdoor spaces*. Hoboken: John Wiley & Sons.
- Marcus, C., C., Francis, C. (1990). *People Places: Design Guidelines for Urban Open Spaces*. New York: Van Nostrand Reinhold.
- Moore, G. T. (2006). *Environment, Behaviour and Society: A Brief Look at the Field and Some Current EBS Research at the University of Sydney*. Proceedings of the 6th International Conference of the Environment-Behavior Research Association (China).
- Pallasmaa, J. (2005). *The eyes of the skin: Architecture and the senses*. Chichester: Wiley-Academy.
- Palti, I. (2016). Defining Conscious Cities. *Journal of Urban Design and Mental Health*, 1, 1. Retrieved from <https://www.urbandesignmentalhealth.com/journal1-ipeditorial.html>
- Palti, I., Bar, M. (2015). A manifesto for conscious cities: should streets be sensitive to our mental needs? *The Guardian* (28 Aug 2015). Retrieved from <https://www.theguardian.com/cities/2015/aug/28/manifesto-conscious-cities-streets-sensitive-mental-needs>
- Porteous, J. D. (1977). *Environment & Behavior: Planning and Everyday Urban Life*. Reading, MA: Addison-Wesley Pub.
- Ramachandran, V. S. (Ed.). (2012). *Encyclopedia of human behavior*. London: Elsevier.
- Rapoport, A. (1975). An “anthropological” approach to environmental design research. In B. Honikman (Ed.), *Responding to social change*. Stroudsburg, Pa.: Dowden, Hutchinson & Ross, pp. 145–151.
- Rapoport, A. (1976a). Socio-cultural aspects of man-environment studies. In A. Rapoport (Ed.), *The mutual interaction of people and their built environment: A cross cultural perspective*. The Hague: Mouton, pp. 7–35.
- Rapoport, A. (1976b). Environmental cognition in cross-cultural perspective. In G. T. Moore & R. G. Gollege (Eds.), *Environmental knowing*. Stroudsburg, Pa.: Dowden, Hutchinson & Ross, pp. 220–234.
- Rapoport, A. (1990). *The meaning of the built environment: A nonverbal communication approach*. Tucson: The University of Arizona Press.
- Riaz, A., Gregor, S., Lin, A. (2018). Biophilia and biophobia in website design: Improving internet information dissemination. In *Information & Management*, 55, 2: pp. 199-214.
- Schueller, S.M. (2012). Positive Psychology. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 140-147.
- Smith, J. R., & Haslam, S. A. (Eds.). (2017). *Social psychology: Revisiting the classic studies*. Los Angeles: SAGE.
- Sommer, R. (1969). *Personal Space: The Behavioural Basis of Design*. Englewood Cliffs N.J.: Prentice Hall.

- Spence, C. (2012). Attention. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 211-217.
- Spencer, C., Gee, K. (2012). Environmental Cognition. In V. S Ramachandran (Ed.), *Encyclopedia of human behavior*, pp. 46-53.
- Stokols, D. (1995). The Paradox of Environmental Psychology. *American Psychologist*, 1, 40, 10: pp. 821-837.
- Sussman A., Ward J. M., (2016). Planning for the Subconscious: Using eye tracking and other biometric tools to better understand ourselves. *Planning*, 82, 6: pp. 31-34.
- Sussman, A., & Hollander, J. B. (2015). *Cognitive architecture: Designing for how we respond to the built environment*.
- Tashakorri, A., Creswell. J. W. (2007). The New Era of Mixed Methods. *Journal of Mixed Methods Research*, 1(Jan 2007): pp. 3-7. Retrieved from <http://journals.sagepub.com/doi/pdf/10.1177/2345678906293042>
- Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.
- Walsh, W. B. (1973). *Theories of Person-Environment Interaction: Implications for the College Student*. IA City, IA: The American College Testing Program.
- Wapner, S., Demick, J., Yamamoto, C., & Minami, H. (Eds.). (2000). *Theoretical perspectives in environment-behavior research: Underlying assumptions, research problems, and methodologies*. New York, NY: Kluwer Academic/Plenum.
- Wapner, S., Quilici-Matteucci, F., & Cool, K. (1991). Cross-cultural comparisons of necessities, amenities and luxuries in the physical, interpersonal and sociocultural aspects of the environment. In T. Niit, M. Raudsepp, & K. Liik (Eds), *Environment and social development: Proceedings of the east-west colloquium in environmental psychology*, pp. 47-56. Tallinn, Estonia: Tallinn Pedagogical Institute.
- Whyte, W. H. (1988). *City: Rediscovering the Center*. New York: Doubleday.
- Whyte, W. H. (1990). *The Social Life of Small Urban Spaces*. Washington, D.C.: Conservation Foundation.
- Whyte, W. H. (2000). *The Essential William H. Whyte* (A. LaFarge, Ed.). New York: Fordham University Press.
- Wilson, E., O. (1984). *Biophilia*. Cambridge: Harvard University Press.
- Zeisel, J. (1981). *Inquiry by design: Tools for environment-behavior research*. Monterey, Calif: Brooks/Cole Pub. Co.
- Zeisel, J. (2006). *Inquiry by design: Environment, behavior, neuroscience in architecture, interiors, landscape, and planning*. New York: Norton & Company.